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RRB

MATHEMATICS

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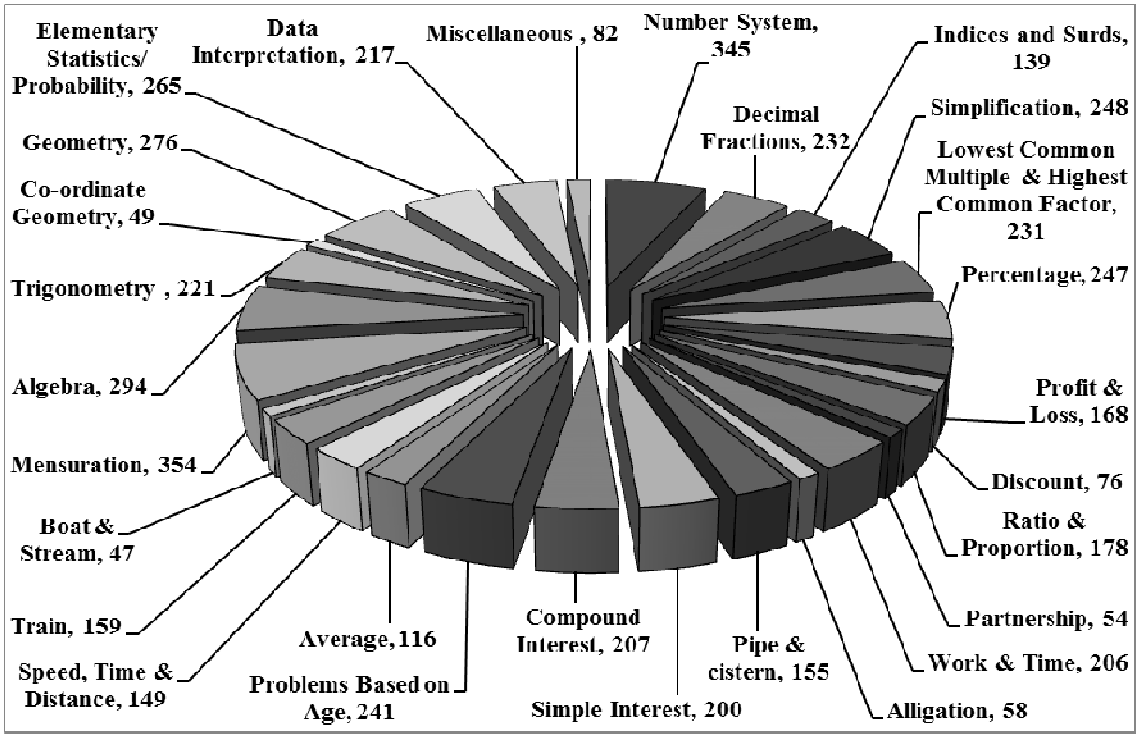
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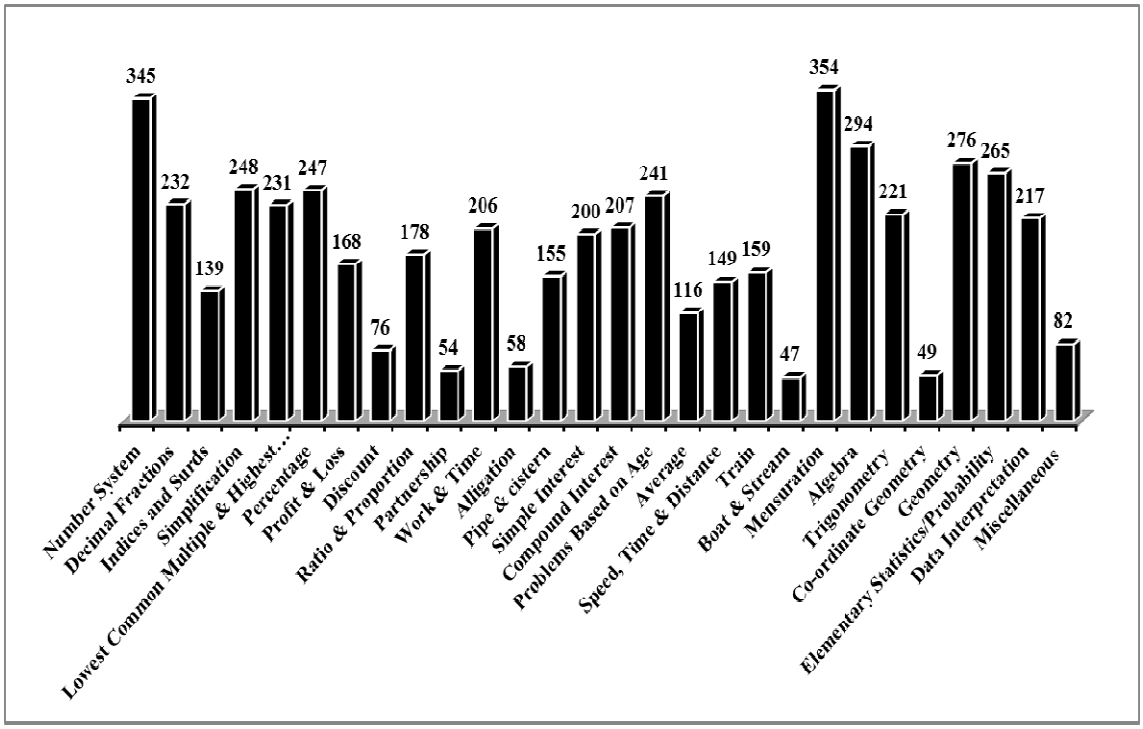
Analysis chart of Question Papers of Various Previous Exams of RRB

S.N.	Exams	Exam year	Total question paper	Total Maths questions
1.	**RRB NTPC 2019 Stage-2**	2022	15	35 × 15 = 525
2.	**RRB Group-D 2019**	2022	99	25 × 99 = 2475
3.	**RRB NTPC 2019 Stage-1**	2020-21	133	30 × 133 = 3990
4.	**RPF Constable 2018**	2019	17	35 × 17 = 595
5.	**RPF SI 2018**	2019	23	35 × 23 = 805
6.	**RRB JE 2018**	2019	38	38 × 30 = 1140
7.	**RRB ALP 2018 Stage-2**	2019	18	18 × 40 = 720
8.	**RRB Paramedical 2019**	2019	7	18 × 7 = 126
9.	**RRB ALP/Tech. 2018 Stage-1**	2018	30	25 × 30 = 750
10.	**RRB Group D 2018**	2018	135	25 × 135 = 3375
11.	**RRB NTPC 2015 Stage-2**	2017	9	35 × 9 = 315
12.	**RRB NTPC 2015 Stage-1**	2016	63	30 × 63 = 1890
		Total	**587**	**16,706**

Note– In this book, out of total **587** papers of JE, ALP, NTPC, RPF Constable, RPF SI, Group D and Paramedical exams conducted by RRB, out of total **16706** questions asked from General Mathematics. Same behavior have been removed and chapterwise compilation of questions of different types has been presented. In this book, every effort has been made by the Examination Special Committee to accommodate maximum variety of questions, so that the examinees can be made aware of the variety of questions asked by RRB.

Trend Analysis of Previous Year RRB : JE, ALP, NTPC, Group-D, RPF SI & Constable, Paramedical Papers Through Pie Chart and Bar Graph





01.

Number System

Type - 1

1. Which of the following numbers is divisible completely by both 9 and 11 ?

(a) 277218 (b) 10098
(c) 12345 (d) 181998

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : Divisibility rule of 9 -
When the sum of the digits of a number is divisible by 9 then the number is also divisible by 9.
Divisibility rule of 11 -
When the difference between the sum of the digit in even and odd place of a number is 0 (zero) or a multiple of 11, then the number will also be divisible by 11.
From option (b),
1 + 0 + 0 + 9 + 8 = 18
i.e. 18 is divisible by 9
$\therefore$ Option (d) us divisible by 9.
And
$$10098 = (9 + 0) - (8+0+1) = 9-9 = 0$$
Hence option (b) 10098, is divisible by both 9 and 11.

2. Which of the following numbers is NOT divisible by 9 ?

(a) 49104 (b) 77832
(c) 35253 (d) 45390

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (d) : Divisibility rule of 9 : A number whose sum of its digit is exactly divisible by 9 then the number is always divisible by 9.
from options -
(a) 49104 $\rightarrow$ 4 + 9 + 1 + 0 + 4 = 18, divisible by 9.
(b) 77832 $\rightarrow$ 7 + 7 + 8 + 3 + 2 = 27, divisible by 9.
(c) 35253 $\rightarrow$ 3 + 5 + 2 + 5 + 3 = 18, divisible by 9.
(d) 45390 $\rightarrow$ 4 + 5 + 3 + 9 + 0 = 21, not divisible by 9.

3. Which of the following number is NOT divisible by 8?

(a) 35792 (b) 35112
(c) 35412 (d) 35552

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Divisibility rule of 8- If the last three digits of a number are divisible by 8, then the number is completely divisible by 8.
from the given options -
(a) 35 $\underline{792}$
$\frac{792}{8} = 99$ (Completely divisible)
(b) 35 $\underline{112}$
$\frac{112}{8} = 14$ (Completely divisible)
(c) 35 $\underline{412}$
$\frac{412}{8} = 51.5$ (Not completely divisible)
(d) 35 $\underline{552}$
$\frac{552}{8} = 69$ (Completely divisible)
Hence, option (c) is not divisible by 8.

4. If the 7 digit number 504x5y3 is divisible by 11, then one of the values of the sum of x and y is:

(a) 11 (b) 5
(c) 17 (d) 7

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

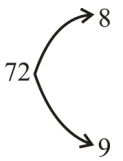
Ans. (c) : Given, 504x5y3
Divisibility rule of 11:- If the difference of the sum of digits at even place and at odd place is zero or divisible by 11 then the given number will be divisible by 11.
504x5y3
(0 + x + y) – (5 + 4 + 5 + 3)
x + y – 17 = 0
x + y = 17
Hence, Sum of x + y = 17

5. If 11-digit number 88p554085k6, k ≠ p, is divisible by 72, then what is the value of (3k + 2p)?

(a) 12 (b) 7
(c) 13 (d) 23

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (c) : Given,
88p554085k6 Where, k ≠ p
Note- The number which is divisible by 72 is also divisible by 8 and 9.
Divisibility rule of 8– If the last three digit of the number are divisible by 8, then the number will be divisible by 8.
Divisibility rule of 9– If the sum of the all digits of a given number is divisible by 9, then number will be divisible by 9.



88p554085k6
On putting, k = 3
$\frac{536}{8} = 67$ (Completely divisible by 8)
and On putting p = 2
$$\frac{8+8+2+5+5+4+0+8+5+3+6}{9}$$

$= \frac{54}{9} = 6$ (Completwly divisible)

Then, $(3k + 2p)$

$= 3 \times 3 + 2 \times 2$

$= 13$

6. Find the remainder, when 171 × 172 × 173 is divided by 17.

(a) 9 (b) 8

(c) 6 (d) 7

RRB Group-D 29/08/2022 (Shift-III)

Ans. (c) : According to the question,

$$\frac{171 \times 172 \times 173}{17}$$

$$\Rightarrow \frac{(170+1) \times (170+2)(170+3)}{17}$$

$$\Rightarrow \frac{1 \times 2 \times 3}{17}$$

$$\Rightarrow \frac{6}{17}$$

$\Rightarrow$ 6 (Remainder)

Hence option (c) is correct.

7. When a number is divided by a divisor, the remainder is 16. When twice the original number is divided by the same divisor, the remainder is 3. Find the value of that divisor

(a) 29 (b) 51

(c) 23 (d) 53

RRB Group-D 30/08/2022 (Shift-II)

Ans. (a) : Let, the original number be N, the divisor be d, quotient be q.

$N = dq + 16$

$\therefore 2N = 2(dq + 16)$

$2N = 2dq + 32$

When $(2dq + 32)$ is divided d then remainder is 3.

2dq is completely divisible by d, then

$\therefore$ Required number = 32 – 3 = 29

8. If the number 6484y6 is divisible by 8, then find the least value of y?

(a) 3 (b) 4

(c) 1 (d) 7

RRB Group-D 02/09/2022 (Shift-II)

Ans. (c) : Divisibility rule of 8 - If the last three digits of the given number are divisible by 8 then it will be divisible by 8.

On putting Least value of y = 1

Number = 648416

Divided by = $\frac{416}{8} = 52$

9. If the 15 digit number 4a5124356789734 is divisible by 9, then the value of "a" is .....

(a) 1 (b) 4

(c) 5 (d) 3

RRB GROUP-D – 22/09/2022 (Shift-III)

Ans. (b) : Divisibility rule of 9 - If the sum of the digits are divisible by 9, then the number is divisible by 9.

Number - 4a5124356789734

On divided by 9 -

$$\frac{4+a+5+1+2+4+3+5+6+7+8+9+7+3+4}{9}$$

$= \frac{a+68}{9} \Rightarrow$ On putting a = 4 $\Rightarrow \frac{4+68}{9} = \frac{72}{9} = 8$

Hence the value of a = 4

10. If the 8 digit number 3x5479y4 is divisible by 88 and the 8 digit number 425139z2 is divisible by 9, then find the maximum possible value of (3x + 2y – z).

(a) 33 (b) 37

(c) 25 (d) 35

RRB Group-D 09/09/2022 (Shift-III)

Ans. (a) : On dividing 3x5479y4 by 88 ie. 8 and 11 Divisibility rule of 8 - If the last three digits of the given number are divisible by 8, then it will be divisible by 8.

Maximum possible value = 8

$$\frac{984}{8} = 123$$

Divisibility rule of 11 - The given number can only be completely divided by 11 if the difference of the sum of digits at odd place and sum of digits at even place in a number is 0 or mutiple of 11.

$3x547984 \Rightarrow (4+9+4+x) \sim (8+7+5+3)$

$17+x \sim 23 = 0$

$x = 6$

On dividing 425139z2 by 9

Divisibility rule of 9 :- If the sum of the digits of a number are divisible by 9, then the number is divisible by 9.

$$\frac{4+2+5+1+3+9+z+2}{9} = \frac{26+z}{9}$$

On putting z = 1

$$\frac{26+1}{9} = \frac{27}{9} = 3$$

Hence,

$3x + 2y - z = 3 \times 6 + 2 \times 8 - 1 = 33$

11. When a number n is divided by 5, the remainder is 2. When n^2 is divided by 5, the remainder will be:

(a) 3 (b) 1

(c) 4 (d) 0

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (c) : Number = Divisor × Quotient + Remainder

According to question,

$n = 5 \times q + 2$

On squaring both the sides,

$n^2 = 25q^2 + 4 + 20q$

On dividing by 5 –

$$\frac{n^2}{5} = 5q^2 + \frac{4}{5} + 4q \quad \text{or } n^2 = 5(5q^2 + 4q) + 4$$

Hence, required remainder will be 4.

12. How many numbers of the first 100 positive integers are divisible by 3 or 4 without a remainder?

(a) 50 (b) 5
(c) 58 (d) 85

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : Total number of positive integers which is divisible by $3 = \frac{100}{3} = 33$

Total number of positive integers which is divisible by $4 = \frac{100}{4} = 25$

Total number of positive integers which is divisible by $12 = \frac{100}{12} = 8$

Hence, the total number of positive integers which is divisible by 3 or 4.

$= (33 + 25 - 8)$

$= 50$

13. How many numbers between 1 and 700 are completely divisible by 17?

(a) 42 (b) 41
(c) 45 (d) 46

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (b) : Numbers between 1 and 700 which are exactly divisible by 17.

17, 34 .....697.

$l = a + (n-1) \times d$

$697 = 17 + (n-1) \times 17$

$680 = (n-1) \times 17$

$40 = n - 1$

$n = 41$

Hence, required number (n) = 41

14. When 19^{300} is divided by 20, find the remainder.

(a) 2 (b) 1
(c) 3 (d) 4

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (b) : From question,

$\frac{19^{300}}{20} \Rightarrow \frac{(20-1)^{300}}{20} \Rightarrow 0 + (-1)^{300} = 1$(Remainder)

15. Which of the following is the greatest three digit number that is divisible by 13?

(a) 990 (b) 575
(c) 988 (d) 908

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (c) : Greatest three digit number = 999

On dividing by $13 = \frac{999}{13} = 76\frac{11}{13}$

$\because$ 999 divided by 13 leaves remainder 11.

$\therefore$ The greatest three digit number divisible by 13 = 999 – 11 = 988

16. The number 93248x6 are divisible by 11. Then digit x is equal to.

(a) 5 (b) 2
(c) 8 (d) 7

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Divisibility rule of 11–In a given number if the difference of sum of all digit even place and placed at odd place is zero or multiple of 11, then that number will also be divisible by 11.

$(9+2+8+6)-(3+4+x)$

$25 - (7+x) = 11$

$18 - x = 11$

$x = 18 - 11$

Hence, $x = 7$

17. $(41^{43} + 43^{43})$ is divisible by:

(a) 86 (b) 74
(c) 12 (d) 84

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : $(x^n + a^n)$ is divisible by $(x + a)$, if the value of n is odd

$\because$ 43 is a odd number, therefore $(41^{43} + 43^{43})$ will be divisible by 41 + 43 = 84

18. If pq is a two-digit number, then pq – qp will be completely divisible by:

(a) 9 (b) 7
(c) 6 (d) 5

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let the two digit number (pq) = 10x + y

Then, qp = 10y + x

According to the question,

$pq - qp$

$= 10x + y - (10y + x)$

$= 10x + y - 10y - x$

$= 9x - 9y$

$= 9(x - y)$

Hence pq – qp will be completely divisible by 9.

19. If n is a natural number then $n^3 - n$ is always divisible by……

(a) 8 (b) 6
(c) 5 (d) 4

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (b) : $\because$ n is a natural number.

$\therefore n^3 - n = n(n^2 - 1) = n(n+1)(n-1)$

n(n+1) (n–1) {Multiplication of three consecutive natural numbers}

On putting the value of n = 2

$n^3 - n = n(n+1)(n-1) = 2 \times 3 \times 1 = 6$

Hence, it will always divisible by 6.

Note- The multiplication of three consecutive natural numbers will be always divisible by 6.

20. A number when divided by 7 leaves a remainder 4. What will be the remainder when the square of the same number is divided by 7?

(a) 2 (b) 4
(c) 1 (d) 3

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let, Quotient = n

Number = Divisor × Quotient + Remainder

Number = 7× n + 4 (Given, Remainder = 4)

On putting n = 1,

Number = 7×1+ 4 = 11

On dividing the number by 7,

Remainder = 4

Hence, on dividing the square of 11 by 7

Remainder $= \frac{(11)^2}{7} = \frac{121}{7} = 2$

21. The smallest positive number which must be added to the greatest number of 4 digits in order that the sum may be exactly divisible by 307 is:

(a) 307 (b) 132 (c) 306 (d) 176

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (b) : The greatest number of 4 digits = 9999

$$307)9999(32$$
$$-\underline{921}$$
$$789$$
$$\underline{614}$$
$$175$$

Hence, the smallest number to be added = 307–175
= 132

22. How many numbers from 3 to 60 are odd numbers that are exactly divisible by 5?

(a) 7 (b) 5 (c) 8 (d) 6

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : Odd numbers between 3 to 60 which divisible by 5.
5, 15, 25, 35, 45, 55
So total number of odd numbers from 3 to 60 which are exactly divisible by 5 = 6.

23. How many numbers between 300 and 1000 are divisible by 7?

(a) 994 (b) 301 (c) 101 (d) 100

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : Total number of numbers between 1 and 1000 which are divisible by 7

$= \frac{1000}{7} = 142$

Total number of numbers between 1 and 300 which are divisible by 7

$= \frac{300}{7} = 42$

Hence, Total number of numbers between 1 and 300 which are divisible by 7 between 300 and 1000
$= 142 - 42 = 100$

24. Find the greatest number of five digits, which is exactly divisible by 468.

(a) 99684 (b) 99486
(c) 99864 (d) 99468

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (a) : The greatest number of five digits = 99999

$$468)99999(213$$
$$\underline{936}$$
$$639$$
$$\underline{468}$$
$$1719$$
$$\underline{1404}$$
$$315$$

Required number = 99999 – 315 = 99684

25. In between 250–1000, how many numbers are completely divisible by 5, 6 & 7.

(a) 5 (b) 7
(c) 6 (d) 3

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : LCM of 5, 6, 7 –

2	5, 6, 7
3	5, 3, 7
5	5, 1, 7
7	1, 1, 7
	1, 1, 1

$2 \times 3 \times 5 \times 7 = 210$

$\because$ Numbers from 250 to 1000 which are divisible by 5, 6, 7 will be always divisible by 210 or in multiples of 210.

Therefore, the numbers are 210×1, 210×2, 210×3, 210×4, 210×5 .....

210, 420, 630, 840, ...

Hence, the required numbers = 3

26. The largest four-digit number that is exactly divisible by 83 is:

(a) 9936 (b) 9954
(c) 9960 (d) 9966

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : The largest four-digit number = 9999

$$83)9999(12$$
$$\underline{83}$$
$$169$$
$$\underline{166}$$
$$39$$

Therefore required number = 9999 – 39 = 9960

Hence, 9960 is the largest four-digit number which is exactly divisible by 83.

27. $(47)^{25} - 1$ is exactly divisible by:

(a) 21 (b) 24
(c) 23 (d) 19

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (c) : $(47)^{25} - 1$

$a^n - b^n$ is completely divisible by $(a - b)$

When n = odd numbers,

As per the question

n = 25 .....(Odd number)

a = 47, b = 1

Then,

$a - b = 47 - 1 = 46 = 2 \times 23$

Hence, $47^{25} - 1$ is divisible by 23.

28. If 111 ..... 1 (n digits) is divisible by 9, then the least value of n is:

(a) 18 (b) 12
(c) 3 (d) 9

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : When the sum of all the digits of a number is divisible by 9, then number will be divisible by 9.

Given number–

- 111.....1 (n digits)
- When n = 1, number is 1, which is not divisible by 9.
- When n = 2, number is 11, which is a prime number and thus not divisible by 9.
- When n = 3, number is 111 and 1+1+1=3, which is not divisible by 9.

⋮

- When n = 9, number is 111111111 and 1+1+1+1+1+1+1+1+1= 9, which is divisible by 9

Hence, the least possible value of n is 9.

29. A number when divided by 280 leaves 73 as the remainder. When the same number is divided by 35, the remainder will be:

(a) 4 (b) 2
(c) 3 (d) 7

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let number = N
N = 280K + 73
= (35×8) K + 70 + 3
= 35 (8K + 2) + 3
N = 35m + 3.....(i) (where, m = 8 K + 2)
or N = 35q + r .....(ii)
On comparing both equation,
r = 3
Hence, on dividing the same numbers by 35 the remainder will be 3.

30. The least number that is divisible by all the numbers from 2 to 10 is–

(a) 2520 (b) 100
(c) 504 (d) 9

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (a) : Required number = LCM of 2, 3, 4, 5, 6, 7, 8, 9, 10
= 2, 3, (2×2), 5, (2×3), 7, (2×2×2), (3×3)×(2×5)
= 2×2×2×3×3×5×7 = 2520

31. How many numbers greater than 2 and less than 30 are divisible by 1 and themselves

(a) 9 (b) 29
(c) 27 (d) 11

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (a) : Prime number-The numbers which is only divisible by 1 and itself are known as prime number. The prime numbers greater than 2 and less than 30 are–
= 3, 5, 7, 11, 13, 17, 19, 23, 29 = Total 9 numbers
Hence, the required number = 9

32. $3^{71}+3^{72}+3^{73}+3^{74}+3^{75}$ is divisible by:

(a) 8 (b) 5
(c) 11 (d) 7

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (c) : $3^{71}+3^{72}+3^{73}+3^{74}+3^{75}$

$= 3^{71}\left(3^0+3^1+3^2+3^3+3^4\right)$

$= 3^{71}\left(1+3+9+27+81\right)$

$= 3^{71}\times 121$

$= 3^{71}\times 11^2$

Hence, given series will be divisible by 11.

33. The smallest 5 digit number that leaves a remainder of 6 when divided by 7 is :

(a) 10009 (b) 10002
(c) 10003 (d) 10007

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Smallest number of 5 digits =10000

$\frac{10000}{7}\Big]_{\text{Remainder}=4}$

Required number = 10000 + (6 – 4) = 10002

34. N is a whole number which when, divided by 6 leaves the remainder 4. Find the remainder when 2N is divided by 6.

(a) 4 (b) 8
(c) 2 (d) Zero

RRB NTPC 28.04.2016 Shift : 1

Ans : (c) Let the quotient be "a" when N is divided by 6.
∴ N = 6a + 4…….(i)
By equation (i) ×2,
2N = 2 × 6a + 8
2N = 12a + 6 + 2
2N = 6 (2a +1) + 2
Hence, the required remainder will be 2.

35. Find the largest number of four digit that is completely divisible by 49.

(a) 9998 (b) 9994
(c) 9992 (d) 9996

RRB RPF-SI -10/01/2019 (Shift-II)
RRB Group-D – 18/09/2018 (Shift-II)

Ans : (d) The largest 4-digit number is 9999.

$$49\overline{)9999}(204$$
$$\underline{98}$$
$$199$$
$$\underline{196}$$
$$3$$

Hence, the required number = 9999-3 = 9996, which is exactly divisible by 49.

36. What should be added to 135642 to get the largest six digit number?

(a) 864350 (b) 863357
(c) 864357 (d) 864347

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (c) Let the required number is x.
Adding x to 135642 to get a largest six digit number
∴ 135642 + x = 999999
x = 999999 – 135642
x = 864357

37. Find the smallest four digit number that is divisible by 47.

(a) 1200 (b) 1025
(c) 1034 (d) 1360

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (c) : The smallest four digit number = 1000

$$47\overline{)1000}\ (21,\ 94,\ 60,\ 47,\ 13)$$

Hence, the smallest four digit number divisible by 47,
= 1000 + (47–13) 1000+34 = 1034

38. Find the least 6 digit number that is a multiple of 18.
(a) 100000 (b) 999900
(c) 100008 (d) 100006

RRB NTPC 29.04.2016 Shift : 1

Ans : (c) The smallest 6 digit number = 100000

$$18\overline{)100000}\ (5555,\ 90,\ 100,\ 90,\ 100,\ 90,\ 100,\ 90,\ 10)$$

The remainder is 10, hence 18 – 10 = 8 is added to the number will make it completely divisible.
Hence, the required number = 100000 + 8 = 100008

39. A student divided a number by 12 instead of 21 and received 35. Find the correct answer.
(a) 20 (b) 15 (c) 26 (d) 25

RRB JE - 26/05/2019 (Shift-II)

Ans : (a) Let the number be x.
According to the question,
On dividing by 12,

$$\frac{x}{12} = 35$$

$x = 35 \times 12$
$x = 420$
The number is 420
Dividing 420 by 21-

$$\frac{420}{21} = 20$$

Hence, the correct answer = 20

40. Find the least number to be added to 231228 to make it exactly divisible by 33.
(a) 3 (b) 4 (c) 2 (d) 1

RRB JE - 27/05/2019 (Shift-III)

Ans : (a) From question,

$$33\overline{)231228}\ (7006,\ 231,\ \times\times\times228,\ 198,\ 30)$$

Hence, the required number = 33 – 30 = 3

41. Which of the following numbers is not divisible by 8?
(a) 12676 (b) 11504
(c) 12832 (d) 12360

RRB RPF Constable -24/01/2019 (Shift-II)

Ans : (a) From options,

(a) $\frac{12676}{8} = 1584.5$

(b) $\frac{11504}{8} = 1438$

(c) $\frac{12832}{8} = 1604$

(d) $\frac{12360}{8} = 1545$

Hence, the number 12676 is not divisible by 8.

42. 276x1, is divisible by 3. What is the sum of the possible values of x?
(a) 18 (b) 21
(c) 12 (d) 15

RRB RPF SI-12/01/2019 (Shift-I)

Ans. (d) If the sum of all digits of a number is divisible by 3, then the number will be divisible by 3.
276x1, is divisible by 3.
2 + 7 + 6 + x + 1 = 16 + x
The number will be completely divisible by 3, by putting the possible values of x as 2, 8, and 5.
Hence, the sum of the possible values of x = 2+8+5 =15

43. By dividing 14528 by a certain number, Suresh gets 83 as quotient and 3 as remainder. What is the divisor?
(a) 165 (b) 185 (c) 195 (d) 175

RRB RPF SI -06/01/2019 (Shift-III)

Ans : (d) Let the divisor is 'x'.
Given- Dividend = 14528
Quotient = 83
Remainder = 3
Dividend = (Divisor × Quotient + Remainder)
$\Rightarrow 14528 = (x \times 83) + 3$
$\Rightarrow 83x = 14528 - 3$
$\Rightarrow 83x = 14525$
$\Rightarrow x = \frac{14525}{83} \Rightarrow x = 175$

44. If the number x4461 is divisible by 11, find the value of x.
(a) 2 (b) 4 (c) 3 (d) 5

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (d) Rule of divisibility by 11-
If the difference between sum of digits at even places and the sum of digits at odd places of a number is 0 or is divisible by 11, then that number will also be divisible by 11.
The number – x 4 4 6 1
x + 4 + 1 – (4 + 6) = 0
x + 5 – 10 = 0
x = 5

45. Which number is divisible by 9?
(a) 56112 (b) 89445
(c) 49653 (d) 58556

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (c) If the sum of all the digits of a number is divisible by 9, the number will also be completely divisible by 9.
Hence, from options-
(a) The sum of the digits of 56112 = 15 (×)
(b) The sum of the digits of 89445 = 30 (×)
(c) The sum of the digits of 49653 = 27 (√)
(d) The sum of the digits of 58556 = 29 (×)
Hence, the number divisible by 9 = 49653

46. Which of the following numbers is divisible by 6?
(a) 12378 (b) 12363
(c) 12370 (d) 12388

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (a) Divisibility rule by 6 – If a given number is divisible by both 2 and 3 then the number will also be divisible by 6.
Divisibility rule by 2 – If the unit digit of a given number is divisible by 2, then the number will also be divisible by 2.
Divisibility rule by 3 – If the sum of all the digits of the number is divisible by 3, then the number will also be divisible by 3.
From option (a)- $1 + 2 + 3 + 7 + 8 = 21$

$$= \frac{21}{3} = 7$$

Hence, the number 12378 is divisible by 6.

47. Choose the missing digit 'x' from the options given for the number 987x54, so that the number is completely divisible by 6.
(a) 2 (b) 5 (c) 3 (d) 1

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (c) : The given number will be divisible by 6 if it is divisible by 2 and 3.
Divisibility rule by 2 – If the unit digit of a number is divisible by 2, then the number will also be divisible by 2.
The unit digit of given number is 4, which is divisible by 2.
Divisibility rule by 3 – If the sum of all the digits of the given number is divisible by 3, then the number will also be divisible by 3.

$$\Rightarrow \frac{9+8+7+x+5+4}{3} = \frac{33+x}{3}$$

From option (c) on putting x = 3

$$\frac{36}{3} = 12$$

Hence, the value of x will be 3.

48. What number should be deducted from 1265 to make it divisible by 29 exactly?
(a) 15 (b) 16 (c) 18 (d) 17

RRB NTPC 05.04.2016 Shift : 3

Ans : (c)

$$29\overline{)1265}\ (43)$$
$$116$$
$$\times 105$$
$$87$$
$$18$$

Hence, 18 should be subtracted from 1265 to make it completely divisible by 29.

49. Find the least number to be added to 1739 so that it is exactly divisible by 11.
(a) 11 (b) 2
(c) 1 (d) 10

RRB NTPC 30.03.2016 Shift : 1

Ans : (d) To get the required number divide 1739 by 11 then subtract the remainder from the divisor.

$$11\overline{)1739}\ (158)$$
$$11$$
$$\times 63$$
$$55$$
$$\times 89$$
$$88$$
$$\times 1$$

Hence, the required number will be 11 – 1 = 10.

50. Find the remainder, when 3^{10} is divided by 7.
(a) 4 (b) 3
(c) 5 (d) 6

RRB NTPC 18.04.2016 Shift : 3

Ans : (a) $3^{10} = 3\times3\times3\times3\times3\times3\times3\times3\times3\times3$
$= 59049$
$\therefore \quad \frac{59049}{7}$
$= 4$ remainder

51. Which of the following numbers is divisible by 12?
(a) 93412 (b) 63412
(c) 73412 (d) 83412

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (d) : The number which is divisible by 12, should be divisible by 3 and 4 also.
If the sum of all the digits of a number is divisible by 3, the number will also be divisible by 3.
If the last two digit of a number are divisible by 4, the number will also be divisible by 4.
From option (d),
Then 8+3+4+1+2 = 18, Which is divisible by 3.
The last 2-digit of the number are 12, Which is also divisible by 4.
Hence, the number 83412 is divisible by 12.

52. Which of the following numbers is divisible by 9?
(a) 56765 (b) 47862
(c) 54321 (d) 87654

RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (b) If the sum of all the digits of a number is divisible by 9, the number will be divisible by 9.
Hence, from option (b),
47862 $\Rightarrow$ 4+7+8+6+2 = 27, which is divisible by 9.
Hence option (b) will be true.

53. If $3x^2 + ax + 4$ is perfectly divisible by $x - 5$, then the value of a is:
(a) – 12 (b) – 5
(c) – 15.8 (d) – 15.6

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (c) According to the question,
$3x^2 + ax + 4 = 0$ --------- (i)
$\because$ equation (i), is divisible by ($x-5$)

Hence,

$\Rightarrow \quad x - 5 = 0$

$\Rightarrow \quad x = 5$

Putting the value of x in equation (i),

$3(5)^2 + a \times 5 + 4 = 0$

$75 + 5a + 4 = 0$

$5a = -79$

$a = -15.8$

54. The product of 4 consecutive numbers is always divisible by which of the following numbers?

(a) 10 (b) 22 (c) 24 (d) 48

RRB RPF SI -05/01/2019 (Shift-I)

Ans : (c) Let 4 consecutive numbers are n, (n+1), (n+2) and (n+3) respectively.

According to the question,

The Product of four consecutive numbers

$= n(n+1)(n+2)(n+3)$

Where n = 1,2,3,…….

Putting n = 1,

Product,

$= 1\ (1+1)\ (1+2)\ (1+3)$

$= 1 \times 2 \times 3 \times 4 = 24$

Putting n = 2,

Product of numbers,

$= 2 \times 3 \times 4 \times 5 = 24 \times 5 = 120$

Hence, the product of 4 consecutive numbers is always divisible by 24.

55. When the number $(5)^{501}$ is divided by 126 then the remainder will be?

(a) 117 (b) 121

(c) 89 (d) 125

RRB ALP CBT-2 Mec. & Diesel 21-01-2019 (Shift-I)

Ans. (d) :

$$= \frac{(5)^{501}}{126} = \frac{(5^3)^{167}}{126} = \frac{(-1)^{167}}{126}$$

$$= \frac{-1}{126}$$

Remainder = 125

Type - 2

56. If each even digit is divided by 2 and 2 is added to each odd digit in the number 4723361, what will be the sum of the largest and the smallest digits thus formed?

(a) 12 (b) 10 (c) 11 (d) 9

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (b) : Given, 4723361

According to the question,

New number obtained by dividing each even digit by 2 and adding 2 to each odd digit.

$$\frac{4}{2}(7+2), \left(\frac{2}{2}\right)(3+2)(3+2), \frac{6}{2}(1+2) \Rightarrow 2915533$$

Hence Sum of largest digit and smallest digit = 9 + 1

= 10

57. If 3 is added to each odd digit and 1 is subtracted from each even digit in the number 42514563, what will be difference between the highest and lowest digits thus formed?

(a) 2 (b) 7

(c) 5 (d) 8

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (b) : Given number = 42514563

According to the question, the number obtained by adding 3 to the odd digit and substracting 1 from the even digit of the number is = 31843856

Hence required difference = 8 – 1 = 7

58. If 3 is added to each odd digit and 2 is subtracted from each even digit in the number 6452851, what will be difference between the largest and smallest digits thus formed?

(a) 8 (b) 6

(c) 4 (d) 2

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (a) : The number obtained by adding 3 to the odd digit and substracting 2 from the even digit of the number is

6 4 5 2 8 5 1

–2 –2 +3 –2 –2 +3 +3

4 2 8 0 6 8 4

Hence the difference of largest and smallest digits

= 8–0

= 8

59. If 1 is subtracted from each odd digit and 1 is added to each even digit in the number 92379654, what will be the sum of the digits which are second from the left and third from the right?

(a) 6 (b) 8

(c) 10 (d) 5

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (c) : The number obtained by adding 1 to the even digit and substracting 1 from the odd digit of the number is 92379654

9 2 3 7 9 6 5 4

–1+1–1–1–1+1–1+1

8 3 2 6 8 7 4 5

So the required sum = 3 + 7

= 10

60. The sum of the digits of a two-digit number is 12. The number obtained by interchanging its digits exceeds the given number by 18. The number is:

(a) 76 (b) 67

(c) 27 (d) 57

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : Let the two digit number be 10x + y

Number oblained by interchanging the digits = 10y + x

According to the question,

$x + y = 12$ -------- (i)

And, On reversing the digits,

$(10y + x) - (10x + y) = 18$

$y - x = 2$ ------- (ii)

On adding eq. (i) and (ii)

$$x + y = 12$$
$$-x + y = 2$$
$$2y = 14$$
$$y = 7$$
$$x = 5$$
Hence, number = $10x + y = 10 \times 5 + 7 = 57$

61. In a five digit number, the digit in the hundred's place is 2 and the digit in the unit's place is twice the digit in the hundred's place. The digit at thousands place is zero. The digit in the ten thousand's place is the sum of the digit in the hundred's place and the digit in the unit's place. The digit in the ten's place is the digit in the ten thousand's place minus 1. The number is:
(a) 60234 (b) 60224
(c) 60254 (d) 60264
RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let us assume the number = abcde
As per question,
$c = 2$
$e = 2 \times c$
$e = 2 \times 2$
$e = 4$
$b = 0$
$a = 2 + 4$
$a = 6$
$d = 6 - 1$
$d = 5$
Putting all values, then the required number = 60254

62. What is the smallest four digit number formed by using the digits 3, 5, 0, 6?
(a) 3056 (b) 0356
(c) 0536 (d) 3506
RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : The smallest four-digit number formed by 3,5,0,6 = 3056

63. What is the smallest five-digit number formed by using the digits 2, 3, 4, 0, 5?
(a) 23045 (b) 20435
(c) 02345 (d) 20345
RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : Largest 5 digit number = 99999
Smallest 5 digit number = 10000
The smallest five digit number that can be formed from the digits 2, 3, 4, 0, 5 is = 20345

64. Find sum of the smallest and the largest positive numbers of 6 digits which contains only digits 0, 4, 6 and each of these digits appears at least once.
(a) 666444 (b) 604604
(c) 666666 (d) 1066646
RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question-
$\because$ Smallest 6 digit no = 400006
Greatest 6 digit no = 666640
$\therefore$ Required sum = 400006 + 666640 = 1066646

65. How many times is digit 3 comes in counting from 301 to 399?
(a) 119 (b) 11
(c) 121 (d) 21
RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : In Counting from 301 to 399, the digit 3 comes a total of 119 times.

66. Find the two-digit number such that the sum of its digits is 8 and the digits of the number get reversed when 36 is added to it.
(a) 71 (b) 35
(c) 62 (d) 26
RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let number = 10x+y
Accoding to the question,
$x+y=8$ …(i)
$(10x+y) + 36 = 10y + x$
$9y - 9x = 36$
$y - x = 4$ …(ii)
On solving equation (i) and equation (ii)
$x = 2$
$y = 6$
Hence, required number = $10x + y = 10 \times 2 + 6 = 26$

67. If the number 2893#$ is divisible by 8 and 5, then one possible choice of the digits that come in the place of # and $ can be:
(a) 0, 2 (b) 2, 2
(c) 0, 0 (d) 2, 0
RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : Divisibility rule of '5' $\Rightarrow$ if a number has '0' or '5' in its unit digit then it is completely divisible by 5.
Divisiblity rule of '8' $\Rightarrow$ if the last three digits of a given number are divisible by '8' then number will be always divisible by 8.
from option 'd'
On putting the value of # = 2 and $ = 0
$\frac{289320}{5} \Rightarrow 57864$
$\frac{289320}{8} \Rightarrow 36165$
Hence, option (d) will be correct.

68. If the largest 4–digit number is subtracted from the smallest 6-digit number, then the remainder will be:
(a) 90000 (b) 99991
(c) 80001 (d) 90001
RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : The smallest number of 6 – digit = 100000
The largest number of 4 – digit = – 9999
Required number = 90001

69. How many significant digits are there to the right of the decimal point in the product of 95.75 and 0.02554?
(a) 5 (b) 3
(c) 4 (d) 6
RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : 95.75×0.02554
$= 2.445455$
So the number obtained as the product of 95.75 and 0.0254 will have 6 significant digits to the right of the decimal point.

70. What is the value of the digits A and B?
BA × B3 = 57 A
(a) A = 2, B = 4 (b) A = 3, B = 5
(c) A = 5, B = 2 (d) A = 5, B = 3
RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : From option (c) Putting the values of A and B in the equation.

$A = 5, B = 2$

$BA \times B3 = 57A$

$25 \times 23 = 575$

$575 = 575$

Hence, option (c) will be correct.

71. The difference between the greatest and the smallest six-digit numbers is:

(a) 988888 (b) 999999

(c) 888888 (d) 899999

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : The largest six digit number is 999999

The smallest six digit number is 100000

$\therefore$ Required difference = 999999 – 100000 = 899999

72. The sum of the greatest and smallest numbers of six digits is:

(a) 100000 (b) 199999

(c) 999999 (d) 1099999

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : According to question,

Greatest number of six-digit = 999999

Smallest number of six-digit = 100000

Hence required sum = 999999 + 100000

= 1099999

73. The least number consisting of five - digit which is divisible by 97 is x. What is the sum of the digits of x?

(a) 13 (b) 15

(c) 17 (d) 16

RRB ALP CBT-2 Physics & Maths 21-01-2019 (Shift-III)

Ans. (c) : Minimum five - digit number = 10000

$$97\overline{)10000}(103$$

$$\underline{-97}$$

$$300$$

$$\underline{-291}$$

$$\times 9$$

Hence, five - digit number that is divisible by 97

$x = 10000 + (97 - 9)$

$x = 10000 + 88$

$x = 10088$

Required sum = 1 + 0 + 0 + 8 + 8

= 17

74. How many total tens digit in the calculation from series 1 to 99?

(a) 98 (b) 90

(c) 99 (d) 100

RRB RPF Constable -17/01/2019 (Shift-II)

Ans : (b) The number of tens digit from 1 to 10 = 1

The number of tens digit from 11 to 90 = 80

The number of tens digit from 91 to 99 = 9

Hence, the total number of tens from series 1 to 99

= 1 + 80 + 9 = 90

75. Find two consecutive numbers where thrice the first number is more than twice the second number by 5.

(a) 5 and 6 (b) 6 and 7

(c) 7 and 8 (d) 9 and 10

RRB NTPC 28.03.2016 Shift : 1

Ans : (c) Let the two consecutive numbers be x and x+1.

According to the question-

$3x = 2(x+1) + 5$

$\Rightarrow 3x = 2x + 7$

$\Rightarrow x = 7$

Hence, the required consecutive numbers will be 7 and 8.

76. How many times does the digit 2 come in place of tens in counting from 1 to 100?

(a) 20 (b) 11

(c) 10 (d) 19

RRB NTPC 31.03.2016 Shift : 1

Ans : (c) From the digit come in place of tens in counting, 1 to 10 = 0 time

From 11 to 20 = 1 time

From 21 to 30 = 9 times

From 31 to 100 = 0 times

$\therefore$ Total required number = 1 + 9 = 10

77. How many times does the digit 5 come in the counting from 1 to 100?

(a) 21 (b) 22

(c) 20 (d) 19

RRB RPF SI-16/01/2019 (Shift-I)

Ans : (c) The total numbers in which 5 comes from 1 to 49 = 5

From 50 to 60, such number = 11

And from 61 to 100, such number = 4

Hence, total required number = 5 + 11 + 4 = 20

Type - 3

78. Find the total number of prime numbers less than 50.

(a) 13 (b) 15

(c) 17 (d) 14

RRB Group-D 06/09/2022 (Shift-III)

Ans. (b) : Total number of prime number less than 50 is 15 which is as follows -

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

79. What is the positive difference between the sum of all prime numbers between 11 and 20 (both included) and the sum of all prime numbers between 30 and 50 (both included)?

(a) 139 (b) 141

(c) 137 (d) 135

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (a) : The sum of all prime numbers between 11 and 20 (both included) = (11 + 13 + 17 + 19) = 60

The sum of all prime number between 30 and 50 (both included) = (31 + 37 + 41 + 43 + 47) = 199

$\therefore$ Required positive difference = 199 ~ 60

= 139

80. The greatest prime number less than 200 is:

(a) 199 (b) 193

(c) 197 (d) 191

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : The greatest prime number less than 200 is 199.

81. Which of the following numbers is prime?
(a) 323 (b) 571
(c) 513 (d) 715
RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : According to option,
571 is a prime number. Whereas 323 is divisible by 17, 513 is divisible by 3 and 715 is divisible by 5.

82. Find the smallest three digit prime number?
(a) 107 (b) 109
(c) 103 (d) 101
RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (d) : The smallest three-digit prime number = 101

83. Which of the following pairs of numbers are co-prime?
(a) 28, 81 (b) 12, 27
(c) 21, 56 (d) 36, 20
RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Co-prime numbers are the numbers whose common factor is only 1.
Hence, in the given option (28, 81) are co-prime numbers.

84. One-third of the sum of all the prime numbers greater than 5 but less than 18 is the square of:
(a) 3 (b) 5
(c) 6 (d) 4
RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (d) : Prime numbers greater than 5 but smaller than 18 = 7, 11,13, 17
According to the question-

$$= \frac{7+11+13+17}{3}$$

$$= \frac{48}{3} = 16 = (4)^2$$

Hence, required number = 4

85. Which of the following is a prime number?
(a) 143 (b) 173
(c) 123 (d) 213
RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (b) : Prime number are the numbers, which are only divisible by 1 and itself.
From the given options-
(a) 143 is divisible by 11, so it is not a prime number.
(b) 173 is divisible by 1 and itself, so it is a prime number.
(c) 123 is divisible by 3, so it is not a prime number.
(d) 213 is divisible by 3, so it is not a prime number.

86. Find the sum of prime no. between 50 and 60.
(a) 118 (b) 114
(c) 110 (d) 112
RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (d) : The prime number between 50 and 60–
53 and 59
Required Sum = 53 + 59 = 112

87. Find the number of all prime numbers less than 55.
(a) 18 (b) 17
(c) 16 (d) 15
RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (c) : The number of all prime numbers less than 55 is 16
i.e. $\Rightarrow$ (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53)

88. The number of pairs of twin primes between 1 and 100 are:
(a) 7 (b) 8
(c) 10 (d) 9
RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (b) : The number of pairs of twin primes between 1 and 100 are 8.
The numbers are -
$\{(3,5),(5,7),(11,13),(17,19),(29,31),(41,43),(59,61),(71,73)\}$
Note- Twins prime numbers are that numbers whose difference is 2.

89. The number that has factors other than 1 and itself is called a ..... number.
(a) Prime Number (b) Composite Number
(c) Even Number (d) Odd Number
RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (b) : Composite Number:- Numbers which have more than two factors.
Ex- 4, 6, 8 -------
Prime Number:- Numbers which have only two factor 1 and itself is called prime number.

90. Find the number of prime number less than 20.
(a) 9 (b) 7
(c) 10 (d) 8
RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : Prime mumber less than 20.
2, 3, 5, 7, 11,13, 17 and 19
Hence the number of prime number less than 20 = 8

91. Three prime number are arranged in descending order. If the product of the first two is 323 and that of the last two is 221, then what is the value of the biggest prime number?
(a) 17 (b) 19
(c) 13 (d) 23
RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let the consecutive prime numbers are x, y and z in which x is biggest prime number.
According to the question,
$x \times y = 323$
Taking
$x = 19$
$y = 17$
$19 \times 17 = 323$
Taking $y = 17$ and $z = 13$
And $17 \times 13 = 221$
So, the biggest prime number is = $\boxed{19}$

92. How many of the integers between 109 and 121, both inclusive, are prime numbers?
(a) 1 (b) 0
(c) 2 (d) 3
RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (c) : Two integers (109, 113) between 109 and 121 both inclusive are prime numbers.

93. Which of the following numbers is prime?
(a) 263 (b) 243
(c) 253 (d) 273
RRB RPF Constable -17/01/2019 (Shift-III)

Ans : (a) To identify a prime number, compare the given number with its nearest square. For example option (a), 263 (Which is between the squares of 16 and 17)

$16^2 = 256$

$17^2 = 289$

Then, divide the given number by all the prime numbers below 16 and 17. If the number is not divisible by any number then it is a prime number.

$\Rightarrow$ 263 (is less than the square of 17)

Which is not divisible by 2,3,5,7, 11 and 13.

Hence, it is a prime number.

94. Find the largest two-digit prime number.

(a) 93 (b) 89 (c) 91 (d) 97

RRB JE - 23/05/2019 (Shift-II)

Ans : (d) The number which is divisible by only 1 and itself is called prime number.

Hence, It is clear that the largest two digit prime number = 97

95. What will be the product of the smallest prime number (except 0) and any whole number?

(a) Always 0

(b) Always 1

(c) Always even number

(d) Always odd number

RRB RPF Constable -20/01/2019 (Shift-II)

Ans : (c) The smallest prime number = 2,

The result of the product of any whole number(except 0) and 2 is always an even number.

96. Find the sum of the prime numbers between 50 and 80.

(a) 392 (b) 390

(c) 463 (d) 396

RRB RPF Constable -18/01/2019 (Shift-I)

Ans : (c) Sum of prime numbers between 50 and 80 = 53 + 59 + 61 + 67 + 71 + 73 + 79 = 463

97. The sum of which four odd prime numbers is 34?

(a) 1, 3, 5, 7 (b) 3, 5, 7, 9

(c) 3, 5, 11, 13 (d) 3, 7, 11, 13

RRB NTPC 04.04.2016 Shift : 2

Ans : (d) From option- (d)

$3 + 7 + 11 + 13 = 34$

98. In a prime number……...

(a) There are more than two divisors.

(b) The number divided by itself and 1.

(c) It has no divisor.

(d) Is not a positive integer.

RRB NTPC 30.03.2016 Shift : 2

Ans : (b)

A prime number is divided by only itself and 1.

99. How many total prime numbers are in first 200 odd natural numbers?

(a) 45 (b) 49 (c) 50 (d) 46

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (a) Total prime numbers in first 200 odd natural numbers = 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199 = 45

100. Which of the following pairs are co-primes?

(a) 348, 296 (b) 114, 213

(c) 59, 97 (d) 3025, 4920

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (c) Such two numbers are called co-prime whose HCF is 1.

In option (c) 59, 97 is the appropriate co-prime pair in the alternatives.

101. Which of the following numbers is divisible?

(a) 719 (b) 709

(c) 729 (d) 739

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (c) The number- 729 is divisible by 3, 9 and 81.

102. How many prime numbers are in first 100 natural numbers?

(a) 25 (b) 27

(c) 24 (d) 26

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (a) Prime numbers in first 100 natural numbers = 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

Therefore, total such numbers are 25.

103. Find out which of the following sets form co-prime numbers.

(a) (12, 7) (b) (21, 42)

(c) (3, 9) (d) (43, 129)

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) Co-prime numbers- The set of two such numbers whose HCF is 1, is called co-prime numbers.

$\therefore$ In option (a), HCF of the numbers (12, 7) = 1

104. Which of the following is an odd composite number?

(a) 13 (b) 17

(c) 12 (d) 15

RRB NTPC 18.01.2017 Shift : 2

Ans : (d) In the given options odd composite number will be 15.

105. Find the sum of first 8 odd prime numbers.

(a) 77 (b) 98

(c) 75 (d) 100

RRB NTPC 19.04.2016 Shift : 2

Ans : (b) First 8 odd prime numbers = 3, 5, 7, 11, 13, 17, 19, 23

Sum of the numbers = 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 = 98

106. How many prime numbers are between positive integers 60 and 100?

(a) 9 (b) 6

(c) 7 (d) 8

RRB NTPC 06.04.2016 Shift : 1

Ans : (d) The prime numbers between 60 and 100 = 61, 67, 71, 73, 79, 83, 89, 97

Hence, Total 8 prime numbers will be between 60 and 100.

107. Which of the following numbers is a prime number?

(a) 121 (b) 141

(c) 181 (d) 161

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (c) Prime numbers are divisible by 1 and itself only.

Example:- 5,11,13,19

From options,
Factors of the numbers,
181 = 1, 181
121 = 1, 11, 121
141 = 1, 3, 47, 141
161 = 1, 7, 23, 161
Hence from the above it is clear that '181' is a prime number.

108. Which of the following pairs is NOT a pair of twin primes?
(a) 11, 13 (b) 71, 73
(c) 131, 133 (d) 191, 193
RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (c) From option (c),
Factor of 131 = 131, 1 and
Factors of 133 = 1, 7, 19, 133.
Hence, this pair is not a pair of twin primes.

109. Which of the following is the prime number series from 1 to 20?
(a) 3, 5, 7, 11, 13, 17, 19
(b) 2, 5, 7, 9, 11, 13, 17, 19
(c) 2, 3, 5, 7, 11, 13, 17, 19
(d) 1, 2, 3, 5, 7, 11, 13, 17, 19
RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (c) Prime numbers:- The number which is divisible by 1 and itself only.
Hence, from options, the required series will be 2,3,5,7,11,13,17,19.

110. Calculate the difference between the largest and the smallest two-digit prime number.
(a) 82 (b) 83
(c) 84 (d) 86
RRB RPF Constable -17/01/2019 (Shift-I)

Ans : (d) The largest two digit prime number = 97
The smallest two digit prime number = 11
Hence, the required number = 97 – 11 = 86

111. Which of the following number is not composite?
(a) 209 (b) 203
(c) 161 (d) 109
RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (d) The number is called composite number. which is formed by multiplying whole numbers.
Hence, 209 = 11 × 19
203 = 7 × 29
161 = 7 × 23
But, 109 cannot be expressed in the form of factors (except 1). So it is not composite.

Type - 4

112. If each packet contains the same number of pencils and there are 96 pencils in all in 12 packets, how many packets will one have to purchase if one requires 304 pencils?
(a) 39 (b) 38
(c) 33 (d) 36
RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (b) : ∵ Pencils present in 12 packets = 96
∵ Pencils present in 1 packet $= \frac{96}{12} = 8$ Pencils
Number of packets required for 304 pencils
$= \frac{304}{8} = 38$ Packets.

113. From 3/4 of a number P, Ramakrishna subtracts 2/3 of another number Q and obtain 5/8 as the difference. What is the answer Ramakrishna should obtain if he subtracts eight times of Q from nine times of P?
(a) $\frac{15}{2}$ (b) $\frac{25}{4}$
(c) $\frac{20}{3}$ (d) $\frac{25}{3}$
RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (a) : According to the question,

$$P \times \frac{3}{4} - Q \times \frac{2}{3} = \frac{5}{8}$$

$$\Rightarrow \frac{3P}{4} - \frac{2Q}{3} = \frac{5}{8} \Rightarrow \frac{9P - 8Q}{12} = \frac{5}{8}$$

$$\Rightarrow 9P - 8Q = \left(\frac{5}{8}\right) \times 12 \Rightarrow 9P - 8Q = \frac{60}{8}$$

$$\therefore 9P - 8Q = \frac{15}{2}$$

114. In a class of 80 students $\frac{1}{10}$ of the class likes chocolate D and $\frac{1}{20}$ of the class likes chocolate E. What is the difference between the number of students who like chocolate D and the number of students who like chocolate E ?
(a) 2 (b) 9
(c) 5 (d) 4
RRB NTPC (Stage-2) 17/06/2022 (Shift-I)

Ans. (d) : Students who likes chocolate D $= 80 \times \frac{1}{10} = 8$
Students who likes chocolate E $= 80 \times \frac{1}{20} = 4$
Hence the required difference = 8–4 = 4

115. Sunita won 3/5 of the marbles that were there in the beginning of the game. Ravi won 2/3 of the remaining marbles while Sunny won the remaining 60 marbles. How many marbles did Sunita Win?
(a) 255 (b) 240
(c) 285 (d) 270
RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : Let, number of marbles be x.
Won by Sunita $= \frac{3x}{5}$
Number of remaining marbles $= x - \frac{3x}{5} = \frac{2x}{5}$
Won by Ravi $= \frac{2x}{5} \times \frac{2}{3} = \frac{4x}{15}$

According to the question,

$$\frac{3x}{5}+\frac{4x}{15}+60=x$$

$$60=x-\left(\frac{3x}{5}+\frac{4x}{15}\right)$$

$$60=x-\frac{13x}{15}$$

$\because \frac{2x}{15}=60 \Rightarrow x=450$

Number of marbles Won by Sunita $=450\times\frac{3}{5}=270$

116. The difference between two numbers is 18. If the difference between their squares is 360, find the larger number.

(a) 18 (b) 15
(c) 19 (d) 16

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (c) : Let the smaller number = y
and larger number = x
According to the question,

$x - y = 18$ ..... (i)

$x^2 - y^2 = 360$

$(x + y)(x - y) = 360$

$(x + y)\ 18 = 360$

$x + y = 20$ .....(ii)

On adding equation (i) and equation (ii) -

$$\begin{array}{r} x+y=20 \\ \underline{x-y=18} \\ 2x=38 \end{array}$$

$x = 19$

$y = 20 - x$

$= 20 - 19$

$= 1$

Hence larger number = 19 and smaller number = 1

117. A 91 cm long wire is cut into two pieces so that the length of one piece is three-fourth of the other. Find the length of the shorter piece.

(a) 36.23 m (b) 39 cm
(c) 42.17 cm (d) 38 cm

RRB Group-D 22/08/2022 (Shift-I)

Ans. (b) : Let the length of second piece = x cm

Length of first piece $=x\times\frac{3}{4}=\frac{3x}{4}$

According to the question,

$$\Rightarrow \frac{3x}{4}+x=91$$

$$\Rightarrow 7x=91\times 4$$

$$\Rightarrow x=\frac{91\times 4}{7}$$

length of second piece (x) = 52 cm

Length of first piece $=52\times\frac{3}{4}$

$= 39$ cm

Hence the length of the shorter piece = 39 cm

118. A 3 digit number is such that the ratio of its units digit, tens digit and hundreds digit is 1 : 2 : 3. The sum of this number and the reversed number obtained by reversing the order of its digits is 1332. Find the number.

(a) 246 (b) 414
(c) 123 (d) 369

RRB Group-D 26/08/2022 (Shift-III)

Ans. (d) :
Let three digit number = $100 \times 3x + 10 \times 2x + x$

$= 300x + 20x + x$

$= 321x$

New number obtained by reversing the digits

$= 100 \times x + 10 \times 2x + 3x$

$= 100x + 20x + 3x$

$= 123x$

According to the question,

$321x + 123x = 1332$

$444x = 1332$

$X = 3$

Hence number = $100\times3 + 10\times2\times3 + 3\times3$

$= 300 + 60 + 9$

$= 369$

119. A man plants 21,025 mango trees in his garden in such a way that there are as many rows as there are mango trees in each row. Find the number of rows.

(a) 135 (b) 125
(c) 145 (d) 130

RRB Group-D 30/08/2022 (Shift-II)

Ans. (c) : Let the number of rows in garden = x
And number of tree in each row = x
According to the question,

$x \times x = 21025$

$x = \sqrt{21025}$

$x = 145$

Hence, Number of rows in garden = 145

120. The sum of two numbers is 27. Five times one number is equal to 4 times the other. The smaller of the two numbers is :

(a) 12 (b) 11 (c) 13 (d) 15

RRB Group-D 30/08/2022 (Shift-II)

Ans. (a) : Let the numbers be x and y
According to the question :

$\because \rightarrow x + y = 27$ ————(i)

$\because \rightarrow 5x = 4y$

$5x - 4y = 0$ ————(ii)

On solving equation (i) and (ii) :

$y = 15$

$x = 12$

Hence, the smaller number is 12.

121. There are two consecutive natural numbers such that the sum of their squares is 313. Find smaller of these two numbers.

(a) 12 (b) 14 (c) 15 (d) 13

RRB Group-D 24/08/2022 (Shift-I)

Ans. (a) :
Let two consecutive natural numbers are x and (x + 1)
According to the question.
$x^2 + (x + 1)^2 = 313$
$x^2 + x^2 + 1 + 2x = 313$
$2x^2 + 2x = 312$
$x^2 + x = 156$
$x (x + 1) = 13 \times 12$
$\boxed{x = 12}$
Hence, smaller of these two numbers = 12

122. In a competitive exam, 3 marks are to be awarded for every correct answer and for every wrong answer, 1 mark will be deducted. Sindhu scored 80 marks in this exam. Had 4 marks been awarded for each correct answer and 2 marks deducted for each incorrect answer. Sindhu would have scored 90 marks. If Sindhu attempted all the questions, then the number of questions in the test are :
(a) 60 (b) 55
(c) 70 (d) 50
RRB Group-D 09/09/2022 (Shift-I)

Ans. (a) : Let the correct question = x
incorrect question = y
According to the question,
$3x - y = 80$ ..... (i)
$4x - 2y = 90$ ..... (ii)
On multiplying by 4 in equation (i) and 3 in eq. (ii)
$12x - 4y = 320$ ..... (iii)
$12x - 6y = 270$ ..... (iv)
$- \quad + \quad -$ (on substracting)
$2y = 50$
$y = 25$
On putting the value of y in equation (i),
$3x = 80 + 25$
$x = \frac{105}{3} = 35$
Hence number of question in the test
$(x+y) = 35 + 25$
$= 60$

123. The cost of 2 tables and 3 chairs is ₹540, while that of 2 tables and 1 chair is ₹470. What is the cost of 5 chairs ?
(a) ₹ 245 (b) ₹ 205
(c) ₹ 175 (d) ₹ 185
RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) : Let the cost by one table and chair be a and b respectively.
According to the first condition,
$2a + 3b = 540$ ..... (i)
According to the second condition,
$2a + b = 470$ ..... (ii)
On substracting equation (ii) from equation (i),
$2a + 3b = 540$
$2a + b = 470$
$- \quad - \quad -$
$2b = 70$
$b = \frac{70}{2}$
$b = 35$
Cost of one chair = ₹35
So cost of 5 chairs = 5 × 35 = ₹175

124. The sum of two positive numbers is 45 and their difference is 19. What are the numbers?
(a) 25, 20 (b) 32, 13
(c) 30, 15 (d) 31, 15
RRB Group-D 01/09/2022 (Shift-III)

Ans. (b) : Let the numbers be x and y respectively
According to the question,
$x + y = 45$ ..... (i)
$x - y = 19$ ..... (ii)
On adding equation (i) and equation (ii),
$2x = 64$
$x = 64/2 = 32$
On putting the value of x in equation (i),
$32 + y = 45$
$y = 45 - 32 = 13$
Hence the numbers are 32 and 13.

125. Find the number whose $\frac{1}{3}^{rd}$ part is 6 more than its $\frac{1}{5}^{th}$ part.
(a) 50 (b) 45 (c) 40 (d) 35
RRB Group-D 06/09/2022 (Shift-II)

Ans. (b) : Let the number be x.
According to the question.
$x \times \frac{1}{3} - x \times \frac{1}{5} = 6$
$5x - 3x = 15 \times 6$
$2x = 90$
$x = 45$

126. The sum of two numbers is 32 and one of them exceeds the other by 18. Find the greater number.
(a) 25 (b) 28 (c) 24 (d) 27
RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : Let the greater number = a
and smaller number = b
According to the question,
$a + b = 32$ ..... (i)
$a - b = 18$ ..... (ii)
On adding eq. (i) and eq. (ii),
$2a = 50$
$a = 25$
So,
$b = 7$
Hence the greater number is 25.

127. Three chairs and two tables cost Rs. 1,850. Five chairs and three tables cost Rs. 2,850. Find the cost of two chairs and two tables.
(a) ₹700 (b) ₹1,700
(c) ₹1,400 (d) ₹1,300
RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Let the cost of chair and table be 'C' and 'T' respectively.
According to the question,
$3C + 2T = 1850$ ..... (i)
$5C + 3T = 2850$ ..... (ii)
On substracting eq. (i) × 3 from eq. (ii) × 2 -
$10C + 6T = 5700$
$9C + 6T = 5550$
$C = ₹150$
So, $T = ₹700$
Hence the cost of two chairs and two tables
$= 150 \times 2 + 700 \times 2$
$= 300 + 1400$
$= ₹1700$

128. A number is split into two parts such that one part is 14 more than the other, and the ratio of the two parts is 7 : 5. Find the number.
(a) 49 (b) 35 (c) 84 (d) 54
RRB GROUP - D – 29/09/2022 (Shift–II)

Ans. (c) :
Let number be x
First part = x + 14
Second part = x
According to the question,
$\frac{x+14}{x} = \frac{7}{5}$
$5x + 70 = 7x$
$2x = 70$
$x = 35$

129. If one-third of a number is 6 more than the number itself, then find the number.
(a) –7 (b) –6 (c) –5 (d) –9
RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (d) : Let the number be x.
According to the question,
$\frac{x}{3} = x + 6$
$\frac{x}{3} - x = 6$
$\frac{-2x}{3} = 6$
$\boxed{x = -9}$

130. Ujjwal has ₹5,250 in currency notes of denominations ₹50, ₹100 and ₹200. The number of notes of each denomination are equal. How many notes in total does Ujwal have ?
(a) 30 (b) 45 (c) 60 (d) 15
RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (b) : Let Ujjwal have ₹ 3x notes because notes of each denomination are equal.
According to the question,
$50x + 100x + 200x = 5250$
$350x = 5250$
$x = 15$
$\therefore$ Total number of notes = 3x
$= 15 \times 3$
$= 45$

131. If the sum of two numbers is 25 and the product is 136, then the sum of their cubes is :
(a) 5425 (b) 5524
(c) 4525 (d) 4524
RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (a) : Let the numbers be a and b respectively.
According to the question
$a + b = 25$
$ab = 136$
$\because [a^3 + b^3 = (a+b)(a^2 + b^2 - ab)]$
$(a+b)^2 = (25)^2$ (On squaring both side)
$a^2 + b^2 + 2ab = 625$
$a^2 + b^2 = 625 - 272$
$a^2 + b^2 = 353$
$a^3 + b^3 = 25 \times (353 - 136)$
$a^3 + b^3 = 25 \times 217$
$a^3 + b^3 = 5425$

132. The product of two consecutive positive natural numbers is 72. The greater of the two numbers is:
(a) 12 (b) 24
(c) 9 (d) 8
RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (c) : Let the two consecutive positive natural number be x and (x + 1) respectively.
So, According to the question,
$x(x + 1) = 72$
$x^2 + x - 72 = 0$
$x^2 + 9x - 8x - 72 = 0$
$(x + 9)(x - 8) = 0$
$\therefore \boxed{x = 8}$
Hence the greater number = x + 1
$\Rightarrow 8 + 1 = 9$

133. The sum of two numbers is 20 and their difference is 16. The ratio of the larger number to the smaller number is:
(a) 1 : 9 (b) 11 : 2
(c) 2 : 11 (d) 9 : 1
RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (d) : Let the two numbers be x and y
According to the question,
$x + y = 20$ ..... (i)
$x - y = 16$ ..... (ii)
On adding eq. (i) and eq. (ii)
$2x = 36$
$x = 18$
$\therefore y = 20 - 18 = 2$
Hence the Required ratio = 18 : 2
= 9 : 1

134. Three chairs and two tables cost ₹7,000 and five chairs and three tables cost ₹11,000. What is the cost of four chairs and two tables ?
(a) ₹ 9,600 (b) ₹ 9,000
(c) ₹ 6,000 (d) ₹ 8,000
RRB Group-D 08/09/2022 (Shift-II)

Ans. (d) : Let the price of chair and table be x and y respectively.

According to the question,

$3x + 2y = 7000$ ..... (i)

$5x + 3y = 11000$ ..... (ii)

On multiplying by 5 in eq. (i) and 3 in eq. (ii)

$15x + 10y = 35000$

$15x + 9y = 33000$ (On substracting)

– – –

×

$y = 2000$

On putting the value of y in eq. (i) -

$3x + 2 \times 2000 = 7000$

$3x = 7000 - 4000$

$x = ₹\ 1000$

$\therefore$ Cost of four chairs and two tables

$= 4 \times 1000 + 2 \times 2000$

$= ₹\ 8000$

135. Pragya invited male and females to her birthday party in the ratio of 7 : 6. If the number of males in the party were 56, then the total number of guests attending the party were?

(a) 48 (b) 104

(c) 108 (d) 112

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let number of males $= 7x$

and, number of female $= 6x$

According to the question-

$7x = 56$

$x = 8$

$\therefore$ Total number of guests $= 7x + 6x$

$= 13x$

$= 13 \times 8$

$= 104$

136. What is the sum of the cube of the natural numbers from 1 to 10, both inclusive?

(a) 3023 (b) 3025

(c) 3024 (d) 3022

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (b) : The sum of the cube of the natural numbers from 1 to 10–

$$= 1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3 + 9^3 + 10^3$$

$$= \left(\frac{10 \times 11}{2}\right)^2 \qquad \left\{\because \Sigma n^3 = \left[\frac{n(n+1)}{2}\right]^2\right\}$$

$$= \frac{100 \times 121}{4} = 3025$$

137. The sum of two numbers is 40 and their product is 60. The sum of their reciprocals is:

(a) $\frac{3}{4}$ (b) $\frac{3}{2}$

(c) $\frac{2}{3}$ (d) $\frac{1}{2}$

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the two numbers are x and y

According to the question,

$x + y = 40$ .....(i)

and $x \times y = 60$ .....(ii)

Sum of reciprocal of numbers $= \frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy}$

From equation (i) and (ii)

$$= \frac{40}{60} \Rightarrow \frac{2}{3}$$

138. What is the sum of the cubes of the natural numbers from 5 to 14?

(a) 10930 (b) 10925

(c) 10935 (d) 10920

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (b): The sum of the cubes of natural number

$$= \left[\frac{n(n+1)}{2}\right]^2$$

Sum of cubes of all natural numbers from 5 to 14

= [Sum of cubes of number 1 to 14] − [Sum of cubes of numbers 1 to 4]

$$= \left[\frac{14(14+1)}{2}\right]^2 - \left[\frac{4(4+1)}{2}\right]^2$$

$= (105)^2 - (10)^2$

$= 11025 - 100 = 10925$

139. If the difference between squares of two consecutive positive odd integers is 56, then the two consecutive odd integers are.

(a) 17,19 (b) 13,15

(c) 11,13 (d) 15,17

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : Suppose first odd number = a

and, second consecutive odd number = a+2

According to the question,

$(a+2)^2 - (a)^2 = 56$

$a^2 + 4 + 4a - a^2 = 56$

$a = \frac{52}{4} = 13$

First Number (a) = 13

Second Number (a + 2) = 13+2 = 15

140. An orchard has 5776 trees and the arrangement of trees is such that there are as many rows as there are trees in a row. Then the number of rows is:

(a) 48 (b) 76

(c) 65 (d) 56

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let the number of trees be X and the number of rows also X.

According to the question,

$X \times X = 5776$

$X^2 = 5776$

$X = 76$

Hence, the number of rows (X) = 76

141. What is the sum of the squares of the numbers from 3 to 18?

(a) 2103 (b) 2102

(c) 2101 (d) 2104

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (d)

Sum of squares of the first 'n' terms $= \frac{n(2n+1)(n+1)}{6}$

Sum of squares of numbers form 3 to 18

$= \left(1^2+2^2+3^2+4^2+.....+18^2\right)-\left(1^2+2^2\right)$

$= \frac{18(18\times2+1)(18+1)}{6}-5$

$= \frac{18\times37\times19}{6}-5$

$= 2109-5$

$= 2104$

142. The sum of two numbers is 20 and their product is 96. What is the difference between the two numbers?

(a) 4 (b) 5

(c) 6 (d) 8

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (a) : Let the two numbers are x and y.

According to the question,

$x + y = 20$

$xy = 96$

From, $x - y = \sqrt{(x+y)^2-4xy}$

$= \sqrt{(20)^2-4\times96}$

$= \sqrt{400-384}$

$= \sqrt{16}$

$= 4$

143. If the sum of two numbers is 30 and the product is 50, then the sum of their reciprocals is:

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$

(c) $\frac{2}{5}$ (d) $\frac{5}{2}$

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (a) : Let the numbers be x and y –

Given,

$x + y = 30$ .....(i)

$xy = 50$ .....(ii)

The sum of reciprocals of numbers

$= \frac{1}{x}+\frac{1}{y} = \frac{x+y}{xy}$

$= \frac{30}{50} = \frac{3}{5}$

144. The sum of two numbers is 25 and their difference is 15. The ratio of the numbers is?

(a) 3:2 (b) 5:3

(c) 4:1 (d) 2:3

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the numbers be a and b.

According to the question,

$a + b = 25$ _____ (i)

$a - b = 15$ _____ (ii)

By equation (i) and (ii)

$\Rightarrow \quad a = \frac{25+15}{2} = 20$

$b = \frac{25-15}{2} = 5$

Hence, the ratio of the numbers a : b = 20 : 5 = 4 : 1

145. The sum of two number is 16 and their product is 63. The sum of their reciprocal is equal to:

(a) $\frac{16}{63}$ (b) $\frac{63}{16}$

(c) $\frac{8}{63}$ (d) $\frac{60}{63}$

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the numbers be x and y

According to the question,

$x + y = 16$ _____ (i)

and $x \times y = 63$ _____ (ii)

then, $\frac{1}{x}+\frac{1}{y} = ?$

$\frac{x+y}{xy} = \frac{16}{63}$

146. The difference between two numbers which are in the ratio 5 : 3 is 50. What is the product of the numbers?

(a) 1035 (b) 9375

(c) 8575 (d) 9975

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the numbers are 5x, 3x

As per question,

$5x-3x = 50$

$2x = 50$

$x = 25$

Hence, the product of two numbers $= 5x\times3x = 15x^2$

$= 15\times25^2 = 9375$

147. $\frac{3}{5}$ of a number is 10 more than half of the second number. If 8 is subtracted from $\frac{3}{7}$ of the first number, then it becomes 4 less than half of the second number. What is the sum of the two numbers?

(a) 56 (b) 57

(c) 54 (d) 55

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the no. be x and y

According to the question,

$\frac{3}{5}x-\frac{y}{2} = 10$

$6x - 5y = 100$ ...(i)

and $\frac{3}{7}x-8 = \frac{y}{2}-4$

$6x - 7y = 56$ ...(ii)

On subtracting equation (ii) from equation(i)

$2y = 44$

$y = 22$

$x = \frac{100+5\times22}{6} = 35$ {from equation (i)}

Hence, sum of two numbers = x+y = 35+22 = 57

148. The ratio of five numbers are 1:2:3:4:5 and their sum is 30. Find the sum of second and fifth number?

(a) 15 (b) 14
(c) 13 (d) 12

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the number are x, 2x, 3x, 4x, 5x.
According to the question,

$x+2x+3x+4x+5x=30$

$15x=30 \Rightarrow x = 2$

Then the sum of (second+fifth) number = $2x+5x=7x$

$= 7\times2=14$

149. There are 2401 students in a school. The PT teacher wants all of them to stand in rows and columns. Find the number of rows, if the number of rows is equal to the number of columns.

(a) 29 (b) 39
(c) 49 (d) 19

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let number of Rows = x

then number of columns = x

Number of students in school = 2401.....(given)

$\because$ Number of rows × Number of columns = 2401

$\therefore$ $x \times x = 2401$

$x^2 = 2401$

$x = 49$

Hence, the number of rows (x) = 49

150. The sum of two numbers is 27 and the difference of their squares is 243. What is the difference between the numbers?

(a) 42 (b) 9
(c) 72 (d) 3

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : let us the numbers be x and y respectively.
Given,

$x + y = 27$———(i)

$x^2 - y^2 = 243$

$(x-y)(x+y) = 243$_____(ii)

Putting value of $(x + y)$ from eq^n (i) in eq (ii),

$(x-y) \times 27 = 243$

$(x-y) = \frac{243}{27} = 9$

So, difference between the numbers = $x-y = 9$

151. What is the sum of the squares of the numbers from 1 to 12?

(a) 655 (b) 660
(c) 650 (d) 665

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (c) : $1^2 + 2^2 + 3^2 + ... + 12^2$

From, Sum of the square of the first n natural numbers

$= \frac{n(n+1)(2n+1)}{6}$

$= \frac{12\times13\times25}{6} = 650$

152. Find the least number which must be added to the number 6412 to get a perfect square.

(a) 149 (b) 129
(c) 181 (d) 150

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (a) : $(80)^2 = 6400$

$(81)^2 = 6561$

Hence on adding 6561 – 6412 = 149, 6412 will be the perfect square.

153. Out of four consecutive numbers, the sum of the first two numbers is equal to the fourth number. What is half of the sum of the four numbers.

(a) 14 (b) 7
(c) 9 (d) 2

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let four consecutive numbers be x, (x + 1), (x +2) and (x + 3)
According to question,

$x + (x+1) = x + 3$

$x = 2$

Half of the sum of four number = $\frac{4x+6}{2} = 2x + 3$

$= 2 \times 2 + 3$

$= 7$

154. 24 mango trees, 56 apple trees and 72 orange trees have to be planted in rows such that each row contains the same number of trees of one variety only. Find the minimum number of rows in which the above mentioned trees may be planted.

(a) 15 (b) 18
(c) 17 (d) 19

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) :
(Number of total columns × Number of total rows)

8×3

8×7

8×9

$8 (3 + 7 + 9)$ = Total number of trees

Total number of rows = 3 + 7 + 9 = 19

155. What is the sum of the cubes of the first four natural numbers?

(a) 96 (b) 84
(c) 100 (d) 1000

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (c) : First four natural numbers–

$\Rightarrow$ 1, 2, 3, 4

Cube,

$(1)^3 = 1$

$(2)^3 = 8$

$(3)^3 = 27$

$(4)^3 = 64$

Sum of cubes of the first four natural numbers

$= 1 + 8 + 27 + 64$

$= 9 + 27 + 64$

$= 36 + 64$

$= 100$

156. $\frac{6}{11}$ **of the people present in a hall are sitting in** $\frac{9}{14}$ **of the chairs available, and the rest are standing. If there are 30 empty chairs, how many people in the hall are standing?**

(a) 40 (b) 35
(c) 30 (d) 45

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (d) : If number of total chair = x

Then empty chair = $x-\frac{9x}{14}=\frac{5x}{14}$

Whereas, $\frac{x\times5}{14}=30$

x = 84 (Number of total chair)

Hence, number of people sitting on the chair.

$\Rightarrow$ 84 – 30 = 54

If total people are y then,

$\frac{y\times6}{11}=54$

or y = 99 people

$\because$ Number of standing people $y\left(1-\frac{6}{11}\right)=y\times\frac{5}{11}$

Hence, Number of standing people = $\frac{99\times5}{11}=45$ people

157. One-fourth of one-eight of a number is 300. What is one fifth of the same number?

(a) 1900 (b) 1910
(c) 1920 (d) 1890

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let the required number = x

According to the question,

$\left(x\times\frac{1}{8}\right)\times\frac{1}{4}=300$

$x=300\times32\Rightarrow x=9600$

Then, $9600\times\frac{1}{5}=1920$

158. Two-fifth of one-fourth of three-seventh of a number is 15. What is the half of that number?

(a) 375 (b) 175
(c) 300 (d) 170

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number is x

According to the question,

$x\times\frac{3}{7}\times\frac{1}{4}\times\frac{2}{5}=15$

x = 350

then, half of that number = $\frac{350}{2}$

= 175

159. Instead of multiplying a number by 2, Rahul divided it by 2 and got the answer as 2. What should be the actual answer?

(a) 4 (b) 8
(c) 6 (d) 2

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the no. = x

According to question,

actual answer = 2x

and from the question

$\frac{x}{2}=2$

x = 4

Actual answer = 2x

$=2\times4=8$

160. In a reunion of class XII, out of 45 students, 30 students participated in the function. If all present in the function shake hands with one other, find the total number of handshakes.

(a) 870 (b) 435
(c) 841 (d) 900

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (b) : Total number of handshakes

$=\frac{n}{2}(n-1)$

$=\frac{30}{2}(30-1)$

$=15\times29$

$=435$

161. The difference of two numbers is 5. If their product is 336, find the sum of the numbers.

(a) 21 (b) 37
(c) 28 (d) 51

RRB JE - 26/06/2019 (Shift-I)

Ans. (b) Let the numbers be x and y respectively.

$x-y=5$ (i)

$xy=336$ (ii)

$(x+y)^2=(x-y)^2+4xy$

From equation (i) and (ii),

$(x+y)^2=(5)^2+4\times336$

$(x+y)^2=25+1344$

$(x+y)^2=1369$

$(x+y)=\sqrt{1369}$

$x+y=37$

Hence, the required sum of the numbers =37

162. If x + y = 11, then $(-1)^x+(-1)^y$ is equal to ..... (where x and y are whole numbers).

(a) -1 (b) 1
(c) 2 (d) 0

RRB JE - 23/05/2019 (Shift-I)

Ans : (d) Given –

$x+y=11$

$(-1)^x+(-1)^y=?$

Note- When the sum of two whole numbers is an odd number then one will be even and second will be odd.

Hence,

$(-1)^{even/odd}+(-1)^{odd/even}=0$

163. From a cloth of 30 m long, 12 pieces each measuring 225 cm are cut and sold. How much is left of the original length?

(a) 1/3 (b) 1/9
(c) 1/10 (d) 3/10

RRB JE - 23/05/2019 (Shift-III)

Ans : (c) The total length of the cloth = 30 m [1m = 100 cm] = 3000 cm

Total length of the cloth that is sold =225×12=2700 cm
The length of the remaining cloth =3000–2700=300 cm
The remaining part $= \frac{300}{3000} = \frac{1}{10}$

164. If 1/7 of a number is subtracted from the number, the result is 30 less than the number. Find the number.
(a) 105 (b) 140
(c) 120 (d) 210

RRB JE - 24/05/2019 (Shift-III)

Ans : (d) Let the number be x.

$$x - \frac{x}{7} = x - 30$$
$$\frac{7x - x}{7} = x - 30$$
$$6x = 7x - 210$$
$$x = 210$$

165. If the product of two numbers is 24, and their square's sum is 52, then find their sum.
(a) 5 (b) 10
(c) 15 (d) 20

RRB RPF Constable -24/01/2019 (Shift-I)

Ans :(b) Let the numbers be x and y.
According to the question,
$x, y = 24$……..(1)
$x^2 + y^2 = 52$……(2)
$\because (x + y)^2 = x^2 + y^2 + 2xy$
$= 52 + 2\times24$
$= 52 + 48 = 100$
$x + y = \sqrt{100} = 10$

166. If 10 is subtracted from the 5 times of a number, then that number will be equal to the number found when adding 8 to 4 times of that number, what is that number?
(a) 15 (b) 18
(c) 22 (d) 21

RRB RPF Constable -25/01/2019 (Shift-III)

Ans. (b) : Let the number be x.
According to the question,
$5x - 10 = 4x + 8$
$x = 18$
Hence, the required number will be 18.

167. When 8 times of a number is added to 4, the result obtained is the smallest 3-digit number. What is that number?
(a) 12 (b) 10
(c) 15 (d) 8

RRB RPF Constable -22/01/2019 (Shift-II)

Ans : (a) Let the number be x,
$\because$ The smallest 3-digit number = 100
According to the question,
$8x + 4 = 100$
$8x = 96$
$x = \frac{96}{8} = 12$
Hence, the required number will be 12.

168. The sum of two numbers is 22. Five times of one number is equal to 6 times the other. Find the larger of the two numbers.
(a) 12 (b) 15
(c) 10 (d) 16

RRB JE - 25/05/2019 (Shift-I)

Ans : (a) Let the numbers are x and y,
According to the question,
$x + y = 22$ .....(i)
and $5x = 6y$ .....(ii)
$x = \frac{6}{5}y$
Putting the value of x in equation (i) -
$\frac{6}{5}y + y = 22$
$\frac{11}{5}y = 22$
$y = \frac{22\times5}{11} = 10$
$y = 10$
$\therefore \quad x = \frac{6}{5}\times10 = 12$
Hence, the larger number is 12.

169. If doubling a number and adding 20 to the result gives the same answer as multiplying the number by 8 and subtracting 4 from the product, find the number.
(a) 3 (b) 4
(c) 6 (d) 2

RRB JE - 25/05/2019 (Shift-II)

Ans : (b) Let the number be = x
According to the question,
$2x + 20 = x \times 8 - 4$
$2x + 20 = 8x - 4$
$24 = 6x$
$\boxed{x = 4}$

170. The product of two numbers is 9375. The quotient, when the largest number is divided by the smallest number is 15. Find the sum of these numbers.
(a) 400 (b) 380
(c) 425 (d) 395

RRB JE - 30/05/2019 (Shift-II)

Ans : (a) Let the smaller number be = x
$\therefore$ Larger number = 15x
According to the question,
$x \times 15x = 9375$
$15x^2 = 9375$
$x^2 = 625$
$x = 25$ first number
$\therefore$ $15x = 15 \times 25 = 375$ second number
Hence, the sum of the numbers = 375 + 25 = 400

171. If 2/3rd of 1/4th of a number is 32. Find the number.
(a) 202 (b) 198
(c) 196 (d) 192

RRB RPF-SI -13/01/2019 (Shift-III)

Ans : (d) Let the number be x,
According to question,
$x \times \frac{1}{4} \times \frac{2}{3} = 32$
$x = 32 \times 6 = 192$

172. If the sum of two numbers is 13 and the sum of their squares is 97, what is their product?

(a) 72 (b) 36
(c) 110 (d) 84

RRB JE - 28/06/2019 (Shift-III)

Ans. (b) Let both the numbers are X and Y.
Given,

$x + y = 13$, and $x^2 + y^2 = 97$, $xy = ?$

$\because (x + y)^2 = x^2 + y^2 + 2xy$ ..... (i)

On putting the values in equation (i),

$(13)^2 = 97 + 2xy$

$169 = 97 + 2xy$

$2xy = 169 - 97$

$xy = \frac{72}{2}$

$xy = 36$

173. Which of the fraction given below, when added to $\frac{13}{5}$, gives 1?

(a) $-\frac{48}{30}$ (b) $-\frac{7}{5}$
(c) $-\frac{28}{10}$ (d) $-\frac{8}{15}$

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) : Let the fraction be x.
According to the question,

$x+\frac{13}{5}=1$

$x=1-\frac{13}{5}$

$x=\frac{-8}{5}$

or, $x=\frac{-8\times6}{5\times6}=\frac{-48}{30}$

174. Shalini, Tanvir and Rashid shared a cake. Shalini had $\frac{1}{6}$ part of it, Tanvir had $\frac{1}{4}$ part of it and Rashid had the remaining part. What was fraction of Rashid's cake?

(a) $\frac{5}{6}$ (b) $\frac{3}{5}$
(c) $\frac{13}{15}$ (d) $\frac{7}{12}$

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (d) Shalini's share of the cake $=\frac{1}{6}$ part

Tanvir's share of the cake $=\frac{1}{4}$ part

Total share of Shalini and Tanvir's cake

$=\frac{1}{6}+\frac{1}{4}=\frac{2+3}{12}=\frac{5}{12}$

Hence, Rashid's share of the cake $=1-\frac{5}{12}=\boxed{\frac{7}{12}}$ part

175. The sum of two numbers is 9. The sum of their reciprocals is 1/2. One of the number is.

(a) 2 (b) 4
(c) 5 (d) 6

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (d) : Let the first number be x and the second number be y.
According to the question,

$x + y = 9$ .....(i)

$\frac{1}{x}+\frac{1}{y}=\frac{1}{2}$ ..... (ii)

From equation (i),

$x + y = 9$

$y = 9 - x$

From equation (ii)

$\frac{1}{x}+\frac{1}{y}=\frac{1}{2}$

$\frac{x+y}{xy}=\frac{1}{2}$

$\frac{9\times2}{xy}=1$

$2 \times 9 = xy$

On putting the value of y,

$18 = x(9 - x)$

$18 = 9x - x^2$

$x^2 - 9x + 18 = 0$

$x^2 - 6x - 3x + 18 = 0$

$x(x - 6) - 3(x - 6) = 0$

$(x - 3)(x - 6) = 0$

$(x - 3) = 0$ or $x = 3$

$(x - 6) = 0$ or $x = 6$

176. If the sum of two numbers is 26 and their difference is 12. Find the difference of their squares.

(a) 296 (b) 312
(c) 324 (d) 336

RRB NTPC 05.04.2016 Shift : 2

Ans : (b) Let the numbers be x and y.

$x + y = 26$

$x - y = 12$

$\therefore$ The difference of the squares,

$= x^2 - y^2$

$= (x + y)(x - y)$

$= 26 \times 12 = 312$

177. If the product of two numbers is thrice of their sum, if 1st number is 12 find the 2nd number.

(a) 2 (b) 3
(c) 4 (d) 5

RRB NTPC 04.04.2016 Shift : 1

Ans : (c) Let the 2nd number be x.

$x \times 12 = (x + 12) \times 3$

$12x = 3x + 36$

$9x = 36$

Hence, $x = 4$

178. Two partners M and N buy a car. M pays his share of $\frac{3}{7}^{th}$ of the total cost of the car. M pays ₹31,540 less as compared to N. What is the cost of the car?

(a) ₹2,32,680 (b) ₹2,03,175
(c) ₹2,20,780 (d) ₹1,85,780

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (c) Let the cost of the car is ₹ x
According to the question,

$$\text{M's share} = \frac{3x}{7}$$

$$\text{N's share} = \frac{3x}{7} + 31540$$

Then, $\frac{3x}{7} + 31540 + \frac{3x}{7} = x$

$x = 31540 \times 7$

$x = ₹2,20,780$

179. If $\frac{2}{3}$ part of a pizza costs ₹ 300, then $\frac{3}{5}$ part of a pizza will cost:

(a) ₹180 (b) ₹250
(c) ₹225 (d) ₹270

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (d) The cost of 2/3 part of the pizza = ₹300

Then, the cost of 1 share of the pizza $= \frac{300 \times 3}{2} = ₹450$

The cost of $3/5^{th}$ share of the pizza $= 450 \times \frac{3}{5}$

$= 90 \times 3 = ₹270$

180. When 472 pieces of plywood, each 0.23 cm thick, are placed on top of each other, what would be the height of the pillar in metre?

(a) 10.856 (b) 1.0856
(c) 108.56 (d) 1.856

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (b) The required height of the pillar,

$$= \frac{0.23 \times 472}{100} = 1.0856 \text{ metre}$$

181. 15 small rods, each of length $23\frac{2}{7}$ m are joined to make a big rod. What is the length of the big rod?

(a) $349\frac{3}{7}$ m (b) $349\frac{1}{7}$ m
(c) $349\frac{2}{7}$ m (d) $349\frac{5}{7}$ m

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (c) The length of each rod $= 23\frac{2}{7} = \frac{163}{7}$ m

In this way, the length of big rod $= 15 \times \frac{163}{7}$

$$= \frac{2445}{7} = 349\frac{2}{7} \text{ m}$$

182. Find the smallest four digit number which is a perfect square.

(a) 1000 (b) 1024
(c) 1081 (d) 1064

RRB NTPC 04.04.2016 Shift : 1

Ans : (b) The smallest 4 digit number = 1000

	32
3	1000
+3	9
62	100
2	124
	−24

Hence, the smallest 4 digit perfect square number = 1000 + 24 = 1024

183. A number when multiplied by $\frac{6}{5}$ gives $\frac{108}{125}$. The number is:

(a) $\frac{625}{648}$ (b) $\frac{648}{625}$
(c) $\frac{18}{25}$ (d) $\frac{25}{18}$

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (c) : Let the number = x
As per question

$$x \times \frac{6}{5} = \frac{108}{125} \text{ or } x = \frac{108 \times 5}{6 \times 125}$$

$$\Rightarrow \quad x = \frac{18}{25}$$

184. Four fifths of a number is 12 more than three fourths of the number. Find the number.

(a) 120 (b) 160
(c) 200 (d) 240

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : Let the number = x
According to the question,

$$\frac{4}{5}x - \frac{3}{4}x = 12$$

$$\frac{16x - 15x}{20} = 12$$

$x = 240$

Hence the number is 240.

185. If $\frac{1}{5}$ of a number multiplied by $\frac{2}{3}$ of the same number gives 480, then the number is?

(a) 60 (b) 70
(c) 80 (d) 100

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let, number = x
According to the question-

$$x \times \frac{1}{5} \times x \times \frac{2}{3} = 480$$

$$\frac{2x^2}{15} = 480$$

$x^2 = 240 \times 15$

$x^2 = 3600$

$\boxed{x = 60}$

186. One-fourth of a number is equal to three-eighth of another number. If 30 is added to the first number, then it becomes six times that of the second number. The first number is:

(a) 12 (b) 20
(c) 10 (d) 15

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the first number is x and the second number is y then,
According to the question,

$$\frac{x}{4}=\frac{3}{8}y$$

$$x=\frac{3}{2}y \quad \text{... (i)}$$

And $x + 30 = 6y$ ... (ii)
Substituting the value of x from equation (i) in equation (ii)-

$$\frac{3}{2}y+30=6y$$

$$\frac{3}{2}y-6y=-30$$

$$\frac{-9y}{2}=-30$$

$$y=\frac{20}{3}$$

From equation (i)-

$$x=\frac{3}{2}\times\frac{20}{3}$$

$$x = 10$$

187. Calculate the positive number which when added by 15 is equal to 100 times the reciprocal of the number.

(a) 10 (b) 20
(c) 5 (d) 15

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let the positive number is x
According to the question,

$$x+15=\frac{1}{x}\times100$$

$$x^2+15x=100$$

$$x^2+15x-100=0$$

$$x^2+20x-5x-100=0$$

$$x(x+20)-5(x+20)=0$$

$$(x+20)\,(x-5)=0$$

$$\boxed{x=5}$$

Hence the number is 5.

188. A number consists of 3 digits whose sum is 18 and the middle digit is equal to the sum of other two. If the number increased by 297 when its digits are reversed, then what is the number?

(a) 585 (b) 495
(c) 396 (d) 486

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the digits of number are x, y and z respectively.
Given,

$x + y + z = 18$ ____ (i)

And, $y = x + z$
On putting the value of y in equation (i),

$x + x + z + z = 18$

$2x + 2z = 18$

$x + z = 9$ ____ (ii)

According to the question,

$100x + 10y + z + 297 = 100z + 10y + x$

$99x + 297 = 99z$

$x + 3 = z$ ____(iii)

On putting the value of z in equation (ii),

$x + x + 3 = 9$

$2x = 6$

$x = 3$

On putting the value of x in equation (ii),

$x + z = 9$

$3 + z = 9$

$z = 6$

From equation (i),

$y = x + z$

$y = 3+6$

$y = 9$

Hence, the number will be 396.

189. If a positive number is subtracted from its square, we get 812. Find the number.

(a) 25 (b) 23
(c) 27 (d) 29

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the number = x
and square of number = x^2
According to the question,

$$x^2-x=812$$

$$x^2-x-812=0$$

$$x^2-29x+28x-812=0$$

$$x(x-29)+28(x-29)=0$$

$$(x-29)(x+28)=0$$

$$x-29=0$$

$$x=29$$

190. The sum of 4 consecutive odd numbers is 160. Find the smallest number.

(a) 27 (b) 37
(c) 35 (d) 25

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the 4 consecutive odd numbers is
x, x +2, x + 4, x + 6
According to the question,

$(x) + (x + 2) + (x + 4) + (x + 6) = 160$

$4x + 12 = 160$

$4x = 148$

$$x=\frac{148}{4}$$

$x = 37$

Hence, the smallest number (x) = 37

191. There are two numbers with the difference of 14 between them and the difference of their squares is 56. What are those numbers?

(a) 9, –5 (b) 2, 16
(c) 3, 17 (d) 23, –9

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the two numbers be x and y respectively.
According to the question,
$x - y = 14$ ……(i)
And $x^2 - y^2 = 56$ ……(ii)
$(x + y)(x - y) = 56$ .....(From, $x^2 - y^2 = (x + y)(x - y)$
From equation (i)
$x + y = 4$ ……(iii)
From equation (i) and equation (iii),
$x = 9, y = -5$

192. The sum of half, one-third and one-fifth of a number exceeds the number by 12. What is the number?

(a) 144 (b) 360
(c) 444 (d) 122

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let the number = x
According to the question,

$$x\left(\frac{1}{2}+\frac{1}{3}+\frac{1}{5}\right)-x=12$$

$$\frac{31x}{30}-x=12$$

$$\frac{x}{30}=12$$

$$\boxed{x=360}$$

193. A number when reduced by $22\frac{1}{2}\%$ becomes 217, find the number.

(a) 315 (b) 212
(c) 280 (d) 420

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (c) : Let the number is x
According to the question,

$$x\left(100\%-22\frac{1}{2}\%\right)=217$$

$$x\times 77\frac{1}{2}\%=217$$

$$x=\frac{217\times 100\times 2}{155}$$

$$x=280$$

194. When 38 is added to 30% of a number. The result is 50. What is the number?

(a) 20 (b) 80
(c) 60 (d) 40

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the number = x
According to the question,

$$x\times\frac{30}{100}+38=50$$

$$x\times\frac{30}{100}=50-38=12$$

$$x \times 30 = 100 \times 12$$

$$x=\frac{1200}{30}=40$$

Hence, number (x) = 40

195. The sum of two numbers is 20 and the difference of their squares is 80. Select both the numbers from the given alternatives.

(a) 15, 5 (b) 13, 7
(c) 11, 9 (d) 12, 8

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the numbers are x and y
According to the question,

$x + y = 20$ … (i)
$x^2 - y^2 = 80$
$(x - y)(x + y) = 80$

From equation (i),

$x - y = 4$ … (ii)

From equation (i) and (ii),

$x = 12, y = 8$

196. When 40 is subtracted from a number, it reduces to its 60%. What is the number?

(a) 130 (b) 160
(c) 200 (d) 100

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the number is x
According to the question,

$$x - 40 = x\times\frac{60}{100}$$

$$x-\frac{60x}{100}=40$$

$$\frac{40x}{100}=40$$

$$x = 100$$

197. The 5th part of a number when divided by 3 yields three times half of tenth part of half of 80. What is the number?

(a) 60 (b) 90
(c) 45 (d) 44

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number is x
According to the question,

$$\frac{x\times\frac{1}{5}}{3}=\left[\frac{80\times\frac{1}{2}\times\frac{1}{10}}{2}\right]\times 3$$

$$\frac{x}{15}=40\times\frac{1}{10}\times\frac{1}{2}\times 3$$

$$x = 90$$

198. If three-fourth of a number is 50 more than its one-third, then find the number.

(a) 140 (b) 130
(c) 120 (d) 100

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the number is x
According to the question,

$$\frac{3}{4}x = \frac{1}{3}x + 50$$

$$\frac{3}{4}x - \frac{1}{3}x = 50$$

$$\frac{9x - 4x}{12} = 50$$

$$5x = 600$$

$$x = 120$$

199. The sum of three consecutive odd numbers is more than first number of it by 20. Find the largest number among them.
(a) 13 (b) 9
(c) 11 (d) 7

RRB JE - 28/06/2019 (Shift-III)

Ans. (c) Let the three consecutive odd numbers are x, x +2, x +4.
According to the question,

$$x + x+2 + x+4 = x + 20$$

$$3x + 6 = x + 20$$

$$2x = 14$$

$$x = 7$$

Hence, the required number = x + 4 = 7 + 4 = 11

200. Three times the first of three consecutive odd integers is 3 more than two times the third. Find the third integer.
(a) 15 (b) 13
(c) 11 (d) 9

RRB JE - 26/06/2019 (Shift-III)

Ans : (a) Let three consecutive odd integers = x, x+2, x+4
According to the question,

$$3x = 2(x + 4) + 3$$

$$3x = 2x + 8 + 3$$

$$x = 11$$

Hence, the third integer = x + 4 = 11 + 4 = 15

201. On adding 18 to a two digit number, the digits of the number are interchanged. The product of the digits is '8'. Find the number.
(a) 42 (b) 18
(c) 32 (d) 24

RRB JE - 27/06/2019 (Shift-I)

Ans : (d) Let the unit digit = x.
tens digit = y
The number = 10y + x
Given, $xy = 8$ ---(i)
According to the question,

$$10y + x + 18 = 10x + y$$

$$9x - 9y = 18$$

$$x - y = 2$$

On putting the value of $x = \frac{8}{y}$

$$\therefore \quad \frac{8}{y} - y = 2$$

$$8 - y^2 = 2y$$

$$y^2 + 2y - 8 = 0$$

$$y^2 + 4y - 2y - 8 = 0$$

$$y(y + 4) - 2(y + 4) = 0$$

$$(y - 2)(y + 4) = 0$$

$$y = 2$$

On putting the value of y in equation (i)-

$$x \times 2 = 8$$

$$x = 4$$

Hence required number = 10y + x = 10 × 2 + 4 = 24

202. The sum of the digits of a two digit number is 10. When the digits are interchanged is reduced the number to 36. Find the changed number.
(a) 82 (b) 73
(c) 37 (d) 28

RRB RPF Constable -17/01/2019 (Shift-III)

Ans : (c) Let the number = 10 x + y
According to the question,

$$x + y = 10 \ldots\ldots.(i)$$

The number obtained by interchanging digits = (10y + x)
According to the question

$$(10x + y) - (10y + x) = 36$$

$$\Rightarrow 9x - 9y = 36$$

$$x - y = 4 \ldots\ldots\ldots(ii)$$

By adding equation (i) and (ii),

$$2x = 14$$

$$x = 7$$

And $y = 3$
Hence, the changed number (10y + x) = 10 × 3 +7 = 37

203. The sum of a two digit number and the number made by interchanging its digits is 132. If the difference of the digits is 4, find the number.
(a) 37 (b) 84
(c) 73 (d) 62

RRB RPF-SI -16/01/2019 (Shift-III)

Ans : (b) Let the tens digit of the number is x and the unit digit is y.
So, the number = 10x + y
According to the question,

$$x - y = 4 \ldots\ldots\ldots\ldots\ldots(i)$$

And, $10x + y + 10y + x = 132$

$$11x + 11y = 132$$

$$x + y = 12 \ldots\ldots\ldots\ldots(ii)$$

From equation (i) and (ii),

$$x - y = 4$$

$$\underline{x + y = 12}$$

$$2x = 16$$

$x = 8, \quad y = 4$
Hence, the required number $= 10x + y = 10 \times 8 + 4 = 84$

204. The sum of the digits of a two digit number is 12. The new number formed when the digits are interchanged is 18 more than the original number. What is the original number?
(a) 39 (b) 48
(c) 75 (d) 57

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (d) Let the tens digit of the number is x and the unit digit is y.
Given, $x + y = 12$ .....(i)
Hence, the two digit number = 10x + y
The number obtained by interchanging the place of the digits = 10y + x

According to the question,

$10y + x = 10x + y + 18$

$9y - 9x = 18$

$9x - 9y = -18$

$\boxed{x - y = -2}$.....(ii)

By adding equation (i) and (ii),

$x + y = 12$

$\underline{x - y = -2}$

$2x = 10$

$\boxed{x = 5}$

$\boxed{y = 7}$

Hence, the required number = $10x+y = 10\times5+7 = 57$

205. The sum of the digits of a two digit number is 9. Also nine times of this number is twice the number obtained by reversing the order of the digits. Find the number.

(a) 19 (b) 18

(c) 28 (d) 30

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Let the tens digit is x and the unit digit is y.

$\therefore$ The number = $10x + y$

According to the first condition,

$x + y = 9$ .....(i)

According to the second condition,

$(10x + y) \times 9 = (10y + x) \times 2$

$90x + 9y = 20y + 2x$

$88x = 11y$

$y = 8x$

Putting the value of y in equation (i),

$x + 8x = 9$

$x = 1$

Putting the value of x in equation (i),

$1 + y = 9$

$y = 8$

Hence, the number = $10x + y$

$= 10 \times 1 + 8 = 18$

206. The sum of the digits of a two digit number is 11. The new number formed when the digits interchanged is 45 less than the original number. Find the original number.

(a) 92 (b) 56

(c) 65 (d) 83

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) : Let the tens digit of the number is a and the unit digit is b.

So, the number = $10a + b$

According to the question,

$a + b = 11$ .....(i)

$10b + a = 10a + b - 45$

$9a - 9b = 45$

$a - b = 5$ .....(ii)

On adding equation (i) and (ii),

$a + b = 11$

$\underline{a - b = 5}$

$2a = 16$

$a = 8$

Putting the value of a in equation (i),

$8 + b = 11$

$b = 3$

Hence, the required number = $10 \times 8 + 3 = 83$

207. The difference between a number of two digits and the new number formed when the digits are interchanged is 45. Find the difference between the two digits.

(a) 4 (b) 5

(c) 6 (d) 7

RRB NTPC 05.04.2016 Shift : 2

Ans : (b) Let the tens digit be x.

And the unit digit be y.

The number = $10x + y$

According to the question,

$(10x + y) - (10y + x) = 45$

$9x - 9y = 45$

Hence, the required difference will be $x - y = 5$

208. The sum of the digits of a two digit number is 11. If the digits are interchanged, the number decreases to 63. Find the number.

(a) 83 (b) 92

(c) 29 (d) 38

RRB NTPC 04.04.2016 Shift : 3

Ans : (b) Let the tens digit be x and the unit digit be y of the number.

$\therefore$ The number = $10x + y$

According to the question-

$x + y = 11$ ..... (i)

And $10y + x = 10x + y - 63$

$9x - 9y = 63$

$x - y = 7$ ..... (ii)

By adding equation (i) and (ii)

$2x = 18 \Rightarrow x = 9,\ y = 2$

Hence, the number = $10x + y = 10 \times 9 + 2 = 92$

209. The sum of the digits of a two digit number is 9. When 27 is added to the number, the place of the digits are interchanged. Find the number.

(a) 45 (b) 36

(c) 18 (d) 27

RRB NTPC 03.04.2016 Shift : 1

Ans : (b) Let the unit digit be x in the two digit number.

Then,

According to the question,

The tens digit = $9 - x$ And the number = $10(9 - x) + x$

$10(9 - x) + x + 27 = 10x + 9 - x$

$\Rightarrow$ $90 - 10x + x + 27 = 9x + 9$

$\Rightarrow$ $90 + 27 - 9 = 18x$

$\Rightarrow$ $18x = 108$

$x = 6$

Then, the number $= 10(9-x) + x$

$= 10(9-6) + 6 = 36$

210. The sum of the digits of a two digit number is 13. If those digits are interchanged, the number gets decreased by 27. Find the changed number.

(a) 85 (b) 76

(c) 67 (d) 58

RRB NTPC 02.04.2016 Shift : 1

Ans : (d) Let the tens digit is x,
The unit digit = 13 – x
∴ The number = 10 × x + (13 –x)
According to the question,
$10 \times (13-x) + x = 10 \times x + (13-x) - 27$
$130 - 10x + x = 10x + 13 - x - 27$
$18x = 144$
$x = 8$
∴ The changed number,
$= 10 \times (13-x) + x$
$= 10 \times (13-8) + 8$
$= 10 \times 5 + 8 = 58$

211. The sum of a two digit number is 9. The number is reduces from 45, when the digits are interchanged, find the changed number.
(a) 45 (b) 72
(c) 63 (d) 27

RRB NTPC 02.04.2016 Shift : 2

Ans : (d) Let the tens digit be = x
And the unit digit be = y
Number = 10 x + y
Given, x + y = 9 ……..(1)
According to the question,
$(10x + y) - (10y + x) = 45$
$9x - 9y = 45$
$x - y = 5$ ..... (2)
Equation (1) + (2)
$2x = 14 \Rightarrow x = 7$
From, equation (1),
$y = 9 - 7 = 2$
Hence, The required number = $10y+x = 10\times2+7 = 27$

212. The sum of digits of a two-digit number is 10. When the digits are reversed, the number decreases by 54. Find the new number.
(a) 73 (b) 28
(c) 82 (d) 37

RRB NTPC 02.04.2016 Shift : 3

Ans : (b) Let the tens digit of the number is x and the unit digit is y.
∴ The number = 10x + y
According to the question,
$x + y = 10$ ----------(i)
And $10x + y = 10y + x + 54$
$\Rightarrow 9x - 9y = 54 \Rightarrow x - y = 6$ -----(ii)
By adding equation (i) and (ii),
$2x = 16 \Rightarrow x = 8, y = 2$
Hence, the new number
$= 10y + x = 10 \times 2 + 8 = 28$

213. The sum of digits of a two-digit number is 10. When the digits are interchanged, the number increases by 18. Find the number.
(a) 46 (b) 64
(c) 19 (d) 28

RRB NTPC 29.03.2016 Shift : 1

Ans : (a) Let the tens digit of the number is x and the unit digit is y.
∴ The number $= 10x + y$
According to the question-
$x + y = 10$ ---------- (i)
And $10x + y = 10y + x - 18$
$9x - 9y = -18$
$x - y = -2$ ---------- (ii)
By adding equation (i) and (ii) -
$2x = 8 \Rightarrow x = 4$, $y = 6$
Hence, The required number $= 10 \times 4 + 6 = 46$

214. The sum of a two digit number and the number formed by interchanging its digits, is 99. Find the number if the difference of the digits is 3.
(a) 27 (b) 63
(c) 45 (d) 54

RRB NTPC 10.04.2016 Shift : 3

Ans : (b) Let the unit digit be y and the tens digit be x.
∴ The number = 10x + y
According to the question,
$(10x + y) + (10y + x) = 99$
$11x + 11y = 99$
$x + y = 9$ ……(i)
$x - y = 3$ ……..(ii)
By adding equation (i) and (ii),
$2x = 12$
$x = 6$
From equation (i), $y = 3$
∴ The required number = $10x+y = 10\times6+3 = 60+3 = 63$

215. The sum of the digits of a two digit number is 5. When the digits are reversed the number decreases by 9. Find the changed number.
(a) 32 (b) 23
(c) 41 (d) 14

RRB NTPC 28.04.2016 Shift : 3

Ans : (b) Let the tens digit of the number be x and the unit digit be y.
∴ the number = 10x + y
According to first condition,
$x + y = 5$ ……(i)
The obtained number after reversing the digits = 10y+x
According to the question,
$(10x+y) - (10y+x) = 9$
$\Rightarrow 9x - 9y = 9$
$\Rightarrow x - y = 1$ .....(ii)
By adding equation (i) and (ii),
$2x = 6$
$x = 3$
From equation (ii)
$3 - y = 1$
$y = 3 - 1 = 2$
Hence, the changed number = 10y + x
$= 10 \times 2 + 3 = 23$

Type - 5

216. $0.\overline{23}$ is
(a) An irrational number
(b) A rational number
(c) A prime number
(d) A composite number

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let us assume
$y = 0.\overline{23}$.....(i)
Multiplying by 100 in equation (i)-

$100y = 23\cdot\overline{23}$ ..... (ii)

Subtracting eq^n (i) from eq^n (ii)

$99y = 23$

$y = \frac{23}{99}$ (Rational number)

217. $(\sqrt{3}+\sqrt{11})^2$ is a/an

(a) Natural number (b) Whole number

(c) Irrational number (d) Rational number

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) :

$(\sqrt{3}+\sqrt{11})^2 = 3+11+2\times\sqrt{3}\times\sqrt{11}$

$(\sqrt{3}+\sqrt{11})^2 = 14+2\sqrt{33}$

Therefore $(\sqrt{3}+\sqrt{11})^2$ is an irrational number

218. The product of $\sqrt{2}$ and $\sqrt{3}$ is:

(a) Sometimes a rational number and sometimes an irrational number

(b) Equal to 4

(c) A rational number

(d) An irrational number

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (d) : From above question,

$\sqrt{2}\times\sqrt{3} = \sqrt{6}$ (irrational number)

An irrational number is a real number that can't be expressed in the form p/q , q≠0

for example - $\sqrt{2}, \sqrt{5}, \sqrt{7}$, etc.

219. The number of rational number between 5 and 7 is:

(a) 2 (b) 0

(c) Infinite (d) 1

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (c) : Note:- There are infinite number of rational numbers between any two integers. Hence, there are infinite number of rational numbers that occurs between 5 and 7.

220. $3+2\sqrt{5}$ is :

(a) Rational number (b) Irrational number

(c) Composite number (d) Natural number

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : Irrational number: The set of real numbers that cannot be represented in form of p/q is called irrational number that means the number which is not rational is called irrational number.

Example- $\sqrt{2}$, $\sqrt{3}$ .....

$\therefore 3+2\sqrt{5}$ is an irrational number.

221. Which of the following rational number lies between $\frac{1}{4}$ and $\frac{1}{2}$.

(a) $\frac{1}{6}$ (b) $\frac{1}{8}$

(c) $\frac{3}{5}$ (d) $\frac{3}{8}$

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) :

$$= \frac{\frac{1}{4}+\frac{1}{2}}{2} = \frac{\frac{1+2}{4}}{2} = \frac{3}{8}$$

Therefore, rational number $\frac{3}{8}$ will lie between $\frac{1}{4}$ and $\frac{1}{2}$.

222. Express $\frac{-40}{56}$ as a rational number whose numerator is –5.

(a) $-\frac{5}{6}$ (b) $-\frac{5}{8}$

(c) $-\frac{5}{7}$ (d) $-\frac{5}{18}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (c) : $-\frac{40}{56} = -\frac{8\times5}{8\times7} = -\frac{5}{7}$

It is clear that option (c) is the required rational number.

223. $\frac{\left(3\sqrt{5}+\sqrt{125}\right)}{\left(\sqrt{80}+6\sqrt{5}\right)}$ .....is

(a) A rational number (b) A natural number

(c) An integer (d) An irrational number

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

$$\frac{3\sqrt{5}+\sqrt{125}}{\sqrt{80}+6\sqrt{5}}$$

$$= \frac{3\sqrt{5}+5\sqrt{5}}{4\sqrt{5}+6\sqrt{5}}$$

$$= \frac{8\sqrt{5}}{10\sqrt{5}} = \frac{8}{10} = \frac{4}{5}\text{ (rational number)}$$

Therefore $\frac{3\sqrt{5}+\sqrt{125}}{\sqrt{80}+6\sqrt{5}}$ is a rational number

224. Number 0.232323 can be written in rational form as:

(a) $\frac{23}{999}$ (b) $\frac{23}{99}$ (c) $\frac{23}{9}$ (d) $\frac{23}{990}$

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : 0.232323....

$$= 0.\overline{23}$$

$$= \frac{23}{99}$$

225. Which of the following rational number lies between 9.2 and 10.5?

(a) 9.15 (b) 9.55

(c) 10.67 (d) 9.08

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (b) ∵ 9.55 is the rational number lies between 9.2 and 10.5.

226. Which of the following is a rational number between $\sqrt{5}$ and $\sqrt{7}$?

(a) $4\frac{1}{5}$ (b) $1\frac{1}{5}$

(c) $2\frac{2}{5}$ (d) $3\frac{1}{5}$

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\sqrt{5}=2.23$ and $\sqrt{7}=2.64$

From the given options,

(a) $4\frac{1}{5}=\frac{21}{5}=4.2$ (b) $1\frac{1}{5}=\frac{6}{5}=1.2$

(c) $2\frac{2}{5}=\frac{12}{5}=2.4$ (d) $3\frac{1}{5}=\frac{16}{5}=3.2$

Hence $2\frac{2}{5}$,is a rational number between $\sqrt{5}$ and$\sqrt{7}$.

227. Which of the following is not a rational number?

$\sqrt{3^2+4^2}, \sqrt{12.96}, \sqrt{125}$ and $\sqrt{900}$

(a) $\sqrt{12.96}$ (b) $\sqrt{900}$

(c) $\sqrt{125}$ (d) $\sqrt{3^2+4^2}$

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\sqrt{3^2+4^2}=\sqrt{9+16}=\sqrt{25}=5 \rightarrow$ Rational number

$\sqrt{12.96}=\sqrt{1296\times10^{-2}}=\frac{36}{10}=\frac{18}{5} \rightarrow$ Rational number

$\sqrt{125}=\sqrt{5\times5\times5}=5\sqrt{5} \rightarrow$ Irrational Number

$\sqrt{900}=\sqrt{30\times30}=30 \rightarrow$ Rational Number

Hence, $\sqrt{125}$ is not a rational number.

228. Which of the following is not a rational number?

(a) $\sqrt[3]{1728}$ (b) π

(c) 2.487627287 (d) 8.36712846781

RRB RPF-SI -05/01/2019 (Shift-I)

Ans : (b) Irrational numbers is a real number which cannot be expressed as p/q. (where p and q are integers and q is not 0).

It means, irrational number cannot be expressed as fractions. for example $\sqrt{2}$ and π are irrational number.

229. Which of the following is not an irrational?

(a) $\sqrt{5428}$ (b) $\sqrt{6084}$

(c) π (d) $\sqrt{7652}$

RRB RPF Constable -18/01/2019 (Shift-III)

Ans. (b) : The real numbers which cannot be expressed as p/q, where p and q are integers and q is not 0, are called irrational numbers. These numbers are represented by Q^C or Q^I.

For example- $\sqrt{2}, 1+\sqrt{3}, \pi$

$\sqrt{6084}=\sqrt{78\times78}=78$ (Rational number)

230. Denote $\overline{0.125}$ as a rational number.

(a) 119/993 (b) 113/990

(c) 125/999 (d) 100/999

RRB JE - 25/05/2019 (Shift-I)

Ans : (c) Let $x = 0.\overline{125}$

$x = 0.125125$ ..... (i)

$1000x = 125.125125$ ..... (ii)

From equation (ii)- equation (i) –

$999x = (125.125125.....) - (0.125125.....)$

$999x = 125.0$

$x=\frac{125}{999}$

231. Find the value of the denominator of $\frac{1}{\left(5+\sqrt{3}\right)}$ in rational number.

(a) $\frac{\left(5-\sqrt{3}\right)}{22}$ (b) $5+\frac{\sqrt{3}}{22}$

(c) $5-\frac{\sqrt{3}}{20}$ (d) $\frac{\left(5-\sqrt{3}\right)}{20}$

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (a)

According to the question-

$$\frac{1}{\left(5+\sqrt{3}\right)}=\frac{\left(5-\sqrt{3}\right)}{\left(5+\sqrt{3}\right)\left(5-\sqrt{3}\right)}$$

$$=\frac{\left(5-\sqrt{3}\right)}{(5)^2-\left(\sqrt{3}\right)^2}$$

$$=\frac{\left(5-\sqrt{3}\right)}{25-3} \qquad =\frac{\left(5-\sqrt{3}\right)}{22}$$

232. Which of the following square roots is irrational?

(a) 21025 (b) 18025

(c) 13225 (d) 15625

RRB Paramedical Exam – 21/07/2018 (Shift-I)

Ans. (b) : $\sqrt{21025}=\sqrt{5\times5\times29\times29}$

= 145 (Rational number)

$\sqrt{18025}=\sqrt{5\times5\times7\times103}$

= 135.257 (Irrational number)

$\sqrt{13225}=\sqrt{5\times5\times23\times23}$

= 5×23=115 (Rational number)

$\sqrt{15625}=\sqrt{5\times5\times5\times5\times5\times5}$

= 5×5×5=125(Rational number)

Hence, it is clear that the square root of 18025 is irrational number.

233. Find the rational value of the denominator of 1/(2+$\sqrt{3}$).

(a) $2+\sqrt{3}$ (b) $2-\sqrt{3}$

(c) 1 (d) $4+\sqrt{3}$

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (b) Rationalizing the denominator of $\frac{1}{2+\sqrt{3}}$,

$$\frac{1}{2+\sqrt{3}}\times\frac{2-\sqrt{3}}{2-\sqrt{3}}$$
$$=\frac{2-\sqrt{3}}{2^2-\left(\sqrt{3}\right)^2}$$
$$=\frac{2-\sqrt{3}}{4-3}=2-\sqrt{3}$$

234. Find the rational value of the denominator of $\frac{1}{(5+2\sqrt{3})}$

(a) $\frac{(5-2\sqrt{3})}{12}$ (b) $\frac{(5-2\sqrt{3})}{13}$

(c) $5-\frac{2\sqrt{3}}{13}$ (d) $5+\frac{2\sqrt{3}}{13}$

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (b) Rationalizing the denominator of the given fraction,

$$=\frac{1}{(5+2\sqrt{3})}\times\frac{(5-2\sqrt{3})}{(5-2\sqrt{3})}$$
$$=\frac{(5-2\sqrt{3})}{(5)^2-(2\sqrt{3})^2} \qquad [(a+b)(a-b)=a^2-b^2]$$
$$=\frac{5-2\sqrt{3}}{25-12}=\frac{5-2\sqrt{3}}{13}$$

235. From the given options, find the rational number between the range 2/4 and 0.6.

(a) $\frac{11}{25}$ (b) $\frac{21}{40}$

(c) $\frac{3}{4}$ (d) $\frac{11}{4}$

RRB NTPC 19.01.2017 Shift : 2

Ans : (b) From option (b)

The rational number between $\frac{2}{4}=0.5$ and 0.6

$=\frac{21}{40}=0.525$

Hence, 0.5< 0.525< 0.6

236. Which of the following numbers is irrational?

(a) $\sqrt[3]{64}$ (b) $\sqrt{64}$

(c) $\sqrt[6]{64}$ (d) $\sqrt[4]{64}$

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (d) From options,

$\sqrt[3]{64}=(64)^{\frac{1}{3}}=\left(4^3\right)^{\frac{1}{3}}=4$ (Rational number)

$\sqrt{64}=(64)^{\frac{1}{2}}=\left(8^2\right)^{\frac{1}{2}}=8$ (Rational number)

$\sqrt[6]{64}=(64)^{\frac{1}{6}}=\left(2^6\right)^{\frac{1}{6}}=2$ (Rational number)

$\sqrt[4]{64}=\sqrt[4]{16}\times\sqrt[4]{4}=2\times\sqrt[4]{4}=$ (Irrational number)

237. Among the following which is a rational number?

(a) $\sqrt[3]{2}$ (b) $\sqrt[3]{8}$ (c) $\sqrt[3]{4}$ (d) $\sqrt[3]{12}$

RRB ALP & Tec. (13-08-18 Shift-III)

Ans : (b) Rational number can be written as p/q ;(q ≠ 0).

From option (b),

$\sqrt[3]{8}=2$ is rational number

238. Which of the numbers given below is NOT rational number?

(a) $\sqrt{64}$ (b) $\sqrt[3]{64}$ (c) $\sqrt[3]{8}$ (d) $\sqrt{8}$

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (d) $\sqrt{64}=8$ (Rational number)

$\sqrt[3]{64}=4$ (Rational number)

$\sqrt[3]{8}=2$ (Rational number)

$\sqrt{8}=2\sqrt{2}$ (Irrational number)

Hence $2\sqrt{2}$ is not a rational number.

(A number which we can write as p/q where p and q both are integers but q ≠ 0 is called rational numbers.)

239. All irrational numbers are---------numbers.

(a) Integers (b) Imaginary

(c) Whole (d) Real

RRB NTPC 19.01.2017 Shift : 3

Ans : (d) All irrational numbers are real numbers.

As- $\sqrt{2}$

240. Which of the following is an irrational?

(a) $\sqrt{1000000}$ (b) $\sqrt[3]{1000000}$

(c) $\sqrt[6]{1000000}$ (d) $\sqrt[4]{1000000}$

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (d) From options-

(a) $\sqrt{1000000}$

$\sqrt{100\times100\times100}=10\times10\times10=1000$ (Rational)

(b) $\sqrt[3]{1000000}=\left(100^3\right)^{1/3}=100$ (Rational)

(c) $\sqrt[6]{1000000}=\left(10^6\right)^{1/6}=10$ (Rational)

(d) $\sqrt[4]{1000000}=10\sqrt[4]{100}$ (Irrational)

241. Which of the following is an irrational number?

(a) $\sqrt[4]{4}$ (b) $\sqrt[3]{8}$ (c) $\sqrt{16}$ (d) $\sqrt[6]{1}$

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (a) : Irrational number – The number which cannot be expressed as p/q. Example- $\sqrt{3},\sqrt{6}.....\sqrt[4]{4}$

From options–

(a) $\sqrt[4]{4}=(2^2)^{1/4}=2^{1/2}=\sqrt{2}$ (Irrational number)

(b) $\sqrt[3]{8}=\sqrt[3]{2\times2\times2}=2$ (Rational number)

(c) $\sqrt{16}=\sqrt{2\times2\times2\times2}=2\times2=4$ (Rational number)

(d) $\sqrt[6]{1}=1$ (Rational number)

Note– π is an irrational number while 22/7 is a rational number.

242. Which of the following is a rational number?

(a) $\sqrt[3]{2}-2$ (b) $\sqrt[3]{8}-2$

(c) $\sqrt[3]{4}+4$ (d) $\sqrt[3]{12}+1$

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (b)
Rational number – Such numbers which can be expressed as p/q ;($q \neq 0$), are called rational numbers.
Example:- $\sqrt[3]{8}, \sqrt{4}$ etc;
Irrational number – Such numbers which cannot be expressed as p/q. Example:- $\pi, \sqrt[3]{2}, \sqrt{2}$ etc;
From options,
$\sqrt[3]{8}-2=0$ is a rational number while others $\sqrt[3]{2}-2$, $\sqrt[3]{4}+4$ and $\sqrt[3]{12+1}$ are irrational numbers.

243. Which of the following is an irrational number?

(a) $\sqrt[4]{1024}$ (b) $\sqrt[10]{1024}$

(c) $\sqrt{1024}$ (d) $\sqrt[5]{1024}$

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (a) From options,
(a) $\sqrt[4]{1024}=4\sqrt[4]{4}$ (Irrational number)
(b) $\sqrt[10]{1024}=2$ (Rational number)
(c) $\sqrt{1024}=32$ (Rational number)
(d) $\sqrt[5]{1024}=4$ (Rational number)

244. Which of the following is not a rational number?

(a) $\sqrt[5]{32}$ (b) $\sqrt[3]{64}$

(c) $\sqrt[4]{32}$ (d) $\sqrt[3]{27}$

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (c) From options,
$\sqrt[5]{32}=2$(Rational)
$\sqrt[3]{64}=4$ (Rational)
$\sqrt[3]{27}=3$ (Rational)
$\sqrt[4]{32}=2\sqrt[4]{2}$ (Irrational)

245. Which from the following is a rational number?

(a) $\sqrt[5]{1551}$ (b) $\sqrt[3]{1331}$

(c) $\sqrt{1221}$ (d) $\sqrt[4]{1441}$

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (b) A rational number can be written as p/q ;($q \neq 0$).
Hence, From option (b) $\sqrt[3]{1331}=\sqrt[3]{11\times11\times11}=11$
Therefore, 11/1 is a rational number.

246. Whose square root from the following numbers is a rational number?

(a) 576 (b) 512

(c) 480 (d) 544

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (a) From the options,
(a) $\sqrt{576}=24$
(b) $\sqrt{512}=16\sqrt{2}$
(c) $\sqrt{480}=4\sqrt{30}$
(d) $\sqrt{544}=4\sqrt{34}$
Hence, square root of 576 is 24, which is a rational number.

247. Whose square root from the following numbers will be rational?

(a) 46232 (b) 46233

(c) 14448 (d) 34225

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (d) : From options–
(a)$46232=\sqrt{46232}=215.016$
(b)$46233=\sqrt{46233}=215.0186$
(c)$14448=\sqrt{14448}=120.199$
(d)$34225=\sqrt{34225}=185$
Hence, The square root of 34225 is 185, which is a rational number.

248. Whose square root from the following numbers is irrational?

(a) 5184 (b) 4465

(c) 3025 (d) 8836

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (b) From options,
(a) $\sqrt{5184}=72$
(b) $\sqrt{4465}=\sqrt{5\times19\times47}$ (Irrational)
(c) $\sqrt{3025}=55$
(d) $\sqrt{8836}=94$
Hence, the square root of 4465 is irrational.

249. Whose square root from the following numbers is rational?

(a) 336 (b) 344

(c) 320 (d) 324

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (d) From option (d),
$\sqrt{324}=\sqrt{18\times18}=18$
Hence, the square root of 324 will be 18, which is a rational number.

250. Whose square root from the following numbers will be irrational?

(a) 6441 (b) 9604

(c) 7921 (d) 5776

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (a) From options,
$\sqrt{6441}=80.25$ is irrational
$\sqrt{9604}=\sqrt{98\times98}=98$
$\sqrt{7921}=\sqrt{89\times89}=89$
$\sqrt{5776}=\sqrt{76\times76}=76$
Hence, the square root of 6441 will be irrational.

251. Whose square root from the following numbers is a rational number?

(a) 144 (b) 136

(c) 128 (d) 120

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (a) From options–
$\sqrt{144}=12$
$\sqrt{136}=2\sqrt{34}$
$\sqrt{128}=8\sqrt{2}$
$\sqrt{120}=2\sqrt{30}$
Hence, the square root of 144 is 12, that is a rational number.

252. Express $\frac{1}{(2+\sqrt{3})}$ as a rational number.

(a) $5-2\sqrt{3}/12$ (b) $(2-\sqrt{3})/1$

(c) $(5-2\sqrt{3})/13$ (d) $5+2\sqrt{3}/13$

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (b) :

On rationalizing the given expression $\frac{1}{(2+\sqrt{3})}$,

$$= \frac{1\times(2-\sqrt{3})}{(2+\sqrt{3})(2-\sqrt{3})}$$

$$= \frac{(2-\sqrt{3})}{(4-3)} = \frac{(2-\sqrt{3})}{1}$$

Type - 6

253. Find the least number which when added to 1780 makes the sum a perfect square.

(a) 46 (b) 49

(c) 69 (d) 72

RRB JE - 27/05/2019 (Shift-II)

Ans : (c) On adding 69 to the number 1780 it will be 1849, which is a perfect square number.

Thus-

$1780 + 69 = 1849$

$1849 = 43 \times 43$

$(43)^2 = 1849$

254. Find the smallest integer whose cube is equal to itself.

(a) -1 (b) 2

(c) 1 (d) 0

RRB JE - 22/05/2019 (Shift-I)

Ans : (a) -1 and 1 are such integers whose cube is equal to itself.

Hence, the smallest integer = -1

$\because (-1)^3 = -1$

255. If the cube of a number is subtracted from $(153)^2$ the result gives 1457. Find the number.

(a) 18 (b) 16

(c) 28 (d) 24

RRB JE - 24/05/2019 (Shift-I)

Ans : (c) Let the number be x.

According to the question,

$(153)^2 - x^3 = 1457$

$x^3 = (153)^2 - 1457$

$x^3 = 23409 - 1457$

$x^3 = 21952$

$\therefore\ x = \sqrt[3]{21952} = \sqrt[3]{28\times28\times28} = 28$

256. Five times of a positive integer is 3 less than twice of its square. Find the integer.

(a) 3 (b) 8

(c) 2 (d) 5

RRB RPF Constable -19/01/2019 (Shift-I)

Ans : (a) Let the positive integer is x.

According to the question-

$5x = 2x^2 - 3$

$2x^2 - 5x - 3 = 0$

$2x^2 - 6x + x - 3 = 0$

$2x(x-3) + 1(x-3) = 0$

$(x-3)(2x+1) = 0$

$x - 3 = 0$

$2x + 1 = 0$

$x = 3$ or $x = -½$ (Invalid)

257. Which of these square numbers cannot be expressed as the sum of two prime numbers?

(a) 81 (b) 49

(c) 121 (d) 144

RRB JE - 30/05/2019 (Shift-II)

Ans : (c)

$81 \rightarrow 2 + 79$ (both of which are prime number)

$49 \rightarrow 2 + 47$ (both of which are prime number)

$144 \rightarrow 3 + 141$(both of which are prime number)

$121 \rightarrow 2 + 119$ (but 119 is not prime number)

Hence, option (c) cannot be expressed as the sum of two prime numbers.

258. Three times the square of a number subtracting by 4 times the number is equal to 50 more than the number. Find the number.

(a) 5 (b) 4

(c) 6 (d) 10

RRB JE - 28/05/2019 (Shift-II)

Ans : (a) Let the number be = x

According to the question,

$3x^2 - x \times 4 = x + 50$

$3x^2 - 4x - x - 50 = 0$

$3x^2 - 5x - 50 = 0$

$3x^2 - 15x + 10x - 50 = 0$

$3x(x-5) + 10(x-5) = 0$

$(x-5)(3x+10) = 0$

$x - 5 = 0$

$x = 5$

259. Which of the following is not a perfect square?

(a) 2025 (b) 16641

(c) 1250 (d) 9801

RRB RPF Constable -20/01/2019 (Shift-I)

Ans : (c) From options-

$1250 = (35.36)^2$ is not a perfect square

$2025 = (45)^2$

$16641 = (129)^2$

$9801 = (99)^2$

Hence 1250 is not a perfect square, while others are perfect squares.

260. Which of these numbers is not a sum of two squares?

(a) 41 (b) 13

(c) 23 (d) 37

RRB JE - 26/06/2019 (Shift-I)

Ans : (c) From options-

(a) $41 = 5^2 + 4^2$ (b) $13 = 2^2 + 3^2$

(c) 23 (d) $37 = 6^2 + 1^2$

Hence the number 23 is not the sum of two squares.

261. Which of these is a perfect square?

(a) 9801 (b) 9887

(c) 9013 (d) 9016

RRB JE - 01/06/2019 (Shift-III)

Ans. (a) From option (a),

	99
9	98 01
9	81
189	17 01
9	17 01
	××××

Hence, 9801 is a perfect square of 99.

262. If the last digit of the square of a number is 1. Find the last digit of its cube.

(a) Only 9 (b) 1 or 9
(c) Any odd number (d) Only 1

RRB JE - 27/06/2019 (Shift-I)

Ans : (b) Let the number be 9. The last digit of whose square is 1. Which is as follows-

$9^2 = 81$

Last digit of 729 which is cube of 9 = 9

Let the number be 11. The last digit of whose square is 1. Which is as follows-

$11^2 = 121$

The last digit of the cube of 11-

$11^3 = 1331$

Hence the last digit = 1

Hence the number will be 1 or 9.

263. The sum and the difference of two numbers are 25 and 3 respectively. Find the difference of their squares.

(a) 165 (b) 75
(c) 154 (d) 140

RRB JE - 27/06/2019 (Shift-III)

Ans : (b) Let the two numbers are x and y

According to the question

$x + y = 25$ ----(i)

$x - y = 3$ ----(ii)

$x^2 - y^2 = (x + y)(x-y) = 25 \times 3 = 75$

Hence, the difference of their squares = 75

264. How many perfect squares are there between 100 and 200?

(a) 7 (b) 4
(c) 6 (d) 5

RRB JE - 27/06/2019 (Shift-III)

Ans : (b) Perfect square numbers greater than 100 or nearest to 100 = 121 = $(11)^2$

Perfect square numbers smaller than 200 or nearest to 200 = 196 = $(14)^2$

The numbers from $(11)^2$ to $(14)^2$ are = 121, 144, 169, 196

Therefore, there will be 4 such perfect square numbers between 100 and 200.

265. Find the least number that should be added to 4042 to make it a perfect square.

(a) 41 (b) 54
(c) 64 (d) 58

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (b) : Square root of 4042,

	63
6	4042
+6	36
123	442
	369
	73

Square of 64 = 64 × 64 = 4096

Hence, the required number = 4096–4042 = 54

By adding 54, the number 4042 will become a perfect square.

266. Divide the number 137592 by the smallest number that leaves no remainder and quotient is a perfect cube. Find the cube root of the quotient.

(a) 8 (b) 2 (c) 4 (d) 6

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (d) 137592 = 2×2×2×3×3×3×7×7×13

Hence, it is clear that, dividing 137592 by 7 × 7 × 13 = 637 will leave no remainder And quotient 216 will be a perfect cube.

216 = 2×2×2×3×3×3

Hence, the required cube root = 2×3 = 6

267. A positive number exceed its square root by 30. Find the number.

(a) 16 (b) 36
(c) 25 (d) 49

RRB NTPC 02.04.2016 Shift : 3

Ans : (b) Let the number be x, then-

$x = \sqrt{x} + 30$

$x - 30 = \sqrt{x}$

On squaring in both side-

$(x-30)^2 = (\sqrt{x})^2$

$x^2 + 900 - 60x = x$

$x^2 - 60x - x + 900 = 0$

$x^2 - 61x + 900 = 0$

$x^2 - 36x - 25x + 900 = 0$

$x(x-36) - 25(x-36) = 0$

$(x-36)(x-25) = 0$

$x - 36 = 0$ or $x - 25 = 0$

$x = 36$ or $x = 25$

25 is not more than its square root, which does not follow the condition.

Hence, the required number will be x = 36.

268. What smallest number should be added to the sum of squares of 15 and 14, so that the resulting number is a perfect square?

(a) 17 (b) 20 (c) 11 (d) 9

RRB NTPC 29.03.2016 Shift : 1

Ans : (b) $15^2 + 14^2 = 225 + 196 = 421$

Let the number to added be x,

$421 + x = 441$

$\Rightarrow x = 441 - 421 = 20$

Hence, the required number = 20

269. Calculate the sum of squares of numbers from 1 to 9.

(a) 284 (b) 285
(c) 385 (d) 380

RRB NTPC 27.04.2016 Shift : 1

Ans : (b) The sum of squares of first n numbers

$$= \frac{n(n+1)(2n+1)}{6}$$

$\therefore$ The sum of squares from 1 to 9 will be-

$$= \frac{9(9+1)(18+1)}{6} = \frac{9\times10\times19}{6} = 285$$

270. Calculate the sum of squares of number from 1 to 10.

(a) 384 (b) 285
(c) 385 (d) 380

RRB NTPC 30.04.2016 Shift : 2

Ans : (c) The sum of squares of first n numbers

$$= \frac{n(n+1)(2n+1)}{6}$$

The sum of squares of the numbers from 1 to 10 will be-

$$= \frac{10(10+1)(20+1)}{6} = \frac{10\times11\times21}{6} = 385$$

271. Find the least number which should be added to 7864, to make it a perfect square.

(a) 61 (b) 57
(c) 71 (d) 79

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (b) Adding 57 to 7864, gives 7921 which is a perfect square of 89.
Hence, it is clear that adding 57 to 7864 will make the number a perfect square.

272. The number 4050 becomes a perfect square when multiplying by a positive integer. Find the square root of the number.

(a) 95 (b) 80
(c) 90 (d) 85

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (c) $\because 4050 = 2\times\overline{3\times3}\times\overline{3\times3}\times\overline{5\times5}$

Hence, number 4050 becomes a perfect square when multiplied by 2 = $4050\times2 = 8100$

$\therefore$ The required square root of the number 8100
$= 2\times3\times3\times5 = 90$

273. Which of the following numbers is a perfect square?

(a) 0.09 (b) 8.1
(c) 0.025 (d) All

RRB NTPC 29.03.2016 Shift : 2

Ans : (a) $0.09 = (0.3)^2$
Hence, only 0.09 is a perfect square number.

Type - 7

274. Find the sum of prime factors of $9^6\times12^4\times7^7$

(a) 13 (b) 12
(c) 14 (d) 11

RRB Group-D 26/08/2022 (Shift-III)

Ans. (b) : $9^6\times12^4\times7^7$
$= 3^{12}\times3^4\times2^8\times7^7$
$= 3^{16}\times2^8\times7^7$
Sum of prime factors
$= 3+2+7 = 12$

275. For any natural number n, $6^n - 5^n$ always ends with ;

(a) 7 (b) 1
(c) 5 (d) 3

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : The unit value of 6^n-5^n for any natural number 'n' will always be 1 because 6 can be any natural number in the power that units number in the power of 5 has its unit digit as 5.

276. What is the total number of odd and even divisors of 120, respectively?

(a) 12,4 (b) 16,0
(c) 4,12 (d) 8,8

RRB NTPC 01.02.2021 (Shift-II) Stage I

Ans. (c) : Divisors of 120–
1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24
30, 40, 60, 120
Number of even divisors – 12,
Number of odd divisors – 4

277. If the sum of five consecutive multiples of 2 is 660, then find the largest number.

(a) 162 (b) 130
(c) 125 (d) 136

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let five consecutive multiple of 2 –
2x, 2x+2, 2x+4, 2x+6, 2x+8
According to the question,
$2x + 2x + 2 + 2x + 4 + 2x + 6 + 2x + 8 = 660$
$10x+20=660$
$10x=640$
$\boxed{x = 64}$
Hence, largest number $= 2x + 8 = 2\times64+8$
$=128+8$
$=\boxed{136}$

278. How many factors of $2^7 \times 3^4 \times 5^3 \times 7$ are even ?

(a) 40 (b) 280
(c) 320 (d) 84

RRB NTPC 31.01.2021 (Shift-I) Stage Ist
RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (b) : $2^7 \times 3^4 \times 5^3 \times 7$ Number of factors.
$= (7 + 1)(4 + 1)(3 + 1)(1 + 1)$
$= 8 \times 5 \times 4 \times 2$
$= 320$
$\therefore$ Number of even factors = 320 – total no. of odd factors.
$= 320 - \{(4 + 1)(3 + 1)(1 + 1)\}$
$= 320 - \{5 \times 4 \times 2\}$
$= 320 - 40$
$= 280$

279. Find the digit in the unit's place of $124^n + 124^{(n+1)}$, where n is any whole number.

(a) 4 (b) 8
(c) 2 (d) 0

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : $124^n + 124^{(n+1)}$
On putting n =1
$= 124 + (124)^2$
For unit digit 4 + 6 = 10
Hence, It is clear that the digit come in the unit place will be '0'.

280. What is the unit digit in the following product? 91×92×93×.....×99
(a) 2 (b) 1 (c) 4 (d) 0
RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (d) **:** $\because 91\times92\times93\times94\times95\times96\times97\times98\times99$
It is clear that multiplying by taking unit digits of all the numbers will give '0' i.e. where 2×5 comes then its unit digit is always zero.

281. Find the number of factors of 4200.
(a) 48 (b) 56 (c) 64 (d) 46
RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (a) : $4200 = 2\times2\times2\times5\times5\times3\times7$
$=2^3\times5^2\times3^1\times7^1$
The number of factors = (3+1) ×(2+1)×(1+1) ×(1+1)
= 4×3×2×2
= 48

282. How many factors does the number 12288 have?
(a) 24 (b) 26
(c) 28 (d) 22
RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (b) : $12288 = 2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times3 = 2^{12}\times3^1$
Hence numbers of factors = (12 + 1) × (1 + 1)
= 13 × 2
= 26

283. If a positive number N, when divided by 5 leaves a remainder 3, then the unit's place digit of N is?
(a) 0 or 5 (b) 0 or 2
(c) 3 or 8 (d) 1 or 5
RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : Required positive number
= 5K+3 ($\because$ K = 0,1,2…..)
= 5×0+3 = 3 (On putting K = 0)
= 5×1+3 = 8 (On putting K = 1)
Hence, unit digit of N = 3 or 8

284. The unit digit in 4 × 38 × 764 × 1256 is :
(a) 6 (b) 8
(c) 4 (d) 5
RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) :
4 × 38 × 764 × 1256
↓ ↓ ↓ ↓
4 × 8 × 4 × 6
= 32 × 24
↓ ↓
= 2 × 4
Hence unit digit = 8

285. Unit digit of $(1373)^{36} - (1442)^{20}$ is -
(a) 2 (b) 4
(c) 5 (d) 3
RRB ALP CBT-2 Physics & Maths 22-01-2019 (Shift-I)

Ans. (c) : $(1373)^{36} - (1442)^{20}$
$=(3)^{36} - (2)^{20}$
$= (3)^{9\times4} - (2)^{5\times4}$
$= (3)^4 - (2)^4$
= 81–16
= 65
= 5

286. How many of the factors of 256 are perfect squares?
(a) 5 (b) 3
(c) 6 (d) 4
RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (a) Perfect square factors of 256 = 1, 4, 16, 64, 256
Hence, the required number of perfect square factors = 5

287. Which of these numbers has the highest number of divisors?
(a) 156 (b) 240
(c) 172 (d) 200
RRB JE - 23/05/2019 (Shift-I)

Ans : (b) From options–
$156 = 2^2\times3^1\times13^1 = (2+1)(1+1)(1+1) = 12$ (divisor)
$240 = 2^4\times3^1\times5^1 = (4+1)(1+1)(1+1) = 20$ (divisor)
$172 = 2^2\times43^1 = (2+1)(1+1) = 6$ (divisor)
$200 = 2^3\times5^2 = (3+1)(2+1) = 12$ (divisor)
Hence, It is clear that the number of the divisors of 240 is highest.

288. Find the unit digit in given factor of $(3451)^{51} \times (531)^{43}$.
(a) 6 (b) 4
(c) 1 (d) 9
RRB RPF-SI -11/01/2019 (Shift-I)

Ans : (c) The given expression is $(3451)^{51} \times (531)^{43}$
According to the question it is clear that the unit digit of 3451 and 531 is 1, so the unit digit of their product will also be 1.

289. How many multiples of $2^8 \times 3^2 \times 5^3 \times 7^5$ are even numbers?
(a) 288 (b) 168
(c) 576 (d) 464
RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c) : The number of factors of $2^8 \times 3^2 \times 5^3 \times 7^5$ = (8 + 1) (2 + 1) (3 + 1) (5 + 1) = 648
$\therefore$ The number of even factors (multiples) = 648 – The number of total odd factors
= 648 – {(2 + 1) (3 + 1) (5 + 1)}
= 648 – {3 × 4 × 6}
= 648 – 72 = 576

290. How many factors of 729 are perfect squares?
(a) 5 (b) 4
(c) 3 (d) 2
RRB Group-D – 01/10/2018 (Shift-I)

Ans. (c) : The factors of 729,

3	729
3	243
3	81
3	27
3	9
3	3
	1

Perfect squares $= \overline{3\times3}\times\overline{3\times3}\times\overline{3\times3}$

Hence, total 3 factors of 729 (9,9,9) are perfect squares.

291. How many multiples of $2^9 \times 3^5 \times 5^4 \times 7^6$ are odd numbers?

(a) 288 (b) 144

(c) 210 (d) 140

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (c) : The required odd multiple number

$= (5+1) \times (4+1) \times (6+1)$

$= 6 \times 5 \times 7 = 210$

292. Find the last digit of 213^6 ?

(a) 6 (b) 3

(c) 7 (d) 9

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (d) The unit digit of 213^6

$213^6 = (213^4 \times 213^2)$

$1 \times 9 = 9$

293. The smallest natural number, by which 216 should be multiplied, so that the number of factors of the product is odd?

(a) 4 (b) 6

(c) 12 (d) 8

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (b)

The number of multiples of $(216 = 2^3 \times 3^3)$ is:

$= (3+1)(3+1) = 4 \times 4 = 16$ (even)

The smallest natural number, by which 216 should be multiplied, so that the number of factors of the product is odd = 6

$\therefore$ Required number of multiples in $216 \times 6 = 2^4 \times 3^4$

$= (4+1)(4+1) = 25$

294. What is the unit digit of $[4523^{1632} \times 2224^{1632} \times 3225^{1632}]$

(a) 1 (b) 0

(c) 4 (d) 5

RRB NTPC 18.01.2017 Shift : 3

Ans : (b) $\left[(4523)^{1632} \times (2224)^{1632} \times (3225)^{1632}\right]$

$\Rightarrow (3)^4 \times (4)^4 \times (5)^4$

$81 \times 256 \times 625$

$1 \times 6 \times 5$

$30 \Rightarrow \boxed{0}$

295. Calculate the total prime factors in the product of $\{(8)^{10} \times (9)^7 \times 7^8\}$

(a) 45 (b) 54

(c) 52 (d) 65

RRB NTPC 18.04.2016 Shift : 2

Ans : (c) $(8)^{10} \times (9)^7 \times 7^8$

$= \left((2)^3\right)^{10} \times \left((3)^2\right)^7 \times (7)^8$

$= 2^{30} \times 3^{14} \times 7^8$

Hence, the total prime factors = 30+14+8 = 52

296. Calculate the total prime factors in the product of $\{(16)^7 \times (27)^6 \times 5^9\}$

(a) 28 (b) 43

(c) 55 (d) 56

RRB NTPC 16.04.2016 Shift : 2

Ans : (c) Total prime factors $\{(16)^7 \times (27)^6 \times 5^9\}$

$= \left(2^4\right)^7 \times \left(3^3\right)^6 \times 5^9$

$= 2^{28} \times 3^{18} \times 5^9$

$= 28 + 18 + 9 = 55$

297. Find the unit digit in the product of $(4211)^{102} \times (361)^{52}$

(a) 3 (b) 1

(c) 4 (d) 7

RRB NTPC 16.04.2016 Shift : 3

Ans : (b)

The required unit digit in $(4211)^{102} \times (361)^{52}$

$\Rightarrow (1)^{102} \times (1)^{52} = 1 \times 1 = 1$

298. Find the unit digit in the following $(1234)^{102} + (1234)^{103}$

(a) 2 (b) 4

(c) 0 (d) 1

RRB NTPC 28.04.2016 Shift : 2

Ans : (c) Given expression: $(1234)^{102} + (1234)^{103}$

The unit digit,

$= (4)^{102} + (4)^{103}$

$= (4^2)^{51} + (4^2)^{51} \times 4^1$

$= (16)^{51} + (16)^{51} \times 4^1$

$= 6 + 6 \times 4$

$= 6 + 2\,4 = 30$

Hence, the unit digit will be 0.

299. How many factors of 512 are perfect squares?

(a) 6 (b) 4

(c) 3 (d) 5

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (d) The factors of 512

= 1, 2, 4, 8, 16, 32, 64, 128, 256, 512

In which = 1, 4, 16, 64, 256 are perfect squares

So, the total number of perfect squares factors is 5.

300. Which is the smallest positive integer or natural number, when divides 1920 so that the number of factors of quotient is odd?

(a) 40 (b) 10

(c) 20 (d) 30

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (d) From options,

Number of factors in $\frac{1920}{40} = 48 = 2^4 \times 3$

is $(4+1)(1+1) = 10\,(\text{Even})$

Number of factors in $\frac{1920}{10} = 192 = 2^6 \times 3$

is $(6+1)(1+1) = 14\,(\text{Even})$

Number of factors in $\frac{1920}{20} = 96 = 2^5 \times 3$

is $(5+1)(1+1) = 12\,(\text{Even})$

Number of factors in $\frac{1920}{30} = 64 = 2^6$

is $(6+1) = 7\,(\text{Odd})$

Hence, option (d) will be required answer.

301. How many factors of the number $2^{10} \times 3^6 \times 5^3 \times 7^5$ are divisible by 2160?

(a) 180 (b) 336
(c) 504 (d) 560

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (c) Factors of $2160 = 2^4 \times 3^3 \times 5^1$
Let the total factors are n.

$$n = \frac{2^{10} \times 3^6 \times 5^3 \times 7^5}{2^4 \times 3^3 \times 5^1}$$

$n = 2^6 \times 3^3 \times 5^2 \times 7^5$

So, the total number of factors = (6+1)(3+1)(2+1)(5+1)
$= 7 \times 4 \times 3 \times 6 = 504$

Type - 8

302. What is the place value of 5 in the number 56789214?

(a) 5×10^6 (b) 5×10^4
(c) 5×10^7 (d) 5×10^5

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (c) : The place value of 5 in 56789214 –

56789214

$\rightarrow 5\times10^7$

303. Find the sum of the place value and the face value of 7 in the number 53736.

(a) 77 (b) 707
(c) 770 (d) 777

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

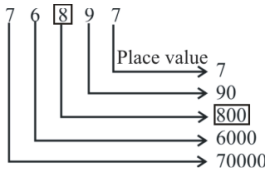
Ans. (b) : The place value and the face value of 7 in the number 53736.
Place value of 7 = 700
Face value of 7 = 7
Required sum = 700 + 7
= 707

304. In the number 76897, what is the place value of 8?

(a) 8 (b) 8000
(c) 800 (d) 80

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (c) :



Hence, place value of 8 in 76897 will be 800.

305. The face value of 8 in 758639 is :

(a) 8000 (b) 80
(c) 800 (d) 8

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : In the given number = 758639
The face value of 8 = 8

306. Find the difference of the place and face values of 6 in 516372

(a) 5998 (b) 6698
(c) 5394 (d) 5994

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : The place values of 6 in 516372–

5 1 6 3 7 2

$\rightarrow 6 \times 1000 = 6000$

the face values of 6 = 6
Required difference = 6000 – 6
= 5994

307. The sum of the place values of 3 in 3636 is:

(a) 330 (b) 3030
(c) 3 (d) 3003

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (b) : The place value of 3 in 3636.

3 6 3 6

$\rightarrow 3 \times 10 = 30$

$\rightarrow 3 \times 1000 = 3000$

Sum of place values of 3 = 3000 + 30
= 3030

308. The difference between the place values of 2 and 3 in the number 128935 is:

(a) 300 (b) 19970
(c) 20000 (d) 30

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (b) :

1 2 8 9 3 5

$\rightarrow$ Place value = 30

$\rightarrow$ Place value = 20000

Required difference = 20000 – 30 = 19970

309. The sum of the place values of 9 in 96961 is:

(a) 9000 (b) 18
(c) 9090 (d) 90900

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : Sum of the place value of 9 in number 96961
= 90000+ 900
= 90900

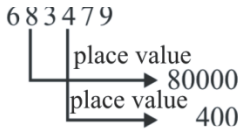
Hence, option (d) is correct.

310. Find the difference between the place values of 8 and 4 in the number 683479.

(a) 7 (b) 80000
(c) 79600 (d) 76600

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) :



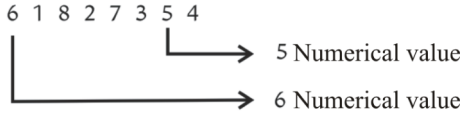
Hence, required difference = 80000 – 4000 = 79600

311. Find the sum of the face values of 6 and 5 in 61827354

(a) 60000300 (b) 30
(c) 40 (d) 11

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) :



Required sum = 6 + 5 = 11

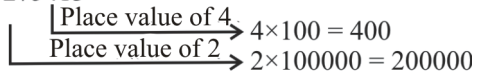
312. The difference between the place values of 2 and 4 in the number 275413 is

(a) 196600 (b) 2
(c) 199600 (d) -2

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c) :

Number 275413



Difference between the place value of 2 and 4
= 200000 – 400 = 199600

313. The digit of hundred's place value of 19! is:

(a) 0 (b) 9
(c) 4 (d) 1

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : 19! = 19 × 18 × 17 ×16 ×…….. × 1
Number of 5 in 19! = 3
So number of zeros = 3
19! = ...000→100th number
Hence the value of 100th place is 0.

314. What is the difference between the place and face values of '5' in the number 3675149?

(a) 5000 (b) 4995
(c) 495 (d) 4990

RRB JE - 23/05/2019 (Shift-I)

Ans : (b) The place value of 5 in the number 3675149
= 5×1000 = 5000
And the face value of 5 = 5
Required difference = 5000–5 = 4995

315. What is the place value of 8 in 634785?

(a) 8 (b) 80
(c) 800 (d) 80,000

RRB RPF Constable -20/01/2019 (Shift-I)

Ans : (b) The place value of 8 in 634785 = 8 ×10 = 80

316. Find the sum of the face value and place value of 6 in the number 206743?

(a) 6749 (b) 12743
(c) 6006 (d) 12

RRB Group-D – 28/11/2018 (Shift-I)

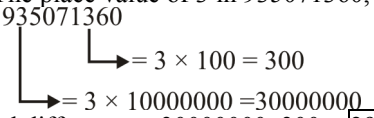
Ans : (c) The face value of 6 in the number 206743 = 6
And the place value of 6 = 6 × 1000 = 6000
The required sum (Face value + Place value) = 6 + 6000 = 6006

317. The difference between two place values of 3 in 935071360 is-

(a) 29999700 (b) 29999701
(c) 2999600 (d) 29999400

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (a) : The place value of 3 in 935071360,



The required difference = 30000000–300 = 29999700

318. Calculate the sum of the face value and the place value of 7 in the number 3728456.

(a) 700007 (b) 0
(c) 7 (d) 700000

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (a) : The place value of 7 = 7 × 100000 = 700000
The face value of 7 = 7.
Hence, the required sum = 700000 + 7 = 700007

319. Find the face value of 4 in 145.390.

(a) 40,000 (b) 4
(c) 140,000 (d) 45

RRB NTPC 04.04.2016 Shift : 2

Ans : (b) The face value of any digit is the same digit.
In the number 145.390 the face value of 4 = 4

320. Find the difference between the place value and face value of the digit 9 in the number 229301?

(a) 9292 (b) 8991
(c) 0 (d) 220

RRB NTPC 03.04.2016 Shift : 2

Ans : (b) The place value of 9 in the number 229301 = 9 × 1000 = 9000
And the face value of 9 = 9
Hence, the required difference = 9000- 9 = 8991

321. What is the difference between the place value and face value of 3 in 273965?

(a) 2035 (b) 3962
(c) 2997 (d) 0

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (c) : In the number 273965,
The place value of 3 = 3 x 1000 = 3000
And the face value = 3
Hence, the required difference = 3000 – 3 = 2997

322. The difference between the place values of '4' and '2' in the number 833749502 is:

(a) 49998 (b) 30098
(c) 39098 (d) 39998

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (d) The given number = 833749502
The place value of 2 = 2
The place value of 4 = 4 x 10000 = 40000
Hence, the required difference = 40000 – 2 = 39998

Type - 9

323. By how much is $\frac{1}{6}$th of 432 smaller than $\frac{3}{4}$th of 216?

(a) –90 (b) 72
(c) 90 (d) 162

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question-

$\frac{1}{6}$ part of $432 = 432 \times \frac{1}{6} = 72$

and $\frac{3}{4}$ part of $216 = 216 \times \frac{3}{4} = 162$

Required difference $= 162 - 72$
$= 90$

324. Terry consumes 1700 mL of milk every day. How many litres of milk will she consume in 5 weeks?

(a) 59 L (b) 60 L
(c) 58.5 L (d) 59.5 L

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (d) :

$\because$ Terry consumes in 1 day = 1700 mL

$\therefore$ In 5 weeks = 35 days $= \frac{1700 \times 35}{1000}$

$= \frac{59500}{1000}$ L

$= 59.5$L

325. Mohan earns ₹60 on first day and spends ₹50 on the second day. He again earns ₹60 on the third day and spends ₹50 on the fourth day and so on. On which day will he have ₹200 with him before spending?

(a) 10th (b) 14th
(c) 28th (d) 29th

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (d) : Mohan earns on the first day = ₹60
and spends on the second day = ₹50
Thus, in 2 days Mohan saves = ₹10
Hence, Mohan saves in 28 days= ₹140
Mohan will earn on 29th day = ₹60
So, On the 29th day Mohan has = 140 + 60
= ₹200

326. In a farmer's house, there are chickens and goats. The total number of their heads is 42 and the total number of their legs is 138. Find the number of chickens.

(a) 15 (b) 18
(c) 20 (d) 22

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the number of chickens = x
Number of goats = y
According to the question,
$x + y = 42$ ____(i)
$2x + 4y = 138$ ____ (ii)
On solving the equation (i) × 4 and (ii)

$$4x + 4y = 168$$
$$-2x \pm 4y = \pm 138$$
$$2x = 30$$
$$\boxed{x = 15}$$

Hence, the number of chickens = x = 15

327. Two bus tickets from city P to Q and three tickets from city P to R cost ₹99, but three tickets from city P to Q and two tickets from city P to R cost ₹91. What are the respective fares from city P to Q and from city P to R.

(a) ₹23, ₹15 (b) ₹51, ₹32
(c) ₹15, ₹23 (d) ₹32, ₹51

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the fares from city P to Q = ₹x
and the fares from city P to R = ₹y
According to the question,
$2x + 3y = 99$ ...(i)
$3x + 2y = 91$ ...(ii)
On multiplying by 3 in equation (i) and 2 in equation (ii)
$6x + 9y = 297$ ...(iii)
$6x + 4y = 182$ ...(iv)
From equation (iii) & (iv) we have –
$5y = 115$
$\boxed{y = ₹23}$
On putting the value of y in equation (i),
$2x + 3 \times 23 = 99$
$2x + 69 = 99$
$2x = 99 - 69$
$x = \frac{30}{2}$
$\boxed{x = ₹15}$
Hence the fares from city P to Q and the fares from city P to R are ₹15, ₹23 respectively.

328. There are 40 persons in a palace. If every person shakes hands with every other person, what will be the total number of handshakes?

(a) 750 (b) 780
(c) 800 (d) 790

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : Total number of handshakes $= \frac{n(n-1)}{2}$

$= \frac{40(40-1)}{2}$

$= \frac{40 \times 39}{2}$

$= 20 \times 39$

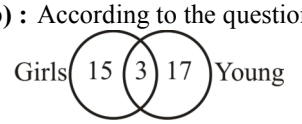
$= 780$

329. In a group of 35 persons, 20 are young and 18 are girls. How many young girls are there in the group ?

(a) 1 (b) 3
(c) 18 (d) 2

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,



Number of young girls in the group = (20+18) – 35
= 38 – 35 = 3

330. X, Y and Z together earn ₹ 2,400/- in 15 days, X and Y together earn ₹ 1,840/- in 16 days. Y and Z together earn ₹ 1,530/- in 18 days. What is the daily earning (in ₹) of Y?

(a) ₹50 (b) ₹40
(c) ₹60 (d) ₹30

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) :

Amount earned by X, Y and Z in 1 day $= \frac{2400}{15} = 160$

Amount earned by X, Y and Z in 1 day $= \frac{1840}{16} = 115$

Amount earned by Y and Z in 1 day $= \frac{1530}{18} = 85$

Daily earning of Y = (Daily earning of X and Y together) + (Daily earning of Y and Z together) – (Daily earning by X, Y and Z together)
= 115 + 85 – 160
= 40

331. The remainder in the expression $27\frac{3}{4}$ is:

(a) 6 (b) 4
(c) 3 (d) 8

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : In the given expression
Dividend = quotient × divisor + remainder
= 27 ×4 +3
∴ Remainder = 3

332. A maximum of how many pieces of exact 17 cm length can be cut from a 960 cm long rod?

(a) 60 (b) 58
(c) 54 (d) 56

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : According to question
Number of pieces $= \frac{960}{17} = 56 + \frac{8}{17}$
Hence, number of pieces of exact 17 cm length will be 56.

333. If 3/11 < x/3 < 7/11, which of the following can be value of 'x'?

(a) 0.5 (b) 1
(c) 2 (d) 3

RRB JE - 23/05/2019 (Shift-I)

Ans : (b) From options,
When X = 0.5 then 0.272 < 0.166 < 0.636 (False)
When X = 1 then 0.272 < 0.333 < 0.636 (True)
When X = 2 then 0.272 < 0.666 < 0.636 (False)
When X = 3 then 0.272 < 1 < 0.636 (False)
Hence, It is clear that the value of x will be 1.

334. If the first number and the second number is 25% and 50% more than the third number respectively, find the ratio between the first and second number.

(a) 5 : 6 (b) 2 : 1
(c) 6 : 5 (d) 1 : 2

RRB JE - 27/05/2019 (Shift-I)

Ans : (a) Let the third number be 100.
Then according to the question the first number = 125
And the second number = 150
Hence, required ratio = First number : Second number = 125 : 150
= $\boxed{5:6}$

335. Solve: $1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+.....$

(a) 2 (b) 1/50
(c) 3 (d) 1/22

RRB JE - 23/05/2019 (Shift-I)

Ans : (a)

$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+.....$

This is a geometrical progression-

$a=1, \quad r=\frac{1}{2}$

Let the sum be S.

$S=\frac{a}{1-r}, \qquad S_\infty=\frac{1}{1-\frac{1}{2}}$

$S_\infty=\frac{1}{\frac{1}{2}}=2 \qquad \boxed{S_\infty=2}$

336. In a school picnic group, 2/9th part were adults and the number of children was more than adults by 95. How many children were present there?

(a) 95 (b) 133
(c) 190 (d) 103

RRB JE - 27/06/2019 (Shift-I)

Ans : (b) Let the total number of people in the group = x

The number of adults = $x \times \frac{2}{9} = \frac{2x}{9}$

The number of children = $x-\frac{2x}{9}=\frac{9x-2x}{9}=\frac{7x}{9}$

$\frac{7x}{9}-\frac{2x}{9}=95$

$\frac{7x-2x}{9}=95$

$\frac{5x}{9}=95$

$x = 171$

Hence, the number of children $=\frac{7x}{9}=\frac{7}{9}\times171=133$

337. Find the value of 52-|8-20|=

(a) 45 (b) 40
(c) 65 (d) 64

RRB RPF Constable -18/01/2019 (Shift-I)

Ans : (b) The given value = $52-|8-20|$

$= 52-|-12|$

$|-A| = A$ (The value of Mod is always +ve.)

Hence, the required value $= 52-12 = 40$

338. If one dozen of apples weigh 1.8 kg, then find the number of apples of three boxes whose total weight is 23.25 kg.

(a) 280 (b) 155
(c) 465 (d) 215

RRB RPF-SI -13/01/2019 (Shift-I)

Ans : (b) Total weight = 23.25 kg

One apples's weight $= \frac{1.8}{12}$kg

The required number of apples,

$= \frac{\text{Total weight}}{1 \text{ apple's weight}} = \frac{23.25\times12}{1.8} = 155$

Number of apples in the box = 155

339. Pick out the set that forms the factors of 36.

(a) (2, 3, 4, 6, 9) (b) (2, 3, 4, 6)
(c) (2, 3, 4, 6, 9, 12, 18) (d) (2, 3, 4, 6, 9, 12)

RRB JE - 27/05/2019 (Shift-III)

Ans : (c) All the factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
Hence, the required set that is formed by the factors of 36 will be = (2, 3, 4, 6, 9, 12, 18)

340. The square of a number is 3 more than twice the number. What is the possible number.

(a) 1 or 3 (b) 1 or -3
(c) -1 or -3 (d) -1 or 3

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (d) Let the number be x
According to the question,

$x^2 = 2x + 3$
$x^2 - 2x - 3 = 0$
$x^2 - 3x + x - 3 = 0$
$x(x - 3) + 1(x - 3) = 0$
$(x - 3)(x + 1) = 0$
$x - 3 = 0$
$x = 3$
$x + 1 = 0$
$x = -1$

Hence, the possible number is -1 or 3.

341. $\left(\frac{3}{10}+\frac{8}{15}\right)$ is directly proportional to-

(a) $\frac{11}{10}$ (b) $\frac{11}{15}$
(c) $\frac{6}{5}$ (d) $\frac{3}{15}$

RRB Group-D – 02/11/2018 (Shift-I)

Ans. (c) $\left(\frac{3}{10}+\frac{8}{15}\right)$

$= \frac{9+16}{30} = \frac{25}{30} = \frac{5}{6}$

$\frac{5}{6}$ is directly proportional to $\frac{1}{\frac{5}{6}} = \frac{6}{5}$

342. Subtract 64.37 out of 1000.03 and add the resultant obtained from it to the sum of 3.4 and 7.56. What will be its value?

(a) 948.62 (b) 944.62
(c) 945.62 (d) 946.62

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (d) According to the question,

$1000.03 - 64.37 = 935.66$

And

$935.66 + (3.4 + 7.56) = 935.66 + 10.96 = 946.62$

343. Seema got ₹ 50 from her father and purchased toffee for ₹ 15. Her mother gave her ₹ 30 but her brother took ₹ 42 from her. How much money did she have left?

(a) ₹ 23 (b) ₹ 24
(c) ₹ 20 (d) ₹ 25

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (a) Total sum of money that Seema have left
= 50-15+30-42 = 80-57 = ₹ 23

344. ₹ 150 of Amit's Pocket money was spent on a pair of shoes and ₹ 75 on a watch. The total amount spent was three-fourth of his total pocket money. What was the amount received by Amit as pocket money?

(a) ₹ 300 (b) ₹ 400
(c) ₹ 375 (d) ₹ 250

RRB ALP CBT-2 Electrician 22-01-2019 (Shift-I)

Ans. (a) : Amount spent on shoes = ₹ 150
Amount spent on watch = ₹ 75
Let Amit's pocket money = ₹ x
According to the question,

$\frac{3x}{4} = 150 + 75$

$3x = 4\times225$

$x = \frac{900}{3}$

x = ₹ 300

So, Amit got the amount for pocket money = ₹ 300

345. Geeta weighs 11.235 kg. Her sister weighs 1.4 times her weight. Find the total weight of both.

(a) 15.729 kg (b) 25.964 kg
(c) 26.964 kg (d) 28.964 kg

RRB NTPC 29.03.2016 Shift : 1

Ans : (c) Geeta's weight = 11.235 kg
∴ The weight of Geeta's sister
$= 11.235\times1.4 = 15.729$ kg
The total weight of both of them
$= 11.235 + 15.729 = 26.964$ kg

02.

Decimal Fractions

Type - 1

1. Which of the following fractions is the largest?

$\frac{7}{9}, \frac{6}{7}, \frac{22}{25}$ **and** $\frac{11}{13}$

(a) $\frac{11}{13}$ (b) $\frac{22}{25}$

(c) $\frac{7}{9}$ (d) $\frac{6}{7}$

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (b) :

$\frac{7}{9} = 0.777$

$\frac{6}{7} = 0.857$

$\frac{22}{25} = 0.88$

$\frac{11}{13} = 0.846$

Hence, fraction $\frac{22}{25} = 0.88$ is the largest.

2. Which of the following fractions is the smallest?

(a) $\frac{9}{11}$ (b) $\frac{11}{12}$

(c) $\frac{8}{13}$ (d) $\frac{10}{14}$

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (c) : From option,

$\frac{9}{11} = 0.8181$

$\frac{11}{12} = 0.916$

$\frac{8}{13} = 0.615$

$\frac{10}{14} = 0.714$

Hence, it is clear that smallest fraction is $\frac{8}{13}$.

3. Which is the smallest fraction among the following fractions?

$\frac{3}{9}, \frac{8}{14}, \frac{5}{8}, \frac{4}{9}$

(a) $\frac{4}{9}$ (b) $\frac{8}{14}$

(c) $\frac{3}{9}$ (d) $\frac{5}{8}$

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (c) : From question,

$\frac{3}{9} = 0.33$ $\frac{8}{14} = 0.57$

$\frac{5}{8} = 0.62$ $\frac{4}{9} = 0.44$

The smallest fraction is $\frac{3}{9}$

4. Find the greatest fraction out of $-\frac{3}{2}, \frac{3}{2}, \frac{11}{4}, \frac{5}{2}$:

(a) $\frac{3}{2}$ (b) $\frac{11}{4}$

(c) $\frac{5}{2}$ (d) $-\frac{3}{2}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) :

$-\frac{3}{2} = -1.5$

$\frac{3}{2} = 1.5$

$\frac{11}{4} = 2.75$

$\frac{5}{2} = 2.5$

It is clear that greatest fraction is $\frac{11}{4}$

5. Which of the following is the smallest fraction?

$\frac{7}{6}, \frac{7}{9}, \frac{4}{5}, \frac{5}{7}$

(a) $\frac{7}{6}$ (b) $\frac{4}{5}$

(c) $\frac{7}{9}$ (d) $\frac{5}{7}$

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{7}{6}=1.16,\ \frac{7}{9}=0.77,\ \frac{4}{5}=0.80,\ \frac{5}{7}=0.71$

Hence the smallest fraction is $\frac{5}{7}$

6. Which of the following fractions is the smallest?

(a) $\frac{7}{8}$ (b) $\frac{7}{10}$

(c) $\frac{3}{4}$ (d) $\frac{5}{7}$

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (b) : On writing given fraction in descending order.

$$\frac{7}{8}>\frac{3}{4}>\frac{5}{7}>\frac{7}{10}$$
$$0.875>0.75>0.714>0.70$$

Hence, $\frac{7}{10}$ will be the smallest fraction.

7. Find the greatest among these fractions.
5/6, 6/11, 2/3, 8/9, 6/7

(a) 2/3 (b) 8/9 (c) 5/6 (d) 6/7

RRB JE - 01/06/2019 (Shift-III)

Ans. (b) From question :-

$\frac{5}{6}=0.83,\ \frac{6}{11}=0.54$

$\frac{2}{3}=0.67,\ \frac{8}{9}=0.89$

$\frac{6}{7}=0.85$

Hence, the greatest fraction is $0.89=\frac{8}{9}$

8. Find the difference between the greatest and the least fraction among 2/3, 3/4, 4/5, 5/6.

(a) 3/5 (b) 1/7 (c) 1/6 (d) 2/5

RRB JE - 22/05/2019 (Shift-I)

Ans : (c) From question,

$\frac{2}{3}=0.66$ (Least fraction)

$\frac{3}{4}=0.75$

$\frac{4}{5}=0.8$

$\frac{5}{6}=0.83$ (Greatest fraction)

Hence, the required difference $=\frac{5}{6}-\frac{2}{3}=\frac{5-4}{6}=\frac{1}{6}$

9. Which of the following is the greatest?

(a) 15/16 (b) 24/25

(c) 34/35 (d) 19/20

RRB JE - 02/06/2019 (Shift-II)

Ans. (c) 15/16 = 0.937
24/25 = 0.96
34/35 = 0.97 (the greatest fraction)
19/20 = 0.95
Hence, option (c) is the greatest fraction.

10. Find the greatest among these fractions.
5/11, 3/15, 12/11, 4/7, 9/12

(a) 12/11 (b) 3/15

(c) 9/12 (d) 4/7

RRB RPF-SI -10/01/2019 (Shift-I)

Ans : (a)

$\frac{5}{11}=0.45,\ \frac{3}{15}=0.2,\ \frac{12}{11}=1.09,\ \frac{4}{7}=0.57,\ \frac{9}{12}=0.75$

Hence, the required largest fraction will be $=\frac{12}{11}$

11. Find the least among these fractions.

$\frac{1}{10},\frac{1}{100},\frac{9}{1000},\frac{500}{10000}$

(a) $\frac{500}{10000}$ (b) $\frac{1}{100}$

(c) $\frac{1}{10}$ (d) $\frac{9}{1000}$

RRB RPF Constable -17/01/2019 (Shift-I)

Ans. (d) : From question,

$\frac{1}{10}=0.1$

$\frac{1}{100}=0.01$

$\frac{9}{1000}=0.009$

$\frac{500}{10000}=0.05$

$0.1>0.05>0.01>0.009$

Hence, it is clear that the required fraction is $\frac{9}{1000}$.

12. Which of the following fractions is the greatest?

(a) 8/19 (b) 9/22

(c) 10/23 (d) 11/24

RRB RPF-SI -11/01/2019 (Shift-III)

Ans : (d) From options

$\frac{8}{19}=0.421,\frac{9}{22}=0.409,\frac{10}{23}=0.43,\frac{11}{24}=0.458$

Hence, the required greatest fraction is $\frac{11}{24}$.

13. Arrange the following ratios in decreasing order, which number will be the last?
11:14, 17:21, 5:7, 2:3

(a) 17:21 (b) 5:7

(c) 2:3 (d) 11:14

RRB Group-D – 05/10/2018 (Shift-II)

Ans. (c) The given proportional numbers are-

$\frac{11}{14},\frac{17}{21},\frac{5}{7},\frac{2}{3}=\frac{33}{42},\frac{34}{42},\frac{30}{42},\frac{28}{42}$

The decreasing order of the numbers,

$\frac{17}{21}>\frac{11}{14}>\frac{5}{7}>\frac{2}{3}$

Hence, the last proportional number will be 2/3.

14. Which of the following fractions is the largest?

$\frac{1}{8},\frac{2}{12},\frac{3}{16},\frac{4}{20}$

(a) $\frac{3}{16}$ (b) $\frac{4}{20}$

(c) $\frac{1}{8}$ (d) $\frac{2}{12}$

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (b) $\frac{1}{8} = 0.125$

$\frac{2}{12} = 0.166$

$\frac{3}{16} = 0.187$

$\frac{4}{20} = 0.200$

Hence, it is clear that $\frac{4}{20}$ is the greatest fraction.

15. Which of the following fractions is the largest?

$\frac{3}{15}, \frac{5}{20}, \frac{8}{64}, \frac{25}{1000}$

(a) $\frac{5}{20}$ (b) $\frac{8}{64}$

(c) $\frac{3}{15}$ (d) $\frac{25}{1000}$

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (a) From options–

(a) $\frac{5}{20} = 0.25$ (b) $\frac{8}{64} = 0.125$

(c) $\frac{3}{15} = 0.2$ (d) $\frac{25}{1000} = 0.025$

Hence, the largest fraction is $\frac{5}{20}$.

16. Which of the following is the smallest fraction?

$\frac{4}{9}, \frac{5}{4}, \frac{3}{8}, \frac{6}{7}$

(a) $\frac{3}{8}$ (b) $\frac{4}{9}$

(c) $\frac{6}{7}$ (d) $\frac{5}{4}$

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (a) From question,

$\frac{4}{9} = 0.444 \Rightarrow \frac{5}{4} = 1.25$

$\boxed{\frac{3}{8} = 0.375}$

$\frac{6}{7} = 0.857$

Hence, it is clear that $\frac{3}{8}$ is the smallest fraction.

17. Which of the following fractions is the largest?

(a) $\frac{29}{77}$ (b) $\frac{8}{21}$

(c) $\frac{5}{14}$ (d) $\frac{25}{66}$

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (b) From option,

$\frac{29}{77} = 0.376$

$\boxed{\frac{8}{21} = 0.380}$

$\frac{5}{14} = 0.357$, $\frac{25}{66} = 0.378$

Hence, it is clear that $\frac{8}{21}$ is the largest fraction.

18. Which of the following is the smallest fraction?

$\frac{6}{11}, \frac{13}{18}, \frac{15}{22}, \frac{19}{36}, \frac{5}{6}$

(a) $\frac{19}{36}$ (b) $\frac{13}{18}$

(c) $\frac{6}{11}$ (d) $\frac{5}{6}$

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (a) : $\frac{6}{11}, \frac{13}{18}, \frac{15}{22}, \frac{19}{36}, \frac{5}{6}$

$\frac{6}{11} = 0.54$, $\frac{13}{18} = 0.72$

$\frac{15}{22} = 0.68$, $\frac{19}{36} = 0.52$

$\frac{5}{6} = 0.83$

Hence, it is clear that the smallest fraction is $\frac{19}{36}$.

19. $\frac{8}{6}, \frac{6}{4}, \frac{5}{3}, \frac{9}{5}$

The largest fraction among the given fractions is:

(a) $\frac{5}{3}$ (b) $\frac{6}{4}$

(c) $\frac{9}{5}$ (d) $\frac{8}{6}$

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans. (c) : $\frac{8}{6} = 1.33$, $\frac{6}{4} = 1.50$

$\frac{5}{3} = 1.66$, $\frac{9}{5} = 1.80$

Hence, it is clear that the required largest fraction is $\frac{9}{5}$.

20. Which of the following is the smallest fraction?

$\frac{3}{15}, \frac{5}{20}, \frac{8}{64}, \frac{25}{1000}$

(a) $\frac{8}{64}$ (b) $\frac{25}{1000}$

(c) $\frac{5}{20}$ (d) $\frac{3}{15}$

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (b) From question,

$\frac{3}{15} = 0.2$, $\frac{5}{20} = 0.25$

$\frac{8}{64}=0.125,\ \frac{25}{1000}=0.025$

Hence, the required smallest fraction is $\frac{25}{1000}$.

21. Which of the following fractions is the least of all?

(a) 6/5 (b) 4/3
(c) 3/2 (d) 5/4

RRB NTPC 29.03.2016 Shift : 3

Ans : (a) From option,

$\frac{6}{5}=1.2,\quad \frac{4}{3}=1.33$

$\frac{3}{2}=1.5,\quad \frac{5}{4}=1.25$

Hence, it is clear that $\frac{6}{5}$ is the required least fraction of all.

22. The smallest of the fractions among 5/8, 3/4, 13/16, 7/12 is_____.

(a) 5/8 (b) 3/4
(c) 13/16 (d) 7/12

RRB NTPC 27.04.2016 Shift : 2

Ans : (d) From question,

$\frac{5}{8}=0.625,\ \frac{3}{4}=0.75,\ \frac{13}{16}=0.8125$

$\frac{7}{12}=0.58$

Hence, the smallest fraction is $\frac{7}{12}$.

23. Which of the following is a reducible fraction?

(a) $\frac{91}{15}$ (b) $\frac{79}{26}$
(c) $\frac{105}{112}$ (d) $\frac{41}{17}$

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (c) A fraction whose fractional shares have a common factor, is called reducible fraction.

$\frac{105}{112}=\frac{7\times15}{7\times16}$

Type - 2

24. The descending order of the fractions $\frac{2}{3},\frac{1}{6},\frac{1}{5},\frac{3}{7}$ is:

(a) $\frac{3}{7},\frac{2}{3},\frac{1}{6},\frac{1}{5}$ (b) $\frac{2}{3},\frac{3}{7},\frac{1}{5},\frac{1}{6}$
(c) $\frac{3}{7},\frac{1}{6},\frac{1}{5},\frac{2}{3}$ (d) $\frac{1}{6},\frac{1}{5},\frac{3}{7},\frac{2}{3}$

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (b) : $\frac{2}{3}=0.666$

$\frac{1}{6}=0.166$

$\frac{1}{5}=0.200 \Rightarrow \frac{3}{7}=0.428$

The descending order = 0.666>0.428>0.200>0.166

$\frac{2}{3}>\frac{3}{7}>\frac{1}{5}>\frac{1}{6}$

$\Rightarrow \frac{2}{3},\frac{3}{7},\frac{1}{5},\frac{1}{6}$

25. Arrange the following fractions in the ascending order.

$\frac{2}{3},\frac{4}{8},\frac{5}{9}$ and $\frac{9}{11}$

(a) $\frac{4}{8}<\frac{5}{9}<\frac{2}{3}<\frac{9}{11}$ (b) $\frac{5}{9}<\frac{2}{3}<\frac{4}{8}<\frac{9}{11}$
(c) $\frac{5}{9}<\frac{2}{3}<\frac{9}{11}<\frac{4}{8}$ (d) $\frac{4}{8}<\frac{5}{9}<\frac{9}{11}<\frac{2}{3}$

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$\underset{\downarrow}{\frac{2}{3}},\ \underset{\downarrow}{\frac{4}{8}},\ \underset{\downarrow}{\frac{5}{9}}$ and $\underset{\downarrow}{\frac{9}{11}}$

0.67 0.50 0.55 0.81

(Ascending order),

0.50 0.55 0.67 0.81

$\frac{4}{8}<\frac{5}{9}<\frac{2}{3}<\frac{9}{11}$

26. The fractions $\frac{1}{3},\frac{4}{7},\frac{2}{5}$ written in ascending order are:

(a) $\frac{1}{3},\frac{4}{7},\frac{2}{5}$ (b) All fractions are equal
(c) $\frac{1}{3},\frac{2}{5},\frac{4}{7}$ (d) $\frac{4}{7},\frac{1}{3},\frac{2}{5}$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : $\frac{1}{3}=0.33$

$\frac{4}{7}=0.57$

$\frac{2}{5}=0.4$

Hence ascending order $=\frac{1}{3},\frac{2}{5},\frac{4}{7}$

27. Select the option that given decimal numbers 0.25, 1.24, 0.0882 and 2.67 are arranged in ascending order.

(a) 2.67, 1.24, 0.25, 0.0882
(b) 0.25, 1.24, 0.08821, 2.67
(c) 1.24, 0.25, 2.67, 0.0882
(d) 0.0882, 0.25, 1.24, 2.67

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (d) : On arranging the given decimal numbers in ascending order-

$0.0882 \rightarrow 0.25 \rightarrow 1.24 \rightarrow 2.67$

Hence, option (d) is correct.

28. Which of the following fractions are in ascending order?

(a) $\frac{12}{18}, \frac{14}{17}, \frac{16}{19}$ (b) $\frac{14}{17}, \frac{12}{18}, \frac{16}{19}$

(c) $\frac{16}{19}, \frac{14}{17}, \frac{12}{18}$ (d) $\frac{12}{18}, \frac{16}{19}, \frac{14}{17}$

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (a) : From options,

$\frac{12}{18} = 0.66, \frac{14}{17} = 0.82, \frac{16}{19} = 0.84$

Required ascending order $= \frac{12}{18}, \frac{14}{17}, \frac{16}{19}$

29. The ascending order of the fractions $\frac{2}{3}, \frac{1}{2}$ and $\frac{1}{6}$ is-

(a) $\frac{2}{3}, \frac{1}{2}, \frac{1}{6}$ (b) $\frac{2}{3}, \frac{1}{6}, \frac{1}{2}$

(c) $\frac{1}{6}, \frac{1}{2}, \frac{2}{3}$ (d) $\frac{1}{6}, \frac{2}{3}, \frac{1}{2}$

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (c) : On equating the denominator $\frac{2}{3}, \frac{1}{2}$ and $\frac{1}{6}$ of fractions we have,

$\frac{2}{3} = \frac{4}{6}$ (Multiply by 2 numerator and denominator)

$\frac{1}{2} = \frac{3}{6}$ (Multiply by 3 numerator and denominator)

$\frac{1}{6} = \frac{1}{6}$

Hence ascending order of fractions $= \frac{1}{6} < \frac{1}{2} < \frac{2}{3}$

30. In which of the following options are the fractions arranged in ascending order?

(a) $\frac{9}{11}, \frac{6}{7}, \frac{5}{6}, \frac{2}{5}, \frac{3}{8}$ (b) $\frac{6}{7}, \frac{5}{6}, \frac{9}{11}, \frac{2}{5}, \frac{3}{8}$

(c) $\frac{2}{5}, \frac{6}{7}, \frac{9}{11}, \frac{3}{8}, \frac{5}{6}$ (d) $\frac{3}{8}, \frac{2}{5}, \frac{9}{11}, \frac{5}{6}, \frac{6}{7}$

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (d) : From option (d),

$\frac{3}{8} = 0.375$, $\frac{2}{5} = 0.40$

$\frac{9}{11} = 0.8181$, $\frac{5}{6} = 0.8333$

$\frac{6}{7} = 0.857$

Ascending order $= \frac{3}{8} < \frac{2}{5} < \frac{9}{11} < \frac{5}{6} < \frac{6}{7}$

31. Arrange the given fractions in decreasing order $\frac{7}{8}, \frac{8}{9}, \frac{9}{10}$

(a) $\frac{9}{10}, \frac{7}{10}, \frac{8}{9}$ (b) $\frac{7}{8}, \frac{8}{9}, \frac{9}{10}$

(c) $\frac{9}{10}, \frac{8}{9}, \frac{7}{8}$ (d) $\frac{8}{9}, \frac{7}{8}, \frac{9}{10}$

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : In the given fractions if the difference between the numerator and denominator of certain fractions are same then the fraction having greater denominator will be greater fraction while the one having smaller denominator will be smaller fraction. Hence the descending order of the fraction will be

$\frac{9}{10}, \frac{8}{9}, \frac{7}{8}$

32. Write the ratio 5 : 3, 7 : 5 and 6 : 4 in descending order.

(a) $\frac{5}{3} > \frac{7}{5} > \frac{6}{4}$ (b) $\frac{7}{5} > \frac{6}{4} > \frac{5}{3}$

(c) $\frac{5}{3} > \frac{6}{4} > \frac{7}{5}$ (d) $\frac{6}{4} > \frac{7}{5} > \frac{5}{3}$

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\frac{5}{3} = 1.67$

$\frac{7}{5} = 1.4$

$\frac{6}{4} = 1.5$

Hence descending order $= \frac{5}{3} > \frac{6}{4} > \frac{7}{5}$

33. Select the option that gives the fractions $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{1}{4}, \frac{7}{10}, \frac{5}{8}$ in ascending order :

(a) $\frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$ (b) $\frac{7}{10}, \frac{5}{8}, \frac{3}{5}, \frac{2}{5}, \frac{1}{3}, \frac{1}{4}$

(c) $\frac{1}{4}, \frac{1}{3}, \frac{3}{5}, \frac{2}{5}, \frac{5}{8}, \frac{7}{10}$ (d) $\frac{1}{3}, \frac{1}{4}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (a) : From question

$\frac{2}{5} = 0.4$, $\frac{1}{3} = 0.33$, $\frac{3}{5} = 0.6$, $\frac{1}{4} = 0.25$,

$\frac{7}{10} = 0.7$, $\frac{5}{8} = 0.625$

Hence, ascending order of given fractions

$= \frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{5}{8}, \frac{7}{10}$

34. If the rational numbers $\frac{4}{-9}, \frac{-7}{18}, \frac{5}{-6}, \frac{-2}{3}$ are arranged in ascending order, then which of these numbers will be placed first?

(a) $\frac{4}{-9}$ (b) $\frac{-7}{18}$

(c) $\frac{5}{-6}$ (d) $\frac{-2}{3}$

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (c)

Rational numbers $= \frac{4}{-9}, \frac{-7}{18}, \frac{5}{-6}$ and $\frac{-2}{3}$

$\frac{4}{-9} = -0.44$

$\frac{-7}{18} = -0.38$

$\frac{5}{-6} = -0.83$

$\frac{-2}{3} = -0.66$

The first number when placed in ascending order

$= -0.83 = \frac{5}{-6}$

35. Arrange the following fractions in descending order.

5/6, 3/7, 8/9, 3/14

(a) 8/9, 5/6, 3/7, 3/14 (b) 8/9, 3/14, 3/7, 5/6

(c) 5/6, 8/9, 3/7, 3/14 (d) 3/7, 8/9, 5/6, 3/14

RRB JE - 22/05/2019 (Shift-III)

Ans : (a)

$\frac{5}{6} = 0.83, \ \frac{3}{7} = 0.42, \ \frac{8}{9} = 0.88, \ \frac{3}{14} = 0.21$

Hence, the descending order of the fractions is $\frac{8}{9}, \frac{5}{6}, \frac{3}{7}, \frac{3}{14}$.

36. Which of the following fractions are in descending order?

(a) 5/8, 7/12, 3/4, 13/16

(b) 7/12, 13/16, 3/4, 5/8

(c) 5/8, 7/12, 13/16, 3/4

(d) 13/16, 3/4, 5/8, 7/12

RRB JE - 26/06/2019 (Shift-III)

Ans : (d) Arranging in descending order-

(a) 5/8 = 0.62, 7/12 = 0.58, 3/4 = 0.75, 13/16 = 0.81

(b) 7/12 = 0.58, 13/16 = 0.81, 3/4 = 0.75, 5/8 = 0.62

(c) 5/8 = 0.62, 7/12 = 0.58, 13/16 = 0.81, 3/4 = 0.75

(d) 13/16 = 0.81, 3/4 = 0.75, 5/8 = 0.62, 7/12 = 0.58

Hence, option (d) is in descending order.

37. Which of the following fractions are in ascending order?

(a) 0.65, 0.76, 0.67, 0.86,

(b) 0.65, 0.86, 0.67, 0.76

(c) 0.65, 0.67, 0.76, 0.86

(d) 0.67, 0.65, 0.76, 0.86

RRB RPF Constable -17/01/2019 (Shift-III)

Ans : (c) From option (c),

$0.65 < 0.67 < 0.76 < 0.86$

Hence, option (c) is in ascending order.

38. Which of the following is true for given numbers?

(a) 13/33<32/47<20/47<25/27

(b) 13/33<20/47<25/27<32/27

(c) 13/33<20/47<32/47<25/27

(d) 20/47<13/33<32/47<25/27

RRB RPF-SI -13/01/2019 (Shift-I)

Ans : (c) The given fractions–

$\frac{13}{33} = 0.\overline{39}, \ \frac{20}{47} = 0.42$

$\frac{32}{47} = 0.68, \ \frac{25}{27} = 0.92$

$0.\overline{39} < 0.42 < 0.68 < 0.92$

Hence, $\frac{13}{33} < \frac{20}{47} < \frac{32}{47} < \frac{25}{27}$ is true.

39. Which of the following is in descending order?

(a) 2/3, 3/4, 4/5, 1/2 (b) 3/4, 4/5, 1/2, 2/3

(c) 4/5, 3/4, 2/3, 1/2 (d) 4/5, 1/2, 2/3, 3/4

RRB RPF Constable -25/01/2019 (Shift-I)

Ans : (c) From option (c),

$\frac{4}{5}, \frac{3}{4}, \frac{2}{3}, \frac{1}{2}$

$\because$ LCM of the denominators = 60

Hence, again from option (c),

$= \frac{48}{60} > \frac{45}{60} > \frac{40}{60} > \frac{30}{60}$

Hence, $\frac{4}{5}, \frac{3}{4}, \frac{2}{3}, \frac{1}{2}$ are in descending order.

40. Whose ascending order from the following numbers is correct?

(a) $\frac{5}{6}, \frac{3}{5}, \frac{7}{9}$ (b) $\frac{3}{5}, \frac{5}{6}, \frac{7}{9}$

(c) $\frac{3}{5}, \frac{7}{9}, \frac{5}{6}$ (d) $\frac{7}{9}, \frac{3}{5}, \frac{5}{6}$

RRB RPF Constable -20/01/2019 (Shift-I)

Ans : (c) From options,

The given fractions–

$\frac{5}{6} = 0.83, \ \frac{3}{5} = 0.6$

$\frac{7}{9} = 0.77$

The required ascending order is 0.6, 0.77, 0.83

$= \frac{3}{5}, \frac{7}{9}, \frac{5}{6}$

41. Which among the following is the correct ascending order of the numbers?

(a) $\frac{1}{3}, \frac{4}{15}, 0.33$ (b) $\frac{1}{3}, 0.33, \frac{4}{15}$

(c) $\frac{4}{15}, 0.33, \frac{1}{3}$ (d) $0.33, \frac{4}{15}, \frac{1}{3}$

RRB NTPC 17.01.2017 Shift-1

Ans : (c) From the given fractions,

$\frac{1}{3} = 0.333, \frac{4}{15} = 0.266$ and 0.33

$0.266 < 0.33 < 0.333$

$$\frac{4}{15} < 0.33 < \frac{1}{3}$$

Hence, the required ascending order of the numbers will be $\frac{4}{15}, 0.33, \frac{1}{3}$.

42. Which of the following is correct for the given numbers?

(a) 13/21 < 57/97 < 52/94 < 36/79
(b) 36/79 < 57/97 < 52/94 < 13/21
(c) 36/79 < 52/94 < 13/21 < 57/97
(d) 36/79 < 52/94 < 57/97 < 13/21

RRB NTPC 02.04.2016 Shift : 1

Ans : (d) From options–

$$\frac{13}{21} = 0.619, \quad \frac{57}{97} = 0.587$$

$$\frac{52}{94} = 0.553, \quad \frac{36}{79} = 0.455$$

Hence, $\frac{36}{79} < \frac{52}{94} < \frac{57}{97} < \frac{13}{21}$ is correct order.

43. Whose ascending order is correct from the given fractions?

(a) $\frac{5}{8}, \frac{19}{24}, \frac{11}{16}$ (b) $\frac{11}{16}, \frac{5}{8}, \frac{19}{24}$
(c) $\frac{5}{8}, \frac{11}{16}, \frac{19}{24}$ (d) $\frac{19}{24}, \frac{11}{16}, \frac{5}{8}$

RRB NTPC 11.04.2016 Shift : 3

Ans : (c) $\frac{5}{8} = 0.625 \quad \frac{19}{24} = 0.791 \quad \frac{11}{16} = 0.687$

Hence, the required ascending order is 0.625 < 0.687 < 0.791

$$\Rightarrow \quad \frac{5}{8} < \frac{11}{16} < \frac{19}{24}$$

Type - 3

44. The decimal expansion of $\frac{31}{2.5}$ will terminate after:

(a) two decimal places
(b) three decimal places
(c) more than three decimal places
(d) one decimal place

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\frac{31}{2.5} = \frac{31 \times 10 \times 4}{2.5 \times 10 \times 4} = \frac{1240}{100} = 12.4$

i,e. the decimal expansion ends after one decimal place

45. Which of the following has terminating decimal representation?

(a) $1\frac{1}{5}$ (b) $4\frac{1}{9}$
(c) $3\frac{1}{7}$ (d) $2\frac{1}{3}$

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (a) : If the denominator of the given rational number is 5 then the rational number will represent the terminating decimal.

From option (a) $1\frac{1}{5} = \frac{6}{5} = 1.2$ (Terminating decimal)

(b) $4\frac{1}{9} = \frac{37}{9} = 4.\overline{1}$ (Non-Terminating decimal)

(c) $3\frac{1}{7} = \frac{22}{7} = 3.\overline{142857}$ (Non-Terminating decimal)

(d) $2\frac{1}{3} = \frac{7}{3} = 2.\overline{3}$ (Non-Terminating decimal)

46. Which of the following numbers has a terminating decimal?

$$\frac{15}{600}, \frac{29}{343}, \frac{7}{2^2 \times 7^2}, \frac{77}{210}$$

(a) $\frac{7}{2^2 \times 7^2}$ (b) $\frac{29}{343}$
(c) $\frac{15}{600}$ (d) $\frac{77}{210}$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : In according to options, converting the fractions into decimals

(a) $\frac{7}{2^2 \times 7^2} = \frac{7}{196} = 0.0357.....$

(b) $\frac{29}{343} = 0.0845.....$

(c) $\frac{15}{600} = 0.025$

(d) $\frac{77}{210} = 0.3\overline{6}$

Hence, from above $\frac{15}{600}$ is terminating decimal.

47. Decimal expansion of $\frac{109}{100}$ is:

(a) $1 + \frac{0}{10} + \frac{9}{100}$ (b) $10 + \frac{9}{100}$
(c) $1 + \frac{9}{100}$ (d) $100 + 9 + \frac{0}{100}$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (a) : Decimal expansion of $\frac{109}{100} = \frac{100}{100} + \frac{0}{10} + \frac{9}{100}$

$$= 1 + \frac{0}{10} + \frac{9}{100}$$

Hence, option (a) is required answer.

48. Which of the following rational numbers have a non-terminating decimal expansion?

(a) $\frac{23}{2^3 5^2}$ (b) $\frac{11}{1000}$
(c) $\frac{4^2}{3^2 5^2}$ (d) $\frac{19}{2^3 5^7 7^5}$

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : From the given option-

(a) $\frac{23}{2^3 5^2} = \frac{23}{200} = 0 \cdot 115$

(b) $\frac{11}{1000} = 0 \cdot 011$

(c) $\frac{4^2}{3^2 5^2} = \frac{16}{225} = 0 \cdot 071111....$

(d) $\frac{19}{2^3 5^7 7^5} = \frac{19}{8 \times 78125 \times 16807}$

$= \frac{19}{10504375000}$

$= 0.00000000181.....$

Hence it is clear from the given options that the decimal expansion of option (d) is non – terminating.

49. Convert $\frac{8}{9}$ into a decimal number.

(a) 0.85 (b) 0.88
(c) 0.91 (d) 0.77

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) : Required decimal number $= \frac{8}{9} = 0.88$

50. The decimal expression of $\frac{3}{8}$ comes to an end after how many digits after the decimal?

(a) 2 (b) 4
(c) 3 (d) 5

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\frac{3}{8} = 0.375$

The decimal range of 3/8 ends after the three digits of decimal.

51. Which of the following is terminating decimal?

(a) $\frac{1}{32}$ (b) $\frac{1}{24}$
(c) $\frac{1}{96}$ (d) $\frac{1}{48}$

RRB RPF-SI -05/01/2019 (Shift-III)

Ans : (a) From options,

$\frac{1}{32} = 0.03125$

$\frac{1}{24} = 0.416666667$

$\frac{1}{96} = 0.0104166667$

$\frac{1}{48} = 0.0208333333$

A terminating decimal is usually defined as a decimal number that contains a finite number of digits after the decimal point.

$\therefore$ option (a) $\frac{1}{32} = 0.03125$

Hence, it is terminating decimal.

52. Which of the following will have a terminating decimal expansion?

(a) $\frac{57}{120}$ (b) $\frac{47}{150}$
(c) $\frac{61}{110}$ (d) $\frac{43}{140}$

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (a) From options,

(a) $\frac{57}{120} = 0.475$

(b) $\frac{47}{150} = 0.31\overline{3}$

(c) $\frac{61}{110} = 0.55\overline{45}$

(d) $\frac{43}{140} = 0.30\overline{714285}$

Hence, $\frac{57}{120}$ will have a terminating decimal expansion.

53. Which of the following numbers will have a value of terminating decimal?

(a) $\frac{9}{45}$ (b) $\frac{6}{45}$
(c) $\frac{3}{45}$ (d) $\frac{12}{45}$

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (a) $\frac{9}{45} = 0.2$

$\frac{6}{45} = 0.1333$

$\frac{3}{45} = 0.06667$

$\frac{12}{45} = 0.26667$

Hence, it is clear that the value of option (a) $\frac{9}{45}$, is a terminating decimal.

54. Which of the following will give terminating decimal?

(a) $\frac{12}{72}$ (b) $\frac{6}{72}$
(c) $\frac{9}{72}$ (d) $\frac{3}{72}$

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (c) $\frac{12}{72} = \frac{1}{6} = 0.166666---$

$\frac{6}{72} = \frac{1}{12} = 0.083333---$

$\frac{9}{72} = \frac{1}{8} = 0.125$

$\frac{3}{72} = \frac{1}{24} = 0.041666----$

Hence, option (c) $\frac{9}{72} = \frac{1}{8} = 0.125$ is correct.

55. Which of the following fractions will not have a value in recurring decimal?

(a) $\frac{20}{56}$ (b) $\frac{25}{56}$

(c) $\frac{10}{56}$ (d) $\frac{21}{56}$

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (d) : From options

(a) $\frac{20}{56} = 0.357142$ (b) $\frac{25}{56} = 0.44642$

(c) $\frac{10}{56} = 0.178571$ (d) $\frac{21}{56} = 0.375$

Hence, the value of option (d) $\frac{21}{56} = 0.375$ is not in recurring decimal.

56. Which of the following options is an example of recurring decimal?

(a) $\frac{24}{60}$ (b) $\frac{24}{90}$

(c) $\frac{24}{120}$ (d) $\frac{24}{30}$

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (b) (a) $\frac{24}{60} = 0.4$ (b) $\frac{24}{90} = 0.266$

(c) $\frac{24}{120} = 0.2$ (d) $\frac{24}{30} = 0.8$

Hence, option (b) $\frac{24}{90}$ is an example of recurring decimal.

57. Which of the following vulgar fractions, when written as a decimal, its value will not be found in a terminating decimal?

(a) $\frac{27}{480}$ (b) $\frac{21}{640}$

(c) $\frac{81}{450}$ (d) $\frac{240}{450}$

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (d) (a) $\frac{27}{480} = 0.05625$

(b) $\frac{21}{640} = 0.0328125$

(c) $\frac{81}{450} = 0.18$

(d) $\frac{240}{450} = 0.5333 = 0.5\overline{3}$

Hence, it is clear that option (d) $\frac{240}{450} = 0.5333 = 0.5\overline{3}$ is not giving a value in terminating decimal.

58. Which of the following fractions will be a terminating decimal?

(a) $\frac{6}{144}$ (b) $\frac{12}{144}$

(c) $\frac{3}{144}$ (d) $\frac{9}{144}$

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (d) $\frac{6}{144} = \frac{3}{72} = \frac{1}{24} = 0.041\overline{6}$

$\frac{12}{144} = \frac{1}{12} = 0.08\overline{3}$

$\frac{3}{144} = \frac{1}{48} = 0.0208\overline{3}$

$\frac{9}{144} = \frac{1}{16} = 0.0625$

Hence, it is clear that option (d) $\frac{9}{144}$ is a terminating decimal fraction.

59. Which of the following will give a recurring decimal?

(a) $\frac{21}{30}$ (b) $\frac{21}{120}$

(c) $\frac{21}{60}$ (d) $\frac{21}{90}$

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (d) $\frac{21}{30} = 0.7$, $\frac{21}{120} = 0.175$, $\frac{21}{60} = 0.35$

$\frac{21}{90} = 0.23333 \Rightarrow 0.2\overline{3}$

Hence option (d) will give recurring decimal.

60. Which of the following will give a terminating decimal?

(a) $\frac{3}{36}$ (b) $\frac{12}{36}$

(c) $\frac{9}{36}$ (d) $\frac{6}{36}$

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (c) From option (c),

$\frac{9}{36} = \frac{1}{4} = 0.25$

Hence, it is clear that option (c) is a fraction of terminating decimal.

61. Which of the following fractions will not give a recurring decimal:

(a) $\frac{8}{56}$ (b) $\frac{6}{56}$

(c) $\frac{4}{56}$ (d) $\frac{7}{56}$

RRB ALP & Tec. (09-08-18 Shift-III)

Ans : (d) From options,

(a) $\frac{8}{56} = 0.142857.....$ (b) $\frac{6}{56} = 0.107142.....$

(c) $\frac{4}{56} = 0.071428.....$ (d) $\frac{7}{56} = 0.125$

Hence it is clear that option (d) will not give a recurring decimal.

Type - 4

62. The value of $0.1\overline{6} + 0.1\overline{5} - 0.1\overline{3}$ is

(a) $\frac{23}{63}$ (b) $\frac{17}{90}$

(c) $\frac{34}{45}$ (d) $\frac{19}{99}$

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (b) : $0.1\overline{6} + 0.1\overline{5} - 0.1\overline{3}$

$= \frac{16-1}{90} + \frac{15-1}{90} - \frac{13-1}{90}$

$= \frac{15}{90} + \frac{14}{90} - \frac{12}{90}$

$= \frac{15+14-12}{90}$

$= \frac{17}{90}$

63. The value of $9.46\overline{7} - 2.46\overline{7} + 4.46\overline{7}$

(a) $\frac{10321}{1100}$ (b) $\frac{10321}{900}$

(c) $\frac{10521}{900}$ (d) $\frac{10521}{1100}$

RRB GROUP-D – 15/09/2022 (Shift-I)

Ans. (b) : $x = 9.46\overline{7} - 2.46\overline{7} + 4.46\overline{7}$

$x = 11.46\overline{7}$

$x = 11.46777$ ....(i)

$100x = 1146.777$ ....(ii)

$1000x = 11467.77$ ....(iii)

समी. (iii) – समी. (ii)

$900x = 10321$

$x = \frac{10321}{900}$

64. Express $0.4\overline{24}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

(a) $\frac{41}{165}$ (b) $\frac{13}{33}$

(c) $\frac{14}{33}$ (d) $\frac{41}{990}$

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (c) : Given,

$\Rightarrow 0.4\overline{24}$ space where p and q are int egers and $q \neq 0$

$\Rightarrow \frac{424-4}{990}$ integers and q + o

$\Rightarrow \frac{420}{990}$

$= \frac{14}{33}$

65. If $0.3\overline{72} = \frac{x}{y}$ where x and y are co-prime, then the value of (x + y) ?

(a) 143 (b) 186

(c) 151 (d) 134

RRB Group-D 26/08/2022 (Shift-I)

Ans. (c) : $\frac{x}{y} = 0.3\overline{72} = \frac{372-3}{990}$

$\frac{x}{y} = \frac{369}{990}$

$\frac{x}{y} = \frac{41}{110}$

$x + y = 41+110$

$= 151$

66. 2.666 … + 2.77 … in fraction form is:

(a) $\frac{47}{9}$ (b) $\frac{29}{9}$

(c) $\frac{31}{9}$ (d) $\frac{49}{9}$

RRB Group-D 18/08/2022 (Shift-I)

Asn. (d) : 2.666 ..... + 2.77.....

$= 2.\overline{6} + 2.\overline{7}$

$= 2 + \frac{6}{9} + 2 + \frac{7}{9}$

$= 4 + \frac{6+7}{9}$

$= 4 + \frac{13}{9}$

$= \frac{36+13}{9} = \frac{49}{9}$

67. Simplify $1.\overline{24}$ is an improper fraction.

(a) $\frac{123}{90}$ (b) $\frac{124}{99}$

(c) $\frac{91}{90}$ (d) $\frac{41}{33}$

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : $1.\overline{24} = 1 + \frac{24}{99}$

$= 1 + \frac{8}{33}$

$= \frac{41}{33}$

68. Express $0.13\overline{241}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

(a) $\frac{3287}{21780}$ (b) $\frac{3827}{24975}$

(c) $\frac{3337}{24160}$ (d) $\frac{3307}{24975}$

RRB Group-D 26/08/2022 (Shift-III)

Ans. (d) : Let x = 0.13241241 ------- (i)

On multiplying by 100 both side in above equation

100x = 13.241241 --------- (ii)

On multiplying by 100000 both side in the equation (i)

100000x = 13241.241241 ------- (ii)

On Subtracting eq (i) from eq (ii) –

$99900x = 13228$

$x = \frac{13228}{99900}$

$x = \frac{3307}{24975}$

Hence, option (d) is correct.

69. If the mixed recurring decimal $0.23\overline{45}$ is expressed as a fraction in its lowest term, then how much its denominator will more than numertor ?

(a) 421 (b) 512

(c) 627 (d) 375

RRB Group-D 06/09/2022 (Shift-II)

Ans. (a) : Fractional form of recurring decimal $0.23\overline{45}$

$\frac{p}{q} = \frac{2345-23}{9900}$

$\frac{p}{q} = \frac{2322}{9900}$

$\frac{p}{q} = \frac{129}{550}$

Required difference = 550 – 129

= 421

Hence its denominator will be 421 more than numerator.

70. The correct expression of $8.\overline{46}$ in the fractional form is

(a) $\frac{84}{99}$ (b) $\frac{846}{99}$

(c) $\frac{83}{99}$ (d) $\frac{838}{99}$

RRB Group-D 13/09/2022 (Shift-III)

Ans. (d) : $8.\overline{46}$

$= 8 + \frac{46}{99} = \frac{838}{99}$

71. Express $4.5\overline{67}$ in the form of $\frac{p}{q}$ where p and q are integeas and $q \neq 0$

(a) $4\frac{281}{495}$ (b) $4\frac{63}{110}$

(c) $4\frac{94}{165}$ (d) $4\frac{283}{495}$

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : $4.5\overline{67}$

$= 4 + \frac{567-5}{990}$

$= 4 + \frac{562}{990}$

$= 4 + \frac{281}{495}$

$= 4\frac{281}{495}$

72. Express $0.2\overline{7}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

(a) $\frac{18}{7}$ (b) $\frac{18}{5}$

(c) $\frac{5}{18}$ (d) $\frac{7}{18}$

RRB Group-D 24/08/2022 (Shift-I)

Ans. (c) : $0.2\overline{7} = x(\text{Let}) = \frac{p}{q}$

x = 0.2777……..(i)

100x = 27.77……..(ii)

On subtracting equation (i) from equation (ii)

$99x = 27.5 \Rightarrow x = \frac{275}{990} = \frac{5}{18}$

Hence, $\frac{p}{q} = \frac{5}{18}$

73. Express $0.\overline{12}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

(a) $\frac{6}{33}$ (b) $\frac{4}{33}$

(c) $\frac{5}{33}$ (d) $\frac{7}{33}$

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (b) : $0.\overline{12}$

$\frac{p}{q} = \frac{12}{99} = \frac{4}{33}$

74. The value of $0.\overline{56}+0.\overline{43}+0.\overline{89}$ is

(a) $1.\overline{98}$ (b) $1.\overline{87}$

(c) $1.\overline{89}$ (d) $1.\overline{88}$

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (c) : $0.\overline{56}+0.\overline{43}+0.\overline{89}$

$= \frac{56}{99}+\frac{43}{99}+\frac{89}{99}$

$= \frac{188}{99} = 1+\frac{89}{99} = 1.\overline{89}$

75. The number $0.12\overline{464}$ in the form $\frac{p}{q}$ is equal to:

(a) $\frac{117}{1950}$ (b) $\frac{17}{950}$

(c) $\frac{67}{4999}$ (d) $\frac{617}{4950}$

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (d) : $0.12\overline{464}$

$= \frac{12464-124}{99000}$

$= \frac{12340}{99000} = \frac{617}{4950}$

76. The value of $3.1\overline{4}$ is:

(a) $3\frac{13}{90}$ (b) $3\frac{12}{90}$

(c) $3\frac{11}{90}$ (d) $3\frac{14}{90}$

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (a) : The value of $3.1\overline{4}$

$= 3+\frac{14-1}{90}$

$= 3+\frac{13}{90}$

$= 3\frac{13}{90}$

77. Simplify $1.\overline{45}+0.3\overline{12}-1.11\overline{2}$.

(a) $\frac{13}{20}$ (b) $\frac{374}{495}$

(c) $\frac{589}{900}$ (d) $\frac{163}{300}$

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (c) : From question,

$1.\overline{45}+0.3\overline{12}-1.11\overline{2}$

$= 1+\frac{45}{99}+0+\frac{312-3}{990}-\left(1+\frac{112-11}{900}\right)$

$= 1+\frac{5}{11}+\frac{309}{990}-\left(1+\frac{101}{900}\right)$

$= 1+\frac{5}{11}+\frac{103}{330}-\frac{101}{900}-1$

$= \frac{5}{11}+\frac{103}{330}-\frac{101}{900}$

$= \frac{4500+3090-1111}{9900}$

$= \frac{6479}{9900}$

$= \frac{589}{900}$

78. Express the decimal number $3.12\overline{7}$ in fraction form

(a) $\frac{281}{900}$ (b) $\frac{563}{180}$

(c) $\frac{180}{563}$ (d) $\frac{365}{180}$

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (b) : $3.12\overline{7}$

$= 3+\frac{127-12}{900} = 3+\frac{115}{900}$

$3+\frac{23}{180} = \frac{563}{180}$

79. $0.5\overline{32}$ _____ is equivalent to the fraction:

(a) $\frac{572}{990}$ (b) $\frac{527}{990}$

(c) $\frac{537}{990}$ (d) $\frac{32}{99}$

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let x = $0.5\overline{32}$ _____(i)

Multiplying by 10 in equation (i),

10x = 5.323232 …. ___(ii)

Again, multiplying by 100 in equation (i),

1000 x = 532.3232 …. (iii)

Substracting equation (ii) from equation (iii),

990 x = 527

$\boxed{x = \frac{527}{990}}$

80. 1.236576576 ... can be written in the form of:

(a) $\frac{125334}{99000}$ (b) $\frac{123534}{99000}$

(c) $\frac{123534}{99900}$ (d) $\frac{125434}{99900}$

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) : 1.236576576 .....

$= 1+0.236\overline{576}$

$= 1+\frac{236576-236}{999000}$

$= \frac{1235340}{999000}$

$= \frac{123534}{99900}$

81. Express $0.03\overline{7}$ in the form of $\frac{p}{q}$, where p is a whole number and q is a natural number.

(a) $\frac{17}{450}$ (b) $\frac{37}{1000}$

(c) $\frac{34}{99}$ (d) $\frac{17}{45}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let,

$x = 0.037$ ...(i)

Multiplying by 100 in equation (i),

$100x = 3.777$ ...(ii)

Multiplying by 10 in equation (ii),

$1000x = 37.777$ ...(iii)

Subtracting eq^n (ii) from eq^n (iii) –

$900x = 34$

$x = \frac{34}{900} = \frac{17}{450}$

or

$\frac{p}{q} = \frac{17}{450}$

82. Evaluate:

$0.6\overline{23}$

(a) $\frac{623}{999}$ (b) $6\frac{23}{999}$

(c) $\frac{617}{990}$ (d) $6\frac{23}{990}$

RRB JE - 31/05/2019 (Shift-II)

Ans : (c) $0.6\overline{23}$

$= \frac{623-6}{990}$ (From decimal fraction system)

$= \frac{617}{990}$

83. What is the correct expression of $0.06\overline{54}$ [($\bar{}$) sign represents continuous decimal)]?

(a) $\frac{18}{275}$ (b) $\frac{18}{277}$

(c) 654 (d) $\frac{654}{1000}$

RRB RPF-SI -10/01/2019 (Shift-III)

Ans : (a) $0.06\overline{54}$

$= \frac{654-6}{9900} = \frac{648}{9900} = \frac{18}{275}$

84. $0.\overline{047619}$, when written as a vulgar fraction, is equal to-

(a) $\frac{1}{21}$ (b) $\frac{1}{19}$

(c) $\frac{1}{23}$ (d) $\frac{1}{17}$

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) : From given number,

$0.\overline{047619} = \frac{047619}{999999} = \frac{1}{21}$

85. Convert $0.\bar{6}$ into fraction:

(a) $\frac{6}{3}$ (b) $\frac{2}{3}$

(c) $\frac{2}{6}$ (d) $\frac{4}{3}$

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (b) : Given,

$0.\bar{6} = \frac{6}{9} = \frac{2}{3}$, (From decimal fraction system)

86. Which of the following fractions' result will not be a recurring decimal?

(a) $\frac{10}{30}$ (b) $\frac{12}{30}$

(c) $\frac{14}{30}$ (d) $\frac{8}{30}$

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans : (b) From options,

(a) $\frac{10}{30} = \frac{1}{3} = 0.\bar{3}$

(b) $\frac{12}{30} = \frac{4}{10} = \frac{2}{5} = 0.4$

(c) $\frac{14}{30} = \frac{7}{15} = 0.4\bar{6}$

(d) $\frac{8}{30} = \frac{4}{15} = 0.2\bar{6}$

Hence, it is clear that option (b) is not in recurring decimal.

87. Which of the following vulgar fractions will not end when represented in decimal?

(a) $\frac{81}{150}$ (b) $\frac{80}{150}$

(c) $\frac{15}{48}$ (d) $\frac{21}{600}$

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (b) From options,

$(a)\frac{81}{150} = 0.54$

$(b)\frac{80}{150} = 0.5333333$

$(c)\frac{15}{48} = 0.3125$

$(d)\frac{21}{600} = 0.035$

Hence, it is clear that option (b) will not end when represented in decimal.

88. When $0.02\overline{36}$ when written as the simplest form, what will be the obtained vulgar fraction?

(a) $\frac{13}{1100}$ (b) $\frac{13}{9999}$

(c) $\frac{13}{3300}$ (d) $\frac{13}{550}$

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (d) $0.02\overline{36}$

$$0.02\overline{36} = \frac{0.2\overline{36}}{10}$$

$$= \frac{236-2}{10\times 990} = \frac{234}{9900}$$

$$= \frac{117}{4950} = \frac{13}{550}$$

89. Express $\frac{7}{11}$ in the form of decimal.

(a) $0.\overline{623}$ (b) $0.\overline{633}$

(c) $0.\overline{63}$ (d) $0.\overline{62}$

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (c) The decimal of $\frac{7}{11}$

$$11\overline{)70}\ 0.6363$$

66

40

33

70

66

40

33

7

Hence, in 0.6363, two digits of the number (6 and 3) are repeating itself.

90. Show $0.08\overline{36}$ in the form of vulgar fraction.

(a) $\frac{46}{555}$ (b) $\frac{23}{1100}$

(c) $\frac{23}{275}$ (d) $\frac{828}{9900}$

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (c) : $0.08\overline{36} = ?$

$$= \frac{836-8}{9900}$$

$$= \frac{828}{9900} = \frac{23}{275}$$

91. When $\frac{1}{450}$, written as recurring decimal, it will be equal to:

(a) 0.2 (b) 0.02

(c) 0.002 (d) 0.0002

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (c) : Given, $\frac{1}{450}$

On dividing,

$$450\overline{)1000}\ 0.0022$$

900

1000

900

100

Hence, $\frac{1}{450} = 0.00\overline{2}$

92. Express $0.09\overline{87}$ as a vulgar fraction in its lowest form?

(a) $\frac{163}{1650}$ (b) $\frac{329}{9990}$

(c) $\frac{326}{3300}$ (d) $\frac{163}{1665}$

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (c) Let $x = 0.09\overline{87}$

$100x = 9.\overline{87}$ Multiplying by 100 in both side,

$= 9.8787$ .....

$= 9.78 + 0.098787$ .....

$100x = 9.78 + x$

$99x = 9.78$

$$x = \frac{9.78}{99}$$

$$= \frac{978}{9900} = \frac{326}{3300}$$

93. Which of the following fractions will give a recurring decimal?

(a) $\frac{27}{60}$ (b) $\frac{27}{72}$

(c) $\frac{27}{48}$ (d) $\frac{27}{84}$

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (d) From options

(a) $\frac{27}{60} = 0.45$ (b) $\frac{27}{72} = 0.375$

(c) $\frac{27}{48} = 0.5625$ (d) $\frac{27}{84} = 0.32\overline{142857}$

Hence, the fraction $\frac{27}{84}$, gives a recurring decimal.

94. If $0.\overline{41}$ is expressed as the vulgar fraction $\frac{41}{999.....9(n\text{ times})}$. Find n.

(a) 1 (b) 3

(c) 4 (d) 2

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (d) Let $0.\overline{41} = x$

$0.414141 ..... = x$

Multiplying by 100 in both sides,

$100x = 41.4141$ .....

$100x = 41 + x$

$99x = 41$

$x = \frac{41}{99}$

Hence, it is clear that the number of digit 9 in denominator is twice. So n = 2.

95. Correct expression of $1.4\overline{27}$ = ? (Bar sign indicates to recurring decimal)

(a) $\frac{1427}{1000}$ (b) $\frac{157}{110}$

(c) $\frac{1427}{10000}$ (d) $\frac{157}{111}$

RRB NTPC 17.01.2017 Shift-3

Ans : (b) $1.4\overline{27} = 1 + 4\overline{27}$

$= 1 + \frac{427 - 4}{990}$

$= 1 + \frac{423}{990} = 1 + \frac{47}{110} = \frac{157}{110}$

96. Correct expression of $0.0\overline{234}$ = ?

(a) $\frac{13}{555}$ (b) $2\frac{34}{100}$

(c) $\frac{134}{990}$ (d) $\frac{234}{1000}$

RRB NTPC 07.04.2016 Shift : 2

Ans : (a) Rule for converting mixed-recurring decimal fraction into common or vulgar fraction:-

firstly non-recurring part is subtracted from recurring part, as numerator, then take 9, equal to the number of recurring digits, and add 0, equal to the number of non-recurring digits, as denominator.

From question,

$0.0\overline{234} = \frac{234 - 0}{9990}$

$= \frac{234}{9990} = \frac{78}{3330} = \frac{13}{555}$

97. Express $\frac{44}{5}\% + \frac{4}{5}\% + \frac{0.4}{5}\%$ in the form of decimal number.

(a) 0.0888 (b) 0.0998

(c) 0.0896 (d) 0.0968

RRB JE - 26/05/2019 (Shift-III)

Ans : (d) From given expression,

$\frac{44}{5}\% + \frac{4}{5}\% + \frac{0.4}{5}\% = \frac{48.4}{5}\%$

$= \frac{48.4}{500} = \frac{0.484}{5} = 0.0968$

98. The decimal representation of $\frac{5}{100} + \frac{2}{5} - \frac{6}{25}$ is:

(a) 0.21 (b) 0.35

(c) 0.51 (d) 0.45

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (a) : From question,

$\frac{5}{100} + \frac{2}{5} - \frac{6}{25}$

$= \frac{1}{20} + \frac{2}{5} - \frac{6}{25}$

$= \frac{5 + 40 - 24}{100}$

$= \frac{21}{100} = 0.21$

Type - 5

99. The sum of $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + ... + \frac{1}{n(n+1)}$ is:

(a) $\frac{n+1}{n}$ (b) $\frac{n(n+1)}{2}$

(c) $\frac{n+1}{2n}$ (d) $\frac{n}{n+1}$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (d) : $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + ... + \frac{1}{n(n+1)}$

$= \frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} + ... + \frac{1}{n(n+1)}$

$= \frac{1}{1} - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + ... + \frac{1}{n} - \frac{1}{(n+1)}$

$= \frac{1}{1} - \frac{1}{(n+1)}$

$= \frac{n+1-1}{n+1} = \frac{n}{n+1}$

100. Express 32 : 20 in its lowest form.

(a) 8 : 5 (b) 8 :10

(c) 16 : 10 (d) 24 : 15

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : $32 : 20 = \frac{32}{4} : \frac{20}{4} = 8 : 5$

101. Solve the following-

$\frac{\sqrt{144}}{6} \times \frac{\sqrt{121}}{8} \times \frac{132}{\sqrt{484}} = ?$

(a) 4 (b) $\frac{155}{36}$

(c) $\frac{33}{2}$ (d) $\frac{3}{4}$

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (c) : $= \frac{\sqrt{144}}{6} \times \frac{\sqrt{121}}{8} \times \frac{132}{\sqrt{484}}$

$= \frac{12}{6} \times \frac{11}{8} \times \frac{132}{22} = \frac{33}{2}$

102. Find the value of $\frac{1}{1.4}+\frac{1}{4.7}+\frac{1}{7.10}+....+\frac{1}{47.50}$

(a) $\frac{49}{50}$ (b) $\frac{47}{150}$

(c) $\frac{47}{50}$ (d) $\frac{49}{150}$

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (d) :

$$\frac{1}{1.4}+\frac{1}{4.7}+\frac{1}{7.10}+.....+\frac{1}{47.50}$$

Given expression 1, 4, 7, ….47, and 4, 7, 10, …..50 are in arithmetic series whose difference is 3. In this case sum of given term–

$$\frac{1}{\text{Difference}}\left(\frac{1}{\text{First term}}-\frac{1}{\text{Last term}}\right)$$

$$=\frac{1}{3}\left(\frac{1}{1}-\frac{1}{50}\right)$$

$$=\frac{1}{3}\times\frac{49}{50}$$

$$=\frac{49}{150}$$

103. Which of these fractions cannot be reduced further?

14/21, 33/43, 18/24, 41/82

(a) 33/43 (b) 92/24

(c) 18/24 (d) 41/82

RRB JE - 26/05/2019 (Shift-III)

Ans : (a)

$\frac{14}{21}=\frac{2}{3}$, $\frac{33}{43}=\frac{33}{43}$

$\frac{18}{24}=\frac{3}{4}$

$\frac{41}{82}=\frac{1}{2}$

Hence, it is clear that $\frac{33}{43}$ cannot be reduced further.

104. Simplify : $\frac{6}{27}\div\frac{27}{30}\div\frac{20}{81}$

(a) 9 (b) 6

(c) 3 (d) 1

RRB RPF Constable -20/01/2019 (Shift-II)

Ans : (d) $\frac{6}{27}\div\frac{27}{30}\div\frac{20}{81}$

$$=\frac{6}{27}\times\frac{30}{27}\times\frac{81}{20}=\frac{6\times3\times3}{27\times2}=\frac{6}{3\times2}=1$$

105. $\frac{0.3}{1000}$ equals to :

(a) 3×10^{-4} (b) 3×10^{-6}

(c) 3×10^{5} (d) 3×10^{-5}

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (a) $\frac{0.3}{1000}=?$

$$\frac{0.3}{1000}$$

$$=\frac{0.3}{10^3}$$

$$=0.3\times10^{-3}$$

$$=3\times10^{-1}\times10^{-3}$$

$$?=3\times10^{-4}$$

106. Convert $\frac{\frac{4}{9}}{12}$ in its simple form:

(a) $\frac{1}{26}$ (b) $\frac{1}{29}$

(c) $\frac{1}{25}$ (d) $\frac{1}{27}$

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (d)

$$\frac{\frac{4}{9}}{12}=\frac{4}{9}\times\frac{1}{12}=\frac{1}{27}$$

107. $1\frac{2}{3}$ inversely proportional to :

(a) $2\frac{2}{3}$ (b) $\frac{3}{5}$

(c) $3\frac{1}{2}$ (d) $\frac{2}{3}$

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (b) $1\frac{2}{3}$

$$=\frac{5}{3}$$

On writing in inverse $=\frac{3}{5}$

108. The lowest fractional value of 4.025 =?

(a) $\frac{161}{40}$ (b) $\frac{116}{20}$

(c) $\frac{161}{20}$ (d) $\frac{116}{40}$

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a) The fractional form of 4.025,

$$=\frac{4025}{1000}$$

$$=\frac{161}{40}$$

109. Which of the following fractions is not equivalent to 4/11?

(a) $\frac{64}{176}$ (b) $\frac{20}{55}$

(c) $\frac{84}{209}$ (d) $\frac{32}{88}$

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (c) From options–

(a) $\frac{64}{176}=\frac{4}{11}$ (b) $\frac{20}{55}=\frac{4}{11}$

(c) $\frac{84}{209} = 0.401$ (d) $\frac{32}{88} = \frac{4}{11}$

Hence, option (c) is not equivalent to 4/11.

110. $2\frac{1}{25} = ?$

(a) 0.24 (b) 2.4

(c) 2.004 (d) 2.04

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (d) $2\frac{1}{25} = \frac{51}{25} = 2.04$

111. What fraction of a day equals to 7 minutes and 12 second?

(a) $\frac{1}{240}$ (b) $\frac{1}{225}$

(c) $\frac{1}{200}$ (d) $\frac{1}{300}$

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (c) The number of hours in a day = 24

$= 24 \times 60 \times 60$ sec

7 min 12 sec = $(7 \times 60 + 12)$

$= (420 + 12) = 432$ sec

The required fraction $= \frac{432}{24 \times 60 \times 60} = \boxed{\frac{1}{200}}$

112. Simplify : $\frac{3}{7\frac{1}{3}} + \frac{3}{3\frac{1}{7}}$

(a) $1\frac{3}{11}$ (b) $1\frac{4}{11}$

(c) $2\frac{3}{7}$ (d) $2\frac{4}{7}$

RRB NTPC 29.03.2016 Shift : 2

Ans : (b) $\frac{3}{7\frac{1}{3}} + \frac{3}{3\frac{1}{7}} = \frac{3}{\frac{22}{3}} + \frac{3}{\frac{22}{7}}$

$= \frac{9}{22} + \frac{21}{22}$

$= \frac{30}{22}$

$= \frac{15}{11} = 1\frac{4}{11}$

113. Find the solution of :– 4/11 + 2/7 + 3/5

(a) 37/35 (b) 481/385

(c) 13/35 (d) 37/385

RRB NTPC 18.01.2017 Shift : 3

Ans : (b) $\frac{4}{11} + \frac{2}{7} + \frac{3}{5}$

$= \frac{35 \times 4 + 2 \times 55 + 3 \times 77}{385}$

$= \frac{140 + 110 + 231}{385}$

$= \boxed{\frac{481}{385}}$

114. Which of the fractions below given is NOT equal to $\frac{9}{17}$?

(a) $\frac{108}{221}$ (b) $\frac{27}{51}$

(c) $\frac{63}{119}$ (d) $\frac{153}{289}$

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (a) Given: $\frac{9}{17}$

$\frac{9 \times 3}{17 \times 3} = \frac{27}{51}$

$\frac{9 \times 7}{17 \times 7} = \frac{63}{119}$

$\frac{9 \times 17}{17 \times 17} = \frac{153}{289}$

Hence $\frac{108}{221}$ will not give any equivalent fraction of $\frac{9}{17}$.

115. How many kilometres are there in one metre?

(a) 0.0001 (b) 0.1

(c) 0.001 (d) 0.01

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (c) 1000m = 1km.

$1\text{m} = \frac{1}{1000}\text{km.} = 0.001$ km.

Hence, one metre has 0.001 km.

Type - 6

116. What will be the value if you multiply $\frac{2}{11}$ by the reciprocal of $-\frac{5}{14}$?

(a) $\frac{28}{55}$ (b) $-\frac{28}{55}$

(c) $\frac{2}{3}$ (d) $-\frac{10}{153}$

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (b) : Reciprocal of $-\frac{5}{14} = -\frac{14}{5}$

$\therefore \quad \frac{2}{11} \times \left(-\frac{14}{5}\right) = -\frac{28}{55}$

117. The reciprocal of the sum of the reciprocals of 5/7 and 9/5 is:

(a) $\frac{35}{88}$ (b) $\frac{88}{45}$

(c) $\frac{45}{88}$ (d) $\frac{88}{35}$

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : The sum of reciprocals of $\frac{5}{7}$ and $\frac{9}{5}$

$$= \frac{7}{5}+\frac{5}{9}$$

$$= \frac{63+25}{45} = \frac{88}{45}$$

Hence, the inverse of the sum of reciprocal of $\frac{5}{7}$ and $\frac{9}{5}$

$= \frac{45}{88}$

118. The sum of A fraction and its inverse is $2\frac{25}{66}$. Find the greater number of the two:

(a) $1\frac{15}{22}$ (b) $1\frac{5}{6}$

(c) $1\frac{20}{33}$ (d) $1\frac{5}{11}$

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (b) Let the fraction be x and its inverse be $\frac{1}{x}$.

According to the question,

$$x+\frac{1}{x}=2\frac{25}{66}-----(I)$$

From option (b),

Putting the value $x=1\frac{5}{6}=\frac{11}{6}$ in equation (I),

$$\frac{11}{6}+\frac{6}{11}=2\frac{25}{66}$$

$$\Rightarrow\frac{121+36}{66}=2\frac{25}{66}$$

$$\Rightarrow\frac{157}{66}=2\frac{25}{66}$$

$$\Rightarrow 2\frac{25}{66}=2\frac{25}{66}$$

Hence greatest fraction $=1\frac{5}{6}$

119. The difference between a positive fraction and its inverse is $6\frac{39}{160}$. Find the fraction.

(a) $\frac{32}{5}$ (b) $\frac{13}{8}$

(c) $\frac{15}{8}$ (d) $\frac{16}{5}$

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (a) Let the positive fraction be x

So, inverse $=\frac{1}{x}$

According to the question,

$$x-\frac{1}{x}=6\frac{39}{160}$$

$$\frac{x^2-1}{x}=\frac{999}{160}$$

$$160x^2 - 160 = 999x$$

$$160x^2 - 999x - 160 = 0$$

$$160x^2 - (1024-25)x - 160 = 0$$

$$160x^2 - 1024x + 25x - 160 = 0$$

$$32x(5x - 32) + 5(5x - 32) = 0$$

$$(32x + 5)(5x - 32) = 0$$

$32x + 5 = 0$, $5x - 32 = 0$

$32x = -5$, $5x = 32$

$\boxed{x = \frac{-5}{32}}$, $\boxed{x = \frac{32}{5}}$

120. The difference of a fraction and its inverse is $\frac{9}{11}$. Then the difference of cubes of the fraction and its inverse will be:

(a) $-\frac{1331}{2538}$ (b) $-\frac{2538}{1331}$

(c) $\frac{3996}{1331}$ (d) $\frac{729}{1331}$

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (c)

Let the fraction be $\frac{x}{1}$, then its inverse will be $\frac{1}{x}$,

According to the question,

$$\frac{x}{1}-\frac{1}{x}=\frac{9}{11}$$

$$\Rightarrow\ x-\frac{1}{x}=\frac{9}{11}$$

On cubing both side,

$$x^3-\frac{1}{x^3}=\left(\frac{9}{11}\right)^3+3\times\frac{9}{11}\quad\left[a^3-b^3=(a-b)^3+3ab(a-b)\right]$$

$$=\frac{729}{1331}+\frac{27}{11}$$

$$=\frac{729+(27\times121)}{1331}\ =\frac{729+3267}{1331}$$

$$\therefore\ x^3-\frac{1}{x^3}=\frac{3996}{1331}$$

121. How should be added to $\frac{4}{5}$ to obtain $\frac{5}{4}$?

(a) $\frac{1}{-1}$ (b) $\frac{16}{20}$

(c) $\frac{9}{20}$ (d) $\frac{1.25}{0.8}$

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (c) Let x be added to the number.

According to the question,

$$x+\frac{4}{5}\ =\ \frac{5}{4}$$

$$x=\frac{5}{4}-\frac{4}{5},\ x\ =\frac{25-16}{20},\ x\ =\frac{9}{20}$$

Hence the required number is $\frac{9}{20}$.

Type - 7

122. Which of the following fractions should be added to $\frac{5}{9}$ to obtain $\frac{11}{6}$ as the sum?

(a) $1\frac{5}{18}$ (b) $1\frac{1}{3}$

(c) $1\frac{5}{15}$ (d) $1\frac{7}{18}$

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) Let the fraction to be added is = $\frac{x}{y}$

According to the question,

$$\frac{5}{9}+\frac{x}{y}=\frac{11}{6}$$

$$\frac{x}{y}=\frac{11}{6}-\frac{5}{9}$$

$$=\frac{33-10}{18}$$

$$\frac{x}{y}=\frac{23}{18}$$

or $\frac{x}{y}=1\frac{5}{18}$

123. Sum of $\frac{5}{11}$ and $\frac{11}{5}$ =?

(a) $\frac{146}{55}$ (b) $\frac{16}{16}$

(c) $\frac{16}{55}$ (d) $\frac{110}{55}$

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (a) : $\frac{5}{11}+\frac{11}{5}$

$$=\frac{25+121}{55}=\frac{146}{55}$$

124. What is the sum of $\frac{1}{3},\frac{4}{3}$ and $\frac{3}{4}$

(a) $\frac{26}{12}$ (b) 2

(c) $\frac{27}{12}$ (d) $\frac{29}{12}$

RRB NTPC 01.02.2021 (Shift-II) Stage I

Ans. (d) : From question,

$$\frac{1}{3}+\frac{4}{3}+\frac{3}{4}=\frac{4+16+9}{12}=\frac{29}{12}$$

125. What is the difference between the biggest and the smallest fraction among $\frac{2}{3},\frac{3}{4},\frac{4}{5}$ and $\frac{5}{6}$?

(a) $\frac{1}{30}$ (b) $\frac{1}{6}$

(c) $\frac{1}{12}$ (d) $\frac{1}{20}$

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (b) : $\frac{2}{3},\frac{3}{4},\frac{4}{5},\frac{5}{6}$

For equaling denominator we have to multiply and divide each fraction by LCM of 3, 4, 5 and 6 = 60.

$\Rightarrow \frac{2}{3}\times\frac{60}{60},\frac{3}{4}\times\frac{60}{60},\frac{4}{5}\times\frac{60}{60},\frac{5}{6}\times\frac{60}{60}$

$\Rightarrow \frac{40}{60},\frac{45}{60},\frac{48}{60},\frac{50}{60}$

Hence, biggest fraction $=\frac{5}{6}$

Smallest fraction $=\frac{2}{3}$

Required difference $=\frac{5}{6}-\frac{2}{3}=\boxed{\frac{1}{6}}$

126. Find the sum of $\frac{5}{2}$ and $\frac{2}{5}$.

(a) $\frac{10}{7}$ (b) $\frac{29}{10}$

(c) $\frac{20}{7}$ (d) $\frac{7}{7}$

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : $\frac{5}{2}+\frac{2}{5}=\frac{25+4}{10}$

$=\frac{29}{10}$

127. Find the number obtained by adding the sum and difference of the numbers 3.03 and 2.05.

(a) 0.606 (b) 6.06

(c) 600.6 (d) 60.06

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (b) : 3.03 + 2.05 = 5.08

3.03 – 2.05 = 0.98

\+ 6.06

128. What should be subtracted from $\left(\frac{3}{4}-\frac{2}{3}\right)$ to get $\frac{-1}{6}$?

(a) $\frac{2}{4}$ (b) $1\frac{1}{4}$

(c) $\frac{1}{4}$ (d) $\frac{1}{3}$

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (c) : Let, the number x to be subtracted

$$\left(\frac{3}{4}-\frac{2}{3}\right)-x=-\frac{1}{6}$$

$$\left(\frac{9-8}{12}\right)-x=-\frac{1}{6}$$

$$\left(\frac{1}{12}\right)-x=-\frac{1}{6}$$

$$\frac{1}{12}+\frac{1}{6}=x \Rightarrow \frac{1+2}{12}$$

$$x=\frac{3}{12} \Rightarrow \boxed{x=\frac{1}{4}}$$

129. What number should be added to $\frac{-5}{7}$ to get $\frac{-2}{3}$?

(a) $\frac{-7}{21}$ (b) $\frac{10}{21}$

(c) $\frac{1}{21}$ (d) $\frac{7}{21}$

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (c) : From question,

$$\frac{-5}{7}+?=\frac{-2}{3}$$

$$=\frac{-2}{3}-\left(\frac{-5}{7}\right)=\frac{-2}{3}+\frac{5}{7}=\frac{5}{7}-\frac{2}{3}=\frac{15-14}{21}$$

$$\boxed{=\frac{1}{21}}$$

130. What number must be subtracted from both the numerator and denominator of the fraction $\frac{15}{19}$ so as to make it $\frac{3}{4}$?

(a) 5 (b) 9

(c) 6 (d) 3

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the fraction become $\frac{3}{4}$ on subtracting the number x from the numerator and denominator.

According to the question,

On subtracting x in both numerator and denominator of 15/19'

$$\frac{15-x}{19-x}=\frac{3}{4}$$

$60 - 4x = 57 - 3x$

$x = 3$

Required number $x = 3$

131. What number must be subtracted from both the denominator and numerator of the fraction $\frac{42}{45}$ so that it becomes $\frac{5}{6}$?

(a) 27 (b) 25

(c) 13 (d) 12

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : If number $= x$

Then $\frac{42-x}{45-x}=\frac{5}{6}$

$252 - 6x = 225 - 5x$

$252 - 225 = 6x - 5x$

$x = 27$

Hence the number to be subtracted from the numerator and denominator of the fraction $\frac{42}{45} = 27$

132. The difference between the fractions 5 minutes of an hour and 20 seconds of an hour is:

(a) $\frac{16}{180}$ (b) $\frac{28}{270}$

(c) $\frac{0.7}{9}$ (d) $\frac{7}{12}$

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (c) : From question,

The fractions 5 minutes of an hour and 20 seconds of an hour

$$=\frac{5}{60}h-\frac{20}{3600}h$$

$$=\frac{5}{60}-\frac{2}{360}$$

$$=\frac{30-2}{360}$$

$$=\frac{28}{360}$$

$$=\frac{7}{90}=\frac{0.7}{9}h$$

133. The fraction which, when subtracted from $\frac{1}{2}$ gives $\frac{3}{4}$ is:

(a) $\frac{1}{4}$ (b) $-\frac{1}{4}$

(c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

RRB RPF-SI -12/01/2019 (Shift-III)

Ans. (b) : Let the fraction be $\frac{1}{x}$,

According to the question,

$$\frac{1}{2}-\frac{1}{x}=\frac{3}{4} \Rightarrow -\frac{1}{x}=\frac{3}{4}-\frac{1}{2} \Rightarrow -\frac{1}{x}=\frac{3-2}{4}$$

$$\boxed{\frac{1}{x}=-\frac{1}{4}}$$

Hence, the required fraction is $-\frac{1}{4}$.

134. The value of $\frac{3}{15}+\frac{13}{14}-\frac{19}{21}+\frac{31}{35}-\frac{23}{30}$=?

(a) $\frac{8}{21}$ (b) $\frac{1}{3}$

(c) $\frac{2}{5}$ (d) $\frac{12}{35}$

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (d)

$\frac{3}{15}+\frac{13}{14}-\frac{19}{21}+\frac{31}{35}-\frac{23}{30}$

(LCM of 15, 14, 21, 35 and 30 is 210)

$=\frac{42+195-190+186-161}{210}$

$\Rightarrow\frac{423-351}{210}$

$\Rightarrow\frac{72}{210}=\frac{12}{35}$

Hence, the required value is $\frac{12}{35}$.

135. The subtracted value of a fraction from $\frac{1}{6}$ is $\frac{1}{13}$. Find the fraction.

(a) $\frac{7}{78}$ (b) $\frac{5}{13}$

(c) $\frac{1}{7}$ (d) $\frac{11}{39}$

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (a) Let the fraction be $\frac{x}{y}$,

According to the question,

$=\frac{1}{6}-\frac{x}{y}=\frac{1}{13}$

$\frac{x}{y}=\frac{1}{6}-\frac{1}{13}$

$\frac{x}{y}=\frac{13-6}{78}$

$\frac{x}{y}=\frac{7}{78}$

Hence, the required fraction is $\frac{7}{78}$.

136. The sum of two fractions is $\frac{7}{4}$. If one is $\frac{5}{3}$, find the another.

(a) $\frac{1}{5}$ (b) $\frac{2}{1}$

(c) $\frac{1}{12}$ (d) $\frac{1}{10}$

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (c) : Let the required fraction be $\frac{x}{y}$,

And the another fraction is given = $\frac{5}{3}$,

According to the question,

$\frac{x}{y}+\frac{5}{3}=\frac{7}{4}$

$\frac{x}{y}=\frac{7}{4}-\frac{5}{3}=\frac{21-20}{12}=\frac{1}{12}$

Hence, the required fraction is $\frac{1}{12}$.

137. Find the difference between 0.02 and 0.002.

(a) 0.018 (b) 0.0018

(c) 1.8 (d) 0.18

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (a) : The difference of 0.02 and 0.002,

$\Rightarrow\frac{0.02\times100}{100}-\frac{0.002\times1000}{1000}$

$\Rightarrow\frac{2}{100}-\frac{2}{1000}$

$\Rightarrow\frac{20-2}{1000}$

$\Rightarrow\frac{18}{1000}=0.018$

Hence, the required difference is 0.018.

138. Which of the following fraction will be subtracted from $\frac{3}{4}$ to give the result $\frac{5}{12}$?

(a) $\frac{1}{3}$ (b) $\frac{2}{8}$

(c) $\frac{1}{6}$ (d) $\frac{2}{3}$

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (a) : Let the fraction be $\frac{1}{x}$,

According to the question,

$\frac{3}{4}-\frac{1}{x}=\frac{5}{12}$

$-\frac{1}{x}=\frac{5}{12}-\frac{3}{4}$

$-\frac{1}{x}=\frac{20-36}{48}$

$-\frac{1}{x}=\frac{-16}{48}$

$\frac{1}{x}=\frac{1}{3}$

Hence, the required fraction is $\frac{1}{3}$.

139. What should be added to $\frac{10}{11}$ to get $\frac{11}{10}$?

(a) $\frac{21}{110}$ (b) $\frac{1}{-1}$

(c) $\frac{1}{55}$ (d) $\frac{2}{11}$

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (a) : Let the number to be added is x.

According to the question,

$$\frac{10}{11}+x=\frac{11}{10}$$
$$x=\frac{11}{10}-\frac{10}{11}=\frac{121-100}{110}=\frac{21}{110}$$
Hence the required number is $\frac{21}{110}$.

140. What should be added to $5\frac{3}{5}$ to get $8\frac{3}{7}$?

(a) $\frac{99}{35}$ (b) $\frac{96}{35}$
(c) $\frac{99}{33}$ (d) $\frac{94}{35}$

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (a) : Let the required number be x.
According to the question,
$$5\frac{3}{5}+x=8\frac{3}{7}$$
$$x=8\frac{3}{7}-5\frac{3}{5}=\frac{59}{7}-\frac{28}{5}$$
$$=\frac{295-196}{35}=\frac{99}{35}$$
Hence, the required number is $\frac{99}{35}$

141. The sum of two fractions is $\frac{7}{6}$. One of the fraction is $\frac{3}{4}$. Find the other.

(a) $\frac{4}{12}$ (b) $\frac{5}{12}$
(c) $\frac{4}{2}$ (d) $\frac{1}{12}$

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) Let the other fraction is x.
According to the question,
$$\Rightarrow x+\frac{3}{4}=\frac{7}{6} \Rightarrow x=\frac{7}{6}-\frac{3}{4}$$
$$\Rightarrow x=\frac{14-9}{12}=\frac{5}{12}$$
Hence, the required fraction is $\frac{5}{12}$.

142. A fraction when added to $\frac{7}{3}$, gives 4. Find the fraction.

(a) $1\frac{2}{3}$ (b) $\frac{11}{2}$
(c) $-\frac{1}{2}$ (d) $\frac{2}{3}$

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (a) Let the required fraction be x.
According to the question,
$$\Rightarrow \frac{x}{1}+\frac{7}{3}=4$$
$$\Rightarrow \frac{3x+7}{3}=4$$
$$\Rightarrow 3x+7=4\times 3$$
$$\Rightarrow 3x+7=12 \Rightarrow 3x=12-7 \Rightarrow 3x=5$$
$$\Rightarrow x=\frac{5}{3}=\left(1\frac{2}{3}\right)$$
Hence, the required fraction is $1\frac{2}{3}$.

143. The difference between two fractions is $\frac{5}{6}$. The smaller one is $\frac{3}{4}$. Find the other.

(a) $\frac{1}{12}$ (b) $\frac{19}{24}$
(c) $\frac{19}{12}$ (d) $\frac{8}{10}$

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (c) Let the other fraction be x.
According to the question,
$$x-\frac{3}{4}=\frac{5}{6}$$
$$\Rightarrow x=\frac{5}{6}+\frac{3}{4}$$
$$x=\frac{38}{24}=\frac{19}{12}$$
Hence, the other fraction is $\frac{19}{12}$.

144. The value of $\frac{5}{3}+\frac{3}{5}$=?

(a) $\frac{15}{8}$ (b) $\frac{8}{15}$
(c) $2\frac{4}{15}$ (d) $\frac{8}{8}$

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (c) From given expression,
$$\Rightarrow \frac{5}{3}+\frac{3}{5}$$
$$=\frac{25+9}{15}$$
$$=\frac{34}{15}=2\frac{4}{15}$$

145. The difference of $\frac{25}{12}$ and $\frac{15}{8}$ = ?

(a) $\frac{10}{24}$ (b) $\frac{7}{13}$
(c) $\frac{10}{4}$ (d) $\frac{5}{24}$

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (d) The difference of $\frac{25}{12}$ and $\frac{15}{8}$,
$$\frac{25}{12}-\frac{15}{8}=\frac{50-45}{24}=\frac{5}{24}$$

146. To get $\frac{25}{3}, \frac{5}{12}$ should be multiplied by:

(a) 10 (b) 20

(c) $\frac{4}{5}$ (d) $\frac{5}{4}$

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (b) Let the required number be x.
According to the question,

$$\frac{5}{12} \times x = \frac{25}{3}$$

$$\frac{x}{4} = 5$$

$$x = 20$$

147. The square root of a positive fraction, when added to 1, is $3\frac{1}{4}$. Find the fraction.

(a) $2\frac{1}{4}$ (b) $6\frac{1}{4}$

(c) $5\frac{1}{16}$ (d) $3\frac{1}{16}$

RRB Group-D – 02/11/2018 (Shift-I)

Ans. (c)

Let the fraction be $= \frac{x}{y}$
According to the question,

$$\sqrt{\frac{x}{y}} + 1 = 3\frac{1}{4}$$

$$\sqrt{\frac{x}{y}} = \frac{13}{4} - 1$$

$$\sqrt{\frac{x}{y}} = \frac{9}{4}$$

$$\frac{x}{y} = \frac{81}{16}, \quad \frac{x}{y} = 5\frac{1}{16}$$

148. The difference between $\frac{11}{12}$ and $\frac{7}{8}$=?

(a) $\frac{1}{4}$ (b) $\frac{4}{4}$

(c) $\frac{4}{24}$ (d) $\frac{1}{24}$

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (d) The difference between $\frac{11}{12}$ and $\frac{7}{8}$

$$= \frac{11}{12} - \frac{7}{8}$$

$$= \frac{88 - 84}{96}$$

$$= \frac{4}{96}$$

$$= \frac{1}{24}$$

Hence, the required difference is $\frac{1}{24}$.

149. What is the fraction which, when subtracted from $\frac{3}{4}$, gives $\frac{2}{5}$?

(a) $-\frac{1}{1}$ (b) $\frac{7}{20}$

(c) $\frac{1}{20}$ (d) $\frac{3}{10}$

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (b) Let the fraction be $\frac{x}{y}$.

According to the question,

$$\frac{3}{4} - \frac{x}{y} = \frac{2}{5}$$

$$\Rightarrow \quad \frac{x}{y} = \frac{3}{4} - \frac{2}{5}$$

$$\Rightarrow \quad \frac{x}{y} = \frac{15 - 8}{20}$$

$$\frac{x}{y} = \frac{7}{20}$$

150. What should be added to 3/5 to get 5/4?

(a) $\frac{15}{20}$ (b) $\frac{13}{20}$

(c) $\frac{2}{-1}$ (d) $\frac{1.25}{0.6}$

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (b) Let the required number be x.
According to the question,

$$\frac{5}{4} = \frac{3}{5} + x$$

$$\frac{5}{4} - \frac{3}{5} = x$$

$$\frac{25 - 12}{20} = x$$

$$x = \frac{13}{20}$$

Hence, the required number is $\frac{13}{20}$.

151. When A fraction is subtracted from 1/5 gives 1/12. Find the fraction.

(a) $\frac{1}{7}$ (b) $\frac{11}{30}$

(c) $\frac{7}{60}$ (d) $\frac{5}{12}$

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (c) Let the fraction be $\frac{x}{y}$.

According to the question,

$$\frac{1}{5} - \frac{x}{y} = \frac{1}{12}$$

$$\frac{1}{5} - \frac{1}{12} = \frac{x}{y}$$

$$\frac{12-5}{60}=\frac{x}{y}$$

$$\frac{x}{y}=\frac{7}{60}$$

152. In which fraction, when 5/16 is added gives 1?

(a) $\frac{11}{32}$ (b) $\frac{13}{2}$

(c) $\frac{22}{32}$ (d) $\frac{6}{8}$

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (c) Let the fraction be x.

$$x+\frac{5}{16}=1, \qquad x=1-\frac{5}{16}$$

$$x=\frac{11}{16}, \qquad x=\frac{2\times11}{2\times16}=\frac{22}{32}$$

Hence, the require fraction is $\frac{22}{32}$.

153. What is the fraction which, when subracted from $\frac{1}{2}$, gives $\frac{2}{3}$?

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$

(c) $-\frac{1}{6}$ (d) $\frac{1}{6}$

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (c) Let the fraction be $\frac{x}{y}$.

According to the problem,

$$\frac{1}{2}-\frac{x}{y}=\frac{2}{3}\Rightarrow\frac{x}{y}=\frac{1}{2}-\frac{2}{3}$$

$$\frac{x}{y}=\frac{-1}{6}$$

154. How much should be added to $\frac{2}{3}$ to obtain $\frac{3}{2}$?

(a) $\frac{4}{9}$ (b) $\frac{5}{6}$

(c) $\frac{1}{-1}$ (d) $\frac{1.5}{6}$

RRB ALP & Tec. (17-08-18 Shift-I)

Ans : (b) Let the number to be added is x.

According to the question,

$$\frac{2}{3}+x=\frac{3}{2}$$

$$x=\frac{3}{2}-\frac{2}{3}=\frac{9-4}{6}=\frac{5}{6}$$

155. A fraction, when subtracted from $\frac{1}{3}$ gives $\frac{1}{12}$. The fraction is:

(a) $\frac{5}{12}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) $\frac{1}{9}$

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (b) Let the fraction be $\frac{x}{y}$.

According to the question,

$$\frac{1}{3}-\frac{x}{y}=\frac{1}{12}$$

$$\frac{x}{y}=\frac{1}{3}-\frac{1}{12}=\frac{4-1}{12}=\frac{3}{12}=\frac{1}{4}$$

$$\frac{x}{y}=\frac{1}{4}$$

156. Which of the fractions given below, when added to $\frac{5}{8}$, gives 1?

(a) $\frac{6}{24}$ (b) $\frac{5}{2}$

(c) $\frac{6}{16}$ (d) $\frac{6}{3}$

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (c) Let the fraction be x.

According to the question,

$$\frac{5}{8}+x=1$$

$$x=1-\frac{5}{8} \quad x=\frac{3}{8}$$

$$x=\frac{3\times2}{8\times2}$$

$$x=\frac{6}{16}$$

Hence the required fraction is = $\frac{6}{16}$.

Type - 8

157. The value of 0.0006697 to three digits of decimal will be:

(a) 0.000670 (b) 0.00669

(c) 0.001 (d) 0

RRB RPF Constable -22/01/2019 (Shift-I)

Ans : (c) The value of 0.0006697 till three digits of decimal = 0.001,
After decimal if the right digit is 5 or more than 5, then we add 1 to the left digit.

158. Which fraction is not equal to $\frac{15}{23}$?

(a) $\frac{105}{162}$ (b) $\frac{75}{115}$

(c) $\frac{45}{69}$ (d) $\frac{30}{46}$

RRB RPF-SI -12/01/2019 (Shift-I)

Ans : (a) From options–

(a) $\frac{105}{162}=\frac{35}{54}$ (b) $\frac{75}{115}=\frac{15}{23}$

(c) $\frac{45}{69}=\frac{15}{23}$ (d) $\frac{30}{46}=\frac{15}{23}$

Hence, it is clear that option (a) is not equal to $\frac{15}{23}$.

159. 0.065 × 0.4 = ?

(a) 0.26 (b) 0.026
(c) 2.6 (d) 0.0026

RRB RPF-SI -11/01/2019 (Shift-I)

Ans : (b) Given,
0.065 × 0.4 = 0.026

160. Find the value of 0.1404 ÷ 0.06 = ?

(a) 0.234 (b) 2.34
(c) 234 (d) 23.4

RRB RPF Constable -18/01/2019 (Shift-I)

Ans :(b) Given,

$$0.1404 \div 0.06$$
$$=\frac{0.1404\times10000}{0.06\times10000}=\frac{1404}{600}=2.34$$

161. Find the sum of the place value of 5 and 4 in $\frac{6}{8}$ and $\frac{6}{25}$ respectively.

(a) $\frac{8}{100}$ (b) $\frac{99}{100}$
(c) $\frac{9}{100}$ (d) $\frac{88}{100}$

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (c) $\frac{6}{8}=0.75$

The place value of 5, in 0.75 = $0.05=\frac{5}{100}$

and, $\frac{6}{25}=0.24$

The place value of 4, in 0.24 = $0.04=\frac{4}{100}$

So, the required sum of both values

$$=\frac{5}{100}+\frac{4}{100}=\frac{9}{100}$$

162. The whole value of 0.008594 to three digits of decimal will be?

(a) 0.008 (b) 0.009
(c) 0.00860 (d) 0.00859

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (b) As we know :- After decimal if the right digit is 5 or more than 5, then we add 1 to the left digit.
Hence, the whole value of 0.008594 to the three digits of decimal will be 0.009.

163. x and y, given correct to 2 decimal place, are given as 4.51 and 2.48 respectively. What is the upper limit of the value of x + y? (The value is correct to the two digits of decimal.)

(a) 7.000 (b) 6.995
(c) 7.010 (d) 6.990

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (a) x + y = 4.51 + 2.48 = 6.99
Hence, the nearest upper limit for the value of (x + y) that is 6.99 = 7.000.

164. Find the value of x.

$$\frac{144}{0.144}=\frac{14.4}{x}$$

(a) 0.0001 (b) 0.0144
(c) 0.1 (d) 0.01

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (b) : Given expression,

$$\frac{144}{0.144}=\frac{14.4}{x}$$
$$144\times x=14.4\times0.144$$
$$x=\frac{14.4\times0.144}{144}$$
$$x=\frac{144\times0.144}{144\times10}$$
$$x=0.0144$$

165. If x is integer 0.80000, then what is interval of x?

(a) $0.79995 < x \le 0.80005$
(b) $0.799905 \le x < 0.800005$
(c) $0.799995 \le x < 0.800005$
(d) $0.79995 \le x < 0.80005$

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (c)
The required interval of x = $0.799995 \le x < 0.800005$

166. If $\frac{0.7}{1-6c}=-0.2$, then c = ?

(a) 0.8 (b) 0.5
(c) 0.75 (d) 0.075

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (c) : Given,

$$\frac{0.7}{1-6c}=-0.2$$
$$-0.2+1.2c=0.7$$
$$1.2c=0.9$$
$$c=\frac{0.9}{1.2}$$
$$c=0.75$$

167. x is written as 15.84, to two digits of decimal. Which of the following is true?

(a) $15.835 < x \le 15.845$
(b) $15.835 < x < 15.845$
(c) $15.835 \le x \le 15.845$
(d) $15.835 \le x < 15.845$

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (d) : Analyzing option (d),
15.835 is less than x, and 15.835 is written to two digits of decimal as 15.84 (approx). While 15.845 will be definitely greater.

168. If x is 0.70000, to five digits of decimal, then interval of x will be:

(a) $0.6995 \le x < 0.70005$
(b) $0.699995 \le x < 0.700005$
(c) $0.699905 \le x < 0.700005$
(d) $0.69995 < x \le 0.70005$

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (b) If x is 0.70000, to five digits of decimal,
Then, $0.699995 \le x < 0.700005$ is correct.

169. The least value of x which makes $\frac{65}{x-14}$ an integer, is:

(a) 1 (b) –51
(c) 79 (d) –1

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (b) From question,
Putting the value of options in the place of x.

(a) $\frac{65}{1-14}=\frac{65}{-13}=-5$ (Integer)

(b) $\frac{65}{-51-14}=\frac{65}{-65}=-1$ is also an integer for which the value of x is the least.

(c) $\frac{65}{79-14}=\frac{65}{65}=1$ (Integer)

(d) $\frac{65}{-1-14}=\frac{65}{-15}=-4.33$ (Non-Integer)

Hence, it is clear that the least required value of x is -51

170. The product of $\frac{144}{100}$ and $\frac{175}{216}$ will be = ?

(a) $\frac{7}{12}$ (b) $\frac{14}{3}$
(c) $\frac{7}{6}$ (d) $\frac{7}{3}$

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (c) $\frac{144}{100}\times\frac{175}{216}$
$=\frac{7}{6}$

171. x and y, are given correct to the two digits of decimal, are written as 3.57 and 3.42 respectively. What is the upper limit for x + y ?

(a) 7.000 (b) 7.010
(c) 6.990 (d) 6.995

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (a) : According to the question,
x and y are correct to the two digits of decimal.
x = 3.57 and y = 3.42,
then, x + y = 3.57 + 3.42 = 6.99
hence, the upper limit of x + y = 7.000

172. x and y, are given correct to the two digits of decimal, are written as 2.51 and 3.50 respectively. What is the lower limit for x + y ?

(a) 6.010 (b) 5.995
(c) 6.000 (d) 5.990

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (c) According to the question,
x = 2.51 and y = 3.50
then,
x + y = 2.51 + 3.50 = 6.01
So the lower limit for x + y is 6.000

173. Find the value of x.

$\frac{484}{4.84}=\frac{48.4}{x}$

(a) 0.484 (b) 0.00484
(c) 0.0484 (d) 4.84

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (a) $\frac{484}{4.84}=\frac{48.4}{x}$
$\Rightarrow \quad x\times 484=48.4\times 4.84$
$\Rightarrow \quad x=\frac{484\times 484}{484\times 1000}$
Hence, x = 0.484

174. x and y, are given correct to the one digit of decimal, and written as 6.2 and 1.3 respectively. What is the upper limit of $\frac{x}{y}$?

(a) 4.96 (b) 5
(c) 4.77 (d) 5.05

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (b) $\frac{x}{y}=\frac{6.2}{1.3}=4.76$

Hence, the value of upper limit of $\frac{x}{y}$ is 5.

175. 1.008 = ?

(a) $1\frac{1}{125}$ (b) $1\frac{3}{25}$
(c) $1\frac{2}{25}$ (d) $1\frac{2}{125}$

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (a) : 1.008 = ?
$\Rightarrow \quad \frac{1008}{1000}=\frac{504}{500}=\frac{252}{250}=\frac{126}{125}=1\frac{1}{125}$
Hence, the value of 1.008 is $1\frac{1}{125}$.

176. If $X=\frac{63.5535}{13.05}$, find the value of X.

(a) 4.48 (b) 4.87
(c) 4.46 (d) 4.28

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (b) $X=\frac{63.5535}{13.05}$
$X=\frac{6355.35}{1305}=4.87$
Hence, the value of X is 4.87

177. If 2334/33.1 = 261, then 23.34/3.31 = ?

(a) 0.261 (b) 2.61
(c) 26.1 (d) 261

RRB NTPC 18.04.2016 Shift : 3

Ans : (c) Given,
$\frac{2334}{33.1}=261$.....(1)
$\because \frac{23.34}{3.31}=\frac{2334}{331}$
$=\frac{2334}{33.1\times 10}$
$=\frac{2334}{33.1}\times\frac{1}{10}$
$=\frac{261}{10}$ {from equation (1)}
$= 26.1$

178. If 23 × 19 = 437, then 0.0437 ÷ 1.9 = ?

(a) 0.0023 (b) 2.3
(c) 0.023 (d) 0.23

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (c) Given,

$$23\times19 = 437$$

According to the question,

$$\frac{0.0437}{1.9} = \frac{0.0437\times10000}{1.9\times10000}$$

$$= \frac{23\times19}{19\times1000}$$

$$= \frac{23}{1000} = 0.023$$

179. If 17 × 29 = 493. How much is 1700 x 0.0029 ?

(a) 0.493 (b) 0.0493
(c) 4.93 (d) 49.3

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (c) : $17\times29 = 493$, तो $1700\times0.0029 = ?$

$\Rightarrow$ 1700×0.0029

$\Rightarrow$ $17\times100\times0.0029$

$\Rightarrow$ 17×0.29

$\Rightarrow$ 4.93

180. If 493 ÷ 29 = 17, then 4.93÷ 0.0017 = ?

(a) 290 (b) 0.29
(c) 2.9 (d) 2900

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (d) Given,

$$493\div29 = 17,$$

So,

$$4.93\div0.0017 = \frac{4.93}{0.0017}$$

$$= \frac{4.93\times10000}{0.0017\times10000} = \frac{49300}{17}$$

$$= 2900$$

181. 23 × 31=713. How much is 0.0713 ÷ 3.1?

(a) 0.0023 (b) 0.23
(c) 0.023 (d) 2.3

RRB ALP & Tec. (13-08-18 Shift-III)

Ans : (c) Given,

$$23\times31 = 713$$

So,

$$0.0713\div3.1 = \frac{0.0713}{3.1}$$

$$= \frac{0.0713\times10000}{3.1\times10000} = \frac{713}{31000}$$

$$= 0.023$$

Type - 9

182. Which of the following fractions is greater than 7/12, and smaller than 11/16?

(a) 1/2 (b) 5/8
(c) 7/8 (d) 3/8

RRB JE - 27/06/2019 (Shift-I)

Ans : (b) From the given fractions,

$$\frac{7}{12} = 0.58 \qquad \frac{11}{16} = 0.68$$

From options–

(a) $\frac{1}{2} = 0.50$ (b) $\frac{5}{8} = 0.62$

(c) $\frac{7}{8} = 0.87$ (d) $\frac{3}{8} = 0.37$

Hence, option (b) is 0.62, which is greater than 0.58 and smaller than 0.68.

183. Which of the following is correct?

(a) $\frac{9}{16} \le \frac{13}{24}$ (b) $\frac{9}{16} > \frac{13}{24}$

(c) $\frac{9}{16} = \frac{13}{24}$ (d) $\frac{9}{16} < \frac{13}{24}$

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) From options,

(a) $\frac{9}{16} \le \frac{13}{24} = 0.56 \le 0.54$ (wrong)

(b) $\frac{9}{16} > \frac{13}{24} = 0.56 > 0.54$ (right)

(c) $\frac{9}{16} = \frac{13}{24} = 0.56 = 0.54$ (wrong)

(d) $\frac{9}{16} < \frac{13}{24} = 0.56 < 0.54$ (wrong)

184. Find the smallest of the following decimals.

(a) 0.1 × 0.1 × 0.1 (b) 0.03 / 3
(c) 0.01 / 2 (d) 0.1 × 0.02 × 0.2

RRB NTPC 05.04.2016 Shift-1

Ans : (d) From options–

(a) $0.1 \times 0.1 \times 0.1 = 0.001$

(b) $0.03 / 3 = 0.01$

(c) $0.01 / 2 = 0.005$

(d) $0.1 \times 0.02 \times 0.2 = 0.0004$

Hence option (d) is the smallest.

185. Find the smallest of the following decimals.

(a) 0.2 × 0.2 × 0.2 (b) 0.02 / 3
(c) 0.01 / 2 (d) 0.1 × 0.02 × 2

RRB NTPC 31.03.2016 Shift : 2

Ans : (d) From options–

(a) $0.2 \times 0.2 \times 0.2 = 0.008$

(b) $\frac{0.02}{3} = 0.0067$

(c) $\frac{0.01}{2} = 0.005$

(d) $0.1 \times 0.02 \times 2 = 0.004$

Hence, it is clear that option (d) is the smallest.

186. Find the fraction which is as much greater than $\frac{4}{7}$ as it is less than $\frac{5}{6}$:

(a) $\frac{59}{84}$ (b) $\frac{84}{59}$

(c) $\frac{58}{84}$ (d) $\frac{59}{85}$

RRB ALP & Tec. (10-08-18 Shift-I)

Ans : (a) Let the fraction is x.
According to the question,

$$\frac{4}{7} < x > \frac{5}{6}$$

Then,

$$x(\text{Middle fraction}) = \frac{\text{Sum of both fractions}}{2}$$

$$x = \frac{\frac{4}{7}+\frac{5}{6}}{2} = \frac{\frac{24+35}{42}}{2} = \frac{59}{84}$$

187. The product of two numbers is 0.432. One of the number is 1.6. What is the other number?
(a) 2.7 (b) 0.027
(c) 0.27 (d) 27

RRB ALP & Tec. (10-08-18 Shift-I)

Ans : (c)

$$\text{The required number} = \frac{\text{Prouduct of both numbers}}{\text{First number}}$$

$$= \frac{0.432}{1.6}$$

$$= 0.27$$

188. Which of the following is true?
(a) $\frac{29}{6} = \frac{53}{12}$ (b) $\frac{29}{6} = \frac{43}{12}$
(c) $\frac{29}{6} > \frac{43}{12}$ (d) $\frac{29}{6} < \frac{43}{12}$

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (c) From options–
(a) $\frac{29}{6} = \frac{53}{12} \Rightarrow 4.83 = 4.41$ (false)
(b) $\frac{29}{6} = \frac{43}{12} \Rightarrow 4.83 = 3.58$ (false)
(c) $\frac{29}{6} > \frac{43}{12} \Rightarrow 4.83 > 3.58$ (true)
(d) $\frac{29}{6} < \frac{43}{12} \Rightarrow 4.83 < 3.58$ (false)
Hence, option (c) is correct.

Type - 10

189. The numerator of a fraction is one less than the denominator. If 6 is added to the numerator, the fraction will be equal to $\frac{5}{4}$ Find the fraction.
(a) $-\frac{20}{21}$ (b) $\frac{19}{20}$
(c) $-\frac{21}{20}$ (d) $\frac{20}{21}$

RRB Group-D 30/08/2022 (Shift-I)

Ans. (b) : Let, denominator be x
then, Numerator = x – 1
$\therefore$ Fraction = x – 1/x
According to the question,

$$\frac{x-1+6}{x} = \frac{5}{4}$$

$4x + 20 = 5x$
$x = 20$

Hence, fraction $\boxed{\frac{x-1}{x} \Rightarrow \frac{19}{20}}$

190. Convert 25 grams to kilogram and express the answer as a fraction.
(a) $\frac{1}{40}$ kg (b) $\frac{1}{400}$ kg
(c) $\frac{1}{4000}$ kg (d) $\frac{1}{4}$ kg

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : 1000 gm = 1kg

$$1\text{gm} = \frac{1}{1000}\text{kg}$$

so,

$$\therefore \quad 25 \text{ gm} = \frac{25}{1000}\text{kg}$$

$$= \frac{1}{40}\text{kg}$$

191. If we add 1 to the numerator and subtract 1 from the denominator of a given fraction, it becomes 1. It becomes $\frac{2}{3}$ if 1 is added to the denominator of the given fraction while the numerator is left unchanged. The fraction originally given is:
(a) $\frac{5}{8}$ (b) $\frac{3}{8}$ (c) $\frac{1}{8}$ (d) $\frac{6}{8}$

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (d) : Let the fraction be $\frac{x}{y}$
According to first condition,

$$\frac{x+1}{y-1} = 1$$

$x + 1 = y - 1$
$x - y = -2$ ..... (i)
According to second condition,

$$\frac{x}{y+1} = \frac{2}{3}$$

$3x = 2y + 2$
$3x - 2y = 2$ ..... (ii)
On multiplying by 3 in eq. (i) and substracting eq. (ii) -
$-y = -8$
$\therefore y = 8$
$x = -2 + 8$ [$\therefore$ From eq. (i)]
$x = 6$

Hence the original fraction $= \frac{x}{y} = \frac{6}{8}$

192. Which fraction bears the same ratio to $\frac{1}{27}$ as $\frac{3}{11}$ does to $\frac{5}{9}$?

(a) $\frac{1}{99}$ (b) $\frac{1}{27}$

(c) $\frac{1}{55}$ (d) $\frac{1}{15}$

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let the fraction = $\frac{x}{y}$

According to the question-

$\frac{x}{y} : \frac{1}{27}$

$27x : y$ ...(i)

$\frac{3}{11} : \frac{5}{9}$

$27 : 55$ ....(ii)

On comparing eq^n (i) and (ii),

$x = 1$, $y = 55$

Hence, the fraction = $\frac{1}{55}$

193. What smallest fraction should be added to $3\frac{2}{3}+6\frac{7}{12}+4\frac{9}{36}+5+7\frac{1}{12}$ to make the sum a whole number?

(a) $\frac{7}{12}$ (b) $\frac{11}{12}$

(c) $\frac{5}{12}$ (d) $\frac{13}{12}$

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (c) : From question,

$$3\frac{2}{3}+6\frac{7}{12}+4\frac{9}{36}+5+7\frac{1}{12}$$

$$= \frac{2}{3}+\frac{7}{12}+\frac{9}{36}+\frac{1}{12}+(3+6+4+5+7)$$

$$= \frac{24+21+9+3}{36}+25$$

$$= \frac{57}{36}+25$$

From option (c),

$$\frac{5}{12}+\frac{57}{36}+25$$

$$= \frac{15+57}{36}+25$$

$$= \frac{72}{36}+25$$

$$= 2 + 25 = 27$$

Hence, the sum obtained by adding 5/12 will become a whole number.

194. The numerator of a fraction is 2 less than the denominator. If the numerator is multiplied by 2 and the denominator is multiplied by 3, then the fraction becomes $\frac{2}{9}$. The fraction is:

(a) $\frac{5}{7}$ (b) $\frac{3}{5}$

(c) $\frac{7}{9}$ (d) $\frac{1}{3}$

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (d) : The numerator of fraction $= x$

Denominator $= x + 2$

According to the question,

$$\frac{x \times 2}{3(x+2)} = \frac{2}{9}$$

$$\frac{x}{3x+6} = \frac{1}{9}$$

$$9x = 3x + 6$$

$$x = 1$$

Fraction $= \frac{x}{x+2} = \frac{1}{3}$

195. The sum of the numerator and denominator of a fraction is 11. If the numerator is decreased by 1, the fraction becomes $\frac{1}{4}$. Find the fraction.

(a) $\frac{2}{9}$ (b) $\frac{3}{8}$

(c) $\frac{4}{7}$ (d) $\frac{5}{6}$

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let fraction $= \frac{x}{y}$

$x+y = 11$ ------- (i)

$$\frac{x-1}{y} = \frac{1}{4}$$

$4x-y = 4$ ---------- (ii)

From equation (i) + equation (ii)

$5x = 15$

$x = 3$

$y = 8$ (From equation (i)

Hence, fraction $= \frac{x}{y} = \frac{3}{8}$

196. Find out the fraction which when add $\frac{1}{2}$ to get 2?

(a) $\frac{1}{2}$ (b) $\frac{1}{-1}$

(c) $\frac{3}{2}$ (d) $\frac{5}{3}$

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the fraction is $\frac{x}{y}$

According to the question,

$$\frac{1}{2}+\frac{x}{y}=2$$

$$\frac{x}{y}=2-\frac{1}{2}$$

$$\frac{x}{y}=\frac{3}{2}$$

Hence, the fraction will be $\frac{3}{2}$.

197. The numerator of a fraction is less than its denominator by 2. If we subtract 2 from the numerator and add 2 to the denominator, then the new fraction is 1/3 what is the original fraction?

(a) 5/7 (b) 5/9
(c) 1/3 (d) 3/7

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let numerator = x–2
denominator = x

According to the question,

$$\frac{(x-2)-2}{x+2}=\frac{1}{3}$$

$$\frac{x-4}{x+2}=\frac{1}{3}$$

$$3(x-4)=(x+2)$$

$$3x-12=x+2$$

$$2x=14$$

$$x=7$$

Original fraction $=\frac{x-2}{x}=\frac{7-2}{7}=\frac{5}{7}$

198. $\frac{4}{5}$% is equivalent to which of the following fractions?

(a) $\frac{1}{25}$ (b) $\frac{1}{125}$
(c) $\frac{1}{725}$ (d) $\frac{4}{125}$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : $\frac{4}{5}\% = \frac{4}{5}\times\frac{1}{100}=\frac{1}{125}$

Hence required fraction = $\frac{1}{125}$

199. If the numerator of a fraction is increased by 30% and its denominator is decreased by 35%, the value of the fraction becomes $\frac{3}{15}$. Find the original fraction.

(a) $\frac{3}{10}$ (b) $\frac{1}{10}$
(c) $\frac{1}{5}$ (d) $\frac{3}{5}$

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let original fraction $= \frac{x}{y}$ $\begin{matrix}\rightarrow \text{Numerator}\\ \rightarrow \text{Denominator}\end{matrix}$

According to the question,

$$\frac{\frac{x\times130}{100}}{y\times\frac{65}{100}}=\frac{3}{15}$$

$$\frac{130x}{65y}=\frac{3}{15}$$

$$\frac{x}{y}=\frac{1}{10}$$

200. How do you show 48% as a fraction?

(a) $\frac{10}{25}$ (b) $\frac{11}{25}$
(c) $\frac{1}{25}$ (d) $\frac{12}{25}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (d) : $48\% = \frac{48}{100} = \frac{12}{25}$

201. Which of the following fractions does NOT lie between $\frac{7}{18}$ and $\frac{3}{5}$?

(a) $\frac{1}{2}$ (b) $\frac{2}{5}$
(c) $\frac{5}{12}$ (d) $\frac{1}{3}$

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (d) : Number between $\frac{7}{18}$ and $\frac{3}{5}$

$\frac{7}{18}$ = 0.39 and $\frac{3}{5}$ = 0.6

From option (d) $\frac{1}{3}$ = 0.33

Hence, option (d) does not lie between 0.39 and 0.6.

202. The numerator of a fraction is 5 less than its denominator. If 2 is subtracted from the numerator and 2 is added to the denominator, the fraction becomes 2/5 find the original fraction.

(a) $\frac{9}{11}$ (b) $\frac{11}{13}$
(c) $\frac{5}{7}$ (d) $\frac{8}{13}$

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (d): Let numerator = a
denominator = a + 5

According to the question,

$$\frac{a-2}{a+5+2}=\frac{2}{5}$$

$5a - 10 = 2a + 14$

$3a = 24 \Rightarrow a = 8$

$\therefore$ Original fraction $= \frac{a}{a+5}=\frac{8}{13}$

203. Three friends arranged a party. Tanveer paid 2/3 as much as Yusuf paid. Yusuf paid 1/2 as much as Sachin paid. The fraction of the total expenditure by Yusuf was.

(a) $\frac{7}{11}$ (b) $\frac{5}{11}$

(c) $\frac{3}{11}$ (d) $\frac{2}{11}$

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (c) : Tanveer Yusuf Sachin

2 : 3 :

1 : 2

2 : 3 : 6

$\therefore$ Total expenditure by Yusuf $= \frac{3}{(2+3+6)}=\frac{3}{11}$

204. A tennis player won 5 matches, lost 12 matches and draw 3 matches in his career. The fraction of matches which lost in his career is.

(a) $\frac{12}{5}$ (b) $\frac{2}{5}$

(c) $\frac{1}{5}$ (d) $\frac{3}{5}$

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : Number of matches won by the player = 5

Number of matches lost by the player = 12

Match draw = 3

Number of total matches = 5 + 12 + 3 = 20

Hence, fraction of the lost matches = $\frac{12}{20}=\frac{3}{5}$

205. If the numerator of a fraction is decreased by 80% and the denominator of the fraction is decreased by 60%, then the resultant fraction is $\frac{5}{6}$. What is the original fraction?

(a) $\frac{7}{3}$ (b) $\frac{3}{5}$

(c) $\frac{5}{3}$ (d) $\frac{6}{5}$

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let original fraction is $\frac{x}{y}$

According to the question,

$$\frac{x\times\frac{20}{100}}{y\times\frac{40}{100}}=\frac{5}{6}$$

$$\frac{x}{2\times y}=\frac{5}{6}$$

$$\frac{x}{y}=\frac{5}{3}$$

Hence original fraction $= \frac{x}{y}=\frac{5}{3}$

206. If 3 is added to the numerator and the denominator of a fraction, it becomes $\frac{10}{11}$. And if 4 is subtracted from the numerator and the denominator, then it becomes $\frac{3}{4}$. What is the fraction?

(a) $\frac{7}{8}$ (b) $\frac{6}{13}$

(c) $\frac{3}{4}$ (d) $\frac{3}{5}$

RRB RPF Constable -25/01/2019 (Shift-III)

Ans : (a) Let the fraction is $\frac{x}{y}$

According to the question,

$$\frac{x+3}{y+3}=\frac{10}{11}$$

$\Rightarrow 11x + 33 = 10y + 30$

$\Rightarrow 11x - 10y = -3$.....(i)

Again, $\frac{x-4}{y-4}=\frac{3}{4}$

$\Rightarrow 4x - 16 = 3y - 12$

$\Rightarrow 4x - 3y = 4$ .....(ii)

From equation (i) and (ii)–

x = 7 and y = 8

Hence, the required fraction is $\frac{7}{8}$.

207. The difference between 3/8 and another smaller number is 1/5. Find another number.

(a) $\frac{3}{40}$ (b) $\frac{2}{3}$

(c) $\frac{7}{40}$ (d) $\frac{8}{15}$

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c) : Let the another smaller number is x.

According to the question,

$$\frac{3}{8}-x=\frac{1}{5}$$

$$-x=\frac{1}{5}-\frac{3}{8}$$

$$-x=\frac{8-15}{40}$$

$$-x = \frac{-7}{40}$$

$$x = \frac{7}{40}$$

Hence, another smaller number is option (c) = $\frac{7}{40}$.

208. The denominator of a fraction exceeds 5 by its numerator. If the numerator is multiplied by 4 and the denominator is multiplied by 3, then the fraction becomes $\frac{1}{2}$. What is the original fraction.

(a) $\frac{3}{8}$ (b) $\frac{2}{7}$

(c) $\frac{4}{9}$ (d) $\frac{1}{6}$

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (a)

Let the numerator is x, then the fraction $= \frac{x}{x+5}$

According to the question,

$$\frac{x \times 4}{(x+5) \times 3} = \frac{1}{2}$$

$$\frac{4x}{3x+15} = \frac{1}{2}$$

$8x = 3x + 15$

$5x = 15$

$x = 3$

Hence, the required fraction is $\frac{x}{x+5} = \frac{3}{3+5} = \frac{3}{8}$

209. If 2 is added to the square of a positive fraction the value $4\frac{1}{4}$ is obtained. Find the fraction.

(a) $2\frac{3}{4}$ (b) $1\frac{1}{4}$

(c) $2\frac{1}{4}$ (d) $1\frac{1}{2}$

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (d) Let the fraction is x.

According to the question,

$$x^2 + 2 = 4\frac{1}{4}$$

$$x^2 + 2 = \frac{17}{4}$$

$$4x^2 + 8 = 17$$

$$4x^2 = 17 - 8$$

$$4x^2 = 9, \quad x^2 = \frac{9}{4}$$

$$x = \frac{3}{2} = 1\frac{1}{2}$$

210. 5/12 of a number is 3/4. What is the number?

(a) $3\frac{1}{5}$ (b) $1\frac{7}{5}$

(c) $1\frac{4}{5}$ (d) $1\frac{5}{16}$

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) : Let the number is x.

According to the question,

$$x \times \frac{5}{12} = \frac{3}{4}$$

$$\Rightarrow x = \frac{9}{5}$$

$$x = 1\frac{4}{5}$$

211. The sum of three fractions is 5. One of them is $1\frac{1}{2}$, and the difference of two others is $\frac{3}{4}$. Find the greatest of the three.

(a) $2\frac{1}{4}$ (b) $2\frac{1}{8}$

(c) $2\frac{1}{2}$ (d) $1\frac{7}{8}$

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (b) : Let other fractions are x and y.

According to the question,

$$x + y + 1\frac{1}{2} = 5$$

$$\Rightarrow \quad x + y = \frac{7}{2} \qquad \text{.....(i)}$$

and $\quad x - y = \frac{3}{4} \qquad$ .....(ii)

Subtracting equation (ii) from equation (i),

$$x + y = \frac{7}{2}$$

$$x - y = \frac{3}{4}$$

$$\frac{- \quad + \quad -}{2y = \frac{7}{2} - \frac{3}{4}}$$

$$2y = \frac{11}{4}$$

$$y = \frac{11}{8}$$

Putting the value of y in equation (i),

$$x + \frac{11}{8} = \frac{7}{2}$$

$$x = \frac{7}{2} - \frac{11}{8} = \frac{17}{8} = 2\frac{1}{8} = 2.125$$

Hence it is clear that the greatest of the three fractions is $2\frac{1}{8}$.

212. Find the divisor of $\frac{1}{5-2\sqrt{3}}$.

(a) $\frac{(5-2\sqrt{3})}{12}$ (b) $\frac{5+2\sqrt{3}}{13}$

(c) $\frac{5-2\sqrt{3}}{13}$ (d) $\frac{5+2\sqrt{3}}{12}$

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (b) On rationalizing $\frac{1}{5-2\sqrt{3}}$

$$=\frac{1}{5-2\sqrt{3}}\times\frac{5+2\sqrt{3}}{5+2\sqrt{3}}$$

$$=\frac{5+2\sqrt{3}}{25-12}=\frac{5+2\sqrt{3}}{13}$$

213. If a rod of length $208\frac{4}{5}$ is cut into equal pieces of length $23\frac{1}{5}$, then the total number of rods obtained is:

(a) 5 (b) 7

(c) 8 (d) 9

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (d) Total length of the rod $=208\frac{4}{5}=\frac{1044}{5}$

According to the question,

The number of rods obtained $=\frac{\text{Total length of rod}}{\text{Length of one part}}$

$$=\frac{\frac{1044}{5}}{23\frac{1}{5}}=\frac{\frac{1044}{5}}{\frac{116}{5}}$$

$$=\frac{1044}{5}\times\frac{5}{116}=\frac{1044}{116}=9$$

214. A steel rod of length $20\frac{3}{26}$ is cut out from a rod of length $56\frac{1}{5}$. Then what is the remaining length of the rod ?

(a) $36\frac{3}{130}$ (b) $36\frac{1}{130}$

(c) $36\frac{11}{130}$ (d) $36\frac{7}{130}$

RRB ALP & Tec. (30-08-18 Shift-II)

Ans : (c) The cut out length of the rod $=20\frac{3}{26}$

$$=\frac{523}{26}$$

Total length of the rod $=56\frac{1}{5}=\frac{281}{5}$

The length of the remaining rod $=\frac{281}{5}-\frac{523}{26}$

$$=\frac{7306-2615}{130}=\frac{4691}{130}=36\frac{11}{130}$$

215. If $\frac{3}{4}$ of the weight of a brick is $\frac{7}{8}$ kg, then $\frac{5}{7}$ of the weight of the brick will be:

(a) $\frac{20}{21}$ kg (b) $\frac{5}{6}$ kg

(c) $\frac{5}{8}$ kg (d) $\frac{15}{32}$ kg

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (b) Let the weight of the brick is x kg.

According to the question,

$$\frac{3x}{4}=\frac{7}{8}$$

$$x=\frac{7}{8}\times\frac{4}{3}$$

Hence $\frac{5x}{7}=\frac{7}{8}\times\frac{4}{3}\times\frac{5}{7}$

$$\frac{5x}{7}=\frac{5}{6}$$

Hence $\frac{5}{7}$ of weight of the bricks will be $\frac{5}{6}$ Kg.

216. Tapan, Ravi and Trisha shared a cake. Tapan had $\frac{1}{4}$ of it, Trisha had $\frac{2}{3}$ of it and Ravi had the rest. What was Ravi's share of the cake?

(a) $\frac{4}{7}$ (b) $\frac{1}{12}$

(c) $\frac{1}{6}$ (d) $\frac{2}{6}$

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (b) Tapan's share $=\frac{1}{4}$

Trisha's share $=\frac{2}{3}$

Hence, Ravi's share $=1-\left(\frac{1}{4}+\frac{2}{3}\right)=1-\frac{11}{12}=\frac{1}{12}$

Hence, Ravi's share of the cake is $=\frac{1}{12}$.

Type - 11

217. 200 g as a fraction of 1 kg is:

(a) $\frac{1}{10}$ (b) $\frac{3}{10}$

(c) $\frac{2}{5}$ (d) $\frac{1}{5}$

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (d) **:** According to the question–

$$200\text{g}=\frac{200}{1000}\text{kg}=\frac{1}{5}\text{kg}$$

Therefore, 200g is a 1/5 part of 1 kg.

218. Which of the following number is closest to zero?

(a) $(1\text{-}0.09)^2$ (b) $1\text{-}(0.09)^2$

(c) 0.009 (d) $(0.09)^2$

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (d) : From the given options-

(a) $(1 - 0.09)^2$

$1 + 0.0081 - 0.18$

$= 0.8281$

(b) $1 - (0.09)^2$

$1 - 0.0081$

$= 0.9919$

(c) 0.009

(d) $(0.09)^2$

$= 0.0081$

Hence, option (d) is closest to zero.

219. Which of the following fraction falls between $\frac{3}{4}$ and $\frac{6}{7}$?

(a) $\frac{11}{9}$ (b) $\frac{9}{10}$

(c) $\frac{5}{9}$ (d) $\frac{9}{11}$

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) : The given fractions $\frac{3}{4} = 0.75$

and $\frac{6}{7} = 0.857$

Now from options-

(a) $\frac{11}{9} = 1.22$

(b) $\frac{9}{10} = 0.9$

(c) $\frac{5}{9} = 0.55$

(d) $\frac{9}{11} = 0.818$

$\because$ 0.818 lies between 0.75 and 0.85

Hence, $\frac{9}{11}$ lies between $\frac{3}{4}$ and $\frac{6}{7}$

220. If 58 out of 100 students in a school are boys, then express the part of the school that consists of boys in decimals.

(a) 0.5 (b) 0.58

(c) 0.8 (d) 0.85

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (b) : Hence, the part of the school that consists of boys in decimals = $\frac{58}{100} = 0.58$

221. When 0.36 is written in its simplest fractional form, the sum of the numerator and the denominator is:

(a) 34 (b) 35

(c) 33 (d) 32

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$0.36 = \frac{36}{100} = \frac{9}{25}$

The sum of the numerator and the denominator of $\frac{9}{25}$

$= 9 + 25 = 34$

222. When the numerator of a fraction increases by 6, the fraction increases by three-fourth. The denominator of the fraction is :

(a) 8 (b) 10

(c) 12 (d) 6

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (a) : If fraction is $\frac{x}{y}$

$\Rightarrow \quad \frac{x+6}{y} = \frac{x}{y} + \frac{3}{4}$

$\Rightarrow \quad \frac{x+6}{y} - \frac{x}{y} = \frac{3}{4}$

$\Rightarrow \quad \frac{6}{y} = \frac{3}{4}$

$\Rightarrow \quad y = 8$

223. How many decimal numbers can be found between 0.225 and 0.227?

(a) 2 (b) Infinite

(c) 1 (d) 226

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (b)

$0.225 = \frac{225}{1000}$ and $0.227 = \frac{227}{1000}$

Infinite decimal number can be found between $\frac{225}{1000}$ and $\frac{227}{1000}$.

224. What would be the value of $\frac{1}{0.24}$ part of 1.44.

(a) 140 (b) 12

(c) 166 (d) 6

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : $1.44 \times \frac{1}{0.24}$

$= \frac{144}{24} = 6$

225. How many equivalent fraction can be formed by any fraction?

(a) Only 2 (b) Only 3

(c) Infinite (d) Only 1

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (c) : From a given fraction, infinite equivalent fraction can be formed.

226. If we increase 50% of the numerator and 80% of the denominator of a fraction, then what fraction of the original will be the new fraction.

(a) $\frac{7}{9}$ (b) $\frac{6}{5}$ (c) $\frac{5}{8}$ (d) $\frac{5}{6}$

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let fraction = $\frac{x}{y}$

According to the question,

$$\text{Fraction after change} = \frac{x \times 150}{y \times 180}$$

$$= \frac{5x}{6y}$$

It is clear that new fraction is $\frac{5}{6}$ of the original fraction.

227. Sum of numerator and denominator of a fraction is 13. Adding 3 and 9 to the numerator and denominator respectively, the fraction becomes 2/3. What is the product of the numerator and denominator of the original fraction?

(a) 45 (b) 42

(c) 30 (d) 24

RRB JE - 25/05/2019 (Shift-II)

Ans : (b)

Let the numerator is x and the denominator is y.

So, $x + y = 13$ ..... (i)

$$\frac{x+3}{y+9} = \frac{2}{3}$$

$3x + 9 = 2y + 18$

$3x - 2y = 9$ ..... (ii)

From equation (i) and (ii),

$x = 7, y = 6$

So, the required product = $xy = 7 \times 6 = 42$

228. A cake is shared among five friends. Four of them get the share of the cake $\frac{1}{8}, \frac{1}{6}, \frac{5}{12}, \frac{1}{12}$ respectively. What is the 5th's share of the cake?

(a) $\frac{1}{6}$ (b) $\frac{5}{24}$

(c) $\frac{1}{4}$ (d) $\frac{3}{8}$

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) The share of the cake all four get

$$= \frac{1}{8} + \frac{1}{6} + \frac{5}{12} + \frac{1}{12}$$

$$= \left(\frac{6+8}{48}\right) + \frac{6}{12} = \frac{14}{48} + \frac{6}{12} = \frac{7}{24} + \frac{6}{12} = \frac{19}{24}$$

Hence, the 5th's share of the cake $= 1 - \frac{19}{24} = \frac{5}{24}$

229. $\frac{2}{3}, \frac{4}{6}, \frac{6}{9}$ are–

(a) Odd (b) Irreducible

(c) Equivalent (d) Alike (equal)

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (c) From given fractions,

$$\frac{2}{3} = 0.\overline{6}$$

$$\frac{4}{6} = 0.\overline{6}$$

$$\frac{6}{9} = 0.\overline{6}$$

$$\frac{2}{3} = \frac{4}{6} = \frac{6}{9}$$

Hence, it is clear that all the given fractions are Equivalent.

230. Saniya won 18 games out of 27 games played. Calculate the games lost in terms of decimal.

(a) 0.333 (b) 0.033

(c) 0.50 (d) 0.667

RRB NTPC 12.04.2016 Shift : 1

Ans : (a)

$$\text{The number of games lost, } = \frac{27-18}{27}$$

$$= \frac{9}{27} = \frac{1}{3} = 0.333$$

231. 0.1, 0.9, 0.01, 0.09, ……., 0.009

(a) 0.0001 (b) 0.1010

(c) 0.001 (d) 0.0011

RRB RPF-SI -13/01/2019 (Shift-II)

Ans : (c) Given,

0.1, 0.9, 0.01, 0.09, ..., 0.009

So, the missing term is 0.001,

When we make pairs of two- two, then the pattern showed in blank is 0.001, 0.009.

232. If $\frac{60}{75}$ is equivalent to $\frac{4}{x}$ then the value of x is :

(a) 15 (b) 4

(c) 18 (d) 5

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (d) According to the question,

$$\frac{60}{75} = \frac{4}{x}$$

$$\Rightarrow \quad x = \frac{4 \times 75}{60}$$

$$\Rightarrow \quad x = 5$$

Hence, the value of x is 5.

03.

Surds and Indices

Type - 1

1. The positive square root of $(34^2 - 16^2)$ is:

(a) 40 (b) 50

(c) 60 (d) 30

RRB Group-D 02/09/2022 (Shift-I)

Ans. (d) : The positive square root of $(34^2 - 16^2)$

$= \sqrt{(34)^2 - (16)^2}$

$= \sqrt{(34+16)(34-16)}$

$= \sqrt{50 \times 18}$

$= \sqrt{900}$

$= 30$

2. The positive square root of $\left(6+2\sqrt{3}\right)\left(6-2\sqrt{3}\right)$ is _____.

(a) 12 (b) $6\sqrt{2}$

(c) 24 (d) $2\sqrt{6}$

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (d) :

square root of $\left(6+2\sqrt{3}\right)\left(6-2\sqrt{3}\right)$

$= \sqrt{\left(6+2\sqrt{3}\right)\left(6-2\sqrt{3}\right)}$

$= \sqrt{(6)^2 - \left(2\sqrt{3}\right)^2}$

$= \sqrt{36-12}$

$= \sqrt{24}$

$= 2\sqrt{6}$

3. The mixes surds form of $\sqrt{1350}$ is:

(a) $14\sqrt{6}$ (b) $13\sqrt{6}$

(c) $12\sqrt{6}$ (d) $15\sqrt{6}$

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

$\sqrt{1350} = \sqrt{2 \times 3 \times 3 \times 3 \times 5 \times 5}$

$= 15\sqrt{6}$

4. Find the value of $\sqrt{2025}$.

(a) 65 (b) 25

(c) 55 (d) 45

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$\sqrt{2025}$

$= \sqrt{45 \times 45}$

$= 45$

5. Which of the following numbers is not a perfect square?

(a) 41,616 (b) 16,384

(c) 23,102 (d) 97,344

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (c) : The unit digit of any perfect square number can be 0, 1, 4, 5, 6 and 9, while 2, 3, 7 and 8 cannot.
The unit digit of the number given in option (c) is 2.
So it is not a perfect square.

6. The value of square root of 90 will lie between.....

(a) 9 and 10 (b) 10 and 11

(c) 8 and 9 (d) 7 and 8

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : From option (a)
Square of 9 = 81
Square of 10 = 100
It is clear that the square root of 90 will lie between 9 and 10.

$\sqrt{90} = 9.487$

7. The value of $\sqrt{4}$ is

(a) 4 (b) 2 or –2

(c) Only 2 (d) Only –2

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

$a = \sqrt{4}$

$a = \pm 2$

$a = 2$ or -2

8. Solve the given equation

$\sqrt{(544)^2 - (256)^2} = ?$

(a) 144 (b) 480

(c) 288 (d) 400

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) : $\sqrt{(544)^2 - (256)^2} = ?$

Let $? = x$

$\sqrt{(544)^2 - (256)^2} = x$

On Taking both side square.

$(544)^2 - (256)^2 = x^2 \qquad \left[a^2 - b^2 = (a+b)(a-b)\right]$

$800 \times 288 = x^2$

$100 \times 2304 = x^2$

$\boxed{x = 480}$

9. The value of $\sqrt{142884}$ is

(a) 368 (b) 388

(c) 378 (d) 358

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c) :

$x = \sqrt{142884}$

$x^2 = 378 \times 378$

$x^2 = (378)^2$

$\boxed{x = 378}$

Second Method

	378
3	142884
3	9
67	528
7	469
748	5984
8	5984
	××××

10. The square root of 18769 consists of how many digits?

(a) 2 (b) 3

(c) 4 (d) 5

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (b) :

	137
1	18769
1	1
23	×87
3	69
267	1869
7	1869
	××××

= 137

Hence square root of 18769 consists of 3 digits.

11. Find the value of $\sqrt{20^2 - 16^2}$

(a) 14 (b) 16

(c) 18 (d) 12

RRB RPF Constable -20/01/2019 (Shift-II)

Ans : (d) Given, $\sqrt{20^2 - 16^2}$

From- $a^2 - b^2 = (a + b)(a - b)$

$\Rightarrow \sqrt{(20+16)(20-16)}$

$\Rightarrow \sqrt{36 \times 4}$

$\Rightarrow 6 \times 2$

$\Rightarrow 12$

12. The square root of 10201 is:

(a) 91 (b) 99

(c) 101 (d) 111

RRB RPF Constable -18/01/2019 (Shift-I)

Ans : (c) On Finding the square root by division method,

	101
1	10201
+1	1
201	×0201
1	0201
	××××

Hence, the square root of 10201 is 101.

13. The square root of 519841 is:

(a) 721 (b) 629

(c) 631 (d) 731

RRB RPF SI -10/01/2019 (Shift-II)

Ans. (a) : Square root of 519841

	721
7	519841
+7	49
142	298
+2	284
1441	1441
1	1441
	××××

Hence, the square root of 519841 is 721.

14. What is the square root of 34596 ?

(a) 174 (b) 176

(c) 204 (d) 186

RRB RPF Constable -19/01/2019 (Shift-II)

Ans. (d) Square root of 34596

	186
1	34596
+1	1
28	245
+8	224
366	2196
6	2196
	××××

So, the required square root of the given number is 186.

15. What is the square root of 11881?

(a) 109 (b) 119

(c) 111 (d) 101

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) : Square root of 11881

	109
1	1 1 8 8 1
1	1
209	1 8 8 1
9	1 8 8 1
	××××

So, the required square root is 109.

16. Which of the following is the square root of 14161 ?

(a) 129 (b) 121

(c) 119 (d) 131

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (c) On finding the square root of 14161

	119
1	14161
+1	1
21	×41
+1	21
229	2061
9	2061
	××××

Hence, 119 is the square root of 14161.

17. What is the square root of 7569 ?

(a) 77 (b) 87

(c) 93 (d) 83

RRB Group-D–03/10/2018 (Shift-II)

Ans : (b) Square root of 7569

	87
8	7569
8	64
167	1169
7	1169
	××××

Hence, the square root of 7569 is 87

18. What is the square root of 8281 ?

(a) 81 (b) 91

(c) 89 (d) 99

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (b) Square root of 8281

	91
9	$\overline{82}\,\overline{81}$
9	81
181	181
1	181
	××

Hence, the required square root is 91.

19. What is the square root of 3364 ?

(a) 64 (b) 62

(c) 58 (d) 52

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (c) Square root of 3364

		5	8		
	5	3	3	6	4
+	5	2	5		
10	8		8	6	4
	8		8	6	4
			×	×	×

Hence, the required square root is 58.

20. What is the value of $\sqrt{183184}$?

(a) 414 (b) 432

(c) 428 (d) 416

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (c) $\sqrt{183184}$ = The square root of 183184.

So finding the square root of 183184,

			4	2	8		
		4	1	8	3	1	8	4
	+	4	1	6				
	8	2	×	2	3	1		
+		2		1	6	4		
8	4	8			6	7	8	4
		8			6	7	8	4
					×	×	×	×

Hence, the required value is 428.

21. The square root of 60025 is:

(a) 275 (b) 255

(c) 245 (d) 265

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (c) : On finding the square root of 60025 by factorization method,

5	60025
5	12005
7	2401
7	343
7	49
7	7
	1

$\sqrt{60025} = \sqrt{5\times5\times7\times7\times7\times7}$

$= 5 \times 7 \times 7$

$= 5 \times 49 = 245$

Hence, the required square root is 245.

22. The square root of 4624 is:

(a) 62 (b) 72

(c) 78 (d) 68

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (d) : On finding the square root by factorization method,

2	4624
2	2312
2	1156
2	578
17	289
17	17
	1

$\sqrt{4624} = \sqrt{2\times2\times2\times2\times17\times17}$

$= 2 \times 2 \times 17$

$= 4 \times 17 = 68$

Hence, the required square root is 68.

23. What is the square root of 5476?

(a) 84 (b) 74

(c) 66 (d) 76

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (b) Finding the square root of 5476 by division method,

	74
7	$\overline{54}\overline{76}$
+7	49
144	576
4	576
	×××

Hence, the required square root is 74,

24. The square root of 4356 is:

(a) 76 (b) 64
(c) 84 (d) 66

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : Finding the square root by division method,

	66
6	4356
6	36
126	× 756
6	756
	×××

Hence, the required square root is 66.

25. Find the square root of 15625.

(a) 145 (b) 125
(c) 135 (d) 150

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (b) On finding the square root by division method,

	125
1	$\overline{1}\,\overline{56}\,\overline{25}$
+1	1
22	56
+2	44
245	1225
5	1225
	××××

$\sqrt{15625}$ = 125

Hence, the square root of 15625 is 125.

26. The square root of 10816 is:

(a) 106 (b) 96
(c) 114 (d) 104

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans. (d) : The square root of 10816

	104
1	10816
+1	1
20	08
+0	00
204	816
4	816
	×××

Hence, the required square root is 104.

27. Find the value of $\sqrt{37249}$ –

(a) 183 (b) 187
(c) 197 (d) 193

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (d) $\sqrt{37249}$ = square root of 37249.

So, finding the square root,

	193
1	$\overline{37}\,\overline{249}$
+1	1
29	272
+9	261
383	1149
3	1149
	××××

Hence, the value of given number is 193.

28. Solve the following equation.

$\sqrt{54}\times\sqrt{6}=?$

(a) 18 (b) 19
(c) 20 (d) 16

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (a) From given equation,

$\sqrt{54}\times\sqrt{6}$

From, $\sqrt[a]{m}\times\sqrt[a]{n}=\sqrt[a]{m\times n}$

$=\sqrt{54\times6}$

$=\sqrt{324}$

$=18$

29. What will be the square root of 25281?

(a) 149 (b) 143
(c) 139 (d) 159

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (d) On finding the square root by division method,

	159
1	$\overline{25}\,\overline{281}$
+1	1
25	152
+5	125
309	2781
9	2781
	××××

Hence, the required square root is 159.

30. What is the square root of 39204?

(a) 198 (b) 196
(c) 194 (d) 202

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (a) The square root of 39204

	198
1	39204
+1	1
29	292
+9	261
388	3104
8	3104
	××××

Hence the square root of 39204 will be 198.

31. Which of the following is the square root of 35721?

(a) 179 (b) 189

(c) 171 (d) 201

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (b) From options

(a) $179 \rightarrow (179)^2 = 32041$

(b) $189 \rightarrow (189)^2 = \boxed{35721}$

(c) $171 \rightarrow (171)^2 = 29241$

(d) $201 \rightarrow (201)^2 = 40401$

Hence the square root of 35721 is '189'.

32. The square root of 41616 is:

(a) 196 (b) 204

(c) 186 (d) 194

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (b) Square root of 41616

	204
2	41616
2	4
404	1616
4	1616
	××××

Hence, the square root of 41616 is 204.

33. What is the square root of 16641?

(a) 139 (b) 121

(c) 129 (d) 131

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (c) The square root of $16641 = \sqrt{16641}$

$= \sqrt{3\times3\times43\times43} = 3\times43 = 129$

Hence, the required square root is 129.

34. What is the square root of 243049?

(a) 497 (b) 503

(c) 493 (d) 487

RRB Group-D – 15/11/2018 (Shift-III)

Ans (c) On Finding the square root by division method,

$\sqrt{243049} = ?$

	493
4	243049
+4	16
89	830
+9	801
983	2949
+3	2949
	××××

Hence, the required square root is 493.

35. How much is the square root of 21904?

(a) 144 (b) 146

(c) 152 (d) 148

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (d) Square root of 21904

	148
1	21904
+1	1
24	119
+4	96
288	2304
8	2304
	××××

Hence, the required square root is 148.

36. What is the square root of 16129?

(a) 143 (b) 137

(c) 127 (d) 117

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) Square root of 16129

	127
1	16129
+1	1
22	61
+2	44
247	1729
7	1729
	××××

Hence, the square root of 16129 is 127.

37. How much is the square root of 10404?

(a) 102 (b) 106

(c) 98 (d) 104

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (a) The square root of 10404,

$\sqrt{10404} = \sqrt{2\times2\times3\times3\times17\times17}$

$= 2 \times 3 \times 17 = 102$

Hence, the square root is 102.

38. How much is the square root of 1521?

(a) 41 (b) 39

(c) 31 (d) 49

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (b) The square root of 1521

	39
3	15 21
+3	9
69	621
+9	621
	×××

Hence, the required square root is 39.

39. The square root of 16900 is:

(a) 130 (b) 110

(c) 140 (d) 120

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (a) Square root of 16900

	130
1	16900
+1	1
23	×69
+3	69
260	××00
+ 0	00
	××

Hence, the required square root is 130.

Type - 2

40. Simplify.

$4\sqrt{0.000081}$

(a) 0.36 (b) 0.036
(c) 0.0036 (d) 0.0018

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : $4\sqrt{0.000081} = 4 \times 0.009$
$= 0.036$

41. Find the square root of 42.25.

(a) 7.5 (b) 4.5
(c) 6.5 (d) 5.5

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (c) : From question,
x = 42.25

$$\sqrt{x} = \sqrt{\frac{4225}{100}} = \frac{65}{10} = \frac{13}{2} = 6.5$$

42. The square root of 13.69 is:

(a) 3.7 (b) 37
(c) 0.037 (d) 0.37

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (a) The square root of 13.69 by division method,

	3.7
3	13.69
3	9
67	469
7	469
	×××

Hence, the required square root of 13.69 is 3.7.

43. $\sqrt{0.00069169} = ?$

(a) 0.00243 (b) 0.000243
(c) 0.0263 (d) 0.243

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (c) : From given number,

$$\sqrt{0.00069169} = \sqrt{\frac{69169}{100000000}}$$

$$= \sqrt{\frac{69169}{100000000}} = \sqrt{\frac{263 \times 263}{10000 \times 10000}} = \frac{263}{10000} = 0.0263$$

44. Find the square root of 0.0324.

(a) 0.18 (b) 1.8
(c) 1.08 (d) 0.018

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (a) The square root of given number,

$$\sqrt{0.0324} = \sqrt{\frac{324}{10000}}$$

$$= \sqrt{\frac{18 \times 18}{100 \times 100}}$$

$$= \frac{18}{100} = 0.18$$

Hence, the required square root is 0.18.

45. Find the value of $\sqrt{4.2436}$

(a) 2.14 (b) 2.16
(c) 2.04 (d) 2.06

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : $\sqrt{4.2436}$ = Square root of 4.2436

	206
2	42436
+2	4
406	×2436
6	2436
	××××

$$\sqrt{4.2436} = \sqrt{\frac{42436}{10000}} = \frac{206}{100} = 2.06$$

46. Find the value of $\sqrt{0.5}$ –

(a) 0.707 (b) 0.947
(c) 0.787 (d) 0.897

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (a) $\sqrt{0.5}$ = Square root of 0.50000

	0.707
7	0.500000
+7	49
1407	10000
7	9849
	151

Hence, the square root of 0.5 is 0.707 (Approx). So, ($\sqrt{0.5}$ = 0.707)

47. Find the value of $\sqrt{0.6}$ –

(a) 0.944 (b) 0.874
(c) 0.894 (d) 0.774

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (d) : $\sqrt{0.6}$ = Square root of 0.600000
So, finding the square root by division method,

	0.774
7	0.600000
+7	49
147	1100
+7	1029
1544	7100
4	6176
	924

Hence the required value is 0.774 (approx).

48. What is the value of $\sqrt{0.8}$

(a) 0.964 (b) 0.694
(c) 0.894 (d) 0.984

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (c) $\sqrt{0.8}$ = square root of 0.800000
So, finding the square root

	0.	8	9	4
8	0.	80	00	00
+8		64		
169		16	00	
+ 9		15	21	
1784			79	00
4			71	36
			7	64

Hence, the value of $\sqrt{0.8}$ is 0.894.

49. The value of $\sqrt{0.0144}$ is:

(a) 0.12 (b) 0.012
(c) 1.2 (d) 0.0012

RRB NTPC 27.04.2016 Shift : 1

Ans : (a) On finding the square root of 0.0144 by division method,

	0.12
1	0.0144
1	01
22	44
+2	44
	××

Hence, the square root of 0.0144 = $\sqrt{0.0144}$ = 0.12

50. $\sqrt{0.015625} \times \sqrt{0.0256}$ = _____

(a) 0.004 (b) 0.002
(c) 0.04 (d) 0.02

RRB ALP CBT-2 Elec. - Mec. 21-01-2019 (Shift-II)

Ans. (d) : $\sqrt{0.015625} \times \sqrt{0.0256}$
$= \sqrt{0.125 \times 0.125} \times \sqrt{0.16 \times 0.16}$
= 0.125 × 0.16
= 0.02

51. Solve the following.

$\sqrt{0.2025} + \sqrt{0.1225}$ = _____

(a) 1.2 (b) 0.6
(c) 0.9 (d) 0.8

RRB ALP CBT-2 Mec. - Diesel 23-01-2019 (Shift-II)

Ans. (d) : $\sqrt{0.2025} + \sqrt{0.1225}$
$= \sqrt{0.45 \times 0.45} + \sqrt{0.35 \times 0.35}$
= 0.45 + 0.35
= 0.8

Type - 3

52. Simplify the following expression.

$\sqrt{12.5 \times 8 \times 1.44}$

(a) 13 (b) 12
(c) 15 (d) 10

RRB NTPC (Stage-2) 16/06/2022 (Shift-I)

Ans. (b) : $\sqrt{12.5 \times 8 \times 1.44}$

$$= \sqrt{\frac{125}{10} \times \frac{144}{100} \times 8}$$

$$= \sqrt{\frac{5 \times 5 \times 5 \times 12 \times 12 \times 2 \times 2 \times 2}{10 \times 100}}$$

$$= \frac{5 \times 12 \times 2}{10}$$

= 12

53. Find the value of $\sqrt{144} + \sqrt{0.0169} - \sqrt{4.41}$

(a) 14.23
(b) 11.2
(c) 15.2
(d) 10.03

RRB Group-D 23/08/2022 (Shift-I)

Ans. (d) : $\sqrt{144} + \sqrt{0.0169} - \sqrt{4.41}$
= 12 + 0.13 – 2.1
= 12.13 – 2.1
= 10.03

54. Find the value of

$0.6 + \left(\sqrt{0.81} - \left(\sqrt{0.0144} + 0.4 \div 0.5\right)\right)$

(a) 0.62 (b) 0.82
(c) 0.58 (d) 0.78

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (c) : Given -

$0.6 + \left(\sqrt{0.81} - \left(\sqrt{0.0144} + 0.4 \div 0.5\right)\right)$

$= 0.6 + \left(0.9 - \left(0.12 + 0.4 \div 0.5\right)\right)$

$= 0.6 + \left(0.9 - \left(0.12 + \frac{4}{5}\right)\right)$

$= 0.6 + \left(0.9 - \left(0.12 + 0.8\right)\right)$

$= 0.6 + \left(0.9 - 0.92\right)$

= 0.58

55. What is the value of x, if

$-3 \times \sqrt{196} + \sqrt{x} = 8 \times 3 - 2$?

(a) 1064 (b) 135
(c) 128 (d) 4096

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$-3\times\sqrt{196}+\sqrt{x}=8\times3-2$

$-3\times14+\sqrt{x}=24-2$

$-42+\sqrt{x}=22$

$\sqrt{x}=22+42$

$\sqrt{x}=64$

On squaring of both sides,

$(\sqrt{x})^2=(64)^2$

$x=64\times64$

$x=4096$

56. If $x\sqrt{12}=4+x\sqrt{3}$, then the value of x is .

(a) $\sqrt{3}$ (b) $\frac{4}{\sqrt{3}}$

(c) $2\sqrt{3}$ (d) $-\sqrt{3}$

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\Rightarrow x\sqrt{12}=4+x\sqrt{3}$

$\Rightarrow 2x\sqrt{3}=4+x\sqrt{3}$

$\Rightarrow x(2\sqrt{3}-\sqrt{3})=4$

$x=\frac{4}{\sqrt{3}}$

57. The value of $\sqrt{72\times18}+\sqrt{0.04}+\sqrt{0.64}$ will be equal to

(a) 24 (b) 12

(c) 36 (d) 37

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : $\sqrt{72\times18}+\sqrt{0.04}+\sqrt{0.64}$

$=\sqrt{9\times8\times2\times9}+0.2+0.8$

$=9\times4+1$

$=36+1$

$=37$

58. The expression (21.98 ×21.98+ 21.98 X + 0.04 × 0.04) will be a perfect square if X = ?

(a) 0.08 (b) 0.20

(c) 0.02 (d) 0.40

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (a) : $21.98\times21.98+21.98X+0.04\times0.04$

$\Rightarrow (21.98)^2+(.04)^2+\underline{2\times0.04}\times21.98$

$(a+b)^2=a^2+b^2+2a\times b$

then $2\times.04=X$

$X=0.08$

59. If $\sqrt{0.003\times0.3\times p}=0.3\times0.03\times\sqrt{q}$, then find the value of p/q is:

(a) 0.9 (b) 0.0009

(c) 0.09 (d) 0.009

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : $\sqrt{0.003\times0.3\times p}=0.3\times0.03\times\sqrt{q}$

$\sqrt{\frac{p}{q}}=\frac{0.3\times0.03}{\sqrt{0.003\times0.3}}$

On squaring of both sides,

$\frac{p}{q}=\frac{0.09\times0.0009}{0.003\times0.3}$

$\frac{p}{q}=\frac{0.000081}{0.0009}$

$\frac{p}{q}=0.09$

60. If $\sqrt{\left(2116\times\sqrt{48\div x}\right)}=92$, find the value of x.

(a) 6 (b) 2

(c) 12 (d) 3

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\sqrt{2116\times\sqrt{48\div x}}=92$

On squaring of both sides,

$2116\times\sqrt{\frac{48}{x}}=92\times92$

$\frac{48}{x}=4\times4$

$x=3$

61. If $\sqrt{225}=15$ then the value of $\sqrt{2.25}+\sqrt{0.0225}+\sqrt{0.000225}$ is:

(a) 1.645 (b) 1.689

(c) 1.665 (d) 1.675

RRB NTPC 13.03.2021 (Shift-I) Stage I

Ans. (c) : Given,

$\sqrt{225}=15$

The value of $\sqrt{2.25}+\sqrt{0.0225}+\sqrt{0.000225}$

$=1.5+0.15+0.015$

$=1.665$

62. If $\sqrt{2916}=54$ then what is the value of the following?

$\sqrt{29.16}+\sqrt{0.2916}+\sqrt{0.002916}+\sqrt{0.00002916}$

(a) 5.9994 (b) 5.90

(c) 6.00 (d) 5.999

RRB NTPC 01.02.2021 (Shift-II) Stage I

Ans. (a) Given, $\sqrt{2916}=54$

Then, $\sqrt{29.16}+\sqrt{0.2916}+\sqrt{0.002916}+\sqrt{0.00002916}$

$=5.4+0.54+0.054+0.0054=5.9994$

63. If $\sqrt{54}+\sqrt{150}=19.60$, then what will be the value of $\sqrt{216}+\sqrt{96}$ be? Give your answer, correct to one decimal place.

(a) 24.6 (b) 24.5

(c) 17.7 (d) 23.9

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given, $\sqrt{54}+\sqrt{150}=19.60$

$3\sqrt{6}+5\sqrt{6}=19.60$

$8\sqrt{6}=19.60$

$\sqrt{6} = 2.45$

$\because \quad \sqrt{216} + \sqrt{96} = 6\sqrt{6} + 4\sqrt{6}$

$= 10\sqrt{6}$

$= 10 \times 2.45$

$= 24.5$

64. If $\sqrt{45} + \sqrt{125} = 17.88$ then what will be the value of $\sqrt{180} + \sqrt{80}$?

(a) 13.4 (b) 21.6

(c) 22.35 (d) 22.2

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$\sqrt{45} + \sqrt{125} = 17.88$

$= 3\sqrt{5} + 5\sqrt{5} = 17.88$

$= 8\sqrt{5} = 17.88$

$\sqrt{5} = \frac{17.88}{8}$ ..... (i)

then $\sqrt{180} + \sqrt{80} = 6\sqrt{5} + 4\sqrt{5} = 10\sqrt{5}$

From equation (i)

$\therefore \quad 10\sqrt{5} = \frac{17.88}{8} \times 10 = 22.35$

65. The sum of the square roots of two integers is $\sqrt{14+8\sqrt{3}}$, what is the sum of their squares?

(a) 144 (b) 388

(c) 100 (d) 162

RRB Group-D – 02/11/2018 (Shift-II)

Ans : (c) Let the integers are x and y.

According to the question,

$\sqrt{x} + \sqrt{y} = \sqrt{14+8\sqrt{3}}$

On squaring both sides,

$\left(\sqrt{x} + \sqrt{y}\right)^2 = \left(\sqrt{14+8\sqrt{3}}\right)^2$

$x + y + 2\sqrt{xy} = 14 + 8\sqrt{3}$

On comparing,

$x + y = 14$ .....(I)

$2\sqrt{xy} = 8\sqrt{3}$

$\sqrt{xy} = 4\sqrt{3}$

$xy = 48$ ..... (II)

From equation (I),

$x + y = 14$

On squaring both sides,

$(x+y)^2 = (14)^2$

$x^2 + y^2 + 2xy = 196$

$x^2 + y^2 = 196 - 2 \times 48 = 196 - 96 = 100$

Hence, the required sum will be 100.

66. If $\sqrt{0.0361}$ x = 1.9, then x = ?

(a) 1000 (b) 10

(c) 100 (d) 1

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (b) Given,

$\sqrt{0.0361}\ x = 1.9$

$x = \frac{1.9}{\sqrt{0.0361}}$

$= \frac{1.9}{0.19} = 10$

67. If $\sqrt{4225} = 65$ Find the value of $\sqrt{42.25} + \sqrt{0.4225}$.

(a) 6.5 (b) 7.25

(c) 6.25 (d) 7.15

RRB JE - 30/05/2019 (Shift-III)

Ans : (d) Given $\sqrt{4225} = 65$

Then, $\sqrt{42.25} + \sqrt{0.4225}$

= 6.5 + .65 ..(Square root of 4225 = 65)

= 7.15

Hence, the required value is 7.15

68. If $\sqrt{7}$ = 2.6457 and $\sqrt{3}$ =1.732, Then find the value of $\frac{1}{\sqrt{7} - \sqrt{3}}$

(a) 1.0944 (b) 1.944

(c) 1.009 (d) 1.0844

RRB RPF Constable -25/01/2019 (Shift-III)

Ans : (a) Given,

$\sqrt{7} = 2.6457$

$\sqrt{3} = 1.732$

then,

$\frac{1}{\sqrt{7} - \sqrt{3}} = \frac{\left(\sqrt{7} + \sqrt{3}\right)}{\left(\sqrt{7} - \sqrt{3}\right) \times \left(\sqrt{7} + \sqrt{3}\right)} = \frac{\sqrt{7} + \sqrt{3}}{4}$

$= \frac{2.6457 + 1.732}{4} = \frac{4.3777}{4} = 1.0944$

Hence, the required value is 1.0944.

69. If $\frac{0.27}{p^2} = 27$, p = ?

(a) 0.001 (b) 0.1

(c) 0.01 (d) 1.0

RRB RPF SI -13/01/2019 (Shift-II)

Ans. (b) Given,

$\frac{0.27}{p^2} = 27$

$p^2 = \frac{0.27}{27} = \frac{27}{2700}$

$p^2 = \frac{1}{100} = \left(\frac{1}{10}\right)^2$

$p = \frac{1}{10} = 0.1$

70. If $\sqrt{45}+\sqrt{20}=11.180$, then find the value of $\sqrt{180}+4\sqrt{5}$

(a) 22.360 (b) 24.595
(c) 20.124 (d) 17.888

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) : Given,

$\sqrt{45}+\sqrt{20}=11.180, \Rightarrow \sqrt{45}+2\sqrt{5}=11.180$

$\sqrt{180}+4\sqrt{5}=2\sqrt{45}+4\sqrt{5}$

$2\left(\sqrt{45}+2\sqrt{5}\right)=2\times 11.180=22.360$

71. If $3\sqrt{5}+\sqrt{125}=17.84$ Then, how much will be $\sqrt{80}+7\sqrt{5}$

(a) 33.3 (b) 24.53
(c) 22.0 (d) 22.3

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (b) Given,

$3\sqrt{5}+\sqrt{125}=17.84$

$3\sqrt{5}+5\sqrt{5}=17.84$

$8\sqrt{5}=17.84$

$\sqrt{5}=\dfrac{17.84}{8}=2.23$

According to the question, $\sqrt{80}+7\sqrt{5}$

$\sqrt{16\times 5}+7\sqrt{5}=4\sqrt{5}+7\sqrt{5}=11\sqrt{5}$

Putting the value of $\sqrt{5}$

$11\sqrt{5}=11\times 2.23=24.53$

72. If $\sqrt{50}+\sqrt{128}=\sqrt{N}$ then what is the value of N?

(a) 26 (b) 390
(c) 338 (d) 182

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (c) Given,

$\sqrt{50}+\sqrt{128}=\sqrt{N}$

$\sqrt{25\times 2}+\sqrt{64\times 2}=\sqrt{N}$

$5\sqrt{2}+8\sqrt{2}=\sqrt{N}$

$13\sqrt{2}=\sqrt{N}$

Squaring on both side,

$\left(13\sqrt{2}\right)^2=\left(\sqrt{N}\right)^2$

$169\times 2=N$

$338=N$

$\boxed{N=338}$

73. If $\sqrt{5}=2.236$, then $\sqrt{5}/\sqrt{2}=?$

(a) 1.581 (b) 1.851
(c) 2.236 (d) 1.782

RRB NTPC 29.04.2016 Shift : 2

Ans : (a) Given,

$\because \sqrt{5}=2.236$ and as we know that $\sqrt{2}=1.414$

$$\frac{\sqrt{5}}{\sqrt{2}}=\frac{2.236}{1.414}=1.581$$

74. Simplify the following expression:

$7\sqrt{48}+7\sqrt{147}$

(a) $77\sqrt{7}$ (b) $76\sqrt{3}$
(c) $76\sqrt{7}$ (d) $77\sqrt{3}$

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (d) From given expression,

$7\sqrt{48}+7\sqrt{147}$

$=7\sqrt{16\times 3}+7\sqrt{49\times 3}$

$=7\sqrt{4\times 4\times 3}+7\sqrt{7\times 7\times 3}$

$=28\sqrt{3}+49\sqrt{3}$

$=77\sqrt{3}$

75. If $\sqrt{0.0169}\ x=1.3$, then x = ?

(a) 10 (b) 1
(c) 100 (d) 1000

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) Given,

$\sqrt{0.0169}\ x=1.3$

$x=\dfrac{1.3}{\sqrt{0.0169}}=\dfrac{1.3}{.13}$

$\boxed{x=10}$

Hence, the required value is 10.

76. If $X^2=841$, then what will be the value of X?

(a) 29 (b) 41
(c) 39 (d) 31

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) Given,

$X^2=841$

$X^2=29\times 29$

$X=\sqrt{29\times 29}$

$X=29$

Hence, the value of x is 29.

77. The value of $\sqrt{214+\sqrt{107+\sqrt{196}}}$

(a) 23 (b) 15
(c) 24 (d) 18

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (b) : $\sqrt{214+\sqrt{107+\sqrt{196}}}$

$\Rightarrow \sqrt{214+\sqrt{107+14}}$

$\Rightarrow \sqrt{214+\sqrt{121}}$

$\Rightarrow \sqrt{214+11}$

$\Rightarrow \sqrt{225}$

$\Rightarrow \sqrt{15\times 15}$

$=15$

78. Solve the following:

$\sqrt{(8+2\sqrt{15})(8-2\sqrt{15})}$

(a) 1 (b) 2
(c) 3 (d) 4

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (b) Given,

$\sqrt{(8+2\sqrt{15})(8-2\sqrt{15})}$

from $(a^2-b^2)=(a+b)(a-b)$

$\sqrt{(8)^2-\left(2\sqrt{15}\right)^2}$

$=\sqrt{64-4\times15}$

$=\sqrt{64-60}=\sqrt{4}=2$

79. If $\sqrt{54}+\sqrt{150}=a$, What will be the value of $\sqrt{96}+\sqrt{216}$

(a) 1.20a (b) 1.50a

(c) 1.60a (d) 1.25a

RRB Group-D – 16/11/2018 (Shift-I)

Ans : (d) Given,

$\sqrt{54}+\sqrt{150}=a$

$\sqrt{2\times3\times3\times3}+\sqrt{2\times3\times5\times5}=a$

$3\sqrt{6}+5\sqrt{6}=a$

$8\sqrt{6}=a$

$\boxed{\sqrt{6}=\frac{a}{8}}$ ...(i)

According to the question,

$\sqrt{96}+\sqrt{216}=?$

$\sqrt{2\times2\times2\times2\times2\times3}+\sqrt{2\times2\times2\times3\times3\times3}$

$4\sqrt{6}+6\sqrt{6}$

$\Rightarrow 10\sqrt{6}$ ...(ii)

From equation (i) and (ii),

$\Rightarrow \frac{a}{8}\times10 \Rightarrow \frac{5a}{4}=1.25a$

80. If $\sqrt{324}=x8$, then what will the value of x?

(a) 3 (b) 2

(c) 1 (d) 4

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (c) : $\sqrt{324}=x8$

Squaring on both side,

$324=(x8)^2$

On putting x = 1,

$324=(18)^2$

$324=324$

81. Simplify –

$4\sqrt{18}+7\sqrt{32}-2\sqrt{50}$

(a) $30\sqrt{2}$ (b) $32\sqrt{3}$

(c) $36\sqrt{2}$ (d) $30\sqrt{3}$

RRB NTPC 04.04.2016 Shift : 1

Ans : (a) Given expression,

$4\sqrt{18}+7\sqrt{32}-2\sqrt{50}$

$=4\sqrt{3\times3\times2}+7\sqrt{4\times4\times2}-2\sqrt{5\times5\times2}$

$=12\sqrt{2}+28\sqrt{2}-10\sqrt{2}$

$=30\sqrt{2}$

82. If $\sqrt{x^2+y^2}=25$ and $y=2x$ then find the value of x.

(a) 5 (b) 25

(c) $\sqrt{125}$ (d) $\sqrt{5}$

RRB NTPC 28.03.2016 Shift : 2

Ans :(c) $\sqrt{x^2+y^2}=25$, $y=2x$

$\sqrt{x^2+y^2}=25$ ..... (i)

On squaring equation (i),

$x^2+y^2=625$

$x^2+(2x)^2=625$ ($\because y=2x$)

$x^2+4x^2=625$

$5x^2=625$

$x^2=125$

$x=\sqrt{125}$

83. If $x+\sqrt{x}=90$, Find x.

(a) 81 (b) 64

(c) 80 (d) 72

RRB NTPC 12.04.2016 Shift : 1

Ans : (a) Given,

$x+\sqrt{x}=90$

$\Rightarrow \sqrt{x}=90-x$

On squaring both side,

$\left(\sqrt{x}\right)^2=(90-x)^2$

$\Rightarrow x=8100+x^2-180x$

$\Rightarrow x^2-181x+8100=0$

$\Rightarrow x^2-100x-81x+8100=0$

$\Rightarrow x(x-100)-81(x-100)=0$

$\Rightarrow (x-81)(x-100)=0$

$\Rightarrow x=81,100$

From, options the value of x will be 81.

84. If $\sqrt{0.0169\times x}=1.3$, then find the value of 'x'.

(a) 10 (b) 1000

(c) 50 (d) 100

RRB JE - 29/05/2019 (Shift-II)

Ans : (d) Given,

$\sqrt{0.0169\times x}=1.3$

$\sqrt{\frac{169\times x}{10000}}=\frac{13}{10}$

Squaring on both side,

$\frac{169\times x}{10000}=\frac{169}{100}$

$x=100$

Type - 4

85. If $\sqrt{\left(1-\frac{99}{2500}\right)}=\frac{49}{\sqrt{x}}$ then find the value of x.

(a) 2500 (b) 2401

(c) 50 (d) 49

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : $\sqrt{\left(1-\frac{99}{2500}\right)}=\frac{49}{\sqrt{x}}$

On squaring both sides

$\Rightarrow \frac{2500-99}{2500}=\frac{(49)^2}{x}$

$\Rightarrow \frac{2401}{2500}=\frac{2401}{x}$

x = 2500

86. Value of the square root of $\frac{36.1}{102.4}$ is:

(a) $\frac{61}{340}$ (b) $\frac{19}{32}$

(c) $\frac{19}{34}$ (d) $\frac{19}{31}$

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : $\sqrt{\frac{36.1}{102.4}}=\sqrt{\frac{361}{1024}}$

$\sqrt{\frac{(19)^2}{(32)^2}}=\frac{19}{32}$

87. Find the square root

$\frac{((0.091)(0.11))}{((0.91)(1.331))}$

(a) $\frac{1}{11}$ (b) $\frac{2}{11}$

(c) $\frac{4}{11}$ (d) $\frac{3}{11}$

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) : $x=\frac{0.091\times0.11}{0.91\times1.331}=\frac{91\times11}{91\times1331}=\frac{1}{121}$

$\sqrt{x}=\sqrt{\frac{1}{121}}=\frac{1}{11}$

88. What is the value of $\sqrt{\frac{1.21\times0.9}{1.1\times0.11}}$?

(a) 6 (b) 3

(c) 12 (d) 9

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

$\sqrt{\frac{1.21\times0.9}{1.1\times0.11}}$

$=\sqrt{\frac{121\times9}{11\times11}}$

$=\sqrt{9}=3$

89. If $\sqrt{3}$ = 1.732, Then what is the value of $\frac{1}{\sqrt{3}}$

(a) 0.577 (b) 2.577

(c) 1.577 (d) 0.770

RRB RPF Constable -22/01/2019 (Shift-I)

Ans : (a) Given,

$\frac{1}{\sqrt{3}}=\frac{1}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}=\frac{\sqrt{3}}{3}$

$=\frac{1.732}{3}=0.57733$

Hence, the value of $\frac{1}{\sqrt{3}}$ = 0.57733.

90. If $\frac{A}{\sqrt{512}}=\frac{\sqrt{162}}{A}$, find the value of A.

(a) 144 (b) $12\sqrt{2}$

(c) 288 (d) 72

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (b) Given,

$\frac{A}{\sqrt{512}}=\frac{\sqrt{162}}{A}$

$A^2=\sqrt{8\times8\times8}\times\sqrt{9\times9\times2}$

$A^2=8\sqrt{8}\times9\sqrt{2}$

$A^2=72\sqrt{16}$

$A=\sqrt{72\times4}$

$A=12\sqrt{2}$

91. If $\frac{x}{\sqrt{243}}=\frac{\sqrt{2187}}{x}$, and x is positive, then what is the value of x ?

(a) 29 (b) 27

(c) 23 (d) 21

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (b) Given,

$\frac{x}{\sqrt{243}}=\frac{\sqrt{2187}}{x}$

$\Rightarrow \frac{x}{\sqrt{9\times9\times3}}=\frac{\sqrt{3\times9\times9\times9}}{x}$

$\Rightarrow \frac{x}{9\sqrt{3}}=\frac{27\sqrt{3}}{x}$

$\Rightarrow x^2=27\times9\times\sqrt{3}\times\sqrt{3}$

$x=\sqrt{27\times27}=27$

Hence, the value of x is 27.

92. Solve :-

$\frac{\sqrt{4375}}{\sqrt{7}}=?$

(a) 64 (b) 25

(c) 36 (d) 16

RRB RPF Constable -22/01/2019 (Shift-I)

Ans. (b) Given,

$$\frac{\sqrt{4375}}{\sqrt{7}} = \sqrt{\frac{4375}{7}}$$

$$= \sqrt{625} = \sqrt{25\times 25} = 25$$

93. Find the value of $\sqrt{\frac{576}{625}}$?

(a) 0.96 (b) 0.9
(c) 0.99 (d) 10

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (a) :

$$\sqrt{\frac{576}{625}} = \frac{24}{25}$$

$$= 0.96$$

94. Find the value of $\sqrt{58\frac{7}{9}}$

(a) $7\frac{2}{3}$ (b) $7\frac{7}{9}$
(c) $2\frac{2}{3}$ (d) $2\frac{7}{9}$

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (a) : $\sqrt{58\frac{7}{9}} = \sqrt{\frac{529}{9}} = \frac{23}{3} = 7\frac{2}{3}$

95. The square root of $5\frac{44}{49}$ is:

(a) $\frac{12}{7}$ (b) $\frac{17}{7}$
(c) $\frac{15}{7}$ (d) $\frac{16}{7}$

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (b) : Square root of $5\frac{44}{49} = \sqrt{\frac{289}{49}} = \frac{17}{7}$

96. Find the square root of

$$\frac{a^2}{b^2}+\frac{b^2}{a^2}+2$$

(a) $\frac{a}{2b}-\frac{b}{2a}$ (b) $\frac{a}{b}-\frac{b}{a}$
(c) $\frac{a-b}{2}$ (d) $\frac{a}{b}+\frac{b}{a}$

RRB JE - 02/06/2019 (Shift-II)

Ans. (d) The required square root,

$$= \sqrt{\frac{a^2}{b^2}+\frac{b^2}{a^2}+2}$$

$$\sqrt{\left(\frac{a}{b}+\frac{b}{a}\right)^2} = \left(\frac{a}{b}+\frac{b}{a}\right)$$

97. If $\sqrt{169}=13$, then $\frac{\left(\sqrt{.00000169}\right)}{13}$ is:

(a) 0.0013 (b) 0.001
(c) 0.0001 (d) 0.013

RRB RPF Constable -24/01/2019 (Shift-III)

Ans : (c) Given,

$$\because \sqrt{169} = 13$$

$$\frac{\sqrt{.00000169}}{13} = \sqrt{\frac{169}{100000000}}\times\frac{1}{13}$$

$$= \frac{13}{10000}\times\frac{1}{13} = \frac{1}{10000} = .0001$$

98. $(0.14/1.4)^2-(0.11/1.1)^2+(0.13/1.3)^2$=?

(a) 1.01 (b) 0.001
(c) 0.10 (d) 0.01

RRB RPF SI -11/01/2019 (Shift-II)

Ans : (d) From given expression,

$$\left(\frac{0.14}{1.4}\right)^2-\left(\frac{0.11}{1.1}\right)^2+\left(\frac{0.13}{1.3}\right)^2$$

$$=\left(\frac{14}{140}\right)^2-\left(\frac{11}{110}\right)^2+\left(\frac{13}{130}\right)^2$$

$$=\left(\frac{1}{10}\right)^2-\left(\frac{1}{10}\right)^2+\left(\frac{1}{10}\right)^2$$

$$= (0.1)^2-(0.1)^2+(0.1)^2$$

$$= 0.01-0.01+0.01$$

$$= 0.01$$

99. $\sqrt{\frac{?}{3136}} = \frac{1}{2}$ Find the value of '?'

(a) 56 (b) 784
(c) 1568 (d) 28

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (b) Given,

$$\sqrt{\frac{?}{3136}} = \frac{1}{2}$$

On squaring both side,

$$\left(\sqrt{\frac{?}{3136}}\right)^2 = \left(\frac{1}{2}\right)^2$$

$$\frac{?}{3136} = \frac{1}{4}$$

$$\boxed{? = 784}$$

100. What is the square root of $\frac{882}{1922}$ is:

(a) $\frac{21}{31}$ (b) $\frac{19}{31}$
(c) $\frac{22}{31}$ (d) $\frac{20}{31}$

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (a) Square root of

$$\sqrt{\frac{882}{1922}}=\sqrt{\frac{441}{961}}=\sqrt{\frac{21\times21}{31\times31}}=\frac{21}{31}$$

101. The square of $1\frac{3}{11}$ is–

(a) $\frac{16}{111}$ (b) $\frac{225}{112}$

(c) $\frac{196}{121}$ (d) $\frac{9}{121}$

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (c) : Square root of $1\frac{3}{11}$

$$=\left(\frac{14}{11}\right)^2$$

$$=\frac{196}{121}$$

102. The value of $\left(-\sqrt{\frac{144}{576}}\right)\times\left(-\frac{16}{\sqrt{64}}\right)$

(a) 4 (b) 9

(c) 1 (d) 0

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (c) Given expression,

$$\left(-\sqrt{\frac{144}{576}}\right)\times\left(-\frac{16}{\sqrt{64}}\right)$$

$$\Rightarrow\left(\frac{-12}{24}\right)\times\left(\frac{-16}{8}\right)$$

$$\Rightarrow\frac{12\times16}{24\times8}=\frac{192}{192}=1$$

103. The value of $\sqrt{\frac{256\times289}{4^3}}$

(a) 4.25 (b) 17

(c) 8.50 (d) 34

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (d) Given expression,

$$\sqrt{\frac{256\times289}{4^3}}=\frac{16\times17}{\sqrt{4\times4\times4}}=\frac{16\times17}{2\times2\times2}=34$$

104. $\frac{\sqrt{196}}{4.375}\times\frac{\sqrt{900}}{9.375}=?$

(a) 8.25 (b) 8.24

(c) 10.24 (d) 9.24

Ans. (c) From given expression,

$$\Rightarrow\frac{\sqrt{196}}{4.375}\times\frac{\sqrt{900}}{9.375}$$

$$\Rightarrow\frac{14}{4.375}\times\frac{30}{9.375}=\frac{420}{41.01}$$

$$\Rightarrow 10.24$$

105. Find the value of $\frac{\sqrt{0.64}}{\sqrt{0.16}}=?$

(a) 2 (b) 8

(c) 6 (d) 10

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (a) From given expression,

$$\Rightarrow\frac{\sqrt{0.64}}{\sqrt{0.16}}=?$$

$$=\frac{0.8}{0.4}=\frac{8}{4}=2$$

106. The value of $\frac{\sqrt{45}\times\sqrt{20}}{\sqrt{12}\times\sqrt{3}}$

(a) 9 (b) 6

(c) 15 (d) 5

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (d) Given,

$$\frac{\sqrt{45}\times\sqrt{20}}{\sqrt{12}\times\sqrt{3}}\Rightarrow\frac{3\sqrt{5}\times2\sqrt{5}}{2\sqrt{3}\times\sqrt{3}}$$

$$\Rightarrow\frac{30}{6}=\boxed{5}$$

107. Solve: $\frac{3\sqrt{121}-\sqrt{361}}{\sqrt{529}+2\sqrt{36}}$

(a) 3/5 (b) 4/7

(c) 1/4 (d) 2/5

RRB NTPC 28.03.2016 Shift : 3

Ans : (d) Given,

$$\frac{3\sqrt{121}-\sqrt{361}}{\sqrt{529}+2\sqrt{36}}=\frac{3\sqrt{11\times11}-\sqrt{19\times19}}{\sqrt{23\times23}+2\sqrt{6\times6}}$$

$$=\frac{33-19}{23+12}$$

$$=\frac{14}{35}=\frac{2}{5}$$

108. If $\sqrt{225}=15$ then $\left(\sqrt{0.00000225}\right)/15=$

(a) 0.0015 (b) 0.001

(c) 0.0001 (d) 0.015

RRB NTPC 12.04.2016 Shift : 1

Ans : (c) $\sqrt{225}=15$

According to the question,

$$\frac{\sqrt{0.00000225}}{15}$$

$$=\frac{\sqrt{\frac{225}{100000000}}}{15}$$

$$=\frac{15}{10000\times15}=\frac{1}{10000}=0.0001$$

109. If $\sqrt{256}=16$ then the value of $\frac{\sqrt{0.00000256}}{16}$ will be:

(a) 0.0016 (b) 0.001
(c) 0.0001 (d) 0.016

RRB NTPC 29.04.2016 Shift : 3

Ans. (c) Given,

$\sqrt{256} = 16$

So,

$$= \frac{\sqrt{\frac{256}{100000000}}}{16}$$

$$= \frac{16}{10000 \times 16}$$

$$= \frac{1}{10000} = 0.0001$$

110. If $\sqrt{9} = 3$ then the value of $\sqrt{81}/\sqrt{3}$

(a) 3 (b) $3/\sqrt{3}$
(c) $3\sqrt{3}$ (d) 9

RRB NTPC 29.04.2016 Shift : 3

Ans. (c) Given, $\sqrt{9} = 3$

So, $\frac{\sqrt{81}}{\sqrt{3}} = \frac{9}{\sqrt{3}} = \frac{3 \times \sqrt{3} \times \sqrt{3}}{\sqrt{3}} = 3\sqrt{3}$

111. If $\sqrt{144} = 12$; then $(\sqrt{.00000144})/12$:

(a) 0.0012 (b) 0.001
(c) 0.0001 (d) 0.012

RRB NTPC 30.04.2016 Shift : 1

Ans : (c) Given,

$\sqrt{144} = 12$

So,

$$\frac{\sqrt{0.00000144}}{12} = \frac{\sqrt{\frac{144}{100000000}}}{12}$$

$$= \frac{12}{10000 \times 12} = \frac{1}{10000} = 0.0001$$

Type - 5

112. If $6^{x+4} = 6^7$ then find the value of x.

(a) 4 (b) 5
(c) 2 (d) 3

RRB Group-D 01/09/2022 (Shift-I)

Ans. (d) : $6^{x+4} = 6^7$

On Comparing

$x + 4 = 7$

$x = 3$

113. If $\left(\frac{512}{125}\right)^3 \times \left(\frac{512}{125}\right)^k = \left(\frac{8}{5}\right)^{15}$ the find the value of k.

(a) -1 (b) 3
(c) -2 (d) 2

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : $\left(\frac{512}{125}\right)^3 \times \left(\frac{512}{125}\right)^k = \left(\frac{8}{5}\right)^{15}$

$$\Rightarrow \left(\frac{8}{5}\right)^9 \times \left(\frac{8}{5}\right)^{3k} = \left(\frac{8}{5}\right)^{15}$$

On comparing both sides

$\Rightarrow 9 + 3k = 15$

$\Rightarrow 3k = 6$

$\Rightarrow k = 2$

114. $[x^{m(n-p)}.x^{n(p-m)}.x^{p(m-n)}][\sqrt[4]{625} - \sqrt{25}]$ value _____will happen.

(a) 0 (b) 2
(c) 5 (d) 1

RRB GROUP-D – 19/09/2022 (Shift-II)

Ans. (a) : $\left[x^{m(n-p)}.x^{n(p-m)}.x^{p(m-n)}\right]\left[\sqrt[4]{625} - \sqrt{25}\right]$

$= x^{m(n-p)+n(p-m)+p(m-n)}\,[5-5]$

$= x^{m(n-p)+n(p-m)+p(m-n)}\,[0]$

$= 0$

115. If $2^x \times 4^{12} \times 8^3 = 16^{11}$ then find the value of x.

(a) 13 (b) 11
(c) 12 (d) 14

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (b) : $2^x \times 4^{12} \times 8^3 = 16^{11}$

$2^x \times (2^2)^{12} \times (2^3)^3 = (2^4)^{11}$

$2^x \times 2^{24} \times 2^9 = 2^{44}$

$2^{x+24+9} = 2^{44}$

On comparing both sides -

$33 + x = 44$

$x = 44 - 33$

$x = 11$

116. Find the value of $4^{-5} \div 4^7 \times 4^{-6}$.

(a) 4^{-20} (b) 4^{-18}
(c) 4^{-16} (d) 4^{-14}

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (b) : $4^{-5} \div 4^7 \times 4^{-6}$

$= 4^{-5} \times \frac{1}{4^7} \times 4^{-6}$

$= 4^{-5} \times 4^{-7} \times 4^{-6}$

$= 4^{-5-7-6}$

$= 4^{-18}$

117. Find the value of $4^2 - 3(8)^{2/3} + (16/9)^{1/2}$

(a) $3\frac{1}{3}$ (b) $5\frac{1}{3}$
(c) 0 (d) 1

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (b) : $4^2 - 3(8)^{2/3} + \left(\frac{16}{9}\right)^{1/2}$

$= 16 - 3\left[(2)^3\right]^{2/3} + \left[\left(\frac{4}{3}\right)^2\right]^{1/2}$

$= 16 - 3 \times 4 + \frac{4}{3}$

$= 4 + \frac{4}{3}$

$= \frac{16}{3}$

$= 5\frac{1}{3}$

118. Find the value of $3^{-5} \times 4^{-5} \times 5^{-5}$

(a) $\frac{1}{60^5}$ (b) $\frac{1}{50^5}$

(c) $\frac{1}{40^5}$ (d) $\frac{1}{30^5}$

RRB GROUP-D – 16/09/2022 (Shift-I)

Ans. (a) : $3^{-5} \times 4^{-5} \times 5^{-5}$

$= \frac{1}{3^5} \times \frac{1}{4^5} \times \frac{1}{5^5}$

$= \frac{1}{60^5}$

119. Find the value of $\left[\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-4} \times \left(\frac{1}{4}\right)^{-3}\right]^{-3}$

(a) $\left(\frac{5}{4}\right)^9$ (b) $\left(\frac{5}{4}\right)^7$

(c) $\left(\frac{32}{5}\right)^9$ (d) $\left(\frac{5}{32}\right)^9$

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : $\left[\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-4} \times \left(\frac{1}{4}\right)^{-3}\right]^{-3}$

$\Rightarrow \left[\left(\frac{8}{5}\right)^{7-4} \times 4^3\right]^{-3}$

$\Rightarrow \left[\frac{8^3}{5^3} \times 4^3\right]^{-3}$

$\Rightarrow \left[\frac{(32)^3}{5^3}\right]^{-3}$

$= \left[\left(\frac{5}{32}\right)^3\right]^3$

$= \left(\frac{5}{32}\right)^9$

120. $\sqrt[5]{\frac{32}{243}}$ value is equal.....?

(a) $\frac{5}{3}$ (b) $\frac{3}{2}$

(c) $\frac{5}{2}$ (d) $\frac{2}{3}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (d) :

$\sqrt[5]{\frac{32}{243}} = \sqrt[5]{\left(\frac{2}{3}\right)^5}$

$= \left(\frac{2}{3}\right)^{5 \times \frac{1}{5}} = \frac{2}{3}$

121. If $\sqrt{x} \div \sqrt{6.25} = 2$, then the value of x is:

(a) 13 (b) 16

(c) 25 (d) 14

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (c) : From question,

$\sqrt{x} \div \sqrt{6.25} = 2$

$\sqrt{x} \div 2.5 = 2$

$\sqrt{x} = 5$

On squaring of both sides,

$x = 25$

122. Which from the following is irrational?

(a) $\sqrt[6]{4096}$ (b) $\sqrt[4]{4096}$

(c) $\sqrt[8]{4096}$ (d) $\sqrt[3]{4096}$

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (c) From options,

(a) $\sqrt[6]{4096} = 4 \Rightarrow (2^{12})^{1/6} = 2^2 = 4$

(b) $\sqrt[4]{4096} = 8 \Rightarrow (2^{12})^{1/4} = 2^3 = 8$

(c) $\sqrt[3]{4096} = 16 \Rightarrow (2^{12})^{1/3} = 2^4 = 16$

(d) $\sqrt[8]{4096} = 2\sqrt[8]{(2)^4} \Rightarrow (2^{12})^{1/8} = 2^{3/2}$

Hence, $\sqrt[8]{4096}$ is irrational, and all others are rational.

123. In the following expression which number should be added so that it becomes a complete square?

1 + 3 + 7 + 9 + 11 + 13

(a) 1 (b) 3

(c) 7 (d) 5

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) : 1 + 3 + 7 + 9 + 11 + 13

= 44

Number = 44 + 5 = 49 = $(7)^2$

Hence, 5 should be added in 44 so that it becomes a complete square.

124. If $\sqrt{5^n} = 625$ then the value of n is :

(a) 9 (b) 6
(c) 8 (d) 7

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (c) :

If $\sqrt{5^n} = 625$

then $5^{\frac{n}{2}} = (5)^4$

On comparing both sides,

$\frac{n}{2} = 4$

Hence, n = 8

125. If $\sqrt{3^n} = 729$, then the value of n is equal to:

(a) 8 (b) 12
(c) 6 (d) 9

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (b) : $\sqrt{3^n} = 729$

$\sqrt{3^n} = 3^6$

$3^n = 3^{12}$ ..... ($\because$ On squaring of both sides)

n = 12

126. $(8)^{2/3} = ?$

(a) $\sqrt{4}$ (b) 2
(c) 4 (d) 64

RRB NTPC 11.04.2016 Shift : 1

Ans : (c) From the question,

$$8^{\frac{2}{3}} = \sqrt[3]{8^2} = \sqrt[3]{64} = \sqrt[3]{4\times4\times4} = 4$$

127. Simplify: $(25)^{\frac{3}{2}}$

(a) 625 (b) 15625
(c) 125 (d) $\sqrt{125}$

RRB NTPC 11.04.2016 Shift : 2

Ans : (c) From the given expression,

$$(25)^{\frac{3}{2}} = \left((5)^2\right)^{\frac{3}{2}} = 5^3 = 125$$

128. Simplify : $(27)^{\frac{-2}{3}}$

(a) 1/18 (b) 9
(c) 1/9 (d) 18

RRB NTPC 26.04.2016 Shift : 2

Ans : (c) $(27)^{\frac{-2}{3}} = \frac{1}{(3)^{3\times\frac{2}{3}}} = \frac{1}{(3)^2} = \frac{1}{9}$

129. $(1000)^{\frac{-1}{3}} = ?$

(a) 10 (b) 100
(c) 1/10 (d) 1/100

RRB NTPC 26.04.2016 Shift : 3

Ans : (c) $(1000)^{\frac{-1}{3}} = \frac{1}{(1000)^{1/3}} = \frac{1}{(10^3)^{1/3}} = \frac{1}{10}$

130. The difference between 1/3 and 1/4 of a number is equal to its square root. Find the number.

(a) 136 (b) 144
(c) 72 (d) 120

RRB JE - 23/05/2019 (Shift-III)

Ans : (b) Let the number is x.

According to the question,

$$\frac{x}{3} - \frac{x}{4} = \sqrt{x}$$

$$\Rightarrow \frac{x}{12} = \sqrt{x}$$

On squaring both side,

$$\frac{x^2}{144} = x$$

x = 144

131. The rearranged number of a divisor $\frac{1}{5+3\sqrt{2}}$?

(a) $(5 - 2\sqrt{3})/12$ (b) $5 + 2\sqrt{3}/12$
(c) $5 - 3\sqrt{3}/12$ (d) $(5 - 3\sqrt{2})/7$

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (d) From given expression,

$$\frac{1}{5+3\sqrt{2}} = ?$$

Rationalizing the denominator,

$$= \frac{1}{5+3\sqrt{2}} \times \frac{5-3\sqrt{2}}{5-3\sqrt{2}}$$

$$= \frac{5-3\sqrt{2}}{25-18}$$

$$= \frac{(5 - 3\sqrt{2})}{7}$$

132. If $\sqrt{1849} \times \sqrt{X} = 2451$, then what will be the value of 'X'?

(a) 3136 (b) 3481
(c) 3364 (d) 3249

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (d) Given,

$\sqrt{1849} \times \sqrt{X} = 2451$

$\sqrt{43\times43} \times \sqrt{X} = 2451$

$\sqrt{X} = \frac{2451}{43}$

$\sqrt{X} = 57$

On squaring both side,

$(\sqrt{x})^2 = (57)^2$

$x = 3249$

133. What is the value of $\sqrt{\left(3\sqrt{9}-3\sqrt{8}\right)\left(9+2\sqrt{18}\right)}$

(a) 2 (b) 4
(c) 3 (d) 9

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (c) From given expression,

$$\sqrt{\left(3\sqrt{9}-3\sqrt{8}\right)\left(9+2\sqrt{18}\right)}$$

$$=\sqrt{\left(3\times3-6\sqrt{2}\right)\left(9+6\sqrt{2}\right)}$$

$$=\sqrt{\left(9-6\sqrt{2}\right)\left(9+6\sqrt{2}\right)} \quad [\because (a-b)(a+b)=a^2-b^2]$$

$$=\sqrt{(9)^2-\left(6\sqrt{2}\right)^2}$$

$$=\sqrt{81-72}=\sqrt{9}=3$$

134. Which of the following expressions expresses the square root of $(3^{38}+3^{39})$?

(a) $6^{38.5}$ (b) $\sqrt{2}\times3^{19.25}$
(c) 2×3^{19} (d) $3^{38.5}$

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (c) Given expression,

$$\sqrt{3^{38}+3^{39}}$$

$$=\sqrt{3^{38}(1+3)}$$

$$=\sqrt{4\times3^{38}}$$

$$=\sqrt{2\times2\times3^{19}\times3^{19}}$$

$$=\boxed{2\times3^{19}}$$

135. If the sum of square roots of two integers is $\sqrt{18+8\sqrt{5}}$. What is the sum of their squares?

(a) 164 (b) 388
(c) 624 (d) 144

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (a) Let both integers are x and y.
According to the question,

$$\left(\sqrt{x}+\sqrt{y}\right)=\sqrt{18+8\sqrt{5}}$$

On squaring both sides,

$$\left(\sqrt{x}+\sqrt{y}\right)^2=\left(\sqrt{18+8\sqrt{5}}\right)^2$$

$$x+y+2\sqrt{xy}=18+8\sqrt{5}$$

$$x+y+2\sqrt{xy}=10+8+2\sqrt{80}$$

$$x+y+2\sqrt{xy}=10+8+2\sqrt{10\times8}$$

Hence, on comparing,
x = 10
y = 8
So, the sum of squares,
$x^2+y^2=10^2+8^2=100+64=164$

136. $\sqrt[3]{0.000216}$ = ?

(a) 0.06 (b) 6
(c) 0.6 (d) $2\sqrt{16}$

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (a) From given expression,

$\sqrt[3]{0.000216}$ = ?

$$\sqrt[3]{\frac{216}{1000000}}$$

$$\sqrt[3]{\frac{6\times6\times6}{100\times100\times100}}=\frac{6}{100}=0.06$$

137. Which of the following expressions denotes the square root of $(3^{34}+3^{35})$–

(a) $\sqrt{2}\times3^{17.25}$
(b) $6^{34.5}$
(c) 2×3^{17}
(d) $3^{34.5}$

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (c) Square root of

$$\left(3^{34}+3^{35}\right)$$

$$=\sqrt{3^{34}+3^{35}}$$

$$=\sqrt{3^{34}(1+3)}$$

$$=\sqrt{4\left(3^{34}\right)}=\sqrt{2\times2\times3^{17}\times3^{17}}=2\times3^{17}$$

138. If $\sqrt{1296}=(?)^2$ then the value of (?) is:

(a) 6 (b) 18
(c) 8 (d) 12

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (a) Given expression,

$$\sqrt{1296}=(?)^2$$

$$1296=(?)^4$$

$$6\times6\times6\times6=?^4$$

$$6^4=?^4$$

$$\boxed{?=6}$$

139. A group of students decided that each member will give as much money as the number of members. If the total collection of money is ₹ 62.41, then the number of members is:

(a) 77
(b) 81
(c) 71
(d) 79

RRB Group-D – 27/11/2018 (Shift-III)

Ans : (d) Let the number of members is *x*.
So, received money by each member = *x* paise.
And total money received by members = $x\times x$ *paise*

$$Rs.62.41=Rs.\frac{x^2}{100} \qquad .....(\because 1\ Rs.=100\ paise)$$

$$62.41\times100=x^2$$

$$x^2=6241$$

$$x=\sqrt{6241}$$

$$x=79$$

Hence, the number of members in group is 79.

04.

Simplification

Type - 1

1. Find the value of (919+9.019+0.919+9.0019)

(a) 937.3999 (b) 973.9399
(c) 937.9399 (d) 973.9939

RRB NTPC (Stage-2) 14/06/2022 (Shift-I)

Ans. (c) : 919 + 9.019 + 0.919 + 9.0019
= 919 + 18.9399
= 937.9399

2. 484.71 + 285.33 – 827.38 +73.9 = ?

(a) 19.78 (b) 36. 54
(c) 16.56 (d) 15.78

RRB NTPC (Stage-2) 17/06/2022 (Shift-I)

Ans. (c) : 484.71 + 285.33 – 827.38 + 73.9 = ?
= 484.71 + 285.33+73.9 – 827.38
= 843.94 – 827.38
= 16.56

3. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?
67.69 + 5.12 - 0.89 ÷ 31.88 = ?

(a) 150 (b) 35
(c) 73 (d) 48

RRB NTPC (Stage-2) 12/06/2022 (Shift-I)

Ans. (c) : 67.69 + 5.12 – 0.89 ÷ 31.88 = ?
Assuming approximately

$$= 68 + 5 - \frac{1}{32}$$

= 73 – 0.031 ≃ 73

4. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?
895.98 + 185.01 + 851.86 + 524.09 = ?

(a) 2460 (b) 1490
(c) 2010 (d) 3540

RRB NTPC (Stage-2) 16/06/2022 (Shift-III)

Ans. (a) : 895.98 + 185.01 + 851.86 + 524.09
Almost assuming
= 896 + 185 + 852 + 524
= 2457 ≈ 2460

5. 19 × 19 = 361. What will be the value of 190 × 0.0019?

(a) 0.00361 (b) 0.361
(c) 3.61 (d) 0.0361

RRB NTPC 17.02.2021 (Shift-II) Stage I

Ans. (b) : 19 × 19 = 361
⇒ 190 × 0.0019
= 0.361

6. Find the quotient of 0.5 ÷ 0.71 (correct to three decimal places)

(a) 0.706 (b) 0.714
(c) 0.705 (d) 0.704

RRB NTPC 03.02.2021 (Shift-II) Stage I

Ans. (d) : Given that,

$$\frac{0.5}{0.71} = \frac{500}{710} = 0.704$$

7. What will the value of the following be (correct to three decimal points)?
160.342 – 32.124

(a) 128.340 (b) 128.242
(c) 128.218 (d) 128.337

RRB NTPC 01.02.2021 (Shift-II) Stage I

Ans. (c) : Given that,
160.342 – 32.124
= 128.218

8. Simplify the following.
5 × 0.5 × 0.05 × 0.005 × 500

(a) 3125 (b) 0.3125
(c) 0.003125 (d) 31.25

RRB NTPC 28.01.2021 (Shift-I) Stage I

Ans. (b) : 5 × 0.5 × 0.05 × 0.005 × 500

$$= 5 \times \frac{5}{10} \times \frac{5}{100} \times \frac{5}{1000} \times 500$$

$$= \frac{5 \times 5 \times 5 \times 5 \times 5}{10000} = \frac{3125}{10000}$$

= 0.3125

9. The value of 80.6 ÷ 4030 = ?
80.6 ÷ 4030 = ?

(a) 0.2 (b) 2
(c) 0.02 (d) 20

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (c) : 80.6 ÷ 4030

$$= \frac{80.6}{4030} = \frac{806}{40300}$$

$$= \frac{2}{100}$$

= 0.02

10. How many one-thirds are in 72?

(a) 24 (b) 288
(c) 144 (d) 216

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

$$\text{No. of one-third in } 72 = \frac{72}{\frac{1}{3}} = 216$$

11. Find the value of 45 ÷ 0.09.

(a) 5 (b) 5000
(c) 50 (d) 500

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

$$45 \div 0.09 = \frac{45}{0.09} = \frac{45 \times 100}{9} = 500$$

12. Find the value of the following.

4.6 × 13.5 + 5.4 × 13.5

(a) 134 (b) 135
(c) 132 (d) 133

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) : Given that,

4.6 × 13.5 + 5.4 × 13.5

= 13.5(4.6 + 5.4) = 13.5 × 10 = 135

13. Solve the following ?

176 + 17.6 + 1.76 + 0.176 + 0.0176 = ?

(a) 195.5536 (b) 195.5556
(c) 195.5356 (d) 195.5336

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given that,

176 + 17.6 + 1.76 + 0.176 + 0.0176

$$\begin{array}{r} 176.0000 \\ 17.6000 \\ 1.7600 \\ 0.1760 \\ +\,0.0176 \\ \hline = \quad 195.5536 \end{array}$$

14. Simplify the given expression.

$$9 \times 0.9 \times 0.09 \times 0.009 \times \frac{1}{0.3} \times \frac{1}{0.03} \times \frac{1}{0.003}$$

(a) 0.243 (b) 2.43
(c) 243 (d) 24.3

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) :

$$9 \times 0.9 \times 0.09 \times 0.009 \times \frac{1}{0.3} \times \frac{1}{0.03} \times \frac{1}{0.003}$$

$$= 9 \times \frac{9}{10} \times \frac{9}{100} \times \frac{9}{1000} \times \frac{10}{3} \times \frac{100}{3} \times \frac{1000}{3}$$

$$= 9 \times 9 \times 9 \times 9 \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3}$$

= 243

15. Solve the following

3.03 + 31.003 + 13.33 + 3.331

(a) 35.97 (b) 50.370
(c) 50.694 (d) 3.597

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

3.03 + 31.003 + 13.33 + 3.331

= 50.694

16. Solve the following

6202.5 + 620.25 + 62.025 + 6.2025 + 0.62025 = ?

(a) 6891.59675 (b) 5892.59775
(c) 6791.59775 (d) 6891.59775

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) : According to the question,

6202.5 + 620.25 + 62.025 + 6.2025 + 0.62025

= 6891.59775

17. 243 ÷ 3 ÷ 3 ÷ 3 ÷ 3 is equal to :

(a) 27 (b) 3
(c) 243 (d) 9

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

243 ÷ 3 ÷ 3 ÷ 3 ÷ 3

= 81 ÷ 3 ÷ 3 ÷ 3

= 27 ÷ 3 ÷ 3

= 9 ÷ 3

= 3

18. Solve the following :

17.6 + 1.76 + 0.176 + 0.0176 + 0.00176 = ?

(a) 19.55356 (b) 19.55336
(c) 19.55556 (d) 19.55536

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : 17.6 + 1.76 + 0.176 + 0.0176 + 0.00176

= 19.36 + 0.176 + 0.0176 + 0.00176

= 19.536 + 0.0176 + 0.00176

= 19.5536 + 0.00176

= 19.55536

19. Find the value of $7 \times 0.7 \times 0.07 \times 0.007 \times 70$:

(a) 1.6807 (b) 0.016807
(c) 0.0016807 (d) 0.16807

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) : From question,

$7 \times 0.7 \times 0.07 \times 0.007 \times 70$

$= 4.9 \times 0.07 \times 0.49$

= 0.16807

20. What is the value of the following expression?

$(-20)^3 + (13)^3 + (7^3)$

(a) 4566 (b) -4650
(c) -5460 (d) 4560

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$(-20)^3 + (13)^3 + (7^3)$

= -8000 + 2197 + 343

= -8000 + 2540

= -5460

21. Simplify

8.8 + .08 + 8.88 + .808

(a) 18.568 (b) 2.656
(c) 1.792 (d) 185.68

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (a) : 8.8 + .08 + 8.88 + .808 = 18.568

22. The value of :

1+2+3 +...+ 30 + 31 + 30 + 29 +...+ 3 + 2 + 1 =?

(a) 900 (b) 999
(c) 961 (d) 1000

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) : 1 + 2 + 3 + 4 + ---------- n + (n - 1) + (n - 2) + ------- 3, 2, 1 = n^2

Example– 1 + 2 + 3 + 4 + 3 + 2 + 1 = 16 = $(4)^2$

Hence, 1 + 2 + 3 + ----- + 30 + 31+ 30 + 29 + 28 + ----- 3 + 2 + 1
$= (31)^2 = 961$

23. 97 × 97 = ?
(a) 9391 (b) 9409
(c) 9049 (d) 9309

RRB NTPC 31.03.2016 Shift : 2

Ans : (b) From the given expression,
$97 \times 97 = (97)^2$
$(100-3)^2 = (100)^2 + (3)^2 - 2 \times 100 \times 3$
$= 10000 + 9 - 600$
$= 9409$

24. 2.09 ÷ 0.000209 = ?
(a) 100000 (b) 1000000
(c) 1000 (d) 10000

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (d) From the given expression,
$2.09 \div 0.000209$
$= \frac{209}{100} \div \frac{209}{1000000}$
$= \frac{209}{100} \times \frac{1000000}{209}$
$= 10000$

25. 1.08 ÷ 0.000108 =
(a) 100000 (b) 1000
(c) 1000000 (d) 10000

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (d) : From the given expression,
$1.08 \div 0.000108$
$= \frac{1.08}{0.000108}$
$= \frac{108}{0.0108}$
$= \frac{108 \times 10000}{108} = 10000$

26. 0.00025 ÷ 12.5 = ?
(a) 0.0025 (b) 0.00002
(c) 0.0002 (d) 0.000002

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (b) : Given that,
$0.00025 \div 12.5$
$= 0.00025 \times \frac{1}{12.5}$
$= \frac{0.00025}{12.5}, = \frac{25}{1250000} = 0.00002$

27. 33.33 - 0.03 + 333.333 - 3.33 = ?
(a) 366.633 (b) 363.303
(c) 366.663 (d) 369.963

RRB RPF Constable -25/01/2019 (Shift-I)

Ans : (b) 33.33 - 0.03 + 333.333 - 3.33
$\Rightarrow$ 33.30 + 330.003 = 363.303

28. 6 kg 5 g = ?
(a) 6.05 kg (b) 0.65 kg
(c) 6.5 kg (d) 6.005 kg

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (d) Given that,
$6\text{kg } 5\text{g} = \left(6 + \frac{5}{1000}\right)\text{kg} \quad \left\{\begin{matrix}1\text{kg} = 1000\text{g} \\ 5\text{g} = 0.005\text{kg}\end{matrix}\right\}$
$= (6 + 0.005)\text{kg}$
$= 6.005 \text{ kg}$

29. 5.52 – $(2.3)^2$ + $(0.8)^3$ × 0.12 ÷ $(0.4)^4$ − 3.14 = ?
(a) –0.51 (b) 0.42
(c) 0.51 (d) –0.63

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (a) According to the question,
$5.52 - (2.3)^2 + (0.8)^3 \times 0.12 \div (0.4)^4 - 3.14$
$= 5.52 - 5.29 + 0.512 \times 0.12 \div 0.0256 - 3.14$
$= 0.23 + 2.4 - 3.14$
$= -0.51$

30. 0.098 + 0.98 + 9.8 + 98 = ?
(a) 108.338 (b) 108.428
(c) 108.878 (d) 108.378

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (c) Given,
$0.098 + 0.98 + 9.8 + 98$
$= \frac{98}{1000} + \frac{98}{100} + \frac{98}{10} + 98$
$= \frac{98 + 980 + 9800 + 98000}{1000} = \frac{108878}{1000} = 108.878$

31. $4 + 3 \times 4 + 3 \times 4^2 + 3 \times 4^3 + 3 \times 4^4 + 3 \times 4^5$ = ?
(a) 10×4^4 (b) 4^6
(c) 5×4^5 (d) 9×4^4

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (b) Given,
$4+3\ (4 + 4^2 + 4^3 + 4^4 + 4^5)$
$\Rightarrow 4 + 3 \times 4\ (1 + 4 + 4^2 + 4^3 + 4^4)$
$\Rightarrow 4 + 3 \times 4\left[\frac{4^5 - 1}{4 - 1}\right]$ $\left\{\because S_n = \frac{a(r^n - 1)}{r - 1}\right\}$
$\Rightarrow 4 + 3 \times 4 \times \frac{4^5 - 1}{3}$ (When r > 1)
$\Rightarrow 4 + 4^6 - 4$
$= 4^6$

32. Fill in the blanks with the most appropriate option.
395 – 39.5– 3.95 – 0.395 = ...
(a) 351.055 (b) 351.145
(c) 351.155 (d) 351.045

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (c) : 395 – 39.5– 3.95 – 0.395
= 395 – 43.45 – 0.395
= 395 – 43.845
= 351.155

33. 0.295 + 2.95 + 29.5 + 295 = ?
(a) 327.856 (b) 327.756
(c) 327.746 (d) 327.745

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (d) : Given that,
0.295 + 2.95 + 29.5 + 295 = ?
$\Rightarrow$ 3.245 + 324.5 = ?
? = 327.745

34. Simplify: $\frac{9}{13} \div \frac{18}{26} \div \frac{90}{52}$

(a) 45/26 (b) 13/45
(c) 26/45 (d) 45/13

RRB NTPC 03.04.2016 Shift : 1

Ans : (c) From the given expression,

$$\frac{9}{13} \div \frac{18}{26} \div \frac{90}{52}$$
$$= \frac{9}{13} \times \frac{26}{18} \times \frac{52}{90}$$
$$= \frac{26}{45}$$

35. Calculate : 19170 ÷ 54 ÷ 5

(a) 17 (b) 1775
(c) 71 (d) 1757

RRB NTPC 11.04.2016 Shift : 3

Ans : (c) From the given expression,

19170 ÷ 54 ÷ 5
= 355 ÷ 5
= 71

36. Calculate:
66666 × 9999

(a) 665693334 (b) 666594334
(c) 666953334 (d) 666593334

RRB NTPC 07.04.2016 Shift : 1

Ans : (d) 66666 × 9999
= 66666 (10000 –1)
= 666660000 – 66666 = 666593334

37. 9876 + 34.567 – ? = 9908.221

(a) 23.45 (b) 234.6
(c) 2.345 (d) 2.346

RRB NTPC 06.04.2016 Shift : 2

Ans : (d) According to the question,
9876 + 34.567 -? = 9908.221
9910.567 -? = 9908.221
? = 9910.567 – 9908.221
? = 2.346

38. Find the value of 1093 × 1093

(a) 1194649 (b) 1162481
(c) 1424649 (d) 1428481

RRB NTPC 22.04.2016 Shift : 1

Ans : (a) Given expression
1093 × 1093
= (1000 + 93) × 1093
= 1093000 + 1093 × 93
= 1093000 + 1093 × (100 – 7)
= 1093000 + 109300 – 1093 × 7
= 1093000 + 109300 – 1093 (10 – 3)
= 1093000 + 109300 – 10930 + 3279
= 1205579 – 10930 = 1194649

39. $(64 \times 5^4) - (5^4 \times 16) = ?$

(a) 40,000 (b) 35,000
(c) 30,000 (d) 25,000

RRB NTPC 26.04.2016 Shift : 1

Ans : (c) $(64 \times 5^4) - (5^4 \times 16)$
$= (64 \times 625) - (625 \times 16)$
$\Rightarrow 40{,}000 - 10{,}000 = 30{,}000$

40. The value of –261+(–380)–(–521)+821–(–121)

(a) 800 (b) 825
(c) 822 (d) 833

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (c)
$\Rightarrow -261 + (-380) - (-521) + 821 - (-121)$
$= -261 - 380 + 521 + 821 + 121$
$= -641 + 1463 = 822$

Type - 2

41. Simplify the following expression :
(15 ÷ 3) –[{(19 – 1) ÷ 2} – {5 × 20 – (7 × 9 – (– 2))}]

(a) 21 (b) 31
(c) – 21 (d) 35

RRB NTPC (Stage-2) 16/06/2022 (Shift-I)

Ans. (b) :
(15 ÷ 3) –[{(19 – 1) ÷ 2} – {5 × 20 – (7 × 9 – (– 2))}]
= 5 – [{(19 – 1)÷ 2} – {5×20 – (7×9 – (– 2))}]
= 5 – [{18 ÷ 2} – {100 – (63 + 2) }]
= 5 – [9 – {100 – 65}]
= 5 – [9 – 35]
= 5 +26
= 31

42. Find the value of 84÷32×8–15÷8×(19–35)

(a) 38 (b) 45
(c) 51 (d) 42

RRB NTPC (Stage-2) 14/06/2022 (Shift-I)

Ans. (c) : 84 ÷ 32 × 8 – 15 ÷ 8 × (19 – 35)
= 84 ÷ 32 × 8 – 15 ÷ 8 × (–16)
$= \frac{84}{32} \times 8 - \frac{15}{8} \times (-16)$
= 21 + 30 = 51

43. Find the value of 72 ÷ 4 × { 8 × 4 – (14 – 19)}

(a) 666 (b) 444
(c) 222 (d) 1296

RRB NTPC (Stage-2) 14/06/2022 (Shift-I)

Ans. (a) : 72 ÷ 4 × { 8 × 4 – (14 – 19)}
= 72÷ 4{8×4–(–5)}
= 72÷ 4{8×4 + 5}
= 72 ÷4{32 + 5}
= 72 ÷4 × 37
= 18 × 37
= 666

44. Find the value of 529 ÷ 23 × 61 – 1403

(a) 0 (b) 2
(c) 3 (d) 1

RRB Group-D 01/09/2022 (Shift-III)

Ans. (a) : 529 ÷ 23 ×61 – 1403
= 23 × 61 – 1403
= 1403 – 1403
= 0

45. Simplify the given expression using BODMAS :

$\frac{4}{11}\times\frac{121}{16}\times 24(75^2-55^2)\times\frac{1}{100}$

(a) 1736 (b) 1726
(c) 1746 (d) 1716

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{4}{11}\times\frac{121}{16}\times 24\left(75^2-55^2\right)\frac{1}{100}$

From BODMAS,

$=\frac{11}{4}\times 24\left[(75+55)(75-55)\right]\times\frac{1}{100}$

We know that, $\left[\because a^2-b^2=(a+b)(a-b)\right]$

$=66\times(130\times 20)\times\frac{1}{100}$

$=66\times 2600\times\frac{1}{100}$

$=1716$

46. The value of 3 + [3 × {3 – (3 + 3) ÷ 6}] is:

(a) 3 (b) 9
(c) 6 (d) -3

RRB NTPC 13.03.2021 (Shift-I) Stage I

Ans. (b) : The value of $3 + [3 \times \{3 - (3 + 3) \div 6\}]$
$= 3 + [3 \times \{3 - 6 \div 6\}]$
$= 3 + [3 \times \{3 - 1\}]$
$= 3 + [3 \times 2]$
$= 3 + 6$
$= 9$

47. Using BODMAS, simplify the following.

$\frac{7}{9}\times\frac{21}{5}\times 25(65^2-55^2)$

(a) 42000 (b) 86000
(c) 98000 (d) 84000

RRB NTPC 28.01.2021 (Shift-I) Stage I

Ans. (c) : Given expression,

$\frac{7}{9}\times\frac{21}{5}\times 25\left(65^2-55^2\right)$

$=\frac{49\times 5}{3}\left[(65+55)(65-55)\right]$

$=\frac{49\times 5}{3}\times 120\times 10$

$= 49 \times 5 \times 40 \times 10$

$= 98000$

48. What is the value of $\frac{2}{7}\times[2+\{2(11+4-2)\}]-2$

(a) 7 (b) 9
(c) 8 (d) 6

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

$\frac{2}{7}\times[2+\{2(11+4-2)\}]-2$

From BODMAS

$=\frac{2}{7}\times[2+\{2\times 13\}]-2$

$=\frac{2}{7}\times[2+26]-2$

$=\frac{2}{7}\times 28-2$

$= 2 \times 4 - 2$

$= 6$

49. The value of $15\times14-30+(3^2+17)$ is:

(a) 154 (b) 266
(c) 124 (d) 206

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given expression,
$15 \times 14 - 30 + (3^2 + 17) = ?$
$= 210 - 30 + 26$
$= 210 - 4 = 206$

50. Solve it

$79 + [37 - \{45 - (1 - 36 \div 6 \times 8)\}] = ?$

(a) 33 (b) 24
(c) 59 (d) 41

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,
$79 + [37 - \{45 - (1 - 36 \div 6 \times 8)\}]$
Solving by BODMAS rule-
$= 79 + [37 - \{45 - (1 - 6 \times 8)\}]$
$= 79 + [37 - \{45 - (1 - 48)\}]$
$= 79 + [37 - \{45 + 47\}]$
$= 79 + [37 - 92]$
$= 116 - 92$
$= 24$

51. Solve the following

$(4+2-16\div4+3)+\{(1+8\times7)\div19\}\times\left[(3+5-4)+(17-9\times4)\right]=?$

(a) –40 (b) 40
(c) –225 (d) 335

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (a) : $(4 + 2 - 16 \div 4 + 3) + \{(1 + 8 \times 7) \div 19\} \times [(3 + 5 - 4) + (17 - 9 \times 4)]$
$= (6 - 4 + 3) + \{57 \div 19\} \times [4 + (-19)]$
$= 5 + 3 \times (-15)$
$= 5 - 45$
$= -40$

52. Solve the following

$2-\left[(-5)\times(-4)-(3-5)\right]=?$

(a) –20 (b) 8
(c) 20 (d) -8

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (a) : $2-[(-5)\times(-4)-(3-5)]=?$
$= 2 - [20 - (3-5)]$
$= 2 - [20+2] = 2 - 22 = -20$

53. Solve the given equation

$2-\left[2-\{2-2(2+2)\}\right]=?$

(a) -4 (b) 6
(c) 4 (d) -6

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (d) : $2-\left[2-\left\{2-2\left(2+2\right)\right\}\right]=?$

$2-\left[2-\left\{2-8\right\}\right]=?$

$2-\left[8\right]=?$

$?=-6$

54. The value of $\left\{\frac{3}{5}\times\left[3+\left\{3+\left(11+5+6\right)\right\}\right]\right\}$ is:

(a) $10\frac{2}{5}$ (b) $12\frac{6}{5}$

(c) $11\frac{4}{5}$ (d) $16\frac{4}{5}$

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (d) : From question,

$\left\{\frac{3}{5}\times\left[3+\left\{3+(11+5+6)\right\}\right]\right\}$

$=\left\{\frac{3}{5}\times\left[3+\left\{3+(22)\right\}\right]\right\}$

$=\left\{\frac{3}{5}\times\left[3+\left\{25\right\}\right]\right\}$

$=\left\{\frac{3}{5}\times\left[28\right]\right\}$

$=\left\{\frac{3}{5}\times 28\right\}$

$=16\frac{4}{5}$

55. Simplify

$24\times 3-5\times\frac{1}{3}\{[-5(5-2)]\div 10\}$

(a) 121.5 (b) 69.5

(c) 74.5 (d) 31.5

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : $24\times 3-5\times\frac{1}{3}\left\{\left[-5(5-2)\right]\div 10\right\}$

Solving by BODMAS rule–

$=24\times 3-5\times\frac{1}{3}\left\{\left[-5\times 3\right)\right]\div 10\}$

$=24\times 3-5\times\frac{1}{3}\left\{-15\div 10\right\}\ =24\times 3-5\times\frac{1}{3}\times\frac{-3}{2}$

$=72+\frac{5}{2}\ =\frac{144+5}{2}$

$=\frac{149}{2}=74.5$

56. Find the value of 7 + 5 - 2 × (7 + 89) - 94 ÷ 2 + (33 ÷ 3 + 9 × 2 - 7) ÷ 11.

(a) -235 (b) -245

(c) 245 (d) -225

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (d) : $7+5-2\times(7+89)-94\div 2+(33\div 3+9\times 2-7)\div 11$

$=12-2\times 96-47+(11+18-7)\div 11$

$=12-192-47+2$

$=14-239=-225$

57. Simplify

$0.3\div\left(0.6\times\frac{2}{3}\right)\times 0.2\left(0.2\times 2\div\frac{1}{2}+0.2\right)$

(a) 0.05 (b) 0.15

(c) 1.5 (d) 0.02

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : $0.3\div\left(0.6\times\frac{2}{3}\right)\times 0.2\left(0.2\times 2\div\frac{1}{2}+0.2\right)$

$=0.3\div(0.4)\times 0.2(0.2\times 4+0.2)$

$=0.3\div(0.4)\times 0.2(1)$

$=\frac{0.3}{0.4}\times 0.2$

$=0.15$

58. Simplify :

1800 ÷ 10 × {45 ÷ (17-2)} × 2 + {- 2 (1 + 2)}

(a) 0 (b) 180

(c) 114 (d) 1074

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given-

$1800\div 10\times\left\{45\div(17-2)\right\}\times 2+\left\{-2(1+2)\right\}$

$=1800\div 10\times\left\{45\div 15\right\}\times 2+\left\{-2\times 3\right\}$

$=1800\div 10\times\left\{3\right\}\times 2+\left\{-6\right\}$

$=1800\div 10\times 6-6$

$=180\times 6-6$

$=1080-6$

$=1074$

59. Solve : $10^9\times10^2\div10^3$

(a) 10^8 (b) 10^6

(c) 10^2 (d) 10^5

RRB RPF Constable -22/01/2019 (Shift-III)

Ans : (a) $10^9\times10^2\div10^3=\frac{10^9\times10^2}{10^3}=10^6\times10^2$

$=10^8$

60. $\{20-(25-33)\}\div\{-5\times4-(-6)\}+56\div(-27+13)=?$

(a) -2 (b) -6

(c) -4 (d) 4

RRB RPF Constable -20/01/2019 (Shift-I)

Ans. (b)

$\{20-(25-33)\}\div\{-5\times4-(-6)\}+56\div(-27+13)=?$

$=\{20+8\}\div\{-20+6\}+56\div(-14)$

$=\{28\}\div\{-14\}-4$

$=-2-4=-6$

61. {40 – (90 ÷ 5 × $\overline{16-8}$ ÷ 2 ÷ 3)} = ?

(a) 16 (b) 28

(c) 14 (d) 64

RRB RPF-SI -11/01/2019 (Shift-II)

Ans : (a) $\{40-(90\div 5\times\overline{16-8}\div 2\div 3)\}=?$

$\Rightarrow\{40-(90\div 5\times 8\div 2\div 3)\}=?$

$\Rightarrow\{40-(90\div 5\times 4\div 3)\}=?$

$\Rightarrow\{40-(18\times 4\div 3)\}=?$

$\Rightarrow\{40-24\}=?$

$?=16$

62. Solve the following.
2550 – [510 – {270 – (90 – 80 + 70)}]
(a) 2240 (b) 2230
(c) 2220 (d) 2210

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (b) $= 2550-[510-\{270-(90-80+70)\}]$
$= 2550-[510-\{270-80\}]$
$= 2550-[510-190]$
$= 2550-320$
$= 2230$

63. Solve the following :
23 – [23 – {23 – (23 – 23 + 23)}]
(a) –1 (b) 23
(c) 1 (d) 0

RRB ALP & Tec. (20-08-18 Shift-III)

Ans : (d) $= 23-[23-\{23-(23-23+23)\}]$
$= 23-[23-\{23-23+23-23\}]$
$= 23-[23-0]$
$= 23-23 = 0$

64. $56 \div \frac{1}{3}\left\{15+12-\left(9+6-\overline{5+7}\right)\right\} = ?$
(a) 9 (b) 8
(c) 12 (d) 7

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (d)
$56 \div \frac{1}{3}\left\{15+12-\left(9+6-\overline{5+7}\right)\right\}$
$= 56 \div \frac{1}{3}\left\{15+12-(15-12)\right\}$
$= 56 \div \frac{1}{3}\left\{15+12-3\right\}$
$= 56 \div \frac{1}{3}\{24\}$
$= 56 \div \frac{1}{3} \times 24$
$= 56 \div 8$
$= \frac{56}{8} = 7$

65. $\left[\left\{2\frac{1}{3}-\left(5+\left(2-3\right)\right\}+3\frac{1}{2}\right] = ?$
(a) $\frac{11}{2}$ (b) $\frac{12}{6}$
(c) $\frac{11}{6}$ (d) 2

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (c) From the given expression,
$\left[\left\{2\frac{1}{3}-(5+(2-3)\right\}+3\frac{1}{2}\right] = ?$
$= \left[\left\{\frac{7}{3}-(5-1)\right\}+\frac{7}{2}\right]$
$= \left[\left\{\frac{7}{3}-4\right\}+\frac{7}{2}\right]$
$= \left[\frac{-5}{3}+\frac{7}{2}\right]$
$= \left[\frac{-10+21}{6}\right]$
$= \frac{11}{6}$

66. 63 – (- 3) (-2 -8 -4) ÷ 3 of { 5 + (-2) (-1) } = ?
(a) -60 (b) 60
(c) 65 (d) 61

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (d) $63-(-3)(-2-8-4) \div 3 \text{ of } \{5+(-2)(-1)\}$
$= 63-(-3)(-14) \div 3 \times \{5+2\}$
$= 63-(-3)(-14) \div 3 \times 7$
$= 63-(-3)(-14) \div 21$
$= 63-42 \div 21$
$= 63-2$
$= 61$

67. 72 ÷ [27 – {35 – (42 – 45 ÷ 9 × 2) }] = ?
(a) 3 (b) 8
(c) 6 (d) 4

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (a) From the given expression,
$72 \div [27-\{35-(42-45 \div 9 \times 2)\}]$
$= 72 \div [27-\{35-(42-10)\}]$
$= 72 \div [27-\{35-32\}]$
$= 72 \div [27-3]$
$= 72 \div 24$
$= 3$

68. If T = (93 + 15) ÷(3 × 4) – 24 + 8, then what will be the value of T?
(a) –4 (b) –7
(c) –2 (d) –5

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (b) Given,
$T = (93+15) \div (3 \times 4) - 24 + 8$
$= (108) \div (12) - 24 + 8$
$= 108 \div 12 - 24 + 8$
$= 9 - 24 + 8$
$= 17 - 24$
$T = -7$

69. 75 ÷ [35 – {63 – (79 – 54 ÷ 9 × 6)}] = ?
(a) 5 (b) 3
(c) 15 (d) 25

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (a) From the given expression,
$75 \div [35-\{63-(79-54 \div 9 \times 6)\}] = ?$
$\Rightarrow 75 \div [35-\{63-(79-6 \times 6)\}] = ?$
$\Rightarrow 75 \div [35-\{63-(79-36)\}] = ?$
$\Rightarrow 75 \div [35-\{63-43\}] = ?$
$\Rightarrow 75 \div [35-20] = ?$
$\Rightarrow 75 \div 15 = 5$

70. $144 \div \left[40-\left\{37-\left(25-112 \div \overline{7 \times 4}\right)\right\}\right]$
(a) 4 (b) 8
(c) 2 (d) 6

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (d) : From the given expression,

$$144 \div \left[40 - \{37 - (25 - 112 \div \overline{7 \times 4})\}\right]$$

$$\Rightarrow 144 \div \left[40 - \{37 - (25 - 112 \div 28)\}\right]$$

$$\Rightarrow 144 \div \left[40 - \{37 - (25 - 4)\}\right]$$

$$\Rightarrow 144 \div \left[40 - \{37 - 21\}\right]$$

$$\Rightarrow 144 \div \left[40 - 16\right]$$

$$\Rightarrow 144 \div 24 = 6$$

71. If G = (96 ÷12) + 14 × (12 +8) ÷ 2, then what will be 1/4th of G?

(a) 148 (b) 37
(c) 36 (d) 38

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (b) Given,

$G = (96 \div 12) + 14 \times (12 + 8) \div 2$
$= 8 + 14 \times 20 \div 2$
$= 8 + 14 \times 10$
$= 8 + 140$
$\boxed{G = 148}$

Then 1/4th of G,

$$\frac{G}{4} = \frac{148}{4} = 37$$

72. $18 \div [\frac{1}{8}\{11 + 16 - (10 + 7 - \overline{6+8})\}] = ?$

(a) 6 (b) 9
(c) 18 (d) 3

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (a) From the given expression,

$$? = 18 \div [\frac{1}{8}\{11 + 16 - (10 + 7 - \overline{6+8})\}]$$

$$= 18 \div [\frac{1}{8}\{11 + 16 - (10 + 7 - 14)\}]$$

$$= 18 \div [\frac{1}{8}\{11 + 16 - 3\}]$$

$$= 18 \div [\frac{1}{8} \times 24]$$

$$? = 18 \div 3 = 6$$

73. $74 - [85 \div \{49 - (41 - 3^5 \div \overline{9 \times 3})\}] = ?$

(a) 59 (b) 79
(c) 49 (d) 69

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (d) From the given expression,

$$74 - [85 \div \{49 - (41 - 3^5 \div \overline{9 \times 3})\}]$$

$$? = 74 - [85 \div \{49 - (41 - 3^5 \div 27)\}]$$

$$= 74 - [85 \div \{49 - (41 - 243 \div 27)\}]$$

$$= 74 - [85 \div \{49 - (41 - 9)\}]$$

$$= 74 - [85 \div \{49 - 32\}]$$

$$= 74 - [85 \div \{17\}]$$

$$= 74 - [85 \div 17]$$

$$= 74 - [5]$$

$$? = 74 - 5 = 69$$

74. Simplify:

$25+15-(51)+(4\times15 \text{ of } 17) \div 20 + \overline{6-2} = ?$

(a) 45 (b) 44
(c) –44 (d) –45

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (b) From the given expression,

$25+15-(51)+(4\times15 \text{ of } 17) \div 20 + \overline{6-2}$

$$\Rightarrow \quad 25 + 15 - 51 + \left(\frac{4 \times 15 \times 17}{20}\right) + 4$$

$$\Rightarrow \quad 40 - 51 + 51 + 4 = 44$$

75. Find the following:

$10 + \left\{26 - 15 \times \left(20 - 5 \div 2 \times \overline{7-5}\right)\right\} = ?$

(a) 189 (b) −198
(c) 198 (d) −189

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (d) : From the given expression,

$$10 + \left\{26 - 15 \times \left(20 - 5 \div 2 \times \overline{7-5}\right)\right\} = ?$$

$$= 10 + \left\{26 - 15 \times \left(20 - 5 \times \frac{1}{2} \times 2\right)\right\}$$

$$= 10 + \left\{26 - 15 \times (20 - 5)\right\}$$

$$= 10 + \left\{26 - 15 \times (15)\right\}$$

$$= 10 + \left\{26 - 225\right\}$$

$$= 10 + 26 - 225$$

$$\boxed{= -189}$$

76. $4 + \frac{1}{6} \times [\{-12 \times (24 - 13 - 3)\} \div (20 - 4)] = ?$

(a) 4 (b) 6
(c) 5 (d) 3

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (d) From the given expression,

$$4 + \frac{1}{6} \times \left[\left\{-12 \times (24 - 13 - 3)\right\} \div (20 - 4)\right]$$

$$= 4 + \frac{1}{6} \times \left[\left\{-12 \times 8\right\} \div 16\right]$$

$$= 4 + \frac{1}{6} \times (-6) = 4 - 1$$

$$= 3$$

77. $45 - [38 - \{80 \div 4 - (8 - 12 \div 3) \div 4\}] = ?$

(a) 25 (b) 27
(c) 26 (d) 28

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (c) From the given expression,

$45 - [38 - \{80 \div 4 - (8 - 12 \div 3) \div 4\}]$
$= 45 - [38 - \{80 \div 4 - 4 \div 4\}]$
$= 45 - [38 - \{20 - 1\}]$
$= 45 - [38 - 19]$
$= 45 - 19 = 26$

78. $4 + (1/6)[\{-10 \times (25 - 13 - 3)\} \div (-5)] = ?$

(a) 8 (b) 9
(c) 6 (d) 7

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (d) From the given expression,

$$4+\frac{1}{6}\left[\left\{-10\times(25-13-3)\right\}\div(-5)\right]$$

$$\Rightarrow 4+\frac{1}{6}\left[\left\{(-10\times9)\div(-5)\right\}\right]$$

$$\Rightarrow 4+\frac{1}{6}\left[(-90)\times\left(\frac{1}{-5}\right)\right]$$

$$\Rightarrow 4+\frac{1}{6}[18] \Rightarrow 4+3=7$$

79. (–8) [36 ÷ {7–(–2)}] ÷ (–4) {19–(–3) × (–5)} = ?

(a) 2 (b) –4
(c) 4 (d) –2

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (a) From the given expression,

$$(-8)\left[36\div\left\{7-(-2)\right\}\right]\div(-4)\left\{19-(-3)\times(-5)\right\}$$

$$=(-8)\left[36\div\left\{9\right\}\right]\div(-4)\left\{19-15\right\}$$

$$=(-8)[4]\div(-16)$$

$$=\frac{32}{16}=2$$

80. Solve the following:
45 – [38 – {60 ÷ 3 – (6 – 9 ÷ 3) ÷ 3}]

(a) 25 (b) 26
(c) 24 (d) 21

RRB ALP & Tec. (13-08-18 Shift-III)

Ans : (b) From the given expression,
45 – [38 – {60 ÷ 3 – (6 – 9 ÷ 3) ÷ 3}]
= 45 – [38 – {20 – 3÷ 3}]
= 45 – [38 – 19]
= 45–19 = 26

81. Solve the following.

$$\left\{38-(60\div5\times\overline{16-8}\div2\div3)\right\}=?$$

(a) 30 (b) 29
(c) 22 (d) 37

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (c) From the given expression,

$$\left\{38-\left(60\div5\times\overline{16-8}\div2\div3\right)\right\}=?$$

$$=\left\{38-\left(60\div5\times8\div2\div3\right)\right\}$$

$$=\left\{38-\left(60\div5\times4\div3\right)\right\}$$

$$=\left\{38-\left(12\times\frac{4}{3}\right)\right\}$$

$$=\left\{38-16\right\}=22$$

Type - 3

82. Simplify the following expression.

$$\frac{(5.5)^3-4^3}{30.25+22+16}$$

(a) 0.75 (b) 14.25
(c) 1.5 (d) 9.5

RRB NTPC (Stage-2) 16/06/2022 (Shift-II)

Ans. (c) : Given expression -

$$\frac{(5.5)^3-4^3}{30.25+22+16}$$

$$=\frac{(5.5-4)(30.25+22+16)}{(30.25+22+16)}$$

$[(a^3 – b^3) = (a – b)(a^2 + ab + b^2)]$

= 5.5 – 4
= 1.5

83. Simplify the following expression :

$$\frac{15^3+20^3+25^3-22500}{15^2+20^2+25^2-300-500-375}$$

(a) 50 (b) 60
(c) 80 (d) 75

RRB NTPC (Stage-2) 16/06/2022 (Shift-I)

Ans. (b) :

$$(a+b+c)=\frac{a^3+b^3+c^3-3abc}{\left(a^2+b^2+c^2-ab-bc-ca\right)}$$

where a = 15, b = 20, c = 25

$$(a+b+c)=\frac{15^3+20^3+25^3-22500}{15^2+20^2+25^2-300-500-375}$$

= 15+20+25
= 60

84. Expression $(3.7)^3 - 3 \times (3.7)^2 \times (0.7) + 3(3.7) \times (0.7)^2 - (0.7)^3$ is equal to which of the following?

(a) 10 (b) 27
(c) 30 (d) 35

RRB GROUP-D – 19/09/2022 (Shift-III)

Ans. (b) : $(a–b)^3 = a^3–3a^2b+3ab^2–b^3$
$(3.7)^3–3\times(3.7)^2\times(0.7)+3(3.7)\times(0.7)^2–(0.7)^3$
$= (3.7–0.7)^3$
$= (3)^3$
$= 27$

85. If a + b = 25 and a - b =13 is then find the value of $(a + b)^2$

(a) 625 (b) 225
(c) 525 (d) 496

RRB Group-D 29/08/2022 (Shift-III)

Ans. (a) : a + b = 25 ....(i)
a – b = 13 ....(ii)
From eq. (i) and eq. (ii)
a = 19, b = 6
$(a+b)^2 = (19 + 6)^2 = 625$

86. If x + y + z = 11 and xy + yz + zx = 42 is the find the value of $x^2 + y^2 + z^2$

(a) 39 (b) 37
(c) 43 (d) 41

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (b) : दिया है–
x + y + z = 11
xy + yz + zx = 42
$\because (x + y + z)^2 = x^2 + y^2 + z^2 + 2 (xy + yz + zx)$

$\Rightarrow (11)^2 = x^2 + y^2 + z^2 + 2 \times 42$
$\Rightarrow x^2 + y^2 + z^2 = 121 - 84$
$\therefore\ x^2 + y^2 + z^2 = 37$

87. If $\frac{x}{y} = \frac{3}{2}$ is then find the value of $\frac{x^2 + y^2}{x^2 - y^2}$

(a) $\frac{7}{5}$ (b) $\frac{11}{5}$
(c) $\frac{13}{5}$ (d) $\frac{9}{5}$

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (c) : If $\frac{x}{y} = \frac{3}{2}$ In $\frac{x^2 + y^2}{x^2 - y^2}$
x = 3 and y = 2
$\frac{x^2 + y^2}{x^2 - y^2} = \frac{(3)^2 + (2)^2}{(3)^2 - (2)^2}$
$= \frac{9 + 4}{9 - 4}$
$= \frac{13}{5}$
$\frac{x^2 + y^2}{x^2 - y^2} = \frac{13}{5}$

88. Find the value of $\frac{(9.8 \times 9.8 - 5.8 \times 5.8)}{2 \times (7.8)}$

(a) 6 (b) 5
(c) 4 (d) 3

RRB Group-D 08/09/2022 (Shift-II)

Ans. (c) : $\frac{9.8 \times 9.8 - 5.8 \times 5.8}{2 \times (7.8)}$
$= \frac{(9.8 - 5.8)(9.8 + 5.8)}{2 \times 7.8}$ [From $(a^2 - b^2) = (a - b)(a + b)$]
$= \frac{4 \times 15.6}{15.6} = 4$

89. The value of $\left(\sqrt{2} + \sqrt{3}\right)\left(\sqrt{2} - \sqrt{3}\right)$ is equal to:

(a) –1 (b) 2
(c) 3 (d) –3

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (a) : $\left(\sqrt{2} + \sqrt{3}\right)\left(\sqrt{2} - \sqrt{3}\right)$
We know that,
$\because (a + b)(a - b) = a^2 - b^2$
$= \left(\sqrt{2}\right)^2 - \left(\sqrt{3}\right)^2$
$= 2 - 3$
$= -1$

90. Find the value of the following equation:
$\frac{(469 + 144)^2 - (469 - 144)^2}{2(469 \times 144)} = ?$

(a) –2 (b) –1
(c) 1 (d) 2

RRB RPF Constable -19/01/2019 (Shift-II)

Ans : (d) Formula:- $\frac{(a+b)^2 - (a-b)^2}{2ab} = \frac{4ab}{2ab}$
From the given expression,
$\frac{(469 + 144)^2 - (469 - 144)^2}{2(469 \times 144)} = ?$
a = 469, b = 144
$= \frac{(a + b)^2 - (a - b)^2}{2(ab)} = \frac{4ab}{2ab} = 2$

91. Find the value of : $\frac{(82 + 28)^2 - (82 - 28)^2}{82 \times 28}$

(a) 220 (b) 4
(c) 8 (d) 110

RRB JE - 28/06/2019 (Shift-III)

Ans. (b) Formula:
$\frac{(a + b)^2 - (a - b)^2}{ab} = \frac{4ab}{ab}$ {a= 82, b=28}
From the given expression,
$\because \quad \frac{(82 + 28)^2 - (82 - 28)^2}{82 \times 28}$
$= \frac{4 \times 82 \times 28}{82 \times 28} = 4$

92. The value of
$\{(0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02 - 1\}$

(a) 1.09 (b) 1.98
(c) 0 (d) 1.562

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (c) : From the given expression,
$\{(0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02 - 1\}$
$\{(0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02\ (.98 + .02) - 1\}$
$[(0.98) + (0.02)]^3 - 1$
$(1.00)^3 - 1 = 1 - 1 = 0$

93. $\left[\frac{1.93 \times 19.3 - 2.07 \times 20.7}{19.3 - 20.7}\right]$ equals to:

(a) 0.40 (b) 4.00
(c) 40 (d) 0.04

RRB NTPC 18.04.2016 Shift : 2

Ans : (b) From the given expression,
$\frac{1.93 \times 19.3 - 2.07 \times 20.7}{19.3 - 20.7}$
$= \frac{10(1.93 \times 1.93) - 10(2.07 \times 2.07)}{10(1.93 - 2.07)}$
$= \frac{(1.93)^2 - (2.07)^2}{(1.93 - 2.07)}$
$= \frac{(1.93 + 2.07)(1.93 - 2.07)}{(1.93 - 2.07)}$
$= 1.93 + 2.07 = 4$

94. If (1 + 2 + x)- (0.12 – 0.42 + 0.94) = 4 then what will be the value of x?

(a) 2.54 (b) 1.64
(c) 1.54 (d) 2.64

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

$(1+2+x)-(0.12-0.42+0.94)=4$

$=(3+x)-(0.64)=4$

$3 + x = 4.64$

$x = 4.64 - 3 = 1.64$

95. If x is the closest approximate to the product 0.3333×0.25×0.499×0.125×24, then find the value of x

(a) $\frac{3}{4}$ (b) $\frac{2}{5}$
(c) $\frac{3}{8}$ (d) $\frac{1}{8}$

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given-

$x = 0.3333\times0.25\times0.499\times0.125\times24$

$x = 0.3\times0.25\times0.5\times0.125\times24$

$x = \frac{3}{10}\times\frac{25}{100}\times\frac{5}{10}\times\frac{125}{1000}\times24$

$x = \frac{3}{10}\times\frac{1}{4}\times\frac{1}{2}\times\frac{1}{8}\times24$

$x = \frac{9}{80} = \frac{1}{8}\times\frac{9}{10}$

$= \frac{1}{8}\times0.9 = \frac{1}{8}\times1$

$x = \frac{1}{8}$ (Approx)

96. If $2x - 3y = -1$ and $\frac{x}{x+y}=\frac{7}{12}$, then the value of 2xy is:

(a) 65 (b) 70
(c) 60 (d) 75

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : $2x - 3y = -1$ .....(i)

and $\frac{x}{x+y}=\frac{7}{12}$

$\Rightarrow 12x = 7x + 7y$

$\Rightarrow 5x = 7y$

$\Rightarrow \frac{x}{y}=\frac{7}{5}$

x = 7, y = 5 which satisty equation (i)

Hence $2xy = 2 \times 7 \times 5 = 70$

97. If $\frac{x}{2y}=\frac{6}{7}$, then what is the value of $\frac{x-y}{x+y}+\frac{14}{19}$=?

(a) $\frac{110}{99}$ (b) $\frac{19}{19}$
(c) $\frac{109}{19}$ (d) $\frac{99}{109}$

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : $\frac{x}{2y}=\frac{6}{7}$

$\frac{x}{y}=\frac{12}{7}$

Let x = 12 k, y = 7 k

$\frac{x-y}{x+y}+\frac{14}{19}$

$= \frac{12k-7k}{12k+7k}+\frac{14}{19}$

$= \frac{5k}{19k}+\frac{14}{19}$

$= \frac{5+14}{19}=\frac{19}{19}$

98. Find the value of 73×73+42×42-2×73×42

(a) 961 (b) 676
(c) 981 (d) 861

RRB RPF-SI -16/01/2019 (Shift-III)

Ans : (a) From the given expression,

$73 \times 73 + 42 \times 42 - 2 \times 73 \times 42$

$= (73)^2 + (42)^2 - 2 \times 73 \times 42$

$= (73 - 42)^2 = (31)^2 = 961$

99. Find the value of $[(525+252)^2 - (525-252)^2]/(525 \times 252)$

(a) 3 (b) 4
(c) 5 (d) 6

RRB RPF Constable -22/01/2019 (Shift-III)

Ans : (b) From the given expression,

$$\frac{(525+252)^2-(525-252)^2}{525\times252}$$

$$=\frac{(525)^2+(252)^2+2\times525\times252-(525)^2-(252)^2+2\times525\times252}{525\times252}$$

$$=\frac{4\times525\times252}{525\times252}=4$$

100. If $\left(a+b\sqrt{2}\right)^2 = 19+6\sqrt{2}$, then a is equal to:

(a) 4 (b) 3
(c) 2 (d) 1

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\left(a+b\sqrt{2}\right)^2 = 19 + 6\sqrt{2}$

$= 19 + 2 \times 3\sqrt{2}$

$= 19 + 2 \times 1 \times 3\sqrt{2}$

$= 1 + 18 + 2 \times 1 \times 3\sqrt{2}$

$= 1^2 + (3\sqrt{2})^2 + 2 \times 1 \times 3\sqrt{2}$

From Formula, $(a+b)^2 = a^2 + b^2 + 2ab$

$\left(a+b\sqrt{2}\right)^2 = (1+3\sqrt{2})^2$

$a+b\sqrt{2} = 1+3\sqrt{2}$

On comparing the both side,

a = 1 and b = 3

101. Given that $a=\sqrt{4}$, find the value of the following.

$\sqrt{9}+25a+\sqrt{64}$

(a) 51 (b) 61

(c) 41 (d) 31

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) : Given, $a=\sqrt{4}=2$

According to the question,

$\sqrt{9}+25a+\sqrt{64}$

$=3+25\times 2+8$

$=3+50+8$

$=61$

102. If $\sqrt{625}\div\sqrt{x}=\frac{1}{5}$, then x = ?

(a) 15625 (b) 3125

(c) 125 (d) 1225

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (a) : $\sqrt{625}\div\sqrt{x}=\frac{1}{5}$

$=\frac{25}{\sqrt{x}}=\frac{1}{5}\Rightarrow\sqrt{x}=125$

$x=15625$

103. If $x=\frac{\sqrt{3}}{2}$, then find the value of $\sqrt{1+x}+\sqrt{1-x}$.

(a) $2-\sqrt{3}$ (b) $\frac{\sqrt{3}}{2}$

(c) 3 (d) $2+\sqrt{3}$

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$x=\frac{\sqrt{3}}{2}$

Then, $\sqrt{1+x}+\sqrt{1-x}=?$

On taking the square,

$\left(\sqrt{1+x}+\sqrt{1-x}\right)^2=\left(\sqrt{1+x}\right)^2+\left(\sqrt{1-x}\right)^2+2\sqrt{1+x}\sqrt{1-x}$

$=1+x+1-x+2\sqrt{(1+x)(1-x)}$

$=2+2\sqrt{1-x^2}$

$=2+2\sqrt{\frac{4-3}{4}}$

$=2+2\sqrt{\frac{1}{4}}$

$=2+2\times\frac{1}{2}$

$=2+1$

$=3$

104. If $x=\frac{1}{\sqrt{2}+1}$, then what will be the value of x+1?

(a) $\sqrt{2}$ (b) 2

(c) $\sqrt{2}+1$ (d) $\sqrt{2}-1$

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (a) : $x=\frac{1}{\sqrt{2}+1}$

$x+1=\frac{1}{\sqrt{2}+1}+1$

$=\frac{1+\sqrt{2}+1}{\sqrt{2}+1}=\frac{2+\sqrt{2}}{\sqrt{2}+1}$

$=\frac{\sqrt{2}\left(\sqrt{2}+1\right)}{\sqrt{2}+1}=\sqrt{2}$

105. if $\frac{2\sqrt{2}+\sqrt{7}}{2\sqrt{2}-\sqrt{7}}=x+y\sqrt{14}$, find the value of y.

(a) 15 (b) 0

(c) 19 (d) 4

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{2\sqrt{2}+\sqrt{7}}{2\sqrt{2}-\sqrt{7}}=x+y\sqrt{14}$

$\frac{2\sqrt{2}+\sqrt{7}}{2\sqrt{2}-\sqrt{7}}\times\frac{2\sqrt{2}+\sqrt{7}}{2\sqrt{2}+\sqrt{7}}=x+y\sqrt{14}$

$\frac{\left(2\sqrt{2}+\sqrt{7}\right)^2}{\left(2\sqrt{2}\right)^2-\left(\sqrt{7}\right)^2}=x+y\sqrt{14}$

$\frac{8+7+4\sqrt{14}}{8-7}=x+y\sqrt{14}$

$15+4\sqrt{14}=x+y\sqrt{14}$

On comparing the both sides,

$x=15$

$y=4$

$\therefore y=4$

106. If $\sqrt{1225\times\sqrt{32\div x}}=70$, find the value of x.

(a) 16 (b) 4

(c) 8 (d) 2

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : Given,

$\sqrt{1225\times\sqrt{32\div x}}=70$

On squaring the both sides,

$1225\times\sqrt{32\div x}=4900$

Again on squaring the both sides,

$(1225)^2\times 32\div x=(4900)^2$

$x=\frac{(1225)^2}{(4900)^2}\times 32$

$x=\frac{48020000}{24010000}$

$x=2$

107. If $\left(\sqrt{5}+1\right)^2 = a+b\sqrt{5}$, then find a, b where (a>b)

(a) 4, 2 (b) 6, 2
(c) 6, 4 (d) 8, 6

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\left(\sqrt{5}+1\right)^2 = a+b\sqrt{5}$$
$$5+1+2\sqrt{5} = a+b\sqrt{5}$$
$$6+2\sqrt{5} = a+b\sqrt{5}$$

On comparing the both sides,

$a = 6$

$b = 2$

108. If $\sqrt{15} = 3.88$, then $\sqrt{\frac{5}{3}} = ?$

(a) $4.29\overline{3}$ (b) $2.29\overline{3}$
(c) $3.29\overline{3}$ (d) $1.29\overline{3}$

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given, $\sqrt{15} = 3.88$

$$\Rightarrow \quad \sqrt{\frac{5}{3}} = \frac{\sqrt{5}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

(on Multiplying by $\sqrt{3}$ in numerator and denominator)

$$\Rightarrow \quad \frac{\sqrt{15}}{3} = \frac{3.88}{3} = 1.29\overline{3}$$

109. If $\frac{3\sqrt{5}-5}{3\sqrt{5}+5} = a+b\sqrt{5}$, then find the value of b.

(a) $\frac{7}{2}$ (b) $\frac{2}{3}$
(c) $-\frac{3}{2}$ (d) $\frac{3\sqrt{5}}{2}$

RRB NTPC 28.01.2021 (Shift-I) Stage I

Ans. (c) :

$$\frac{3\sqrt{5}-5}{3\sqrt{5}+5} = a+b\sqrt{5}$$

$$\text{L.H.S} = \frac{3\sqrt{5}-5}{3\sqrt{5}+5} = \frac{3\sqrt{5}-5}{3\sqrt{5}+5} \times \frac{3\sqrt{5}-5}{3\sqrt{5}-5} = \frac{\left(3\sqrt{5}-5\right)^2}{45-25}$$
$$= \frac{45+25-30\sqrt{5}}{20} = \frac{70-30\sqrt{5}}{20} = \frac{7-3\sqrt{5}}{2}$$
$$= \frac{7}{2} - \frac{3}{2}\sqrt{5}$$

Hence, on comparing the L.H.S. from R.H.S.,

$$b = -\frac{3}{2}$$

110. If $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ then 3(x + y) = ?

(a) 13 (b) 8
(c) 12 (d) 10

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (c) : $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}, y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$$3(x+y) = 3\left(\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1}\right)$$
$$= 3\left(\frac{3+1+2\sqrt{3}+3+1-2\sqrt{3}}{2}\right)$$
$$= 12$$

111. If $\sqrt{7} = 2.6$, then the value of $\frac{5\sqrt{7}}{4\sqrt{7}-0.4}$ is:

(a) 1.3 (b) 1.2
(c) 1.5 (d) 1.1

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (a) : $\frac{5\sqrt{7}}{4\sqrt{7}-0.4} \qquad \left(\because \sqrt{7} = 2.6\right)$

$$= \frac{5\times 2.6}{4\times 2.6 - 0.4} = \frac{13.0}{10.4-0.4} = \frac{13}{10} = 1.3$$

112. Solve the following:

$$\frac{\left(0.54\times 0.540 - 0.460\times 0.460\right)}{\left(1-0.920\right)} = ?$$

(a) 0.1 (b) 2
(c) 1 (d) 0.01

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (c) From the given expression,

$$\frac{0.54\times 0.540 - 0.460\times 0.460}{\left(1-0.920\right)}$$

From, $(a^2 - b^2) = (a + b)(a - b)$

$$\Rightarrow \frac{\left(0.54\right)^2 - \left(0.460\right)^2}{\left(1-0.920\right)} = \frac{\left(0.54+0.460\right)\left(0.54-0.460\right)}{\left(1-0.920\right)}$$
$$\Rightarrow \frac{1\times 0.08}{0.08} = 1$$

113. If $\frac{x}{y} = \frac{4}{5}$ then find the value of $\frac{5x+7y}{5x-7y} + \frac{6x+4y}{7x-8y}$.

(a) $-\frac{4}{5}$ (b) $\frac{11}{3}$
(c) $\frac{3}{2}$ (d) $-\frac{22}{3}$

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : Given,

$$\frac{x}{y} = \frac{4}{5}$$

Let $x = 4, y = 5$

$$\frac{5x+7y}{5x-7y}+\frac{6x+4y}{7x-8y}=\frac{20+35}{20-35}+\frac{24+20}{28-40}$$

$$=\frac{55}{-15}+\frac{44}{-12}$$

$$=-\frac{11}{3}-\frac{11}{3}$$

$$=-\frac{22}{3}$$

114. If $\frac{x-y}{3}=\frac{x+y}{5}=\frac{xy}{8}$, then find the value of xy.

(a) 18 (b) 14
(c) 16 (d) 12

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let, $\frac{x-y}{3}=\frac{x+y}{5}=\frac{xy}{8}=k$

$x - y = 3k$ … (i)

$x + y = 5k$ … (ii)

From equn. (i) + (ii) ,

$x = 4k$ and $y = k$

$\frac{xy}{8}=k$

$xy = 8k$

$x \quad y = 8k$

$\downarrow \quad \downarrow$

$4k \times k = 8k$

$k = 2$

$xy = 8k \Rightarrow xy = 8\times2=16$

115. If $\frac{x}{y}=\frac{6}{5}$, then the value of $\frac{x^2+y^2}{x^2-y^2}$ is:

(a) $\frac{60}{34}$ (b) $\frac{61}{11}$
(c) $\frac{11}{61}$ (d) $\frac{60}{11}$

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (b) : $\frac{x}{y}=\frac{6}{5}$

$x = 6k$

and $y = 5k$

$$\frac{x^2+y^2}{x^2-y^2}=\frac{(6k)^2+(5k)^2}{(6k)^2-(5k)^2}=\frac{61k^2}{11k^2}$$

$$=\frac{61}{11}$$

116. If $\frac{154}{0.154}=\frac{15.4}{x}$, then find the value of x

(a) 0.0154 (b) 15.4
(c) 154 (d) 1.54

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (a) :

$$\frac{154}{0.154}=\frac{15.4}{x}$$

$$\frac{1000}{1}=\frac{15.4}{x}$$

$$\therefore \quad x=\frac{15.4}{1000}=0.0154$$

117. If $\frac{3x}{2y}=\frac{48}{72}$ then $\frac{x}{y}$ in its lowest term is:

(a) $\frac{2}{9}$ (b) $\frac{4}{9}$
(c) $\frac{5}{9}$ (d) $\frac{3}{9}$

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

$$\frac{3x}{2y}=\frac{48}{72}$$

$$\frac{x}{y}=\frac{48\times2}{72\times3}$$

$$\frac{x}{y}=\frac{2}{3}\times\frac{2}{3}$$

$$\frac{x}{y}=\frac{4}{9}$$

118. If $\frac{9^m\times3^5\times27^3}{3\times81^4}=3^9$ then the value of m is:

(a) 6 (b) 5
(c) 7 (d) 12

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

$$\frac{9^m\times3^5\times27^3}{3\times81^4}=3^9$$

$$9^m=\frac{3^9\times3\times(3^4)^4}{3^5\times(3^3)^3}$$

$$9^m=\frac{3^9\times3^1\times3^{16}}{3^5\times3^9}$$

$$9^m = 3^{26}\times3^{-14}$$

$$3^{2m}=3^{12}$$

$$2m = 12$$

$$\therefore \quad m = 6$$

119. The value of x in the equation $x+\frac{5}{27}=\frac{12}{27}$ is

(a) $\frac{7}{27}$ (b) $\frac{10}{27}$
(c) $\frac{1}{3}$ (d) $\frac{9}{27}$

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (a) : $x+\frac{5}{27}=\frac{12}{27}$

$x=\frac{12}{27}-\frac{5}{27}=\frac{7}{27}$

Hence $x=\frac{7}{27}$

120. Simplification of

$$\frac{0.2\times0.2+0.02\times0.02-0.4\times0.02}{0.36}$$

(a) 2.199 (b) 0.09
(c) 2 (d) 3.195

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (b) : $\frac{0.2\times0.2+0.02\times0.02-0.4\times0.02}{0.36}$

From Formula $\because a^2+b^2-2ab=(a-b)^2$

$=\frac{(0.2)^2+(0.02)^2-2\times0.2\times0.02}{0.36}$

$=\frac{(0.2-0.02)^2}{0.36}$

$=\frac{(0.18)^2}{0.36}=0.09$

121. If 65×65 = 4225, then the value of 6.5×6.5 = ?

(a) 422.5 (b) 42.25
(c) 42025 (d) 0.004225

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (b) :

$\because 65\times65=4225$

$\therefore 6.5\times6.5=65\times65\times0.01$

$=4225\times0.01$

$=42.25$

122. Find the value of

$$\frac{(0.03)^2+(0.51)^2+(0.083)^2}{(0.003)^2+(0.051)^2+(0.0083)^2}$$

(a) 100 (b) 10
(c) 0.1 (d) 1000

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$\frac{(0.03)^2+(0.51)^2+(0.083)^2}{(0.003)^2+(0.051)^2+(0.0083)^2}$

$=\frac{100[(0.003)^2+(0.051)^2+(0.0083)^2]}{(0.003)^2+(0.051)^2+(0.0083)^2}$

$=100$

123. Find the value of

$$\frac{(3.17+9.12)^2+(3.17-9.12)^2}{3.17\times3.17+9.12\times9.12}.$$

(a) 4 (b) 3
(c) 2 (d) 1

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (c) :

$\frac{(3.17+9.12)^2+(3.17-9.12)^2}{3.17\times3.17+9.12\times9.12}$

$\because \frac{(a+b)^2+(a-b)^2}{a^2+b^2}=\frac{2(a^2+b^2)}{(a^2+b^2)}=2$

$=\frac{2\left[(3.17)^2+(9.12)^2\right]}{\left[(3.17)^2+(9.12)^2\right]}$

$=2$

124. If $\frac{1}{25}:\frac{1}{x}=\frac{1}{x}:\frac{1}{625}$, then x = ?

(a) 25 (b) 125
(c) 625 (d) 1.25

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (b) : $\frac{1}{25}:\frac{1}{x}=\frac{1}{x}:\frac{1}{625}$

$\frac{\frac{1}{25}}{\frac{1}{x}}=\frac{\frac{1}{x}}{\frac{1}{625}} \Rightarrow \frac{1}{25}\times\frac{x}{1}=\frac{625}{x}$

$\Rightarrow \frac{x}{25}=\frac{625}{x} \Rightarrow x^2=25\times625$

$x=\sqrt{25}\times\sqrt{625}=5\times25=125$

125. Find the value of $\frac{0.5\times0.5+0.09-0.15}{0.125+0.027}$.

(a) $\frac{5}{4}$ (b) $\frac{5}{6}$ (c) $\frac{4}{5}$ (d) $\frac{3}{4}$

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (a) : $\frac{0.5\times0.5+0.09-0.15}{0.125+0.027}$

$=\frac{0.5\times0.5+0.3\times0.3-0.5\times0.3}{(0.5)^3+(0.3)^3}$

$=\frac{(0.5)^2+(0.3)^2-(0.5)\times(0.3)}{(0.5+0.3)\{(0.5)^2+(0.3)^2-(0.5)\times(0.3)\}}$

$\{\because x^3+y^3=(x+y)(x^2+y^2-xy)\}$

$=\frac{1}{(0.5+0.3)}=\frac{1}{0.8}=\boxed{\frac{5}{4}}$

126. If 2508 ÷ 12.54 + (X × 11) = 200, Then find the value of X.

(a) 2.5 (b) 0
(c) 4 (d) 3.5

RRB JE - 22/05/2019 (Shift-III)

Ans : (b) Given,
2508 ÷ 12.54 + (X × 11) = 200
200 + (X × 11) = 200
(X × 11) = 200 – 200

$X=\frac{0}{11}$

X = 0

127. If $\frac{x}{x^2-1}=\frac{A}{x-1}+\frac{B}{x+1}$, then find the value of A and B.

(a) 2, –2 (b) 1/2, –1/2
(c) 1/2, 1/2 (d) 2, 2

RRB JE - 23/05/2019 (Shift-III)

Ans : (c)

$$\frac{x}{x^2-1}=\frac{A}{x-1}+\frac{B}{x+1}$$

$$\frac{x}{x^2-1}=\frac{A(x+1)+B(x-1)}{(x^2-1)}$$

$x = Ax + A + Bx – B$

$x + 0 = x (A + B) + (A – B)$

$A + B = 1$ (On comparing)

$\underline{A – B = 0}$

$2A = 1$

$A = 1/2$

$B = 1/2$

128. If 5x/(1 + 1/(1 + x/(1 – x))) =1, find the value of 'x'.

(a) 1 (b) 1/3
(c) 5/3 (d) 2/3

RRB JE - 29/05/2019 (Shift-II)

Ans : (b) Given,

$$=\frac{5x}{1+\frac{1}{1+\frac{x}{1-x}}}=\frac{5x}{1+\frac{(1-x)}{1-x+x}}=\frac{5x}{1+\frac{(1-x)}{1}}=\frac{5x}{2-x}=1$$

$\therefore 5x = 2 – x$

$6x = 2$

$x=\frac{1}{3}$

129. Simplify: $y+[y–(y+x)+\{y–(y–x)\}+(z+x)]$ = ?

(a) y (b) $x + y + z$
(c) $y + z$ (d) $x + z$

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (b) From the given expression,

$= y + [y – (y + x) + \{y – (y – x) \} + (z + x)]$

$= y + [y – y – x + \{y – y + x \} + z + x]$

$= y – x + x + z + x$

$= x + y + z$

130. 23 × 31 = 713, then 0.00713 ÷ 3.1 = ?

(a) 0.023 (b) 0.0023
(c) 0.23 (d) 2.3

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (b) Given,

$23\times31 = 713$

$23=\frac{713}{31}$ .....(I)

Then,

$$0.00713\div3.1=\frac{713\times10}{31\times100000}$$

$$=23\times\frac{1}{10000}=0.0023 \quad \text{.....}\left(From\ eq^{n}\ (I)\right)$$

131. If $\frac{0.5-0.1x}{1.3-0.8x}=0.2$, then x = ?

(a) – 1 (b) – 1
(c) – 3 (d) – 4

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (d) Given,

$$\frac{0.5-0.1x}{1.3-0.8x}=0.2,$$

$0.5 – 0.1x = 0.26 – 0.16x$

$0.16x – 0.1x = 0.26 – 0.5$

$0.06x = - 0.24$

$x=-\frac{0.24}{0.06}$

$x = – 4$

132. Solve the following equation to find the value of x.

$$\frac{(x-5)}{3}-\frac{(x-2)}{4}=\frac{7}{2}$$

(a) 42 (b) 60
(c) 56 (d) 52

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (c) Given,

$$\frac{(x-5)}{3}-\frac{(x-2)}{4}=\frac{7}{2}$$

$$\Rightarrow\frac{4(x-5)-3(x-2)}{12}=\frac{7}{2}$$

$$\Rightarrow\frac{4x-20-3x+6}{12}=\frac{7}{2}$$

$$\Rightarrow\frac{x-14}{12}=\frac{7}{2}$$

$\Rightarrow x – 14 = 42$

$\Rightarrow x = 56$

133. If 1120/√x = 80, then x = ?

(a) 225 (b) 196
(c) 125 (d) 336

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (b) Given,

$1120 / \sqrt{x} = 80$

$\frac{1120}{\sqrt{x}}=80$

$\frac{1120}{80}=\sqrt{x}$

$14=\sqrt{x}$

$x = 14^2 = 196$

134. If p = 36 – 2 (20 + 12 ÷ 4 × 3 – 2 × 2) + 10, then what is twice of p?

(a) –8 (b) –4
(c) –2 (d) –10

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (a) Given,

P = 36– 2 (20 + 12 ÷ 4 × 3 – 2 × 2) + 10

P = 36 – 2 (20 + 3 × 3 – 2 × 2) + 10

P = 36–2 (29 – 4) + 10
P = 36 – 50 + 10
P = –4
Hence, twice of p will be = – 4 × 2 = –8

135. If 1131 ÷ 39 = 29, then 11.31 ÷ 0.0029 = ?
(a) 3.9 (b) 3900
(c) 390 (d) 0.39

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (b) Given,

$$1131 \div 39 = 29$$

$$\frac{1131}{39} = 29$$

$$\frac{1131}{29} = 39$$

Then,

$$11.31 \div 0.0029 = \frac{11.31}{0.0029}$$

$$= \frac{1131 \times 10000}{29 \times 100} = 39 \times 100$$

$$= 3900$$

136. If $\frac{1}{x-a-b} = \frac{1}{x} - \frac{1}{a} - \frac{1}{b}$ then find the value of x.
(a) –a, b
(b) a, b
(c) a, –b
(d) –a, –b

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (b) Given,

$$\frac{1}{x-a-b} = \frac{1}{x} - \frac{1}{a} - \frac{1}{b}$$

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{x} - \frac{1}{x-a-b}$$

$$\frac{a+b}{ab} = \frac{x-a-b-x}{x(x-a-b)}$$

$$\frac{a+b}{ab} = \frac{-(a+b)}{x(x-a-b)}$$

$x^2 – (a + b) x + ab = 0$
$x (x – a) –b (x – a) = 0$
$(x – a) (x – b) = 0$
$x = a, x = b$
So, the value of x is a and b.

137. If 202.4 ÷ x = 5.06, then find the value of x.
(a) 30 (b) 42
(c) 43 (d) 40

RRB Group-D – 31/10/2018 (Shift-III)

Ans : (d) From the given expression,

$$202.4 \div x = 5.06$$

$$\Rightarrow \quad \frac{202.4}{x} = 5.06$$

$$\Rightarrow \quad x = \frac{202.4}{5.06}$$

$$\Rightarrow \quad x = \frac{20240}{506}$$

$$x = 40$$

138. If 123 × 356 = 43788, then 1.23 × 35.6 =?
a) 4.3788 (b) 43.788
(c) 0.43788 (d) 437.88

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (b) Given,

$$123 \times 356 = 43788$$

$$1.23 \times 35.6 = \frac{123}{100} \times \frac{356}{10} = \frac{43788}{1000} = 43.788$$

139. Simplify:
$1 \div [\{p^2 / (p + 6)\} + \{6p/(p + 6)\}]$
(a) $\frac{1}{p}$ (b) $\frac{1}{(p+6)}$
(c) $p + 6$ (d) p

RRB NTPC 17.01.2017 Shift-2

Ans : (a) From the given expression,

$$1 \div \left[\{p^2/(p+6)\} + \{6p/(p+6)\}\right]$$

$$= 1 \div \left[\frac{p^2}{p+6} + \frac{6p}{p+6}\right]$$

$$= 1 \div \left[\frac{p(p+6)}{(p+6)}\right]$$

$$= 1 \div p \quad = \frac{1}{p}$$

140. 19 × 23 = 437. Then 190 × 0.023 = ?
(a) 0.0437 (b) 0.437
(c) 43.7 (d) 4.37

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (d) Given,

$$19 \times 23 = 437$$

So,

$$190 \times 0.023 = 19 \times 23 \times \frac{10}{1000}$$

$$= 437 \times \frac{10}{1000} = 4.37$$

141. The value of $\frac{(0.27)^2 - (0.13)^2}{0.27 + 0.13}$ is:
(a) 0.03 (b) 1.40
(c) 0.40 (d) 0.14

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{(0.27)^2 - (0.13)^2}{0.27 + 0.13}$

Formula - $a^2 – b^2 = (a–b)(a+b)$

$$= \frac{(0.27 + 0.13)(0.27 - 0.13)}{(0.27 + 0.13)}$$

$= 0.27 – 0.13$
$= 0.14$

142. What is the value of the following expression?

$$\frac{(2.7)^2 - (0.8)^2}{2.7 - 0.8}$$

(a) 2.5 (b) 3.5
(c) 7.0 (d) 0

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) :

$$\frac{(2.7)^2-(0.8)^2}{2.7-0.8}$$

From formula- $a^2 - b^2 = (a - b)(a + b)$

$$\Rightarrow \frac{(2.7-0.8)(2.7+0.8)}{(2.7-0.8)}$$

$= 2.7 + 0.8$

$= 3.5$

Type - 4

143. Find the value of $39 \div \left\{6 \times \left(\frac{6}{7} \text{ of } \frac{7}{8}\right)\right\}$

(a) $\frac{26}{3}$ (b) $\frac{25}{3}$

(c) $\frac{23}{3}$ (d) $\frac{28}{3}$

RRB Group-D 09/09/2022 (Shift-I)

Ans. (a) : $39 \div \left\{6 \times \left(\frac{6}{7} \text{ of } \frac{7}{8}\right)\right\}$

$= 39 \div \left\{6 \times \left(\frac{6}{7} \times \frac{7}{8}\right)\right\}$

$= 39 \div \left\{6 \times \left(\frac{3}{4}\right)\right\}$

$= 39 \times \frac{2}{9}$

$= \frac{26}{3}$

144. Find the value of $2 + \left[2 + 2 \div \left\{2 + 2 \div \left(2 + \frac{1}{3}\right)\right\}\right]$

(a) $\frac{57}{10}$ (b) $\frac{37}{10}$

(c) $\frac{47}{10}$ (d) $\frac{67}{10}$

RRB Group-D 08/09/2022 (Shift-I)

Ans. (c) : $2 + \left[2 + 2 \div \left\{2 + 2 \div \left(2 + \frac{1}{3}\right)\right\}\right]$

$= 2 + \left[2 + 2 \div \left\{2 + 2 \times \frac{3}{7}\right\}\right]$

$= 2 + \left[2 + 2 \times \frac{7}{20}\right]$

$= 2 + \left[2 + \frac{7}{10}\right]$

$= , 2 + \frac{27}{10} \Rightarrow \frac{47}{10}$

145. Find the value of $20 + \frac{24}{7} \times \{(1 \div 2) + (2 \div 3)\}$

(a) 34 (b) 28

(c) 24 (d) 32

RRB Group-D 08/09/2022 (Shift-II)

Ans. (c) : $20 + \frac{24}{7} \times \{(1 \div 2) + (2 \div 3)\}$

$= 20 + \frac{24}{7} \times \left\{1 \times \frac{1}{2} + 2 \times \frac{1}{3}\right\}$

$= 20 + \frac{24}{7} \times \left\{\frac{1}{2} + \frac{2}{3}\right\}$

$= 20 + \frac{24}{7} \times \frac{7}{6}$

$= 20 + 4 = 24$

146. Simplify the following expression :
$3.5 \times 0.5 \times (4.4 - 0.625 \div 1.5625)$

(a) 10.5 (b) 7

(c) 14 (d) 1.75

RRB NTPC (Stage-2) 17/06/2022 (Shift-III)

Ans. (b) : $3.5 \times 0.5 \times (4.4 - 0.625 \div 1.5625)$

$= 1.75 \times (4.4 - 0.4)$

$= 1.75 \times 4 = 7$

147. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?
$15.95 - 4.01 + 13.99 \times 5.13 = ?$

(a) 75 (b) 82

(c) 80 (d) 77

RRB Group-D 29/08/2022 (Shift-I)

Ans. (b) : $15.95 - 4.01 + 13.99 \times 5.13 = ?$

Approx value

$16 - 4 + 14 \times 5 = ?$

$12 + 70 = ?$

$? = 82$

148. Which of the following options is the closest approximate value which will come in place of question mark (?) in the following equation?
$18.96 + 12.96 + 15.16 - 17.89 \times 2.04 + 49.93 \div 5.1 = ?$

(a) 23 (b) 22

(c) 24 (d) 21

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Ans. (d) : To the nearest value -

$= 19 + 13 + 15 - 18 \times 2 + 50 \div 5$

$= 47 - 36 + 50 \div 5$

$= 47 - 36 + 10$

$= 21$

149. Find the value of

$$\frac{(34.2 \times 6.84) \div (102.6 \times 0.00171)}{(12.5 \times 0.8) \div 0.03}$$

(a) 4 (b) 0.004

(c) 0.04 (d) 0.4

RRB NTPC (Stage-2) 16/06/2022 (Shift-III)

Ans. (a) : According to the question

$$\frac{(34.2\times6.84)\div(102.6\times0.00171)}{(12.5\times0.8)\div0.03}$$

$$=\frac{34.2\times6.84}{(102.6\times0.00171)}\times\frac{0.03}{(12.5\times0.8)}$$

$$=\frac{34.2\times6.84\times0.03}{102.6\times0.00171\times12.5\times0.8}$$

$$=\frac{342\times684\times3\times1000}{1026\times171\times125\times8}$$

$$=4$$

150. Find the value of

$$\frac{\left(11\frac{11}{12}\times1\frac{3}{13}\div2\frac{3}{4}\right)\div\left(\frac{7}{10}\div\left(\frac{3}{4}\times1\frac{2}{5}\right)\right)}{\frac{1}{4}\times\frac{2}{3}\times2\frac{2}{5}}$$

(a) 10 (b) $3\frac{1}{5}$

(c) $1\frac{1}{5}$ (d) 20

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Ans. (d) :

$$\frac{\left(11\frac{11}{12}\times1\frac{3}{13}\div2\frac{3}{4}\right)\div\left[\frac{7}{10}\div\left(\frac{3}{4}\times1\frac{2}{5}\right)\right]}{\frac{1}{4}\times\frac{2}{3}\times2\frac{2}{5}}$$

$$=\frac{\left(\frac{143}{12}\times\frac{16}{13}\times\frac{4}{11}\right)\div\left[\frac{7}{10}\div\left(\frac{3}{4}\times\frac{7}{5}\right)\right]}{\frac{1}{4}\times\frac{2}{3}\times\frac{12}{5}}$$

$$=\frac{\left(\frac{143}{12}\times\frac{16}{13}\times\frac{4}{11}\right)\div\left[\frac{7}{10}\times\frac{20}{21}\right]}{\frac{1}{4}\times\frac{2}{3}\times\frac{12}{5}}$$

$$=\frac{\frac{16}{3}\times\frac{21}{14}}{\frac{2}{5}}$$

$$=\frac{\frac{16}{2}}{\frac{2}{5}}=\frac{16}{2}\times\frac{5}{2}=\frac{80}{4}$$

$$=20$$

151. If $1\frac{1}{4}\times\left(5\frac{3}{4}\div\frac{2}{7}\text{ of k}\right)\div2\frac{7}{8}-3\frac{3}{4}=(17-4)\div2\text{ of }2$ is then find the value of $\frac{k+1}{k-1}$

(a) $\frac{5}{2}$ (b) 9

(c) 7 (d) $\frac{11}{3}$

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Ans. (b) :

$$\Rightarrow1\frac{1}{4}\left(5\frac{3}{4}\div\frac{2}{7}\text{ of k}\right)\div2\frac{7}{8}-3\frac{3}{4}=(17-4)\div2\text{ of }2$$

$$\Rightarrow\frac{5}{4}\times\left(\frac{23}{4}\div\frac{2k}{7}\right)\div\frac{23}{8}-\frac{15}{4}=13\div4$$

$$\Rightarrow\frac{5}{4}\times\frac{161}{8k}\times\frac{8}{23}-\frac{15}{4}=\frac{13}{4}$$

$$\Rightarrow\frac{35}{4k}=\frac{28}{4}$$

$$\Rightarrow\frac{35}{4k}=7$$

$$\Rightarrow k=\frac{35}{4\times7}=\frac{5}{4}$$

$$\frac{k+1}{k-1}=\frac{\frac{5}{4}+1}{\frac{5}{4}-1}=\frac{9}{1}=9$$

152. Simplify the following expression :

$$2\frac{1}{6}\times\left\{1\frac{19}{26}+\frac{15}{13}\times\left(\frac{5}{7}\div\frac{25}{14}\right)\right\}$$

(a) $4\frac{5}{6}$ (b) $4\frac{3}{4}$

(c) $4\frac{4}{5}$ (d) $4\frac{2}{3}$

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Ans. (b) :

$$2\frac{1}{6}\times\left\{1\frac{19}{26}+\frac{15}{13}\times\left(\frac{5}{7}\div\frac{25}{14}\right)\right\}$$

$$=\frac{13}{6}\times\left\{\frac{45}{26}+\frac{15}{13}\times\frac{5}{7}\times\frac{14}{25}\right\}$$

$$=\frac{13}{6}\times\left\{\frac{45}{26}+\frac{6}{13}\right\}$$

$$=\frac{13}{6}\times\left(\frac{45+12}{26}\right)$$

$$=\frac{13}{6}\times\frac{57}{26}=\frac{19}{4}=4\frac{3}{4}$$

153. $\frac{9}{15}\times\frac{45}{81}\times\left\{\frac{49}{6}\times\left(\frac{16}{7}-2\right)\right\}\times\frac{24}{5}\div\frac{16}{15}=?$

(a) $\frac{5}{9}$ (b) $\frac{9}{5}$

(c) $\frac{2}{7}$ (d) $\frac{7}{2}$

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Ans. (d) :

$$\frac{9}{15}\times\frac{45}{81}\left\{\frac{49}{6}\times\left(\frac{16}{7}-2\right)\right\}\times\frac{24}{5}\div\frac{16}{15}=?$$

$$=\frac{9}{15}\times\frac{45}{81}\times\left\{\frac{49}{6}\times\frac{2}{7}\right\}\times\frac{24}{5}\div\frac{16}{15}=?$$

$$=\frac{9}{15}\times\frac{45}{81}\times\frac{7}{3}\times\frac{24}{5}\div\frac{16}{15}=?$$

$$=\frac{9}{15}\times\frac{45}{81}\times\frac{7}{3}\times\frac{24}{5}\times\frac{15}{16}=?$$

$$\boxed{\frac{7}{2}=?}$$

154. Find the value of $\frac{3}{4}\times2\frac{2}{3}\div\frac{5}{9}$ of $1\frac{1}{5}-\frac{3}{5}$ of $\left(\frac{2}{3}\div\frac{2}{3}\text{ of }\frac{3}{2}\right)+\frac{4}{5}\times1\frac{1}{9}\div\frac{8}{15}-\frac{2}{3}$

(a) $1\frac{3}{10}$ (b) $4\frac{2}{5}$

(c) $3\frac{9}{10}$ (d) $3\frac{3}{5}$

RRB NTPC (Stage-2) 16/06/2022 (Shift-I)

Ans. (d) :

$$\frac{3}{4}\times2\frac{2}{3}\div\frac{5}{9}\text{ of }1\frac{1}{5}-\frac{3}{5}\text{ of }\left(\frac{2}{3}\div\frac{2}{3}\text{ of }\frac{3}{2}\right)+\frac{4}{5}\times1\frac{1}{9}\div\frac{8}{15}-\frac{2}{3}$$

$$=\frac{3}{4}\times\frac{8}{3}\div\frac{2}{3}-\frac{3}{5}\text{ of}\left(\frac{2}{3}\right)+\frac{4}{5}\times\frac{25}{12}-\frac{2}{3}$$

$$=\frac{3}{4}\times\frac{8}{3}\times\frac{3}{2}-\frac{2}{5}+\frac{5}{3}-\frac{2}{3}$$

$$=3-\frac{2}{5}+\frac{3}{3}$$

$$=3-\frac{2}{5}+1$$

$$=4-\frac{2}{5}$$

$$=\frac{18}{5}$$

$$=3\frac{3}{5}$$

155. Find the value of $\frac{1}{4}+\frac{2}{5}\div\left[\left\{2\frac{1}{5}-2\right\}\times5\right]-\frac{2}{3}\times\frac{3}{5}$

(a) $\frac{5}{6}$ (b) $\frac{2}{3}$

(c) $\frac{1}{4}$ (d) $\frac{3}{5}$

RRB Group-D 29/08/2022 (Shift-I)

Ans. (c) : $\frac{1}{4}+\frac{2}{5}\div\left[\left\{2\frac{1}{5}-2\right\}\times5\right]-\frac{2}{5}$

$$=\frac{1}{4}+\frac{2}{5}\div\left[\left(\frac{11}{5}-2\right)\times5\right]-\frac{2}{5}$$

$$=\frac{1}{4}+\frac{2}{5}\div\frac{1}{5}\times5-\frac{2}{5}$$

$$=\frac{1}{4}+\frac{2}{5}-\frac{2}{5}$$

$$=\frac{1}{4}$$

156. Simplify the following expression

$$\frac{(0.11)^2+(0.06)^2+(0.031)^2}{(0.011)^2+(0.006)^2+(0.0031)^2}$$

(a) 1000 (b) 1

(c) 100 (d) 10

RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) : $\frac{(0.11)^2+(0.06)^2+(0.031)^2}{(0.011)^2+(0.006)^2+(0.0031)^2}$

$$\frac{(0.11)^2+(0.06)^2+(0.031)^2}{0.01\left[(0.11)^2+(0.06)^2+(0.031)^2\right]}$$

$$=\frac{1}{0.01}=100$$

157. If 1.5x = 0.02y is, then find the value of $\frac{1}{\left(\frac{y+x}{y-x}\right)}$

(a) $\frac{38}{37}$ (b) $\frac{370}{38}$

(c) $\frac{37}{380}$ (d) $\frac{37}{38}$

RRB Group-D 13/09/2022 (Shift-II)

Ans. (d) : $1.5x = 0.02y$

$$\frac{x}{y}=\frac{0.02}{1.5}$$

$$\frac{x}{y}=\frac{2}{150}$$

$$\frac{x}{y}=\frac{1}{75}$$

Let

$x = 1$

$y = 75$

$$\frac{1}{\left(\frac{y+x}{y-x}\right)}=\frac{1}{\frac{75+1}{75-1}}$$

$$=\frac{74}{76}=\frac{37}{38}$$

158. Find the value of

$$\left(a+\frac{1}{b}\right)^r\left(a-\frac{1}{b}\right)^s \div \left(b+\frac{1}{a}\right)^r\left(b-\frac{1}{a}\right)^s$$

(a) $(ab)^{r+s}$ (b) $\left(\frac{a}{b}\right)^{r+s}$

(c) $\frac{a^r}{b^s}$ (d) $\left(\frac{b}{a}\right)^{r+s}$

RRB Group-D 22/08/2022 (Shift-I)

Ans. (b) : The given expression is as follows -

$$\left(a+\frac{1}{b}\right)^r\left(a-\frac{1}{b}\right)^s \div \left(b+\frac{1}{a}\right)^r\left(b-\frac{1}{a}\right)^s$$

$$\Rightarrow \frac{(ab+1)^r}{b^r}\times\frac{(ab-1)^s}{b^s} \div \frac{(ab+1)^r}{a^r}\times\frac{(ab-1)^s}{a^s}$$

$$\Rightarrow \frac{(ab+1)^r}{b^r}\times\frac{(ab-1)^s}{b^s}\times\frac{a^r}{(ab+1)^r}\times\frac{a^s}{(ab-1)^s}$$

$$\Rightarrow \frac{a^{r+s}}{b^{r+s}}$$

$$\Rightarrow \left(\frac{a}{b}\right)^{r+s}$$

159. Solve the following

$(625)^{0.17} \times (625)^{0.08} = ?$

(a) 5 (b) 25

(c) 1 (d) 2.5

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$$(625)^{0.17} \times (625)^{0.08} = ?$$

$$= [(25)^2]^{0.17} \times [(25)^2]^{0.08}$$

$$= [(5^2)^2]^{0.17} \times [(5^2)^2]^{0.08}$$

$$= 5^{0.68} \times 5^{0.32}$$

$$= 5^{0.68 + 0.32}$$

$$? = 5$$

160. If $19\frac{2}{3} - 7\frac{1}{4} = x + 2\frac{1}{2}$, then what will be the value of x?

(a) $9\frac{11}{12}$ (b) $\frac{11}{12}$

(c) $11\frac{9}{12}$ (d) $9\frac{1}{12}$

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : $19\frac{2}{3} - 7\frac{1}{4} = x + 2\frac{1}{2}$

$$\frac{59}{3} - \frac{29}{4} = x + \frac{5}{2}$$

$$x = \frac{59}{3} - \frac{29}{4} - \frac{5}{2}$$

$$x = \frac{236 - 87 - 30}{12}$$

$$x = \frac{119}{12} \text{ or } 9\frac{11}{12}$$

161. Solve the following.

$$8 \div 8 \times \frac{8+8}{8 \div 8 \times 8 + 8} = ?$$

(a) 128 (b) 1

(c) 64 (d) $\frac{1}{128}$

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (b) : $8 \div 8 \times \frac{8+8}{8 \div 8 \times 8 + 8} = ?$

$$1 \times \frac{16}{16} = 1 \times 1 = 1$$

162. The value of $\frac{32 \div 4 - 5 \times 8 \div 3}{5 \times 3 - \{6 + 3\}}$ is:

(a) $\frac{4}{9}$ (b) $-\frac{8}{9}$

(c) $\frac{8}{9}$ (d) $\frac{1}{9}$

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\frac{32 \div 4 - 5 \times 8 \div 3}{5 \times 3 - \{6 + 3\}}$$

$$= \frac{8 - 5 \times 8 \div 3}{15 - 9}$$

$$= \frac{8 - \frac{40}{3}}{6} = \frac{-\frac{16}{3}}{6}$$

$$= -\frac{16}{18} = -\frac{8}{9}$$

163. The value of $\frac{\{(13)^3 - 4^3\}}{13 - 8 \div 2} \div 8 - \{2 + 6 \times 9\}$ is:

(a) $-\frac{217}{8}$ (b) $-\frac{211}{8}$

(c) $-\frac{685}{8}$ (d) $\frac{685}{8}$

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

$$\frac{\{(13)^3 - 4^3\}}{13 - 8 \div 2} \div 8 - \{2 + 6 \times 9\}$$

$$= \frac{(2197 - 64)}{13 - 4} \times \frac{1}{8} - (2 + 54)$$

$$= \frac{2133}{9} \times \frac{1}{8} - 56$$

$$= \frac{711}{3} \times \frac{1}{8} - 56$$

$$= \frac{711}{24} - \frac{56}{1}$$

$$= \frac{711 - 1344}{24} = -\frac{633}{24}$$

$$= -\frac{211}{8}$$

164. What will be the value after simplifying this continued fraction?

$$\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4}}}}$$

(a) $\frac{19}{43}$ (b) $\frac{43}{19}$

(c) $\frac{5}{19}$ (d) $\frac{43}{5}$

RRB NTPC 03.02.2021 (Shift-II) Stage I

Ans. (a) : $\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4}}}}$

$= \cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{\frac{5}{4}}}}$

$= \cfrac{1}{2+\cfrac{1}{3+\frac{4}{5}}}$

$= \cfrac{1}{2+\cfrac{1}{\frac{19}{5}}} = \cfrac{1}{2+\frac{5}{19}}$

$= \frac{1}{43/19} = \frac{19}{43}$

165. Simplify the given expression

$$4\frac{1}{10}-\left[2\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{2}{5}+\frac{3}{10}\right)\right\}\right]$$

(a) $\frac{19}{15}$ (b) $\frac{12}{25}$

(c) $\frac{31}{25}$ (d) $\frac{26}{15}$

RRB NTPC 28.01.2021 (Shift-I) Stage I

Ans. (d) : According to the question,

$$4\frac{1}{10}-\left[2\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{2}{5}+\frac{3}{10}\right)\right\}\right]$$

$= \frac{41}{10}-\left[\frac{5}{2}-\left\{\frac{5}{6}-\frac{7}{10}\right\}\right]$

$= \frac{41}{10}-\left[\frac{5}{2}-\left\{\frac{25-21}{30}\right\}\right]$

$= \frac{41}{10}-\left[\frac{5}{2}-\frac{4}{30}\right]$

$= \frac{41}{10}-\left[\frac{75-4}{30}\right]$

$= \frac{41}{10}-\frac{71}{30}$

$= \frac{123-71}{30} = \frac{52}{30}$

$= \frac{26}{15}$

166. Solve the following:

$$\frac{1}{2}\times\frac{2}{3}-\frac{3}{4}\left(\frac{1}{2}\times\frac{1}{3}+\frac{5}{6}\right)\times\frac{4}{21} = ?$$

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) 2 (d) $\frac{4}{21}$

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (d) : $\frac{1}{2}\times\frac{2}{3}-\frac{3}{4}\left(\frac{1}{2}\times\frac{1}{3}+\frac{5}{6}\right)\times\frac{4}{21}$

$= \frac{2}{6}-\frac{3}{4}\left(\frac{1}{6}+\frac{5}{6}\right)\times\frac{4}{21}$

$= \frac{1}{3}-\frac{3}{4}\times 1\times\frac{4}{21}$

$= \frac{1}{3}-\frac{1}{7}$

$= \frac{7-3}{21} = \frac{4}{21}$

167. Solve the following

$$\frac{1}{2}\left[\frac{3}{4}-\left\{\frac{1}{4}-(-5-3)\right\}\right]$$

(a) $3\frac{3}{4}$ (b) $3\frac{1}{4}$

(c) $-3\frac{3}{4}$ (d) $-3\frac{1}{4}$

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (c) $\frac{1}{2}\left[\frac{3}{4}-\left\{\frac{1}{4}-(-5-3)\right\}\right]$

$= \frac{1}{2}\left[\frac{3}{4}-\left\{\frac{1}{4}-(-8)\right\}\right]$

$= \frac{1}{2}\left[\frac{3}{4}-\left\{\frac{1}{4}+8\right\}\right]$

$= \frac{1}{2}\left[\frac{3}{4}-\frac{33}{4}\right]$

$= \frac{1}{2}\left(-\frac{30}{4}\right)$

$= \frac{-15}{4}$ or $-3\frac{3}{4}$

168. Find the value

$$\frac{1}{5\times8}+\frac{1}{8\times11}+\frac{1}{11\times14}+\frac{1}{14\times17}$$

(a) $\frac{4}{17}$ (b) $\frac{4}{85}$

(c) $\frac{24}{85}$ (d) $\frac{2}{85}$

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\frac{1}{5\times8}+\frac{1}{8\times11}+\frac{1}{11\times14}+\frac{1}{14\times17}$$
$$=\frac{1}{3}\left[\frac{1}{5}-\frac{1}{8}+\frac{1}{8}-\frac{1}{11}+\frac{1}{11}-\frac{1}{14}+\frac{1}{14}-\frac{1}{17}\right]$$
$$=\frac{1}{3}\left[\frac{1}{5}-\frac{1}{17}\right]$$
$$=\frac{4}{85}$$

169. For x > 0 find the value of

$$\left(1+\frac{1}{x+1}\right)\left(1+\frac{1}{x+2}\right)\left(1+\frac{1}{x+3}\right)\left(1+\frac{1}{x+4}\right)$$

(a) $1+\frac{1}{x+5}$ (b) $\frac{1}{x+5}$

(c) $\frac{x+1}{x+5}$ (d) $\frac{x+5}{x+1}$

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (d) : $\left(1+\frac{1}{x+1}\right)\left(1+\frac{1}{x+2}\right)\left(1+\frac{1}{x+3}\right)\left(1+\frac{1}{x+4}\right)$

$$=\left(\frac{x+1+1}{x+1}\right)\left(\frac{x+2+1}{x+2}\right)\left(\frac{x+3+1}{x+3}\right)\left(\frac{x+4+1}{x+4}\right)$$
$$=\left(\frac{x+2}{x+1}\right)\left(\frac{x+3}{x+2}\right)\left(\frac{x+4}{x+3}\right)\left(\frac{x+5}{x+4}\right)$$
$$=\frac{(x+2)}{(x+1)}\times\frac{(x+3)}{(x+2)}\times\frac{(x+4)}{(x+3)}\times\frac{(x+5)}{(x+4)}$$
$$=\frac{x+5}{x+1}$$

170. Simplify the given expression.

$$\frac{5+5\times5}{5\times5+5}\times\frac{\frac{1}{5}\div\left(\frac{1}{5}\times\frac{1}{5}\right)}{\left(\frac{1}{5}\times\frac{1}{5}\right)\div\frac{1}{5}}-\left(5-\frac{1}{5}\right)\times\frac{10}{2}$$

(a) 3 (b) 1

(c) 0 (d) 2

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\frac{5+5\times5}{5\times5+5}\times\frac{\frac{1}{5}\div\left(\frac{1}{5}\times\frac{1}{5}\right)}{\left(\frac{1}{5}\times\frac{1}{5}\right)\div\frac{1}{5}}-\left(5-\frac{1}{5}\right)\times\frac{10}{2}$$
$$=\frac{30}{30}\times\frac{25/5}{5/25}-\frac{24}{5}\times\frac{10}{2}$$
$$=1\times25-24$$
$$=25-24=1$$

171. Solve the following

$$\left\{1-\frac{1}{4}\right\}\left\{1-\frac{2}{4}\right\}...\left\{1-\frac{5}{4}\right\}\left\{1-\frac{6}{4}\right\}=?$$

(a) $\frac{3}{64}$ (b) 0

(c) $\frac{3}{256}$ (d) $-\frac{3}{256}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (b) : from question,

$$\left\{1-\frac{1}{4}\right\}\left\{1-\frac{2}{4}\right\}...\left\{1-\frac{5}{4}\right\}\left\{1-\frac{6}{4}\right\}$$
$$=\left(1-\frac{1}{4}\right)\left(1-\frac{2}{4}\right)\left(1-\frac{3}{4}\right)\left(1-\frac{4}{4}\right)\left(1-\frac{5}{4}\right)\left(1-\frac{6}{4}\right)$$
$$=\frac{3}{4}\times\frac{2}{4}\times\frac{1}{4}\times0\times-\frac{1}{4}\times-\frac{2}{4}$$
$$=0$$

172. Simplify

$$25\div10-\left\{\frac{7}{4}\times\frac{1}{3}\right\}\times\frac{6}{5}+\frac{14}{3}\times\frac{9}{10}-\left\{\frac{1}{5}\div\frac{1}{25}\right\}$$

(a) 1 (b) 11

(c) 5 (d) 10

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

$$25\div10-\left\{\frac{7}{4}\times\frac{1}{3}\right\}\times\frac{6}{5}+\frac{14}{3}\times\frac{9}{10}-\left\{\frac{1}{5}\div\frac{1}{25}\right\}$$
$$=25\div10-\left\{\frac{7}{12}\right\}\times\frac{6}{5}+\frac{21}{5}-\left[\frac{1}{5}\times25\right]$$
$$=25\div10-\left\{\frac{7}{12}\right\}\times\frac{6}{5}+\frac{21}{5}-5$$
$$=25\div10-\left\{\frac{7}{12}\right\}\times\frac{6}{5}+\left(-\frac{4}{5}\right)$$
$$=25\div10-\frac{7}{10}-\frac{4}{5}$$
$$=\frac{25}{10}-\frac{7}{10}-\frac{4}{5}$$
$$=\frac{25}{10}-\frac{7}{10}-\frac{8}{10}=\frac{25}{10}-\frac{15}{10}=\frac{10}{10}=1$$

173. The value of $\frac{11}{5}-\left(\frac{2}{3}\text{ of }\frac{3}{5}-\frac{1}{5}\right)+\left(\frac{6}{5}\div\frac{4}{5}\right)$ is -

(a) $\frac{7}{2}$ (b) $\frac{2}{3}$

(c) $\frac{3}{5}$ (d) $\frac{1}{5}$

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) :

$$\frac{11}{5}-\left(\frac{2}{3}\text{ of }\frac{3}{5}-\frac{1}{5}\right)+\left(\frac{6}{5}\div\frac{4}{5}\right)$$

$$=\frac{11}{5}-\left(\frac{2}{5}-\frac{1}{5}\right)+\frac{3}{2}$$

$$=\frac{11}{5}-\frac{1}{5}+\frac{3}{2}$$

$$=2+\frac{3}{2}=\frac{7}{2}$$

174. Find the value of $777\frac{1}{5}+777\frac{2}{5}+777\frac{3}{5}+777\frac{4}{5}$

(a) 3000 (b) 3018
(c) 3108 (d) 3110

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (d) :

$$777\frac{1}{5}+777\frac{2}{5}+777\frac{3}{5}+777\frac{4}{5}$$

$$4\times777+\frac{1}{5}+\frac{2}{5}+\frac{3}{5}+\frac{4}{5}$$

$$3108+\frac{10}{5}=3108+2=3110$$

175. The value of $\frac{1}{4}+\frac{1}{4\times5}+\frac{1}{4\times5\times6}$, correct to four decimal places, is

(a) 0.3150 (b) 0.3140
(c) 0.3092 (d) 0.3083

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given expression,

$$\frac{1}{4}+\frac{1}{4\times5}+\frac{1}{4\times5\times6}$$

$$=\frac{1}{4}+\frac{1}{20}+\frac{1}{120}$$

$$=\frac{30+6+1}{120}=\frac{37}{120}=0.3083$$

176. Select the number that can replace the question mark (?) in the following equation.

$$?+\frac{18}{24}+3\frac{3}{4}=23\frac{13}{24}$$

(a) $19\frac{1}{24}$ (b) $19\frac{13}{24}$
(c) 1 (d) $19\frac{11}{24}$

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (a) : From question,

$$?+\frac{18}{24}+3\frac{3}{4}=23\frac{13}{24}$$

$$?+\frac{18}{24}+\frac{15}{4}=\frac{565}{24}$$

$$?=\frac{565}{24}-\frac{18}{24}-\frac{15}{4}$$

$$=\frac{565-18-90}{24}=\frac{457}{24}=19\frac{1}{24}$$

177. Find the value of x

$$1\frac{1}{5}-3\frac{2}{4}\div1\frac{3}{4}\div\left(x+3\frac{1}{8}\right)\div1\frac{1}{7}=1$$

(a) $x=3\frac{5}{8}$ (b) $x=3\frac{3}{8}$
(c) $x=5\frac{5}{8}$ (d) $x=7\frac{5}{8}$

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (c) : $1\frac{1}{5}-3\frac{2}{4}\div1\frac{3}{4}\div\left(x+3\frac{1}{8}\right)\div1\frac{1}{7}=1$

$$\frac{6}{5}-\frac{14}{4}\times\frac{4}{7}\times\frac{8}{(8x+25)}\times\frac{7}{8}=1$$

$$\frac{6}{5}-\frac{14}{(8x+25)}=1$$

$$\frac{1}{5}=\frac{14}{(8x+25)}$$

$$8x+25=70$$

$$8x=45$$

$$x=5\frac{5}{8}$$

178. Solve the following.

$$\left(1+\frac{1}{x}\right)\left(1+\frac{1}{x+1}\right)\left(1+\frac{1}{x+2}\right)\left(1+\frac{1}{x+3}\right)=?$$

(a) $x+4$ (b) $\frac{x+4}{x}$
(c) $1+\frac{1}{x+4}$ (d) $\frac{1}{x}$

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\left(1+\frac{1}{x}\right)\left(1+\frac{1}{x+1}\right)\left(1+\frac{1}{x+2}\right)\left(1+\frac{1}{x+3}\right)$$

$$=\left(\frac{x+1}{x}\right)\left(\frac{x+1+1}{x+1}\right)\left(\frac{x+2+1}{x+2}\right)\left(\frac{x+3+1}{x+3}\right)$$

$$=\frac{x+1}{x}\times\frac{x+2}{x+1}\times\frac{x+3}{x+2}\times\frac{x+4}{x+3}$$

$$=\frac{x+4}{x}$$

179. The value of $\left(35.7-\left(3+\frac{1}{3+\frac{1}{3}}\right)-\left(2+\frac{1}{2+\frac{1}{2}}\right)\right)$

(a) 34.8 (b) 36.6
(c) 30 (d) 35

RRB NTPC 11.03.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

$$\left(35.7-\left(3+\frac{1}{3+\frac{1}{3}}\right)-\left(2+\frac{1}{2+\frac{1}{2}}\right)\right)$$

$$=\left(35.7-\left(3+\frac{1}{\frac{10}{3}}\right)-\left(2+\frac{1}{\frac{5}{2}}\right)\right)$$

$$=\left(35.7-\left(3+\frac{3}{10}\right)-\left(2+\frac{2}{5}\right)\right)$$

$$=35.7-\frac{33}{10}-\frac{12}{5}$$

$$=35.7-3.3-2.4$$

$$=35.7-5.7=30.0$$

180. Simplify the following.

$$\mathbf{240\div\frac{5}{1\div\frac{4}{1\div\frac{5}{1\div 3}}}}$$

(a) $\frac{4}{3}$ (b) $\frac{5}{3}$

(c) $\frac{4}{5}$ (d) $\frac{5}{4}$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (c) : Given question,

$$240\div\frac{5}{1\div\frac{4}{1\div\frac{5}{1\div 3}}}$$

$$=240\div\frac{5}{1\div\frac{4}{1\div\frac{5}{1/3}}}$$

$$=240\div\frac{5}{1\div\frac{4}{1\div 15}}$$

$$=240\div\frac{5}{1\div 4\times 15}$$

$$=240\div\frac{5}{\frac{1}{60}}$$

$$=240\div 300$$

$$=\frac{240}{300}=\frac{4}{5}$$

181. Simplify : (−4.6)× (−4.6) ÷ (−4.6 + 0.6)

(a) - 5.29 (b) - 0.529

(c) - 4.06 (d) 5.01

RRB RPF Constable -24/01/2019 (Shift-I)

Ans : (a) From the given expression,

(-4.6) × (-4.6) ÷ (-4.6 + 0.6)

= (-4.6) × (-4.6) ÷ (- 4.0)

= (-4.6) × (-4.6) ×1/(-4) = -5.29

182. Simplify : $\mathbf{\frac{121}{3\frac{2}{3}}+\frac{92}{7\frac{1}{3}}}$

(a) $41\frac{12}{13}$ (b) $40\frac{13}{11}$

(c) $43\frac{11}{19}$ (d) $45\frac{6}{11}$

RRB JE - 23/05/2019 (Shift-II)

Ans : (d) From the given expression,

$$\frac{121}{3\frac{2}{3}}+\frac{92}{7\frac{1}{3}}=\frac{121\times 3}{11}+\frac{92\times 3}{22}$$

$$=\frac{6\times 121+92\times 3}{22}=\frac{726+276}{22}$$

$$=\frac{1002}{22}=\frac{501}{11}=45\frac{6}{11}$$

183. Solve: $\mathbf{\frac{3.6\times 0.48\times 2.50}{0.12\times 0.09\times 0.5}}$

(a) 8000 (b) 8

(c) 800 (d) 80

RRB JE - 24/05/2019 (Shift-I)

Ans : (c) From the given expression,

$$\frac{3.6\times 0.48\times 2.50}{0.12\times 0.09\times 0.5}=\frac{36\times 48\times 250}{12\times 9\times 5}=16\times 50=800$$

184. Find the value of

$$\mathbf{\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\frac{1}{4\times 5}+\frac{1}{5\times 6}+.....+\frac{1}{9\times 10}}$$

(a) 1/10 (b) 5/11

(c) 9/10 (d) 2/5

RRB JE - 24/05/2019 (Shift-III)

Ans : (c) From the given expression,

$$\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\frac{1}{4\times 5}+\frac{1}{5\times 6}+.....+\frac{1}{9\times 10}$$

$$\left[\frac{1}{1}-\frac{1}{2}\right]+\left[\frac{1}{2}-\frac{1}{3}\right]+\left[\frac{1}{3}-\frac{1}{4}\right]+\left[\frac{1}{4}-\frac{1}{5}\right]+\left[\frac{1}{5}-\frac{1}{6}\right]+.....+\left[\frac{1}{9}-\frac{1}{10}\right]=\left[\frac{1}{1}-\frac{1}{10}\right]$$

$$\left[\frac{10-1}{10}\right]=\frac{9}{10}$$

185. Simplify:

$$\mathbf{3+\frac{1}{1+\frac{1}{2+\frac{1}{4}}}}$$

(a) 48/13 (b) 18/49

(c) 1/12 (d) 3/13

RRB JE - 25/05/2019 (Shift-I)

Ans : (a) From the given expression,

$$= 3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{4}}} \qquad = 3 + \frac{1}{1 + \frac{1}{\frac{9}{4}}}$$

$$= 3 + \frac{1}{1 + \frac{4}{9}} = 3 + \frac{9}{13} = \frac{48}{13}$$

186. Simplify: $\left[1 + \frac{1}{10 + \frac{1}{10}}\right] + \left[1 - \frac{1}{10 + \frac{1}{10}}\right]$

(a) 2 (b) 101/10
(c) 3/10 (d) 91/101

RRB JE - 28/05/2019 (Shift-I)

Ans : (a) From the given expression,

$$\left[1 + \frac{1}{10 + \frac{1}{10}}\right] + \left[1 - \frac{1}{10 + \frac{1}{10}}\right]$$

$$\left[1 + \frac{10}{101}\right] + \left[1 - \frac{10}{101}\right]$$

$$\left[\frac{101 + 10}{101}\right] + \left[\frac{101 - 10}{101}\right]$$

$$\frac{111}{101} + \frac{91}{101} = \frac{202}{101} = 2$$

187. Simplify:

$$\frac{1\frac{1}{4} \div 1\frac{1}{2}}{\frac{1}{15} + 1 - \frac{9}{10}}$$

(a) 4 (b) 5
(c) 2 (d) 3

RRB JE - 30/05/2019 (Shift-II)

Ans : (b) From the given expression,

$$\frac{1\frac{1}{4} \div 1\frac{1}{2}}{\frac{1}{15} + 1 - \frac{9}{10}}$$

$$\Rightarrow \frac{\frac{5}{4} \div \frac{3}{2}}{\frac{2 + 30 - 27}{30}}$$

$$\Rightarrow \frac{\frac{5}{4} \times \frac{2}{3}}{\frac{5}{30}} = \frac{\frac{5}{6}}{\frac{5}{30}}$$

$$= \frac{5}{6} \times \frac{30}{5} = 5$$

188. Simplify :

$0.\overline{09} \times 7.\overline{3}$

(a) 11/3 (b) 61/9
(c) 2/3 (d) 67/99

RRB RPF-SI -06/01/2019 (Shift-III)

Ans : (c) From the given expression,

$$0.\overline{09} \times 7.\overline{3}$$

$$= \frac{9}{99} \times \left(7 + \frac{3}{9}\right) = \frac{9}{99} \times \frac{66}{9} = \frac{66}{99} = \frac{2}{3}$$

189. Simplify:

$3.\overline{36} - 2.\overline{05} + 1.\overline{33}$

(a) $2.\overline{61}$ (b) 2.61
(c) $2.\overline{64}$ (d) 2.64

RRB JE - 02/06/2019 (Shift-I)

Ans : (c) From the given expression,

$$3.\overline{36} - 2.\overline{05} + 1.\overline{33}$$

$$= 4.\overline{69} - 2.\overline{05} = 2.\overline{64}$$

190. Solve the following equation:

$(7.5 \times 7.5 - 2.5 \times 2.5) \div (1.5^2 + 2.75) = ?$

(a) 10 (b) 50
(c) 20 (d) 5

RRB RPF-SI -05/01/2019 (Shift-III)

Ans. (a) : Given equation,

$$(7.5 \times 7.5 - 2.5 \times 2.5) \div (1.5^2 + 2.75) = ?$$

$$= \frac{(7.5 - 2.5)(7.5 + 2.5)}{(2.25 + 2.75)}$$

$$= \frac{5.0 \times 10.0}{5.00}$$

$$= \frac{5 \times 10}{5} = 10$$

191. $\frac{0.12 \div 0.15}{2} = ?$

(a) 4 (b) 0.04
(c) 0.004 (d) 0.4

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (d) From the given expression,

$$\frac{0.12 \div 0.15}{2} = ?$$

$$\frac{0.12 \times \frac{1}{0.15}}{2} = ?$$

$$\frac{12}{15 \times 2} = ?$$

$$? = 0.4$$

192. $\frac{3 - 0.2}{0.1 \times (3 + 0.2)} = ?$

(a) 8.75 (b) 0.0875
(c) 87.5 (d) 0.875

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (a) From the given expression,

$$\frac{3-0.2}{0.1\times(3+0.2)}$$

$$\Rightarrow \frac{2.8}{0.32}=8.75$$

193. Find the value of the following equation:

$$\frac{1+2}{\left\{1+\frac{2}{1+\frac{1}{3}}\right\}}=?$$

(a) $\frac{21}{4}$ (b) $\frac{21}{5}$

(c) $\frac{6}{5}$ (d) $\frac{9}{4}$

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (c) From the given expression,

$$\frac{1+2}{\left\{1+\frac{2}{\left(1+\frac{1}{3}\right)}\right\}}$$

$$=\frac{3}{\left\{1+\frac{2\times3}{4}\right\}}=\frac{3}{\frac{10}{4}}=\frac{12}{10}=\frac{6}{5}$$

194. Solve the following equation:

$$11\div3+\frac{1}{9}-5\times6\left(1\times\frac{1}{6}\right)=?$$

(a) $\frac{-1}{9}$ (b) $\frac{-11}{9}$

(c) $\frac{11}{9}$ (d) $\frac{11}{8}$

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (b) From the given expression,

$$11\div3+\frac{1}{9}-5\times6\left(1\times\frac{1}{6}\right)$$

$$=11\div3+\frac{1}{9}-5\times1$$

$$=\frac{11}{3}+\frac{1}{9}-5=\frac{33+1-45}{9}=\frac{-11}{9}$$

195. $\frac{0.16\times1.65}{0.075\times0.02^2}=?$

(a) 8400 (b) 8000

(c) 7500 (d) 8800

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : From the given expression,

$$?=\frac{0.16\times1.65}{0.075\times0.02^2}$$

$$=\frac{16\times165\times10^{-4}}{75\times10^{-3}\times4\times10^{-4}}$$

$$=\frac{16\times165\times10^{3}}{75\times4}$$

$$=\frac{4\times165\times10^{3}}{75}$$

$$=\frac{4\times33\times10^{3}}{15}=\frac{4\times33\times10\times100}{15}$$

$$=\frac{4\times33\times2\times100}{3}=4\times11\times2\times100=8800$$

196. Find the value of $3\frac{5}{8}+\frac{6}{16}-\frac{5}{24}+3\frac{1}{2}=?$

(a) $\frac{751}{24}$ (b) $\frac{715}{24}$

(c) $\frac{175}{24}$ (d) $\frac{157}{24}$

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (c) From the given expression,

$$3\frac{5}{8}+\frac{6}{16}-\frac{5}{24}+3\frac{1}{2}$$

$$=\frac{29}{8}+\frac{6}{16}-\frac{5}{24}+\frac{7}{2}$$

$$=\frac{6\times29+3\times6-2\times5+24\times7}{48}$$

$$=\frac{174+18-10+168}{48}=\frac{350}{48}=\frac{175}{24}$$

197. Solve the following equation:

$$\frac{16}{3}-\left\{4\frac{1}{3}-\left(3\frac{1}{3}-\left(2\frac{1}{3}-\frac{1}{3}\right)\right)\right\}=?$$

(a) $4\frac{1}{3}$ (b) $5\frac{1}{3}$

(c) $1\frac{1}{3}$ (d) $2\frac{1}{3}$

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) : From the given expression,

$$\frac{16}{3}-\left\{4\frac{1}{3}-\left(3\frac{1}{3}-\left(2\frac{1}{3}-\frac{1}{3}\right)\right)\right\}=?$$

$$=\frac{16}{3}-\left\{4\frac{1}{3}-\left(3\frac{1}{3}-\left(\frac{7}{3}-\frac{1}{3}\right)\right)\right\}$$

$$=\frac{16}{3}-\left\{4\frac{1}{3}-\left(\frac{10}{3}-\frac{6}{3}\right)\right\}$$

$$=\frac{16}{3}-\left\{\frac{13}{3}-\frac{4}{3}\right\}$$

$$=\frac{16}{3}-\frac{9}{3}$$

$$=\frac{7}{3}$$

$$=2\frac{1}{3}$$

198. $(1 + 2/3) \div [(1+1/3) \div (2/3 +1)] = ?$

(a) $\frac{4}{3}$ (b) $\frac{3}{4}$

(c) $\frac{12}{25}$ (d) $\frac{25}{12}$

RRB NTPC 17.01.2017 Shift-2

Ans : (d) From the given expression,

$$\left(1+\frac{2}{3}\right)\div\left[\left(1+\frac{1}{3}\right)\div\left(\frac{2}{3}+1\right)\right]$$

$$=\frac{5}{3}\div\left[\frac{4}{3}\times\frac{3}{5}\right]$$

$$=\frac{5}{3}\times\frac{5}{4}$$

$$=\frac{25}{12}$$

199. Solve : $(0.25\times0.004)+0.374-0.72=?$

(a) -0.345 (b) 0.325

(c) 1.94 (d) -0.945

RRB NTPC 04.04.2016 Shift : 2

Ans : (a) $(0.25\times0.004)+0.374-0.72$

$=0.001-0.346$

$=-0.345$

200. Simplify: (3/2+5/3) ÷(3/2+2/3)

(a) 1 (b) 19/13

(c) 13/19 (d) 13/16

RRB NTPC 04.04.2016 Shift : 3

Ans : (b) From the given expression,

$$\left(\frac{3}{2}+\frac{5}{3}\right)\div\left(\frac{3}{2}+\frac{2}{3}\right)=\left(\frac{9+10}{6}\right)\div\left(\frac{9+4}{6}\right)$$

$$=\frac{19}{6}\div\frac{13}{6}$$

$$=\frac{19}{6}\times\frac{6}{13}=\frac{19}{13}$$

201. $5(10)^4+6(10)^3+4(10)-3(1/100)=?$

(a) 54,60.33 (b) 54,309.97

(c) 56,407.00 (d) 56,039.97

RRB NTPC 31.03.2016 Shift : 3

Ans : (d) From the given expression,

$$5(10)^4+6\times(10)^3+4(10)-3(1/100)$$

$$=5\times10000+6\times1000+4\times10-3\times\frac{1}{100}$$

$$=50000+6000+40-0.03$$

$$=56040-0.03=56039.97$$

Type - 5

202. Find the value of $5\sqrt{12}+6\sqrt{27}-4\sqrt{75}+\sqrt{192}$

(a) $20\sqrt{3}$ (b) $22\sqrt{3}$

(c) $18\sqrt{3}$ (d) $16\sqrt{3}$

RRB NTPC (Stage-2) 17/06/2022 (Shift-I)

Ans. (d) : $5\sqrt{12}+6\sqrt{27}-4\sqrt{75}+\sqrt{192}$

$=5\sqrt{4\times3}+6\sqrt{9\times3}-4\sqrt{25\times3}+\sqrt{64\times3}$

$=5\times2\sqrt{3}+6\times3\sqrt{3}-4\times5\sqrt{3}+8\sqrt{3}$

$=\sqrt{3}(10+18-20+8)$

$=\sqrt{3}(16)$

$=16\sqrt{3}$

203. Find the positive value of

$$\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+.....+\frac{1}{\sqrt{15}+\sqrt{16}}$$

(a) 1 (b) 3

(c) 4 (d) 2

RRB NTPC (Stage-2) 16/06/2022 (Shift-III)

Ans. (b) :

$$=\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+.....+\frac{1}{\sqrt{15}+\sqrt{16}}$$

$$=\frac{1}{\sqrt{2}+1}+\frac{1}{\sqrt{3}+\sqrt{2}}+\frac{1}{\sqrt{4}+\sqrt{3}}+.....+\frac{1}{\sqrt{16}+\sqrt{15}}$$

After rationalizing the denominator

$$=\frac{\sqrt{2}-1}{2-1}+\frac{\sqrt{3}-\sqrt{2}}{3-2}+\frac{\sqrt{4}-\sqrt{3}}{4-3}+.....+\frac{\sqrt{16}-\sqrt{15}}{16-15}$$

$$=\sqrt{2}-1+\sqrt{3}-\sqrt{2}+\sqrt{4}-\sqrt{3}+.....\sqrt{16}-\sqrt{15}$$

$=-1+\sqrt{16}=-1+4=3$

204. Find the value of $\left\{\left(234^5-243^8+\frac{1}{72}\right)^{-8}\right\}^0+8$

(a) 9 (b) 234

(c) 243 (d) 10

RRB Group-D 29/08/2022 (Shift-I)

Ans. (a) : $\left\{\left(234^5-243^8+\frac{1}{72}\right)^{-8}\right\}^0+8$

Any number to the power '0' has the value 1.

Hence

$1 + 8 = 9$

205. Find the value of $5\sqrt{6}-\sqrt{\left[3(4-2)\right]}+\left(\frac{12}{\sqrt{6}}\right)$

(a) $8\sqrt{6}$ (b) $6\sqrt{6}$

(c) $5\sqrt{6}$ (d) $7\sqrt{6}$

RRB Group-D 08/09/2022 (Shift-III)

Ans. (b) : $5\sqrt{6}-\sqrt{\left[3(4-2)\right]}+\left(\frac{12}{\sqrt{6}}\right)$

$=5\sqrt{6}-\sqrt{6}+2\sqrt{6}$

$=7\sqrt{6}-\sqrt{6}$

$=6\sqrt{6}$

206. Find the value of $\sqrt{729}+\sqrt{1681}+\sqrt{576}-\sqrt{1849}$

(a) 55 (b) 37
(c) 49 (d) 64

RRB Group-D 23/08/2022 (Shift-II)

Ans. (c) : $\sqrt{729}+\sqrt{1681}+\sqrt{576}-\sqrt{1849}$
$= 27 + 41 + 24 - 43$
$= 49$

207. If a = 5 then find the value of $\sqrt{(4a^2-4a+1)}+6a$

(a) 69
(b) 39
(c) 49
(d) 59

RRB Group-D 02/09/2022 (Shift-III)

Ans. (b) : दिया है-
$a = 5$
$\sqrt{(4a^2-4a+1)}+6a$
$= \sqrt{(4(5)^2-4\times5+1)}+6\times5$
$= \sqrt{100-20+1}+6\times5$
$= \sqrt{81}+6\times5$
$= 9 + 30$
$= 39$

208. Simplify $\frac{8^2\times3^3}{\sqrt{64}\times\sqrt{81}}$

(a) 24 (b) 27
(c) 64 (d) 72

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : According to the question -
$=\frac{8^2\times3^3}{\sqrt{64}\times\sqrt{81}}$
$=\frac{8\times8\times3\times3\times3}{8\times3\times3}$
$= 24$

209. Find the value of $\sqrt{2+\sqrt{2+\sqrt{2}.....}}$

(a) 1.75 (b) 2
(c) 2.5 (d) 1.5

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (b) : Let $x = \sqrt{2+\sqrt{2+\sqrt{2}.....}}$
Squaring the both side
$x^2 = 2+\sqrt{2+\sqrt{2+\sqrt{2}.....}}$
$x^2 = 2 + x$
$x^2 - x - 2 = 0$
$x^2 - 2x + x - 2 = 0$
$x(x-2)+1(x-2) = 0$
$(x-2)(x+1) = 0$
$x = 2$

210. The possible value of x in the given equation -:
$\sqrt{\frac{x}{1-x}}+\sqrt{\frac{1-x}{x}}=\frac{25}{12}$

(a) $\frac{12}{25}$ or $\frac{13}{25}$ (b) $\frac{8}{25}$ or $\frac{17}{25}$
(c) $\frac{19}{25}$ or $\frac{6}{25}$ (d) $\frac{9}{25}$ or $\frac{16}{25}$

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\sqrt{\frac{x}{1-x}}+\sqrt{\frac{1-x}{x}}=\frac{25}{12}$
$\frac{x+1-x}{\sqrt{x}\left(\sqrt{1-x}\right)}=\frac{25}{12}$
$\frac{1}{\sqrt{x-x^2}}=\frac{25}{12}$
On Squaring on both sides,
$\left(\frac{1}{\sqrt{x-x^2}}\right)^2=\left(\frac{25}{12}\right)^2$
$\frac{1}{x-x^2}=\frac{625}{144}$
$625x-625x^2=144$
$625x^2-625x+144=0$
$625x^2-400x-225x+144=0$
$25x(25x-16)-9(25x-16)=0$
$(25x-16)(25x-9)=0$
$(25x-16)=0 \quad (25x-9)=0$
$x=\frac{16}{25} \quad x=\frac{9}{25}$

211. What is the value of the following expression?
$\frac{\sqrt{225}}{14}\times\frac{\sqrt{196}}{22}\times\frac{\sqrt{484}}{15}$

(a) 14 (b) 1
(c) 2 (d) 3

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) :
$=\frac{\sqrt{225}}{14}\times\frac{\sqrt{196}}{22}\times\frac{\sqrt{484}}{15}$
$=\frac{15}{14}\times\frac{14}{22}\times\frac{22}{15}$
$=1$

212. The value of $\sqrt{0.04}+\sqrt{1.44}+\sqrt{1.69}+\sqrt{0.0009}$ is:

(a) 10.3 (b) 1.70
(c) 2.03 (d) 2.73

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\sqrt{0.04}+\sqrt{1.44}+\sqrt{1.69}+\sqrt{0.0009}$
$= 0.2 + 1.2 + 1.3 + 0.03$
$= 2.73$

213. The value of $\sqrt{10+\sqrt{221+\sqrt{12+\sqrt{16}}}}$ is :

(a) 3 (b) 5
(c) 4 (d) 6

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : $\sqrt{10+\sqrt{221+\sqrt{12+\sqrt{16}}}}$

$= \sqrt{10+\sqrt{221+\sqrt{12+4}}}$

$= \sqrt{10+\sqrt{221+4}}$

$= \sqrt{10+15}$

$= 5$

214. Evaluate the following.

$$\frac{2+\sqrt{5}}{2-\sqrt{5}}+\frac{2-\sqrt{5}}{2+\sqrt{5}}+\frac{\sqrt{5}-1}{\sqrt{5}+1}$$

(a) $\frac{-35-\sqrt{5}}{2}$ (b) $\frac{-32-\sqrt{5}}{2}$

(c) $\frac{-31-\sqrt{5}}{2}$ (d) $\frac{-33-\sqrt{5}}{2}$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (d) : $\frac{2+\sqrt{5}}{2-\sqrt{5}}+\frac{2-\sqrt{5}}{2+\sqrt{5}}+\frac{\sqrt{5}-1}{\sqrt{5}+1}$

$= \frac{\left(2+\sqrt{5}\right)^2+\left(2-\sqrt{5}\right)^2}{4-5}+\frac{\sqrt{5}-1}{\sqrt{5}+1}$

$= \frac{4+5+4\sqrt{5}+4+5-4\sqrt{5}}{-1}+\frac{\sqrt{5}-1}{\sqrt{5}+1}$

$= -18+\frac{\sqrt{5}-1}{\sqrt{5}+1}\times\frac{\sqrt{5}-1}{\sqrt{5}-1}$

$= -18+\frac{6-2\sqrt{5}}{4}$

$= -18+\frac{3-\sqrt{5}}{2}$

$= \frac{-36+3-\sqrt{5}}{2}$

$= \frac{-33-\sqrt{5}}{2}$

215. Find the positive value of the following square root.

$\sqrt{56+\sqrt{56+\sqrt{56+...}}} = ?$

(a) 12 (b) 4
(c) 56 (d) 8

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) : Let–

$x = \sqrt{56+\sqrt{56+\sqrt{56.....}}}$ ____(i)

On Squaring the both sides,

$x^2 = 56+\sqrt{56+\sqrt{56+\sqrt{56+.....}}}$

$x^2 = 56 + x$ {from equn. (i)}

$x^2 - x - 56 = 0$

$x^2 - 8x + 7x - 56 = 0$

$x(x-8)+7(x-8) = 0$

$(x-8)(x+7) = 0$

$x - 8 = 0$

$x = 8$ (positive value)

216. Solve the following -

$\sqrt[3]{\sqrt{0.000064}} = ?$

(a) 2.0 (b) 0.02
(c) 0.002 (d) 0.2

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (d) : $\sqrt[3]{\sqrt{0.000064}} = \sqrt[3]{\sqrt{0.008\times0.008}}$

$= \sqrt[3]{0.008}$

$= \sqrt[3]{0.2\times0.2\times0.2}$

$= \left[(0.2)^3\right]^{\frac{1}{3}} = 0.2$

217. $\frac{\left(\frac{2}{5}+\frac{4}{15}\right)}{\left(\frac{3}{5}-\frac{2}{5}\right)}$ **of** $\frac{3}{12} = ?$

(a) $\frac{5}{7}$ (b) $\frac{2}{6}$

(c) $\frac{5}{6}$ (d) $\frac{6}{5}$

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (c) From the given expression,

$\frac{\frac{2}{5}+\frac{4}{15}}{\left(\frac{3}{5}-\frac{2}{5}\right)}$ of $\frac{3}{12} = \frac{\frac{30+20}{75}}{\frac{1}{5}}\times\frac{3}{12}$

$\frac{50}{75}\div\frac{1}{5}\times\frac{3}{12}$

$\frac{50}{75}\times\frac{5}{1}\times\frac{3}{12}$

$\frac{50}{15}\times\frac{3}{12} = \frac{5}{6}$

218. Simplify : $\left(3+\sqrt{8}\right)+\frac{1}{(3-\sqrt{8})}-(6+4\sqrt{2})$

(a) 4 (b) 1
(c) 0 (d) 6

RRB JE - 23/05/2019 (Shift-III)

Ans : (c) From the given expression,

$= 3+\sqrt{8}+\frac{1}{3-\sqrt{8}}\times\frac{3+\sqrt{8}}{3+\sqrt{8}}-\left(6+4\sqrt{2}\right)$

$= 3+\sqrt{8}+3+\sqrt{8}-\left(6+4\sqrt{2}\right)$

$= 6 + 2\sqrt{8} - 6 - 4\sqrt{2}$
$= 6 + 4\sqrt{2} - 6 - 4\sqrt{2}$
$= 0$

219. Simplify : $\sqrt{25+10\sqrt{6}}+\sqrt{25-10\sqrt{6}}$

(a) $2\sqrt{15}$ (b) $2\sqrt{5}$
(c) $\sqrt{55}$ (d) $\sqrt{50}$

RRB JE - 24/05/2019 (Shift-III)

Ans : (a) From the given expression,

$\sqrt{25+10\sqrt{6}}+\sqrt{25-10\sqrt{6}}$

Let, $X = \sqrt{25+10\sqrt{6}}+\sqrt{25-10\sqrt{6}}$

On squaring both sides,

$X^2 = 25+10\sqrt{6}+25-10\sqrt{6}+2\left(\sqrt{(25)^2-\left(10\sqrt{6}\right)^2}\right)$

$X^2 = 50+2\left(\sqrt{625-600}\right)$

$X^2 = 50+2\times 5$

$X^2 = 60$

$X = \sqrt{60}$

$X = 2\sqrt{15}$

220. If $3\sqrt{5}+\sqrt{125}$ = 17.88, then find the value of $\sqrt{80}+6\sqrt{5}$

(a) 22.25 (b) 22.35
(c) 18.75 (d) 20.235

RRB JE - 31/05/2019 (Shift-I)

Ans : (b) Given,

$3\sqrt{5}+\sqrt{125} = 17.88$

$3\sqrt{5}+5\sqrt{5} = 17.88$

$8\sqrt{5} = 17.88$

$\sqrt{5} = \dfrac{17.88}{8}$

$\sqrt{80}+6\sqrt{5} = ?$

$4\sqrt{5}+6\sqrt{5} = ?$

$10\sqrt{5} = ?$

$= \dfrac{17.88\times 10}{8} = 22.35$

221. Find the value of $\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{...}}}}}$?

(a) 5 (b) $\sqrt{30}$
(c) 5.4 (d) 6

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a) Let

$\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{.....}}}}} = x$

Squaring on both sides,

$30 - x = x^2$

$\Rightarrow x^2 + x - 30 = 0$

$\Rightarrow (x+6)(x-5) = 0$

$\Rightarrow x = 5$

Hence, $\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{30-\sqrt{.....}}}}} = 5$

222. Solve: $\dfrac{\sqrt{5}}{\sqrt{3}-\sqrt{2}} - \dfrac{3\sqrt{3}}{\sqrt{5}-\sqrt{2}} - \dfrac{\sqrt{8}}{\sqrt{5}+\sqrt{3}} = ?$

(a) 0 (b) 1/2
(c) -1 (d) -1/2

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (a) : From the given expression,

$\dfrac{\sqrt{5}}{\sqrt{3}-\sqrt{2}} - \dfrac{3\sqrt{3}}{\sqrt{5}-\sqrt{2}} - \dfrac{\sqrt{8}}{\sqrt{5}+\sqrt{3}} = ?$

$? = \dfrac{\sqrt{5}(\sqrt{3}+\sqrt{2})}{3-2} - \dfrac{3\sqrt{3}(\sqrt{5}+\sqrt{2})}{5-2} - \dfrac{2\sqrt{2}(\sqrt{5}-\sqrt{3})}{5-3}$

$= \sqrt{15}+\sqrt{10}-\sqrt{15}-\sqrt{6}-\sqrt{10}+\sqrt{6}$

$= 0$

223. Simplify : $(2.25)^{\frac{1}{2}}$

(a) 1.5 (b) 15
(c) 1.6 (d) 2/3

RRB NTPC 17.01.2017 Shift-3

Ans : (a) From the given expression,

$(2.25)^{1/2}$

$= \sqrt{2.25}$

$= \sqrt{\dfrac{225}{100}}$

$= \sqrt{\dfrac{15\times 15}{10\times 10}}$

$= \dfrac{15}{10} = 1.5$

224. $\sqrt{75.24+?} = 8.71$

(a) 0.6241 (b) 6.0241
(c) 6.241 (d) 62.41

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (a) : From the given expression,

$\sqrt{75.24+?} = 8.71$ Let ? = x

$\sqrt{75.24+x} = 8.71$

On squaring the both side,

$(75.24+x) = (8.71)^2$

$75.24 + x = 75.8641$

$x = 75.8641 - 75.24$

$\boxed{x = 0.6241}$

225. If $\dfrac{x}{\sqrt{128}} = \dfrac{\sqrt{162}}{x}$ Then find the value of 'X'.

(a) 14 (b) 12
(c) 144 (d) 13

RRB JE - 23/05/2019 (Shift-III)

Ans : (b) Given,

$\dfrac{x}{\sqrt{128}} = \dfrac{\sqrt{162}}{x}$

$\Rightarrow x^2 = \sqrt{162} \times \sqrt{128}$

$\Rightarrow x^2 = \sqrt{18 \times 9 \times 16 \times 8}$

$\Rightarrow x^2 = 144$

$\Rightarrow x = \sqrt{144}$

$x = 12$

226. If $\sqrt{75} + \sqrt{363} = \sqrt{N}$, then what is the value of N?

(a) 729 (b) 438

(c) 768 (d) 27

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (c) From the given expression,

$\sqrt{75} + \sqrt{363} = \sqrt{N}$

On squaring both sides,

$\left(\sqrt{75}\right)^2 + \left(\sqrt{363}\right)^2 + 2\sqrt{75} \times \sqrt{363} = \left(\sqrt{N}\right)^2$

$75 + 363 + 2 \times 5\sqrt{3} \times 11\sqrt{3} = N$

$438 + 330 = N$

$N = 768$

227. Evaluate:

$\sqrt{19600} + \sqrt{0.0196} + \sqrt{0.00000196}$

(a) 142.1414 (b) 140.1414

(c) 143.1414 (d) 141.1414

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (b) : From the given expression,

$\sqrt{19600} + \sqrt{0.0196} + \sqrt{0.00000196}$

$= 140 + 0.14 + 0.0014$

$= 140.1414$

228. $\sqrt{0.015625} \times \sqrt{0.0256}$ = _____

(a) 0.004 (b) 0.002

(c) 0.04 (d) 0.02

RRB ALP CBT-2 Elec. - Mec. 21-01-2019 (Shift-II)

Ans. (d) : $\sqrt{0.015625} \times \sqrt{0.0256}$

$= \sqrt{0.125 \times 0.125} \times \sqrt{0.16 \times 0.16}$

$= 0.125 \times 0.16$

$= 0.02$

229. Solve:-

$\sqrt{0.2025} + \sqrt{0.1225}$ = _____

(a) 1.2 (b) 0.6

(c) 0.9 (d) 0.8

RRB ALP CBT-2 Mec. - Diesel 23-01-2019 (Shift-II)

Ans. (d) : $\sqrt{0.2025} + \sqrt{0.1225}$

$= \sqrt{0.45 \times 0.45} + \sqrt{0.35 \times 0.35}$

$= 0.45 + 0.35$

$= 0.8$

Type - 6

230. Find the simplified form of $\dfrac{a^{10} \times b^{-7} \times c^{-4}}{a^{-5} \times b^2 \times c^5}$

(a) $a^{15} \times b^{-9} \times c^{-9}$ (b) $a^5 \times b^9 \times c^{-9}$

(c) $a^{15} \times b^9 \times c^9$ (d) $a^5 \times b^{-9} \times c^{-9}$

RRB Group-D 30/08/2022 (Shift-III)

Ans. (a) : $\dfrac{a^{10} \times b^{-7} \times c^{-4}}{a^{-5} \times b^2 \times c^5}$

$\Rightarrow a^{10} \times a^5 \times b^{-7} \times b^{-2} \times c^{-4} \times c^{-5}$

$\Rightarrow a^{15} \times b^{-9} \times c^{-9}$

231. Find the value of $\{1 + (1 - 2)^{-1} + 2 - (1 - 2)^{-2}\}^2$

(a) 8 (b) 0

(c) 1 (d) 9

RRB Group-D 13/09/2022 (Shift-III)

Ans. (c) : $\{1 + (1-2)^{-1} + 2 - (1-2)^{-2}\}^2$

$= \{1 + (-1)^{-1} + 2 - (-1)^{-2}\}^2$

$= \{1 - 1 + 2 - (-1/1)^2\}^2$

$= \{0 + 2 - 1\}^2$

$= \{1\}^2$

$= 1$

232. Simplify $(3^2)^3 + (2^3)^2$

(a) 739 (b) 729

(c) 793 (d) 379

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (c) : $(3^2)^3 + (2^3)^2$

$= (9)^3 + (8)^2$

$= 729 + 64$

$= 793$

233. If a : b = $\sqrt{7} : \sqrt{3}$, then the value of (3a + 2b) : (3a-2b) is equal to:

(a) $\dfrac{2+\sqrt{21}}{\left(-2+\sqrt{21}\right)}$ (b) $\dfrac{2+\sqrt{21}}{\left(2-\sqrt{21}\right)}$

(c) $\dfrac{2+\sqrt{21}}{\left(-2-\sqrt{21}\right)}$ (d) $\dfrac{2-\sqrt{21}}{\left(2+\sqrt{21}\right)}$

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

$$a : b = \sqrt{7} : \sqrt{3} \Rightarrow \frac{a}{b} = \frac{\sqrt{7}}{\sqrt{3}}$$

Let $a = \sqrt{7}$, $b = \sqrt{3}$

then, $(3a + 2b) : (3a - 2b)$

$= \left(3 \times \sqrt{7} + 2 \times \sqrt{3}\right) : \left(3 \times \sqrt{7} - 2 \times \sqrt{3}\right)$

$= \left(3\sqrt{7} + 2\sqrt{3}\right) : \left(3\sqrt{7} - 2\sqrt{3}\right)$

$= \dfrac{3\sqrt{7} + 2\sqrt{3}}{3\sqrt{7} - 2\sqrt{3}}$

On multiplying by $\sqrt{7}$ in numerator and denominator,

$= \dfrac{21 + 2\sqrt{21}}{21 - 2\sqrt{21}} = \dfrac{\sqrt{21}\left(\sqrt{21} + 2\right)}{\sqrt{21}\left(\sqrt{21} - 2\right)}$

$= \dfrac{2 + \sqrt{21}}{-2 + \sqrt{21}}$

234. If x : y = 2 : 3 then what is the value of (5x+3y) : (5x-3y)

(a) 19 : 3 (b) 19 : 2
(c) 9 : 1 (d) 19 : 1

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : $x : y = 2 : 3 \Rightarrow \frac{x}{y} = \frac{2}{3}$

Let- $x = 2,\ y = 3$

then, $(5x + 3y) : (5x - 3y)$

$= (5 \times 2 + 3 \times 3) : (5 \times 2 - 3 \times 3)$

$= (10 + 9) : (10 - 9)$

$= 19 : 1$

235. If a : b = 3 : 2, then $(7a+9b):(5a+7b)$ = ?

(a) 29 : 19 (b) 29 : 39
(c) 39 : 29 (d) 19 : 39

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let $a = 3x$ and $b = 2x$

then, $\frac{7a+9b}{5a+7b} = \frac{7\times3x+9\times2x}{5\times3x+7\times2x}$

$= \frac{21x+18x}{15x+14x}$

$= \frac{39x}{29x} = \frac{39}{29} = 39 : 29$

236. On simplification $\frac{2^{10}-3^{10}}{5^{10}-6^{10}}$ is:

(a) A positive rational number
(b) A negative rational number
(c) Neither a positive nor a negative rational number
(d) Can not be defined

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$\frac{2^{10}-3^{10}}{5^{10}-6^{10}} = \frac{1024-59049}{9765625-60466176} = \frac{-58025}{-50700551}$

$= \frac{58025}{50700551}$ (A positive rational number)

237. How will you write 2.84 hours in hours, minutes and seconds?

(a) 2 hours 8 minutes 4 seconds
(b) 3 hours 24 minutes
(c) 2 hours 50 minutes 24 seconds
(d) 2 Hours 50 minutes 4 seconds

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) :

2.84 hours = 2 hours +.84 ×60 minutes

= 2 hours +50.4 minutes

= 2 hours +50 minutes + 0.4 ×60 seconds

= 2 hours +50 minutes + 24 seconds

238. Find the value

$$\frac{(0.01)^2+(0.22)^2+(0.333)^2+(0.4444)^2}{(0.001)^2+(0.022)^2+(0.0333)^2+(0.04444)^2}$$

(a) 50 (b) 75
(c) 125 (d) 100

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (d) :

$$\frac{(0.01)^2+(0.22)^2+(0.333)^2+(0.4444)^2}{(0.001)^2+(0.022)^2+(0.0333)^2+(0.04444)^2}$$

$$= (10)^2\left[\frac{\left((1)^2+(22)^2+(333)^2+(4444)^2\right)}{(1)^2+(22)^2+(333)^2+(4444)^2}\right]$$

$= 100$

239. How will you write 8.17 hours in hours, minutes and seconds?

(a) 8 hours, 17 minutes
(b) 8 hours, 10 minutes, 12 seconds
(c) 8 hours, 10 minutes, 7 seconds
(d) 8 hours, 12 minutes

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (b) : 8.17 hours

$= 8 \text{ hours} + \frac{17}{100}\times 60 \text{ minutes}$

$= 8 \text{ hours} + 10.2 \text{ minutes}$

$= 8 \text{ hours} + 10 \text{ minutes} + \frac{2}{10}\times 60 \text{ seconds}$

$= 8 \text{ hours}, 10 \text{ minutes}, 12 \text{ seconds}$

240. Solve the following

$$\left(1^3+2^3+3^3+....+8^3\right)^{\frac{-5}{2}}$$

(a) $36^{-7.5}$ (b) $8^{-7.5}$
(c) 6^{-10} (d) 10^3

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$(1^3 + 2^3 + 3^3 + \text{----------} + 8^3)^{-5/2}$

Sum of the cubes of n natural numbers $= \left\{\frac{n(n+1)}{2}\right\}^2$

$= \left[\left\{\frac{8(8+1)}{2}\right\}^2\right]^{-5/2}$

$= \left[(4\times9)^2\right]^{-5/2}$

$= \left[(36)^2\right]^{-5/2}$

$= (36)^{-5}$

$= \frac{1}{36^5}$

$= \frac{1}{(6^2)^5} = 6^{-10}$

241. Solve the following

$\left(\frac{1}{5}x-\frac{1}{6}y\right)(5x+6y)=?$

(a) $x^2+\frac{11xy}{30}-y^2$ (b) $x^2+\frac{11xy}{30}-y^2$

(c) $x^2+\frac{11xy}{30}-y$ (d) Y^2

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (a) :

$\left(\frac{1}{5}x-\frac{1}{6}y\right)(5x+6y)$

$=\frac{5x^2}{5}+\frac{6xy}{5}-\frac{5xy}{6}-\frac{6y^2}{6}$

$=x^2+\frac{36xy-25xy}{30}-y^2$

$=x^2+\frac{11xy}{30}-y^2$

242. Simplify: $\sqrt{12}\times\sqrt{27}$

(a) $4\sqrt{3}$ (b) $3\sqrt{4}$

(c) 18 (d) 9

RRB RPF-SI -06/01/2019 (Shift-III)

Ans : (c) From the given expression,

$=\sqrt{12}\times\sqrt{27}=2\sqrt{3}\times3\sqrt{3}=6\times3=18$

243. Simplify: $\frac{0.1\times0.1+0.2\times0.2}{0.3\times0.3+0.6\times0.6}$

(a) 2/9 (b) 1/9

(c) 1/3 (d) 2/3

RRB JE - 27/05/2019 (Shift-I)

Ans : (b) From the given expression,

$\frac{0.1\times0.1+0.2\times0.2}{0.3\times0.3+0.6\times0.6}$

$=\frac{\frac{1}{100}+\frac{4}{100}}{\frac{9}{100}+\frac{36}{100}}=\frac{5}{100}\times\frac{100}{45}$

$=\boxed{\frac{1}{9}}$

244. $(0.2\times0.2\times0.2)\times(0.06\times0.06\times0.06)\div(0.12\times0.12\times0.12)=?$

(a) 0.008 (b) 0.001

(c) 0.002 (d) 0.006

RRB RPF-SI -10/01/2019 (Shift-III)

Ans : (b) From the given expression,

$\frac{(0.2)^3\times(0.06)^3}{(0.12)^3}$

$\frac{(0.2\times0.06)^3}{(0.12)^3}=\left(\frac{0.012}{0.12}\right)^3$

$=\left(\frac{1}{10}\right)^3$

$=(0.1)^3$

$=0.001$

245. Solve: $\left(\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2$

(a) 3/4 (b) 4/3

(c) $2\sqrt{3}$ (d) $\frac{4}{\sqrt{3}}$

RRB JE - 02/06/2019 (Shift-III)

Ans : (b) From the given expression,

$\left(\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2=\left(\sqrt{3}\right)^2+\left(\frac{1}{\sqrt{3}}\right)^2-2\sqrt{3}\times\frac{1}{\sqrt{3}}$

$=3+\frac{1}{3}-2=\frac{9+1-6}{3}=\frac{10-6}{3}=\frac{4}{3}$

246. Solve the equation: 467 × 467 + 166 × 166 –2 × 467 × 166 = ?

(a) 90106 (b) 960600

(c) 90601 (d) 90060

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (c) From the given expression,

$467\times467+166\times166-2\times467\times166$

$(A-B)^2=A^2+B^2-2AB$

On putting A = 467, B = 166

$467\times467+166\times166-2\times467\times166$

$(467)^2+(166)^2-(2\times467\times166)$

$(467-166)^2=(301)^2=90601$

247. Solve: $\sqrt{(0.15+0.12)}\sqrt{(0.15-0.12)}$

(a) 0.09 (b) 0.03

(c) 0.9 (d) 0.3

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (a) From the given expression,

$\sqrt{(0.15+0.12)}\sqrt{(0.15-0.12)}$

$=\sqrt{(0.15)^2-(0.12)^2}$

$=\sqrt{0.0225-0.0144}$

$=\sqrt{0.0081}=0.09$

248. Solve the following:

$(3.6+6.4)(3.6-6.4)-(3.6-6.4)^2=?$

(a) 29.6 (b) –35.84

(c) 32.6 (d) 32.68

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (b) : From the given expression,

$(3.6+6.4)(3.6-6.4)-(3.6-6.4)^2=?$

$\Rightarrow(3.6-6.4)\left[(3.6+6.4)-(3.6-6.4)\right]=?$

$\Rightarrow(3.6-6.4)\left[3.6+6.4-3.6+6.4\right]=?$

$\Rightarrow(3.6-6.4)(6.4+6.4)=?$

$\Rightarrow(-2.8)(12.8)=?$

$?=-35.84$

05.

Lowest Common Multiple & Highest Common Factor

Type - 1

1. What is the LCM of 98, 28 and 112 ?

(a) 784 (b) 1176

(c) 392 (d) 1568

RRB NTPC (Stage-2) 15/06/2022 (Shift-III)

Ans. (a) : LCM of 98, 28 and 112

98 = 7×7×2

28 = 7×2×2

112 = 2×2×2×2×7

L.C.M. = 2×2×2×2×7×7

= 784

2. The LCM of the numbers 36, 54, 72 and 96 is :

(a) 1064 (b) 764

(c) 864 (d) 964

RRB Group-D 09/09/2022 (Shift-I)

Ans. (c) : The LCM of the numbers 36, 54, 72 and 96 is

$36 = 2 \times 2 \times 3 \times 3$

$54 = 2 \times 3 \times 3 \times 3$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

Hence the LCM of 36, 54, 72, 96

$= 2\times2\times2\times 2 \times 2 \times 3 \times 3 \times 3$

$= 32 \times 27$

$= 864$

3. The LCM of the numbers 24, 42 and 56 is :

(a) 816 (b) 186

(c) 168 (d) 618

RRB Group-D 01/09/2022 (Shift-I)

Ans. (c) : Factors of 24, 42, 56

24 = 2×2×2×3

42 = 2×3×7

56 = 2×2×2×7

LCM = 2×2×2×3×7 = 168

4. The LCM of the numbers 70, 28 and 42 is :

(a) 116 (b) 420

(c) 280 (d) 700

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : LCM of (70, 28, 42)

2	70,	28,	42
2	35,	14,	21
3	35,	7,	21
5	35,	7,	7
7	7,	7,	7
	1,	1,	1

Hence LCM of 70, 28 and 42 = 2 × 2 × 3 × 5 × 7

= 420

5. A Former plants three different types of plants in equal number in a garden. All plants of one type are planted to form a rectangle, in which no rectangel contains more than one type no plants of any type are left out. After all the plants were planted, the rectangle of plant A had 70 rows, the rectange of plant B had 28 rows and the rectange of plant C had 42 rows. Find the mininum number of plants of each type planted by the farmer in the garden.

(a) 70 (b) 420

(c) 210 (d) 140

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (b) : Minimum number of plants of each type planted by the farmer = LCM of 70, 28, and 42

$70 = 2 \times 5 \times 7$

$28 = 2 \times 2 \times 7$

$42 = 2 \times 3 \times 7$

LCM = $2 \times 2 \times 3 \times 5 \times 7$

$= 420$

Hence the Minimum number of plants = 420

6. The LCM of two prime numbers x and y (x > y) is 119. The value of 3y – x is:

(a) 2 (b) 4

(c) 8 (d) 6

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (b) : LCM = 119

$\therefore$ Numbers x and y = 17 × 7

$\therefore$ x = 17, y = 7

3y – x

= 3 × 7 – 17

= 21 – 17 = 4

7. The L.C.M. of any two consecutive positive integers x and x + 1 is?

(a) 1 (b) (x) (x + 1)

(c) x (d) x + 1

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) : LCM of x and (x+1) = The LCM of any two consective positive integers is equal to the product of those numbers.
$\therefore$ LCM of x and $(x + 1) = x (x + 1)$

8. If the product of two co-primes is 104, then their LCM is?
(a) can't be determined
(b) is 104
(c) is 1
(d) is equal to their HCF

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (b**) :** Factor of 104, we have
$104 = 13 \times 8$
HCF of co-prime numbers is always 1.
Now,
HCF×LCM = Product of two numbers.
$1 \times$ LCM = 104
LCM = 104

9. The LCM of 6, 9 and x is 72. Which of the given options can be a possible value of x?
(a) 18 (b) 12
(c) 36 (d) 24

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : LCM = 72
$= 2 \times 2 \times 2 \times 3 \times 3$
Number = 6, 9, x
$6 = 2 \times 3$
$9 = 3 \times 3$
HCF = 3
$$\text{Number } x = \frac{72}{3}$$
Hence, it is clear that x = 24

10. What is the LCM of 22, 24, 48 and 16
(a) 48 (b) 528
(c) 64 (d) 176

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (b) : LCM of 22, 24, 48 and 16

2	22,24,48,16
2	11,12,24, 8
2	11, 6,12, 4
2	11, 3, 6, 2
3	11, 3, 3, 1
11	11, 1, 1, 1
	1, 1, 1, 1

$=2\times2\times2\times2\times3\times11=528$
LCM of 22, 24, 48, 16 = 528

11. The LCM of 4, 6 and x CANNOT be:
(a) 24 (b) 18
(c) 36 (d) 60

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (b**) :** L.C.M of 4, 6 and x = 12x
So, it is clear that the L.C.M of 4, 6 and x will be a multiple of 12.
The number given in option (b) is not a multiple of 12. Hence, L.C.M of 4,6 and x can't be 18.

12. In which of the following that CANNOT be the L.C.M. of 3, 4 and x.
(a) 60 (b) 24
(c) 18 (d) 36

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (c) : 18 cannot be the LCM of 3,4 and x because 18 is not perfectly divisible by 4.

13. What is the LCM of $\sqrt[2]{169}, \sqrt[3]{27}, \sqrt[3]{64}$ and $\sqrt[2]{144}$
(a) 156 (b) 312
(c) 182 (d) 468

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : From question,
$\sqrt[2]{169} = 13, \sqrt[3]{27} = 3, \sqrt[3]{64} = 4, \sqrt[2]{144} = 12$

2	13, 3, 4, 12
2	13, 3, 2, 6
3	13, 3, 1, 3
13	13, 1, 1, 1
	1, 1, 1, 1

Hence, LCM = $2 \times 2 \times 3 \times 13$
$= 156$

14. The LCM of $8^2\times6^3$ and $4^6\times9^3$ is:
(a) $2^9 \times 3^6$ (b) $2^9 \times 3^3$
(c) $2^{12} \times 3^3$ (d) $2^{12} \times 3^6$

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : From question,
$8^2 \times 6^3 \rightarrow (2^3)^2 \times (2\times3)^3 = 2^6 \times 2^3\times3^3 = 2^9\times3^3$ .....(i)
$4^6 \times 9^3 \rightarrow (2^2)^6 \times (3^2)^3 = 2^{12} \times 3^6$.....(ii)
LCM of equation (i) and (ii) $= 2^{12} \times 3^6$

15. LCM of $2^4 \times 3^4 \times 5^3$ and $2^2 \times 3^6 \times 5^5 \times 7^2$ is
(a) $2^3 \times 3^5 \times 5^4 \times 7$ (b) $2^2 \times 3^2 \times 5^2 \times 7^2$
(c) $2^6 \times 3^{10} \times 5^8 \times 7^2$ (d) $2^4 \times 3^6 \times 5^5 \times 7^2$

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,
$2^4\times3^4\times5^3 = 2^2\times2^2\times3^2\times3^2\times5^3$
$2^2\times3^6\times5^5\times7^2 = 2^2\times3^2\times3^2\times3^2\times5^5\times7^2$
LCM = $2^4\times3^6\times5^5\times7^2$

16. Find the LCM of $(2^2 \times 3^2 \times 5 \times 7)$, $(2^2\times3\times5^2\times7)$ and $(2 \times 3 \times 5 \times 7)$.
(a) 6300 (b) 7200
(c) 9000 (d) 8400

RRB JE - 24/05/2019 (Shift-III)

Ans : (a) LCM of the given expressions,
$= 2^2 \times 3^2 \times 5^2 \times 7$
$= 4 \times 9 \times 25 \times 7$
$= 6300$

17. Find the LCM of 60, 120 and 225.
(a) 360 (b) 1800
(c) 600 (d) 900

RRB RPF SI -06/01/2019 (Shift-II)

Ans : (b) Finding the LCM by using common division method,

2	60,	120,	225
2	30,	60,	225
2	15,	30,	225
3	15,	15,	225
3	5,	5,	75
5	5,	5,	25
5	1,	1,	5
	1,	1,	1

The required LCM

$= 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 = 1800$

18. The LCM of 2.05, 1.05, 2 is equals to which among the following?

(a) LCM of 205/100, 105/100 and 200/100
(b) LCM of 205, 105 and 200
(c) LCM of 21/20, 41/20 and 20/20
(d) LCM of 205, 105 and 200/10

RRB JE - 30/05/2019 (Shift-II)

Ans : (a) From the question,

$$2.05 = \frac{205}{100}$$

$$1.05 = \frac{105}{100}$$

$$2 = \frac{200}{100}$$

So, the LCM of 2.05, 1.05, 2

$$= \text{LCM of } \left(\frac{205}{100}, \frac{105}{100}, \frac{200}{100}\right)$$

19. The LCM of 36 and K is 72. Find the possible value of K.

(a) 24 only (b) 8, 24, 72
(c) 24, 72 (d) 8 only

RRB JE - 27/06/2019 (Shift-III)

Ans : (b) Given,
The LCM of 36 and K = 72.
From options,
The possible value of K will be = 8, 24 and 72.

20. What is the LCM of the two corresponding numbers, X and Y?

(a) X Y (b) $\frac{(X.Y)}{2}$

(c) 1 (d) $\frac{X}{Y}$

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (a) The LCM of the numbers X and Y = X Y
Note:- The LCM of the corresponding numbers is their product.

21. The LCM of 16, 24, 36, 52 and 54 is:

(a) 5616 (b) 5216
(c) 432 (d) 5618

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans : (a) Finding the LCM by using common division method,

2	16,	24,	36,	52,	54
2	8,	12,	18,	26,	27
2	4,	6,	9,	13,	27
2	2,	3,	9,	13,	27
3	1,	3,	9,	13,	27
3	1,	1,	3,	13,	9
3	1,	1,	1,	13,	3
13	1,	1,	1,	13,	1
	1,	1,	1,	1,	1

Hence, the required LCM

$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 13 = 5616$

22. Find the LCM of 24, 96 and 36.

(a) 576 (b) 216
(c) 288 (d) 144

RRB NTPC 17.01.2017 Shift-2

Ans : (c) Finding the LCM by using common division method,

2	24,	96,	36
2	12,	48,	18
2	6,	24,	9
2	3,	12,	9
2	3,	6,	9
3	3,	3,	9
3	1,	1,	3
	1,	1,	1

The required LCM = $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$

23. The LCM of 14, 35 and 56 is:

(a) 280 (b) 140
(c) 210 (d) 560

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (a) Finding the LCM by using prime factorization method,
$14 = 2 \times 7$
$35 = 5 \times 7$
$56 = 2 \times 2 \times 2 \times 7$
Hence, the required LCM $= 7 \times 5 \times 2 \times 2 \times 2 = 280$

Type - 2

24. What is the smallest natural number that should be added to 1225 such that a remainder of 3 is left when the resulting number is divided by each of the numbers 12, 18, 21 and 28?

(a) 41 (b) 38
(c) 35 (d) 43

RRB Group-D 05/09/2022 (Shift-III)

Ans. (b) : LCM of 12, 18, 21 and 28

2	12, 18, 21, 28
2	6, 9, 21, 14
3	3, 9, 21, 7
3	1, 3, 7, 7
7	1, 1, 7, 7
	1, 1, 1, 1

L.C.M = 2×2×3×3×7 = 252

$$252\overline{)1225}(4$$
$$\underline{1008}$$
$$217$$

Hence, required number = (252 – 217) + 3 = 38

25. The largest four-digit number which when divided by 7, 11, and 13 leaves remainder 4 in each case is :

(a) 9999 (b) 9009
(c) 1005 (d) 9013

RRB Group-D 09/09/2022 (Shift-II)

Ans. (c) : LCM of 7, 11 and 13 = 7 × 11 × 13
= 1001
Hence, required number = 1001 + 4 = 1005

26. The least number which on being divided by 2, 3, 4, 5 and 6 leaves a remainder of 1 but no remainder when divided by 7 is :

(a) 322 (b) 301
(c) 308 (d) 315

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : The smallest number = LCM of 2, 3, 4, 5 and 6 = 60,
According to the question-
$(60x+1)$, is divisible by 7.
$\therefore$ Taking x = 5
Required number = 60 × 5 +1 = 301

27. Find the least number that when divided by 9, 8, 10 and 12 leaves a remainder 3 in each case.

(a) 365 (b) 361
(c) 363 (d) 367

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : L.C.M. of 9, 8, 10 and 12 = 360
According to question, in each case the remainder is 3
Number = 360 + 3
So, number will be 363.

28. Find the second term in a sequence of numbers that leaves that remainders 1, 2 and 7 when divided by 2, 3 and 8 respectively.

(a) 37 (b) 38
(c) 48 (d) 47

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (d) : LCM of number 2, 3 and 8 = 24
Required number = 24K–1
$(\because 2-1=1, 3-2=1, 8-7=1)$
(On putting K = 2)
= 24×2–1 = 47

29. The least multiple of 7 which when divided by 8, 12 and 16 leaves 3 as remainder in each case

(a) 70 (b) 48
(c) 147 (d) 56

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (c) : Number = (L.C.M of 8, 12 and 16) K + 3
= 48 K + 3 Where K = 1, 2, 3, 4.....
Taking K = 3 for the least multiple of 7.
Least multiple = 48 × 3 + 3
= 147

30. Find the sum of the numbers between 400 and 500 such that when 8, 12, and 16 divide them, it leaves 5 as remainder in each case.

(a) 932 (b) 912
(c) 942 (d) 922

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) : LCM of 8, 12 and 16 = 48
Number between 400 and 500 which are divisible by 48 = 432 + 480
Required number = (432 + 5), (480 + 5) = 437, 485
Sum of Number = 437 + 485 = 922

31. Find the smallest multiple of 14 which when divided by 6, 8 and 12 leaves remainders 4, 6 and 10 respectively

(a) 46 (b) 336
(c) 70 (d) 40

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (c) : 6 – 4 = 2
8 – 6 = 2
12 – 10 = 2
LCM of 6, 8, 12 · 24
According to question,
$$\frac{24x-2}{14}$$
On putting x = 3
$$= \frac{72-2}{14} = \frac{70}{14}$$
Hence the required multiple of 14 is 70.

32. Find the least number which when divided by 8, 12 and 16, leaves 3 as the remainder in each case but when divided by 7 leaves no remainder

(a) 266 (b) 147
(c) 149 (d) 248

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (b) : Number = (LCM of 8, 12, and 16) k + 3
Number = 48k + 3
k = 3 putting
= 48 × 3 + 3
144 + 3 = 147
Hence, number '147' is divisible by 7.

33. What will be the least multiple of 23 which when divided by 18, 21 and 24 leaves the remainder 7, 10 and 13 respectively.

(a) 3113 (b) 3013
(c) 3103 (d) 3131

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : LCM of $18, 21, 24 = 504$

$$\left\{\begin{array}{l}\because\ 18-7=11\\ 21-10=11\\ 24-13=11\end{array}\right\}$$

Required Number $= 504 \times n - 11$

Let, on putting $n = 6$

$= 504 \times 6 - 11$

Required Number $= 3013$

34. Find the sum of the numbers between 400 and 600 such that when they are divided by 6, 12 and 16, there will be no remainder.

(a) 2610 (b) 2016

(c) 2620 (d) 2026

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (b) : LCM of Number $6, 12,$ and $16 = 48$

Required numbers $= 48 \times 9 = 432$

$= 48 \times 10 = 480$

$= 48 \times 11 = 528$

$= 48 \times 12 = 576$

Total Required number $= 2016$

35. Find the largest four-digit number which when divided by 7, 9 and 11 leaves a remainder of 5 in each case.

(a) 9707 (b) 9467

(c) 9236 (d) 9763

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

L.C.M. of 7, 9 and 11 = 693

The largest four-digit number = 9999

$$693\overline{)9999}(14$$
$$\underline{693}$$
$$3069$$
$$\underline{2772}$$
$$297$$

Required Number = 9999 – 297+ 5 = 9707

36. Find the least positive number; which when divided by 5, 6, 8, 9 and 12 gives 1 as a remainder in each case and is completely divisible by 13.

(a) 3640 (b) 3614

(c) 3601 (d) 3627

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (c) : L.C.M of 5, 6, 8, 9 and 12 is = 360

$\therefore$ Required number $= 360\ K + 1$

On putting $K = 10$, Number is completely divisible by 13.

$\therefore$ Required number $= 360 \times 10 + 1$

$= 3600 + 1$

$= 3601$

37. Find the least number which when divided by 5 leaves no remainder, when divided by 4 leaves a remainder of 1, but when divided by 6 or 7, leaves a remainder of 5.

(a) 450 (b) 430

(c) 425 (d) 400

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (c) : LCM of (5,4,6,7) = 420+5

$= 425$

$\frac{425}{5} \equiv 0$ (remainder), $\frac{425}{4} \equiv 1$ (remainder),

$\frac{425}{6} \equiv 5$ (remainder), $\frac{425}{7} \equiv 5$ (remainder),

38. Find the smallest 4-digit number which when divided by 2, 3 and 5 leaves a remainder of 1 in each case?

(a) 1091 (b) 1021

(c) 1001 (d) 1041

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : LCM of 2, 3 and 5 = 30

The smallest 4-digit number = 1000

$$30\overline{)1000}(33$$
$$\underline{90}$$
$$100$$
$$\underline{90}$$
$$10$$

Required number = 1000 + (30 –10) +1

1000 + 20 + 1

= 1021

39. A number when divided by 10, 9 and 8 separately leaves remainders 9, 8, and 7 respectively. What is the least of such numbers?

(a) 353 (b) 719

(c) 1359 (d) 359

RRB JE - 27/05/2019 (Shift-II)

Ans : (d) According to the questions,

(10–9) = (9–8) = (8–7) = 1

$\therefore$ The required number = (LCM of 10, 9 and 8) – 1

= 360–1

= 359

40. Find the smallest number from which, if 6 is reduced then, it is completely divisible by 12, 15, 20 and 27.

(a) 542 (b) 540

(c) 546 (d) 500

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (c) LCM of 12, 15, 20 and 27,

$12 = 2 \times 2 \times 3$

$15 = 3 \times 5$

$20 = 2 \times 2 \times 5$

$27 = 3 \times 3 \times 3$

LCM = $2 \times 2 \times 3 \times 5 \times 3 \times 3$

$= 540$

Hence, the required number = 540 + 6 = 546

41. Find the least number, which when divided by 16, 24, 36 and 54, leaves remainder 12, 20, 32 and 50 respectively?

(a) 432 (b) 444

(c) 428 (d) 452

RRB RPF SI -11/01/2019 (Shift-III)

Ans : (c) According to the question,

16 – 12 = 4, 24 – 20 = 4

36 – 32 = 4 , 54 – 50 = 4

2	16, 24, 36, 54
2	8, 12, 18, 27
2	4, 6, 9, 27
2	2, 3, 9, 27
3	1, 3, 9, 27
3	1, 1, 3, 9
3	1, 1, 1, 3
	1, 1, 1, 1

So, the required number = (LCM of 16,24,36 and 54)–4

= 2×2×2×2×3×3×3 = 432 – 4 = 428

42. The largest five digit number, which when divided by 5, 6 and 7, gives remainder 2 in each case. What is the number?

(a) 99958 (b) 99972

(c) 99858 (d) 99962

RRB RPF Constable -19/01/2019 (Shift-II)

Ans. (d) : The largest five digit number = 99999

LCM of 5, 6 and 7 = 5×6×7 = 210

So,

$$210\overline{)99999}\ (476$$

840

1599

1470

1299

1260

39

Remainder = 39

Hence, the number = 99999 – 39 = 99960

But in each condition remainder is 2, so the required number = 99960 + 2 = 99962

43. What is the smallest number, which when divided by 6, 7, 8, 9, and 12, gives remainder 2 in each case?

(a) 508 (b) 608

(c) 502 (d) 506

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (d) LCM of 6, 7, 8, 9, and 12.

2	6,7,8,9,12
2	3,7,4,9,6
2	3,7,2,9,3
3	3,7,1,9,3
3	1,7,1,3,1
7	1,7,1,1,1
	1,1,1,1,1

LCM = 2 × 2 × 2 × 3 × 3 × 7 = 504

So, the required number = 504 + 2 = 506

44. What is the smallest number which when divided by 4, 6, 10 and 15, gives remainder 3 in each case?

(a) 58 (b) 126

(c) 37 (d) 63

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (d) LCM of 4, 6, 10 and 15.

2	4,6,10,15
2	2,3,5,15
3	1,3,5,15
5	1,1,5,5
	1,1,1,1

LCM = 2 × 2 × 3 × 5 = 60

So, the required number = 60 + 3 = 63

45. What is the greatest number smaller than 5000 which when divided by 5, 6 and 7, leaves remainders of 4, 5 and 6 respectively?

(a) 4830 (b) 4829

(c) 4845 (d) 4831

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (b) : According to the question,

Remainder = 5 – 4 = 1, 6 – 5 = 1, 7 – 6 = 1

LCM of 5, 6 and 7 = 2 × 3 × 5 × 7 = 210

So,

$$210\overline{)5000}\ (23$$

420

800

630

170

Hence, the required number = (5000 – 170) – 1 = 4829

46. What is the smallest number greater than 3000 which when divided by 4, 7 and 10, leaves remainders of 3, 6 and 9 respectively?

(a) 3079 (b) 3080

(c) 3081 (d) 3101

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (a) : According to the question,

Remainder = 4 – 3 = 1, 7 – 6 = 1, 10 – 9 = 1

LCM of 4, 7 and 10 = 2 × 2 × 5 × 7 = 140

Let the number = 140 k -1

On putting k = 22,

The required number = 140 × 22 – 1 = 3079

47. Find 150% of X, if X is the least number which when divided by 6, 7, 8, 9 and 12 leaves remainders 2, 3, 4, 5 and 8 respectively.

(a) 750 (b) 500

(c) 1000 (d) 1200

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) According to the question,

The number when divided by 6, 7, 8, 9 and 12 leaves remainders 2, 3, 4, 5 and 8 respectively.

6 − 2 = 4

7 − 3 = 4

8 − 4 = 4

9 − 5 = 4

12 − 8 = 4

The number = (LCM of 6, 7, 8, 9 and 12) – 4

2	6	7	8	9	12
2	3	7	4	9	6
2	3	7	2	9	3
3	3	7	1	9	3
3	1	7	1	3	1
7	1	7	1	1	1
	1	1	1	1	1

$= (2\times2\times2\times3\times3\times7) - 4 = 504 - 4 = 500$

So, 150% of the number $= 500\times\frac{150}{100}$

$= 5\times150 = 750$

48. A natural number, when divided by 4, 5, 6 and 7, leaves a remainder of 3 in each case. What is the smallest of all such numbers?

(a) 63 (b) 423
(c) 843 (d) 213

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (b)
The required least number = (LCM of 4, 5, 6 and 7)+3
= 420+3
= 423

49. Find the least number which divided by 20, 25, 35 and 40 leaves remainder 14, 19, 29 and 34 respectively?

(a) 1364 (b) 1394
(c) 1384 (d) 1374

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b) According to the question,
$20 - 14 = 6$
$25 - 19 = 6$
$35 - 29 = 6$
$40 - 34 = 6$
Hence, the required number
= (LCM of 20, 25, 35 and 40) – 6

2	20	25	35	40
2	10	25	35	20
2	5	25	35	10
5	5	25	35	5
5	1	5	7	1
7	1	1	7	1
	1	1	1	1

$= (2\times2\times2\times5\times5\times7) - 6 = 1400 - 6 = 1394$

50. What is the smallest number which, divided by 15 and 20, leaves remainder 9 in each case?

(a) 60 (b) 65
(c) 69 (d) 309

RRB ALP & Tec. (28.08.2015, SHIFT I)

Ans :(c) LCM of 15 and 20
$\because$ $15 = 3\times\boxed{5}$
$20 = 4\times\boxed{5}$
$\text{LCM} = 3\times4\times5 = 60$
So, the required number = 60 + 9 = 69

Type - 3

51. Ravi has 1530 eggs with him while Vinita has 2380 eggs with her that needs to be placed in cartons. What is the maximum number of eggs that each carton should hold so that both Ravi as well as Vinita finds such cartons acceptable to use, leaving no empty space, nor having any egg unpacked?

(a) 170 (b) 255
(c) 340 (d) 85

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (a) : HCF of 1530 and 2380
$1530 = 2\times5\times17\times3\times3$
$2380 = 2\times5\times17\times2\times7$
$\text{HCF} = 2\times5\times17 = 170$
Hence, Maximum number of eggs = 170

52. What is the HCF of 144, 360 and 504 ?

(a) 24 (b) 36
(c) 72 (d) 18

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (c) : HCF of 144, 360 and 504
$144 = 2\times2\times2\times2\times3\times3$
$360 = 2\times2\times2\times3\times3\times5$
$504 = 2\times2\times2\times3\times3\times7$
$\text{HCF} = 2\times2\times2\times3\times3$
Hence required HCF = 72

53. Kiran has 24 white beads and Resham has 18 black beads. They want to arrange the beads in such a way that each row contains equal number of beads and each row must contain either only black beads or only white beads. What is the greatest number of beads that can be arranged in a row?

(a) 8 (b) 3
(c) 6 (d) 12

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (c) : Kiran has 24 white beads and
Resham has 18 black beads.
$24 = 2\times2\times2\times3$
$18 = 2\times3\times3$
$\text{HCF} = 2\times3 = 6$
So maximum number of beads is 6 that can be arranged in a row.

54. If $x = 2^3\times3^2\times5\times7^3$, $y = 2^2\times3^3\times5^2\times7^2$, and $z = 2^4\times3\times5^3\times7$. Then the HCF of x, y and z is:

(a) 1260 (b) 840
(c) 420 (d) 630

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,
$x = 2^3\times3^2\times5\times7^3$
$y = 2^2\times3^3\times5^2\times7^2$
$z = 2^4\times3\times5^3\times7$
HCF of x, y and z $= 2^2\times3\times5\times7$
$= 4\times3\times5\times7$
$= 420$

55. The HCF of two different numbers is always 1, when:

(a) Both numbers are prime numbers
(b) Both numbers are even numbers
(c) Both numbers are odd numbers
(d) One number is odd and the other number is even

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : The HCF of two different numbers is always 1 when both numbers are prime numbers.

56. The HCF of 64, 48 and y is 8. Which of the options below cannot be a possible value of y?

(a) 96 (b) 104
(c) 88 (d) 72

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (a) :

$64 = 2\times2\times2\times2\times2\times2$

$48 = \underline{2\times2\times2}\times2\times3$

HCF = 8

From the given options -

(a) $96 = 2\times2\times2\times2\times2\times3$
(b) $104 = 13\times8$
(c) $88 = 11\times8$
(d) $72 = 9\times8$

So the possible value of y cannot be 96.

57. If the HCF of 408 and 1032 is expressed as 516m – 252 × 4, then m is:

(a) –2 (b) 6
(c) –6 (d) 2

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (d) : $408 = 2\times2\times2\times3\times17$

$1032 = 2\times2\times2\times3\times43$

$HCF = 2\times2\times2\times3 = 24$

According to the question,

$24 = 516m - 252\times4$

$516m = 24 + 1008$

$516\,m = 1032$

$\boxed{m = 2}$

58. A conference organized by an educational institution is being done, where the participants will be teachers of different subjects. The number of participants in Physics, Chemistry and Mathematics are 112, 144 and 192 respectively, the same number of participants are to be seated in each room, and All the participants sitting in a room should be teachers of the same subject. Find the minimum number of rooms required for the event.

(a) 35 (b) 23
(c) 32 (d) 28

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : HCF of the numbers 112, 144, 192

$\underline{2\times2\times2\times2}\times7,\ \underline{2\times2\times2\times2}\times3\times3,\ \underline{2\times2\times2\times2}\times3\times2\times2$

= 16

Hence the Minimum number of rooms

$$= \frac{112}{16} + \frac{144}{16} + \frac{192}{16}$$

$= 7 + 9 + 12$

$= 28$

59. Three numbers are in the ratio 4 : 5 : 7, and their LCM is 5600. Their HCF is :

(a) 40 (b) 10
(c) 20 (d) 30

RRB Group-D 09/09/2022 (Shift-I)

Ans. (a) : Let, three numbers = 4x, 5x, 7x

LCM = 140x

HCF = x

According to the question,

$140x = 5600$

$x = 40$

Hence, HCF of the number = 40

60. If P = a × m × r and Q = b × m × 2 × r, where a, b, m, r are odd prime numbers, then the HCF of P and Q is:

(a) a r (b) b r
(c) m r (d) 2 r

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$P = a\times m\times r$

$Q = b\times m\times 2\times r$

$\because$ a, b, m, r are odd prime numbers

$\therefore$ HCF of P and Q = m×r

61. What is the HCF of n and n + 1 where n is a natural number?

(a) 3 (b) 2
(c) 0 (d) 1

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : HCF of n and n + 1 = 1

Where (n = 1.....∞)

Hence, the HCF of two consecutive natural number is always 1.

62. 7 orange trees, 28 apple trees and 42 mango trees have to be planted in rows such that each row contains the same number of trees of one variety only. Minimum number of row in which the trees may be plant is

(a) 14 (b) 12
(c) 11 (d) 5

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) : HCF of 7, 28 and 42 = 7

According to the question, minimum number of rows

$= \frac{7}{7} + \frac{28}{7} + \frac{42}{7} = 1+4+6=11$ rows

63. Three containers contain 72 litres, 90 litres and 144 litres of milk respectively. What should be the biggest 'measuring -can', which can measure all the different quantities exactly (Without a remainder)?

(a) 17 litres (b) 18 litres
(c) 11 litres (d) 13 litres

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (b) : Capacity of the largest 'Measuring Can' = HCF of 72, 90 and 144 litres.

$72 = 2\times2\times2\times3\times3$

$90 = 2\times3\times3\times5$

$144 = 2\times2\times2\times2\times3\times3$

HCF = 18

Hence, the capacity of the largest 'Measuring Can' is 18 litres.

64. Three pieces of aluminium rod of different length, 44 cm, 22 cm and 55 cm respectively, are given to a boy. He has to cut them into rods of same length such that no aluminium waste is left. The maximum length (in cm) of such rod will be:

(a) 11 cm (b) 22 cm
(c) 5.5 cm (d) 16.5 cm

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (a) : HCF of 44 cm , 22 cm and 55 cm = 11 cm.

65. A daily wage labourer was engaged for a certain number of days for ₹5850, but being absent on some of those days he was paid only ₹5200. What was his maximum possible daily wage?

(a) ₹600 (b) ₹650
(c) ₹700 (d) ₹750

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (b) : His maximum possible daily wage = HCF of 5850 and 5200 = ₹650

66. Find the greatest possible length that can be used to measure exactly the lengths 7 m, 3 m 85cm and 12 m 95 cm.

(a) 35 cm (b) 65 cm
(c) 45 cm (d) 85 cm

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

7 m $\rightarrow$ 700 cm

3 m 85 cm $\rightarrow$ 385 cm

12 m 95 cm $\rightarrow$ 1295 cm

$\because$ HCF of 700, 385 and 1295 = 35 cm

(Greatest possible length)

67. The sum of two numbers is 288 and their HCF is 16. How many pairs of such numbers can be formed?

(a) 2 (b) 5
(c) 4 (d) 3

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let number is 16x and 16 y

According to the question,

$16(x + y) = 288$

$x + y = 18$

$1 + 17 = 18$

$5 + 13 = 18$

$7 + 11 = 18$

Hence 3 pairs can be formed.

68. What is the HCF of 81, 91, 101, and 111?

(a) 3 (b) 13
(c) 1 (d) 7

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (c) : HCF of 81, 91, 101 and 111 -

$81 = 3\times3\times3\times3$

$91 = 7\times13$

$101 = 101$

$111 = 3\times37$

Hence HCF = 1

69. A shopkeeper has 50 litres of oil in one can and 35 litres of oil in another can. The maximum capacity of the container that can measure the oil of either can exact number of times is?

(a) 35 litres (b) 5 litres
(c) 10 litres (d) 15 litres

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (b) : The maximum capacity of container which can measure the oil of each container in whole number = H.C.F of numbers

HCF of 35 & 50 = 5

70. If the HCF of 51 and 85 is expressed in the form of 51 m – 85, then the value of m will be:

(a) 3 (b) 1
(c) 5 (d) 2

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (d) : HCF of 51 and 85

$51 = 3\times17$

$85 = 5\times17$

HCF = 17

According to the question,

$17 = 51\text{ m} - 85$

$17 + 85 = 51\text{ m}$

$102 = 51\text{ m}$

$\boxed{m = 2}$

71. Find the HCF of $(3^{45} - 1)$ and $(3^{35} - 1)$

(a) 80 (b) 242
(c) 81 (d) 728

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

$$\left(3^{45}-1\right)=\left(3^{9\times5}-1\right)=\left\{\left(3^5\right)^9-1\right\}$$

And $$\left(3^{35}-1\right)=3^{7\times5}-1=\left\{\left(3^5\right)^7-1\right\}$$

Hence, common factor of $\left\{\left(3^5\right)^9-1\right\}$ and $\left\{\left(3^5\right)^7-1\right\}$

$= 3^5 - 1$

$= 243 - 1$

$= 242$

So, HCF of $\left(3^{45}-1\right)$ and $\left(3^{35}-1\right) = 242$

72. The HCF of two even numbers should be at least _____.

(a) 0 (b) 4 (c) 2 (d) 1

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : The highest common factor of two even numbers must be atleast 2. Because all even numbers are always divisible by 2.

73. HCF of $2^4 \times 3^4 \times 5^3 \times 7^2$ and $2^2 \times 3^6 \times 5^5$ is:

(a) $2^2 \times 3^4 \times 5^3$

(b) $2^3 \times 3^5 \times 5^4 \times 7$

(c) $2^6 \times 3^{10} \times 5^8 \times 7^2$

(d) $2^2 \times 3^2 \times 5^3 \times 7^2$

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : On finding the HCF of $(2^4 \times 3^4 \times 5^3 \times 7^2)$ and $(2^2 \times 3^6 \times 5^5)$

HCF = $2^2 \times 3^4 \times 5^3$

74. The product of two co-prime numbers is 117. Find their HCF.

(a) 117 (b) 7

(c) 1 (d) 13

RRB JE - 25/05/2019 (Shift-I)

Ans : (c) Co-prime numbers: Pair of such numbers whose HCF is 1 are called co-prime numbers.

$117 = 13 \times 9$

HCF of (13, 9) = 1

75. Find the HCF of $2 \times 3^2 \times 5^2$, $5 \times 3 \times 2^2$ and $5^2 \times 3 \times 2^2$.

(a) 150 (b) 30

(c) 60 (d) 90

RRB JE - 25/05/2019 (Shift-II)

Ans : (b) On finding the HCF,

$2 \times 3^2 \times 5^2$

$5 \times 3 \times 2^2$

$5^2 \times 3 \times 2^2$

HCF = $2 \times 3 \times 5 = 30$

76. What is the HCF of 148 and 370?

(a) 148 (b) 37

(c) 74 (d) 2

RRB RPF Constable -20/01/2019 (Shift-I)

Ans. (c) On finding HCF of 148 and 370,

$148 = 74 \times 2$

$370 = 74 \times 5$

Hence, the required HCF = 74

77. The value of half of the HCF of 36 and 144 is:

(a) 144 (b) 18

(c) 36 (d) 72

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (b) : On finding the HCF,

$36 = 2 \times 2 \times 3 \times 3$

$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$

So, the HCF = $2 \times 2 \times 3 \times 3 = 36$

So, the required value $= \frac{36}{2} = 18$

78. Find the HCF of $(5^3 \times 4^3)$, $(3^5 \times 5^2 \times 4^4)$ and $(3^2 \times 5 \times 4^3)$.

(a) 340 (b) 328

(c) 230 (d) 320

RRB Group-D – 16/11/2018 (Shift-I)

Ans. (d) HCF of given expression,

$(5^3 \times 4^3)$, $(3^5 \times 5^2 \times 4^4)$ and $(3^2 \times 5 \times 4^3)$

HCF $= 5 \times 4^3$

$= 5 \times 64 = 320$

79. Find the HCF of 2349, 2835 and 3078.

(a) 81 (b) 9

(c) 27 (d) 3

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (a) On finding HCF by division method,

$2835\overline{)3078}(1$

$\underline{2835}$

$243\overline{)2835}(11$

$\underline{243}$

405

$\underline{243}$

$162\overline{)243}(1$

$\underline{162}$

$81\overline{)162}(2$

$\underline{162}$

$\times\times$

$81\overline{)2349}(29$

$\underline{162}$

729

$\underline{729}$

$\times\times\times$

So, it is clear that the required HCF is 81.

80. If $59 \times 29 = 1711$, then what is the HCF of 6844 and 354?

(a) 236 (b) 118

(c) 177 (d) 59

RRB Group-D – 15/11/2018 (Shift-III)

Ans. (b) : On finding HCF by division method,

$354\overline{)6844}(19$

$\underline{354}$

3304

$\underline{3186}$

$118\overline{)354}(3$

$\underline{354}$

$\times\times\times$

So, the required HCF = 118

81. Find the HCF of $(3^3 \times 5^3 \times 6^3)$, $(3^2 \times 3^5 \times 5^2 \times 6^4)$, $(3^3 \times 3^2 \times 5 \times 6^3)$.

(a) 1560 (b) 1600

(c) 1280 (d) 29160

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (d) : HCF of given expressions,

$3^3 \times 5^3 \times 6^3 \Rightarrow 3^3 \times 5^3 \times 6^3$

$3^2 \times 3^5 \times 5^2 \times 6^4 \Rightarrow 3^7 \times 5^2 \times 6^4$

$3^3 \times 3^2 \times 5 \times 6^3 \Rightarrow 3^5 \times 5 \times 6^3$

So, the required HCF = $3^3 \times 5 \times 6^3 = 27 \times 5 \times 216$

$= 29160$

82. 245 and 343 guests will come on Sohrab's birthday. Chocolate is to be offered to each guest. The seller said that she would pack the chocolates in the carton and take back the unopened carton, but she will add the packing cost for the carton she has to pack. In this situation, how much chocolates should Sohrab hold in each carton?

(a) 77 (b) 7
(c) 21 (d) 49

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (d)
The number of the chocolates in each carton = HCF of 245 and 343
So, on finding the HCF by division method,

245) 343 (1
245
98) 245 (2
196
49) 98 (2
98
××

So, the required number of chocolates in each carton is 49.

83. The number of students in a school in 4th, 5th and 6th grade was 188, 282 and 423. If the each class is divided into sections and each section had the same number of students, so what was the total minimum number of sections of these three classes?
(a) 20 (b) 18
(c) 19 (d) 17

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (c) On finding the HCF of 188, 282 and 423 by division method,

188) 282 (1 94) 423 (4
188 376
94) 188 (2 47) 94 (2
188 94
××× ××

So, HCF = 47
So, the number of students in each section of each class = 47

$\frac{188}{47} = 4, \quad \frac{282}{47} = 6, \quad \frac{423}{47} = 9$

Hence, the total minimum number of sections of three classes = 4 + 6 + 9 = 19

84. Sheeba has 24 chocolates, 36 biscuits and 60 ice creams to distribute to her classmates. She wants each of her classmates to get the same number of each thing. What is the maximum number of classmates in which she can distribute completely without saving a single thing?
(a) 6 (b) 18
(c) 12 (d) 15

RRB NTPC 29.04.2016 Shift : 1

Ans : (c) According to the question,
The number of chocolates, biscuits and ice creams is 24, 36 and 60 respectively.
So, the maximum number of classmates = HCF of 24, 36 and 60

$24 = 2\times2\times2\times3$

$36 = 2\times2\times3\times3$

$60 = 2\times2\times3\times5$

$= 2\times2\times3 = 12$

85. What is the HCF of 2189 and 2587?
(a) 3 (b) 197
(c) 199 (d) 198

RRB NTPC 30.04.2016 Shift : 3

Ans : (c) On finding the HCF by division method,

2189) 2587 (1
2189
398) 2189 (5
1990
199) 398 (2
398
×××

So, the required HCF is 199.

86. Find the greatest length which can be used to measure exactly three cloth pieces of length 1.26 m, 1.98 m and 1.62 m respectively.
(a) 12 cm (b) 14 cm
(c) 16 cm (d) 18 cm

RRB NTPC 31.03.2016 Shift : 2

Ans : (d) The required length = HCF of 126cm, 198cm and 162 cm.

126) 198 (1 18) 162 (9
126 162
72) 126 (1 ×××
72
54) 72 (1
54
18) 54 (3
54
××

So, the HCF = 18cm.
Hence, the greatest length = 18cm

87. 50 pens, 80 pencils and 65 scales were distributed among some students and found that five out of each item were not distributed. Find the number of students.
(a) 5 (b) 20
(c) 15 (d) 10

RRB NTPC 31.03.2016 Shift : 3

Ans : (c) According to the question,
50 – 5 = 45
80 – 5 = 75
65 – 5 = 60
So, the required number of students = HCF of 45, 75 and 60.

$45 = 3\times3\times5$

$75 = 3\times5\times5$

$60 = 2\times2\times3\times5$

So, HCF = $3\times5 = 15$

88. Which number is a factor of all numbers?
(a) 2 (b) 1
(c) -1 (d) 0

RRB JE - 25/05/2019 (Shift-II)

Ans : (b) According to the question,
1 is a factor of all numbers.
Example-
$12 = \boxed{1} \times 2 \times 2 \times 3$
$15 = \boxed{1} \times 3 \times 5$

89. You have 20 big and 16 small diaries and want to make gift packs containing both in each pack. What is the maximum number of gift packs you can make without any left over?

(a) 5 (b) 4
(c) 3 (d) 2

RRB NTPC 29.03.2016 Shift : 3

Ans : (b) The maximum number of gift packs = HCF of 20 and 16.

$$16\overline{)20}\,(1$$
$$\underline{16}$$
$$4\overline{)16}\,(4$$
$$\underline{16}$$
$$\times\times$$

So, HCF = 4,
So, 4 maximum gift packs can be made.

90. What is the HCF of 36, 72 and 126?

(a) 18 (b) 36
(c) 9 (d) 12

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (a) On finding the HCF by factorization method,

$36 = 2 \times 2 \times 3 \times 3$
$72 = 2 \times 2 \times 2 \times 3 \times 3$
$126 = 2 \times 3 \times 3 \times 7$

So, the required HCF = $2 \times 3 \times 3 = 18$

Type - 4

91. The greatest number, which divides 2000 and 2200 to leave 22 and 38 respectively as remainders, is:

(a) 46 (b) 39
(c) 42 (d) 36

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (a) : According to the question,
2000 – 22 = 1978
2200 – 38 = 2162 HCF = 46

$$1978\overline{)2162}\,(1$$
$$\underline{1978}$$
$$184\overline{)1978}\,(10$$
$$\underline{1840}$$
$$138\overline{)184}\,(1$$
$$\underline{138}$$
$$46\overline{)138}\,(3$$
$$\underline{138}$$
$$\times$$

Hence, the greatest number is 46.

92. Find the greatest number by which when the numbers 158 and 215 are divided, it leaves remainders 4 and 5, respectively.

(a) 21 (b) 18
(c) 7 (d) 14

RRB Group-D 02/09/2022 (Shift-I)

Ans. (d) :
According to the question,
First number = 158–4 = 154
Second Number = 215 – 5 = 210

$$154\overline{)210}\,(1$$
$$\underline{154}$$
$$56\overline{)154}\,(2$$
$$\underline{112}$$
$$42\overline{)56}\,(1$$
$$\underline{42}$$
$$14\overline{)42}\,(3$$
$$\underline{42}$$
$$\times\times$$

Hence, the greatest required number = 14

93. Let x be the greatest number which divides 7072, 8505 and 9925 leaving remainders 22, 45 and 55 respectively. Find the sum of the digit of x.

(a) 6 (b) 5
(c) 7 (d) 8

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : According to the question,
7072 – 22 = 7050
8505 – 45 = 8460
9925 – 55 = 9870
HCF = 1410
sum of digit of x = 1 + 4 + 1 + 0
= 6

94. The largest number which divides 55, 72 and 123 leaving the remainders 3, 7 and 6 respectively is:

(a) 13 (b) 66
(c) 26 (d) 117

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,
55 – 3 = 52
72 – 7 = 65
123 – 6 = 117
HCF of 52, 65 and117 = 13
Hence the required largest number = 13

95. The greatest number that divides 155 and 307 leaving remainders 5 and 7, respectively is:

(a) 15 (b) 25
(c) 150 (d) 30

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,
155 – 5 = 150
307 – 7 = 300
Hence required number = HCF of 150 and 300
= 150

96. The greatest number that will divide 155, 260, 315 and leave the remainders 5, 10 and 15 respectively is:

(a) 75 (b) 25
(c) 10 (d) 50

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (d) : Required number = HCF of (155 – 5), (260 – 10) and (315 – 15)

= HCF of 150, 250, and 300 = 50

97. What is the largest number that 2270, 3739 and 6677 must be divided by to obtain the same remainder in each case?

(a) 1489 (b) 1459

(c) 1479 (d) 1469

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (d) : First we subtract the smaller number from the larger number,

Then the number obtained is:–

3739 – 2270 = 1469

6677 – 2270 = 4407

6677 – 3739 = 2938

HCF of 1469, 4407 and 2938 = 1469

Hence, Required number = 1469

98. Find the largest number which, when divides 1250 and 1615, gives remainder 4 and 5 respectively.

(a) 13 (b) 14

(c) 16 (d) 18

RRB NTPC 28.04.2016 Shift : 1

Ans : (b) 1250 – 4 = 1246

1615 – 5 = 1610

HCF of 1246 and 1610 = 14

$$1246\overline{)1610}\,(1$$
$$1246$$
$$\overline{364)1246}\,(3$$
$$1092$$
$$\overline{154)364}\,(2$$
$$308$$
$$\overline{56)154}\,(2$$
$$112$$
$$\overline{42)56}\,(1$$
$$42$$
$$\overline{14)42}\,(3$$
$$42$$
$$\overline{\times\times}$$

Hence the required number is = 14

99. Find the greatest number that will divide 115, 149 and 183 leaving remainders 3, 5, 7 respectively.

(a) 20 (b) 16

(c) 18 (d) 14

RRB JE - 24/05/2019 (Shift-II)

Ans : (b) Required number = HCF of the numbers (115–3), (149–5) and (183–7)

= HCF of 112, 144 and 176

= 16

Hence, the required number is 16.

100. Find the largest possible length that can be used to measure the length of 2m 76cm, 5m 52cm and 11m 96cm.

(a) 92 cm (b) 11.96 cm

(c) 92 m (d) 1196 cm

RRB RPF SI -12/01/2019 (Shift-III)

Ans : (a) Given,

$2m\ 76cm = 2\times100+76 = 276cm$

$5m\ 52cm = 5\times100+52 = 552cm$

$11m\ 96cm = 11\times100+96 = 1196cm$

So, the largest possible length = HCF of 276, 552 and 1196.

$$552\overline{)1196}\,(2$$
$$1104$$
$$\overline{92)552}\,(6 \qquad 92\overline{)276}\,(3$$
$$552 \qquad\qquad 276$$
$$\overline{\times\times\times} \qquad\qquad \overline{\times\times\times}$$

HCF = 92cm

101. What is the largest number by which dividing 1657 and 2037, gives remainders 6 and 5 respectively?

(a) 150 (b) 125

(c) 127 (d) 130

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (c) : According to the question,

1657 – 6 = 1651

2037 – 5 = 2032

So, the HCF of 1651 and 2032,

$$1651\overline{)2032}\,(1$$
$$1651$$
$$\overline{381)1651}\,(4$$
$$1524$$
$$\overline{127)381}\,(3$$
$$381$$
$$\overline{\times\times\times}$$

So, the required number is 127.

102. What is the largest number by which, dividing 63, 77 and 98, gives remainders 3, 5 and 2 respectively?

(a) 10 (b) 9

(c) 6 (d) 8

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (c) According to the question,

63 – 3 = 60

77 – 5 = 72

98 – 2 = 96

So, the required number = HCF of 60, 72 and 96.

$60 = 2\times2\times3\times5$

$72 = 2\times2\times2\times3\times3$

$96 = 2\times2\times2\times2\times2\times3$

HCF = $2\times2\times3 = 12$

While 12 is not in the option but 12 will be divisible by 6.

So, option (c) is required answer.

103. Find such greatest number which gives same remainders in each case when dividing 270, 675 and 1215.

(a) 45 (b) 135

(c) 270 (d) 75

RRB NTPC 19.04.2016 Shift : 3

Ans : (b) According to the question,

$675-270=405=3\times3\times3\times5$

$1215-675=540=2\times2\times3\times3\times5$

$1215-270=945=3\times3\times3\times5\times7$

$HCF=3\times3\times5=135$

So, the required number is 135.

Type - 5

104. The HCF of fractions is calculated as $\frac{\text{HCF of the numerators}}{\text{LCM of the denominators}}$. Find the HCF of $\frac{2}{3}, \frac{4}{5}$ and $\frac{3}{2}$.

(a) $\frac{1}{40}$ (b) $\frac{1}{30}$

(c) $\frac{5}{30}$ (d) $\frac{3}{50}$

RRB GROUP-D – 29/09/2022 (Shift-III)

Ans. (b) : $\text{HCF}=\frac{\text{HCF of the numerators}}{\text{LCM of the denominators}}$

$=\frac{\text{HCF of }(2,4,3)}{\text{LCM of }(3,5,2)}$

$=\frac{1}{30}$

105. The LCM of fractions is calculated as $\frac{\text{LCM of the numerators}}{\text{HCF of denomination}}$. Find the LCM of $\frac{5}{6}, \frac{6}{5}$, and $\frac{3}{2}$,

(a) 20 (b) 15

(c) 30 (d) 25

RRB GROUP-D – 28/09/2022 (Shift-II)

Ans. (c) :

$\text{LCM of fractions}\ \frac{\text{LCM of the numerators}}{\text{HCF of denominator}}$

$\text{LCM of }\frac{5}{6},\frac{6}{5}\text{ and }\frac{3}{2}=\frac{\text{LCM of 5, 6 and 3}}{\text{HCF of 6, 5 and 2}}$

$=\frac{30}{1}$

$=30$

106. The LCM of $\frac{2}{3},\frac{4}{9},\frac{7}{12},\frac{3}{5}$ is:

(a) 98 (b) 94

(c) 84 (d) 86

RRB NTPC 13.03.2021 (Shift-I) Stage Ist

Ans. (c) : L. C. M of $\frac{2}{3}, \frac{4}{9}, \frac{7}{12}, \frac{3}{5}$

$\frac{\text{L.C.M. of numerator}}{\text{H.C.F. of denominator}}=\frac{\text{L.C.M. of 2, 4, 7 and 3}}{\text{H.C.F. of 3, 9, 12 and 5}}$

$=\frac{4\times7\times3}{1}$

$=84$

107. Find the greatest possible length that can be used to measure exactly the lengths $3\frac{1}{2}$m and $8\frac{3}{4}$m.

(a) $\frac{11}{4}$m (b) $\frac{7}{4}$m

(c) $\frac{3}{4}$m (d) $\frac{9}{4}$m

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\text{HCF of }3\frac{1}{2}\text{ and }8\frac{3}{4}=\frac{\text{HCF of numerator}}{\text{LCM of denominator}}$

$\text{HCF of }\frac{7}{2}\text{and }\frac{35}{4}=\frac{\text{HCF of 7, 35}}{\text{LCM of 2, 4}}=\frac{7}{4}$

Hence, greatest possible length $=\frac{7}{4}$m

108. What is the LCM of $\frac{6}{25},\frac{4}{45}$ and $\frac{3}{35}$?

(a) $\frac{1}{5}$ (b) $\frac{12}{5}$

(c) $\frac{210}{12}$ (d) $\frac{12}{210}$

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (b) : Given fractions $=\frac{6}{25},\frac{4}{45},\frac{3}{35}$

$\text{L.C.M. of fractions}=\frac{\text{L.C.M. of Numerator}}{\text{H.C.F. of Denominator}}$

L.C.M. of Numerator $\Rightarrow$

$6=2\times3$

$4=2\times2$

$3=1\times3$

L.C.M. $=2\times2\times3=12$

H.C.F. of Denominator $\Rightarrow$

$25=5\times5$

$45=5\times3\times3$

$35=5\times7$

$\text{HCF}=5$

Hence, L.C.M. of given fraction $=\frac{12}{5}$

109. Find the H.C.F. of $\frac{2}{3},\frac{4}{9},\frac{8}{15}$ and $\frac{10}{21}$?

(a) $\frac{315}{4}$ (b) $\frac{4}{315}$

(c) $\frac{315}{2}$ (d) $\frac{2}{315}$

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (d) :

$\because$ HCF of fractions = $\frac{\text{H.C.F of numerators}}{\text{L.C.M of denominators}}$

$\frac{2}{3},\frac{4}{9},\frac{8}{15}$ and $\frac{10}{21}$ H. C. F. = $\frac{\text{H.C.F of } 2,4,8 \text{ and } 10}{\text{L.C.M of } 3,9,15 \text{ and } 21}$

$= \frac{2}{315}$

110. Determine the LCM of $\frac{2}{3},\frac{4}{9},\frac{8}{15}$ and $\frac{10}{21}$.

(a) $\frac{40}{3}$ (b) $\frac{3}{40}$

(c) $\frac{3}{20}$ (d) $\frac{20}{3}$

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (a) : LCM of $\frac{2}{3},\frac{4}{9},\frac{8}{15}$ and $\frac{10}{21}$

LCM of given fractions = $\frac{\text{LCM of numerator}}{\text{HCF of denominator}}$

$\text{LCM} = \frac{(2,4,8,10)\text{LCM}}{(3,9,15,21)\text{HCF}} = \frac{40}{3}$

111. Find the HCF of $\frac{2}{9},\frac{16}{81},\frac{32}{117}$ and $\frac{54}{189}$

(a) $\frac{4}{6459}$ (b) $\frac{4}{1899}$

(c) $\frac{2}{7371}$ (d) $\frac{8}{8483}$

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

HCF of $\frac{2}{9},\frac{16}{81},\frac{32}{117},\frac{54}{189} = \frac{2\times1}{9},\frac{2\times8}{9\times9},\frac{2\times16}{13\times9},\frac{2\times27}{9\times21}$

HCF of fraction = $\frac{\text{HCF of numerator}}{\text{LCM of denominator}}$

$= \frac{2}{27\times13\times21} = \frac{2}{7371}$

112. Find the LCM and HCF of 1.75, 5.6 and 7.

(a) 24, 0.2 (b) 28, 0.25

(c) 28, 0.35 (d) 24, 0.35

RRB JE - 23/05/2019 (Shift-I)

Ans : (c)

LCM of 1.75, 5.6 and 7 = LCM of $\frac{175}{100},\frac{560}{100},\frac{700}{100}$

$\text{LCM} = \frac{\text{The LCM of numerator}}{\text{The HCF of denominator}}$

$= \frac{2800}{100} = 28$

HCF of $\frac{175}{100},\frac{560}{100},\frac{700}{100}$

$= \frac{\text{The HCF of numerator}}{\text{The LCM of denominator}} = \frac{35}{100} = 0.35$

Hence, LCM and HCF = 28 and 0.35

113. Find the GCD of 1.08, 0.36 and 0.9.

(a) 0. 03 (b) 18

(c) 0. 18 (d) 1. 8

RRB JE - 24/05/2019 (Shift-I)

Ans : (c) GCD of 1.08, 0.36 and 0.9

$= GCD \text{ or } HCF \text{ of } \frac{108}{100},\frac{36}{100},\frac{90}{100} = \frac{GCD \text{ of } 108,36,90}{LCM \text{ of } 100,100,100}$

$= \frac{18}{100} = 0.18$

114. Find the HCF of 36/75, 48/50 and 72/30.

(a) 144/50 (b) 144/45

(c) 12/75 (d) 12/150

RRB JE - 27/05/2019 (Shift-III)

Ans : (d)

The HCF of $\frac{36}{75},\frac{48}{50},\frac{72}{30} = \frac{\text{The HCF of numerator}}{\text{The LCM of denominator}}$

$= \frac{HCF \text{ of } 36,48,72}{LCM \text{ of } 75,50,30} = \frac{12}{150}$

115. LCM of a set of fractions is:

(a) LCM of numerators/ HCF of denominators

(b) HCF of numerators/ LCM of denominators

(c) LCM of numerators/ LCM of denominators

(d) HCF of numerators/ HCF of denominators

RRB JE - 30/05/2019 (Shift-I)

Ans : (a)

LCM of a fraction = $\frac{\text{The LCM of numerator}}{\text{The HCF of denominator}}$

116. Find the LCM of 0.63, 10.5, 2.1 and 4.20.

(a) 63 (b) 0.63

(c) 6.30 (d) 6300

RRB NTPC 16.04.2016 Shift : 1

Ans : (a) According to the question,

$0.63 = \frac{63}{100}, 10.5 = \frac{105}{10}, 2.1 = \frac{21}{10}, 4.20 = \frac{420}{100} = \frac{42}{10}$

So, the LCM of $\frac{63}{100},\frac{105}{10},\frac{21}{10} and \frac{42}{10}$

$= \frac{LCM \text{ of } 63,105,21,42}{HCF \text{ of } 100,10,10,10}$

$= \frac{21\times3\times5\times2}{10} = \frac{630}{10} = 63$

117. Find the LCM of 17/31, 34/62 and 48/93.

(a) 816/31 (b) 802/31

(c) 912/31 (d) 804/31

RRB NTPC 04.04.2016 Shift : 3

Ans : (a) The LCM of given fractions,

LCM of 17, 34 and 48,

$17 = 1\times17$

$34 = 1\times2\times17$

$48 = 1\times2\times2\times2\times2\times3$

$LCM = 1\times2\times2\times2\times2\times3\times17 = 816$

HCF of 31, 62 and 93,

$31 = 1 \times 31$

$62 = 1 \times 2 \times 31$

$93 = 1 \times 3 \times 31$

$HCF = 1 \times 31 = 31$

So, the required LCM = $\frac{\text{The LCM of numerator}}{\text{The HCF of denominator}}$

$= \frac{816}{31}$

Type - 6

118. The ratio of the two numbers is 3 : 4 and their LCM is 480. Find their HCF.

(a) 40 (b) 160

(c) 30 (d) 120

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given,

Ratio of two numbers = 3: 4

LCM = 3 × 4 × x

Then 3× 4 × x = 480

12x = 480

x = 40

Hence, the HCF of 3x and 4x HCF are 40.

119. If the sum of two numbers is 54 and the LCM and HCF of these numbers are 84 are 6, respectively, then the sum of the reciprocal of the numbers is :

(a) $\frac{9}{28}$ (b) $\frac{7}{28}$

(c) $\frac{3}{28}$ (d) $\frac{5}{28}$

RRB Group-D 29/08/2022 (Shift-II)

Ans. (c) : Let the two numbers be x and y.

According to the question,

$\therefore x + y = 54$ .....(i)

$\because x\,y = LCM \times HCF$

$\therefore xy = 84 \times 6$ ..... (ii)

Sum of reciprocal of the numbers = $\frac{1}{x}+\frac{1}{y}=\frac{y+x}{xy}$

From equation (i) & (ii) $\Rightarrow \frac{y+x}{xy}=\frac{54}{84\times6}=\frac{3}{28}$

120. If the product of two numbers, not necessarily distinct from each other, is 25 and their HCF is 5, then their LCM is :

(a) 7 (b) 4

(c) 5 (d) 6

RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) : Let the numbers 5x and 5y

$5x \times 5y = 25$

$xy = \frac{25}{25} = 1$

Therefore, the value of x and y each will be 1 then LCM of the numbers 5x and 5y = 5x and 5y = 5 × 1 = 5

121. The HCF and the LCM of two numbers are 1080 and 30240, respectively. If one of the numbers is 4320, then the other number is_____

(a) 30240 (b) 1080

(c) 7560 (d) 8640

RRB Group-D 13/09/2022 (Shift-II)

Ans. (c) : I^{st} number × IInd number = LCM × HCF

4320 × IInd number = 1080×30240

IInd number = $\frac{1080\times30240}{4320}=7560$

122. If the ratio of two numbers is 5 : 7, and their HCF is 8, then their LCM is :

(a) 480 (b) 580

(c) 380 (d) 280

RRB Group-D 13/09/2022 (Shift-I)

Ans. (d) : Let the two numbers are 5x and 7x respectively.

Given-

HCF = 8

I^{st} Number = 5 × 8 = 40

IInd Number = 7 × 8 = 56

By formula - I^{st} Number × IInd Number = HCF × LCM

40 × 56 = 8 × LCM

LCM = 40 × 7

= 280

123. If LCM and HCF of two numbers are 70 and 7 respectively and if one number is 35, then what will be the second number?

(a) 40 (b) 49

(c) 25 (d) 14

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given, LCM = 70

HCF = 7

From formula:- LCM×HCF = First number × Second number

If second number is x then

70×7 = 35×x

x = 14

∴ Second number will be 14.

124. The HCF of two numbers is 6 and their LCM is 84 if one of these numbers is 42. Then the second number is:

(a) 40 (b) 48

(c) 12 (d) 30

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (c) : L.C.M × H.C.F. = First number × Second number

84 × 6 = 42 × Second number

Second number = $\frac{84\times6}{42}=12$

125. If the LCM of a and b is c, then their HCF is:

(a) $\frac{ab}{b}$ (b) $\frac{bc}{a}$

(c) $\frac{c}{ab}$ (d) $\frac{ab}{c}$

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (d) : LCM.× HCF = First number×second number

$c \times HCF = a \times b$

$HCF = \frac{ab}{c}$

126. If the HCF of two numbers is 2 and their product is 120. Find the LCM of the number.

(a) 120 (b) 90

(c) 30 (d) 60

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (d) : Product of both numbers = HCF × LCM

$120 = 2 \times LCM$

$LCM = 60$

127. The HCF and LCM of 36 and N are 9 and 180 respectively. Then find the value of N ?

(a) 65 (b) 63

(c) 45 (d) 90

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : From Formula,

Product of both numbers = LCM × HCF

$36 \times N = 9 \times 180$

$N = 45$

128. If the LCM of $20x^3y^2$ and $10x^4y^4$ is $20x^4y^4$ find the HCF.

(a) $10x^2y^2$ (b) $20x^3y^2$

(c) $10x^3y^2$ (d) $20x^2y^2$

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) :

First Number × Second Number = HCF × LCM

$$HCF = \frac{20x^3y^2 \times 10x^4y^4}{20x^4y^4}$$

$$= 10x^3y^2$$

129. The product of the LCM and HCF of two positive numbers is 28 and their difference is 3. The numbers are

(a) 3 and 5 (b) 7 and 5

(c) 4 and 7 (d) 5 and 6

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (c) : Difference between number = 3

Then numbers be a and a+3.

We know that,

Product of two numbers = Product of their LCM and HCF

$28 = a(a + 3)$

$a^2 + 3a - 28 = 0$

$a^2 + 7a - 4a - 28 = 0$

$a(a + 7) - 4(a + 7) = 0$

$(a + 7)(a - 4) = 0$

$\Rightarrow a = -7, 4$

$a = 4$ (on taking positive value)

Now, $a = 4$ and $a + 3 = 7$

Hence, the numbers are 4 and 7.

130. The HCF and LCM of two numbers are 75 and 450 respectively. If the first number is divided by 3, the quotient is 75. The second number is

(a) 75 (b) 225

(c) 450 (d) 150

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the first number is x

According to the question,

$\frac{x}{3} = 75$

$x = 225$

We know that,

First number × Second number = LCM × HCF

$225 \times$ Second number $= 450 \times 75$

Second number $= \frac{450 \times 75}{225} = 150$

131. The HCF and LCM of two numbers are 60 and 420, respectively. If the first number is divided by 2, then the quotient is 60. The second number is:

(a) 150 (b) 190

(c) 170 (d) 210

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : HCF = 60 , LCM = 420

Let the first number be a

From the formula, Dividend = divisor × quotient + remainder

As per question, $a = 2 \times 60 + Zero$

$a = 120$

So the first number $a = 120$

LCM × HCF = First number × Second number

$420 \times 60 = 120 \times$ Second number

$$\text{Second number} = \frac{420 \times 60}{120} = 210$$

132. The LCM of two positive integers is thrice the larger number. The difference of the smaller number and the HCF of the two numbers is 6. The smaller number is :

(a) 9 (b) 11

(c) 5 (d) 7

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let larger number = aH

Smaller number = bH

L.C.M. = 3aH

H.C.F of aH and bH = H

L.C. M of aH and bH= abH

$\therefore abH = 3aH$

$b = 3$

$\because bH - H = 6$ (On putting the value of b)

$3H - H = 6$

$2H = 6$

$H = 3$

Smaller number = $bH = 3 \times 3 = 9$

133. HCF and LCM of two numbers are 5 and 210 respectively. If the numbers are between 25 and 40, the sum of the numbers will be :

(a) 60 (b) 65

(c) 50 (d) 55

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let, the number be 5a and 5b respectively.
Where a and b are co-prime number.
First number × Second number = L.C.M × H.C.F
5a ×5b = 5×210
ab = 42
The possible value of a and b according to the questions
Hence,
The number are 5a = 5 × 6 = 30
And 5b = 5 × 7 = 35
Sum of numbers = 35 + 30 = 65

134. Find the HCF and the LCM of 570 and 1425.
(a) 285, 2750 (b) 285, 2850
(c) 289, 2650 (d) 185, 2850

RRB RPF Constable -19/01/2019 (Shift-II)

Ans : (b) HCF of given numbers,
$570 = 2\times3\times5\times19$
$1425 = 3\times5\times5\times19$
$HCF = 3\times5\times19 = 285$
LCM of given numbers,

2	570	1425
3	285	1425
5	95	475
5	19	95
19	19	19
	1	1

$LCM = 2\times3\times5\times5\times19 = 2850$

135. The HCF and LCM of two numbers are 12 and 720 respectively. How many pairs are possible of these numbers?
(a) 3 (b) 4
(c) 2 (d) 1

RRB RPF SI -05/01/2019 (Shift-I)

Ans. (b) : Product of co-factors $= \frac{LCM}{HCF}$
$= \frac{720}{12} = 60$
Possible pairs - (1, 60), (4, 15), (3, 20), (5, 12)
So, the number of possible pairs is 4.

136. Find the LCM and HCF of inverse of 18 and 24.
(a) 1/6., 1/4 (b) 72.6
(c) 1/72. 1/6 (d) 1/6.1/7

RRB JE - 22/05/2019 (Shift-I)

Ans : (c) Inverse of $18 = \frac{1}{18}$
Inverse of $24 = \frac{1}{24}$
LCM of $\frac{1}{18},\frac{1}{24} = \frac{\text{LCM of } 1,1}{\text{HCF of } 18,24} = \boxed{\frac{1}{6}}$
HCF of $\frac{1}{18},\frac{1}{24} = \frac{\text{HCF of } 1,1}{\text{LCM of } 18,24} = \boxed{\frac{1}{72}}$

137. The LCM and the HCF of two numbers are 693 and 11 respectively. If one is 99, find the other number.
(a) 77 (b) 79
(c) 12 (d) 34

RRB JE - 26/05/2019 (Shift-III)

Ans : (a)
LCM × HCF = First number × Second number
693 × 11 = 99 × Second number
So, the second number $= \frac{693\times11}{99} = 77$

138. The LCM of two positive integers x and y (x > y) are xy. What is the HCF of both the numbers?
(a) 1
(b) x + y
(c) Cannot be determined
(d) x – y

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (a) : LCM × HCF = First number × Second number
$xy \times HCF = x \times y$
$HCF = 1$

139. The LCM of two numbers is 42 times their HCF. The sum of LCM and HCF is 602. If one of them is 84, then find the other number.
(a) 98 (b) 78
(c) 87 (d) 89

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (a) According to the question,
LCM = HCF × 42
LCM + HCF = 602
HCF × 42 + HCF = 602
HCF (42 + 1) = 602
$HCF = \frac{602}{43} = 14$
So, First number × Second number = LCM × HCF
84 × Second number = 14 × 42 × 14
Second number $= \frac{14\times42\times14}{84} = 98$

140. The LCM of three numbers is 4752 and the HCF is 6. If two numbers are 48 and 66, find the third number.
(a) 54 (b) 56
(c) 58 (d) 52

RRB NTPC 29.04.2016 Shift : 3

Ans. (a) : According to the question,
∵ HCF of all three numbers is 6.
The number in options which is divisible by 6 will be the third number.
So, from options, only 54 is divisible by 6.
Hence the third number is 54.

141. The HCF of two numbers is 12 and their LCM is 72. If one of them is 24, then the other number is:
(a) 48 (b) 60
(c) 36 (d) 72

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (c)

LCM × HCF = First number × Second number

$72 \times 12 = 24 \times$ Second number

$$\text{Second number} = \frac{12 \times 72}{24}$$

$= 36$

Type - 7

142. Two natural number are in the ratio of 6:5 and the product of their LCM and HCF is 6750. What is the sum of the numbers ?

(a) 180 (b) 165

(c) 160 (d) 145

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (b) : Let the two numbers be 6 x and 5x.

and product of LCM and HCF = 6,750

$\because$ 1st number × 2nd number = LCM × HCF

$6x \times 5x = 6{,}750$

$30x^2 = 6{,}750$

$x^2 = \frac{6{,}750}{30}$

$x^2 = 225$

$\boxed{x = 15}$

1st number = $6x = 6 \times 15 = 90$,

2nd number = $5x = 5 \times 15 = 75$

Hence Sum of both numbers = 90 + 75 = 165

143. The LCM of two numbers is 20 times their HCF, and the sum of the LCM and the HCF is 504. If the difference of the numbers is 24, then find the sum of the numbers.

(a) 210 (b) 216

(c) 225 (d) 180

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : According to the question,

$L = 20\,H$ —— (i)

and, $L + H = 504$ ——(ii)

$H(a - b) = 24$ ——(iii)

From equation (iii) $a - b = 1$

$20H + H = 504 \Rightarrow H = 24$

equation (iii) and $(a - b) = 1$

$\because L = Hab$

$\therefore Hab = 20H$ [from equation (i)]

$ab = 20$

$(a + b)^2 = (a - b)^2 + 4ab$

$= 1 + 80 = 81$

$\Rightarrow (a + b) = 9$

Hence, Sum of numbers $= H(a + b)$

$= 24 \times 9 = 216$

144. The ratio of two numbers is 11:4 and their HCF is 16. What is the sum of these two numbers?

(a) 240 (b) 320

(c) 256 (d) 224

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (a) :

Let the two numbers are 11x and 4x respectively.

Given, $x = HCF = 16$

First Number = $11 \times 16 = 176$

Second number = $4 \times 16 = 64$

Sum of numbers = $176 + 64 = 240$

145. The LCM of two numbers is 84. If the numbers are in the ratio 2: 3, then find the sum of the numbers.

(a) 40 (b) 70

(c) 25 (d) 60

RRB Group-D 24/08/2022 (Shift-I)

Ans. (b) : Let two numbers are a and b then,

$a : b = 2 : 3 = 2x : 3x$

HCF of 2x and 3x = x

According to the questions,

$a \times b = LCM \times HCF$

$2x \times 3x = x \times 84$

$x = 14$

Sum of the numbers $= (2x + 3x) = 5x = 5 \times 14$

$= 70$

146. Consider two numbers whose LCM + HCF = 504, and LCM – HCF = 456. If one of these two numbers is 96, find the other number.

(a) 100 (b) 130

(c) 120 (d) 126

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (c) : Given that

$LCM + HCF = 504$ .....(I)

$LCM - HCF = 456$ .....(II)

$2LCM = 960$

$\boxed{LCM = 480}$

From equation (I)

$HCF = 504 - 480$

$\boxed{HCF = 24}$

We know that

LCM × HCF = First number × Second number

$480 \times 24 = 96 \times$ second number

$$\text{Second number} = \frac{480 \times 2}{8}$$

$= 120$

147. Find the ratio between the LCM and the HCF of 5, 15 and 20.

(a) 8 : 1 (b) 11 : 2

(c) 14 : 3 (d) 12 : 1

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (d) : $5 = 1 \times 5$
$15 = 1 \times 3 \times 5$
$20 = 1 \times 2 \times 2 \times 5$
$(LCM) = 1 \times 2 \times 2 \times 3 \times 5$
$= 60$
$(HCF) = 1 \times 5 = 5$
$\frac{LCM}{HCF} = \frac{60}{5}$
LCM : HCF = 12 : 1

148. The sum of two numbers is 72. Their HCF and LCM are 2 and 102, respectively. The sum of the reciprocals of the same two numbers is

(a) $\frac{7}{19}$ (b) $\frac{6}{17}$
(c) $\frac{8}{19}$ (d) $\frac{5}{17}$

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (b) :
Let two number be A and B, LCM = 102, HCF = 2
According to the question, A+ B = 72 ...(i)
And product of two numbers = HCF × LCM
$A \times B = 2 \times 102$
$A \times B = 204$ ...(ii)
The sum of the reciprocals of the same two numbers is
$= \frac{1}{A} + \frac{1}{B} = \frac{B+A}{AB}$
$= \frac{A+B}{AB} = \frac{72}{204}$
$= \frac{6}{17}$

149. The LCM of two numbers is 26 times their HCF. The sum of the HCF and LCM is 729. If one number is 81, find the other.

(a) 231 (b) 234
(c) 233 (d) 232

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question-
Let- LCM = x
and HCF = y
$x = 26y$
$x + y = 729$
$26y + y = 729$
$27y = 729$
$(y) = 27$
First number×Second number = LCM×HCF
$81 \times$ Second number $= (26 \times 27) \times 27$
Hence, second number $= \frac{26 \times 27 \times 27}{81} = 234$

150. The ratio of two numbers is 2 : 3 and their LCM is 120. What is the smallest of two numbers?

(a) 40 (b) 20
(c) 50 (d) 30

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : Let numbers are 2x and 3x.
Given,
LCM = 120, HCF = x (Let)
$\therefore$ LCM × HCF = 2x × 3x
$\Rightarrow 120 \times x = 6x^2$
$\therefore x = \frac{120}{6} = 20$
So, smallest number = 2x
$= 2 \times 20$
$= 40$

151. The ratio of two numbers is 3 : 4 and their H.C.F is 4. Their L.C.M is:

(a) 42 (b) 34
(c) 84 (d) 48

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : Ratio of two numbers = 3 : 4
Let two number are 3x and 4x respectively
L.C.M of 3x, 4x = 12x
H.C.F = 4
First Number × Second Number = L.C.M × H.C.F
$3x \times 4x = 12x \times 4$
$\boxed{x = 4}$
Hence, L.C.M of 3x and 4x = 12x
$= 12 \times 4$
$= 48$

152. If the sum of two numbers is 84 and their HCF and LCM are 3 and 124 respectively, the sum of the reciprocals of the two numbers will be:

(a) $\frac{11}{31}$ (b) $\frac{9}{31}$
(c) $\frac{8}{31}$ (d) $\frac{7}{31}$

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the first and second numbers are Ha and Hb respectively.
$L = Hab \Rightarrow 124 = 3ab$
$ab = \frac{124}{3}$
And $H(a + b) = 84 \Rightarrow (a + b) = 28$
Then, $\frac{1}{Ha} + \frac{1}{Hb} = \frac{Ha + Hb}{Ha \times Hb}$
$= \frac{H(a+b)}{H^2ab}$
$= \frac{(a+b)}{Hab} = \frac{28}{124} = \frac{7}{31}$

153. The LCM of two numbers is 721, and the numbers are in the ratio of 1 : 7. What is the sum of the numbers?

(a) 825 (b) 728
(c) 721 (d) 824

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the numbers is x and 7x
Then, LCM of numbers = 7x
According to the question,
$\therefore$ 7x = 721
x = 103
Hence the total of numbers = x +7x
= 103 + 7 × 103
= 103 +721
= 824

154. What is the ratio of the L.C.M. and H.C.F. of the number 56 and 84?
(a) 2 : 3 (b) 3 : 2
(c) 6 : 1 (d) 7 : 2

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) : LCM of 56, 84 = 168
and HCF = 28

2	56, 84
2	28, 42
2	14, 21
3	7, 21
7	7, 7
	1, 1

Required Ratio $= \frac{168}{28} = \frac{6}{1} \Rightarrow 6:1$

155. The HCF and LCM of two numbers are in the ratio of 1 : 30 and the difference between the HCF and LCM is 493. Find the product of LCM and HCF.
(a) 8670 (b) 540
(c) 6064 (d) 4040

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let, HCF = x
LCM = 30x
According to the question,
LCM – HCF = 493
30x – x = 493
29 x = 493
x = 17
Hence, HCF × LCM = 30x × x
= 30 × 17 × 17
= 8670

156. Find three numbers such that their ratio is 3 : 4 : 5 and their HCF is 7.
(a) 12, 16, 20 (b) 21, 28, 35
(c) 24, 32, 40 (d) 6, 8, 10

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the three numbers is 3x, 4x and 5x
HCF = 7
Hence Numbers 3x = 3 × 7 = 21
4x = 4 × 7 = 28
5x = 5 × 7 = 35

157. What is the product of the LCM and the HCF of 15 and 25?
(a) 375 (b) 225
(c) 75 (d) 150

RRB NTPC 17.02.2021 (Shift-II) Stage I

Ans. (a) : LCM of 15 and 25
15 = 3× 5
25 = 5 × 5
LCM = 75
HCF = 5
Product = LCM × HCF
= 75 × 5
= 375

158. What is the product of LCM and HCF of 18 and 42 ?
(a) 756 (b) 736
(c) 746 (d) 766

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : 18 = 2 × 3 × 3
42 = 2 × 3 × 7
HCF = 2 × 3 = 6
LCM = 2 × 3 × 3 × 7 = 126
Product of LCM and HCF
= 6 × 126
= 756

159. The sum and difference of the LCM and HCF of two numbers are 682 and 638 respectively. If the sum of the two numbers is 286, find the numbers.
(a) 246 and 40 (b) 226 and 60
(c) 220 and 66 (d) 242 and 44

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : LCM + HCF = 682 ……(i)
LCM – HCF = 638 ……(ii)
By adding eq^{n} (i) and (ii)
2 LCM = 1320
LCM = 660
On putting the value of LCM in eqn (i)-
660 + HCF = 682
HCF = 22
According to the question-
LCM × HCF = x × y
660 × 22 = (286 – y) × y (Given: x + y =286)
660 ×22 = 286y – y^2
y^2 – 286y + 14520 = 0
y^2 – (220 + 66)y + 14520 = 0
y^2 – 220y – 66y + 14250 = 0
y (y – 220) – 66 (y – 220) = 0
(y – 220)(y – 66) = 0
So the numbers are 220 and 66.

160. The product of the LCM and the HCF of two positive numbers is 32 and the difference of the numbers is 4. The sum of the number is.

(a) 12 (b) 14
(c) 16 (d) 10

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the number is A and B

$\because$ First number × Second number = LCM × HCF

According to the question,

$A \times B = 32$

And $A - B = 4$

Then $(A+B) = ?$

$(A+B)^2 = (A-B)^2 + 4AB$

$(A+B)^2 = 16 + 4 \times 32$

$(A+B)^2 = 16 + 128 = 144$

$(A+B) = 12$

161. The HCF of two numbers is 19 and the other two factors of their LCM are 11 and 13. The larger number of the two numbers is:

(a) 243 (b) 241
(c) 249 (d) 247

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the smaller and larger numbers is Ha and Hb

HCF = 19

Then numbers- Ha = 19 × 11 = 209

Hb = 19 × 13 = 247

Hence larger number (Hb) = 247

162. The LCM of two numbers is 91 times their HCF. The sum of the HCF and LCM is 2760. If one of the numbers is 210, Then find the second number.

(a) 30 (b) 2730
(c) 390 (d) 420

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let HCF is x then LCM will be 91x.

According to question –

$91x + x = 2760$

$92x = 2760$

$x = 30$

$\because$ First number × Second number = LCM × HCF

$210 \times$ Second number $= 91 \times 30 \times 30$

Second number $= 13 \times 30 = 390$

163. The sum of two numbers is 60 and their HCF and LCM are 12 and 72 respectively. The sum of the reciprocal of the two numbers is:

(a) $\frac{1}{5}$ (b) $\frac{5}{72}$

(c) $\frac{5}{6}$ (d) $\frac{5}{12}$

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Let the numbers are a & b respectively.

According to the question,

$a + b = 60$ ...(i)

L.C.M. × H.C.F. = Product of both numbers a & b.

$$\frac{a+b}{ab} = \frac{60}{12 \times 72}$$

$$\frac{a}{ab} + \frac{b}{ab} = \frac{5}{72}$$

$$\frac{1}{b} + \frac{1}{a} = \frac{5}{72} \text{ or } \frac{1}{a} + \frac{1}{b} = \frac{5}{72}$$

164. The sum of the LCM and the HCF of two numbers is 372. If LCM is equal to 92 times of HCF and one number is 368, find the other number.

(a) 360 (b) 4
(c) 92 (d) 96

RRB JE - 01/06/2019 (Shift-III)

Ans. (b) Let HCF = x

Then LCM = 92x

LCM + HCF = 372

$92x + x = 372$

$$x = \frac{372}{93}$$

$x = 4$

LCM × HCF = First number × Second number

$92x \times x = 368 \times$ Second number

$$\text{Second number} = \frac{92 \times x \times x}{368} = \frac{92 \times 4 \times 4}{368} = 4$$

165. If the product of two numbers is 4941 and their LCM is 81 then, what is their HCF?

(a) 60 (b) 59
(c) 35 (d) 61

RRB NTPC 17.01.2017 Shift-3

Ans : (d) From formula,

Product of two numbers = LCM × HCF

$4941 = 81 \times HCF$

$$HCF = \frac{4941}{81} = 61$$

166. The ratio of two number is 8:9 and their HCF is 6. Their LCM will be:

(a) 432 (b) 54
(c) 48 (d) 423

RRB NTPC 17.01.2017 Shift-3

Ans : (a) According to the question,

HCF of both numbers = 6

And their ratio is 8:9,

So, the First number = 8 × 6 = 48

Second number = 9 × 6 = 54

LCM × HCF = First number × Second number

$48 \times 54 = 6 \times LCM$

$$LCM = \frac{48 \times 54}{6}$$

LCM = 432

167. The HCF of two numbers in the ratio 15:11 is 13. Find their LCM.

(a) 4290 (b) 2145
(c) 27885 (d) 165

RRB JE - 02/06/2019 (Shift-III)

Ans : (b) Let the numbers are 15x and 11x.

HCF = x

x = 13

So, the numbers are $15\times13=195,\quad 11\times13=143$.
So, the LCM of 195 and 143,

$195=3\times5\times13$

$143=11\times13$

$LCM=3\times5\times11\times13=2145$

168. Three numbers in the ratio 3:4:5 have the LCM 2400. What is the HCF of these number?
(a) 80 (b) 40
(c) 120 (d) 200

RRB JE - 27/05/2019 (Shift-I)

Ans : (b) Let the numbers are 3x, 4x and 5x.
So, the LCM of 3x, 4x and 5x = 60x
$\Rightarrow$ 60x = 2400
$\Rightarrow$ x = 40
So, the numbers = 120, 160, 200
HCF of 120, 160, 200
$120 \Rightarrow \underline{2\times2\times2}\times3\times\underline{5}$
$160 \Rightarrow \underline{2\times2\times2}\times2\times2\times\underline{5}$
$200 \Rightarrow \underline{2\times2\times2}\times5\times\underline{5}$
Hence, HCF = $2\times2\times2\times5=\boxed{40}$

169. Find the ratio of the LCM and HCF of the numbers 99 and 15.
(a) 165 : 1 (b) 3 : 55
(c) 165 : 3 (d) 1 : 165

RRB JE - 28/05/2019 (Shift-II)

Ans : (a) LCM of 99, 15

3	99, 15
3	33, 5
5	11, 5
11	11, 1
	1, 1

LCM = $3\times3\times5\times11=495$
HCF of 99, 15
$99=3\times3\times11$
$15=3\times5$
HCF = 3
So, the required ratio = $\frac{LCM}{HCF}=\frac{495}{3}=165:1$

170. Two numbers are in a ratio 4:5. Their LCM is 180. Find their sum.
(a) 70 (b) 90
(c) 72 (d) 81

RRB JE - 24/05/2019 (Shift-III)

Ans : (d) Let the numbers are 4x and 5x.
The LCM of 4x and 5x = 20x
According to the question,
20 x = 180
x = 9
So, the numbers are 36 and 45.
Hence, the required sum = 36 + 45 = 81

171. If two numbers, whose HCF is 9, are in a ratio 5:7, then find their difference.
(a) 12 (b) 18
(c) 8 (d) 24

RRB JE - 28/06/2019 (Shift-III)

Ans. (b) Let the numbers are 5x and 7x.
HCF of 5x and 7x = x
$\therefore$ x = 9
So, the required difference = 7x – 5x = 2x
= 2 × 9 = 18

172. The division of two numbers gives 6 and their product is 96. Find the product of the sum and the difference of these numbers.
(a) 540 (b) 560
(c) 592 (d) 9180

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (b) Let the numbers are x and y.
According to the question,

$\frac{x}{y}=6\Rightarrow x=6y-----(i)$

$xy=96-----(ii)$

On putting the value of equation (i) in equation(ii),

$6y.y=96$

$6y^2=96$

$y^2=16$

$y=4$

$\therefore x=6\times4=24$

So, the required value,

$(x+y)(x-y)=(24+4)\times(24-4)$

$=28\times20=560$

173. Which is the second greatest factor of 56 and 84?
(a) 23 (b) 18
(c) 14 (d) 24

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (c) On doing factorization,
$56=2\times2\times2\times7$
$84=2\times2\times3\times7$
The first greatest factor = $7\times2\times2=28$
The second greatest factor = $7\times2=14$

174. What is the smallest number with 7 factors exactly?
(a) 100 (b) 36
(c) 64 (d) 16

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (c) The number of factors of $a^x\times b^y\times c^z$ $\cdot (x+1)\times(y+1)\times(z+1)$ where a, b, c are prime numbers.
From options-
So,
The number of factors of $100=2^2\times5^2=(2+1)(2+1)=9$
The number of factors of $36=2^2\times3^2=(2+1)(2+1)=9$
The number of factors of $64=2^6=(6+1)=7$
The number of factors of $16=2^4=(4+1)=5$
So, it is clear that the required smallest number with 7 factors exactly is 64.

175. The LCM of two numbers is 78. And the ratio of these numbers is 2:3. Find the sum of these numbers.
(a) 60 (b) 26
(c) 65 (d) 39

RRB NTPC 30.03.2016 Shift : 2

Ans : (c) Let the numbers are 2x and 3x.
So, the LCM = 78
$2\times3\times x=78$
x = 13
So, the required sum = $(5x)=5\times13=65$

176. What is the highest common factor of 360 and 450?

(a) 90 (b) 45
(c) 10 (d) 9

RRB NTPC 29.03.2016 Shift : 3

Ans : (a) So, on finding the HCF by division method,

$$360\overline{)450}\,(1$$
$$\underline{360}$$
$$90\overline{)360}\,(4$$
$$\underline{360}$$
$$\times\times\times$$

So, the HCF is 90.

177. If P is the largest number which, when divides 60, 150 and 285, gives the same remainder in each case, then find the sum of digits of p.

(a) 7 (b) 5
(c) 4 (d) 9

RRB NTPC 19.04.2016 Shift : 3

Ans : (d) The required number = The HCF of (150 – 60), (285 – 150) and (285 – 60)

$90 = 2 \times \underline{3 \times 3 \times 5}$
$135 = 3 \times \underline{3 \times 3 \times 5}$
$225 = \underline{3 \times 3 \times 5} \times 5$
HCF = $3 \times 3 \times 5 = 45$

So, the required sum = 4 + 5 = 9

178. The sum of two numbers is 30 and their LCM is 25. Find the larger number.

(a) 55 (b) 25
(c) 1 (d) 15

RRB NTPC 30.04.2016 Shift : 1

Ans.: (b) Let the larger number is x and small number is y.

According to the question,

$x + y = 30$ ……(I)

And the LCM of x and y = 25,
From given options,
If x = 25, then y = 5 (from option (b))
Then, the LCM of 25 and 5 = 25
And the sum = 25 + 5 = 30

Type - 8

179. A rectangular courtyard is 18 m 72 cm long and 13 m 20 cm broad. It is to be paved with square tiles all of the same size. Find the least possible number of such tiles required.

(a) 4292 (b) 4290
(c) 4294 (d) 4295

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given that,

Length (l) = 18 m 72 cm = 1872 cm

Broad (b) = 13 m 20 cm = 1320 cm

For minimum number of tiles, we have to calculate HCF of 1872 and 1320.

$1872 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 13$
$1320 = 2 \times 2 \times 2 \times 3 \times 5 \times 11$
$\therefore$ HCF = $2 \times 2 \times 2 \times 3 = 24$ cm

Therefore, the maximum size of the tile should be square tile of side 24 cm.

So, required of minimum tiles

$$= \frac{1872 \times 1320}{24 \times 24} = 78 \times 55$$
$$= 4290$$

180. Flooring of a room 12 m long and 8 m wide is to be designed by squares of maximum possible area. Find the number of square designs required.

(a) 6 (b) 4
(c) 5 (d) 8

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (a) : Side of one Square design = HCF of 12 and 8 = 4

$$\text{Required number} = \frac{\text{Area of floor of room}}{\text{Area of one square design}}$$
$$= \frac{12 \times 8}{4 \times 4} = 6$$

181. The floor of a hall measuring 16 meters in length and 12 meters in width is to be paved with square tiles. If the least number of tiles are to be used, then what is the length of each square tile?

(a) 4 meters (b) 12 meters
(c) 48 meters (d) 24 meters

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (a) : Length of floor = 16m
Breadth of floor = 12m
$\therefore$ HCF of 16 & 12 = 4
Hence the length of each square tiles = 4 meter

182. What is the length of the side of the largest square tile, which is used for constructing the floor of tile of 13.92m length and 5.22m breadth.

(a) 58 cm (b) 1 m 16 cm
(c) 1 m 74 cm (d) 87 cm

RRB Group-D – 24/10/2018 (Shift-III)

Ans. (c) : The side of the largest square tile = HCF of 13.92m and 5.22m,

On finding the HCF by division method,

$$522\overline{)1392}\,(2$$
$$\underline{1044}$$
$$348\overline{)522}\,(1$$
$$\underline{348}$$
$$174\overline{)348}\,(2$$
$$\underline{348}$$
$$\times\times\times$$

So, the HCF is 174.
Hence, the length of the side = 174cm = 1m 74cm,

Type - 9

183. Five bells commence tolling together and toll at intervals of 3, 6, 12, 15 and 18 seconds respectively. They tolled at 9:58:45 hours then at which time they will again toll together?

(a) 10:02:45 (b) 10:01:45

(c) 10:01:15 (d) 10:00:15

RRB NTPC (Stage-2) 16/06/2022 (Shift-II)

Ans. (b) : LCM of 3, 6, 12, 15 and 18.

3	3, 6, 12, 15 18
2	1, 2, 4, 5, 6
2	1, 1, 2, 5, 3
3	1, 1, 1, 5, 3
5	1, 1, 1, 5, 1
	1, 1, 1, 1, 1

$= 3\times2\times2\times3\times5$

= 180 sec or 3 minutes

According to the question,

The bells rings at 9 : 58 : 45

9 : 58 : 45

: 3 :

10 : 01 : 45 The bells rang together again

Hence, At 10:01:45 hours they will again toll together.

184. There are three consecutive road crossings at which traffic lights change after every 35 seconds, 42 seconds and 90 seconds, respectively. if the lights are set on simultaneously at 8:00, then after how much time will they change again simultaneously?

(a) 10 minutes 30 seconds

(b) 9 minutes 10 seconds

(c) 7 minutes 20 seconds

(d) 9 minutes 30 second

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (a) : L.C.M of 35, 42 and 90.

2	35, 42, 90
3	35, 21, 45
3	35, 7, 15
5	35, 7, 5
7	7, 7, 1
	1, 1, 1

$= 2 \times 3 \times 3 \times 5 \times 7$

= 630 Seconds

= 10 minute 30 seconds

After 10 minutes 30 seconds light will again change simultaneously.

185. There are four table clocks. They ring every 10 min, 15 min, 20 min and 25 min respectively. If they all ring together at 10 am, then at what time will they ring together again?

(a) 10:00 a.m. (b) 3:00 p.m.

(c) 10:00 p.m. (d) 3:30 p.m.

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (b) :

L.C.M. of 10,15,20 and 25 = 300 min = 5 hours

Hence the table clock will again ring at 10:00 am + 5 hours simultaneously = 3 : 00 pm

186. A pendulum strikes 2 times in 3s and another pendulum strikes 5 times in 7s. If both pendulum start striking at the same time, how many simultaneous strikes will take place in 1 min?

(a) 2 (b) 4

(c) 5 (d) 3

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (a) : According to question:

Pendulum on strikes 1 time = Difference of $\frac{3}{2}$ seconds

And other pendulum on strikes 1 time = Difference of $\frac{7}{5}$ seconds

If both Pendulum start striking at the same time, then they will strike together = LCM of $\frac{3}{2}$ and $\frac{7}{5}$ = Difference of 21 seconds

They strike together in 1 min (60 sec)) = $= \frac{60}{21} = \frac{20}{7} = 2\frac{6}{7} = 2$ times (take only whole number)

187. Three electronic bells are fixed in three adjoining temples. The priests of these temples decided to ring the bells at different times with the intervals of 2, 3 and 5 min. If the bells start tolling together for the first time at 8 : 00 : 00 in the morning, up to 9 : 00 : 00 in the morning they will toll together:

(a) 4 times after the starting time

(b) 2 times after the starting time

(c) 5 times after the starting time

(d) 15 times after the starting time

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : L.C.M. of 2, 3, 5 = 30 minute

Difference between 8 : 00 – 9.00 = 1 hour

Hence, bell will ring in 60 minute $= \frac{60}{30}$

= 2 times

188. A, B and C begin together to move around a circular stadium and they complete their revolutions in 42s, 63s and 84s respectively. After how much time will they come together at the starting point?

(a) 152s (b) 252s

(c) 452s (d) 256s

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : Time taken by A, B and C to meet again at the starting point = LCM of 42, 63 and 84 = 252 seconds.

$42 = 2\times3\times7$

$63 = 3\times3\times7$

$84 = 2\times2\times3\times7$

LCM = 2 × 2 × 3 × 3 × 7

= 252s

189. Moving along circular path, Ansh takes 18 minutes to complete one round and Siddhi takes 12 minutes for the same. If they start from the same point and at the same time, then after what time they will meet again at the starting point?

(a) 1.5 minutes (b) 216 minutes

(c) 36 minutes (d) 6 minutes

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : LCM of 18 minutes and 12 minutes = 36 minutes

If Ansh and Siddhi started from same point and same time then they will meet again at the same point after 36 minutes.

190. Three different traffic signals change lights every 72, 108 and 48 seconds respectively. If the lights change simultaneously at 9:30:00 am, then at what time will they change next simultaneously?

(a) 9:44:24 am (b) 9:37:12 am

(c) 9:37:20 am (d) 9:36:12 am

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,

LCM of 72, 108 and 48

2	72, 108, 48
2	36, 54, 24
2	18, 27, 12
2	9, 27, 6
3	9, 27, 3
3	3, 9, 1
3	1, 3, 1
	1, 1, 1,

LCM = 2×2×2×2×3×3×3 = 432

If at 9:30 light change simultaneously and 432 seconds or 7 min. 12 second after they change simultaneously again.

Hence, Required time = 9:37:12 a.m.

191. In a temple, four bells ring together at intervals of 12, 16, 24 and 36 minutes respectively. If they start ringing at regular intervals from 6:00 am when will they ring together again?

(a) 8 : 24 am (b) 5 : 24 am

(c) 7 : 24 am (d) 6 : 24 am

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (a) LCM of 12, 16, 24 and 36,

2	12, 16, 24, 36
2	6, 8, 12, 18
2	3, 4, 6, 9
2	3, 2, 3, 9
3	3, 1, 3, 9
3	1, 1, 1, 3
	1, 1, 1, 1

LCM = 2×2×2×2 ×3 ×3 = 144

So, 144 min = 2 hours and 24 minutes

So, the first interval = 6:00 + 2:24=8:24am

So, at 8:24 am the bells will ring together.

192. Three bells ring at intervals of 15, 20 and 30 minutes respectively. If they ring together at 11:00 am, then when will they ring together again?

(a) 11.30 a.m. (b) 12 noon

(c) 12.30 p.m (d) 1.00 p.m

RRB NTPC 28.03.2016 Shift : 1

Ans : (b) LCM of 15, 20 and 30 = 60

So, all the three bells ring together at the interval of 60 minutes = 1 hour.

So, the bells will ring together at 11:00 + 1:00 = 12:00 noon.

193. Four bells ring at intervals of 16, 24, 36 and 42 minutes respectively. If they were last ring together at 6:00 am, then after how many minutes will they ring together again?

(a) 842 minute (b) 964 minute

(c) 886 minute (d) 1008 minute

RRB NTPC 18.01.2017 Shift : 2

Ans : (d) The bells will ring together again = LCM of 16, 24, 36 and 42.

2	16, 24, 36, 42
2	8, 12, 18, 21
2	4, 6, 9, 21
2	2, 3, 9, 21
3	1, 3, 9, 21
3	1, 1, 3, 7
7	1, 1, 1, 7
	1, 1, 1, 1

LCM = 2 × 2 × 2 × 2 × 3 × 3 × 7 = 1008

Hence, after 1008 minutes they will ring together.

194. The traffic lights at four different road crossings change after every 15 sec, 18 sec, 27 sec and 30 sec respectively. If they all change simultaneously at 6:10:00 hours, then at what time will they again change simultaneously?

(a) 6:14:30 hours (b) 6:40:00 hours

(c) 6:14:00 hours (d) 10:40:00 hours

RRB NTPC 16.04.2016 Shift : 3

Ans. : (a)

Traffic lights will again change simultaneously

= LCM of 15, 18, 27 and 30

On finding the LCM by common division method,

2	15, 18, 27, 30
3	15, 9, 27, 15
3	5, 3, 9, 5
3	5, 1, 3, 5
5	5, 1, 1, 5
	1, 1, 1, 1

LCM = $2 \times 3 \times 3 \times 3 \times 5 = 270$ sec

So, after 270 seconds = 4 min 30 sec,

Hence the traffic lights will change simultaneously at 6:10:00 + 00:04:30 = 6:14:30

195. Three clocks are designed to ring after every 1 hour, 2 hours and 3 hours respectively. If they ring together then after how many hours will they ring together?

(a) 3 hours (b) 6 hours

(c) 4 hours (d) 12 hours

RRB NTPC 29.04.2016 Shift : 2

Ans : (b) According to the question,

The interval for ringing three clocks' together = LCM of 1 hour, 2 hours and 3 hours = 6

So, they will ring together after 6 hours.

196. Three bells ring at intervals of 15, 30 and 45 minutes respectively. At what time will they ring together again, if they rang simultaneously at 8.00 AM?

(a) 8.30 AM (b) 9.30 AM

(c) 9.00 AM (d) 8.45 AM

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (b) All the three bells will ring together again = LCM of 15, 30 and 45

On finding the LCM by common division method,

2	15, 30, 45
3	15, 15, 45
3	5, 5, 15
5	5, 5, 5
	1, 1, 1,

LCM = $2 \times 3 \times 3 \times 5 = 90$ min

So, the required time = 8:00 + 90 min = 9:30 AM

Type - 10

197. Which of the following numbers is divisible by 7, 11 and 13?

(a) 1005001 (b) 1003001

(c) 1004001 (d) 1002001

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : LCM of 7, 11 and 13 = $7 \times 11 \times 13$

= 1001

$\therefore (1001)^2 = 1002001$

Hence, 1002001 divisible by 7, 11 and 13.

198. The smallest natural number which is divisible by 8, 12, 28 and 36 is:

(a) 252 (b) 168

(c) 504 (d) 336

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (c) : Smallest natural number which is divisible by 8, 12, 28 and 36 $\Rightarrow$ LCM of 8, 12, 28 and 36

$\therefore$ LCM of 8, 12, 28 and 36 = 504

Hence, 504 is required answer.

199. What is the largest number that will divide both 288 and 468 without leaving any remained?

(a) 18 (b) 72

(c) 36 (d) 39

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (c) : According to the question,

$\therefore$ $288 = 2\times2\times2\times2\times2\times3\times3$

and $468 = 2\times2\times3\times3\times13$

$\therefore$ HCF of 288 and 468 $= 2\times2\times3\times3$

$= 36$

Hence, the largest number is 36 that will divide both 288 and 468 without leaving any remained.

200. The smallest four-digit number that is exactly divisible by each of 24, 40 and 56 is :

(a) 1080 (b) 1680

(c) 1260 (d) 1170

RRB Group-D 05/09/2022 (Shift-II)

Ans. (b) : Factorization of 24, 40 and 56

$24 = 2\times2\times2\times3$

$40 = 2\times2\times2\times5$

$56 = 2\times2\times2\times7$

LCM = $2\times2\times2\times3\times5\times7 = 840$

Hence the smallest number of four digit = 2×840

$= 1680$

201. In finding the greatest common factor (HCF) of two numbers by division method. The quotients are 1, 5 and 2 respectively, and the last divisor is 15. Find the least common multiple (LCM) of the numbers.

(a) 2130 (b) 3045

(c) 2115 (d) 2145

RRB Group-D 06/09/2022 (Shift-III)

Ans. (d) : Dividend = Divisor × Quotient + Remainder

Last divisor = 15, Quotient = 2

Dividend = $15\times2 = 30$

Divisior = 30, Quotient = 5, Remainder = 15

Dividend = $30 \times 5 + 15$

$= 165$

Again,

Divisor = 165, Quotient = 11, Remainder = 30

Dividend = $165 \times 1 + 30$

$= 195$

Hence the numbers are = 165, 195

$165 = 15\times11$

$195 = 15\times13$

LCM = $15 \times11\times13 = 2145$

202. Find the samllest number which is divisible by 10, 14 and 28 is a perfect square.

(a) 19600 (b) 4900

(c) 140 (d) 18600

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (b) : LCM of 10, 14 and 28 = 140

From option (b) $\frac{4900}{140} = 35$

Hence, the number 4900 is the samllest perfect square of the given number.

203. Find the greatest 4-digit number that is divisible by 15, 25, 40 and 75.

(a) 9200 (b) 9600

(c) 9400 (d) 9000

RRB JE - 24/05/2019 (Shift-I)

Ans : (b) Thegreatest 4-digit number = 9999

LCM of 15, 25, 40 and 75 = 600

$$\begin{array}{r} 600\overline{)9999}(16 \\ \underline{600} \\ 3999 \\ \underline{3600} \\ 399 \end{array}$$

Hence, the greatest 4-digit number that is divisible by 15, 25, 40 and 75 = 9999 – 399 = 9600

204. Find the largest number of four digits that is completely divisible by 27, 18, 15 and 12.

(a) 9730 (b) 9710

(c) 9700 (d) 9720

RRB JE - 26/06/2019 (Shift-III)

Ans : (d) LCM of 12, 15, 18 and 27 = 540

$$\begin{array}{r} 540)\ 9999\ (18 \\ \underline{540} \\ 4599 \\ \underline{4320} \\ 279 \end{array}$$

Hence, the required number = 9999 – 279 = 9720

205. Find the largest 3-digit number that is completely divisible by 10, 8 and 12.

(a) 940 (b) 960

(c) 980 (d) 999

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) LCM of 10, 12 and 8

2	10, 8, 12
2	5, 4, 6
2	5, 2, 3
3	5, 1, 3
5	5, 1, 1
	1, 1, 1

LCM = 2 ×2×2×3×5 = 120

The largest 3-digit number = 999

According to the question-

$$\begin{array}{r} 8 \\ 120\overline{)999} \\ 960 \\ \overline{39} \end{array}$$

Hence, the required number = 999 – 39 = 960.

206. If a natural number is divided by 4, 5, 6 or 7, leaves remainder 1 in each case. Find that smallest number.

(a) 421 (b) 61

(c) 841 (d) 211

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (a) LCM of 4,5,6 and 7 = 420

The required number = 420 + 1 = 421

Hence, In each condition 421 leaves remainder 1, when divided by 4, 5, 6 and 7 respectively.

207. Which of the following is the largest such number, which leaves remainder 9 and 20, when divides 105 and 164 respectively?

(a) 36 (b) 48

(c) 24 (d) 96

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) 105 – 9 = 96 and 164 – 20 = 144

$$\begin{array}{r} 1 \\ 96\overline{)144} \\ 96 \\ 48\overline{)96}(2 \\ 96 \\ \overline{\times\times} \end{array}$$

Hence, that largest number = HCF of 96 and 144 = 48

208. Which is the largest such number which leaves remainder 2 and 3, when divides 258 and 323 respectively?

(a) 40 (b) 24

(c) 64 (d) 132

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (c) : 258 – 2 = 256

323 – 3 = 320

HCF of 320 and 256 = 64

Hence the largest number will be 64 by which dividing 258 and 323 will give remainder 2 and 3 respectively.

209. Which of the following is the least number that should be added to 3496, so that the sum is exactly divisible by 2, 6, 4 and 3 ?

(a) 11 (b) 8

(c) 15 (d) 4

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (b) : L.C.M of 2, 6, 4 and 3 = 12

$$\begin{array}{r} 12\overline{)3496}(291 \\ \underline{24} \\ 109 \\ \underline{108} \\ 16 \\ \underline{12} \\ 4 \end{array}$$

Hence, on adding the number 12– 4 = 8 in 3496, the sum (3504) is exactly divisible by 2, 6, 4 and 3.

210. How many four-digit numbers are completely divisible by 5, 12 and 18?

(a) 49 (b) 47

(c) 48 (d) 50

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (d) : L.C.M. of 5, 12 and 18 = 180

Smallest 4 -digit numbers divisible by 180,

$$180\overline{)1000}(5$$
$$\underline{900}$$
$$100$$

Number = 1000 + 80 = 1080

(Adding 80 to 1000 will completely divisible this number by 180)

Greatest 4-digit numbers divisible by 180,

$$180\overline{)9999}(55$$
$$\underline{900}$$
$$\times 999$$
$$\underline{900}$$
$$\times 99$$

Number= 9999 – 99 = 9900

$\because$ Last term = First term + (n – 1)d

9900 = 1080 + (n – 1) 180

8820 = (n – 1) 180

n – 1 = 49

n = 50

So, there are 50 four digits numbers which will be divisible by 180.

211. Find the least number, which is exactly divisible by 12, 15, and 18.

(a) 160 (b) 120

(c) 180 (d) 240

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (c) : The least number, which is exactly divisible by 12, 15 and 18 = LCM of 12, 15 and 18.

Hence, LCM of 12, 15 and 18 = 180

212. What least number should be added to 3500 to make it exactly divisible by 42, 49, 56 and 63?

(a) 24 (b) 22

(c) 26 (d) 28

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (d) : LCM of 42, 49, 56, and 63 $= 7^2 \times 2^3 \times 3^2$

= 3528

Required number = 3528 – 3500 = 28

213. The greatest number of four digits which is divisible by 15, 20, 25, and 45 is.

(a) 9090 (b) 9900

(c) 9990 (d) 9000

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b) : The greatest number of four digits which is completely divisible by 15, 20, 25 and 45 = [LCM(15, 20, 25, 45] K

N = 900 K

Keeping K = 11

$\therefore$ N = 900 × 11 = 9900

214. What is the smallest number which when increased by 3 is divisible by 27, 35, 25 and 21?

(a) 4725 (b) 317

(c) 4728 (d) 4722

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) :

Required number = LCM of 27, 35, 25 and 21 – 3

= 4725 – 3

= 4722

215. The least perfect square number completely divisible by 4, 5, 9 and 12 is?

(a) 900 (b) 400

(c) 2500 (d) 3600

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (a) : L.C.M. of 4, 5, 9 and 12

= 2×2×3×3×5

= 180

2	4, 5, 9, 12
2	2, 5, 9, 6
3	1, 5, 9, 3
3	1, 5, 3, 1
5	1, 5, 1, 1
	1, 1, 1, 1

From option -

$$\frac{900}{180} = 5$$

Hence the least perfect square number is 900 which is divisible by 4, 5, 9 and 12.

216. The least number that should be added to 1549 so that the sum is exactly divisible by 2, 3, 5 and 7 is.

(a) 210 (b) 131

(c) 79 (d) 1339

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) : Given number = 1549

Now, L.C.M. of 2, 3, 5 and 7 = 210

Now dividing 1549 by 210,

$$210\overline{)1549}(7$$
$$\underline{1470}$$
$$79$$

Remainder = 79

Now the number to be added to 1549 so that the sum obtained is completely divisible by 2, 3, 5 and 7 = 210 – 79 = 131

217. The least number which should be added to 4707 so that the sum is exactly divisible by 4, 5, 6 and 8 is:

(a) 73 (b) 93

(c) 83 (d) 63

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (b) : L.C.M. of 4, 5, 6, 8 = 120
Number greater than 4707 which is divisible by 120
= 120×40 = 4800
Number to be added = 4800 – 4707
= 93

218. The number between 6000 and 7000 that is divisible by each of 12, 21, 32 and 18 is.
(a) 6048 (b) 6064
(c) 6480 (d) 6040

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : L.C.M. of 12, 21, 32 and 18 = 2016
Required number = 2016k
Let, taking k = 3
Required number = 2016 × 3
= 6048

219. The least number that should be added to 5474, so that the sum is exactly divisible by 3, 4, 6 and 8 is:
(a) 23 (b) 24
(c) 22 (d) 21

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (c) : L.C.M. of 3, 4, 6 and 8 = 24

$$\begin{array}{r} 24\overline{)\,5474\,(228} \\ \underline{48} \\ 67 \\ \underline{48} \\ 194 \\ \underline{192} \\ \times 2 \end{array}$$

Number = 24 – 2
= $\boxed{22}$
The least number is 22 which when added to divisible the number.

220. Find the least number which is required to be added to 2495 so that the sum is exactly divisible by 3, 4 , 5 and 6.
(a) 33 (b) 23
(c) 25 (d) 13

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (c) : LCM of 3, 4, 5 and 6 = 60
Required number = 60 K – 2495
$(\because K = \frac{2495}{60} = 41.58)$
= 60 × 42 – 2495
= 2520 – 2495 = 25

221. The greatest number of five digits which is completely divisible by 12, 22, 42 and 55 is:
(a) 99025 (b) 97020
(c) 94010 (d) 96050

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : L.C.M of 12, 22, 42 and 55 = 4620
The greatest five digit number = 99999
$\frac{99999}{4620} = 21 \cdot 6448052$
So, required number = 4620 × 21
= 97020

222. Find the largest number that will divide exactly the product of four consecutive integers.
(a) 12 (b) 8
(c) 6 (d) 24

RRB JE - 02/06/2019 (Shift-II)

Ans. (d) According to the question,
The product of four consecutive integers
= 2 × 3 × 4 × 5 = 120
Which is exactly divisible by 12, 6, 8 and 24. But 24 is the largest of all.

223. Find the number between 300 and 500 which will be exactly divisible by 6, 8, 10 and 12:
(a) 320 (b) 340
(c) 490 (d) 360

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (d) LCM of 6, 8, 10 and 12,
6 = 2 × 3
8 = 2 × 2 × 2
10 = 2 × 5
12 = 2 × 2 × 3
LCM = 2 × 2 × 2 × 3 × 5 = 120
So, the required number
= Multiples of 120 between 300 and 500.
= $\boxed{360}$ and 480.

224. Find the least square number among the following, which is exactly divisible by 6, 9, 12, 13 and 15.
(a) 621000 (b) 456000
(c) 173000 (d) 152100

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (d) From options, only 152100 is a perfect square, other numbers are not perfect squares.
LCM of 6, 9, 12, 13 and 15 = 2340
So,
$\frac{152100}{2340} = 65$ (Exactly divisible number)
So, the required number is 152100 which is the square of 390.

225. Find the smallest square number which is exactly divisible by 4, 9 and 14.
(a) 1008 (b) 252
(c) 1764 (d) 504

RRB NTPC 17.01.2017 Shift-2

Ans : (c) LCM of 4, 9 and 14

2	4, 9, 14
2	2, 9, 7
7	1, 9, 7
3	1, 9, 1
3	1, 3, 1
	1, 1, 1

LCM = 2 × 2 × 3 × 3 × 7 = 252
252 is not a square number. But its multiple 1764 is a square number.
So, from options 1764 is the required number.

226. What is the smallest 5-digit number which is exactly divisible by 12, 24, 48, 60 and 96?

(a) 10000 (b) 10024

(c) 10160 (d) 10080

RRB NTPC 03.04.2016 Shift : 1

Ans : (d) LCM of given numbers,

2	12,	24,	48,	60,	96
2	6,	12,	24,	30,	48
2	3,	6,	12,	15,	24
2	3,	3,	6,	15,	12
2	3,	3,	3,	15,	6
3	3,	3,	3,	15,	3
5	1,	1,	1,	5,	1
	1,	1,	1,	1,	1

LCM = 2×2×2×2×2×3×5 = 480

The smallest 5-digit number = 10000

480)10000(20

9600

400

So, the required number = 10000 + (480 – 400)

= 10080

227. Find is the largest 3-digit number which is exactly divisible by 15, 25 and 30?

(a) 900 (b) 930

(c) 960 (d) 975

RRB NTPC 28.03.2016 Shift : 2

Ans : (a) LCM of 15, 25 and 30 = 150

The largest three digit number = 999

150) 999 (6

900

×99

So, the required number = 999 – 99 = 900

228. Find the smallest number which, when doubled is exactly divisible by 14, 35, 28 and 91.

(a) 14 (b) 1820

(c) 910 (d) 1260

RRB NTPC 22.04.2016 Shift : 3

Ans : (c) According to the question,

LCM of 14, 35, 28 and 91

2	14,	35,	28,	91
7	7,	35,	14,	91
	1,	5,	2,	13

LCM = 2 × 7 × 5 × 2 × 13 = 1820

So, the required number = $\frac{1820}{2} = 910$

229. Find the smallest number which is exactly divisible by 6, 8, 12 and 16.

(a) 48 (b) 24

(c) 64 (d) 80

RRB NTPC 27.04.2016 Shift : 3

Ans : (a) The required number = LCM of 6, 8, 12 and 16

On finding the LCM by common division method,

2	6,	8,	12,	16
2	3,	4,	6,	8
2	3,	2,	3,	4
2	3,	1,	3,	2
3	3,	1,	3,	1
	1,	1,	1,	1

LCM = 2 × 2 × 2 × 2 × 3 = 48

230. What is the smallest of five digit number that is exactly divisible by 12, 18, 20 and 25?

(a) 10000 (b) 10800

(c) 11250 (d) 10680

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (b) : On finding the LCM of given numbers,

2	12	18	20	25
2	6	9	10	25
3	3	9	5	25
3	1	3	5	25
5	1	1	5	25
5	1	1	1	5
	1	1	1	1

LCM = 2×2×3×3×5×5 = 900

900 is the required three-digit,

so the product of 900 which is smallest

5-digit number = 900 × 12 = 10800

231. Find the smallest square number from among the given options which is divisible by each of 8, 15 and 20.

(a) 3600 (b) 6400

(c) 14400 (d) 4900

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (a) LCM of 8, 15 and 20.

8 = 2 × 2 × 2

15 = 3 × 5

20 = 2 × 2 × 5

LCM = 2 × 2 × 2 × 3 × 5 = 120

From options, only (a) 3600 is a number which is square of 60

and divisible by 120 which is LCM of 8, 15 and 20.

06.

Percentage

Type - 1

1. Jack obtained 45% marks in a test and failed by 18 marks. If he obtained 65% marks, he would have got 6 marks more than the minimum marks required to pass the test. How much were the maximum marks one could obtain in that test?

(a) 130 (b) 140
(c) 120 (d) 80

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (c) : According to the question,

$$45\% + 18 = 65\% - 6$$
$$65\% - 45\% = 18 + 6$$
$$20\% = 24$$

$\because$ 20% = 24 marks

$\therefore$ $100\% = \frac{24}{20} \times 100$

Hence the maximum marks of the test = 120 marks

2. The population of a town is 224375. If it is annually increase at the rate of 4%, then what will be its population after 2 years.

(a) 232846 (b) 236864
(c) 240468 (d) 242684

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : According to the question,

Population of town after 2 years $= 224375 \times \left(1 + \frac{4}{100}\right)^2$

$$= 224375 \times \frac{26}{25} \times \frac{26}{25}$$
$$= 242684$$

3. The current population of a town is 15,625. It increases by 8% and 12% in two successive years but decreases by 22% in the third year. What is the population of the town at the end of the third year?

(a) 13,230 (b) 15,120
(c) 14,742 (d) 14,042

RRB Group-D 05/09/2022 (Shift-I)

Ans. (c) : Population increased in two successive years by 8% and 12% respectively.

Increase percentage in 2 years = $8+12+\frac{12 \times 8}{100} = 20.96$

Population decreased in 3rd year = 22%

Compound increases in 3rd year = $20.96 - 22 - \frac{20.96 \times 22}{100}$

$$= -5.65\%$$

Thus, the population of the town at the end of 3rd year

$$= 15625 \times \frac{94.35}{100} = 14742.18 \approx 14742$$

4. The population of a village increases at the rate of 10% per annum. If its population 2 years ago was 10,000, the present population is :

(a) 12,100 (b) 12,400
(c) 12,000 (d) 11,000

RRB Group-D 09/09/2022 (Shift-III)

Ans. (a) :

Present population of the village = $10000 \times \left(1 + \frac{10}{100}\right)^2$

$$= 10000 \times \frac{11}{10} \times \frac{11}{10}$$
$$= 12100$$

5. 20% of the population of a city died due to war and of the remaining population, 5% died in an epidemic. If the present population of the city is 15,200, then find the population of the city before the war.

(a) 20,000 (b) 19,680
(c) 23,500 (d) 20,100

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (a) : Let the population of the city before the war be x.

According to the question,

$$x \times \frac{80}{100} \times \frac{95}{100} = 15200$$
$$x = \frac{15200 \times 100 \times 100}{80 \times 95}$$
$$x = \frac{15200000}{760}$$
$$x = 20000$$

6. During the first year, the population of a town increased by 10% and in the second year it diminished by 10%. At the end of the second year its population was 4,73,220. The population at the beginning of the first year was:

(a) 4,78,880 (b) 4,78,800
(c) 4,78,000 (d) 4,78,780

RRB GROUP-D – 15/09/2022 (Shift-I)

Ans. (c) : Let the population at the beginning of the first year = x

Population after 10% increase = $x \times \frac{110}{100} = \frac{11x}{10}$

Population after 10% decrease = $\frac{11x}{10} \times \frac{90}{100} = \frac{99x}{100}$

According to the question

$$\frac{99x}{100} = 473220$$

$$x = 478000$$

7. The population of a town increases by 10% every year. If the present population is 20,000 in the next year it will be:

(a) 18,000 (b) 22,000
(c) 2,200 (d) 1,800

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : Next year population of the town

$$= 20,000 \times \frac{110}{100}$$

$$= 22,000$$

8. If the population of a village increased from 1,75,000 to 2,62,500 in 5 years, then find the average percentage increase in the population per year.

(a) 15% (b) 9%
(c) 10% (d) 12%

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) : Population of village = 175000
After 5 years, the population of village = 262500
Increase in population = 262500 – 175000
= 87500
Average increase in population per year

$$= \frac{87500}{5} = 17500$$

So, percentage increase $= \frac{17500}{175000} \times 100 = 10\%$

9. A bacterial population increases at the rate of 6% in the first 10 minutes and then 10% in the next 10 minutes. What is the overall percentage increase in the population at the end of 20 minutes?

(a) 16 % (b) 16.6%
(c) 16.3 % (d) 16.5%

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (b) :
The overall percentage increase in the population

$$= \left(6 + 10 + \frac{6 \times 10}{100}\right)\%$$

$$= (16 + 0.6)\%$$

$$= 16.6\ \%$$

10. The population of a town is 10,000. If the male population increases by 5% and the female population by 10%, the population will become 10,800. How much of the town's present population is female?

(a) 7000 (b) 6000
(c) 8000 (d) 5000

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let, the number of males = x
And the number of females = (10, 000 – x)
According to the question-
105% of x + 110% of (10, 000 – x) = 10800

$$x \times \frac{105}{100} + (10,000 - x) \times \frac{110}{100} = 10800$$

$$\frac{21}{20}x + (10,000 - x) \times \frac{22}{20} = 10800$$

$$21x + 220000 - 22x = 10800 \times 20$$

$$22x - 21x = 220000 - 216000$$

$$x = 4000$$

Hence, the present number of females

$$= (10,000 - 4000)$$

$$= 6000$$

11. The population of a town increases at the rate of 10% every year. The present population is 1,000. In how many years will the population become 1,331?

(a) 3 (b) 2.5
(c) 2 (d) 3.5

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (a) : Let, n years will the population become 1,331.
We know that,

$$A = P\left[1 + \frac{r}{100}\right]^n$$

$$\frac{1331}{1000} = \left[1 + \frac{10}{100}\right]^n$$

$$\frac{1331}{1000} = \left[\frac{11}{10}\right]^n$$

$$\left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^n$$

n = 3 years

12. The population of Ludhiana city increases by 20% annually. If its present population is 8,47,000. What will be population in 2 years?

(a) 12,14,682 (b) 12,10,681
(c) 12,12,068 (d) 12,19,680

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : Present population = 8,47,000
According to the question,

$$\text{Population of city after 2 years} = 847000\left(1 + \frac{20}{100}\right)^2$$

$$= 847000 \times \frac{36}{25}$$

$$= 12,19,680$$

13. The total population of a village is 4,000. The number of males and females increases by 10% and 20% respectively and consequently the population of the village becomes 4500. What was the number of males in the village prior to the new members coming in?

(a) 2500 (b) 3000
(c) 4000 (d) 2000

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let, the no. of males = x
And number of females = y
From the initial part of the question,

$$x + y = 4000$$
$$x = 4000 - y \quad \ldots (1)$$

From the second part of the question,

$$x + x \times \frac{10}{100} + y + y\frac{20}{100} = 4500$$
$$\frac{110x + 120y}{100} = 4500$$
$$110x + 120y = 450000 \quad \ldots(2)$$

On putting the value of x from eq^{n}–1 in eq^{n} –2,

$$110 (4000 - y) + 120y = 450000$$
$$440000 - 110y + 120y = 450000$$
$$10y = 10000$$
$$y = 1000$$

$\therefore$ Number of females (y) = 1000
And number of males (x) = 4000 – y
= 4000 – 1000 = 3000

14. 5% population of a town died because of epidemic, and 8% of the remaining population panicked and left the town. If the present population of the town is 88274, then find the total population of the town at the beginning.
(a) 1,21,600 (b) 1,01,000
(c) 99,800 (d) 84,500

RRB RPF Constable -17/01/2019 (Shift-III)

Ans : (b) Let the population of the town is 100%.
Rest population after epidemic = 95%
Number of panicked people = 8%

$$\text{Rest people} = \frac{95 \times 92}{100} = 87.40\%$$

Given,
87.40% = 88274

$$100\% = \frac{88274 \times 100}{87.40} = 1,01,000$$

Hence, the total population of the town is 1,01,000

15. The population of a village increased from 18000 to 22500. What is the increase percentage?
(a) 25% (b) 15%
(c) 30% (d) 20%

RRB JE - 29/05/2019 (Shift-III)

Ans : (a) Required increase percentage

$$= \frac{(22500 - 18000) \times 100}{18000} = \frac{4500 \times 100}{18000} = 25\%$$

16. The population of a town increased by 10% and 20% in two successive years, but decreased by 25% in the third year. Find the ratio of the population in the third year to that of 3 year ago.
(a) 100 : 99 (b) 99 : 100
(c) 2 : 1 (d) 1 : 1

RRB JE - 01/06/2019 (Shift-I)

Ans : (b) Let the population of the town is x.
Population after three years,

$$x \times \frac{(100+10)}{100} \times \frac{(100+20)}{100} \times \frac{(100-25)}{100}$$

$$x \times \frac{110}{100} \times \frac{120}{100} \times \frac{75}{100} = \frac{99x}{100}$$

$$\frac{\text{Population in third year}}{\text{Population before three years}} = \frac{\frac{99x}{100}}{x}$$

$$= \frac{99x}{100} \times \frac{1}{x} = \frac{99}{100} = 99 : 100$$

17. 62% population of a town is educated. If the number of uneducated people in the town is 24567, then what is the number of educated people?
(a) 41823 (b) 64650
(c) 35688 (d) 40083

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (d) : Educated population of the town = 62%
Uneducated population = (100 - 62) = 38%
Let, the total population of the town is x, then number of uneducated people,

$$24567 = \frac{x \times 38}{100}$$
$$x = \frac{24567 \times 100}{38} = 64650$$

So, the total educated population of the town

$$= \frac{64650 \times 62}{100} = 40083$$

18. What will be the population of a town after two years, if the present population is 1,20,0000 and population growth rate is 4%?
(a) 1297920 (b) 1207920
(c) 1300000 (d) 1297820

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (a)
The present population of the town = 1,20,0000
% growth rate = 4%

$$\text{Population after two years} = 1200000\left(1 + \frac{4}{100}\right)^2$$
$$= 1200000 \times \frac{26}{25} \times \frac{26}{25}$$
$$= \frac{1200000 \times 676}{625} = 1297920$$

19. The population of a town is growing at a rate of 5% per year. If the present population of the town is 1,85,220, then what was the population of the town one year ago?
(a) 1,76,000 (b) 1,70,500
(c) 1,76,400 (d) 1,76,200

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (c) : Let the population of the town before a year was 100x.
And it is growing at a rate of 5%,
The present population = 105x
According to the question,
105x=185220
x=1764
The population before a year = 100x
= 100×1764 =176400

20. The population of a town is 8000. If the men are increased by 8% and women by 12%, then the population will be 8680. Find the number of women in the town.

(a) 2500 (b) 1500
(c) 2000 (d) 1000

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (d) Let the number of men in the town is x.
So, the number of women = 8000 – x
According to the question,

$$x \times \frac{108}{100} + (8000 - x) \times \frac{112}{100} = 8680$$

$$\frac{108x + 8000 \times 112 - 112x}{100} = 8680$$

$$896000 - 4x = 868000$$

$$4x = 896000 - 868000$$

$$4x = 28000$$

$$x = 7000$$

So, the number of women = 8000 – 7000 = 1000

21. In 2018, the population of a colony became 54000, which is increasing at a rate of 5% per year. Find the population of the colony two years ago?

(a) 45980 (b) 48980
(c) 49500 (d) 50000

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (b) : Let two years ago the population of the colony was P,
From question,

$$54000 = P\left(1 + \frac{5}{100}\right)^2$$

$$54000 = P \times \frac{21}{20} \times \frac{21}{20}$$

$$P = \frac{54000 \times 20 \times 20}{21 \times 21}$$

$$P = \frac{21600000}{441}$$

P = 48980 (Approximately)

22. The number of people in a town increased by 3% at the beginning of each year. If the present population of the town is 30,00,000, then the population after three years will be:

(a) 3277181 (b) 3217881
(c) 3278181 (d) 3281781

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (c) Population of the town after n years,

$$= \text{present population} \left(1 + \frac{r}{100}\right)^n$$

Where, n = 3 years, r = 3%

So, the population after 3 years $= 30,00,000\left(1 + \frac{3}{100}\right)^3$

$$= 30,00,000 \times \frac{103 \times 103 \times 103}{100 \times 100 \times 100}$$

$$= 3 \times 103 \times 103 \times 103 = 3278181$$

Type - 2

23. Vimal secured 46% marks in the exam and failed to qualify in the exam by 10 marks. If he secured 52% marks, he would have secured 8 marks more than what was the minimum qualifying marks. What were the minimum marks one had to score to qualify in the exam?

(a) 148 (b) 146
(c) 156 (d) 138

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (a) : Let total marks be x.
According to the question,

$$x \times 46\% + 10 = x \times 52\% - 8$$

$$(x \times 52\%) - (x \times 46\%) = 10 + 8$$

$$\frac{x \times 52}{100} - \frac{x \times 46}{100} = 18$$

$$\frac{52x - 46x}{100} = 18$$

$$\frac{6x}{100} = 18$$

$$6x = 1800$$

$$x = 300$$

On putting the value of x
Minimum qualifying marks = (300 × 46%) + 10

$$= \left(\frac{300 \times 46}{100}\right) + 10$$

= 138 + 10
= 148 marks

24. In an examination Sunita scored 90% of what Anita scored, while Anita's score was 110% of want Vinita scored if Sunita scored 198 marks in the examination, how many marks did Vinita score ?

(a) 200 (b) 242
(c) 220 (d) 180

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : Given, Sunita's score = 198 marks
According to the question,

$$\text{Anita's score} = \frac{198}{90} \times 100$$

= 220

$$\text{Vinita's score} = \frac{220}{110} \times 100$$

= 200 marks

25. Two students appeared for an entrance examination. One of them secured 15 marks more than the other and his marks are 80% of the sum of their marks. What are the marks obtained by each of them?

(a) 5 and 20 (b) 6 and 21
(c) 8 and 23 (d) 4 and 19

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) : Let obtained marks by second student = x

Obtained marks by first student = (x+15)

$$x + 15 = (2x + 15) \times \frac{80}{100}$$

$$5x + 75 = 8x + 60$$

$$3x = 15$$

$$x = 5$$

Hence, Marks obtained by each of them = 5 and 20.

26. A student scored 80/80 marks in term 1 and 75/90 marks in term 2. What will be his percentage of final score, if the weightage given to the terms is 40% and 60% respectively. (correct to the nearest integer)

(a) 70% (b) 90%

(c) 85% (d) 95%

RRB Group-D 22/08/2022 (Shift-I)

Ans. (b) : According to the question,

Total obteined marks in term 1 and 2 = 80 + 75

= 155

Maximum marks of terms 1 and 2 = 80 + 90

= 170

$$\text{Percentage of final score} = \frac{155}{170} \times 100$$

$$= 91.17\%$$

= 90% (approximate)

27. The average marks obtained in mathematics by the students of a class was 70. The average marks obtained by the boys is 20% more than the average marks obtained by the girls. If the ratio of the number of boys to that of girls is 3 : 2 then the average marks obtained by the girls is :

(a) 65 (b) 62.5

(c) 63 (d) 63.5

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) : Let the number of boys and girls be 3x and 2x respectively.

Sum of total marks = 70 × 5x

= 350x

Let the average marks obtained by the girls = y

Then the average marks obtained by the boys

$$= y + \frac{20y}{100}$$

$$= \frac{120y}{100}$$

$$= \frac{6y}{5}$$

According to the question,

$$\frac{18xy}{5} + 2xy = 350x$$

$$\frac{28y}{5} = 350$$

$$28y = 350 \times 5$$

$$y = \frac{350 \times 5}{28} = 62.5$$

28. In a school the ratio of the number of boys and girls is 5:6. 20% boys and 25% girls are scholarship holders. How many students did not get a scholarship?

(a) $\left(\frac{950}{11}\right)\%$ (b) $\left(\frac{850}{11}\right)\%$

(c) $\left(\frac{8000}{11}\right)\%$ (d) $\left(\frac{750}{11}\right)\%$

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) :

Let the number of boys = 500

And the number of girls = 600

Number of boys, who are not scholarship holder

$$= 500 \times \frac{80}{100} = 400$$

Number of girls, who are not scholarship holder

$$= 600 \times \frac{75}{100} = 450$$

Percentage of students who are not scholarship holder

$$= \frac{400 + 450}{1100} \times 100$$

$$= \left(\frac{850}{11}\right)\%$$

29. In a class 82% students passed and 2% students were placed in the reappear category. The number of students who failed was 592. What was the total number of students in the class?

(a) 3700 (b) 3600

(c) 2000 (d) 2700

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let, no. of the total students in class = x

$$\text{Passed student} = x \times 82\% = x \times \frac{82}{100}$$

Again passed students in reappear category

$$= x \times 2\% = x \times \frac{2}{100}$$

$$\text{Total passed students} = x \times \frac{2}{100} + x \times \frac{82}{100}$$

$$= x \times \frac{84}{100}$$

$$\text{Failed students} = x - x \times \frac{84}{100} = x \times \frac{16}{100}$$

According to the question-

$$x \times \frac{16}{100} = 592$$

$$x = \frac{592}{16} \times 100$$

$$\boxed{x = 3700}$$

30. Tony should get 40% of the total marks to pass. He obtained 120 marks and failed by 30 marks. What are the total marks?

(a) 500 (b) 400

(c) 300 (d) 375

RRB NTPC 11.03.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

$40\ \% = 120 + 30$

$40\% = 150$

$100\ \% = \frac{150}{40} \times 100$

$= 375$

Hence, the total marks of exam = 375

31. Ravi and Rajesh wrote an entrance examination of join the M.Tech. programme. Ravi obtained 8 marks more than Rajesh and his marks were 52% of the sum of their marks. What are marks obtained by Ravi and Rajesh respectively?

(a) 104, 96 (b) 100, 92

(c) 90, 98 (d) 108, 100

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let Rajesh got x marks.

Ravi got (x + 8) marks.

According to the question,

$x + 8 = (x + x + 8) \times \frac{52}{100}$

$25x + 200 = 26x + 104$

$26x - 25x = 200 - 104$

$x = 96$

Hence, marks obtained by Ravi $= x + 8 = 96 + 8 = 104$

Marks obtained by Rajesh = 96

32. In an examination 45% of the students qualified and 79750 are not qualified. How many students appeared for the examination ?

(a) 140000 (b) 154000

(c) 145250 (d) 145000

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the total students =100%

Qualified students = 45%

Then unqualified students = (100 – 45)=55%

According to the question,

55% = 79750

$100\% = \frac{79750}{55} \times 100$

$\therefore 100\% = 145000$

33. The ratio of the number of boys to the girls in a school is 3 : 2. If 20% of the boys and 25% of the girls are scholarship holders, find the percentage of those who are NOT scholarship holders.

(a) 78% (b) 87%

(c) 68% (d) 86%

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the number of boys in school = 3x

And number of girls = 2x

Total number of students in school = 5x

Number of students who hold scholarship

$= 3x \times \frac{20}{100} + 2x \times \frac{25}{100}$

$= \frac{110x}{100} = \frac{11x}{10}$

Number of students who don't hold scholarship

$= 5x - \frac{11x}{10}$

$= \frac{39x}{10}$

Required percentage $= \frac{\frac{39x}{10}}{5x} \times 100$

$= \frac{39x \times 100}{10 \times 5x}$

$= 78\%$

34. In an examination, 80% students passed in Physics, 70% students passed in Chemistry while 15% students failed in both the subjects. If 325 students passed in both the subjects, find the total number of students who appeared in the examination.

(a) 450 (b) 550

(c) 200 (d) 500

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Percentage of students passed in both subjects

= (80+70) – (100–15)

= (150 – 85)% = 65% students

As per question,

65% of total students = 325

Hence, total number of students $= \frac{325}{65} \times 100$

= 500 students

35. A student must score 40% marks to pass an examination. He gets 70 marks and fails by 20 marks. Find the maximum marks.

(a) 175 (b) 360

(c) 125 (d) 225

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) : Marks gain by the students = 70

Marks gain to qualify the exam = 40% (maximum marks)

According to the question,

$40\% = 70 + 20$

$\Rightarrow \quad 40\% = 90$

$\Rightarrow \quad 100\% = \frac{90}{40} \times 100$

$= 225$

So, maximum marks = 225

36. Rahul had to appear for a test in four subjects. In the first three subjects the maximum marks were 50 each, in which Rahul secured 60% on an average. In the fourth subject Rahul scored 54 marks and his overall percentage is 64%. What were the maximum marks in the fourth subject ?

(a) 75 (b) 80

(c) 84 (d) 60

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the total marks obtained by Rahul in the first three subjects = x

According to the question,

$$\frac{x}{150}\times 100 = 60$$

$$x = 90$$

Let the maximum marks of the fourth subject = y

$$\therefore \frac{(90+54)}{(150+y)}\times 100 = 64$$

$$14400 = 9600 + 64\,y$$

$$y = \frac{4800}{64} = 75$$

37. If Mohan secured 72% marks in Physics and 68% in Chemistry, what percentage of marks did Mohan get in both subjects together, assuming that the two subjects have equal weightage?

(a) 65% (b) 60%

(c) 55% (d) 70%

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) : ∵ Weightage of both subjects are same.

∴ Let the total marks of both subject is 100.

Now, marks obtained in Physics

$$= 100\times\frac{72}{100} = 72 \text{ marks}$$

And marks obtained in Chemistry

$$= 100\times\frac{68}{100} = 68 \text{ marks}$$

Percentage of marks obtained in both subjects

$$= \frac{\text{Total marks obtained in both subject}}{\text{Total marks of both subjects}}\times 100$$

$$= \frac{72+68}{100+100}\times 100 = 70\,\%$$

38. An examination requires 33% marks in order to pass. A candidate who gets 210 marks fails by 21 marks. What are the total marks for the examination?

(a) 500 (b) 400

(c) 700 (d) 350

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

210 + 21 = 33%

33% = 231

$$100\% = \frac{231}{33}\times 100$$

$$\boxed{100\% = 700}$$

Hence, total marks of examination = 700

39. Rakhi scored 12 marks more than Mohan. If Rakhi scored 54% marks out of a maximum of 200, then how much did Mohan score?

(a) 34 marks (b) 46 marks

(c) 69 marks (d) 96 marks

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (d) : Number scored by Rakhi

$$= 200\times\frac{54}{100} = 108 \text{ marks}$$

Number scored by Mohan = 108 – 12 = 96 marks

40. In an examination a student scored 65% marks but was 20 marks below the qualifying marks. Another student scored 80% marks and scored 5% more marks than the qualifying marks. Total marks of the examination are:

(a) 400 (b) 500

(c) 300 (d) 200

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the total marks of examination = x

According to the question,

$$x\times\frac{65}{100} + 20 = x\times\frac{80}{100} - x\times\frac{5}{100}$$

$$\frac{75x}{100} - \frac{65x}{100} = 20$$

$$\frac{10x}{100} = 20$$

$$x = 200$$

Hence, total marks of exmination = 200

41. In order to qualify in an examination, one has to secure 50% of the overall marks. In the examination consisting of two papers, a student secured 40% in the first paper of 200 marks. Minimum what percentage of marks should be secured in the second paper of 150 marks in order to qualify in the examination?

(a) 65% (b) 60%

(c) 68% (d) 64%

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (d) : From question,

Maximum marks of the first question paper = 200

Maximum marks of the second question paper = 150

Minimum marks to qualify $= \frac{(200+150)\times 50}{100}$

$$= \frac{350}{2} = 175 \text{ marks}$$

Marks obtained in first question paper $= 200\times\frac{40}{100} = 80$

Remaining minimum marks = 175 – 80 = 95

Required percentage of marks $= \frac{95}{150}\times 100$

= 63.33% ≈ 64%

42. If Anju scored 68 out of 80 in Hindi, 46 out of 60 in Mathematics, 74 out of 90 in Science, and 35 out of 45 in English, then in which subject did Anju score the maximum percentage of marks ?

(a) Mathematics (b) Hindi

(c) English (d) Science

RRB RPF-SI -05/01/2019 (Shift-II)

Ans : (b) Hindi $\% = \frac{68}{80} \times 100 = \frac{68}{4} \times 5 = 85\%$

Mathematics $\% = \frac{46}{60} \times 100 = \frac{46}{3} \times 5 = \frac{230}{3} = 76.67\%$

Science $\% = \frac{74}{90} \times 100 = \frac{740}{9} = 82.22\%$

English $\% = \frac{35}{45} \times 100 = \frac{35}{9} \times 20 = \frac{700}{9} = 77.78\%$

So, Anju got maximum percentage of marks in Hindi.

43. In an examination, 40 out of 85 students scored less than 50%. The ratio of the number of students, scoring less than 50% to the number of students scoring 50% more marks is:

(a) 8 : 9 (b) 3 : 4
(c) 9 : 8 (d) 5 : 7

RRB RPF Constable -18/01/2019 (Shift-I)

Ans : (a) The required ratio
= 40 : (85 – 40)
= 40 : 45
= 8 : 9

44. The percentage of obtained marks should be 42% to pass an exam. If the maximum marks is 450, then how many marks must be obtained to pass the exam?

(a) 201 (b) 168
(c) 210 (d) 189

RRB Group-D – 15/11/2018 (Shift-III)

Ans. (d) : Maximum marks = 450
The percentage of marks obtained to pass the exam = 42%
So, the marks obtained to pass the exam

$$= 450 \times \frac{42}{100} = 189$$

45. In a test Chitra obtained 58.5 marks that was also equivalent to obtaining 78% marks. How many marks was the test out of?

(a) 85 (b) 65
(c) 75 (d) 80

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (c) : Let the maximum marks were N.
According to the question,

$$58.5 = \frac{N \times 78}{100}$$

$$N = \frac{5850}{78} = 75$$

46. In a class 5% of students are absent on some day. If the number of present students is 38, then what is the total number of students in the class that day?

(a) 40 (b) 50
(c) 33 (d) 45

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (a) Let the total students in the class = 100%
% of students present in the class = 100 – 5 = 95%
The students present in the class = 38
So, the number of total students $= 38 \times \frac{100}{95} = 40$

47. Ram obtained 40% marks in an exam and failed by 20 marks. Aditya obtained 45% marks and that is 30 marks more than the passing marks. What is the percentage of passing marks?

(a) 38% (b) 42%
(c) 43% (d) 33%

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (b) According to the question,
40% marks + 20 marks = 45% marks – 30 marks
20 + 30 = 5% marks
5% = 50
1% = 10
100% = 1000

So, the total marks to pass $= 1000 \times \frac{40}{100} + 20$

$= 420$

So, the % of passing marks $= \frac{420}{1000} \times 100 = 42\%$

48. Pranjoy obtained 272 marks in an exam, which was equal to get 64% marks. How many marks was the exam?

(a) 425 (b) 475
(c) 450 (d) 440

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (a) According to the question,
64% = 272

$$1\% = \frac{272}{64}$$

$$100\% = \frac{272}{64} \times 100 = 425 \text{ marks}$$

So, the maximum marks of the exam were 425.

49. The following table shows the results of the students participated in the exam. What is the percentage of the passed students?

Result	Number of students
Pass	150
Fail	100

(a) 40% (b) 60%
(c) 50% (d) 30%

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (b)

The % of passed students $= \frac{\text{Passed students}}{\text{Total students}} \times 100$

$$= \frac{150}{250} \times 100$$

$= 60\%$

50. A candidate obtains 20% marks and fails by 35 marks, while another candidate obtains 50% marks, which is 32 more than the passing marks. What are the maximum marks of the exam?

(a) 250 (b) $\frac{670}{3}$
(c) 450 (d) 500

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (b) Let the maximum marks of the exam be x.
According to the question,
20% x + 35 = 50% x – 32
35 + 32 = 50% x – 20% x

$67 = 30\%x$

$30\%x = 67$

$\frac{30}{100}x = 67$

$x = \frac{670}{3}$

51. Durba got 70% marks in an exam. He obtained 20 out of 25 marks in another exam. If his total score is 78% then what were the maximum marks of the first exam?

(a) 7.6 (b) 6.25

(c) 7.25 (d) 6

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (b) Let the maximum marks of the first exam be x.

And the obtained marks = y

According to the first condition,

$$\frac{y}{x} = \frac{70}{100}, \quad y = \frac{7x}{10}$$

According to the second condition,

$$\frac{y+20}{x+25} = \frac{78}{100}$$

$$\frac{7x+200}{x+25} = \frac{78}{10}$$

$70x + 2000 = 78x + 1950$

$8x = 50$

$x = 6.25$

Therefore, maximum marks = 6.25

52. A student had got few marks from maximum marks probably. These marks were 75% as %. If one more question would be added of one mark in the exam then his obtained marks percentage would have 76%. What were the initial maximum marks of the exam?

(a) 24 (b) 25

(c) 20 (d) 19

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (a) Let the maximum marks = x

And the student had got y marks.

According to the first condition,

$$\frac{y}{x} = \frac{75}{100}$$

$$y = \frac{3x}{4} \text{-----(I)}$$

According to the second condition,

$$\frac{y+1}{x+1} = \frac{76}{100}$$

$$\frac{\frac{3x}{4}+1}{x+1} = \frac{76}{100} \quad \{\text{From eq}^{\text{n}}.\ (\text{I})\}$$

$$\frac{3x+4}{x+1} = \frac{76}{25}$$

$75x + 100 = 76x + 76$

$x = 24$

Hence, the maximum marks is 24.

53. The minimum passing marks in an exam are 38%. If maximum marks are 750, then how many marks a student need to pass the exam?

(a) 285 (b) 304

(c) 323 (d) 266

RRB Group-D – 05/12/2018 (Shift-III)

Ans : (a) Minimum required marks to pass the exam

$$= 750 \times \frac{38}{100} = 285$$

54. A exam was organized for class 10th students, 96% students passed and 50 failed. How many students were present in the exam?

(a) 1600 (b) 1400

(c) 1200 (d) 1250

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) Let the number of students = 100%

Passed students = 96%

Failed students = 4%

According to the question,

$\because$ $4\% = 50$

$1\% = \frac{50}{4}$

So, the number of students present in the exam

$$= 100\% = \frac{50 \times 100}{4} = 1250$$

55. Diksha obtained 58% marks in an exam, for which maximum marks were 450. She got how many marks?

(a) 276 (b) 261

(c) 290 (d) 275.5

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (b) Obtained marks by Diksha = 58%

Maximum marks = 450

So, the marks obtained by Diksha

$$= \frac{58}{100} \times 450$$

$$= \frac{58 \times 9}{2}$$

$$= 261$$

56. In a class of 60 students 60% are boys. If 25% girls go to school by bicycle, then find the number of girls who do not go to school by bicycle?

(a) 24 (b) 27

(c) 18 (d) 36

RRB NTPC 18.01.2017 Shift : 2

Ans : (c) From question,

Number of boys in 60 students $= \frac{60 \times 60}{100} = 36$

Then, number of girls = 60 – 36 = 24

The number of girls who go to school by bicycle

$$= \frac{24 \times 25}{100} = 6$$

So, the required number of girls = 24 – 6 = 18

57. A student scored 470 marks in 6 subjects. The maximum marks for each subject was 100. What was his score in percentage?

(a) 67.33% (b) 69.45%

(c) 78.33% (d) 78.67%

RRB NTPC 05.04.2016 Shift : 3

Ans : (c) Total marks = 600

Obtained marks = 470

So, the required % $= \frac{470 \times 100}{600}$

$= 78.33\%$

58. In a test, Charan secured 54 marks that was also equivalent to obtaining 72% marks. How many marks was the test out of?

(a) 75 (b) 85
(c) 80 (d) 65

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (a) Marks secured by Charan = 54 (which is 72% of the total marks.)
Let the total marks of the exam is x, then

$$54 = \frac{x \times 72}{100}$$

$$x = \frac{100 \times 54}{72}$$

x = 75 marks

Type - 3

59. Ramu used to spend 72% of his income. His income is increased by 12% and he increases his expenditure by 5%. If Ramu earlier saved ₹y and after the increases he now saves ₹ x, then what is the value of $\left(\frac{x-y}{y} \times 100\right)$% ?

(a) 30% (b) 22%
(c) 25% (d) 27%

RRB Group-D 30/08/2022 (Shift-I)

Ans. (a) : Let the initial income of Ramu = 100%
Initial expenditure = 72%
Initial saving (y) = 28%
According to the question,

Increased income of Ramu = $100 \times \frac{112}{100} = ₹\ 112$

Increased expenditure = $72 \times \frac{5}{100} = ₹3.6$

∴ New expenditure = 72 + 3.6 = 75.6%
Final saving (x) = 112% – 75.6% = 36.4%

Required valve of $\left(\frac{x-y}{y} \times 100\right)$%

$$= \frac{(36.4-28)}{28} \times 100 \Rightarrow \frac{8.4}{28} \times 100 = 30\%$$

60. The income of Raman is ₹45,000. He saves 12.5% of his income. If his income increases by 18% and expenditure increases by 20%, then his savings will :

(a) decrease by ₹215 (b) increase by ₹225
(c) increase by ₹250 (d) decrease by ₹220

RRB Group-D 05/09/2022 (Shift-III)

Ans. (b) : Initially -
Raman's income = ₹ 45000

Saving of Raman $= \frac{45000 \times 12.5}{100} = ₹\ 5625$

Raman's expenditure = 45000 – 5625 = 39375
After increasing,

Raman's income $= 45000 \times \frac{118}{100} = ₹\ 53100$

Raman's expenditure $= \frac{39375 \times 120}{100} = ₹\ 47250$

Raman's saving = 53100 – 47250 = ₹ 5850
Increase in saving = 5850 – 5625 = ₹ 225

61. A man saves 30% of his monthly income. If his monthly income increases by 10%, then he saves 20% more than the previous savings. The percentage increase in his expenditure is _____ (rounded off to one decimal place).

(a) 5.7% (b) 4.8%
(c) 7.3% (d) 6.8%

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : Let the man's monthly income = ₹ 100
Saving = 30, Expenditure = 100 – 30 = ₹70

New monthly income of man $= 100 \times \frac{110}{100} = ₹\ 110$

New saving $= 30 \times \frac{120}{100} = ₹36$

New expentiture = 110 – 36 = ₹74

∴ Percentage increase in expenditure $= \frac{74-70}{70} \times 100$

$$= \frac{4}{70} \times 100$$

$$= 5.714 \text{ or } 5.7\%$$

62. Tanvi saves ₹ 5,000 from the salary every month after spending 80% of her monthly salary. Tanvi's salary is :

(a) ₹ 25,000 (b) ₹ 30,000
(c) ₹ 35,000 (d) ₹ 20,000

RRB Group-D 13/09/2022 (Shift-III)

Ans. (a) : Let the monthly salary of Tanvi be 100%.
Expenses of Tanvi's monthly salary = 80%
Saving of Tanvi's monthly salary = 100 – 80 = 20%
According to the question,
20% = ₹ 5000
1% = 250
100% = ₹ 250,00

63. From the salary of Hari, 15% is deducted as house rent, 20% of the remaining amount is spent on children's education and 10% of the remaining balance is his medical expenses, Finally, he is left with ₹42,840. Find his total salary.

(a) ₹ 65,000 (b) ₹ 75,000
(c) ₹ 72,000 (d) ₹ 70,000

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (d) : Let the salary of Hari = ₹ x

House rent $= \frac{x \times 15}{100} = ₹\ 0.15x$

Children's education $= (x - 0.15x) \times \frac{20}{100}$

$= ₹\ 0.17x$

$\text{Medical expenses} = (x - 0.15x - 0.17x) \times \frac{10}{100}$

$= ₹\ 0.068x$

According to the question,

$x - (0.15x + 0.17x + 0.068x) = 42840$

$x - 0.388x = 42840$

$0.612x = 42840$

$x = \frac{42840}{0.612}$

$\boxed{x = ₹\ 70,000}$

Hence the total salary of Hari will be ₹ 70,000

64. Last year, Ranjan's monthly salary was Rs. 34,500 and this year his monthly salary is Rs. 38,640. What is the percentage increase in Ranjan's monthly salary in this year over his monthly salary last year?

(a) 15% (b) 12%
(c) 20% (d) 13%

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (b) : According to the question-

Last year, Ranjans monthly salary = Rs. 34,500
This year his monthly salary = Rs. 38640

$\text{Salary increase (In percentage)} = \frac{4140}{34500} \times 100$

$= \boxed{12\%}$

65. Vikas spends 80% of his salary. His salary is increased by 25% and his expenditure increased by 15% What is the percentage increase in his savings?

(a) 55% (b) 50%
(c) 60% (d) 65%

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (d) : Let income = ₹100

Expenditure + Saving = Income
80 + 20 = 100

From question,

$\text{Increase in expenditure} = 80 \times \frac{15}{100} = 12$

$\text{Increase in income} = 100 \times \frac{25}{100} = 25$

$\text{Increase in saving} = 25 - 12 = 13$

$\text{Percentage increase in saving } \% = \frac{13}{20} \times 100 = 65\%$

66. The sum of the salaries of A and B together is ₹4300. A spends 95% of his salary and B, 80% of his salary. If their savings are the same, what is A's salary ?

(a) ₹3442 (b) ₹3430
(c) ₹3440 (d) ₹3445

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let salary of A is x and salary of B is y.

$\therefore x + y = 4300$ _____ (I)

$\because$ Expenses of A = 95%

$\therefore$ Savings of A = 5%

And expenses of B = 80%

$\therefore$ Savings of B = 20%

According to the question-

Saving of A = Saving of B

$\therefore \frac{5x}{100} = \frac{20y}{100}$

$\Rightarrow 5x - 20y = 0$

$\Rightarrow x - 4y = 0$ _____(II)

On subtracting equation. (I and II),

$5y = 4300$

$\Rightarrow y = 860$

$\therefore x = 3440$ from eqution (I)

Hence, salary of A is ₹ 3440.

67. Ravi's salary is 20% more than Mohan's salary. If Mohan's salary is ₹1600 then Ravi's salary will be:

(a) ₹1890 (b) ₹1920
(c) ₹800 (d) ₹1750

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let, Mohan's salary 100x then Ravi's salary 120x.

According to the question,

$100x = 1600$

$x = 16$

Ravi's salary = $120x$

$= 120 \times 16$

$= ₹1920$

68. Ashok bhai spends 10% of his monthly income and saves ₹5400 every month. What is his monthly income?

(a) ₹6,000 (b) ₹5,000
(c) ₹6,400 (d) ₹5,400

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the monthly income of Ashok bhai is ₹x

$\text{Savings} = x \times \frac{90}{100}$

According to the question,

$x \times \frac{90}{100} = 5400$

$x = ₹\ 6000$

69. Moris spent 25% of his income on food. He got an increment of ₹ 1000, but he did not increase his expenditure on food stuffs. Therefore, his expense of food decreased to 20%. What was his initial income?

(a) ₹ 6500 (b) ₹ 6000
(c) ₹ 5000 (d) ₹ 4000

RRB RPF SI -16/01/2019 (Shift-I)

Ans : (d) Let the initial income = ₹y

According to the question,

$y \times \frac{25}{100} = (y + 1000) \frac{20}{100}$

$25y - 20y = 20000$

$5y = 20000$

$y = ₹4000$

70. Arun's income is 150% of Bala's income. Chandu's income is 120% of Arun's income. If the total income of Arun, Bala and Chandu is ₹ 86000, then find Chandu's income.

(a) ₹ 36000 (b) ₹ 32000
(c) ₹ 30000 (d) ₹ 34000

RRB RPF Constable -19/01/2019 (Shift-III)

Ans : (a) Let Bala's income = ₹x

So, Arun's income = $x \times \frac{150}{100} = \frac{3x}{2}$

And Chandu's income = $\frac{3x}{2} \times \frac{120}{100} = \frac{9x}{5}$

According to the question,

$$x + \frac{3x}{2} + \frac{9x}{5} = 86000$$

$$\frac{10x + 15x + 18x}{10} = 86000$$

$43x = 10 \times 86000$

$x = 20000$

So, Chandu's income = $\frac{9 \times 20000}{5}$ = ₹36000

71. The annual income of Somnath is ₹ 24,00,000. He pays ₹ 40,000 EMI for his vehicle every month. What percentage of his monthly income is spent on EMI?

(a) 20 (b) 18
(c) 10 (d) 24

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (a) Somnath's annual income = 2400000

Monthly income = $\frac{1}{12} \times 2400000 = 200000$

Monthly payment of EMI = 40000

So, the required % = $\frac{40000}{200000} \times 100 = 20\%$

72. On an average Reenu uses 15% of her monthly salary for shopping, going to restaurants and malls. The remaining 40% goes to her savings. If she spends ₹40,000 on home in a month, then what is her annual income?

(a) ₹1020000 (b) ₹1400000
(c) ₹1200000 (d) ₹1000000

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (c) : According to the question,

40% = ₹40000

$$100\% = \frac{40000}{40} \times 100 = 100000$$

So, annual income = 12 × 100000 = ₹1200000

73. Seema's annual income is ₹ 15,00,000. She pays an EMI of ₹ 30,000 per month. What percentage of her monthly income goes to EMI?

(a) 24 (b) 26
(c) 28 (d) 25

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (a) Seema's annual income = ₹ 15,00,000

So, the monthly income = $\frac{15,00,000}{12}$

= ₹ 1,25,000

EMI payment of every month = = ₹ 30,000

So, the required % = $\frac{30,000}{125,000} \times 100$

$= \frac{3000}{125}$

= 24%

74. Sunaina works in a private company and her annual income is ₹ 3,00,000. She has a new and an old vehicle. 5% of her income is spent on keeping of new vehicle and 2% more than the expenditure on new one is spent on old one. What is the total annual expenditure on the maintenance of both the vehicles?

(a) ₹20,000 (b) ₹36,000
(c) ₹12,500 (d) ₹25,000

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (b) Annual income of Sunaina = ₹ 3,00,000

Expenditure on new vehicle = 5% of the income

$= 300000 \times \frac{5}{100}$

= ₹ 15000

Expenditure on old vehicle = 5 + 2 = 7%

$= 300000 \times \frac{7}{100}$ = ₹ 21000

So, the total expenditure on both vehicles

= 15000 + 21000 = ₹ 36000

75. Every month, Kritika spends 30% of her income on house rent and 60% of the rest on household expenditure. If she save of ₹6300 per month, then what is her total monthly income?

(a) ₹22,000 (b) ₹20,500
(c) ₹22,500 (d) ₹25,000

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (c) Let Kritika's monthly income = ₹ 100x

So, the house rent expenditure = ₹ 30x

And Household expenditure = $\frac{70x \times 60}{100}$ = ₹ 42x

∴ Total expenditure = 30x + 42x = 72x

So, the savings = 100x – 72x = 28x

So, the monthly income of Kritika (100x) = $\frac{6300}{28} \times 100$

= ₹ 22500

76. Minakshi spends an average of 10% of her monthly salary on shopping and going to restaurant and malls. The rest 80% is spent on her household expenditure and 10% are saved. If the monthly household expenditure is ₹ 48,000, then what is the monthly income?

(a) ₹ 60,000 (b) ₹ 80,000
(c) ₹ 1,20,000 (d) ₹ 54,000

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (a) : Let the monthly income = 100%

Household expenditure = 80%

Monthly household expenditure = ₹ 48,000

∴ 80% = 48000

$$100\% = \frac{48000}{80} \times 100$$

$= 600 \times 100$

So, the monthly income = ₹60000

77. On an average Pramod uses 10% of his monthly income to fill petrol in his car. The rest 80% is spent on home expenditure and he saves 10% of his salary. On a monthly basis, if he spends ₹ 24,000 on household expenditure then what is his annual income?

(a) ₹ 360000 (b) ₹ 160000
(c) ₹ 80000 (d) ₹ 240000

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (a) Let the monthly income = ₹x
Monthly household expenditure = 80% = ₹24000

$$x \times \frac{80}{100} = 24000\ ,$$

$$x = 30000$$

So, the annual income = 30000 × 12 = ₹360000

78. Manoj spends 33% of his income on food. He got an increment of ₹ 1000 in his income, but he did not expand his expenditure on food. So, his expenditure on food reduced to 27%. What was his initial income?

(a) ₹4,500 (b) ₹6,500
(c) ₹5,500 (d) ₹5,000

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (a) Let Manoj's income = ₹x

$$\text{Food expenditure} = x \times \frac{33}{100} = \frac{33x}{100}$$

Manoj's new income = x + 1000

$$\text{Deduction in expenditure} = (x + 1000) \times \frac{27}{100}$$

Previous expenditure = new expenditure

$$\frac{33x}{100} = \frac{27x + 27000}{100}$$

33x = 27 x + 27000
6x = 27000
x = 4500
So, the initial income is ₹4500.

79. Suman is a hostess of an agricultural land. She had let it on lease to a third party for five year. Instead of income. From lease, she also gets an annual salary of ₹ 6,00,000. In five years, total income of agricultural land is 50% of her annual salary. How much money she earns each year?

(a) ₹3,00,000 (b) ₹6,60,000
(c) ₹6,00,000 (d) ₹6,30,000

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b) Annual salary of Suman = ₹6,00,000
Income from agriculture in five years = one years' income $\times \frac{50}{100} = \frac{600,000 \times 50}{100} = ₹300000$
So, income from agriculture in one year

$$= \frac{30,0000}{5} = 60000$$

So, total annual earning = 600000 + 60000 = ₹660000

80. If Santi spends 50% of his monthly income on food, 20% on rent and saves ₹1500 then, what is his monthly income?

(a) ₹ 5500 (b) ₹ 5000
(c) ₹ 6000 (d) ₹ 4500

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (b) : Let the monthly salary = ₹100%
Total expenditure = 50% + 20% = 70%
And savings = 30%
Savings = ₹1500
So, 30%

$$\frac{1500 \times 100}{30}$$

100% = 5000
So, the monthly salary = ₹5000

81. Alok saves ₹ 1200 after spending 85% of his salary. What is his monthly salary?

(a) ₹ 8,000 (b) ₹ 8,500
(c) ₹ 10,000 (d) ₹ 12,000

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (a) Let the monthly salary of Alok is ₹ x
According to the question,

$$1200 = x \times \frac{15}{100}$$

x = ₹ 8000

82. A person pays as his debt ₹8960 per month for repayment of loan, which is 28% of his monthly salary. Calculate his monthly salary.

(a) ₹32,000 (b) ₹34,000
(c) ₹28,000 (d) ₹30,000

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) According to the question,
28% = ₹8960

$$\therefore 100\% = \frac{8960}{28} \times 100 = 32000$$

So, the monthly salary = ₹32000

83. 30% increment was done to an employee's salary, so that his salary became ₹ 910. What was his salary before increment?

(a) ₹1300 (b) ₹880
(c) ₹700 (d) ₹810

RRB NTPC 19.01.2017 Shift : 2

Ans : (c) Let the salary before increment= 100x
Salary after increment = 130x
According to the question,
130x = ₹910 $\Rightarrow$ x = ₹ 7
So, the salary before increment
= 100x = 100 × 7 = ₹700

84. Veer spends 15% of his monthly income on the house rent and 60% of the rest on household expenditure. If he saves ₹2210, what is his monthly income ?

(a) ₹ 6500 (b) ₹ 7500
(c) ₹ 8000 (d) ₹ 7000

RRB ALP & Tec. (10-08-18 Shift-I)

Ans : (a) Let the monthly income of Veer = ₹x
According to the question,

$$\frac{(100-15)}{100} \text{ of } \frac{(100-60)}{100} \text{ of } x = 2210$$

$$x \times \frac{85}{100} \times \frac{40}{100} = 2210$$

$$x = \frac{2210 \times 100 \times 100}{85 \times 40} = ₹6500$$

Type - 4

85. If 27.5% of a number is 11, then the number is:

(a) 44 (b) 36

(c) 40 (d) 48

RRB NTPC (Stage-2) 17/06/2022 (Shift-II)

Ans. (c) : Let the number be k

According to the question,

$k \times 27.5\% = 11$

$\Rightarrow k \times \frac{275}{100 \times 10} = 11$

$\Rightarrow k = 40$

86. If 75% a number is added to 75, then the result is the number itself. The number is:

(a) 300 (b) 200

(c) 250 (d) 350

RRB NTPC (Stage-2) 14/06/2022 (Shift-I)

Ans. (a) : Let the number be x

According to the question,

$x \times \frac{75}{100} + 75 = x$

$\Rightarrow \frac{3x}{4} + 75 = x$

$\Rightarrow 4x - 3x = 75 \times 4$

$\Rightarrow \boxed{x = 300}$

87. Find the value of k, if k% of 280 = 50% of 350

(a) 60 (b) 72.5

(c) 62.5 (d) 75

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (c) : According to the question,

K% of 280 = 50% of 350

$280 \times \frac{K}{100} = \frac{350}{100} \times 50$

$K = \frac{250}{4}$

K = 62.5

88. If 22.5 of 32% $-\frac{2}{3} \times \sqrt[3]{512} \times \sqrt{81} = y$, then the value of y is:

(a) –41.2 (b) –41.8

(c) –40.2 (d) –40.8

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : $22.5 \times 32\% - \frac{2}{3} \times \sqrt[3]{512} \times \sqrt{81} = y$

$22.5 \times 32\% - \frac{2}{3} \times 8 \times 9 = y$

$0.225 \times 32 - 48 = y$

$7.2 - 48 = y$

$y = -40.8$

89. A number when increased by $47\frac{1}{2}$ %, gives 590. The number is :

(a) 400 (b) 500

(c) 600 (d) 700

RRB Group-D 09/09/2022 (Shift-III)

Ans. (a) : Let the number be = x

According to question,

$x \times \frac{295}{200} = 590$

$x = \frac{590 \times 200}{295} = 400$

90. If 35% of x = 40% of y, then x : y is _____ .

(a) 8 : 9 (b) 7 : 8

(c) 9 : 8 (d) 8 : 7

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : Given:–

35% of x = 40% of y

$\frac{35}{100} \times x = \frac{40}{100} \times y$

$\frac{x}{y} = \frac{40}{35}$

Hence, $\boxed{x : y = 8 : 7}$

91. The value of 60% of 28% of 250 = _____.

(a) 22 (b) 56

(c) 68 (d) 42

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (d) : $250 \times 28\% \times 60\%$

$= \frac{250 \times 28}{100} \times \frac{60}{100}$

= 42

92. If 10% of 24% of x is 240, then x = ?

(a) 1000 (b) 10000

(c) 100 (d) 100000

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : According to the question,

$x \times \frac{24}{100} \times \frac{10}{100} = 240$

$x = \frac{240 \times 100 \times 100}{24 \times 10}$

x = 10000

93. The difference between 48% and 38% of a number is 354. What is 58% of that number?

(a) 2034.6 (b) 1893.78

(c) 1987.56 (d) 2053.2

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let the numbers is x

Hence,

$\frac{x \times 48}{100} - \frac{x \times 38}{100} = 354$

$$\frac{48x-38x}{100}=354$$

$$10x=35400$$

$$x=3540$$

Now, 58% of numbers

$$3540\times\frac{58}{100}=2053.2$$

94. Two numbers A and B are less than a third number C by 15% and 32% respectively. By what percentage is number B less than number A?

(a) 20 (b) 80

(c) 68 (d) 32

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question-

From first condition-

$$A=C-C\times\frac{15}{100}=0.85C$$

From second condition-

$$B=C-C\times\frac{32}{100}=0.68\,C$$

$$\text{Required \% reduction}=\frac{0.85-0.68}{0.85}\times100$$

$$=20\%$$

95. 19% of 16% of 1480 is the same as ?

(a) 38% of 8% of 1480 (b) 48% of 6% of 1480

(c) 9% of 26% of 1480 (d) 35% of 1% of 1480

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

$$1480\times\frac{16}{100}\times\frac{19}{100}=1480\times\frac{\boxed{2\times2\times2}}{100}\times\frac{\boxed{2\times19}}{100}$$

$$\Rightarrow1480\times\frac{8}{100}\times\frac{38}{100}=\boxed{1480\text{ of 8\% of 38\%}}$$

96. Two fifth of seven seventeenth of three fifth of a number is 84. Find 40% of that number?

(a) 850 (b) 570

(c) 280 (d) 340

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let numbers = x

According to the question,

$$x\times\frac{3}{5}\times\frac{7}{17}\times\frac{2}{5}=84$$

$$x=850$$

$$40\%\text{ of }850=\frac{850\times40}{100}=340$$

97. 50% of a number is 21 less than $\frac{4}{5}$th of that number. Find the number.

(a) 40 (b) 70

(c) 60 (d) 50

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number is x

According to the question,

$$x\times\frac{50}{100}=x\times\frac{4}{5}-21$$

$$\Rightarrow\quad\frac{x}{2}=\frac{4x}{5}-21$$

$$\Rightarrow\quad\frac{4x}{5}-\frac{x}{2}=21$$

$$\Rightarrow\quad\frac{8x-5x}{10}=21$$

$$\Rightarrow\quad3x=210$$

$$\Rightarrow\quad x=70$$

98. 40% of the first number is 12 and 50% of the number is 24. The ratio of the first number to the second number is:

(a) 8 : 5 (b) 4 : 5

(c) 5 : 8 (d) 1 : 2

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (c) : Let the first number = x

The second number = y

According to the question,

$$\frac{x\times40}{100}=12$$

$$\text{or}\quad x=\frac{12\times100}{40}=30$$

$$\frac{y\times50}{100}=24$$

$$\text{or } y=\frac{24\times100}{50}=48$$

Ratio of the first number (x) and second number (y)

$$\Rightarrow\frac{x}{y}=\frac{30}{48}$$

$$\frac{x}{y}=\frac{5}{8}$$

or $\boxed{x:y=5:8}$

99. If 28% of a number is 20, then what is the value of 49% of the same number?

(a) 45.5 (b) 42

(c) 38.5 (d) 35

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let, the number be x.

According to the question-

$$x\times\frac{28}{100}=20$$

$$x=\frac{20\times25}{7}$$

Now, the value of 49% of the number x.

$$=\frac{20\times25}{7}\times\frac{49}{100}$$

$$=35$$

100. 50% of 500 = —— of 2500

(a) 30% (b) 40%

(c) 20% (d) 10%

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (d) : 50% of 500 = x% of 2500

$$500 \times \frac{50}{100} = 2500 \times x\%$$

$$x\% = \frac{500 \times 50}{2500 \times 100}$$

$$x = \frac{1}{10} \times 100$$

$$x = 10\%$$

101. Which number is 40% less than 80?

(a) 38 (b) 58

(c) 68 (d) 48

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

40% less than 80 = 60% of 80

$$= 80 \times \frac{60}{100}$$

$$= 48$$

102. 75% of 75% is equal to:

(a) 0.5662 (b) 0.5625

(c) 0.5652 (d) 0.5666

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (b) : From question,

75% of 75%

$$= \frac{75}{100} \times \frac{75}{100}$$

$$= \frac{3}{4} \times \frac{3}{4}$$

$$= \frac{9}{16}$$

$$= 0.5625$$

103. Find the value of x, if 20% of 75 = 225 –x% of 420.

(a) 50 (b) 1535

(c) 20 (d) 3

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (a) : 20% of 75 = 225 – (x% of 420)

$$\frac{20}{100} \times 75 = 225 - x\% \text{ of } 420$$

$15 = 225 - 4.2x$

$4.2x = 210$

$x = 50$

104. When 106 is subtracted from a number, it reduces to its 47%. What is 11.5% of that number?

(a) 13 (b) 31

(c) 23 (d) 32

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let the number is x

According to the question,

$$x - 106 = x \times \frac{47}{100}$$

$$x - \frac{47x}{100} = 106$$

$$53x = 10600$$

$$x = 200$$

$$11.5\% \text{ of } 200 = 200 \times \frac{11.5}{100} = 23$$

105. If 60% of a number is added to 36, gives the number itself then the number is:

(a) 90 (b) 100

(c) 75 (d) 80

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

$60\% + 36 = 100\%$

$40\% = 36$

$10\% = 9$

$\therefore \ 100\% = 90$

Hence the number = 90

106. 40% of a number is 46 less than $\frac{4}{5}$ of that number, find the number.

(a) 110 (b) 105

(c) 115 (d) 85

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the number is x

According to the question,

$$x \times 40\% = x \times \frac{4}{5} - 46$$

$$x \times \frac{2}{5} = x \times \frac{4}{5} - 46$$

$$x \times \frac{2}{5} = 46$$

$$\Rightarrow x = 23 \times 5 = 115$$

107. 35% of a number is the same as 30% of another number. find the ratio of the first number to the second number.

(a) 5 : 7 (b) 6 : 7

(c) 7 : 9 (d) 8 : 9

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let first number A and second number B.

According to the question, A × 35% = B× 30%

$$A \times \frac{35}{100} = B \times \frac{30}{100}$$

$$A \times 35 = B \times 30$$

$$A \times 7 = B \times 6$$

$$A : B = 6 : 7$$

108. If one-fourth of half of a number is 25, then 20% of that number is?

(a) 40 (b) 80

(c) 20 (d) 60

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the number is x

According to the question,

$$\left(\frac{x}{2}\right)\times\frac{1}{4} = 25$$

$$x = 25 \times 8 = 200$$

$$20\% \text{ of } x = 200 \times \frac{20}{100} = 40$$

109. The difference between 82% and 73% of the same number is 72. What is 48% of the number?

(a) 418 (b) 384

(c) 360 (d) $\frac{1440}{31}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number is x

$$x\times\frac{82}{100} - x\times\frac{73}{100} = 72$$

$$\frac{9x}{100} = 72$$

$$x = 800$$

$$48\% \text{ of number } = 800\times\frac{48}{100} = 384$$

110. 25% of a number is 7 more than 30% of another number. The difference between the numbers is 29. What are the numbers?

(a) 39 and 10 (b) 40 and 11

(c) 34 and 5 (d) 37 and 8

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the two numbers x and y

∴ According to the question,

$$25\%\times x = y\times 30\% + 7$$

$$\frac{25\times x}{100} = \frac{y\times 30}{100} + 7$$

$$\frac{x}{4} = \frac{3y}{10} + 7$$

$$\frac{x}{4} = \frac{3y+70}{10}$$

$$5x = 6y + 140$$

$$5x - 6y = 140 \text{ ..... (1)}$$

Again,

According to the question,

$$\because x - y = 29 \text{ ..... (2)}$$

From equation (1) and (2) × 5

$$5x - 6y = 140$$

$$\underline{5x - 5y = 145}$$

$$y = 5$$

On putting the value of y in equation (2),

$$x - y = 29$$

$$x - 5 = 29$$

$$x = 34$$

Hence the numbers are 34 and 5

111. A number is first decreased by 20% and then increased by 15%. The number so obtained is 64 less than the original number. Find the original number.

(a) 600 (b) 850

(c) 800 (d) 700

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the original number = x

According to the question,

$$x - x\frac{80}{100}\times\frac{115}{100} = 64$$

$$x - \frac{92x}{100} = 64$$

$$\frac{100x - 92x}{100} = 64$$

$$8x = 6400$$

$$\boxed{x = 800}$$

112. If the difference between a number and its 25% is 24, then the number is?

(a) 28 (b) 32

(c) 40 (d) 34

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : Let the number is x

According to the question,

$$x - x\times\frac{25}{100} = 24$$

$$\frac{75x}{100} = 24$$

$$x = \frac{24\times 100}{75}$$

$$x = 32$$

113. If 15% of A is equal to 18% of B, then what percentage of B is equal to 20% of A ?

(a) 42% (b) 20%

(c) 24% (d) 25%

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$$A \text{ of } 15\% = B \text{ of } 18\%$$

$$A\times\frac{15}{100} = B\times\frac{18}{100}$$

$$\frac{A}{B} = \frac{18}{15} = \frac{6}{5}$$

On taking A = 6 and B = 5,

If x% of B is equal to 20% of A then

$$B \times \frac{x}{100} = A \times \frac{20}{100}$$

On putting the value of A and B,

$$5 \times \frac{x}{100} = 6 \times \frac{20}{100}$$

$$x = \frac{6 \times 20}{5} = 24\%$$

Hence, 24% of B is equal to 20% of A.

114. The difference of two numbers is 20% of the larger number. If the smaller number is 40, then find the larger number?

(a) 50 (b) 40
(c) 60 (d) 45

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the largest number be x and the smallest number be y.

As per the question

$$x - y = \frac{x \times 20}{100}$$

$$x - 40 = \frac{x \times 20}{100} \qquad \{\because y = 40\}$$

$$x - 40 = \frac{x}{5}$$

$$5x - 200 = x$$

$$5x - x = 200$$

$$4x = 200$$

$$x = \frac{200}{4} = 50$$

$\therefore$ Largest number will be 50.

115. What is to be added to 12% of 2400, so that the sum will be equal to 18% of 5400?

(a) 952 (b) 972
(c) 288 (d) 684

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (d) : Let the required number = x

According to the question,

$$2400 \times \frac{12}{100} + x = 5400 \times \frac{18}{100}$$

$288 + x = 972$

$x = 972 - 288$

$x = 684$

116. If 20% of a = b, then b% of 20 is equals to which of the following?

(a) 20% of a (b) 4% of a
(c) 5% of a (d) 30% of a

RRB JE - 24/05/2019 (Shift-I)

Ans : (b) Let b% of 20 is equal to x% of a.

$\because$ $a \times 20\% = b$

$\Rightarrow$ $a \times \frac{20}{100} = b$

$\Rightarrow$ $a = 5b$

$\therefore$ $20 \times \frac{b}{100} = a \times \frac{x}{100}$

$\Rightarrow$ $20b = ax$

$\Rightarrow$ $20 \times \frac{a}{5} = ax$

$x = 4\%$

Hence, b% of 20 is equal to 4% of a.

117. What percentage of 1 hour is 1 min 12 sec?

(a) 2% (b) 12%
(c) 11% (d) 1.2%

RRB RPF SI -06/01/2019 (Shift-II)

Ans : (a) The required percentage,

$$= \frac{(60\sec. + 12\sec.)}{60 \times 60} \times 100 = \frac{72}{60 \times 60} \times 100 = 2\%$$

118. If 40% of 70 is x % more than 30% of 80, then find the value of 'x'.

(a) 40% (b) 16.67%
(c) 14.28% (d) 33.33%

RRB RPF SI -13/01/2019 (Shift-III)

Ans : (b) 40% of 70 $= 70 \times \frac{40}{100} = 28$

30% of 80 $= 80 \times \frac{30}{100} = 24$

Difference $= 28 - 24 = 4$

According to the question,

$\because$ 28 is x % more than 24

$\therefore$ $x = \frac{4}{24} \times 100$

$x = 16.66 \approx 16.67\%$

119. The 8th share of a number is equal to what percentage of it?

(a) 12.5% (b) 25%
(c) 2.5% (d) 1.25%

RRB JE - 26/05/2019 (Shift-II)

Ans : (a) Let the number be x and its 8th share is equal to its y%.

According to the question,

$$\frac{x}{8} = x \times \frac{y}{100}$$

$$y = \frac{100}{8}$$

$$\boxed{y = 12.5\%}$$

120. If 75% of 480 + x % of 540 = 603, then find the value of 'x'.

(a) 55 (b) 65
(c) 35 (d) 45

RRB JE - 27/05/2019 (Shift-III)

Ans : (d) Given,

75% of 480 + x % of 540 = 603

$$480 \times \frac{75}{100} + 540 \times \frac{x}{100} = 603$$

$$540 \times \frac{x}{100} = 603 - 480 \times \frac{3}{4}$$

$$540 \times \frac{x}{100} = 603 - 360$$

$540 \times \frac{x}{100} = 243$

$x = \frac{243 \times 100}{540}$, $\boxed{x = 45}$

121. A number when 35 subtracted from a number it is reduced to 80% of itself. What is $\frac{4}{5}^{th}$ part of that number?

(a) 90 (b) 120
(c) 140 (d) 70

RRB JE - 30/05/2019 (Shift-II)

Ans : (c) Let the number be x.
According to the question,

$x - 35 = x \times \frac{80}{100}$

$x - 35 = \frac{4x}{5}$

$5x - 175 = 4x$

$x = 175$

So, $\frac{4}{5}^{th}$ part of the number = $175 \times \frac{4}{5} = 140$

122. If 5% of A + 4% of B = 2/3 (6% of A + 8% of B), then find A : B.

(a) 1 : 1 (b) 4 : 3
(c) 1 : 2 (d) 5 : 4

RRB JE - 30/05/2019 (Shift-III)

Ans : (b) Given,
5% of A + 4% of B = 2/3 (6% of A + 8% of B)

$\frac{A \times 5}{100} + \frac{B \times 4}{100} = \frac{2}{3}\left(\frac{6 \times A}{100} + \frac{8 \times B}{100}\right)$

$\frac{5A}{100} - \frac{12A}{300} = \frac{16B}{300} - \frac{4B}{100}$

$\frac{3A}{300} = \frac{4B}{300}$

$3A = 4B$

$\frac{A}{B} = \frac{4}{3}$, A : B = 4 : 3

123. What is the percentage form of the ratio 1 : 8?

(a) 6.25% (b) 12.5%
(c) 8% (d) 80%

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Percentage form of the ratio 1 : 8,

$= \frac{1}{8} \times 100 = 12.5\%$

124. 76% of a number is 95. The number is:

(a) 124 (b) 125
(c) 120 (d) 130

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (b) Let the number be x.
According to the question,

$x \times \frac{76}{100} = 95$

$x = \frac{95 \times 100}{76}$

$x = \frac{5 \times 100}{4}$

$x = 125$

125. Find the number, which is 30% more than 240.

(a) 312 (b) 340
(c) 331 (d) 320

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (a) The required number,

$\frac{240 \times 130}{100} = 312$

126. 108% of a number is 189. What is the number?

(a) 200 (b) 175
(c) 190 (d) 180

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (b) Let the number be x.

$x \times \frac{108}{100} = 189$

$x = \frac{189 \times 100}{108}$

$\boxed{x = 175}$

127. What percent of a day is 6 hours?

(a) 30% (b) 40%
(c) 25% (d) 45%

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (c) One day = 24 hours

$\therefore \frac{6}{24} \times 100 = 25\%$

128. What percentage is 15 minutes of $1\frac{1}{2}$ days?

(a) 10% (b) $\frac{5}{6}\%$
(c) $\frac{25}{36}\%$ (d) $41\frac{2}{3}\%$

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (c) Number of minutes in days $= \frac{3}{2} \times 24 \times 60$

$= 36 \times 60$ min.

So, the required % $= \frac{15}{36 \times 60} \times 100 = \frac{25}{36}\%$

129. 48 is what percent of 60?

(a) 72 (b) 75
(c) 78 (d) 80

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (d) The required percentage,

$\frac{48 \times 100}{60} = 80\%$

130. What will be 46% of 250?

(a) 92 (b) 115
(c) 126.5 (d) 103.5

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (b) The required percentage,

$\frac{250 \times 46}{100} = \frac{25 \times 46}{10} = \frac{1150}{10} = 115$

131. A number becomes 725 when increased by 45%. Find the number.

(a) 500 (b) 450
(c) 600 (d) 525

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (a) Let the number be x.
According to the question,

$$x + \frac{45}{100}x = 725$$

$$\frac{100x + 45x}{100} = 725$$

$$145x = 725 \times 100$$

$$x = 500$$

132. A team wins 45 games, which was 60% of played games. How many games were played by team?

(a) 50 games (b) 75 games
(c) 60 games (d) 65 games

RRB NTPC 28.04.2016 Shift : 3

Ans : (b) Let the number of played games by the team be x.
According to the question,

$$x \times 60\% = 45$$

$$\Rightarrow x = \frac{45}{60} \times 100$$

$$\therefore x = \frac{3}{4} \times 100 = 75$$

So, the number of played games by the team is 75.

133. Find the value of 10% of 110 of 110%

(a) 18.15 (b) 11.55
(c) 6.05 (d) 12.1

RRB ALP CBT-2 Mec. & Diesel 21-01-2019 (Shift-I)

Ans. (d) : $110 \text{ of } 110\% \text{ of } 10\% = 110 \times \frac{110}{100} \times \frac{10}{100}$

$$= \frac{11 \times 11}{10}$$

$$= 12.1$$

134. What is 18% of 90% of 500?

(a) 81 (b) 80
(c) 78 (d) 79

RRB ALP CBT-2 Electrician 22-01-2019 (Shift-II)

Ans. (a) : According to the question,

$$500 \times \frac{90}{100} \times \frac{18}{100}$$

$$= 9 \times 9$$

$$= 81$$

Type - 5

135. Bhuvan's salary was first decreased by 16% and subsequently increased by 25%. Find the net percentage change in his salary.

(a) 5% decrease (b) 10% decrease
(c) 10% increase (d) 5% increase

RRB Group-D 26/08/2022 (Shift-III)

Ans. (d) : According to the question –
Require net % change in his salary

$$= \left(-16 + 25 + \frac{(-16) \times (25)}{100}\right)\%$$

= (9 – 4) = 5% increase

Hence, option (d) is correct.

136. The cost of a washing machine is 40% less than the cost of a TV. If the cost of the washing machine increases by 18% and that of the TV decreases by 10%, then what is the change in the total cost of 5 washing machines and 2 TVs?

(a) Decreases by 6.5% (b) Decreases by 6.4%
(c) Increases by 6.5% (d) Increases by 6.8%

RRB Group-D 09/09/2022 (Shift-II)

Ans. (d) : Let the cost price of TV = ₹ 100
Then the cost price of washing machine = ₹ 60
Total cost price of 5 washing machine and 2TV
= (5 × 60 + 2 × 100) = ₹ 500

Cost price of TV after conversion $= 100 \times \frac{90}{100} =$ ₹ 90

Cost price of washing machine after conversion

$$= \frac{60 \times 118}{100} =$$ ₹ 70.8

Total cost price of 5 washing machine and 2TV's after conversion = (5 × 70.8 + 90 × 2) = ₹ 534
Difference = 534 – 500 = ₹ 34

Hence, increasing in percentage $= \frac{34}{500} \times 100 = 6.8\%$

137. The price of a bike was increased by 10% and then again increased by 8%. The net percentage increase in the price of the bike is:

(a) 18% (b) 19%
(c) 18.8% (d) 17%

RRB Group-D 28-09-2022 (Shift-II)

Ans. (c) : According to the question,

Net percentage increase $= 10 + 8 + \frac{10 \times 8}{100}$

= 18 + 0.8

= 18.8%

138. If the salary of an employee is increased by 15% and subsequently reduced by 15%, then what will be the overall percentage reduction in the salary?

(a) 2.75 (b) 3.25
(c) 2.50 (d) 2.25

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let the salary of employee ₹100
After increment of employe's salary by 15% = 115

After reduction of 15% $= \frac{85}{100} \times 115 = 97.75$

Over all percentage reduction

$$= \frac{100 - 97.75}{100} \times 100 = 2.25\%$$

139. The price of an article was reduced by 15% and it's daily sale increased by 25%. Find the net percentage effect on daily sale.

(a) 6.25% increase (b) 6.15% increase
(c) 6.1% increase (d) 6.35% increase

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (a) : We know that

$$\text{Net \% effect} = \left(-x + y - \frac{xy}{100}\right)\%$$

Where, $-x$ = decrease

$+y$ = increase

$$\therefore \text{Net \% effect} = -15 + 25 - \frac{15 \times 25}{100}$$

$$= (10 - 3.75)\%$$

$$= 6.25\% \text{ increase}$$

140. A number was increased by 40% and then decreased by 40%. The net change in the number in percentage is:

(a) 32% decrease (b) 16% increase
(c) no change (d) 16% decrease

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (d) : From question,

$$\text{Percentage change} = 40\% - 40\% - \frac{40\% \times 40\%}{100}$$

$$= -16\%$$

Here, '-' ve sign shows decrement.

141. The price of a mobile if first decreased by 20% and then increased by 10%. The net change in the price will be:

(a) 14% (b) 10%
(c) 12% (d) 15%

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the initial price of mobile = ₹100

$$\text{Price after reduction of 20\%} = 100 \times \left(\frac{100 - 20}{100}\right) = ₹80$$

$$\text{Price after 10\% increment} = 80 \times \frac{(100 + 10)}{100} = ₹88$$

$$\text{Now, final change in price} = 100 - 88 = ₹12$$

$$\text{Hence, percentage change} = \frac{12}{100} \times 100 = 12\%$$

142. A man's working hours per day were increased by 35% and his wages per hour were decreased by 25%. By what percentage were his daily earnings increased?

(a) 1.25 (b) 1.2
(c) 1.35 (d) 1.3

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (a) : Percentage change $= \left(\pm x \pm y \pm \frac{xy}{100}\right)$

Percentage increase in daily earning

$$= 35 - 25 - \frac{35 \times 25}{100}$$

$$= 10 - 8.75$$

$$= 1.25$$

143. On the first day 84500 people visited a trade fair. On the 4th day number reduced to 16900. By what percentage people reduced on the 4th day?

(a) 80% (b) 0%
(c) 75% (d) 20%

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (a) : Number of people on the 4th day = 84500 – 16900

$$= 67600$$

$$\text{Reduced precentage} = \frac{67600}{84500} \times 100 = 80\%$$

144. A shopkeeper cheats to the extent of 10% while buying as well as while selling. While he was eventually caught and punished at what percent was he gaining till then?

(a) 21% (b) 20%
(c) 34% (d) $21\frac{1}{2}\%$

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (a) : From formula, % change = $\left(x + y + \frac{xy}{100}\right)\%$

$$\text{Required percentage} = 10 + 10 + \frac{10 \times 10}{100}$$

$$= 10 + 10 + 1 = 21\%$$

145. A man's income at first increased by 20% and later on increased again by 30%. Find the total percent increase.

(a) 58 (b) 54
(c) 60 (d) 56

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) :

First method : Let man's income is ₹ x

$$\text{Income at first increased by 20\%} = \frac{120x}{100}$$

Income after again increased by 30%

$$= \frac{120x}{100} \times \frac{130}{100} = \frac{156x}{100}$$

$$\text{Percentage increased} = \frac{\frac{156x}{100} - x}{x} \times 100$$

$$= \frac{56}{100} \times 100$$

$$= 56\%$$

Second method :

$$\text{Percentage increased} = \left(x \pm y \pm \frac{x \times y}{100}\right)\%$$

$$20 + 30 + \frac{20 \times 30}{100} = 56\%$$

146. Sohan decreased his expenses by 25%. Later, he decreased then further by 10%. By what percentage did his expenses decrease altogether?

(a) 32.5% (b) 34.5%
(c) 31.5% (d) 33.5%

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (a) : When there are two successive reductions in the price of the article,

Then percentage change $= \left(-x - y + \frac{x \times y}{100}\right)\%$

$x = 25, y = 10$

Then, $= -25 - 10 + \frac{25 \times 10}{100}$

$= -25 - 10 + 2.5$

$= -32.5$ (Negative sign denotes reduction)

So, overall his expenses decreased by 32.5%

147. A number is first decreased by 5% and then increased by 5%. What will be the net increase or decrease?

(a) 0.25% increase
(b) 25% decrease
(c) 0.25% decrease
(d) No increase or decrease

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : Decrease percentage in original number

$= (\pm x \pm y \pm \frac{xy}{100})\%$

$= -5 + 5 - \frac{5 \times 5}{100}$

$= 0.25\%$ decrease

148. If a number is increased by 20% and then it is decreased by 10%. Its net increase or decrease is:

(a) 8% increase (b) 10% decrease
(c) 10 % increase (d) 8% decrease

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the number = 100

On increasing by 20% the number = 120

Again on decreasing by 10% the number $= 120 \times \frac{(100-10)}{100} = 108$

So, the percentage increase in the number

$= \frac{108-100}{100} \times 100$

= 8% increase

149. The profit of a company increased by 10% from April to May, then it decreased by 20% from May to June and again increased by 50% from June to July. What was the % growth in profit from April to July?

(a) 15% (b) 45%
(c) 32% (d) 13%

RRB NTPC 18.01.2017 Shift : 3

Ans : (c) From April to June

$= 10 - 20 + \frac{10 \times (-20)}{100} = -10 - 2 = -12\%$

From April to July $= -12 + 50 + \frac{(-12) \times 50}{100} = \boxed{32\%}$

150. The price of a book was first increased by 25% and then reduced by 20%. What is the change in its original price?

(a) 5% decrease (b) No change
(c) 10% increase (d) 10% decrease

RRB JE - 25/05/2019 (Shift-III)

Ans : (b) Percentage change $= \left(x - y - \frac{xy}{100}\right)\%$

$= 25 - 20 - \frac{25 \times 20}{100} = 25 - 25 = 0\%$

151. If the consumption of sugar increases from 12 kg to 15 kg, then find the percentage growth.

(a) 39.2% (b) 20%
(c) 25% (d) 33.3%

RRB JE - 01/06/2019 (Shift-III)

Ans. (c) Initial consumption of sugar = 12 kg.

And now the consumption of sugar = 15 kg.

Growth = 15 – 12 = 3 kg.

So, % growth $= \frac{3}{12} \times 100 = 25\%$

152. The price of rice is increased from ₹ 25 per kg to ₹ 30 per kg. The consumption should be reduced to what percentage so that the expenditure remains the same?

(a) $16\frac{2}{3}\%$ (b) $8\frac{1}{3}\%$
(c) 10% (d) 16%

RRB RPF Constable -22/01/2019 (Shift-II)

Ans : (a) Initial price of rice = ₹25 /kg.

Now the price of rice = ₹30/kg.

Increased price = 30 – 25 = ₹5/kg.

So, required percentage $= \frac{5}{30} \times 100$

$= \frac{50}{3} = 16\frac{2}{3}\%$

153. When the price of a cycle decreased by 20%, then the number of selling of bicycles increased by 20%. What was the effect on sale of the shop?

(a) 4% decrease (b) 4% increase
(c) 10% increase (d) 10% decrease

RRB JE - 27/06/2019 (Shift-III)

Ans : (a) % change $= \left(x \pm y \pm \frac{xy}{100}\right)\%$

$= -20 + 20 - \frac{20 \times 20}{100}$

= –4% (–ve sign denotes decrease)

So, the sale of the shop will be decreased by 4%.

154. How many % is the single discount equivalent to two consecutive discounts of 12% and 5%?

(a) 17% (b) 8.5%
(c) 16.4% (d) 15.2%

RRB RPF SI -11/01/2019 (Shift-II)

Ans : (c) If both consecutive discounts are a% and b%, then equivalent discount

$$\left(= a + b - \frac{ab}{100}\right)\%$$

So, equivalent discount of 12% and 5%

$$= 12 + 5 - \frac{12 \times 5}{100}$$
$$= 17 - 0.6 = 16.4\%$$

155. The price of petrol has been increased by 10% in the new budget. The passenger of a motor vehicle can reduce the consumption to how many %, so that his total expenditure on petrol remains the same?

(a) 10% (b) $9\frac{1}{11}\%$

(c) 11% (d) $11\frac{1}{9}\%$

RRB RPF SI -10/01/2019 (Shift-II)

Ans : (b) Formula- for such cases,

$$\text{Decrease \%} = \left(\frac{x}{100 + x}\right) \times 100$$

Given- Growth = 10%

So, decrease % in 10% consumption,

$$= \left(\frac{10}{100 + 10}\right) \times 100$$
$$= \frac{1}{11} \times 100 = 9\frac{1}{11}\%$$

156. The salary of labour has been increased by 25%. The new salary should be decreased by which % so that the initial salary remains the same?

(a) 12% (b) 15%

(c) 20% (d) 10%

RRB RPF Constable -20/01/2019 (Shift-I)

Ans : (c) From formula,

$$\text{Decrease \%} = \frac{x}{100 + x} \times 100$$

So, % decrease in the salary $= \frac{25}{100 + 25} \times 100$

$$= \frac{25}{125} \times 100$$
$$= \frac{100}{5} = 20\%$$

157. In a shopping mall the cost price of an article was increased by 10% and then it was reduced by 10%. What is the percentage increase or decrease?

(a) 1.5% increase (b) 1% increase

(c) 1% decrease (d) 1.5% decrease

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (c) : In such cases there is always loss if increased % and decreased % are same

$$\text{Loss \%} = \frac{x^2}{100}\%$$
$$= \frac{10^2}{100}$$
$$= \frac{100}{100}\% = 1\%$$

158. If the cost price of tomatoes increases by 25% per kg and Sudha wants to spend only 15% more on the tomatoes. Calculate the percentage reduction in the quantity of tomatoes get by Sudha.

(a) 10% (b) 12%

(c) 8% (d) 12.5%

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (c) : Let the initial price of tomatoes = x ₹/ kg

Price after 25% increase $= x \times \frac{125}{100} = \frac{5x}{4}$ ₹/ kg

Expenditure on tomatoes by Sudha $= x \times \frac{115}{100} = \frac{23x}{20}$

So, the quantity of tomatoes $= \frac{\frac{23x}{20}}{\frac{5x}{4}} = \frac{23x \times 4}{20 \times 5x} = \frac{23}{25}$ kg

So, the decrease quantity of the tomatoes $= 1 - \frac{23}{25} = \frac{2}{25}$ kg

$\therefore$ Required decrease % $= \frac{\frac{2}{25}}{1} \times 100 = 8\%$

159. If a person's salary increases by 11% on first year and on second year decreases by 11%, then what will be the % change in his salary at the beginning of the third year with respect of the initial salary?

(a) -1.21 (b) -1.23

(c) +1.21 (d) +1.22

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (a) : Percentage change in the salary

$$= \left(\frac{100 + 11}{100} \times \frac{100 - 11}{100} - 1\right) \times 100$$
$$= \left(\frac{89}{100} \times \frac{111}{100} - 1\right) \times 100$$
$$= \frac{-121}{10000} \times 100 = -1.21\%$$

160. The price of an article is reduced by 25%. By how much will the new price have to be increased to maintain the original price?

(a) 108% (b) $\frac{105}{3}\%$

(c) $\frac{50}{7}\%$ (d) $\frac{100}{3}\%$

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (d) Decrease/Increase % $= \frac{100x}{(100 \pm x)}$

Increase % $= \frac{100 \times 25}{100 - 25} = \frac{100 \times 25}{75} = \frac{100}{3}\%$

161. An employee's salary was firstly increased by 10% and then reduced by 10%. What was the change in his salary?

(a) 1% (b) 2.2%
(c) -1% (d) 2.4%

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (c) Decrease/Increase % $= \left(x \pm y \pm \frac{x \times y}{100}\right)\%$

$= 10 + (-10) + \frac{10 \times (-10)}{100}$

$= 10 - 10 - \frac{100}{100} = -1\%$

162. If a fraction y/x becomes 6/7 when its numerator is increased by 12% and denominator is decreased by 2%. Find the initial fraction.

(a) $\frac{3}{4}$ (b) $\frac{4}{3}$
(c) $\frac{1}{2}$ (d) $\frac{1}{5}$

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (a) Fraction = y/x

According to the question,

$\Rightarrow \quad \frac{y \times 112}{x \times 98} = \frac{6}{7}$

$\Rightarrow \quad \frac{y}{x} = \frac{6 \times 98}{7 \times 112} = \frac{6 \times 14}{112}$

$\Rightarrow \quad \frac{y}{x} = \frac{3}{4}$

163. The price of a residential flat increases by 15% per year. If the present price is ₹ 60,00,000, then what will be the cost after two years?

(a) ₹78,00,000 (b) ₹83,45,000
(c) ₹85,39,500 (d) ₹79,35,000

RRB NTPC 28.03.2016 Shift : 3

Ans : (d) The cost of the flat after two years,

$= 6000000\left(1 + \frac{15}{100}\right)^2$

$= 6000000 \times \frac{23}{20} \times \frac{23}{20} = 15000 \times 529 = ₹\,79,35,000$

164. Onion's price is increased by 35% in the new government policy. A person should reduce his consumption by which percentage so that his expenditure remains the same?

(a) 25% (b) 29%
(c) 26% (d) 33%

RRB NTPC 16.04.2016 Shift : 3

Ans : (c) Required% reduction in consumption

$= \frac{R}{100 + R} \times 100$

$= \frac{35}{100 + 35} \times 100 \quad = \frac{35}{135} \times 100$

$= \frac{7}{27} \times 100 = 25.92 \approx 26\%$

Type - 6

165. 20% of the toys produced in a factory were defective and 25% of the remaining were damaged. If 4800 toys were in good condition, then what was the original number of toys produced?

(a) 9000 (b) 8000
(c) 6000 (d) 10000

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let, number of toys in factory = x

No. of defective toys = $x \times \frac{20}{100} = \frac{x}{5}$

No. of damage toys = $\left(x - \frac{x}{5}\right) \times \frac{25}{100}$

$= \frac{4x}{5} \times \frac{1}{4} = \frac{x}{5}$

According to the question-

$x - \left(\frac{x}{5} + \frac{x}{5}\right) = 4800$

$x - \frac{2x}{5} = 4800$

$\frac{3x}{5} = 4800$

$\boxed{x = 8000}$

166. Due to 25% reduction in the price of wheat per kg, John is able to buy 5 kg more for ₹600 What is the original price of wheat per kg?

(a) ₹50 (b) ₹45
(c) ₹40 (d) ₹60

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (c) : Suppose original price of wheat per kg = ₹ x

After reduction of 25%,

Price of wheat per kg = $x \times \frac{75}{100} = ₹\ \frac{3x}{4}$

According to the question

$\frac{600}{\frac{3x}{4}} - \frac{600}{x} = 5$

$\frac{2400}{3x} - \frac{600}{x} = 5$

$\frac{2400 - 1800}{3x} = 5$

or $15x = 600$

$x = ₹\ 40$ per kg

167. Anita operates a fashion boutique. Her expenditure details are as follows:

30% on purchases, 40% on tailor's payment and 30% on rent and electricity. If her total expenditure is ₹ 50,000/ month, then how much has she spent in tailor's payment?

(a) ₹19,000 (b) ₹18,000
(c) ₹20,000 (d) ₹21,000

RRB RPF Constable -24/01/2019 (Shift-I)

Ans. (c) : Total expenditure in % = Purchase + Tailor + Rent and Electricity

$30\% + 40\% + 30\% = 100\%$

$100\% = 50000$

$1\% = 500$

$\Rightarrow$ So, tailor's payment

$40\% = 40 \times 500 = ₹20000$

168. On a short occupation following expenditures occurs: 25% on purchase, 25% on employees' salary and 50% on maintenance. If the occupation pays ₹ 2,00,000, then what is its expenditure on maintenance?

(a) ₹ 3,00,000 (b) ₹ 4,00,000
(c) ₹ 2,00,000 (d) ₹ 2,50,000

RRB RPF SI -12/01/2019 (Shift-III)

Ans : (b) Expenditure on salary = 25% = ₹2,00,000
So, the amount spent on maintenance

$$\Rightarrow 50\% = \frac{2,00,000 \times 50}{25} = ₹400000$$

169. Achyutya opens a tea stall by investing ₹ 25,000. He spends 30% on furnishing and 20% on purchasing other necessary things for stall. How much money did he have to purchase the rest things for his shop?

(a) ₹12,500 (b) ₹5,000
(c) ₹20,000 (d) ₹12,000

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (a) Total amount that Achyutya have = 25, 000
Total expenditure = 30% + 20% = 50%

$$\text{So, the rest amount } = 25000 \times \frac{50}{100} = ₹12,500$$

170. Mridula operates a small shop of pets. Her expenditure details are as follows: 90% on procurement and 10% on rent and electricity. If she monthly spends ₹ 15,000 on rent and electricity, then how much she spends monthly on procurement?

(a) 1.35 lacs (b) 5 lacs
(c) 4.5 lacs (d) 2 lacs

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (a) From question,
Expenditure on rent and electricity = 15000 = 10%
Then, 90% (expenditure on procurement)

$$= \frac{15000 \times 90}{10} = 135000 = ₹1.35 \text{ lacs}$$

171. A grocery store purchases 600 bottles of juice packed by two different sellers. 20% goods are taken by first seller, and 80% by the second. The cost price of one bottle is ₹ 25. After observing the second seller's goods, the shopkeeper finds that 25% goods can be used for a period of one day. He decides to return the goods. How much money will he get back from second seller?

(a) ₹ 4,000 (b) ₹ 3,750
(c) ₹ 3,000 (d) ₹ 3,500

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (c) Total bottles = 600
From first seller-

$$\Rightarrow 600 \times \frac{20}{100} = 120 \text{ bottles.}$$

From second seller-

$$600 \times \frac{80}{100} = 480 \text{ bottles.}$$

25% (spoiled) = 120 bottles

75%(accurate) = 360 bottles

So, the money received for spoiled bottles by second seller = $120 \times 25 = ₹3000$

172. 30% of sales of a food retail chain is dairy product and rest are fresh products. If the monthly sales of the chain is ₹ 50,000 then what is the selling amount of dairy products?

(a) ₹15,000 (b) ₹25,000
(c) ₹22,000 (d) ₹30,000

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (a) Sales of dairy products = 30%
Sales of fresh products = 70%
Monthly selling amount = ₹ 50,000
So, the selling amount of dairy products

$$= 50,000 \times \frac{30}{100} = ₹15,000$$

173. Last year, Manish Korner had invested 1 lacs on shop-1 and 1.5 lacs on shop-2 for changing the furniture. He collected the expenditure in next three quarters: 20% in quarter-1, 55% in quarter-2. What was the amount (in₹) collected in quarter-3?

(a) ₹60,500 (b) ₹62,500
(c) ₹62,600 (d) ₹70,000

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (b)
Total invested money = 100000+150000= ₹250000
Quarter –1 -------- 20%
Quarter –2 --------- 55%
So, quarter − 3 .....{100 – (20 + 55)} = 25%
So, he will collect 25% expenditure in quarter – 3.

$$\text{Then, } 250000 \times \frac{25}{100} = ₹62500$$

174. In a firm, the average salary of male worker is ₹ 5,200 and for women ₹ 4200 and the average salary of all workers is ₹ 5000. What is the percentage of male workers in the firm?

(a) 40% (b) 80%
(c) 20% (d) 60%

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans : (b) Let the number of male workers in the firm is x.
And female workers = y
Total salary of male workers = ₹5200 x
Total salary of female workers = ₹4200 y
Total salary of all workers = ₹5000 (x+y)
$5200x + 4200y = 5000x + 5000y$
$200x = 800y$

$x = 4y$

$x : y = 4 : 1$

$x\% = \frac{4}{5} \times 100 = 80\%$

So, the required % is 80%.

175. Last year in a small industrial enterprise, Mayank's investment was ₹ 20,000. This year he is making a plan to increase his investment by 30% in compare to previous year's investment, for providing services to new customers. How much is he planning this year?

(a) ₹ 60,000 (b) ₹ 22,500

(c) ₹ 26,000 (d) ₹ 23,000

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (c) Last year investment = ₹20000

Plan to increase = 30%

Increased money = $20000 \times \frac{30}{100} = ₹6000$

So, the required money = 20000 + 6000 = ₹26000

176. In a sport showroom there are different game accessories. There is 50% selling of swimming accessories, 40% of outdoor game accessories and 10% of indoor game accessories. If in a particular month store sells swimming costumes of worth ₹ 10,000, then what is the estimated amount of the sale of outdoor game accessories?

(a) ₹8000 (b) ₹5000

(c) ₹3000 (d) ₹4000

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (a) Sales of swimming costumes in particular month = ₹10000

$\because$ 50% sales belongs to swimming accessories.

According to the question,

$\therefore$ 50% = 10000

So, the total sales of game accessories = ₹20000

So, the selling price of outdoor game accessories

$= 20000 \times \frac{40}{100} = ₹8000$

177. Suresh purchases two books of ₹ 1,200, he sells one on 20% profit and second on 16% loss. If the selling price of both books is same then, find the estimated cost price of books.

(a) ₹ 550 and ₹ 650 (b) ₹ 600 and ₹ 600

(c) ₹ 500 and ₹ 700 (d) ₹ 400 and ₹ 800

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (c) Let the cost price of one book be ₹ x

So, the cost price of other book = ₹ (1200 – x)

According to the question,

$$\frac{x \times 120}{100} = (1200 - x) \times \frac{84}{100}$$

$\Rightarrow$ $120x + 84x = 1200 \times 84$

$\Rightarrow$ $204x = 1200 \times 84$

$\Rightarrow$ $x = \frac{1200 \times 84}{204}$

$\Rightarrow$ $x = ₹494.11 \approx ₹ 500$

So, the cost price of other book = 1200 – 500 = ₹ 700

178. A resort offers special discount on weekend. They create a log of weekend customers. They see a growth of 15% in their customers, this year. Last year they had 1500 customers. How many customers do they have this year?

(a) 1,825 (b) 1,700

(c) 1,650 (d) 1,725

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (d) : Growth = 15%

The number of customers in last year = 1500

The numbers of customers this year = $1500 \times \frac{115}{100}$

$= 15 \times 115$

$= 1725$

179. The book agrees to gives a loan of 2,38,75,697 to Arvind which is 17% less than the amount required to his business. How much amount does he need?

(a) ₹28765900 (b) ₹4375303

(c) ₹5700108 (d) ₹5125533

RRB NTPC 03.04.2016 Shift : 2

Ans : (a) The required amount

$= 2,38,75,697 \times \frac{100}{100 - 17}$

$= 287659 \times 100 = ₹28765900$

180. An investor invests 1/2 part of his money at 5%, 1/4 part at 10% and the rest at 8%, after 2 years his income is ₹ 2800 then find the total amouont.

(a) ₹10000 (b) ₹15000

(c) ₹20000 (d) ₹12000

RRB NTPC 19.04.2016 Shift : 1

Ans : (c) Let the total amount of the investor is ₹x,

Rest part $= x - \left(\frac{x}{2} + \frac{x}{4}\right) = \frac{x}{4}$

$$\therefore \frac{\frac{x}{2} \times 5 \times 2}{100} + \frac{\frac{x}{4} \times 10 \times 2}{100} + \frac{\frac{x}{4} \times 8 \times 2}{100} = 2800$$

$$\frac{x}{20} + \frac{x}{20} + \frac{x}{25} = 2800$$

$$\frac{5x + 5x + 4x}{100} = 2800$$

$14x = 280000 \Rightarrow x = ₹20000$

181. Production of sugar was 1584 million kg. in 2001 which was 20% more than 1991. Find the production of sugar in 1991 (in million kg.).

(a) 1980 (b) 1280

(c) 1900 (d) 1320

RRB NTPC 12.04.2016 Shift : 1

Ans : (d)

Production of sugar in $1991 = \frac{1584}{100 + 20} \times 100$

$= \frac{1584}{120} \times 100 = 1320$ million kg.

182. A drug supervisor rejects 0.05% of medicines as defective medicines. How many medicines will tested to reject 4 medicines?

(a) 5000 (b) 8000

(c) 6000 (d) 8500

RRB NTPC 22.04.2016 Shift : 1

Ans : (b) ∵ 100 medicines will tested to reject 0.05% medicines.

$\therefore$ Tested medicines, to reject 1 medicine $= \frac{100}{0.05}$

Then, to reject 4 medicines $= \frac{100}{0.05} \times 4$

$= \frac{100 \times 400}{5} = 20 \times 400 = 8000$

183. 15% of an alloy was silver. If in a quantity of alloy there was 51 g of silver, what was the quantity of the other metal in the alloy ?

(a) 204 g (b) 340 g
(c) 300 g (d) 289 g

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (d) Percentage of other metal in alloy
=100–15=85%

So, the quantity of other metal $= \frac{51 \times 85}{15}$

$= \frac{17 \times 85}{5} = 17 \times 17 = 289$ gm.

Type - 7

184. A football team lost 40% of the matches it played. If it won 75 matches, then find the number of matches is played.

(a) 125 (b) 140
(c) 110 (d) 130

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : % of matches win = (100 – 40)%
= 60%

Total number of matches $= \frac{\text{Won matches}}{\%\text{ of matches won}} \times 100$

$= \frac{75}{60} \times 100$

= 125

185. 60% of 40% of 32% of an amount is Rs. 432. What is the amount (in Rs.)?

(a) 5,625 (b) 5,555
(c) 5,525 (d) 5,605

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the amount = ₹x

According to the question,

$x \times \frac{60}{100} \times \frac{40}{100} \times \frac{32}{100} = 432$

$x \times \frac{3}{5} \times \frac{2}{5} \times \frac{8}{25} = 432$

$x = 9 \times 5 \times 5 \times 25$

$x = 625 \times 9$

x = ₹5,625

186. 44% of a number is 798.6. What is 63% of that number?

(a) 1143.8 (b) 1143.45
(c) 1143.46 (d) 1143.47

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number = x
From question,

$\frac{x \times 44}{100} = 798.6$

x = 1815

$\therefore 63\%$ of x $= \frac{1815 \times 63}{100} = 1143.45$

187. A fruit seller has some oranges. He sells 60% of them and still has 360 oranges. Originally, he had _____ oranges.

(a) 930 (b) 920
(c) 950 (d) 940

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : Let the fruit seller had x oranges.
The remaining oranges after the sale of 60% of the oranges = 40%
According to the question-

$x \times \frac{40}{100} = 380$

x = 950

188. A number, when 42 is subtracted from it, reduces to its 70%. What is two-fifth of that number?

(a) 84 (b) 140
(c) 100 (d) 56

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (d) Let the number = x
According to the question,
$x - 42 = x \times 70\%$

$x - 42 = x \times \frac{7}{10}$

$10x - 420 = 7x$

$3x = 420$

$x = 140$

$\therefore \frac{2}{5}^{\text{th}}$ part of this number $= x \times \frac{2}{5} = 140 \times \frac{2}{5}$

= 56

18. Find the value of 110 of 100% of 10%?

(a) 18.15 (b) 11.55
(c) 6.05 (d) 12.1

RRB ALP CBT-2 Mec. & Diesel 21-01-2019 (Shift-I)

Ans. (d) : 110 of 110% of 10% $= 110 \times \frac{110}{100} \times \frac{10}{100}$

$= \frac{11 \times 11}{10}$

= 12.1

190. In a solution the quantity of common salt in 320 gm water is 33 gm. Calculate the concentration % of the solution in context of mass by mass percentage.

(a) 9.35 g (b) 9.35%
(c) 9.09% (d) 13.05%

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (b) Concentration % of the solution

$$= \frac{33}{320+33} \times 100 = \frac{3300}{353} = 9.348 \approx 9.35\%$$

191. In a solution the quantity of common salt in 320 gm water is 31 gm. Calculate the concentration % of the solution in context of mass by mass percentage.

(a) 9.60% (b) 9.60%
(c) 8.83% (d) 9.09%

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (c)

Concentration % of the solution $= \frac{31}{320+31} \times 100$

$$= \frac{31}{351} \times 100 = 8.83\%$$

192. In a solution the quantity of common salt in 320 gm water is 45 gm. Calculate the concentration % of the solution in context of mass by mass percentage.

(a) 12.33% (b) 12.36%
(c) 10.36% (d) 12.43%

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (a) Concentration % of the solution

$$= \frac{45}{320+45} \times 100 = \frac{4500}{365}$$

$$= 12.33\%$$

193. A solution is prepared by mixing 45 gm salt in 520 gm water. Calculate the concentration of the solution in context of mass by mass percentage.

(a) 7.96% (b) 8.86%
(c) 8.1% (d) 6.96%

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (a) : The required concentration percentage

$$= \frac{45}{565} \times 100 = \frac{4500}{565} = 7.96\%$$

194. A solution has 8% salt. If the volume of the solution is 550 ml, then what is the quantity of salt in it?

(a) 42.5 ml (b) 48 ml
(c) 38.5 ml (d) 44 ml

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (d) Volume of the solution = 550 ml
Salt = 8%

So, quantity of the salt $= 550 \times \frac{8}{100} = 44$ ml

195. The amount of glucose required to prepare 250 g of a solution in which the glucose content is 5% will be:

(a) 125 g (b) 12.5 g
(c) 50 g (d) 25 g

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (b) Mass of the solution = 250 gm
Total quantity of glucose in the solution = 5%
So, the quantity of glucose in the solution in gram

$$= 250 \times \frac{5}{100} = 12.5\,gm$$

Type - 8

196. Ravi's salary was first reduced by 50% and subsequently raised by 50%. How much lower was his final salary compared to his initial salary?

(a) 24% (b) 32%
(c) 21% (d) 25%

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : Given :–

Reduced salary $\rightarrow$ 50%

Increased salary $\rightarrow$ 50%

$\because$Required salary decrease $50 - 50 = -\frac{50 \times 50}{100} = -25\%$

197. A's salary is 20% less than B's salary. What percentage of B's salarly more than A's salary.

(a) 15% (b) 25%
(c) 17% (d) 20%

RRB Group-D 26/08/2022 (Shift-III)

Ans. (b) : Given -

A : B = 80 : 100

According to question,

B का वेतन A के वेतन से प्रतिशत अधिक है $= \frac{20}{80} \times 100$

$= 25\%$

198. The income of A is 25% less than the income of B whose income is 40% more than that of C. The income of C is 20% less than that of D. By what percent is the income of A more than the income of C?

(a) 8% (b) 5%
(c) 10% (d) 4%

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : Let D's income be = ₹ 100

According to question,

Ratio of income

A		B		C	D
$112 \times \frac{75}{100}$	= 84 :	$\frac{80 \times 140}{100}$	= 112 :	80 :	100
21	:	28	:	20 :	25

Required % $= \frac{21-20}{20} \times 100 = 5\%$

199. Number A is eight times as large as number B. By what percentage is number B less than number A?

(a) 20% (b) 80%
(c) 87.5% (d) 12.5%

RRB NTPC (Stage-II) 15/06/2022 (Shift-II)

Ans. (c) : Let the number of A and B be 8x and x respectively.

$\therefore$ A B
8x , x

Difference = 8x – x = 7x

Required less % $= \frac{7x}{8x} \times 100 = 87.5\%$

200. If 15% of A : 25% of B :: 8 : 11, then A : B is equal to :

(a) 33:32 (b) 5 : 4
(c) 40 : 33 (d) 4 : 33

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (c) : Given,

15% of A : 25% of B : : 8 : 11

$\Rightarrow \frac{A \times 15\%}{B \times 25\%} = \frac{8}{11}$

$\frac{3A}{5B} = \frac{8}{11}$

$\Rightarrow$ 33A = 40 B

$\therefore$ $\boxed{A : B = 40 : 33}$

201. Find the value of k, if 18% of 450 = 30% of k.

(a) 270 (b) 750
(c) 250 (d) 320

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (a) : Given,

18% of 450 = 30% of K

$\Rightarrow 450 \times \frac{18}{100} = \frac{K \times 30}{100}$

$\therefore$ $\boxed{K = 270}$

202. 12.5% of the first number is 37.5% of the second number. If the second number is subtracted from the first number. We get an answer of 1428. Find the sum of the two numbers.

(a) 2846 (b) 2856
(c) 2936 (d) 2716

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (b) : According to the question,

$12.5 \times I = 37.5 \times II$

$\frac{I}{II} = \frac{37.5}{12.5}$

I : II = 3:1

Then, 3 – 1 = 2 unit $\rightarrow$ 1428

1 unit $\rightarrow$ 714

$\therefore$ Sum of both numbers = 3 + 1
= 4 unit
= 4 × 714
= 2856

203. If24% of a number is 39, then what is the number?

(a) 162.5 (b) 161.5
(c) 160.5 (d) 163.5

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) : Let number be = x

According to the question,

$x \times 24\% = 39$

$x = \frac{39 \times 100}{24} = 162.5$

204. The price (per litre) of petrol increases by 52%. By what percent should its consumption be reduced such that the expenditure on it increases by 14% only?

(a) 38% (b) 25%
(c) 30% (d) 35%

RRB Group-D 05/09/2022 (Shift-II)

Ans. (b) : Price×Consumption= Expense

Initial 1 1 1

Present $1.52 \times x = 1.14$

$x = \frac{1.14}{1.52} = \frac{57}{76}$

Increase % $= \left(1 - \frac{57}{76}\right) \times 100$

$= \frac{19}{76} \times 100 = 25\%$

205. If A's height is 25% less than that of B, then approximately by how much percentage height of B's is greater than that of A?

(a) 33% (b) 75%
(c) 50% (d) 25%

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let,

B's height = 100 m

A's height $= 100 \times \frac{75}{100} = 75\,m$

According to the question-

B's height greater than that of A $= \frac{(100 - 75)}{75} \times 100$

$= \frac{25}{75} \times 100 = 33.33\%$

= 33% (Approx)

206. If the price of sugar falls by 25%, by how much percentage must a household increase in its consumption so that the budget remains the same?

(a) $33\frac{2}{3}\%$ (b) $33\frac{1}{4}\%$
(c) $33\frac{3}{4}\%$ (d) $33\frac{1}{3}\%$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : Required increase $= \frac{100-75}{75} \times 100$

$= \frac{25}{75} \times 100$

$= 33\frac{1}{3}\%$

207. The price of tea has been reduced by 20%. In order to restore the original price, the new price must be increased by:

(a) 35% (b) 20%

(c) 30% (d) 25%

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let initial price of tea = ₹100

Price of tea after reducing = ₹80

Required growth $= \frac{100-80}{80} \times 100$

$= 25\%$

208. If 40% of (a – b) is equal to 20% of (a + b), then b is what percentage of a?

(a) 25% (b) 35%

(c) 100/3% (d) 28%

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

(a – b) of 40% = (a + b) of 20%

$\Rightarrow \frac{(a-b)\times 40}{100} = \frac{(a+b)\times 20}{100}$

$\Rightarrow 40a - 40b = 20a + 20b$

$\Rightarrow 20a = 60b$

$\Rightarrow a = 3b$

$\frac{a}{b} = \frac{3}{1}$

Required percentage $= \frac{1}{3} \times 100$

$= \frac{100}{3}\%$

209. If A is 120% of B, then what percentage of (A+B) is B?

(a) $4\frac{5}{11}\%$ (b) $40\frac{5}{11}$ **%**

(c) $45\frac{5}{11}$ **%** (d) $5\frac{4}{11}$ **%**

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (c) : A is 120% of B

$\therefore \quad A = B \times \frac{120}{100}$

$\frac{A}{B} = \frac{6}{5}$

Required percentage $= \frac{5}{11} \times 100$

$= \frac{500}{11}$

$= 45\frac{5}{11}$ **%**

210. If the price of tea increases by 20%, by what percentage should a household reduce its consumption of tea so that the budget remains the same?

(a) $15\frac{2}{3}\%$ (b) $16\frac{2}{3}\%$

(c) $14\frac{2}{3}\%$ (d) $13\frac{2}{3}\%$

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let the original price of the tea be ₹100

Increased price of the tea = ₹120

Percentage decrease $= \frac{120-100}{120} \times 100$

$= \frac{20}{120} \times 100$

$= 16\frac{2}{3}\%$

Hence the consumption of $16\frac{2}{3}\%$ of tea is to be decreased so that the expenditure on the remains the same.

211. In the new budget, the price of petrol has risen by 20%. By how much percentage must a motorist reduce consumption of petrol so that his expenditure on it does NOT increase?

(a) $16\frac{1}{2}\%$ (b) $16\frac{3}{4}\%$

(c) $16\frac{4}{5}\%$ (d) $16\frac{2}{3}\%$

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the motor driver reduce the consumption of petrol, so that his expenditure on petrol does not increase.

$\therefore \quad x = \frac{R}{100+R} \times 100$

$= \frac{20}{100+20} \times 100 \qquad \{\because \text{Given, R} = 20\%\}$

$= \frac{20}{120} \times 100$

$= 16\frac{2}{3}\%$

212. If X's income is 40% less than that of Y, then Y's income is approximately what percentage more than that of X?

(a) 66.33% (b) 66.67%

(c) 67.67% (d) 67.33%

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (b) : Let-

Y = 100 units

X = 60 units

Required percentage $= \frac{40}{60} \times 100$

$= \frac{200}{3} = 66.67\%$

213. If the income of the Sachin exceeds the income of Sohan with 50/7% then Sohan's income is approximately what percentage less than Sachin income

(a) 6.67% (b) 8.67%

(c) 5.67% (d) 7.67%

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let the income of Sohan = 100

So the income of Sachin $= 100+100\times \frac{50}{7\times 100}$

$= 100+\frac{50}{7} = \frac{750}{7}$

Income of Sachin – Income of Sohan $= \frac{750}{7} - 100$

$= \frac{50}{7}$

Required percentage $= \frac{\frac{50}{7}}{750/7} \times 100$

$= \frac{50}{7} \times \frac{7}{750} \times 100 = \frac{100}{15} = \frac{20}{3}$

$= \boxed{6.67\%}$

214. What percentage of a day is 3 h?

(a) $16\frac{1}{2}\%$ (b) $10\frac{1}{2}\%$

(c) $14\frac{1}{2}\%$ (d) $12\frac{1}{2}\%$

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let x% of a day be equal to 3 hours.

According to the question-

$24 \times \frac{x}{100} = 3$

$x = \frac{100}{8} = \frac{25}{2} = 12\frac{1}{2}\%$

215. If A's salary is 20% less than B's then by what percentage is B's salary more than A's ?

(a) 20% (b) 25%

(c) $33\frac{1}{3}\%$ (d) $16\frac{2}{3}\%$

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

$B \times \frac{80}{100} = A \Rightarrow \quad A = \frac{4B}{5}$

A : B = 4 : 5

Required percentage $= \frac{5-4}{4} \times 100$

$= \frac{1}{4} \times 100 = 25\%$

216. The price of rice is increased by 25%. By what percent should a family decrease its consumption so that their expenditure remains the same?

(a) 25% (b) 7.5%

(c) 5% (d) 20%

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let, price of rice = ₹100

And consumption of rice = 100 kg

So, total cost = 100 ×100 = ₹10,000

Price of rice after 25% increment = ₹125

Let consumption after increase = x kg

According to the question,

x ×125 = 10,000

x = 80

Hence, percentage reduction in consumption of rice

$= \frac{100-80}{100} \times 100\%$

= 20%

217. The numbers x and y are such that x : y = 4 : 5. If x is more than z by 20%, then y will be more than z by.

(a) 40% (b) 30%

(c) 50% (d) 60%

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given –

x : y = 4 : 5

According to the question,

$x = z \times \frac{120}{100}$

x : z = 6 : 5

Or z : x = 5 : 6

And x : y = 4 : 5

With the help of above ratio,

∴ z : x : y = 20 : 24 : 30

Hence, the percentage of y greater than z.

$= \frac{y-z}{z} \times 100\% = \frac{10}{20} \times 100$

= 50%

218. A vendor purchased 300 mangoes for ₹600. Some of the manoges were rotten and were thrown away. He sold the remaining mangoes at ₹3 each and made a profit of ₹210. The percentage of mangoes thrown away is

(a) 10% (b) 20%

(c) 5% (d) 30%

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (a) : Selling price (SP) =₹600
Let number of rotten mangoes = x
Remaining mangoes = (300 – x)
According to the question,
(300 –x) × 3 = (600+210)
900 – 3x = 810
x = 30

Percentage of rotten mangoes $= \frac{30}{300} \times 100 = 10\%$

219. Ananya and Babita have respectively 20% and 28% less money than their friend Kavita by what percentage has Babita less money than Ananya :

(a) 20 (b) 90
(c) 48 (d) 10

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (d) Let the friend of Ananya and Babita has amount = ₹ 100

Friend	Ananya	Babita
₹ 100	₹ 80	₹ 72

Babita has less% of money than Ananya

$$= \frac{8}{80} \times 100 = 10\%$$

220. A class of 50 girls and 70 boys sponsored a musical programme. If 40% of the girls and 50% of the boys attended, approximately what percentage of the class attended the programme?

(a) 46% (b) 42%
(c) 48% (d) 44%

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (a) : Total numbers of students in class = 50 + 70 = 120

No.of present students in musical programme

$$= 50 \times \frac{40}{100} + 70 \times \frac{50}{100}$$
$$= 20 + 35$$
$$= 55$$

Hence, percentage of class present in the programme

$$= \frac{55}{120} \times 100$$
$$= 45.83 \square 46\%$$

221. If 90% of y is x, then what percentage of x will be y?

(a) 11.1 (b) 111.1
(c) 101.1 (d) 121.11

RRB RPF Constable -25/01/2019 (Shift-III)

Ans. (b) According to the question,

$y \times 90\% = x$

$$\frac{x}{y} = \frac{90}{100}$$

$x : y = 9:10$

Let k% of x is y.

$$x \times \frac{k}{100} = y, \quad 9 \times \frac{k}{100} = 10$$

$$\therefore \quad k = \frac{10}{9} \times 100 = 111.1\%$$

222. Shyam's marks are 25% more than Divya's marks. How many % of Divya's marks are less than Shyam's marks?

(a) 20% (b) 15%
(c) 10% (d) 40%

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (a) Let Divya's marks =100

Then Shyam's marks $= 100 \times \frac{125}{100} = 125$

Shyam's marks - Divya's marks = 125 – 100= 25

So, Divya's marks are 25 less than Shyam's marks.

Required % $= \frac{25}{125} \times 100$

$$= \frac{100}{5} = 20\%$$

Type - 9

223. In measuring the sides of a rectangle error of 10% and 8% in excess are made. Find the error percent in its area.

(a) 1.88% (b) 18.8%
(c) 188% (d) 0.188%

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (b) : The error percent in its area $= \pm a \pm b \pm \frac{a \times b}{100}$

$$= 10 + 8 + \frac{10 \times 8}{100}$$
$$= 18.8\%$$

224. If each side of a square is increased by 50% then what is the percentage change in its area?

(a) 75% (b) 90%
(c) 110% (d) 125%

Ans. (d) : Percentage change in area of square

$$= a + b + \frac{a \times b}{100}$$
$$= 50 + 50 + \frac{50 \times 50}{100}$$
$$= 125\%$$

225. By what percent does the curved surface area of a cylinder decrease, if the radius is increased by 10% and the height is decreased by 40%?

(a) 51.8% (b) 24.3%
(c) 20% (d) 34%

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : Percentage change in the curved surface area of a cylinder $= +10 - 40 - \frac{10 \times 40}{100}$

$= -30 - 4$

$= -34\%$

$= 34\%$ decreased

226. The length of 2 adjacent side of a square are increased by 35% and 25% respectively. As a result, the area of the rectangle will be more than the area of square.

(a) 68.75% (b) 69.75%
(c) 67.75% (d) 70.75%

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question, the two adjacent sides of the square are increasing by 35% and 25% respectively.

$= x + y + \frac{x \times y}{100}$

Let the area of square be 100%

Percentage increase = $35 + 25 + \frac{35 \times 25}{100}$

$= 60 + 8.75 = 68.75$

The area of rectangle is 68.75% more than the area of the square.

227. If the length and breadth of a rectangular plot of land are increased by 10% and 8% respectively then what will be the percentage increase or decrease in its area ?

(a) 16.8% decreage (b) 18.8% decreage
(c) 16.8% increase (d) 18.8% increase

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : $\left(x + y + \frac{xy}{100}\right)\%$

Increase % $= \left(10 + 8 + \frac{10 \times 8}{100}\right)$

$= 18 + \frac{80}{100}$

$= 18.8\%$ increase

228. The lengths of 2 adjacent sides of a square are increased by 35% and 25%. The area of the resulting rectangle exceeds the area of the square by

(a) 68.75% (b) 69.75%
(c) 67.75% (d) 70.75%

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question, two adjacent sides of a square are increasing by 35% and 25% respectively.

We know that,

Formula– $\left(x + y + \frac{x \times y}{100}\right)\%$

Let the area of the square is 100.

Hence, increase $= 35 + 25 + \frac{35 \times 25}{100}$

$= 60 + 8.75 = 68.75\%$

The area of the rectangle 68.75% more than the area of the square.

229. If the length and breadth of a rectangular plot of land are increased by 10% and 8% respectively, then by how much percentage will its area increase or decrease?

(a) 16.8% decrease (b) 18.8% decrease
(c) 16.8% increase (d) 18.8% increase

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : Formula– $\left(x + y + \frac{xy}{100}\right)\%$

Required % increase $= \left(10 + 8 + \frac{10 \times 8}{100}\right)$

$= 18 + \frac{80}{100}$

$= 18.8\%$ increase

230. If the radius of a circle is decreased by 35% then its area decreases by:

(a) $57\frac{3}{4}\%$ (b) $57\frac{2}{4}\%$
(c) $56\frac{3}{4}\%$ (d) $57\frac{1}{4}\%$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (a) : Let, radius of circle (r) = 100 units

$\therefore$ Area of circle = $\pi r^2 = \pi \times 100 \times 100$

$= \pi\ 10000$

Radius of circle when reduced by 35% (R) = 65 units

$\therefore$ Area of circle = $\pi R^2 = \pi \times 65 \times 65$

$= \pi\ 4225$

$\therefore$ % decrease in area = $\frac{\pi(10000 - 4225)}{\pi 10000} \times 100$

$= \frac{5775}{100} = 57 \cdot 75\ \%$

$= 57\frac{3}{4}\ \%$

Hence, there will be a decrease of $57\frac{3}{4}\%$ in the area.

231. If each side of a rectangle is increased by 25%, then its area will increase by:

(a) $55\frac{1}{4}\%$ (b) $60\frac{1}{4}\%$
(c) $56\frac{1}{4}\%$ (d) $54\frac{1}{4}\%$

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (c) : Area of rectangle = length × breadth

$100 \xrightarrow{+25\%} 125 \xrightarrow{+25\%} 156.25$

Hence, increase in area = 156.25 – 100

= 56.25%

$= 56\frac{1}{4}\%$

232. If the radius of a circle is reduced by 25%, its area is reduced by:

(a) 6.25% (b) 43.75%

(c) 50% (d) 56.25%

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (b) : From question,

Required reduction % in area of circle = $-25 - 25 + \frac{25 \times 25}{100}$

= –50 + 6.25

= – 43.75%

= 43.75%

233. Each side of a square is increased by 50% Find the percentage increase in its area.

(a) 150% (b) 25%

(c) 125% (d) 50%

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (c) : By given data:–

Increase in side of square = 50%

Percentage increase in area of square = $\left(a + b + \frac{ab}{100}\right)\%$

∴ Percentage increase in area of square

$= \left(50 + 50 + \frac{50 \times 50}{100}\right)\% = 100 + 25 = 125\%$

234. If the length and breadth of a rectangle is increased by 8% and 12% respectively, then what will be the % increase in the area of the rectangle?

(a) 20.96% (b) 22%

(c) 20% (d) 24%

RRB RPF Constable -18/01/2019 (Shift-III)

Ans. (a) Percentage growth = $(x + y + \frac{xy}{100})\%$

Percentage increase in the area of the rectangle = $8 + 12 + \frac{8 \times 12}{100}$

$= 20 + \frac{24}{25} = 20 + 0.96 = 20.96\%$

235. If the side of a square is increased by 10%, then the area of the square is increased by……..

(a) 40% (b) 10%

(c) 20% (d) 21%

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (d) % change = $\left(x + y + \frac{xy}{100}\right)\%$

Change in the area of the square on increasing its side by 10%

$= 10 + 10 + \frac{10 \times 10}{100} = 21\%$

236. If the side of a square is increased by 30%, then find the percentage increase of its area.

(a) 84% (b) 112%

(c) 69% (d) 72%

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (c) Area of the square = $(\text{side})^2$

Formula- % growth = $\left(x + y + \frac{xy}{100}\right)\%$

% growth = $30 + 30 + \left(\frac{30 \times 30}{100}\right)$

% growth = 69%

237. If the length of a rectangle increased by 15% and the breadth decreased by 20%, then find the % change in area of the rectangle.

(a) 0.8% decrease (b) 0.8% increase

(c) 8% decrease (d) 8% increase

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (c) Increase in length = 15% = x

And decrease in breadth = 20% = y

Change in area = $(x - y - \frac{x \times y}{100})\%$

$= 15 - 20 - \frac{15 \times 20}{100} = -5 - \frac{300}{100} = -5 - 3$

= –8%

Hence, area or rectangle will be decreased by 8%.

Type - 10

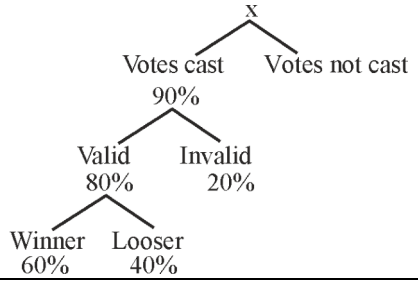
238. In an election, 90% of those entitled to vote cast their ballot, 80% of the votes cast was valid. The winner got 60% of the valid votes. If the winner got 64800 votes, what was the number of people entitled to vote ?

(a) 150000 (b) 125000

(c) 200000 (d) 175000

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : Let the number of people entitled to vote = x



Then,
According to the question,

$$x \times 90\% \times 80\% \times 60\% = 64800$$

$$x \times \frac{90}{100} \times \frac{80}{100} \times \frac{60}{100} = 64800$$

$$\frac{x \times 9 \times 4 \times 3}{10 \times 5 \times 5} = 64800$$

$$x = \frac{16200000}{108}$$

Hence, the number of people entitled to vote is x = 150000

239. In an election a candidate with 37% votes loses by a difference of 520000 votes to the winning candidate. What is the total number of votes cast in that election with two contestants?

(a) 1500000 (b) 2000000
(c) 2200000 (d) 1700000

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (b) :

Total votes	Losing Candidate	Winning candidate
100%	37%	63%

Difference in the % of votes between the candidates− 26%
While actual difference in votes = 520000
Here 26% —— 520000

$$1\% \text{ —— } \frac{520000}{26} = 20000$$

$\therefore$ 100% – 2000000
Total votes = 2000000

240. In an election, there were only two candidates. The winning candidate got 48% of the total votes. His opponent got 6800 votes which was 34% of the total votes. Some of the votes were invalid. The winning margin of the candidate who won the election and the number of invalid votes respectively are:

(a) 3000 votes, 3600 votes
(b) 2800 votes, 3600 votes
(c) 3600 votes, 2800 votes
(d) 3200 votes, 3600 votes

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : Let number of total votes = 100
Votes obtained by winner candidate = 48
Votes obtained by opponent = 34
Invalid votes = 100 - (48 + 34) = 18
Votes received by the opponent = 6800
34 units = 6800
1unit = 200
Winning margin = 48 - 34 = 14
1unit = 200
14units = 2800
Winning votes = 2800
Invalid votes = 18×200 = 3600

241. In an election between two candidates, 75% of the voters enrolled in the election to cast their votes, out of which 2% were declared invalid. A candidate got 9261 votes, which were 75% of the valid votes. The total number of voters enrolled in that election were.

(a) 18000 (b) 16400
(c) 16000 (d) 16800

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let total number of voter = x

$$\text{Number of cast votes} = x \times \frac{75}{100} = \frac{75x}{100}$$

$$\text{Valid votes} = \frac{75x}{100} \times \frac{98}{100}$$

According to the question,

$$9261 = \frac{75x}{100} \times \frac{98}{100} \times \frac{75}{100}$$

$$9261 = x \times \frac{3}{4} \times \frac{49}{50} \times \frac{3}{4}$$

$$\boxed{x = 16800}$$

242. In an election, candidate A got 75% of total valid votes. If 15% of total votes were declared invalid and the total number of votes is 560000, then the number of valid votes polled in favour of A is:

(a) 355000 (b) 357000
(c) 356000 (d) 358000

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b) : The number of valid votes polled in favour of A is

$$= 560000 \times \frac{85}{100} \times \frac{75}{100}$$

= 3, 57, 000

243. In an election, there were only two candidates. The losing candidate got 48% of the total votes. His opponent got 6000 votes more and won by a margin of 3% votes. What was the number of invalid votes?

(a) 2000 (b) 3200
(c) 6000 (d) 3000

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let total votes = 100%
Votes obtained by losing candidate = 48%
Votes obtained by winning candidate = 52%
Difference of obtained votes = 52 – 48 = 4%
As per question,
Difference of votes = 3%
It means that 1% votes are illegal/invalid
$\therefore$ 3% → 6000
1% (Invalid votes) = 2000

244. District XYZ has 50,000 voters out of them, 20% are urban voters and 80% rural voters. For an election 25% of the rural voters were shifted to the urban area. Out of the voters in both rural and urban areas, 60% are honest, 70% are hardworking and 35% are both honest and hardworking.

Two candidates A and B, contested the election. Candidate B swept the urban vote, while Candidate A found favour with the rural voters. Voters who were both honest and hardworking voted for NOTA. How many votes were polled in favour of candidate A, candidate B and NOTA, respectively?

(a) 19500, 13000 and 17500

(b) 17000, 15500 and 17500

(c) 17875, 14625 and 17500

(d) 19000, 13500 and 17500

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question

Total number of voters in XYZ district = 50,000

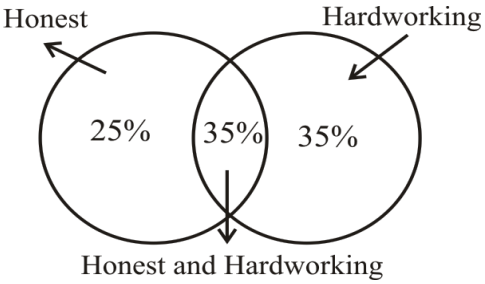
Urban voters $= 50000 \times \frac{20}{100} = 10{,}000$

Rural voters = (50000–10000) = 40,000

Total number of urban voters (after 25% shift) $= 10000 + 40000 \times \frac{25}{100}$

$= 20000$

Remaining number of rural voters = 30000



$\because$ Total turnout given in NOTA $= 50000 \times \frac{35}{100}$

$= 17500$

$\therefore$ A got total votes

= 30000 – NOTA votes pulled in rural

$= 30000 - 30000 \times \frac{35}{100}$

= 30000 – 10500

= 19500

$\therefore$ B got total votes

= 20000 – NOTA votes pulled in urban

$= 20000 - 20000 \times \frac{35}{100}$

= 20000 – 7000 = 13000

245. In an election the votes cast for two candidates were in the ratio 2:9. If the successful candidate received 984321 votes find the total votes polled.

(a) 1203059 (b) 1302059

(c) 1320059 (d) 1230059

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let number of votes obtained by both the canditates in the election be 2x and 9x respectively.

Votes received by the winning candidate = 984321

9x = 984321

x = 109369

$\therefore$ Total number of votes = 11 × 109369

= 1203059

246. A candidate won with 75% valid votes, in an election. 15% votes were invalid out of 560000 votes. What is the number of valid votes which the winner candidate got?

(a) 350000 (b) 280000

(c) 275000 (d) 357000

RRB RPF SI -12/01/2019 (Shift-III)

Ans : (d) Let the number of valid votes which the winner candidate got = x

Total votes = 560000

According to the question,

$x = 560000 \times \frac{75}{100} \times \frac{85}{100}$

$x = 560000 \times \frac{3}{4} \times \frac{17}{20}$

$x = 7000 \times 51$

$\boxed{x = 357000}$

247. In an election, a candidate got 62% of the total votes and won the election by 35640 votes. What is the total number of votes cast, if no vote is declared invalid?

(a) 356400 (b) 57484

(c) 93790 (d) 148500

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (d) : Let the total votes = 100%

According to the question,

Rest votes = 100% – 62% = 38%

% difference = 62% – 38% = 24%

24% = 35640

$100\% = \frac{35640 \times 100}{24} = 5940 \times 25 = 148500$

07.

Profit & Loss

Type - 1

1. If the cost price of an item is ₹4,500 and its selling price is ₹3,500 then the loss percentage is :

(a) $44\frac{2}{9}\%$ (b) $55\frac{2}{9}\%$

(c) $22\frac{2}{9}\%$ (d) $33\frac{2}{9}\%$

RRB Group-D 09/09/2022 (Shift-I)

Ans. (c) : The cost price of an item (CP) = ₹4500

Selling price (SP) = ₹ 3500

$$\text{loss\%} = \frac{CP - SP}{CP} \times 100$$

$$= \frac{4500 - 3500}{4500} \times 100$$

$$= \frac{1000}{4500} \times 100$$

$$= \frac{1000}{45}$$

$$= 22\frac{2}{9}\%$$

2. By selling an item for ₹222 a person incurs a loss of ₹48. What is the percentage of loss incurred in the transaction?

(a) $17\frac{7}{9}\%$ (b) $21\frac{23}{37}\%$

(c) $16\frac{7}{18}\%$ (d) $18\frac{8}{9}\%$

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (a) : Cost price of the itom = 222+48 = ₹270

$$\text{Loss \%} = \frac{48}{270} \times 100 \Rightarrow \frac{160}{9} = 17\frac{7}{9}\%$$

3. The selling price of 32 items is equal to the cost price of 38 items. Find the profit percentage.

(a) 16.25% (b) 15.79%

(c) 18.75% (d) 19.25%

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (c) : Given,

$32 \times SP = 38 \times CP$

$$\Rightarrow \quad \frac{SP}{CP} = \frac{38}{32}$$

Hence, P = 38 – 32

= 6

$$\text{Profit \%} = \frac{P \times 100}{CP}$$

$$= \frac{6 \times 100}{32}$$

$$\therefore \quad P = \frac{75}{4}\% \text{ or } 18.75\%$$

4. The initial profit percentage on the sale of an item was 74%. If the cost price of the item went up by 50%, but the selling price remained the same, what would be the new profit percentage?

(a) 8% (b) 16%

(c) 13% (d) 24%

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (b) :

Let initial cost price of the item (C.P.) = 100

↓ + 74% Profit

Selling price (S.P.) = 174

According to the quesiton,

When CP increase 50%

Cost Price = 150 ┐

But, Selling price is same = 174 ┘ 24 Profit

$$\text{New Profit\%} = \frac{24}{150} \times 100$$

= 16%

5. By selling an article for ₹ 211.20 a trader loses 12%. If he sells it for ₹ 248.40, then his loss gain percent is:

(a) Loss, 2.5% (b) Loss, 5%

(c) Gain, 5.5% (d) Gain, 3.5%

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (d) : Selling price of an article = ₹ 211.20

$$\text{Cost price of article} = 211.20 \times \frac{100}{88} = ₹\ 240$$

Given, Selling price of article = ₹ 248.40

$$\text{Profit \%} = \frac{248.40 - 240}{240} \times 100$$

$$= \frac{8.40}{240} \times 100 = 3.5\%$$

6. A person sells his goods at 30 % profit. If the cost price increases by 25%, and the selling price increases by 10% then what is his new profit percentage?

(a) 16.4% (b) 13.5%

(c) 14.4% (d) 15.6%

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (c) : Let the cost price of goods (C.P) = ₹100

$\therefore$ Selling price (S.P) = $\frac{100\times130}{100}$ = ₹130

Again,

After 25% increase,

$$\text{New C.P} = \frac{100\times125}{100}$$
$$= ₹125$$

After increase,

$$\text{New S.P} = \frac{130\times110}{100}$$
$$= ₹143$$
$$\text{New Profit} = 143 - 125 = ₹18$$
$$\text{New Profit\%} = \frac{\text{Profit}}{\text{C.P}}\times100$$
$$= \frac{18}{125}\times100$$
$$= 14.4\%$$

7. A retailer would have made a profit of 18% if he sold an article at its marked price. If he allowed a discount of 10% on the market price, what would his actual profit on that article have been?

(a) 6.2% (b) 5.5%

(c) 7.1% (d) 4.6%

RRB Group-D 26/08/2022 (Shift-III)

Ans. (a) : Let the cost price of the article = ₹ 1100

$\therefore$ Selling price = Marked price = 118

At 10% discount the selling price of articel = $118\times\frac{90}{100}$

= ₹ 106.2

Required profit % = $\frac{106.2-100}{100}\times100$

= 6.2%

8. A person sells a sofa at a certain price. If he sold it at 60% of this price, then there will be a loss of 20%. The percentage profit when sofa was sold at the original selling price is :

(a) 12% (b) $33\frac{1}{3}$ %

(c) $15\frac{1}{2}$ % (d) $12\frac{1}{2}$ %

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Let the original selling price of the sofa = ₹ x and cost price of sofa = ₹ y

According to the question,

$$x\times\frac{60}{100} = y\times\frac{80}{100}$$
$$3x = 4y$$
$$\frac{x}{y} = \frac{4}{3}$$

Required profit % = $\frac{4-3}{3}\times100$

$= \frac{100}{3}\%$ or $33\frac{1}{3}\%$

9. A dealer claims to sell his goods at cost price but uses a weight that actually weights 800 gm though 1 kg is written on it. Find his gain percentage.

(a) 25% (b) 18%

(c) 20% (d) 15%

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (a) : According to the question,

Required prcentage profit = $\frac{(1000-800)}{800}\times100$

$= \frac{200}{800}\times100$

= 25%

10. A shopkeeper sells wheat at ₹20/kg that he purchased at ₹18/kg and he gives only 900 gm of wheat instead of 1 kg while selling. The actual percentage profit of the shopkeeper is:

(a) 22.45 % (b) 24.45 %

(c) 23.45 % (d) 20.45 %

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (c) : Cost price of 1000 gm wheat = ₹18

$$1\,\text{gm cost price} = ₹\frac{18}{1000}$$

Selling price of 900 gm = ₹ 20

$$1\,\text{gm selling price} = ₹\frac{20}{900}$$

Actual profit percentage = $\frac{\left(\frac{20}{900}-\frac{18}{1000}\right)}{\frac{18}{1000}}\times100$

$$= \frac{\frac{20000-16200}{900000}}{\frac{18}{1000}}\times100$$
$$= \frac{3800\times1000}{900000\times18}\times100$$
$$= \frac{3800}{162}$$
$$= 23.45\%$$

11. Atulit buys an old bicycle for Rs. 4,000 and spends Rs. 400 for its repairs. If he sells the bicycle for Rs. 5,000, his percentage gain is:

(a) $7\frac{13}{12}$ % (b) $7\frac{13}{11}$ %

(c) $13\frac{1}{11}$ % (d) $13\frac{7}{11}$ %

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (d) : Cost price of the bicycle for Atulit = 4000 + 400 = ₹4400

Selling price of the bicycle = ₹5000

Profit = 5000 – 4400

= ₹600

$$\text{Profit \%} = \frac{600}{4400} \times 100$$

$$= \frac{600}{44}$$

$$= \frac{150}{11}$$

$$= 13\frac{7}{11}\%$$

12. The selling price of 9 articles is equal to the cost price of 15 articles. In this transaction there is a:

(a) loss of 40%
(b) gain of 66.6% nearly
(c) loss of 66.6% nearly
(d) gain of 40%

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question-

$$9 \times SP = 15 \times CP$$

$$\frac{SP}{CP} = \frac{15}{9}$$

$SP > CP$

$$\because \quad \left(\text{Profit\%} = \frac{SP - CP}{CP} \times 100 \right)$$

$$\therefore \text{ Profit\%} = \frac{15-9}{9} \times 100$$

$$= \frac{6}{9} \times 100, \quad = \frac{200}{3}$$

$$= 66.66\%$$

13. The ratio of the marked price to the cost price of an article is 5 : 3. If the selling price of that article is ₹3645 and the shopkeeper gave two successive discounts of 25% and 10% on the marked price, then what is the profit or loss percent during this transaction ?

(a) 12.5% Profit (b) 10% Profit
(c) 15% Loss (d) 15.5% Loss

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let marked price = ₹5x

and cost price = ₹3x

On successive discount of 25% and 10% on marked price,

$$\therefore \text{ Selling price (SP)} = \frac{90}{100} \times \frac{75}{100} \times 5x$$

$$3645 = \frac{90}{100} \times \frac{75}{100} \times 5x$$

$$x = 1080$$

Cost price (CP) = 3x = ₹3240

$$\text{Profit\%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{3645 - 3240}{3240} \times 100 = \frac{405}{3240} \times 100$$

$$= 12.5\%$$

14. A woman buys a car at 24% discount of the printed price and sells it a 20% higher of printed price. Her percentage gain is:

(a) $7\frac{17}{19}\%$ (b) $57\frac{17}{19}\%$
(c) $57\frac{7}{19}\%$ (d) $5\frac{17}{19}\%$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let the marked price of the car = 100

$$\text{Cost price of the car for woman} = \frac{100 - 24}{100} \times 100$$

$$= 76$$

$$\text{Selling price of the car for woman} = \frac{100 + 20}{100} \times 100$$

$$= 120$$

$$\text{Hence, profit \%} = \frac{120 - 76}{76} \times 100$$

$$= \frac{44}{76} \times 100 = 57\frac{17}{19}\%$$

15. A tradesman marks his goods 25% above the cost price and allows his customers a 12% reduction on their bills. What percentage profit does he make?

(a) 10% (b) 12 .5%
(c) 14% (d) 18%

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : Let, the cost price of goods = ₹100

$$\text{Marked price of goods} = 100 + 100 \times \frac{25}{100}$$

$$= ₹125$$

Selling price of goods after discount = Marked price – 12% discount on marked price

$$= 125 - 125 \times \frac{12}{100}$$

$$= 125 - 15$$

$$= 110$$

$$\text{Hence, profit \%} = \frac{110 - 100}{100} \times 100$$

$$= 10\ \%$$

16. In selling 33 metres cloth, Rani's profit is equal to the selling price of 11 m cloth, then what is her gain percent?

(a) 60% gain (b) 30% gain
(c) 50% gain (d) 20% gain

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let SP of 1 meter cloth = ₹1

Then SP of 33 meters cloth = ₹33

CP of 33 meters cloth = (33–11) = ₹22

$$\begin{matrix} CP:SP \\ 22:33 \end{matrix} = \begin{matrix} CP:SP \\ 2:3 \end{matrix}$$

$$\text{Profit\%} = \frac{1}{2} \times 100 = 50\%$$

17. When a bicycle manufacturer reduced the selling price by 50%, the number of bicycles sold radically increased by 700%. Initially, the manufacturer was getting a profit of 140%. What is the new profit percentage?

(a) 30% (b) 10%
(c) 20% (d) 40%

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the cost price of 1 bicycle = Rs. 100

Initial profit = 140% of 100

$= \frac{140}{100} \times 100$

= Rs. 140

$\therefore$ Selling price = CP + Profit

= 100 + 140

= Rs. 240

New, selling price = 50% of 240

$= 240 \times \frac{50}{100}$

= Rs. 120

Number of bicycle sold in SP = 1 + 700%

$= 1 + \frac{700}{100}$

= 8 units

$\therefore$ Net SP = 120 × 8 = 960

Net CP = 100 × 8 = 800

New profit% = $\frac{960 - 800}{800} \times 100 = 20\%$

18. If the selling price of an article is $\frac{5}{4}$ of its cost price, then the profit percentage obtained in the transaction is:

(a) 35% (b) 30%
(c) 25% (d) 40%

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : Selling price $= \frac{5}{4} \times$ Cost price

$\frac{\text{Selling price}}{\text{Cost price}} = \frac{5}{4}$

Let Selling price = 5k

Cost price = 4k

Profit = 5k – 4k = 1k

Profit% = $\frac{1k}{4k} \times 100 = \boxed{25\%}$

19. Mahathi purchases a cooker at $\frac{9}{10}$th of its marked price and sold it for 8% more than its marked price. Find the gain percentage.

(a) 20% (b) 14%
(c) 10% (d) 16%

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the marked price of cooker = ₹x

Then cost price = $x \times \frac{9}{10} = \frac{9x}{10}$

And selling price = $x \times \frac{108}{100}$

$= ₹\frac{27x}{25}$

Profit percentage = $\frac{\text{S.P} - \text{C.P}}{\text{C.P}} \times 100$

$= \frac{\frac{27x}{25} - \frac{9x}{10}}{\frac{9x}{10}} \times 100$

$= \frac{\frac{270x - 225x}{250}}{\frac{9x}{10}} \times 100$

$= \frac{45x \times 10}{250 \times 9x} \times 100$

Profit percentage = $\frac{5}{25} \times 100$

= 20%

20. Vikas buys an old bike for ₹30,000 and spends ₹5,000 on its repairs. If he sells the bike for ₹42000, his gain percentage.

(a) 20% (b) 18%
(c) 17% (d) 19%

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (a) : Total cost price of bike = 30000 + 5000

= ₹ 35000

Selling price = ₹42000

Profit % = $\frac{42000 - 35000}{35000} \times 100$

= $\frac{7000}{35000} \times 100$

Profit % = $\frac{100}{5}$ = 20%

21. Babu purchased a car for ₹3,00,000/- and a bike for his son for ₹1,00,000/-. He sold the car at a profit of 10% and bike at a loss of 20%. What is the net gain or loss?

(a) 2% profit (b) 1.5% loss
(c) 2.5% loss (d) 2.5% profit

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (d) : CP of the car = ₹300000

CP of the bike = ₹100000

Total CP of car and bike = 300000+100000

= ₹400000

On selling the car there is a profit of 10% and on the bike there is a loss of 20%.

SP = $300000 \times \frac{110}{100} + 100000 \times \frac{80}{100}$

SP = 330000 + 80000

SP = 410000

Profit = SP - CP = 410000 - 400000
= ₹10000

$$\text{Profit\%} = \frac{\text{Profit}}{\text{Cost price}} \times 100$$

$$= \frac{10000}{400000} \times 100 = 2.5\% \text{ Profit}$$

22. A retailer marks all his goods at 50% above the cost price and thinking that he will still make 25% profit, offers a discount of 25% on the marked price. What is his actual profit on the sales?

(a) 17% (b) 12%
(c) 12.60% (d) 12.50%

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the CP = 100
Marked price (MP) = 150
According to the question,
with 25% discount

$$SP = 150 \times \frac{75}{100}$$

SP = 112.5
If there is a profit of 25% on the cost price

$$SP = 100 \times \frac{125}{100} = 125$$

$$\text{Percentage of real profit} = \frac{125 - 112.5}{100} \times 100$$

= 12.50%

23. A book was sold for ₹230 with a profit of 15%. If it was sold for ₹210, then what would have been the percentage of profit or loss?

(a) 5% loss (b) 4% profit
(c) 4% loss (d) 5% profit

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : SP of Book = ₹ 230

$$\text{CP of Book} = 230 \times \frac{100}{115}$$

= ₹ 200

$$\text{Profit percentage of selling at ₹ 210} = \frac{10}{200} \times 100 = 5\%$$

24. The cost price of an article is 75% of the marked price. If a discount of 15% is allowed, then the profit or loss percentage is:

(a) 15% profit (b) 13.33% profit
(c) 15.55% loss (d) 12.44% loss

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Let the marked price of article = ₹ x

$$\therefore \text{ Cost price} = x \times \frac{75}{100} = ₹\frac{3x}{4}$$

$$\text{Selling price after 15\% discount} = x \times \frac{85}{100} = ₹\frac{17x}{20}$$

$$\text{Profit \%} = \frac{\frac{17x}{20} - \frac{3x}{4}}{3x/4} \times 100$$

$$= \frac{17x - 15x}{20} \times \frac{4}{3x} \times 100$$

$$= \frac{2x}{5} \times \frac{1}{3x} \times 100$$

$$= \frac{40}{3}\% \text{ or } 13.33\%$$

25. Kaveri bought a toy for ₹ 280 and sold it for ₹ 315. How much profit did she get?

(a) 17.5% (b) 12.5%
(c) 16% (d) 15.25%

RRB RPF SI -05/01/2019 (Shift-II)

Ans. (b) : Cost price of the toy = ₹280
Selling price of the toy = ₹315
Formula– Profit (p) = Selling price – Cost price
P = 315 –280 = ₹35
Formula–

$$P\% = \frac{\text{Profit}}{\text{Cost Price}} \times 100$$

$$= \frac{35}{280} \times 100 = \frac{5 \times 100}{40} = \frac{50}{4} = 12.5\%$$

26. Geeta prepares cakes for programs. She prepared a cake for birthday party and sold it for ₹ 700. The cost price for preparing the cake was ₹ 350. What is the profit % she gained?

(a) 200% (b) 50%
(c) 100% (d) 150%

RRB RPF Constable -17/01/2019 (Shift-I)

Ans. (c) : Cost price (CP) = ₹350
Selling price (SP) = ₹700

$$\text{Profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{700 - 350}{350} \times 100 = \frac{350}{350} \times 100 = 100\%$$

27. By selling a pen for ₹144, Anurag losses 1/7 of the cost price. If the pen is sold for ₹ 189, then what will be the profit %?

(a) 11% (b) 12.5%
(c) 11.5% (d) 14%

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) Given–

$$\text{Loss} = \frac{\text{Cost Price}}{7}$$

Selling price (SP) = ₹144
Hence, Loss = Cost price (CP) − Selling price (SP)

$$\frac{CP}{7} = CP - 144$$

$$CP - \frac{CP}{7} = 144$$

$$\frac{6CP}{7} = 144$$

CP = 24 × 7
CP = 168
New selling price = ₹189

$$\text{Profit \%} = \frac{SP - CP}{CP} \times 100 = \frac{189 - 168}{168} \times 100$$

$$= \frac{21}{168} \times 100 = 12.50\%$$

28. The selling price of an item with 16.5% profit was ₹ 466. Had it been sold for ₹ 330, what would have been the percentage loss?

(a) 17.25 (b) 17.75
(c) 17 (d) 17.5

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (d)

$$\text{Selling price} = \text{Cost price} \times \frac{(100 \pm \text{Profit/Loss})}{100}$$

$$466 = \text{Cost price} \times \frac{(100+16.5)}{100}$$

$$\text{Cost price} = \frac{466 \times 100}{116.5}$$

$$\text{Cost price} = ₹400$$

$$\text{Loss} = 400 - 330 = ₹70$$

$$\text{Loss\%} = \frac{70 \times 100}{400} = 17.5\%$$

29. A carpenter suffers a loss of 10% on selling a footboard for ₹ 72. How much profit (%) or loss will be if he sells the footboard for ₹ 96?

(a) Profit, 10% (b) Profit, 20%
(c) Loss, 16% (d) Loss, 25%

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (b) $\text{Cost price} = \frac{\text{Selling price}}{100 - \text{Loss}\%} \times 100$

$$= \frac{72 \times 100}{100-10}$$

$$= \frac{7200}{90} = 80$$

Again selling price $= ₹96$

$(\because \text{SP} > \text{CP} \rightarrow \text{profit})$

$$\text{Profit\%} = \frac{\text{Selling price} - \text{Cost price}}{\text{Cost price}} \times 100$$

$$= \frac{96-80}{80} \times 100 = 20\%$$

30. The selling price of an item inclusive of a 16% profit was ₹ 435. What would be the percentage loss if the item was sold for ₹ 330?

(a) 12.25 (b) 13
(c) 12 (d) 12.5

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (c) : The cost price of the item $= 435 \times \frac{100}{116} = ₹375$

If the item was sold for ₹ 330 then,

$$\text{Loss \%} = \frac{375-330}{375} \times 100$$

$$= \frac{45}{375} \times 100 = 12\%$$

31. By selling a table for ₹ 16,870, a shopkeeper suffers a loss of ₹ 1,080. His loss percentage (rounded off to one decimal place) is :

(a) 6.1% (b) 6.2%
(c) 6.4% (d) 6.0%

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (d): Selling price of the table = ₹16,870

Loss = ₹1080

Then, the cost price of the table

= 16870+1080 = ₹17,950

$$\text{Loss \%} = \frac{\text{Loss}}{\text{Cost price}} \times 100 = \frac{1080}{17950} \times 100 = \frac{108000}{17950}$$

$$= 6.0167$$

Loss % = 6.01%

32. The S.P of a washing machine is $1\frac{1}{3}$ of its C.P. Find the gain percent.

(a) 33% (b) 66%
(c) $33\frac{1}{3}\%$ (d) $66\frac{1}{3}\%$

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (c) Let cost price $= ₹100$

$$\text{Selling price} = 100 \text{ of } 1\frac{1}{3} = 100 \times \frac{4}{3} = ₹\frac{400}{3}$$

$$\text{Profit} = \frac{400}{3} - 100 = \frac{100}{3}$$

$$\text{Profit\%} = \frac{\text{Profit}}{\text{Cost price}} \times 100 = \frac{\frac{100}{3}}{100} \times 100 = \frac{100}{3}\%$$

$$= 33\frac{1}{3}\%$$

33. A seller buys a certain number of bananas at the rate of 8 for ₹5 and sells them at the rate of 5 for ₹8. What will be his profit percentage?

(a) 40% (b) 144%
(c) 156% (d) 48%

RRB ALP CBT-2 Elec. - Mec. 23-01-2019 (Shift-II)

Ans. (c) : According to the question,

8 bananas were bought ₹5

Cost price of 1 bananas $= ₹\frac{5}{8}$

5 bananas sold for ₹ 8

Selling price of 1 bananas $= ₹\frac{8}{5}$

We know that,

$$\text{Profit \%} = \left(\frac{\text{SP} - \text{CP}}{\text{CP}}\right) \times 100$$

$$= \frac{\frac{8}{5} - \frac{5}{8}}{\frac{5}{8}} \times 100$$

$$= \left(\frac{64-25}{40}\right) \times \frac{8}{5} \times 100$$

$$= \frac{39}{40} \times \frac{8}{5} \times 100$$

$$= 156\%$$

Type - 2

34. The difference between 12% gain and 4% loss on sale of the item was ₹28. What was the cost price of the item?

(a) ₹ 175 (b) ₹ 189
(c) ₹ 196 (d) ₹ 168

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given, Profit = 12%, Loss = 4%,
According to the question,
Difference in selling price = ₹28
(12% + 4%) = 28
16% = 28

$$\therefore\ 100\% = \frac{28}{16}\times 100 = 175$$

Hence, Cost price of item = ₹175

35. Sheetal incurred 28% loss by selling an item for ₹207. What was the cost price of the item?
(a) ₹ 292.50 (b) ₹ 282.50
(c) ₹ 277.50 (d) ₹ 287.50

RRB NTPC (Stage-2) 16/06/2022 (Shift-II)

Ans. (d) : Let CP of item = 100%
Loss incurred = 28%

$$\because\quad (100 - 28) = 72\% \rightarrow 207$$

$$1\% \rightarrow \frac{207}{72}$$

$$100\% \rightarrow \frac{207}{72}\times 100$$

$$= ₹\ 287.50$$

36. A shopkeeper sells an article at 20% profit. If he had bought the article at 10% less and sold it at ₹18 more than the previous selling price, he would have made 40% profit. What is the original cost price of the article? (in ₹)
(a) ₹ 350 (b) ₹ 320
(c) ₹ 300 (d) ₹ 280

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (c) : Let Cost price of the article = ₹x

$$\text{Selling price} = \frac{x\times 120}{100}$$

$$= ₹\ \frac{6x}{5}$$

According to the question,

$$\text{Cost price of the article if he bought 10\% less} = \frac{90x}{100}$$

$$= ₹\ \frac{9x}{10}$$

$$\text{Selling price} = \frac{6x}{5} + 18$$

Again, $\text{Selling price} = \text{Cost price}\times\frac{100+\text{Profit}}{100}$

$$\frac{6x}{5} + 18 = \frac{9x}{10}\times\frac{100+40}{100}$$

$$\frac{6x}{5} + 18 = \frac{9x}{10}\times\frac{140}{100}$$

$$\frac{90+6x}{5} = \frac{63x}{50}$$

$$900 + 60x = 63x$$

$$3x = 900$$

$$x = ₹\ 300$$

37. By selling an item for ₹2,332 a person incurred a loss of 12%. What was the cost price of the item?
(a) 2,650 (b) 2,675
(c) 2,620 (d) 2,625

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : According to the question,

$$88\% \longrightarrow ₹2,332$$

$$1\% \longrightarrow \frac{2332}{88}\times 1$$

$$100\% \longrightarrow \frac{2332\times 100}{88}$$

Hence Cost Price of the item = ₹2650

38. Chandrasekhar sold 12 identical articles for a total of ₹420, incurring a loss equal to the cost price of 7 such articles. The cost price of 1 such article is:
(a) ₹84 (b) ₹48
(c) ₹60 (d) ₹35

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : Let Cost Price of 12 article = 12 unit
Loss = 7 unit,
According to the question,
SP = CP – Loss = 12 – 7 = 5 unit
$\therefore$ 5 unit = ₹420
1 unit = ₹84
$\therefore$ Cost price of 1 article = ₹ 84

39. An article is sold at a profit of 28%. If the cost price is increased by ₹50 and the selling price is reduced by ₹18, then the profit would be 11.6%. What is the original cost price (in ₹) of the article ?
(a) 480 (b) 350
(c) 450 (d) 400

RRB Group-D 08/09/2022 (Shift-I)

Ans. (c) :
Let the original cost price of the article = ₹ x, then

$$\text{selling price} = \frac{x\times 128}{100} = ₹\frac{32x}{25}$$

According to the question

$$\text{When cost price} = x + 50, \text{ then selling price} = \frac{32x}{25} - 18$$

$$\text{profit\%} = \frac{\text{Selling price} - \text{cost price}}{\text{cost price}}\times 100$$

$$11.6 = \frac{\frac{32x-450}{25} - x - 50}{x+50}\times 100$$

$$11.6x + 580 = \frac{32x - 450 - 25x}{25}\times 100$$

$$11.6x + 580 = (7x - 1700)\times 4$$

$$11.6x + 580 = 28x - 6800$$

$$16.4x = 7380$$

$$x = ₹\ 450$$

40. Arvind bought an article for ₹ x. He sold it to Biru at a loss of 15%. Biru spent ₹ 126 on its transportation and sold it to Meenu at a profit of 25%. If Meenu bought it for ₹ 1475, then find the value of ₹ x.

(a) ₹1,240 (b) ₹1,160
(c) ₹1,320 (d) ₹1,280

RRB Group-D 06/09/2022 (Shift-II)

Ans. (a) :

On selling Biru → SP $= x \times \frac{85}{100} = \frac{17x}{20}$

After expense incurred by Biru on transportation cost price of article for Biru $\left(\frac{17x}{20} + 126\right)$

According to the question

Cost price of article for Meenu $\rightarrow \left(\frac{17x + 2520}{20}\right) \times \frac{125}{100}$

$= ₹\ 1475$

$17x = 295 \times 80 - 2520$

$17x = 23600 - 2520$

$17x = 21080$

$\therefore \quad x = ₹\ 1240$

41. The cost of 10 chairs is equal to that of 4 tables. The cost of 15 chairs and 2 tables is equal to ₹2,000. The cost of a table is:

(a) ₹ 100 (b) ₹ 500
(c) ₹ 200 (d) ₹ 250

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (d) : 10 chair = 4 table

1 chair $= \frac{4}{10}$ table

15 chair + 2 table = 2000

$\frac{15 \times 4}{10}$ table + 2 table = 2000

8 table = 2000

1 table = ₹ 250

42. Mr. X sells it to Mr. Y at a profit of 25%. If Mr. Y pays ₹225 for the article, then what was the cost price for the original seller?

(a) ₹ 250 (b) ₹ 150
(c) ₹ 200 (d) ₹ 275

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the cost price of article = ₹x

According to the question,

$x \times \frac{120}{100} \times \frac{125}{100} = 225$

$x = ₹150$

43. The profit earned after selling an article for ₹1,875 is the same as the loss occurred after selling the article for ₹1,385. What is the cost price (in ₹) of the article?

(a) ₹1,360 (b) ₹1,660
(c) ₹1,630 (d) ₹1,650

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (c) : Let Profit = Loss = ₹ x

$\Rightarrow 1875 - x = 1385 + x$

$\Rightarrow 2x = 1875 - 1385$

$\Rightarrow 2x = 490$

$\Rightarrow x = 245$

Hence cost price = 1875 – 245 = ₹ 1630

44. An article was sold at a gain of 12%. Had it been sold for ₹ 33 more, the gain would have been 14%. The cost price of the article is:

(a) ₹ 1750.00 (b) ₹ 1800.00
(c) ₹ 1650.00 (d) ₹ 1850.00

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c) : Let the cost price of the article = 100

Old selling price $= 100 \times \frac{112}{100} = 112$

New selling price $= 100 \times \frac{114}{100} = 114$

According to the question,

114 – 112 = 33

2 = 33

1 = 16.5

100 = ₹1650

Henec, the cost price of article is ₹ 1650

45. Anupama sold a book at 10% profit. If she would have sold the book for ₹20 more her profit % would have been 15%. Find the cost price of book?

(a) ₹450 (b) ₹400
(c) ₹500 (d) ₹375

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (b) : Let the cost price of book = ₹x

Selling price $= x \times \frac{110}{100}$

$= ₹\frac{11}{10}x$

According to the question,

$\frac{11x}{10} + 20 = x\frac{115}{100}$

$\frac{11x}{10} + 20 = \frac{23}{20}x$

$\frac{23x}{20} - \frac{11x}{10} = 20$

$\frac{23x - 22x}{20} = 20$

$\boxed{x = ₹400}$

Hence, cost price of book is ₹400.

46. Qamar sold 18 toys for ₹980, thereby making a loss equal to the cost price of 4 toys. What the cost price of each toy?

(a) ₹ 60 (b) ₹ 75
(c) ₹ 70 (d) ₹ 80

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : Selling price of 18 toys = ₹980

Loss = cost price of 4 toys

18CP = 18SP + 4CP

14CP = 18SP

$\frac{CP}{SP}=\frac{18}{14}=\frac{9}{7}$

or CP of 1 toy $=\frac{9}{7}SP$

While selling price of 1 toy $=\frac{980}{18}$

According to the question-

Cost price of 1 toy $=\frac{980}{18}\times\frac{9}{7}=₹70$

47. 5% more is gained by selling a cow for ₹1010 than what is gained by selling it for ₹1000 find the cost price of the cow?

(a) 200 (b) 280

(c) 400 (d) 300

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the CP of a cow be x,

According to the quesion,

$x\times\frac{5}{100}=1010-1000$

$x\times\frac{5}{100}=10$

$x=\frac{10\square\times100}{5}$

$\boxed{x=₹200}$

48. Sarita buys two old Samsung phones and three Mi mobile phones for ₹40200. If she sells the Samsung phones at a 10% profit and the Mi Phones at a 20% profit then her total profit is ₹5640. The cost price of the Mi Phone is:

(a) ₹5,400 (b) ₹1,200

(c) ₹4,400 (d) ₹5,000

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the cost price of samsung phone = ₹ x

And cost price of Mi phone = ₹ y

According to the question,

Total cost price = 2 × x + 3 × y = 40200 .....(1)

Total selling price $=\frac{110}{100}\times2x+\frac{120}{100}\times3y$

$=\frac{11x}{5}+\frac{18y}{5}$

Total profit = Total selling price – Total cost price

$5640=\frac{11x}{5}+\frac{18y}{5}-(2x+3y)$

$5640=\frac{x}{5}+\frac{3y}{5}$

x + 3y = 5 ×5640

x + 3y = 28200 .....(2)

On multiplying by 2 in equation (2), then substracting from equation (1),

2x + 3y = 40200

2x + 6y = 56400

– – –

– 3y = –16200

y = ₹ 5400

Total cost price of Mi-phone is 5400.

49. 40% of the goods are sold at 2% loss while the rest of the goods are sold at 4% profit. If there is a total profit of ₹ 250, then the cost price of goods sold is:

(a) ₹ 5,625 (b) ₹ 6,525

(c) ₹ 9,000 (d) ₹ 15,625

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (d) : Let the cost price of total goods = 100x

According to the question,

Total selling price $=\frac{40x\times(100-2)}{100}+\frac{60x(100+4)}{100}$

$\Rightarrow\quad\frac{40x\times98+60x\times104}{100}=\frac{3920x+6240x}{100}$

$\Rightarrow\quad\frac{10160x}{100}=101.6x$

Profit = 101.6x – 100x = 1.6x

1.6x = 250

$x=\frac{250}{1.6}$

Now the cost price of goods $=\frac{250}{1.6}\times100=₹15625$

50. The difference between 7% profit and 6% loss while selling an item is ₹104. What is the cost price of the item?

(a) ₹780 (b) ₹820

(c) ₹800 (d) ₹850

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the cost price of the item = ₹x

According to the question,,

$x\times\frac{107}{100}-x\times\frac{94}{100}=104$

$\frac{13x}{100}=104$

x = ₹800

51. A person sells his table at a profit of $12\frac{1}{2}$% and chair at a loss of $8\frac{1}{3}$% but on the whole he gains ₹25. On the other hand, if he sells the table at a loss of $8\frac{1}{3}$% and the chair at a profit of $12\frac{1}{2}$% then he neither gains nor loses. Find the cost price of the table.

(a) ₹360 (b) ₹350

(c) ₹380 (d) ₹370

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let cost price of table = ₹x
And cost price of chair is ₹y
According to the 1st condition-

$$\frac{25x}{200}-\frac{25y}{300}=25 \Rightarrow 3x-2y=600 \text{ .....(i)}$$

According to 2nd condition-

$$\frac{25y}{200}-\frac{25x}{300}=0 \Rightarrow 3y-2x=0 \text{ .....(ii)}$$

By equation (i) and (ii)-
9x – 4x = 1800
5x = 1800
x = ₹ 360 (Hence, cost price of book is ₹360.)

52. An article is sold at a profit of 20%. If both the cost price and selling price are ₹100 less, the profit will be 4% more. Find the cost price.
(a) ₹800 (b) ₹500
(c) ₹600 (d) ₹700

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the cost price = 100 x

$$100x \rightarrow 120x$$
$$\downarrow \qquad \downarrow$$
$$(100x-100)\times\frac{124}{100} \qquad (120x-100)$$

Accoding to the question-

$$100(x-1)\times\frac{124}{100}=120x-100$$

124x – 124 = 120x – 100
4x = 24
x = 6
Cost price of the article = 100x = 100×6 = ₹600

53. Tony purchases two cars A and B at a total cost of ₹6,50,000. He sells car A at a profit of 20% and car B at a loss of 25% and gets the same selling price for both the cars. What are the purchasing prices of car A and car B respectively?
(a) ₹2,00,000; ₹4,50,000
(b) ₹4,50,000; ₹2,00,000
(c) ₹3,00,000; ₹3,50,000
(d) ₹2,50,000; ₹4,00,000

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the cost price of A and B be x and (650000 –x) respectively.
∵ He earns 20% profit on car A
Therefore he sold the car A at 1.2 x
And on car B he suffers a loss of 25%
Therefore he sold Car B at 0.75 (650000 – x)
∵ The selling price of A and B is same
1.2x = 0.75(650000 – x)
1.2 x = 487,500 – 0.75x
1.95 x = 487,500

$$x=\frac{487,500}{1.95}$$

x = 250,000
Cost price of car A = ₹250,000
And selling price of car B = ₹400000

54. A person gets a profit equal to the cost price of 3 beds, by selling 18 beds for ₹ 16,800. Find the cost price of one bed.
(a) ₹750 (b) ₹650
(c) ₹800 (d) ₹700

RRB JE - 29/05/2019 (Shift-I)

Ans : (c) Let the cost price of a bed = ₹ x
The selling price of 18 beds = The cost price of 18 beds + The cost price of 3 beds.
So, the selling price of 18 beds
= The cost price of 21 beds
= ₹16800
The cost price of 21 beds = ₹21x
21x = 16800
x = ₹ 800

55. By selling an item, Madan earned a profit equal to the 1/4th of its cost price. If he would sell it for ₹ 375, then what was the cost price?
(a) ₹312.50 (b) ₹350
(c) ₹300 (d) ₹281.75

RRB JE - 29/05/2019 (Shift-I)

Ans : (c) Let Cost price = ₹ x
According to the question,

$$\text{Profit} = \frac{x}{4}$$

Profit = Selling price - Cost price

$$\frac{x}{4}=375-x$$

$$x+\frac{x}{4}=375$$

$$\frac{5x}{4}=375$$

$$x=375\times\frac{4}{5}$$

x = 75×4
x = ₹ 300
Hence, Cost price will be ₹300.

56. On selling 17 balls at ₹ 720, there is a loss equal to the cost price of 5 balls. What is the cost price of a ball?
(a) ₹ 40 (b) ₹ 55
(c) ₹ 60 (d) ₹ 45

RRB JE - 02/06/2019 (Shift-II)

Ans. (c) 17 balls → ₹720
According to the question,
There is a loss equal to the cost price of 5 balls.
(17–5) balls → ₹720
12 balls → ₹720

$$1 \text{ ball} = \frac{720}{12}=₹60$$

57. Jack sells a garment for ₹ 1440 and earns 20% profit. What will be the cost price of the garment?
(a) ₹1152 (b) ₹1240
(c) ₹1200 (d) ₹1180

RRB RPF SI -10/01/2019 (Shift-II)

Ans : (c) Selling price = ₹1440
Profit % = 20%

$$\text{Cost price} = \frac{\text{Selling price} \times 100}{(100 + \text{profit}\%)}$$

$$= \frac{1440 \times 100}{100 + 20} = \frac{1440 \times 100}{120} = ₹1200$$

58. A seller sells 12 chairs at a profit of 12% and 4 chairs at a loss of 3%. If his total profit is ₹ 1650, the cost price of each chair is:
(a) ₹ 1490 (b) ₹ 1250
(c) ₹ 1100 (d) ₹ 1380

RRB RPF SI -06/01/2019 (Shift-I)

Ans : (b) Let the cost price of each chair = ₹ x.
According to the question,-

$$\text{Selling price} = 12x \times \frac{(100+12)}{100} + 4x \times \frac{(100-3)}{100}$$

$$= \frac{3x \times 112}{25} + \frac{97x}{25}$$

$$= \frac{336x + 97x}{25} = \frac{433x}{25}$$

Cost price = 12x + 4x = 16x
Profit = Selling price − Cost price

$$1650 = \frac{433x}{25} - 16x$$

$$1650 \times 25 = 433x - 400x$$

$$x = \frac{1650 \times 25}{33}$$

$$x = 50 \times 25 = 1250$$

$$x = ₹1250$$

59. 2/3 part of an item sold at a profit of 6% and the remaining part was sold at a loss of 3%. If the total profit is ₹ 540, then what was the total cost of the item?
(a) ₹17, 000 (b) ₹18, 000
(c) ₹16, 500 (d) ₹18, 500

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (b) Let the total cost of item = ₹ x.
According to the question,

$$\text{Selling price of } \frac{2}{3} \text{ part of } x = \frac{2x}{3} \times \frac{106}{100} = \frac{212x}{300}$$

$$\text{Remaining part} = x - \frac{2x}{3} = \frac{x}{3}$$

$$\therefore \text{ The selling price of } \frac{x}{3} \text{ part} = \frac{x}{3} \times \frac{97}{100} = \frac{97x}{300}$$

$$\text{The selling price of total item} = \left(\frac{212x}{300} + \frac{97x}{300}\right) = \frac{309x}{300}$$

$$\text{Profit} = \frac{309x}{300} - x = 540$$

$$\frac{9x}{300} = 540$$

$$x = ₹18000$$

Hence, the total cost of the item was ₹18000.

60. Sharad bought two bags for ₹ 900. He sold one of them at a profit of 25% and other at a loss of 25%. If the selling price both the bags is same, then the cost prices of both the bags are:
(a) ₹ 437.5 and ₹ 462.5
(b) ₹ 330 and ₹ 570
(c) ₹ 347.5 and ₹ 552.5
(d) ₹ 337.5 and ₹ 562.5

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (d) : Let the cost price of first bag = ₹ x
And the cost price of the second bag = ₹ (900 – x)
According to the question,,

$$x \times \frac{125}{100} = (900 - x)\frac{75}{100}$$

$$5x = 2700 - 3x$$

$$8x = 2700$$

$$x = \frac{2700}{8} = 337.5$$

So, the cost price of first bag = 337.5
And the cost price of the second bag
= 900–337.5 = 562.5

61. The difference between a loss of 13% and a profit of 15% was ₹ 63. The cost price of the item is:
(a) 225 (b) 207
(c) 198 (d) 243

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (a) Let the cost price of the item = ₹ X.

$$\text{On selling at 13\% loss} = \frac{(100-13) \times X}{100} = \frac{87X}{100}$$

$$\text{On selling at 15\% profit} = \frac{(100+15) \times X}{100} = \frac{115X}{100}$$

According to the question,,

$$\frac{115X}{100} - \frac{87X}{100} = 63$$

$$\frac{28X}{100} = 63$$

$$X = \frac{63 \times 100}{28} = ₹225$$

62. A mobile, when sold at a profit of 6% then earns ₹ 870 more than when it is sold at a loss of 6%. What is the cost price of the mobile phone?
(a) ₹ 6000 (b) ₹ 7000
(c) ₹ 6265 (d) ₹ 7250

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (d) According to the first condition,

$$\text{S.P.} = \frac{\text{C.P.} \times (100 + \text{Profit}\%)}{100}$$

$$= \frac{x \times 106}{100}$$

According to the second condition,

$$\text{S.P.} = \frac{\text{C.P.} \times (100 - \text{Loss}\%)}{100}$$

$$= \frac{x \times 94}{100}$$

Hence, $\frac{106x}{100} = \frac{94x}{100} + 870$

$$\frac{106x}{100} - \frac{94x}{100} = 870$$

$$\frac{12x}{100} = 870$$
$$x = \frac{870 \times 100}{12} = ₹7250$$

63. If an item is sold at 13% loss and 14% profit, then the difference between both the prices is ₹ 162. What is the cost price of the item?
(a) ₹ 625 (b) ₹ 620
(c) ₹ 600 (d) ₹ 640

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (c) Let the cost price of the item = ₹ x,
According to the question,,

$$x \times \frac{114}{100} - x \times \frac{87}{100} = 162$$
$$\Rightarrow \frac{x}{100}[114 - 87] = 162$$
$$\Rightarrow x = \frac{162 \times 100}{27}$$
$$x = 6 \times 100$$
$$x = 600$$

64. An item was sold at a loss of 12%. If it was sold for ₹ 49 more, then there would be a profit of 2%. The cost price of the item is ₹……..
(a) 325 (b) 300
(c) 375 (d) 350

RRB Group-D – 16/11/2018 (Shift-I)

Ans. (d) Let Cost price = ₹ x
On selling at a loss of 12%,

$$\text{Selling price} = \frac{88x}{100}$$

On selling at a profit of 2%,

$$\text{Selling price} = \frac{102x}{100}$$

According to the question,

$$\frac{102x}{100} - \frac{88x}{100} = 49$$
$$14x = 4900$$
$$x = ₹350$$

65. Spoorti had sold a pair of shoes at a profit of 17% for ₹ 2,223. What was the cost price of the shoes?
(a) ₹ 1,905 (b) ₹ 1,870
(c) ₹ 1,880 (d) ₹ 1,900

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (d) : Let the cost price = ₹ x.
Profit % = 17%
Selling price = ₹ 2223

$$\therefore \text{CP} = \frac{\text{SP}}{(100 + \text{P}\%)} \times 100$$
$$= \frac{2223}{117} \times 100 = ₹1900$$

66. A person buys two watches for ₹ 480. He sells one of them at 15% loss and the other at 19% profit. After that he comes to know, that he has sold both the watches at the same price. Find the cost price of both the watches.
(a) ₹280, 200 (b) ₹270, 190
(c) ₹285, 200 (d) ₹280, 205

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (a) : Let the cost price of the first watch = ₹ x.
The cost price of the second watch = ₹ (480 - x)
According to the question,,

$$x \times \frac{85}{100} = (480 - x) \times \frac{119}{100}$$
$$\Rightarrow 5x = 480 \times 7 - 7x$$
$$\Rightarrow 12x = 480 \times 7$$
$$x = ₹ 280$$

Hence the cost price of the second watch
$$= 480 - 280 = ₹ 200$$

67. A shopkeeper marked the price of a new item as ₹ 1280. If he gets a profit of 20% even after giving a discount of 10%, then find the cost price of the item.
(a) ₹1120 (b) ₹960
(c) ₹1000 (d) ₹940

RRB NTPC 04.04.2016 Shift : 3

Ans : (b) Let the cost price of the item = ₹ x.
Marked prices = ₹ 1280, Discount = 10%

$$\text{Selling price of the item} = 1280 \times \frac{100 - 10}{100} = 1280 \times \frac{90}{100}$$

According to the question,
Profit = 20%

$$x = 1280 \times \frac{90}{100} \times \frac{100}{100 + 20}$$
$$x = 1280 \times \frac{90}{120}$$
$$x = ₹ 960$$

68. A wholesaler sold a water purifier at a loss of 40%. If the selling price has been increased by ₹125, then wholesaler will get the profit of 10%. What was the cost price of the purifier?
(a) ₹ 250 (b) ₹ 225
(c) ₹ 275 (d) ₹ 300

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) Let the cost price of the water purifier is ₹ x.
According to the question,-

$$x \times \frac{(100 - 40)}{100} + 125 = \frac{x \times 110}{100}$$
$$\Rightarrow \frac{60x}{100} + 125 = \frac{110x}{100}$$
$$\Rightarrow \frac{50x}{100} = 125$$
$$\Rightarrow \frac{x}{2} = 125$$
$$\Rightarrow x = 125 \times 2 = 250$$

Type - 3

69. By selling an item for ₹4125. A gains 10%. At what price (in ₹) should he sell the item in order to gain 18%?
(a) 4,450 (b) 4,425
(c) 4,400 (d) 4,510

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : Cost price of item $= \frac{\text{Selling price} \times 100}{(100 + \text{profit}\%)}$

$= \frac{4125 \times 100}{(100+10)}$

$= \frac{4125 \times 100}{110}$

Cost price of item = 3750

For 18% gain, selling price of item

$= \frac{\text{Cost price}(100 + \text{profit}\%)}{100}$

$= \frac{3750 \times (100+18)}{100}$

$= \frac{3750 \times 118}{100} = 4425$

Hence, Selling price of article = ₹ 4425

70. The selling price of 2 blankets are the same. One of the blanket is sold at $66\frac{2}{3}$% profit and the CP of the other blanket is ₹ 400 less than its SP. if the total profit on selling both the blankets is 50% then find the selling price of each blanket.

(a) ₹ 1510 (b) ₹ 1530

(c) ₹ 1520 (d) ₹ 1500

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : Let the selling price of each blanket = ₹ x

Cost price of 1st blanket $= x \times \frac{100}{\left(100 + \frac{200}{3}\right)} = ₹\frac{3x}{5}$

Cost price of 2nd blanket = ₹ (x – 400)

According to the question,

$\frac{3x}{5} + (x - 400) = 2x \times \frac{100}{150}$

$\Rightarrow \frac{8x - 2000}{5} = \frac{4x}{3}$

$\Rightarrow 24x - 6000 = 20x$

$\Rightarrow 4x = 6000$

$\Rightarrow x = \frac{6000}{4}$

$\Rightarrow \boxed{x = ₹\ 1500}$

71. By selling an item for ₹ 1,729 Rohini made a loss of 30%. At what price should she sell the item to make a gain of 16%?

(a) ₹ 2,856.20 (b) ₹ 2,865.20

(c) ₹ 2,856.50 (d) ₹ 2,866.40

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (b) : According to the question,

CP of article $= 1729 \times \frac{100}{70} = ₹\ 2470$

SP of the article at 16% profit $= \frac{2470 \times 116}{100} = ₹\ 2865.20$

72. When the selling price of a TV is ₹18,700, the shopkeeper incurred a loss of 15%. What should be the selling price of that TV to gain 15% ?

(a) ₹ 25,300 (b) ₹ 34,200

(c) ₹ 43,200 (d) ₹ 19,800

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : According to the question,

Let the CP of TV = 100 unit

SP of TV = 18,700

Loss = 15%

$\therefore$ SP of TV $\Rightarrow 85\% \rightarrow 18700$

$1\% \rightarrow \frac{18700}{85}$

CP of TV $\Rightarrow 100\% = \frac{1870000}{85}$

To gain 15%,

SP of TV $= \frac{1870000}{85} \times \frac{115}{100}$

$= \frac{18700 \times 115}{85}$

$= \frac{18700 \times 23}{17} = 1100 \times 23$

$= ₹25300$

73. The owner loses 20% when he sells a plot for ₹19,50,000. At what price must he sell the plot in order to gain a profit of 20%?

(a) ₹22,50,000 (b) ₹21,00,000

(c) ₹29,25,000 (d) ₹25,95,000

RRB Group-D 30-08-2022 (Shift-III)

Ans. (c) : Given,

SP = ₹19,50,000

Loss = 20%

$\because$ CP of plot $= \frac{\text{SP} \times 100}{(100 - \text{L}\%)}$

$\text{CP} = \frac{1950000 \times 100}{80} = 2437500$

$\therefore$ To earn 20% profit,

SP of plot $= \frac{2437500 \times 120}{100} = ₹2925000$

74. The cost price of an article is ₹5,000. What should the selling price of the article be so that a profit of 25% is earned ?

(a) ₹5,250 (b) ₹6,250

(c) ₹7,250 (d) ₹8,250

RRB Group-D 09/09/2022 (Shift-II)

Ans. (b) : Cost price of article = ₹ 5000

Profit% = 25%

Profit% $= \frac{5000 \times 25}{100} = ₹\ 1250$

Total selling price = 5000 + 1250

$= ₹\ 6250$

75. A man buys a table for Rs. 2,800 and sells it at a loss of 30%. The selling price (in Rs.) of the table is _____

(a) 1,890 (b) 1,960
(c) 1,440 (d) 1,770

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Cost price of table = ₹ 2800
loss % = 30%

$$\text{Selling price of table} = 2800 \times \frac{70}{100}$$
$$= ₹1960$$

76. The marked price of an article is ₹400 and successive discounts of 10% and 12% are offered on its sale. The selling price of the article is :

(a) Rs. 306.80 (b) Rs. 323.80
(c) Rs. 313.80 (d) Rs. 316.80

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (d) :

$$\text{Selling price} = \text{Marked price} \ \frac{(100 - \text{discount}\%)}{100}$$
$$= 400 \times \left(\frac{100-10}{100}\right) \times \left(\frac{100-12}{100}\right)$$
$$= 400 \times \frac{90}{100} \times \frac{88}{100}$$
$$= 4 \times 9 \times 8.8$$
$$= ₹\ 316.80$$

77. The percentage profit earned by James on selling an article for ₹ 1920 is equal to the percentage loss incurred by selling the same article for ₹ 1500. At what selling price should he sell the article if he wants to make a profit of 10%.

(a) ₹ 2,000 (b) ₹ 4,000
(c) ₹ 1,881 (d) ₹ 7,000

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (c) : Let, cost price of article = ₹ x
According to the question,
Profit = Loss
1920 – x = x – 1500
2x = 3420
x = ₹ 1710
For 10% profit

$$\text{SP of article} = \text{CP} \times \frac{(100 + \text{P}\%)}{100}$$
$$= 1710 \times \frac{110}{100}$$
$$\Rightarrow \text{Rs.}1881$$

78. A shopkeeper purchased a machine for ₹70,000 and spent ₹5,000 as overhead expenditure. Had he purchased the machine at 15% less, he would have earned a profit of 15%. What is the selling price of the machine?

(a) ₹78,175 (b) ₹75,000
(c) ₹74,175 (d) ₹74,000

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (c) : CP of Machine = ₹ 70,000
Extra expenditure = ₹ 5,000
On reducing 15% in the CP of machine

$$\text{SP of machine} = 70,000 \times \frac{85}{100} = 59500$$

According to the question-

$$\text{SP} = (59500 + 5000) \times \frac{115}{100}$$
$$= 64500 \times \frac{115}{100}$$
$$= ₹\ 74175$$

79. By selling an article for 1,785, a dealer loses 15%. At what price should he sell the article to gain 15%?

(a) ₹2,415 (b) ₹1,785
(c) ₹2,100 (d) ₹2,205

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let- Cost price (CP) = ₹x
Selling price (SP) = ₹1785, Loss = 15%

$$\because \quad \text{CP} \times \frac{85}{100} = 1785$$
$$\text{CP} = \frac{1785 \times 100}{85} = ₹2100$$

If profit is 15% then,

$$\text{CP} \times \frac{115}{100} = \text{SP}$$
$$2100 \times \frac{115}{100} = \text{SP}$$

Hence, SP = ₹2415

80. The difference between a 12.5% profit and a 10.5% loss, while selling an item, is ₹161. What would the selling price of the item be if the intended profit is 19%?

(a) ₹833 (b) ₹798
(c) ₹817 (d) ₹850

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) : Let, Cost price (CP) = ₹ x

$$\text{Selling price at 12.5\% profit } (SP_1) = ₹\ x \times \frac{112.5}{100}$$

$$\text{Selling price at 10.5\% loss } (SP_2) = ₹\ x \times \frac{89.5}{100}$$

According to the question,

$$\frac{112.5}{100}x - \frac{89.5}{100}x = 161$$
$$23x = 16100$$
$$x = \frac{16100}{23}$$
$$\boxed{x = ₹700}$$

$$\text{Selling price at a profit of 19\%} = \text{Cost price} \times \frac{119}{100}$$
$$= 700 \times \frac{119}{100} = ₹833$$

Selling price = ₹833

81. A shopkeeper incurred a loss of 10% by selling an item for ₹1,980. At what price (₹ in) should he sell that item to gain 15%?

(a) 2,193 (b) 2,475
(c) 2,005 (d) 2,530

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (d) : Cost price of the article $= \frac{SP \times 100}{100 - loss\%}$

$$CP = \frac{1980 \times 100}{100-10} = \frac{1980 \times 100}{90} = ₹2200$$

Now selling the article at 15% profit.

Selling price of the article $= \frac{CP \times (100+15)}{100}$

$$= \frac{2200 \times 115}{100}$$
$$= 22 \times 115$$
$$= ₹2530$$

82. A shopkeeper bought 25 chairs from a manufacturer for ₹37,500 and sold them at a profit equal to the selling price of 5 chairs. Then the SP of one chairs is:

(a) ₹1,875 (b) ₹1,200
(c) ₹1,500 (d) ₹1,250

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (a) : Let the selling price of each chair is x Rs.

$\therefore$ Selling price of 25 chairs = 25x

Profit = Selling price of 5 chairs

$= ₹5x$

Cost price of 25 chairs $= ₹37,500$

According to the question,

$$25x - 37500 = 5x$$
$$\Rightarrow 20x = 37500$$
$$\Rightarrow x = \frac{37500}{20}$$
$$\Rightarrow x = ₹1875$$

Hence, the selling price of one chair $(x) = ₹1875$

83. On selling a product at ₹360, shopkeeper makes a loss of 10%. Find the selling price at which he makes a profit of 30%.

(a) ₹600 (b) ₹480
(c) ₹520 (d) ₹740

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (c) :

Cost price of the article

$$= \text{Selling price} \times \frac{100}{(100 - \text{Loss }\%)}$$

$$\text{Cost price} = 360 \times \frac{100}{90}$$
$$= 4 \times 100$$

Cost price $= ₹400$

$\because$ To get 30% profit

$$\text{Selling price of the article} = 400 \times \frac{130}{100} = ₹520$$

84. A man makes 8% profit by selling a washing machine for ₹21600 at what price should he sell this machine to get 20% profit?

(a) ₹ 28,000 (b) ₹ 23,200
(c) ₹ 26,000 (d) ₹ 24,000

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : Selling price of the washing machine = ₹21600

profit = 8%

We know that, $\text{Cost price} = \frac{\text{Selling Price}}{(100+\text{Profit})} \times 100$

$$= \frac{21600}{108} \times 100$$
$$= ₹\ 20,000$$

And the selling price of the article to get 20% profit -

$$= 20,000 \times \frac{100+20}{100}$$
$$= ₹\ 24,000$$

85. A television manufacturer earns a profit of 10% by selling one TV set for ₹24,750. If the production cost is increased by 15%, then what would be the new selling price of the TV set so as to gain a profit of 15%?

(a) ₹ 28,756.25 (b) ₹ 27,756.25
(c) ₹ 29,756.25 (d) ₹ 26,756.26

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let Initial price (cost) = 100%

Profit = 10%, Selling price = 110

110 = 24750

$$1 = \frac{24750}{110}$$
$$100\% = \frac{24750}{110} \times 100$$
$$= 22500$$

Initial price = 22500 (cost price)

$\because$ The cost price increased by 15%

Then, new cost price $= 22500 \times \frac{115}{100} = 25875$

New selling price of the article –

So, $25875 \times \frac{115}{100} = ₹29756.25$

86. K buys a car for ₹ 4.50 lacs and spends ₹ 1.25 lacs on its accessories. He sold the car at a loss of 20%. Find the selling price of the car.

(a) ₹4.00 lacs (b) ₹4.20 lacs
(c) ₹4.40 lacs (d) ₹4.60 lacs

RRB RPF SI -11/01/2019 (Shift-III)

Ans : (d) Total price of the car = 4.50 + 1.25 = ₹ 5.75 lacs

$\therefore$ Selling price $= \frac{100 - Loss\%}{100} \times$ Cost price

$$= \left(\frac{100-20}{100}\right) \times 5.75$$
$$= \frac{80}{100} \times 5.75 = 4.600 = ₹4.60 \text{ lacs}$$

87. A cycle bought at ₹ 1400 is sold at a loss of 15%. What is the selling price?
(a) ₹1290 (b) ₹1090
(c) ₹1190 (d) ₹1385
RRB JE - 01/06/2019 (Shift-I)

Ans : (c) The selling price of the cycle

$$= \text{Cost price} \times \frac{(100 - Loss\%)}{100}$$

$$= 1400 \times \frac{100-15}{100}$$

$$= 1400 \times \frac{85}{100}$$

$$= 14 \times 85 = ₹1190$$

88. There is loss of 25% on selling an article for ₹2400. What should be the selling price to get the profit of 25%?
(a) ₹2700 (b) ₹4000
(c) ₹3600 (d) ₹4200
RRB JE - 01/06/2019 (Shift-I)

Ans : (b)
The cost price of an article

$$= \text{Selling price} \times \frac{100}{(100 - \text{Loss}\%)}$$

$$= 2400 \times \frac{100}{(100-25)}$$

$$= 2400 \times \frac{100}{75}$$

$$= ₹3200$$

The selling price of the article

$$= \text{Cost price} \times \frac{(100 + \text{Profit})}{100}$$

$$= 3200 \times \frac{100+25}{100}$$

$$= 3200 \times \frac{125}{100}$$

$$= 32 \times 125 = ₹4000$$

89. A seller gets 22% loss on selling a set of books for ₹ 1,755. What should be its selling price for getting 6% profit?
(a) ₹2,375 (b) ₹2,385
(c) ₹2,355 (d) ₹2,365
RRB RPF Constable -20/01/2019 (Shift-II)

Ans. (b)

$$\text{Cost price} = \frac{\text{Selling price}}{(100 \pm \text{Loss/Profit}\%)} \times 100$$

Let selling price = ₹x
According to the question,,

$$\frac{1755}{100-22} \times 100 = \frac{x}{100+6} \times 100$$

$$\frac{1755}{78} = \frac{x}{106}$$

$$x = \frac{1755 \times 106}{78}$$

$$x = \frac{186030}{78}$$

$$x = ₹2385$$

90. On selling an old phone for ₹ 6360, Ranjita got 47% less than the cost of buying it a few years ago. At what price should Ranjita sell it to get the profit of 13%?
(a) ₹13,560 (b) ₹10,550
(c) ₹11,550 (d) ₹ 12,550
RRB Group-D – 05/10/2018 (Shift-I)

Ans. (a) : Let the cost price of the phone is ₹ x.

$$\therefore x \times \frac{(100-47)}{100} = 6360$$

$$\Rightarrow x = \frac{6360 \times 100}{53}$$

$$= ₹12,000$$

So, the selling price for 13% profit

$$= \text{Cost price} \times \frac{100+13}{100}$$

$$= 12,000 \times \frac{113}{100} = ₹\ 13,\ 560$$

91. A person bought an item for ₹ 96 and sold it at a profit of 25%, then what was the selling price of the item?
(a) ₹120 (b) ₹125
(c) ₹114 (d) ₹115
RRB Group-D – 19/09/2018 (Shift-III)

Ans. (a) :

$$\text{SP} = \text{CP} = \frac{(100 + \text{Profit}\%)}{100}$$

$$= \frac{96 \times (100+25)}{100}$$

$$= \frac{96 \times 125}{100} = \boxed{₹120}$$

92. Pavan sold an item at a loss of 12.5%. If he could have sold it for ₹ 56 more, he would have made a profit of 22.5%. What should be the selling price of the item to make a profit of 25%?
(a) ₹ 182 (b) ₹ 190
(c) ₹ 185 (d) ₹ 200
RRB Group-D – 19/09/2018 (Shift-II)

Ans. (d) : Let the cost price of the item is x and the selling price is y then,

$$12.5 = \frac{(x-y) \times 100}{x}$$

$$22.5 = \frac{(y+56-x) \times 100}{x}$$

$$\text{or, } 22.5 = \frac{(y+56-x) \times 100 \times 12.5}{(x-y) \times 100}$$

$$\Rightarrow \quad 22.5(x-y) = (y-x+56) \times 12.5$$

$$\Rightarrow \quad 9(x-y) = (y-x+56) \times 5$$

$$\Rightarrow \quad 9x - 9y = 5y - 5x + 280$$

$$\Rightarrow \quad 14x - 14y = 280$$

$$\Rightarrow \quad x - y = 20$$

$$\text{Now, } 12.5 = \frac{20 \times 100}{x} \text{ or } x = \frac{2000}{12.5} = ₹160$$

So, the cost price of the item = ₹ 160
Then, the selling price of the item for 25% profit

$$= \frac{25\times160}{100} + 160 = 5\times8 + 160 = 40 + 160 = ₹200$$

93. A person bought an article for ₹ 1975 and sold it at a profit of 12%. What was the selling price of the article?

(a) ₹ 2,212 (b) ₹ 2,192
(c) ₹ 2,222 (d) ₹ 2,202

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (a) The cost price of the article = ₹ 1975
Profit% = 12%

$$\left[\text{S.P.} = \text{C.P.} \times \frac{100 \pm \text{Profit/Loss}}{100}\right]$$ (S.P. = Selling price & C.P. = Cost price)

$$\text{S.P.} = \frac{1975\times(100+12)}{100}$$

$$= \frac{1975\times112}{100}$$

$$= \frac{221200}{100} = 2212$$

S.P. = ₹2,212

94. On selling a jute bag for ₹48, Ashmit incurs a loss of 20%. In order to make a profit of 20% what should be the selling price of the jute bag?

(a) ₹ 72 (b) ₹ 52
(c) ₹ 56 (d) ₹ 68

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (a) : Let cost price (C.P.) = x
Selling price (S.P.) = 48, Loss = 20%

$$\because \quad x\times\frac{80}{100} = 48$$

$$x = ₹60$$

If the profit is 20%, then

$$\text{SP} = x\times\frac{120}{100}$$

$$\text{SP} = \frac{60\times120}{100}$$

SP = ₹ 72

95. A toy was bought for ₹1125 and sold at a loss of 16%. The selling price of the toy was.

(a) ₹ 960 (b) ₹ 945
(c) ₹ 955 (d) ₹ 975

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (b) : Given-
The cost price (CP) of the toy = ₹ 1125
Loss % = 16%
Selling price (SP) = ?

Formula, $\left[\text{C.P.} = \frac{\text{S.P.}}{(100 - \text{Loss})}\times100\right]$

$$\Rightarrow \quad 1125 = \frac{SP}{84}\times100$$

$$\Rightarrow \quad SP = \frac{1125\times84}{100}$$

$$SP = \frac{1125\times84}{100} = ₹945$$

96. The cost price of 5kg of wheat and 10 kg of lentil were at ₹ 70 and ₹ 80 per kg respectively. On selling, he gained 10% profit on wheat and 20% profit on lentil. What was the total selling price of all items?

(a) ₹1,375 (b) ₹1,345
(c) ₹1,400 (d) ₹1,350

RRB NTPC 27.04.2016 Shift : 2

Ans : (b) Given that,
The cost price of 5 kg of wheat = 70 × 5 = 350
The cost price of 10 kg of lentil = 80 × 10 = 800
According to the question,

$$\text{The selling price of all items} = \frac{350\times110}{100} + \frac{800\times120}{100}$$

$$= 385 + 960 = ₹1345$$

97. If a person bought an item for ₹ 96 and sold it at a profit of 12.5%, the selling price of the item was:

(a) ₹105 (b) ₹110
(c) ₹112 (d) ₹108

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (d) Selling price of the item $= 96\left(1 + \frac{12.5}{100}\right)$

$$= 96\times\frac{112.5}{100} = 96\times1.125 = ₹108$$

98. A defective piece of article which costs ₹1200 is being sold at a loss at 15%. If the price is further reduced by 5%, find the SP?

(a) ₹ 1000 (b) ₹ 969
(c) ₹ 960 (d) ₹ 990

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (b) The selling price of the article at 15% loss

$$= 1200\times\frac{(100-15)}{100} = 1200\times\frac{85}{100}$$

$$= ₹1020$$

Again, the selling price of the article after a loss of 5%

$$= 1020\times\frac{(100-5)}{100} = 1020\times\frac{95}{100} = ₹969$$

99. A trader buys 60 bags of grain at the rate of ₹400 each. If he sells 18 bags at 8% profit. To gets a total profit of 16.4% on 60 bags. On which rate he should sell remaining bags?

(a) ₹ 400 (b) ₹ 480
(c) ₹ 540 (d) ₹ 520

RRB ALP CBT-2 Electrician 23-01-2019 (Shift-I)

Ans. (b) : Total cost price = ₹ 400×60 = ₹ 24000

$$\text{Selling price of 18 bags} = \left(400 + 400\times\frac{8}{100}\right) = ₹432$$

Let the selling price of the remaining bags to make a profit of 16.4% = ₹ x
According to the question,

$$432\times18 + x\times(60-18) = 24000 + 24000\times\frac{16.4}{100}$$

$$42x + 7776 = 24000 + 3936$$

$$42x = 27936 - 7776$$

$42x = 20160$

$x = 480$

So to make a profit of 16.4% of each bag, the rest of the bags should sell at a cost of 480 Rs.

Type - 4

100. Himani bought a washing machine for ₹8000 and spent ₹500 on its repairs. She sold it at 20% profit with the money she got by selling it, she bought another washing machine and sold it at 10% loss. What is her overall loss / profit?

(a) Profit ₹640 (b) Loss ₹640

(c) Profit ₹680 (d) Loss ₹600

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (c) : Total Cost Price of first washing machine

$= 8000 + 500$

$= ₹8500$

Profit on first washing machine $= 8500 \times \frac{20}{100}$

$= ₹1700$

$SP_1 = CP_1 + Profit$

$= 8500+1700$

$= ₹10200$

Loss on second washing machine $= CP_2 \times \frac{10}{100}$

$= 10200 \times \frac{10}{100}$

$= ₹1020$

Because, Selling Price of first washing machine (SP_1) = Cost Price of second washing machine (CP_2)

$\therefore \quad SP_2 = CP_2 - Loss$

$= 10200 - 1020$

$= ₹9180$

Overall Profit of Himani $= SP_2 - CP_1$

$= 9180 - 8500$

$= ₹680$

101. Arvind bought 120 m cloth for ₹ 15000. He sold 45% of it at a gain of 40%, 25% of it at a loss of 10% and the remaining cloth at the cost price. His profit (in ₹) in the entire transaction is–

(a) ₹ 4075 (b) ₹ 2325

(c) ₹ 4180 (d) ₹ 2035

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (b) : Cost price of cloth = ₹15000

Selling price of 45% part of cloth $= 15000 \times \frac{45}{100} \times \frac{140}{100}$

$= ₹9450$

Selling price of 25% part $= 15000 \times \frac{25}{100} \times \frac{90}{100}$

$= ₹3375$

Selling price of remaining 30% part of cloth

$= 15000 \times \frac{30}{100} \times \frac{100}{100}$

$= ₹4500$

Profit = Selling price – Cost price

$= (9450 + 3375 + 4500) - 15000$

$= 17325 - 15000$

$= ₹ 2325$

102. A man sold a shirt for ₹960, at loss of 4%. He sells a sweater for ₹840 at a profit of 20%. Find his net profit or loss.

(a) Profit, ₹100 (b) Loss, ₹123

(c) Loss, ₹100 (d) Profit, ₹123

RRB Group-D 02/09/2022 (Shift-II)

Ans. (a) : Let the cost of shirt and sweater be x and y respectively.

According to the question,

$x \times \frac{96}{100} = 960$

$x = ₹ 1000$

$y \times \frac{120}{100} = 840$

$y = ₹ 700$

So his net profit $(960 + 840) - (1000 + 700)$

$= 1800 - 1700 = 100$

103. A table and a swing were sold for ₹ 9,936 each. The table was sold for a profit of 8% and the swing was sold for a loss of 8%. What is the gain or loss percentage in the whole transaction?

(a) 2% profit (b) 0.64% loss

(c) 0.64% profit (d) No profit no loss

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (b) : There is always loss in such transactions

Required loss% $= \frac{x^2}{100}$

$= \frac{(8)^2}{100}$

$= \frac{64}{100}$

$= 0.64\%$

104. A person bought articles A and B for a total of ₹ 2312. He sold A at a loss of 16°% and sold B at a gain of 20%. The selling prices of A and B were the same. What was the difference between the cost prices of A and B ?

(a) ₹ 408 (b) ₹428

(c) ₹ 420 (d) ₹ 416

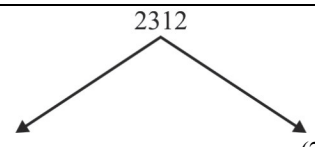
RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (a) : Given,

Cost price (C.P.) of article A and B = 2312

and He sold A and B at 16% loss and 20% profit respectively.

According to the question,



CP of A CP of B

$$\frac{x\times(100-16)}{100}=\frac{(2312-x)\times120}{100}$$

$$\frac{x\times84}{100}=\frac{(2312-x)\times120}{100}$$

$7x = 23120 - 10x$

$17x = 23120$

$$x=\frac{23120}{17}=1360$$

CP of A (x) = ₹1360

CP of B = 2312 – 1360 = ₹ 952

Difference between cost price of A and B

= 1360 – 952

= ₹408

105. X purchases a car at ₹150000 and then sold it to Y at a profit of 5%. Y later sold it back to X at a loss of 2%. Find the overall profit or loss for X in the entire transaction.

(a) X loss ₹4,350 (b) X gain ₹3,150

(c) X gain ₹4,350 (d) X gain ₹4,500

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

X will sell the car to Y after taking 5% profit

$$=15,0000\times\frac{105}{100}=₹\ 1,57,500$$

Now according to the question Y will sell it back to X at a loss of 2%.

$$=157500\times\frac{98}{100}=₹\ 154350$$

Thus X sells the car to Y for Rs. 157500 and buys it again for ₹ 154350. So the profit for X in the whole transaction is :

= 157500 – 154350 = ₹ 3150

106. A motor car worth ₹ 2,00,000/- is sold by Ramu at 5% profit to Rahul. Rahul sells the motor car back to Ramu at 2% loss. Ramu's net profit (in ₹) in complete transaction is:

(a) ₹ 3,208 (b) ₹ 2,058

(c) ₹ 4,200 (d) ₹ 3,200

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

Price of motor car = ₹ 200000

Selling price of motor car for Ramu

= Cost price of motor car for Rahul

$$=200000\times\frac{105}{100}=₹\ 210000$$

Selling price of motor car for Rahul = Cost price of motor car for Ramu

$$=210000\times\frac{98}{100}=₹\ 205800$$

In the whole transaction profit of Ramu

= 210000–205800 = ₹4200

107. The cost price of a car was ₹1,50,000. It was sold by X at a profit of 5% to Y. It was later sold back to X by Y at a 1% loss. Find X's profit in the entire transaction.

(a) ₹4000 (b) ₹3,150

(c) ₹4500 (d) ₹1,575

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (d) : Cost price of car = ₹ 1,50,000

X will sell the car to Y after taking 5% profit = ₹ 105% of 1,50,000

$$=150000\times\frac{105}{100}$$

= ₹ 157500

Now according to the question Y will sell it back to X at a loss of 1%

$$=\frac{99}{100}\times157500$$

= ₹ 155925

Hence profit of X = 157500 – 155925

= ₹1575

108. The set of 2 pants and 4 shirts or 1 pant and 6 shirts costs ₹ 5,600. A shopkeeper decides to sell them separately. He sold 10 shirts for ₹ 6,000. Find the loss or profit on each shirt.

(a) Profit ₹1000 (b) Loss ₹1000

(c) Profit ₹100 (d) Loss ₹100

RRB RPF SI -12/01/2019 (Shift-II)

Ans : (d) 2P + 4S = 5600 ……(i) Where S = Shirt

1 P + 6S = 5600……..(ii) P = Pant

On multiplying by 2 in equation (ii)

2P + 4 S = 5600

$\underline{-2P + -12S = -11200}$ and

8S = 5600

1 S = 700

∴ So, the cost price of 1 shirt = ₹700

And the selling price of 10 shirt = 6000

$$\therefore \text{ So, the selling price of 1 shirt } =\frac{6000}{10}=₹600$$

∴ Loss = 700 – 600 = ₹100

109. An item was sold at a profit of 12.5% for ₹ 2250. What was the amount of profit?

(a) ₹275 (b) ₹250

(c) ₹225 (d) ₹300

RRB NTPC 05.04.2016 Shift-1

Ans : (b) Given-

Selling price = ₹2250

Profit = 12.5%

$$\therefore \text{ Cost price } =\frac{\text{Selling price}\times100}{(100+12.5)}$$

$$=\frac{2250\times100}{112.5}=₹2000$$

So, the amount of profit = Selling price – Cost price

= 2250 – 2000 = ₹250

110. If Reena sells 12 mobile phones for ₹ 1,88,160, whose cost price is ₹ 14056 per phone, then how much total profit he earned?

(a) ₹19,488 (b) ₹17,621
(c) ₹21,014 (d) ₹18, 958

RRB NTPC 29.03.2016 Shift : 1

Ans : (a) The selling price of 12 mobiles = ₹ 188160
The total cost price of 12 mobile phones
$= ₹12 \times 14056 = 168672$
Total profit earned by Reena $= 188,160 - 168,672$
$= ₹\ 19,488$

111. The MRP of a clock is ₹ 4750 and a discount of 12% is given on its sale. If the shopkeeper has bought it for ₹ 3850 then what will be its profit?

(a) ₹240 (b) ₹570
(c) ₹900 (d) ₹330

RRB NTPC 28.03.2016 Shift : 2

Ans : (d) MRP = ₹ 4750, Cost price = ₹ 3850
Discount % = 12%

$$\text{Selling price (SP)} = \frac{\text{MRP} \times (100 - \text{discount}\%)}{100}$$

$$\text{SP} = \frac{4750 \times (100 - 12)}{100}$$

$$\text{SP} = \frac{4750 \times 88}{100} = 4180$$

Profit = SP – CP = 4180 – 3850 = ₹330

112. Jiva bought an item for ₹ 2500 and sold it at 25% above the cost price and paid ₹ 125 on it. Find the profit is in ₹?

(a) ₹500 (b) ₹550
(c) ₹475 (d) ₹625

RRB NTPC 18.01.2017 Shift : 2

Ans : (a) $\left[\text{Selling price} = \text{Cost price} \times \frac{(100 \pm \text{P/L})}{100}\right]$

$$\text{Selling price} = \frac{2500 \times 125}{100} = 3125$$

Profit = Selling price − (Cost price + Tax)
Profit = 3125– (2500+125)
Profit = 3125–2625 = 500

Type - 5

113. When the cost price of x articles is equal to selling price of y articles, the profit is 25% then find the ratio of x : y.

(a) 4 : 5 (b) 5 : 4
(c) 5 : 3 (d) 3 : 3

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,
C.P. of x articles (CP) = S.P. of y articles (SP)

$$\frac{SP}{CP} = \frac{x}{y}$$

Given, $\frac{SP}{CP} = \frac{125}{100} = \frac{5}{4}$

Hence, $\frac{x}{y} = \frac{5}{4}$

Hence, ratio of x and y are 5 : 4.

114. On selling an item at a profit of 4% and 10%, there is a difference of ₹3 in selling price then, the ratio of the selling price of both is:

(a) 52:55 (b) 51:55
(c) 34:35 (d) 55:52

RRB RPF SI -11/01/2019 (Shift-II)

Ans :(a) Let the cost price of the item = ₹ x.
According to the question,

$$\frac{x \times 110}{100} - \frac{x \times 104}{100} = 3$$

$$110x - 104x = 300$$

$$6x = 300$$

Cost price = 50

The selling price at a profit of 4% $= \frac{50 \times 104}{100} = 52$

The selling price at a profit of 10% $= \frac{50 \times 110}{100} = 55$

The required ratio = 52 : 55

115. If the loss is 15%, then find the ratio of the cost price and the selling price.

(a) 17 : 20 (b) 15 : 17
(c) 10 : 9 (d) 20 : 17

RRB JE - 27/06/2019 (Shift-I)

Ans : (d) Let the cost price of the item = ₹ x.

Loss = 15%

$$\text{Selling price} = \text{Cost price} \times \frac{(100 - \text{Loss})}{100}$$

$$= x \times \frac{100 - 15}{100}$$

$$= x \times \frac{85}{100} = \frac{17x}{20}$$

Cost price : Selling price

$$x : \frac{17x}{20}$$

20 : 17

116. The difference of selling prices of an item on the basis of profit of 8% and 12% is ₹ 3. The ratio of the selling prices of both the items is:

(a) 27 : 28 (b) 27 : 29
(c) 29 : 31 (d) 27 : 31

RRB NTPC 17.01.2017 Shift-3

Ans : (a) Let the cost price of the item = ₹ x.
The difference of selling prices = ₹ 3
According to the question,

$$x \times \frac{112}{100} - x \times \frac{108}{100} = 3$$

$$\frac{4x}{100} = 3, \quad x = \frac{300}{4} = 75$$

So, the required ratio $= 75 \times \frac{108}{100} : 75 \times \frac{112}{100}$
$= 108 : 112 = 27 : 28$

117. On selling an item at a profit of 4% and 12%, there is a difference of ₹3 in selling price then, the ratio of the selling price of both the items is:

(a) 13:14 (b) 13:15
(c) 12:15 (d) 13:53

RRB NTPC 26.04.2016 Shift : 3

Ans : (a) Let the cost price of the item = ₹ x.
The difference of selling prices = ₹ 3
According to the question,,

$$= \frac{112x}{100} - \frac{104x}{100} = 3$$

$$\therefore \quad 8x = 300 \Rightarrow x = \frac{300}{8}$$

$$\text{Ratio of selling price} = \frac{104x}{100} : \frac{112x}{100}$$

$$= \frac{104}{100} \times \frac{300}{8} : \frac{112}{100} \times \frac{300}{8}$$

$$= 104 : 112 = 13 : 14$$

118. Vishnu spends ₹5000 to buy 12 tables and some chairs. The cost of one table is ₹50 and that of the one chair is ₹40. What is the ratio of the numbers of the chairs to the number of tables purchased ?

(a) 5 : 2 (b) 55 : 6
(c) 5 : 1 (d) 55 : 4

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (b) Total expenditure = ₹ 5000
A table costs = ₹ 50
The price of 12 tables = ₹ 50×12 = 600
Rest amount =5000–600= ₹ 4400
A chair costs = ₹ 40

$$\text{The number of purchased chairs} = \frac{4400}{40} = 110$$

The required ratio = 110 : 12
= 55 : 6

Type - 6

119. A shopkeeper sold two toys for ₹990 each. On first toy he gained 10% and on the second he lost 10%. Find the total percentage gain or loss.

(a) 10% Loss (b) 10% Gain
(c) 1% Loss (d) 1% Gain

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (c) : Selling price of the toys = 990 + 990
= ₹ 1980

According to the question,

$$\text{Cost price of the toys} = 990 \times \frac{100}{110} + 990 \times \frac{100}{90}$$

= 900 + 1100
= ₹2000

$$\text{Loss \%} = \frac{2000 - 1980}{2000} \times 100$$

$$= \frac{20}{2000} \times 100 = 1\%$$

120. A business man sold two flats for ₹8,25,000 each. On one he gains 9% while on the other he loses 9%. Then how much is his gain or loss in the whole transaction?

(a) 0.75% profit (b) 0.81% loss
(c) 0.96% profit (d) 0.18% loss

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (b) : If on selling two articles at the same price there is a loss of x% on one and a profit of x% on the other then the loss percentage in the whole transaction is–

$$\text{Loss\%} = \frac{x^2}{100}$$

Then in the given question the percentage loss in the whole transaction.

$$= \frac{(9)^2}{100} = \frac{81}{100} = 0.81\% \text{ loss}$$

121. A dealer sells a table for ₹ 400 making a profit of 25%. He sells another table at a loss of 10% and on the whole transaction he makes neither profit nor loss. How much (in ₹) did the second table cost for him?

(a) 750 (b) 700
(c) 800 (d) 850

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the cost price of the second table (CP_2) = ₹ x
According to the question –

$$400 - 400 \times \frac{100}{125} = x - x \times \frac{90}{100}$$

$$\therefore \ 400 + x \times \frac{90}{100} = 400 \times \frac{100}{125} + x$$

$$400 + \frac{9x}{10} = 320 + x$$

$$80 = \frac{x}{10} \Rightarrow \ \therefore \ x = ₹\ 800$$

122. Ram Kumar bought two LED TV sets for ₹41000. By selling one at a profit of 20% and the other at a loss of 15%, he found that the selling prices of both the TV sets are the same. Find his overall gain or loss.

(a) ₹ 400 profit (b) ₹ 200 loss
(c) ₹ 200 profit (d) ₹ 400 loss

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let cost price of LED is x.
$\therefore$ Cost price of the other LED TV = ₹ (41000 – x)
According to the question

$$x \times \frac{120}{100} = (41000 - x) \times \frac{85}{100}$$

$$\frac{6x}{5} = (41000 - x) \times \frac{17}{20}$$

$$24x = 41000 \times 17 - 17x$$

$$41x = 41000 \times 17$$

$$x = ₹17000$$

Total selling price $= 17000 \times \frac{120}{100} + 24000 \times \frac{85}{100}$

$= 20400 + 20400$

$= ₹\,40800$

Loss $= 41000 - 40800$

$= ₹\,200$ loss

123. Two items whose cost price is ₹ 2500 each, one is sold at a profit of 5%. If the total profit is 20%, then find the profit on second item.

(a) 20% (b) 25%

(c) 30% (d) 35%

RRB JE - 01/06/2019 (Shift-III)

Ans. (d) Let the second item is sold on x% profit.

According to the question,,

$2500 \times \frac{(100+5)}{100} + 2500 \times \frac{(100+x)}{100} = 5000 \times \frac{(100+20)}{100}$

$25 \times 105 + 25\,(100 + x) = 50 \times 120$

$2625 + 2500 + 25x = 6000$

$25x = 6000 - 5125$

$25x = 875$

$x = 35\%$

124. A trader sells a shirt at 6% less amount than the printed price. He fixed the printed price 15% more than the cost price. What is the profit % earned by the trader?

(a) 8.1% (b) 21%

(c) 13.5% (d) 9%

RRB JE - 20/05/2019 (Shift-I)

Ans. (a) : According to the question,,

The profit earned by the trader $= x + y + \frac{xy}{100}$

$= -6 + 15 + \frac{-6 \times 15}{100} = 9 + \frac{-90}{100} = 9 - 0.9 = 8.1\%$

125. A horse and a cow were sold for ₹ 12000 each. The horse was sold at 20% profit and the cow at 10% loss. What is the loss/profit on both deals (up to 2 digits of decimal)?

(a) Profit of ₹1000 Profit

(b) Loss of ₹1000

(c) Profit of ₹666.67

(d) No profit and no loss

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (c) The cost price of the horse

$= \text{Selling price} \times \frac{100}{100 + \text{Profit}\%}$

$= 12000 \times \frac{100}{(100+20)} = ₹10000$

The cost price of cow $= 12000 \times \frac{100}{(100-10)}$

$= 12000 \times \frac{100}{90} = ₹13333.33$

Hence, profit = (12000+12000)–(10000+13333.33)

= 24000 – 23333.33 = ₹666.67

126. A shopkeeper cheats up to 7% by using under-weight in buying and selling fruits, then his total profit percentage is:

(a) 14.25 (b) 14.49

(c) 14.75 (d) 14.55

RRB NTPC 07.04.2016 Shift : 2

Ans : (b) Profit % $= \left(2x + \frac{x^2}{100}\right)\%$

$= 2 \times 7 + \frac{(7)^2}{100}$

$= 14 + \frac{49}{100} = 14 + 0.49 = 14.49\%$

Type - 7

127. A vendor sells 15 lemons for 3 rupees gaining 60%. How many did he buy for a rupee?

(a) 7 (b) 8

(c) 10 (d) 9

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) : Selling price of one lemon = $₹\frac{3}{15} = ₹\frac{1}{5}$

Cost price of one lemon = $\frac{100}{160} \times \frac{1}{5} = \frac{1}{8}$

Hence, he bought 8 lemons for a rupee.

128. A man buys 15 identical articles for a total of ₹ 15. If he sells each of them for ₹ 1.23, then his profit percentage is:

(a) 23% (b) 50%

(c) 32% (d) 8%

RRB Group-D 18/08/2022 (Shift-II)

Ans. (a) : According to the question -

Cost price of 15 articles = ₹15

Cost price of 1 articles = ₹1

Selling price of 1 articels = ₹1.23

% profit $= \frac{1.23 - 1}{1} \times 100$

$= 0.23 \times 100$

$= 23\%$

129. A shopkeeper uses a weight of 950 gm instead of 1 kg sells the articles at the marked price, which is 15% above the cost price. What is his profit percentage?

(a) $23\frac{7}{19}\%$ (b) $20\frac{5}{19}\%$

(c) $21\frac{1}{19}\%$ (d) $22\frac{3}{19}\%$

RRB Group-D 30-08-2022 (Shift-II)

Ans. (c) : Let, cost price of 1 gram of article = ₹1

$\therefore$ CP of 1000g = ₹1000

And, CP of 950g of article = ₹950

According to the question,

SP of article $= \frac{1000 \times 115}{100} = ₹1150$

Required Profit % = $\frac{(1150-950)}{950}\times 100$

$=\frac{200}{950}\times 100 \Rightarrow \frac{400}{19}$

$\Rightarrow 21\frac{1}{19}\%$

130. A dishonest dealer professes to sell his goods at the cost price but uses a false weight and thus gains 25%. How much quantity of grains does he give for a kilogram?

(a) 800 gram (b) 900 gram

(c) 750 gram (d) 975 gram

RRB Group-D 23/08/2022 (Shift-II)

Ans. (a) : Let the amount of grain be x grams.

According to the question -

$$\frac{25}{100}=\frac{1000-x}{x}$$

$x = 4000 - 4x$

$$x=\frac{4000}{5}$$

$x = 800$ gm

131. A shopkeeper allows 4% discount on his marked price. If the cost price of an article is ₹120 and he has to make a profit of 10%, then his marked price must be :

(a) ₹120.50 (b) ₹137.50

(c) ₹117.50 (d) ₹127.50

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) : Let marked price = ₹x

According to the question,

$$x\times\frac{96}{100}=120\times\frac{110}{100}$$

$$x=\frac{1100}{8}$$

$x = ₹137.50$

132. Hrithik sells a table at a profit of 37.5%. If he had bought it at 12.5% less and sold it for ₹330 less, he would have gained 10%. The cost price of the table is what percentage less than ₹1000?

(a) 21% (b) 20%

(c) 23% (d) 22%

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : Let cost price (CP) of the table = ₹x

Selling Price (SP) of the table $=\frac{x\times 137.5}{100}$

$= ₹\ \frac{11x}{8}$

According to the question,

Cost price of item on buying 12.5 % less $=\frac{x\times 87.5}{100}$

$= ₹\frac{7x}{8}$

New selling price of the table $= \left(\frac{11x}{8}-330\right)$

Again, according to the question,

Profit = SP – CP

$$\left(\frac{11x}{8}-330\right)-\frac{7x}{8}=\frac{7x}{8}\times\frac{10}{100}$$

$$\frac{11x-2640}{8}=\frac{7x}{8}+\frac{7x}{80}$$

$$\frac{11x-2640}{8}=\frac{70x+7x}{80}$$

$110x–26400 = 70x+7x$

$33x = 26400$

$x = ₹\ 800$

Hence,

Required % = $\frac{1000-800}{1000}\times 100 = 20\%$

133. A dishonest dealer professes to sell his goods at cost price but uses a false weight and thus gains 20%. For a kilogram he uses a weight of how many grams?

(a) 750.5 gm (b) 708.06 gm

(c) 833.33 gm (d) 785.5 gm

RRB Group-D 26/08/2022 (Shift-III)

Ans. (c) : Given, Profit% = 20%

Let the dealer purchases 1000 gm at Rs. 1000

Let the dealer sell N gm at Rs. 1000

then,

$\Rightarrow \quad 20 = \frac{1000-N}{N}\times 100$

$\Rightarrow \quad 6N = 5000$

$\Rightarrow \quad N = 833.33$

Hence, he uses weight of 833.33 gm.

134. A dealer buys 200 quintals of wheat at ₹1,200 per quintal. He spends ₹10,000 on transportation and storage. If he sells the wheat at ₹13 per kg, then the profit percentage of the dealer is:

(a) 1% (b) 3%

(c) 2% (d) 4%

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (d) : ∵ Cost price of wheat

$= 1200\times 200+10000 = ₹\ 2,50,000$

∵ Total selling price at ₹13 per kg.

$=13\times 200\times 100 = ₹\ 2,60,000$

Profit % $= \frac{260000-250000}{250000}\times 100$

$= \frac{10000}{250000}\times 100 = 4\%$

135. Rahim purchased 20 kg of oranges at the rate of ₹45/kg and sold them at the rate of ₹54/kg. During this period 1.5 kg oranges got spoiled. He sold the spoiled oranges at the rate of ₹10/kg. His net gain or loss percent is?

(a) 14% loss (b) 14% gain

(c) $12\frac{2}{3}\%$ gain (d) $12\frac{2}{3}\%$ loss

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (c) : Amonut spent by Rahim to buy 20 kg of oranges at the rate of ₹45/kg = 45 × 20 = ₹900

Amount received on selling 18.5 kg of oranges at the rate of ₹54/kg = 54 × 18.5 = 999

Amount received on selling 1.5 kg of spoiled oranges at the rate of ₹10/kg = 1.5× 10 = 15

Total selling price = 999 + 15 = ₹1014

Profit = Selling price − Cost price

= 1014 – 900 = 114

$\text{Profit\%} = \frac{114}{900}\times 100 = \frac{38}{3}\% = 12\frac{2}{3}\%$

136. A vendor sells 10 oranges for ₹1 and gains 30%. How many oranges did he buy for ₹1?

(a) 11 (b) 7

(c) 13 (d) 9

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given:

Selling price of ten oranges = ₹1

Selling price of one orange $= ₹\frac{1}{10}$

Cost price of one orange $= \frac{1}{10}\times\frac{100}{(100+30)}$

$= \frac{1}{10}\times\frac{100}{130} = \frac{1}{13}$

Number of oranges bought in one rupee $= \frac{1}{\frac{1}{13}}$

= 13

137. A vendor bought bananas at the rate of 6 for ₹10 and sold them at the rate of 4 for ₹6. What is the percentage gain or loss?

(a) 20% (b) 10%

(c) 90% (d) 30%

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (b) : Cost price of 6 bananas = ₹10

Cost of 1 banana $= ₹\frac{10}{6}$

Selling price of 4 bananas = ₹6

Selling price of 1 banana $= ₹\frac{6}{4}$

Profit/Loss = Selling price – Cost price

$= \frac{6}{4}-\frac{10}{6} = \frac{18-20}{12} = \frac{-2}{12}$

$= -\frac{1}{6}$ $\{\because (-)\text{sign denotes loss}\}$

$\therefore \text{Loss\%} = \frac{\frac{1}{6}}{\frac{10}{6}}\times 100 = \frac{1}{6}\times\frac{6}{10}\times 100 = 10\%$

138. A retailer buys a bag contains 54 kg oranges at ₹25 per kg. Later upon sorting he finds that 4 kg oranges are rotten, he throws them and sells the remaining ones at ₹36 per kg. Find his profit percent.

(a) $33\frac{1}{3}\%$ (b) 40%

(c) 25% (d) 30%

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (a) : Given-

Cost price of oranges = 25 ₹/kg

Cost price of 54 kg oranges = 54×25 = ₹1350

After 4 kg oranges are rotten the remaining oranges = 54 – 4 = 50kg

Selling price of the remaining oranges = 36 ₹/kg

Price obtained on selling 50 kg of oranges = 50×36 = ₹1800

Profit = 1800–1350 = ₹450

Percentage profit $= \frac{450\times 100}{1350} = \frac{3\times 100}{9}$

$= 33\frac{1}{3}\%$

139. A man buys 20 articles for ₹16 and sells them at the rate of ₹1.50 per article. What is his gain in percentage?

(a) 87.5% (b) 86.5%

(c) 85.5% (d) 84.5%

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : From question,

Cost price of 20 articles = ₹16

$\therefore$ Cost price of 1 article $= \frac{16}{20} = ₹0.8$

Given, Selling price of an article = ₹1.50

Profit = Selling price – Cost price

= 1.5 – 0.8

= ₹0.7

Profit % $= \frac{0.7}{0.8}\times 100\%$

$= \frac{7}{8}\times 100\%$

= 87.5 %

140. Sabiha purchased 240 cups for her shop at ₹8 each. During transportation, 24 cups got damaged, and she sold the remaining cups at ₹12 each. Find her overall percentage profit.

(a) 45% (b) 30%

(c) 40% (d) 35%

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : Cost price of 240 cups at the rate of ₹8 per cup

= 240 × 8 = ₹1920

$\because$ 24 cups were damaged

Remaining cups = 240 – 24 = 216

Selling price of 216 cups at the rate of ₹12 per cup

$= 216 \times 12$

$= ₹2592$

$\because \quad \left(P\% = \frac{SP - CP}{CP} \times 100\right)$

Hence, Profit % $= \frac{2592 - 1920}{1920} \times 100\%$

$= \frac{67200}{1920} = 35\%$

141. A shopkeeper sold some articles at ₹77/- each and earned a profit of 40%. What would be the selling price of each article if the profit is 6%

(a) ₹59.75 (b) ₹60.40

(c) ₹62.50 (d) ₹58.30

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (d) : Sells an article at the rate of ₹77 each.

Selling price = ₹140% of C.P.

$140\% = ₹77$

$1\% = \frac{77}{140}$

$100\% = \frac{77}{140} \times 100$

Cost price = ₹55

Now the article has to be sold for 106% to get 6%, profit.

$100\% = ₹55$

$1\% = \frac{55}{100}$

$106\% = \frac{55}{100} \times 106$

$= ₹58.30$

The selling price of each atricle will be ₹58.30

142. A man bought a number of apples at 5 for ₹50 and equal number at 6 for ₹50. If he sells them at 11 for ₹100. What would be his percentage profit or loss?

(a) $\frac{100}{121}$% loss (b) $\frac{100}{121}$% profit

(c) $\frac{121}{100}$% profit (d) $\frac{121}{100}$% loss

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (a) : Cost price of 1 apple bought at the rate of 5 in

$₹50 = ₹\frac{50}{5}$

Cost price of 1 apple bought at rate of 6 in $₹50 = ₹\frac{50}{6}$

Cost price of two apples (one rate of 5 + one rate of 6)

$= \frac{50}{5} + \frac{50}{6} = ₹\frac{55}{3}$

$\therefore$ Cost price of 1 apple $= \frac{55}{2 \times 3}$

$= ₹ (55/6)$

Selling price of 1 apple $= ₹ (100/11)$

$\Rightarrow \therefore$ Loss% $= \frac{\frac{605 - 600}{66}}{(55/6)} \times 100$

$\Rightarrow$ Loss% $= \frac{100}{121}\%$

143. A man purchased 20 dozen mangoes for ₹1,000. Out of these, 40 mangoes were rotten and could not be sold. At what rate per dozen should he sell the remaining mangoes to make a profit of 30%?

(a) ₹78 (b) ₹80

(c) ₹72 (d) ₹70

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (a) : Cost price of 20 dozen mangoes = ₹ 1000

20 dozens $= 20 \times 12 = 240$ mangoes

Remaining mangoes $= 240 - 40 = 200$

Selling price of 1 mango at 30% profit

$= \frac{1000}{200} \times \frac{130}{100} = \frac{13}{2}$

Selling price of 1 dozen mango at 30% profit

$= \frac{13}{2} \times 12 = ₹78$

144. A man buys 5 pens for ₹ 1 and sells 4 pens for ₹ 1. Find his profit %.

(a) 25% (b) 40%

(c) 50% (d) 20%

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (a) The cost price of a pen $= ₹ \frac{1}{5}$

And the selling price of a pen $= ₹ \frac{1}{4}$

Profit $= \frac{1}{4} - \frac{1}{5} = \frac{1}{20}$

Profit % $= \frac{\frac{1}{20}}{\frac{1}{5}} \times 100$

$= \frac{5}{20} \times 100 = 5 \times 5 = 25\%$

145. A man sold two bicycles at a total profit of 20%. If he had bought them for ₹ 3500 each and the first one sold them at a profit of 5%, then what is the profit % he should have from the second?

(a) 20% (b) 35%

(c) 25% (d) 30%

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (b) Total cost price = 3500 + 3500 = ₹ 7000

Selling price at a profit of 20% $= 7000 \times \frac{120}{100} = ₹ 8400$

Selling price of first bicycle at a profit of 5%

$= 3500 \times \frac{105}{100}$

$S.P._I = ₹3675$

Hence, the selling price of second bicycle = 8400 – 3675 = ₹4725

Profit $= 4725 - 3500$
$= ₹\ 1225$
Profit $\% = \frac{1225}{3500} \times 100$
Profit $\% = 35\%$

146. A shopkeeper sold 6 radios at a loss of 20%. Find the profit which he should sell the television, so that he can be at overall zero loss. The cost price of the television is three times that of each radio.
(a) 40% (b) 50%
(c) 30% (d) 60%

RRB RPF Constable -19/01/2019 (Shift-II)

Ans : (a) Let the cost price of a radio = ₹ 100
So, the cost price of the 6 radios = ₹ 600
According to the question,
Selling price $= 600 \times \frac{80}{100} = \boxed{₹\ 480}$
$\therefore$ Loss $= 600 - 480$
$= ₹\ 120$
The cost price of a television $= 3 \times$ (The cost of a radio)
$= 3 \times 100$
$= ₹\ 300$
Let the required profit % = x %, then
$300 \times \frac{x}{100} = 120$
$3x = 120$
$x = 40\%$

147. Pens are bought at the rate of 8 for ₹ 40 and sold at 6 for ₹ 40. Find the loss or profit %.
(a) Profit of 40% (b) Profit of 33.33%
(c) Loss of 30% (d) Profit of 20%

RRB JE - 24/05/2019 (Shift-I)

Ans : (b) The cost price of a pen $= \frac{40}{8} = ₹5$
The selling price of a pen $= \frac{40}{6} = ₹\frac{20}{3}$
$\therefore$ Profit % $= \frac{\left(\frac{20}{3} - 5\right)}{5} \times 100 = \frac{5}{3 \times 5} \times 100 = 33.33\%$

148. 10 dozen of chocolates are purchased at the rate of ₹ 10 per dozen and sold at the rate of ₹ 2 per piece. If the merchant had to spends ₹ 50 on rent then, find the percentage profit.
(a) 60% (b) 18%
(c) 50% (d) 40%

RRB JE - 26/06/2019 (Shift-I)

Ans : (a) Let the cost price of 1 dozen chocolates = ₹ 10
So, the cost price of 10 dozen of chocolates = 10 × 10 = ₹ 100
And including the rent = 100 + 50 = ₹ 150
The number of chocolates in a dozen = 12
So, the number of chocolates in 10 dozen $= 12 \times 10 = 120$
The selling price of 1 chocolate = ₹ 2
So, the selling price of 120 chocolates = 120 × 2 = ₹ 240
Profit = Selling price − Cost price = 240 − 150 = 90
Profit $\% = \frac{\text{Profit}}{\text{Cost price}} \times 100 = \frac{90}{150} \times 100 = 6 \times 10 = 60\%$

149. A person buys apples at the rate 8 for of ₹ 34 for 8 and sells them at the rate of 12 for ₹ 57. How many apples will he have to be sold to earn a net profit of ₹45?
(a) 90 (b) 150
(c) 100 (d) 135

RRB JE - 02/06/2019 (Shift-III)

Ans : (a) The cost price of 1 apple = 34/8 = ₹ 4.25
The selling price of 1 apple = 57/12 = ₹ 4.75
Profit = Selling price − Cost price
$= 4.75 - 4.25 = ₹0.50$ or ₹1/2
So, the profit on 1 apple is ₹ 1/2
₹ 1/2 = 1 apple
₹1 = 2 apple
₹45 = 45 × 2 = 90 Apples
Hence, he has to sell 90 apples to get a net profit of ₹45.

150. A seller buys a dozen of pencils for ₹ 25 and sells at the rate of 5 pencils for ₹ 12 for. Find the percentage of Profit or loss?
(a) 15% Loss (b) 15.2% Loss
(c) 15.2% Profit (d) 15% Profit

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (c) ∵ The cost price of 12 pencils = ₹ 25
So, the cost price of 1 pencil = ₹ 25/12
∵ The selling price of 5 pencils = ₹ 12
So, the selling price of 1 pencil = ₹ 12/5
So, the required profit $\% = \frac{\frac{12}{5} - \frac{25}{12}}{\frac{25}{12}} \times 100$
$= \frac{\frac{144 - 125}{60}}{\frac{25}{12}} \times 100 = \frac{19}{60} \times \frac{12}{25} \times 100 = 15.2\%$

151. A person bought 3 oranges for ₹ 1 and 2 oranges for ₹ 1. On which amount will he have sold each dozen to earn a profit of 20%?
(a) ₹ 8 (b) ₹ 18
(c) ₹ 10 (d) ₹ 6

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (d) ∵ The price of 3 oranges = ₹ 1
The price of 1 orange = ₹ 1/3
∵ The price of 2 oranges = ₹ 1
The price of 1 orange = ₹ 1/2
So, the price of the mixture of 2 oranges $= \frac{1}{3} + \frac{1}{2} = \frac{5}{6}$
The price of the mixture of 1 orange $= \frac{5}{12}$
The price of 1 orange at the profit of 20% $= \frac{5}{12} \times \frac{120}{100}$
The price of 1 orange $= ₹\frac{1}{2}$
So, the price of 12 oranges at the profit of 20% = ₹ 6

152. A boy buy eggs at the rate of ₹ 16 per 18 eggs and sells them at the rate of ₹ 20 per 22 eggs. What is his profit/loss percentage?

(a) $\frac{23}{11}$% Profit (b) $\frac{23}{11}$% Loss

(c) $\frac{25}{11}$% Profit (d) $\frac{78}{11}$% Loss

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (c) The cost price of an egg = ₹$\frac{16}{18}$

The selling price of an egg = ₹$\frac{20}{22}$

$$\text{Profit} = \frac{20}{22} - \frac{16}{18} \qquad (\text{Profit} = \text{SP} - \text{CP})$$

$$= \frac{360-352}{18\times22} = \frac{8}{18\times22}$$

$$\text{Profit \%} = \frac{\frac{8}{18\times22}}{\frac{16}{18}} \times 100 = \frac{8\times18}{18\times22\times16}\times100$$

$$\text{Profit \%} = \frac{25}{11}\%$$

153. A man bought some oranges at a rate of 3 fruits for 1 rupee and some more oranges at the rate of 2 fruits for 1 rupee. At what price will he has to sell the oranges per dozen to get 20% profit?

(a) ₹ 5 (b) ₹ 4

(c) ₹ 10 (d) ₹ 6

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) : By first condition,

Cost price of 3 oranges of first type = ₹1

$\therefore$ Cost price of 6 oranges of first type = $\frac{1}{3}\times6$ =₹ 2

By second condition,

Cost price of 2 oranges of second type = ₹1

$\therefore$ Cost price of 6 oranges of second type = $\frac{1}{2}\times6$ =₹3

Total cost price of 12 oranges = 2 + 3 =₹ 5

Cost price of 12 oranges to earn a profit of 20%

$$= 5\times\frac{120}{100} = ₹6$$

154. The cost of 2 pencils, 4 pens and 8 erasers is. ₹12 and the cost of 8 pens, 10 pencils and 4 erasers is ₹36. What will be the cost of 3 pencils. 3 pens and 3 erasers?

(a) ₹10 (b) ₹15

(c) ₹12 (d) ₹18

RRB NTPC 02.04.2016 Shift : 3

Ans : (c) Let the cost of Pencil, Pen and Erasers are x, y and z respectively,

According to question

$$2x + 4y + 8z = 12 \text{.....(i)}$$

$$10x + 8y + 4z = 36 \text{.....(ii)}$$

$$12x + 12y + 12z = 48$$

Adding equ. (i) and (ii)

$$x + y + z = 4$$

$$\therefore 3x + 3y + 3z = 4\times3 = ₹12$$

155. When 90 chocolates are sold at ₹160 then a chocolate trader suffers a loss of 20%. In order to earn a profit of 20% how many chocolate should be sale at ₹96?

(a) 45 (b) 36

(c) 54 (d) 28

RRB NTPC 03.04.2016 Shift : 1

Ans : (b) $\because$ Selling price of 90 chocolates = ₹ 160

$\therefore$ Selling price of 1 chocolate = ₹$\frac{160}{90}$ = ₹ $\frac{16}{9}$

Cost price of 1 chocolate = $\frac{16}{9}\times\frac{100}{(100-20)}$

$$= \frac{16}{9}\times\frac{100}{80} = ₹\frac{20}{9}$$

Selling price of 1 chocolate in order to earn 20% profit.

$$= \frac{20}{9}\times\frac{100+20}{100} = \frac{20}{9}\times\frac{120}{100}$$

Selling price of 1 chocolate = $\frac{8}{3}$

No. of chocolates in ₹1 = $\frac{3}{8}$

$\therefore$ No. of chocolate in ₹96 = $96\times\frac{3}{8} = 36$

156. Vikas buy 5 bananas for ₹4 and sells 4 bananas for ₹5. Find his profit%.

(a) 55.56% (b) 53.25%

(c) 45.50% (d) 56.25%

RRB NTPC 16.04.2016 Shift : 3

Ans : (d) $\because$ Cost price of 5 bananas = ₹4

$\therefore$ Cost price of 1 banana = ₹$\frac{4}{5}$

Selling price of 4 bananas = ₹5

Selling price of 1 banana = ₹$\frac{5}{4}$

Profit = Selling price – Cost price

$$= \frac{5}{4} - \frac{4}{5} = \frac{25-16}{20}$$

$$\text{Profit} = \frac{9}{20}$$

Hence, Profit% = $\frac{9}{20}\times100\times\frac{5}{4} = \frac{225}{4}$ = 56.25%

157. A man buy 10 oranges for ₹ 3 and sells 8 for ₹ 3. Calculate his profit percentage?

(a) 20% (b) 25%

(c) 27% (d) 30%

RRB NTPC 27.04.2016 Shift : 3

Ans : (b) Cost price of 1 orange = ₹ $\frac{3}{10}$

Selling price of 1 orange = ₹ $\frac{3}{8}$

$$\text{Profit \%} = \left(\frac{\frac{3}{8}-\frac{3}{10}}{\frac{3}{10}}\times 100\right)\%$$

$$= \left(\frac{\frac{30-24}{80}}{\frac{3}{10}}\times 100\right)\%$$

$$= \left(\frac{6}{80}\times\frac{10}{3}\times 100\right)\% = 25\%$$

Type - 8

158. A shopkeeper marks his goods at a price so that allowing a discount of 20%, he still makes a profit of 8%. Find the marked price of an article which costs him ₹500.

(a) ₹765 (b) ₹875
(c) ₹575 (d) ₹675

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : Given- Cost price = ₹ 500
Discount = 20%
Profit = 8%

$$\frac{\text{Marked price}}{\text{Cost price}} = \frac{100+\text{Profit\%}}{100-\text{Discount\%}}$$

$$\frac{\text{Marked price}}{500} = \frac{100+8}{100-20}$$

$$\text{Marked price} = \frac{108}{80}\times 500$$

Marked price = ₹675

159. Rupert purchases a second-hand TV for Rs. 4,600, spend some money on its repairs, and then sells it for Rs. 5,406, thereby earning a profit of 6%. How much did Rupert spend on the repairs?

(a) ₹600 (b) ₹500
(c) ₹450 (d) ₹400

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question, let the cost to repair TV = ₹x

Cost price of TV = ₹4600 + x
Selling price of TV = ₹5406

$$\text{Profit \%} = \frac{806-x}{4600+x}\times 100$$

$$6 = \frac{806-x}{4600+x}\times 100$$

$$27600 + 6x = 80600 - 100x$$

$$106x = 53000$$

$$x = 500$$

160. What percentage of profit on cost price equals 20% of profit on selling price?

(a) 28% (b) 30%
(c) 25% (d) 22%

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) :

$$\text{Profit \%} = 20\% = \frac{20}{100} = \frac{1}{5}$$

S.P = 5 Unit
Profit = 1 Unit
C.P = 5 – 1 = 4 Unit

$$\text{Profit \% on cost price} = \frac{1}{4}\times 100 = 25\%$$

161. If the discount and percentage profit are both 20%, then by what percentage is the marked price above the cost price?

(a) 50% (b) 40%
(c) 70% (d) 60%

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) Given that
Discount = 20%
Profit % = 20%
Let, marked price = 100

$$\text{Selling Price} = \frac{100\times 80}{100} = ₹80$$

$$\text{Cost price} = \frac{\text{Selling price}\times 100}{100+\text{profit}} = \frac{80\times 100}{120} = ₹\ \frac{200}{3}$$

Marked price increased relatively to cost price

$$= 100 - \frac{200}{3} = ₹\ \frac{100}{3}$$

$$\text{Required \%} = \frac{\frac{100}{3}}{\frac{200}{3}}\times 100$$

$$\text{Required \%} = \frac{100\times 100\times 3}{3\times 200}\% = 50\%$$

162. A salesman offers 20% additional discount, after offering an initial discount of 25% on the labelled rate of a laptop. If the final sale price of the laptop is ₹18,000, then what was its labelled rate ?

(a) ₹ 35,000 (b) ₹ 40,000
(c) ₹ 30,000 (d) ₹ 28,000

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let marked price is ₹x.
According to the question,

$$x\times\frac{75}{100}\times\frac{80}{100} = 18000$$

$$\boxed{x = ₹30,000}$$

163. The cost price of 120 pens is the same as the selling price of x pens. If the profit is 25%, then the value of x is:

(a) 91 (b) 95
(c) 96 (d) 90

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (c) : Cost price of 120 pens = Selling price of x pens

$$\frac{\text{Cost price}}{\text{Selling price}} = \frac{x}{120}$$

$$\text{Profit \%} = \frac{\text{S.P.–C.P.}}{\text{C.P.}}\times 100$$

$$25 = \frac{120 - x}{x} \times 100$$
$$x = 120 \times 4 - 4x$$
$$5x = 120 \times 4$$
$$x = \frac{120 \times 4}{5}$$
$$x = 96$$

164. A weaver sells a saree at ₹150 to a shopkeeper and earns profit of 25%. The shopkeepers sold the same saree to a customer and earns a profit of 30%. If the weaver could sell the saree directly to the customer at ₹180 then what would be his profit % and what would be the customer's profit in ₹?

(a) 50%, ₹ 25 (b) 60%, ₹ 20
(c) 50%, ₹ 15 (d) 40%, ₹ 20

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (c) Cost price of the saree by the weaver (CP)

$$= 150 \times \frac{100}{125} = ₹120$$

Cost price of shopkeeper (CP) = ₹150

Selling price of shopkeeper (SP) and cost price of the customer $= 150 \times \frac{130}{100} = ₹195$

Therefore when the weaver sells directly to the customer then

$$\text{Profit \% of weaver} = \frac{180 - 120}{120} \times 100 = 50\%$$

Profit of customer = 195 - 180 = ₹15

165. John buy four old tractors for ₹2 lacs. He spent total of ₹3 lacs in maintenance and repairing. If he already sells one tractor out of four tractors for ₹1 lacs, then in order to get total 40% profit, what will be the average selling price of the all remaining 3 tractors?

(a) ₹ 1.5 lacs (b) ₹ 1.2 lacs
(c) ₹ 2 lacs (d) ₹ 2.3 lacs

RRB NTPC 19.04.2016 Shift : 3

Ans : (c) Total cost price of all 4 tractors = 2 + 3 = ₹5 lacs

To earn 40% profit, the selling price of the tractor

$$= \frac{5 \times 140}{100} = ₹7 \text{ lacs}$$

∵ One tractor is sold for ₹1 lacs

∴ Average selling price of remaining the tractors

$$= \frac{7 - 1}{3} = ₹2 \text{ lacs}$$

166. A shopkeeper sold two items, one at 25% profit and second at 15% loss and earned profit of 35. If the price of the item sold at 25% profit is twice that of item sold at 15% loss, then find the sum of the cost price of both the items.

(a) 100 (b) 400
(c) 300 (d) 200

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (c)

Let the cost price of the item sold at 25% profit = 2x

Cost of item sold at 15% loss = x

According to the question,

$$\frac{2x \times 125}{100} + \frac{x \times 85}{100} = 3x + 35$$
$$\frac{250x + 85x}{100} = 3x + 35$$
$$335x - 300x = 3500$$
$$35x = 3500$$
$$x = 100$$

Hence, cost of second item = 2x = ₹200

Hence the required sum = 100 + 200 = ₹300

167. Reema buys a car for ₹75000. She spends ₹10000 on its repairing. Later she sold this car to Cheeru at 15% profit. Cheeru sold it to Ritu at 10% profit. What sum of money was spend by Ritu to buy the car?

(a) ₹1,02,575 (b) ₹1,05,752
(c) ₹1,02,252 (d) ₹1,07,525

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (d) Price of the car bought by Reema = ₹75000

Repairing expense = ₹10000

Total cost = ₹85000

$$\text{Selling price of car (to Cheeru)} = 85000 \times \frac{115}{100} = ₹97750$$

Cost price of Cheeru = ₹97750

$$\text{Selling price of Cheeru (to Ritu)} = 97750 \times \frac{110}{100}$$
$$= ₹107525$$

Hence, the sum of money spent by Ritu to buy the car = ₹107525

168. A man buys a land for ₹3 lacs. He sells its 25% part at 25% loss and 40% part at 25% profit. In order to earn a total profit of 15% for how much money should he sell the remaining part of the land.

(a) ₹1,37,500 (b) ₹1,38,750
(c) ₹1,34,500 (d) ₹1,45,000

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (b) Total cost price = ₹3 lacs

To earn total 15% profit, the selling price

$$= 300000 \times \frac{115}{100} = 345000$$

$$\text{Cost price of part I} = 300000 \times \frac{25}{100} = 75000$$

$$\text{Selling price of part I} = 75000 \times \frac{75}{100} = 56250$$

$$\text{Cost price of part II} = 300000 \times \frac{40}{100} = 120000$$

$$\text{Selling price of part II} = 120000 \times \frac{125}{100} = 150000$$

Total selling price = Selling price–I + Selling price–II
= 56250 + 150000 = 206250

Remaining = 345000 – 206250 = ₹138750

Hence, in order to earn total 15% profit the rest part of the land has to be sold in ₹138750

08.

Discount

1. The price of an article is increased by 20% and then two successive discounts of 5% each are allowed. The selling price of the article is ..... above its cost price.

(a) 6.9% (b) 7.8%
(c) 9.2% (d) 8.3%

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Let the cost price of article = ₹ 100
According to the question,

$$\text{Selling price} = 100 \times \frac{120}{100} \times \frac{95}{100} \times \frac{95}{100}$$

$$= \frac{120 \times 95 \times 95}{10000}$$

$$= ₹\ 108.3$$

$$\text{Required percentage} = \left(\frac{108.3 - 100}{100} \times 100\right)\%$$

$$= 8.3\%$$

2. A single discount equivalent to successive discounts of 10%, 15% and 20% is :

(a) 45% (b) 36.6%
(c) 40% (d) 38.8%

RRB Group-D 30-08-2022 (Shift-II)

Ans. (d) : We know that,
Single equivalent discount of three successive discount of x, y and z $= -(x + y + z) + \frac{(xy + yz + zx)}{100} - \frac{(xyz)}{10000}$
Equivalent discount % = –

$$-(10 + 15 + 20) + \frac{(150 + 300 + 200)}{100} - \frac{(10 \times 15 \times 20)}{1000}$$

= –45 + 6.5 – 0.3
$\Rightarrow$ – 38.8% (– sign denotes discount)
Hence, 38.8% is correct.

3. The list price of an article is ₹1,200 and a discount of 15% is offered on the list price. What additional discount percent on the already discounted price must be offered to a customer to bring the net selling price to ₹887.40 ?

(a) 13% (b) 12.5%
(c) 11.5% (d) 12%

RRB Group-D 08/09/2022 (Shift-I)

Ans. (a) : Let the additional discount percentage = x %
Given that
The list price of the article = ₹1200

$$\text{Price after a discount of } 15\% = 1200 \times \frac{85}{100} = ₹1020$$

According to the question,

$$1020 \times \frac{(100 - x)}{100} = 887.40$$

$$5100 - 51x = 4437$$

$$51x = 663$$

$$x = 13\%$$

4. The marked price of a cooker is same at four shops I, II, III and IV. Shop I allows two successive discounts of 20% and 15%, shop II allows successive discounts of 18% and 17%, shop III allows successive discounts of 25% and 10% and shop IV allows successive discounts of 15%, 15% and 5% on the marked price of the cooker. Which shop is selling the cooker at the lowest price?

(a) I (b) II
(c) IV (d) III

RRB Group-D 05/09/2022 (Shift-III)

Ans. (d) : Total discount given by shop I

$$= 100 - \left(\frac{100 - 20}{100} \times \frac{100 - 15}{100} \times 100\right) = 32\%$$

Total discount given by shop II

$$= 100 - \left(\frac{100 - 18}{100} \times \frac{100 - 17}{100} \times 100\right) = 31.94\%$$

Total discount given by shop III

$$= 100 - \frac{100 - 25}{100} \times \frac{100 - 10}{100} \times 100 = 32.5\%$$

Total discount given by shop IV

$$= 100 - \left\{\left(\frac{100 - 15}{100}\right) \times \left(\frac{100 - 15}{100}\right) \times \left(\frac{100 - 5}{100}\right) \times 100\right\}$$

= 100 – 68.63
= 31.36%
It is clear from the above explanation that shop III gives maximum discount, therefore shop III is selling the cooker at the lowest price.

5. The difference between the selling price on a discount of 32% and two successive discount of 20% each on a certain bill is ₹ 25. Find the actual amount of the bill.

(a) ₹200 (b) ₹625
(c) ₹576 (d) ₹425

RRB Group-D 18/08/2022 (Shift-III)

Ans. (b) : Let the actual amount of the bill = ₹ x

According to the question,

$$x\times\left(\frac{100-32}{100}\right)-x\left(\frac{100-20}{100}\right)\times\left(\frac{100-20}{100}\right)=25$$

$$\frac{68x}{100}-x\times\frac{80}{100}\times\frac{80}{100}=25$$

$$\frac{68x-64x}{100}=25$$

$$x=\frac{25\times100}{4}\Rightarrow x=₹\ 625$$

6. The listed price of an article is ₹200. A customer purchases it at ₹150 after two successive discounts. If one discount is 10%, then the other discount percentage (rounded off to two decimal places) is :

(a) 20% (b) 11.11%

(c) 12.5% (d) 16.66%

RRB Group-D 09/09/2022 (Shift-II)

Ans. (d) : Let the other discount is x%

According to the question,

$$200\times\left(\frac{100-10}{100}\right)\times\left(\frac{100-x}{100}\right)=150$$

$$2\times90\times\frac{100-x}{100}=150$$

$$900-9x=150\times5$$

$$9x=900-750$$

$$x=\frac{150}{9}$$

$$=16.66\%$$

7. The marked price of a car is ₹5,00,000. Under a scheme successive discount of 10% and 8% are offered on it. Find the total discount offered while selling the car under the given scheme.

(a) ₹ 86,000 (b) ₹ 82,000

(c) ₹ 76,000 (d) ₹ 90,000

RRB GROUP - D – 29/09/2022 (Shift–II)

Ans. (a) :

The total discount offered while selling the car

$$=5,00,000-5,00,000\times\frac{90}{100}\times\frac{92}{100}$$

$$=5,00,000-414000$$

$$=₹\ 86000$$

8. If a% is the first discount and b% is the second discount on the marked price of an article, then an equivalent single discount percentage is given by:

(a) $a+b-\frac{ab}{100}$ (b) $a+b+\frac{ab}{100}$

(c) $a+b-\frac{a-b}{100}$ (d) $a+b-\frac{a+b}{100}$

RRB Group-D 29-09-2022 (Shift-II)

Ans. (a) : First discount = a%

Second discount = b%

Single discount percentage $=\left(a+b-\frac{ab}{100}\right)$

9. Find the single percentage discount equivalent to three successive discounts of 30%. 20% and 10%

(a) 62% (b) 46.9%

(c) 49.6% (d) 50.4%

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (c) : Required equivalent successive discount

$$\%=100-100\times\frac{(100-30)}{100}\times\frac{(100-20)}{100}\times\frac{(100-10)}{100}$$

$$=100-100\times\frac{70}{100}\times\frac{80}{100}\times\frac{90}{100}$$

$$=100-50.4$$

$$=49.6\%$$

10. After two successive discounts, a tie with a list price of ₹120 is available at ₹90. If the second discount is 9% what is the first discount percentage? [Give your answer correct to 2 places of decimal.]

(a) 71.58% (b) 17.58%

(c) 84.42% (d) 63.33%

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (b) : Let the first discount = x%

Selling price = list price $\left(\frac{100-\text{discount}\%}{100}\right)$

$$90=120\times\frac{(100-x)}{100}\times\frac{100-9}{100}$$

$$=\frac{90000}{12\times91}=100-x$$

$$82.4175=100-x$$

$$x=100-82.4175$$

$$=17.58\%$$

11. If the marked price of an article is ₹ 2,850 and the discount is 21% then find the selling price.

(a) ₹ 2,521.50 (b) ₹ 2,259.50

(c) ₹ 2,215.50 (d) ₹ 2,251.50

RRB Group-D 27-09-2022 (Shift-II)

Ans. (d) : The marked price of an article = ₹ 2850

Discount = 21%

Hence the selling price $=2850\times\frac{(100-21)}{100}$

$$=2850\times\frac{79}{100}$$

$$=\frac{57\times79}{2}$$

$$=₹\ 2251.50$$

12. During a sale, a TV shop owner offers four different types of successive discounts for any consumer to choose from. Which of the following options will give the best possible price to the shop owner as a percentage of the marked price of an item?

(a) 25% and 15% (b) 30% and 10%
(c) 35% and 5% (d) 20% and 20%

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (d) :

$\because \left[\text{Discount\%} = -x - y + \frac{xy}{100}\right]$ where (–) $\Rightarrow$ discount

(a) 25% and 15% $\rightarrow$ discount% $= -25-15 + \frac{25\times15}{100}$

$= -40+3.75$

$= -36.25\%$

(b) 30% and 10% discount% $= -30-10+\frac{30\times10}{100}$

$= -40 + 3$

$= -37\%$

(c) 35% and 5% $\rightarrow$ discount % $= -35-5+\frac{35\times5}{100}$

$= -40 + 1.75$

$= -38.25\%$

(d) 20% and 20% discount% $= -20-20+\frac{20\times20}{100}$

$= -40 + 4$

$= -36\%$

Therefore the two sucessive discount of 20% and 20% will give the best possible price to the shop owner as a percentage of the marked price of an item.

13. John bought a laptop at 25% discount on the marked price. If he paid Rs. 28,473 for the laptop. What was its marked price?

(a) Rs. 37,946 (b) Rs. 37,496
(c) Rs. 37,694 (d) Rs. 37,964

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (d) : Let the marked price of a laptop be Rs. x

Discount upon Rs. x is 25%

According to the question,

$28473 = x - \frac{25x}{100}$

$\therefore\ 28,473 = x - \frac{x}{4}$

or $\frac{3x}{4} = 28,473$

$\therefore\ x = \frac{28,473\times4}{3}$

$\therefore$ x = Rs. 37964

14. If the selling price of an article is 3 times the discount offered and if the percentage of the discount is equal to the percentage profit, find the ratio of the discount offered to the cost price.

(a) 7 : 12 (b) 7 : 6
(c) 5 : 12 (d) 7 : 11

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the discount offered on an article = 100

Selling price (SP) = 300

Marked price (MP) = 400

$\text{Discount\%} = \frac{100}{400}\times100$

$= 25\%$

Hence profit% = 25%

Cost price (CP) $= 300\times\frac{100}{125} = 240$ $\left(\text{CP} = \frac{\text{SP}\times100}{100+\text{d\%}}\right)$

$\therefore$ Discount : Cost price = 100: 240

= 5: 12

15. To gain 25% after announcing a discount of 10%, the shopkeeper must mark the price of the article with cost price ₹ 360 as?

(a) ₹460 (b) ₹486
(c) ₹500 (d) ₹450

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the marked price of the article = ₹x

Cost price of the article = ₹360

According to the question-

$\text{CP} = \frac{\text{MP}(100-\text{D\%})}{100+\text{Profit\%}}$

$360 = \frac{x\times(100-10)}{(100+25)}$

$x = \frac{360\times125}{90}$

x = ₹ 500

$\therefore$ Marked price of the article = ₹500

16. Ramu purchased a TV set with an additional 15% discount on the reduced price after deducting 25% discount on the labeled price. If the labeled price was ₹12,000, at what price did he purchase the TV set?

(a) ₹7650 (b) ₹7560
(c) ₹7000 (d) ₹7600

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (a) : Required cost price = The discount on marked price will eventually be equal to selling price.

$₹12000\times\frac{75}{100}\times\frac{85}{100} = ₹\ 7650$

17. Big Mart is offering 5% discount on card payment. How much percentage above cost price should the marked price be so as to make a profit of 10%?

(a) $15\frac{5}{19}\%$ (b) $14\frac{16}{19}\%$
(c) $16\frac{14}{19}\%$ (d) $15\frac{15}{19}\%$

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the cost price (CP) = 100

Given, Discount = 5%, Profit = 10%

We know that

$$\frac{\text{Marked price}}{\text{Cost price}} = \frac{100 + \text{Profit\%}}{100 - \text{Discount\%}}$$

$$\frac{\text{Marked price}}{100} = \frac{100+10}{100-5}$$

$$\text{Marked price} = \frac{110 \times 100}{95} = \frac{2200}{19} = 115\frac{15}{19}$$

Profit = Marked price – Cost price

$$= 115\frac{15}{19} - 100$$

$$= \frac{2200 - 1900}{19}$$

$$\text{Profit} = \frac{300}{19}$$

$$\text{Profit \%} = \frac{\frac{300}{19}}{100} \times 100 = 15\frac{15}{19}\%$$

18. If a painting was sold for ₹5,225 after a discount of 5%, then what is the marked price of the painting?

(a) ₹5,550 (b) ₹5,500

(c) ₹5,200 (d) ₹5,575

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : We know that, $\text{MP} = \frac{100 \times \text{SP}}{(100 - \text{D\%})}$

$$\text{Marked price of painting} = 5225 \times \frac{100}{95}$$

$$= 55 \times 100$$

$$= ₹5500$$

19. The cost price of 12 oranges is equal to the selling price of 9 oranges and the discount offered on 10 oranges is equal to the profit earned on 5 oranges. Find the discount percentage (up to 2 digits after the decimal)?

(a) 33.33 (b) 44.44

(c) 11.11 (d) 16.67

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

12CP = 9SP

$$\frac{\text{CP}}{\text{SP}} = \frac{9}{12} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

10 Discount = 5 Profit

$$\frac{\text{Discount}}{\text{Profit}} = \frac{5}{10} = \frac{1}{2}$$

CP : SP = 6 : 8 & D : P = 1: 2

Let the cost price = ₹6x

and selling price = ₹8x

Profit = Selling price – Cost price

Profit = 8x – 6x = 2x

Then, Discount = x $\left[\because \frac{\text{D}}{\text{P}} = \frac{1}{2}\right]$

Marked price = 8x + x = ₹9x (MP = SP + D)

$$\text{Discount\%} = \frac{x}{9x} \times 100 \left(\text{Discount\%} = \frac{\text{D}}{\text{MP}} \times 100\right)$$

= 11.11%

20. A dealer marks his goods 20% above the cost price. Then he allows a discount in it makes a profit of 8%. find the rate of discount offered by the dealer?

(a) 12% (b) 4%

(c) 10% (d) 6%

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) :

$$\frac{\text{MP}}{\text{CP}} = \frac{100 + \text{P}}{100 - \text{D}}$$

$$\frac{120}{100} = \frac{100+8}{100-\text{D}}$$

$$\frac{6}{5} = \frac{108}{100-\text{D}}$$

$$600 - 6\text{D} = 540$$

$$6\text{D} = 60$$

$$\text{D} = 10\%$$

21. The original price of a TV set is ₹9000. The price is discounted by 20% and then raised by 10%. What is its new price?

(a) ₹9,000 (b) ₹9,920

(c) ₹7,920 (d) ₹7,900

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (c) : Original price of TV = ₹9000

After 20% discount, price of TV = $9000 \times \frac{80}{100} = ₹7200$

After raised by 10%, price of TV = $\frac{7200 \times 110}{100} = ₹7920$

Hence, new price of TV = ₹7920

22. Rahul bought a sweater at a discount of 25% and saved Rs. 200. What was the cost of the sweater before the discount was given?

(a) ₹650 (b) ₹400

(c) ₹800 (d) ₹600

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the cost of the sweater before the discount is given = ₹ x

According to the question,

$$x \times \frac{25}{100} = 200$$

x = ₹ 800

23. If the amount in a bill is decreased by 10%, then ₹ 279 is to be paid. How much is the original bill?

(a) ₹ 280 (b) ₹ 300

(c) ₹ 310 (d) ₹ 330

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let us assume original bill = ₹x

If deducting the 10% of bill = 0.9x

As per question,

$$0.9x = 279$$

$$x = \frac{279}{0.9}$$

$$x = ₹310$$

24. The value of a machine depreciates at the rate of 10% per annum. If its present value is 1,62,000. What was the value (in ₹) of the machine 2 years ago?

(a) ₹2,00,000 (b) ₹50,000

(c) ₹54,66,123 (d) ₹1,31,220

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (a) : 2 years ago value of the machine

$$= \frac{162000}{\left(1-\frac{10}{100}\right)^2}$$

$$= \frac{162000}{9\times 9}\times 100$$

$$= ₹200000$$

25. A company offers 5% discount on cash purchases. How much would Darshan pay in cash for a bike purchased from the company, if the market price is ₹75,200?

(a) ₹ 74,000 (b) ₹ 70,450

(c) ₹ 72,540 (d) ₹ 71,440

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given, Discount = 5%

Market price (MP) = ₹75200

$$\text{Selling Price} = \frac{MP\times(100-D\%)}{100}$$

$$\text{Selling price (SP)} = 75200\times\frac{95}{100}$$

$$= ₹71440$$

Hence, Amount paid by Darshan = ₹71440

26. A shopkeeper gives 20% discount on MRP. Joginder buys a suitcase from the shop, at an additional discount of 20% on the reduced price. If the MRP of the suitcase is ₹1,200, then find the purchasing price paid by Joginder.

(a) ₹ 864 (b) ₹ 768

(c) ₹ 800 (d) ₹ 600

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (b) : Purchasing price of suitcase

$$= 1200\times\frac{(100-20)}{100}\times\frac{(100-20)}{100}$$

$$= 1200\times\frac{80}{100}\times\frac{80}{100}$$

$$= 12\times 64$$

$$= ₹768$$

27. The value of a car depreciates at the rate of 20% every year. After two years the value of the car will be ₹4,80,000/-. The original price of the car is.

(a) ₹ 6,00,000/- (b) ₹ 7,50,000/-

(c) ₹ 5,50,300/- (d) ₹ 6,20,000/-

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let original price of the car was ₹x

According to the question,

$$x\times\frac{80}{100}\times\frac{80}{100} = 480000$$

$$x = \frac{480000\times 100\times 100}{80\times 80}$$

Original Price of car x = ₹7,50,000/-

28. In order to get 17% profit even after giving 22% discount, the marked price of an article should be how much more that its cost price?

(a) 50% (b) 35%

(c) 28% (d) 45%

RRB JE - 23/05/2019 (Shift-III)

Ans : (a) Let the cost price = 100

Given- Discount = 22%

Profit = 17%

$$\frac{\text{Marked price}}{\text{Cost price}} = \frac{100+\text{Profit \%}}{100-\text{Discount\%}}$$

$$\frac{\text{Marked price}}{100} = \frac{117}{78}$$

$$\Rightarrow \text{Marked price} = \frac{100\times 117}{78}$$

Marked price = 150

Profit = Marked price – Cost price

= 150 – 100 = 50

$$\text{Profit \%} = \frac{50\times 100}{100} = 50\% \quad \left(\text{Profit\%} = \frac{\text{Profit}\times 100}{\text{Cost Price}}\right)$$

29. If the selling price is ₹1680, there is a loss of 16%. If there is a profit of 15% even after giving 8% discount then what should be the marked price of the product?

(a) ₹ 2200 (b) ₹ 2000

(c) ₹ 2500 (d) ₹ 2600

RRB JE - 28/06/2019 (Shift-III)

Ans. (c) SP = ₹ 1680

$$\because \quad CP = \frac{SP\times 100}{(100-\text{loss\%})}$$

$$\therefore \quad CP = 1680\times\frac{100}{84} = ₹\ 2000$$

{Where MP = Marked price, SP = Selling price, CP = Cost price, D = Discount}

$$\frac{CP\times(100+P)}{100}=\frac{MP(100-D)}{100}$$

$2000 \times 115 = MP \times 92$

$$MP=\frac{2000\times115}{92}=₹\ 2500$$

30. A shopkeeper offers a discount of 10% every 4 months. If a person buys an item under this scheme in December for ₹25515, then what was the initial price of that item in January?

(a) ₹ 45000 (b) ₹ 35000
(c) ₹ 36000 (d) ₹ 40000

RRB JE - 22/05/2019 (Shift-III)

Ans : (b) Let the initial price of an item = ₹x
According to the question,

$$\Rightarrow \quad x\times\frac{90}{100}\times\frac{90}{100}\times\frac{90}{100}=25515$$

$$\Rightarrow \quad \frac{x\times729}{1000}=25515$$

$$\Rightarrow \quad x=\frac{25515\times1000}{729}$$

$\Rightarrow$ $x = 35 \times 1000$
$x = ₹\ 35000$

31. Which one is better?
(1) A successive discount of 10% and 20%
(2) A successive discount of 20% and 10%.

(a) Both are similar
(b) Cannot be determined
(c) A successive discount of 20% and 10%.
(d) A successive discount of 10% and 20%

RRB JE - 23/05/2019 (Shift-II)

Ans : (a)
(1) Total successive discount of 10% and 20%

$$=10+20-\frac{20\times10}{100}=30-2=28\%$$

(2) Total successive discount of 20% and 10%

$$=20+10-\frac{20\times10}{100}=30-2=28\%$$

Hence it is clear that both are similar.

32. Find the selling price of an item if the shopkeeper gives it two successive discounts of 5% on the marked price of ₹80?

(a) ₹ 72 (b) ₹ 70.10
(c) ₹ 72.20 (d) ₹ 73

RRB JE - 25/05/2019 (Shift-I)

Ans : (c) Given that
Marked price = ₹ 80
On giving two successive discount of 5%.

$$\text{Selling price} = 80\times\left(\frac{100-5}{100}\right)\times\left(\frac{100-5}{100}\right)$$

$$=80\times\frac{95}{100}\times\frac{95}{100}$$

$$=\frac{722000}{10000}=₹\ 72.20$$

33. An item list at ₹65 was purchased for ₹56.16 after two successive discounts, of which the first is 10%. Find the second discount?

(a) 9% (b) 6%
(c) 2% (d) 4%

RRB JE - 26/05/2019 (Shift-II)

Ans : (d) Marked price = ₹65, Selling price = ₹56.16
First discount $(D_1) = 10\%$, Second Discount $(D_2) = ?$
Formula-

$$\text{Marked price}\times\frac{(100-D_1)}{100}\times\frac{(100-D_2)}{100}=\text{Selling price}$$

$$65\times\frac{(100-10)}{100}\times\frac{(100-D_2)}{100}=56.16$$

$$\frac{65\times90}{100}\times\frac{(100-D_2)}{100}=56.16$$

$$(100-D_2)=\frac{56.16\times1000}{65\times9}$$

$$(100-D_2)=\frac{56160}{585}$$

$100 - D_2 = 96$
$100 - 96 = D_2$
$4 = D_2$
Hence, second discount $(D_2) = 4\%$

34. The listed price of an item in a showroom is ₹2000 and it is being sold at successive discount of 20% and 10%. Find its net selling price?

(a) ₹ 1520 (b) ₹ 1400
(c) ₹ 1440 (d) ₹ 1700

RRB JE - 30/05/2019 (Shift-I)

Ans. (c)
Selling price = Marked price × (100–Discount)/100

$$\text{Selling price} = 2000\times\frac{80}{100}\times\frac{90}{100}$$

$$=2000\times\frac{4}{5}\times\frac{9}{10}$$

$$=36\times40=₹\ 1440$$

35. Due to 25% reduction in market price, Sita is able to buy 1 kg more sugar for ₹30. Find the actual price of sugar?

(a) ₹7.50 (b) ₹10
(c) ₹16.50 (d) ₹7.30

RRB JE - 30/05/2019 (Shift-II)

Ans : (b) Let the actual price of sugar = ₹x

$$\text{price after 25\% reduction} = x\times\frac{75}{100}=\frac{3x}{4}$$

According to the question,

$$\frac{30}{\frac{3x}{4}}-\frac{30}{x}=1$$

$$\frac{120}{3x}-\frac{30}{x}=1$$

$$\frac{120-90}{3}=x$$

$$\frac{30}{3}=x$$

$x = ₹\ 10$

36. A Successive discount of 10% and 20% are displayed in an advertisement. For a sale if an additional discount of 5% is given on cash payment, then find the total discount available on purchase by cash payment?

(a) 40% (b) 35%
(c) 31.6% (d) 32%

RRB JE - 26/06/2019 (Shift-I)

Ans : (c) Equivalent discount of two successive discount of 10% and 20%

$$= 10 + 20 - \frac{10 \times 20}{100}$$

$$= 30 - 2 = 28\%$$

Again total discount after 5% discount

$$= 28 + 5 - \frac{28 \times 5}{100}$$

$$= 33 - 1.4 = 31.6\%$$

Hence there will be a total discount of 31.6%.

37. Find the actual profit percentage using the given Stagements.

1. There would be 20% profit, without any discount.

2. Although 5% discount is offered.

(a) 15% (b) 12%
(c) 14% (d) 20%

RRB JE - 26/06/2019 (Shift-I)

Ans. (c) Given

$x = +20\%, y = -5\%$

Actual profit % $= x + y + \frac{xy}{100}$

$$= 20 - 5 + \frac{20 \times -5}{100}$$

$$= 20 - 5 - 1 = 14\%$$

38. An item whose marked price is ₹80 is sold for ₹68. Find the rate of discount?

(a) 12% (b) 15%
(c) 16% (d) 18%

RRB JE - 31/05/2019 (Shift-I)

Ans : (b) Marked price = ₹80

Selling price = ₹68

Rate of discount $= \frac{\text{Marked price - Selling price}}{\text{Marked price}} \times 100$

$$= \frac{80 - 68}{80} \times 100$$

$$= \frac{12}{80} \times 100 = 15\%$$

39. Goods worth ₹6500 was purchased with a discount of 5%. Then a sales tax of 4% was included in the bill. Find the amount of the bill.

(a) ₹6500 (b) ₹6576
(c) ₹6422 (d) ₹6600

RRB JE - 31/05/2019 (Shift-III)

Ans. (c) Amount paid for goods after 5% discount

$$= 6500 \times \frac{95}{100} = ₹6175$$

Amount of bill on including sales tax of 4%

$$= 6175 \times \frac{104}{100} = ₹6422$$

40. Due to two consecutive discounts at the labeled price of ₹6000, the selling price decrease to ____ If two consecutive discount of 10% and 20% are given?

(a) ₹ 4230 (b) ₹ 4000
(c) ₹ 4200 (d) ₹ 4320

RRB JE - 02/06/2019 (Shift-II)

Ans. (d) Selling price

$$= 6000 \times \left(\frac{100 - D_1}{100}\right)\left(\frac{100 - D_2}{100}\right)$$

$$= 6000 \times \frac{90}{100} \times \frac{80}{100}$$

$$= 6 \times 9 \times 80 = ₹4320$$

41. After deducting 5% commission, a television set cost ₹9595. Find its marked price?

(a) ₹10000 (b) ₹10100
(c) ₹10075 (d) ₹10500

RRB JE - 28/06/2019 (Shift-III)

Ans. (b) $SP = MP \times \frac{(100 - 5)}{100}$ {Where SP-Selling price, MP - Marked price}

$$9595 = MP \times \frac{95}{100}$$

$$MP = \frac{9595 \times 20}{19} = ₹\ 10100$$

42. A shop offers 30% discount on MRP of a product. If the MRP of the product is ₹500, what is the selling price?

(a) ₹500 (b) ₹250
(c) ₹300 (d) ₹350

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (d) On giving 30% discount

Selling price $= 500 \times \frac{100 - 30}{100}$ $\left(SP = \frac{MP(100 - d\%)}{100}\right)$

$$= 500 \times \frac{70}{100} = ₹\ 350$$

43. A shirt was marked at ₹ 1600. During a Diwali festival offer, 10% discount was allowed on it. What will be the selling price of the shirt?

(a) ₹1,400 (b) ₹1,540
(c) ₹1,440 (d) ₹1,240

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (c)
Marked price = ₹ 1600
Discount = 10%
Selling price of the shirt

$$= \frac{\text{Marked price} \times (100 - \text{discount}\%)}{100}$$
$$= \frac{1600 \times (100-10)}{100}$$
$$= \frac{1600 \times 90}{100}$$
$= ₹1,440$

44. Neha bought a book for ₹1300 at a 30% discount and sold it at a 30% profit. How much did he earn?
(a) ₹ 273 (b) ₹ 390
(c) ₹ 780 (d) ₹ 0

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) According to the question-
Cost price $= ₹1300$
$$\text{Selling price} = \frac{1300 \times 130}{100} = 1690$$
We know that,
Profit = Selling price − Cost price
Profit $= 1690 - 1300 = ₹390$

45. Find the discount rate when the marked price is ₹1,880 and the selling price is ₹1,598?
(a) 12% (b) 20%
(c) 15% (d) 13%

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (c) MP = ₹1880, SP = ₹1598
$$\text{Discount} = \frac{\text{Marked Price} - \text{selling price}}{\text{Marked Price}} \times 100$$
$$\text{Discount rate} = \frac{1880-1598}{1880} \times 100 = 15\%$$

46. The marked price of an article is ₹352 and its selling price is ₹326. What is the discount rate (up to one digit of decimal) given on the item?
(a) 8% (b) 7.8%
(c) 7.4% (d) 8.3%

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (c) Given, MP = ₹352 and SP = ₹326
$$\text{Rate of discount} = \frac{352-326}{352} \times 100$$
$$= \frac{26}{352} \times 100 = 7.4\%$$

47. The current price of a computer is ₹32450, which is 12% less than its previous year price. What was the price of computer last year?
(a) ₹37,424 (b) ₹36,344
(c) ₹28,556 (d) ₹36,875

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (d)
Reduction in price of computer last year = 12%
$$\text{Price of computer last year} = 32450 \times \frac{100}{88}$$
$$= \frac{3245000}{88} = ₹\ 36875$$
Hence price of computer last year = ₹36,875

48. If the market price is 30% more than its cost price and a 10% discount is offered on the market price, find the profit percentage.
(a) 17% (b) 15%
(c) 31/2% (d) 12%

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) x = 30% , y = 10%
$$\text{Profit \%} = x - y - \frac{xy}{100}$$
$$= 30 - 10 - \frac{30 \times 10}{100}$$
$= 30 - 13 = 17$ % profit

49. In a factory, the sales center decided not only to get rid of old stock but also to get variable costs in the process. In this case, he sold each set at a less price of ₹399. If the fixed cost is 24% of the total cost, then what was the less cost price of each set?
(a) ₹ 520 (b) ₹ 540
(c) ₹ 525 (d) ₹ 550

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (c)
$$\text{Selling price} = \text{Marked price} \times \frac{(100 - \text{Discount}\%)}{100}$$
According to the question,
Selling price = ₹ 399
Discount % = 24%
$$399 = \text{Marked price} \times \frac{(100-24)}{100}$$
$$\text{Marked price} = \frac{399 \times 100}{76}$$
$= 21 \times 25 = ₹\ 525$

50. A person saved ₹5 by buying a dress in a sale. If he spends ₹45, how much percent will he save?
(a) 15% (b) 30%
(c) 10% (d) 18%

RRB Group-D – 31/10/2018 (Shift-III)

Ans : (c) Person has total money = 5+45 = ₹50
$$\text{Profit \% or saving \%} = \frac{50-45}{50} \times 100$$
$$= \frac{5}{50} \times 100 = 10\%$$

51. A shop sells clothes at a 60% discount on weekends. On Sunday, an additional discount of 10% is available on the discounted price. If you buy a shirt on Sunday for ₹36, how much more money you have to pay to buy the same shirt on Tuesday of the same month?
(a) ₹ 57 (b) ₹ 50
(c) ₹ 68 (d) ₹ 64

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (d) Let the price of shirt = ₹ x

Selling price of shirt on Sunday,

$$= x \times \left(1-\frac{D_1}{100}\right)\left(1-\frac{D_2}{100}\right) = 36$$

$$\Rightarrow \quad x \times \frac{40}{100} \times \frac{90}{100} = 36 \qquad \{D_1 = 60\%,\ D_2 = 10\%\}$$

$$x = ₹\ 100$$

Hence additional money to be given on Tuesday

$$= 100 - 36 = ₹64$$

52. Find the selling price when the marked price is ₹160 and the discount is 12%?

(a) 140.80 (b) 132.80

(c) 160.80 (d) 100

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (a) Selling price (SP) = ?

Marked price = ₹ 160

Discount (D) = 12%

$$\because \text{ Selling price} = \text{Marked price} \times \frac{(100 - \text{discounts})}{100}$$

$$\therefore \ SP = 160 \times \frac{88}{100} = 8 \times \frac{88}{5}$$

$$SP = ₹\ 140.8$$

53. The price of a Television is ₹14000 inclusive of VAT. If the rate of VAT is 12%, find the original price of the Television?

(a) ₹ 12,000 (b) ₹ 13,000

(c) ₹ 12,500 (d) ₹ 13,500

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (c) Let the original price of television is ₹x.

According to the question,

$$x \times \frac{112}{100} = 14000$$

$$x = ₹12,\ 500$$

54. A shopkeeper allows a discount of 20% to his customers and still gains 25%. Find the marked price of an article whose cost price ₹600 for the shopkeeper?

(a) ₹937.50 (b) ₹937

(c) ₹930 (d) ₹1,000

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (a) Let the Marked price of article = ₹x

According to the question-

$$x \times \frac{80}{100} = 600 \times \frac{125}{100}$$

$$x = \frac{750 \times 10}{8} = 937.50$$

Hence, marked price (x) = ₹937.50

55. Find the rate of discount on an article whose marked price is ₹ 170 and selling price is ₹ 130 is?

(a) 22.45% (b) 24.26%

(c) 23.53% (d) 23.60%

RRB ALP & Tec. (17-08-18 Shift-I)

Ans : (c)

$$\text{Discount\%} = \frac{\text{Marked price} - \text{Selling price}}{\text{Marked price}} \times 100$$

$$= \frac{170 - 130}{170} \times 100 = \frac{40}{170} \times 100$$

$$= 23.53\% \quad \text{(Approx)}$$

56. Two devices whose cost price are ₹15000 and ₹20000 respectively, discounts of 8% and 12% are allowed on them respectively. Find the total selling price?

(a) ₹ 30,200 (b) ₹ 28,600

(c) ₹ 31,400 (d) ₹ 31,800

RRB NTPC 26.04.2016 Shift : 1

Ans : (c) Cost price of first device = ₹15000

Discount = 8%

$$\left[\text{Selling price} = \frac{\text{Cost price} \times (100 - \text{Discount})}{100}\right]$$

$$\text{Selling price} = \frac{15000 \times (100 - 8)}{100}$$

$$= \frac{15000 \times 92}{100} = 150 \times 92$$

Selling price of first device = ₹13, 800

Cost price of second device = ₹20, 000

Discount = 12%

$$\text{Selling price} = \frac{20000 \times (100 - 12)}{100} = 200 \times 88$$

Selling price of second device = ₹17,600

Total selling price = 13,800+17,600 = ₹31,400

57. ___ is a single discount equivalent to 25%, 20% and 10% successive discounts?

(a) 40% (b) 46%

(c) 50% (d) 54%

RRB NTPC 03.04.2016 Shift : 3

Ans : (b)

$$\text{Discount} = 100 \times \frac{75}{100} \times \frac{80}{100} \times \frac{90}{100} = 54\%$$

Equivalent discount = 100–54 = 46%

58. A publisher, adding 30% of the production cost of the book, fixed the book's selling price at ₹260. Although, he gives a discount of 12% on the selling price for selling the book. What will be the profit percentage?

(a) 13.7 (b) 12.87

(c) 13.4 (d) 14.4

RRB Group-D – 02/11/2018 (Shift-I)

Ans. (d) According to the question,

Cost price × 130% = 260

$$\text{Cost price} \times \frac{130}{100} = 260$$

Cost price = ₹200

On 12% discount,

$$\text{Selling price} = 260 \times \frac{88}{100} = \frac{13 \times 88}{5} = \frac{1144}{5}$$

$$\text{Profit \%} = \left(\frac{\text{Selling price - Cost price}}{\text{Cost price}}\right)\times 100$$

$$= \frac{\left(\frac{1144}{5}-200\right)100}{200}$$

$$= \frac{(1144-1000)\times 100}{1000} = 14.4$$

59. Himanshi bought a T-shirt at a discount of 20% on its marked price. But sold it at marked price. What is the profit or loss percentage on the whole transaction?

(a) 25% profit (b) 15% loss
(c) 15% profit (d) 25% loss

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (a) Let MP = 100, CP = 80, SP = 100

$$\text{Profit\%} = \left(\frac{SP-CP}{CP}\times 100\right)$$

$$\text{Profit\%} = \frac{20}{80}\times 100 = 25\% \text{ profit}$$

60. After giving 20% discount on marked price, Kishore earns a profit of 12%. How much is the marked price more than the cost price?

(a) 40% (b) 32%
(c) 25% (d) 8%

RRB NTPC 29.03.2016 Shift : 1

Ans : (a) Let marked price is ₹100.

$$\therefore \text{ Selling price} = 100\times\frac{100-20}{100} = 80$$

$$\text{Cost price of an article} = 80\times\frac{100}{100+12} = 80\times\frac{100}{112}$$

$$= \frac{5\times 100}{7} = \frac{500}{7}$$

$$\text{Marked price - Cost price} = 100-\frac{500}{7} = \frac{200}{7}$$

$$\text{Required \%} = \frac{\frac{200}{7}}{\frac{500}{7}}\times 100 = \frac{200}{500}\times 100 = 40\%$$

61. Shopkeeper earns 26% profit even after allowing 10% discount on marked price. If the cost price is ₹800, find the marked price?

(a) ₹1120 (b) ₹1100
(c) ₹1000 (d) ₹1008

RRB NTPC 30.04.2016 Shift : 2

Ans : (a) Marked price of an article $= \frac{800\times 126}{90}$

$= ₹\ 1120$

62. An article was sold for ₹3600 at a discount of 10%. Find the selling price if the discount was 15%?

(a) ₹3,600 (b) ₹4,000
(c) ₹3,800 (d) ₹3,400

RRB NTPC 05.04.2016 Shift : 3

Ans : (d) Let selling price of an article = ₹x

Selling price after the discount of 10% $= x\times\frac{90}{100}$

$$3600 = x\times\frac{90}{100}$$

$$x = ₹4000$$

Selling price after the discount of 15%

$$= 4000\times\frac{85}{100} = ₹3400$$

63. A trader marks his goods 20% above the cost price. If he gives a discount of 5% what will be the percentage of the final profit received?

(a) 12% (b) 14%
(c) 15% (d) 18%

RRB NTPC 03.04.2016 Shift : 1

Ans : (b) Let the cost price = ₹100

$$\text{Selling price} = 100\times\left(\frac{100+20}{100}\right)\times\left(\frac{100-5}{100}\right)$$

$$= 100\times\frac{120}{100}\times\frac{95}{100} = ₹114$$

Profit = S.P.- C.P

$= ₹114 - ₹100 = ₹14$

$$\text{Profit\%} = \left(\frac{14}{100}\times 100\right)\% = 14\%$$

Trick: $\text{(Profit/Loss)\%} = \pm x \pm y \pm \frac{xy}{100}$ $\begin{bmatrix} + \rightarrow \text{increase} \\ - \rightarrow \text{decrease} \end{bmatrix}$

$$= +20 - 5 + \frac{20\times(-5)}{100}$$

$$= +20 - 5 - 1$$

Profit = 14%

64. Find the discount (in percentage) if a book marked at ₹90 is sold for ₹76.

(a) 14.65% (b) 15.56%
(c) 13.45% (d) 14.75%

RRB NTPC 18.01.2017 Shift : 1

Ans : (b) Discount $\% = \frac{90-76}{90}\times 100$

$$= \frac{14}{90}\times 100$$

$$= \frac{140}{9} = 15.56\%$$

65. Manish bought a mobile phone and got 50% discount on the marked price and sold it for ₹8100 at a profit of 35% of his cost price. What was the marked price?

(a) ₹8000 (b) ₹12000
(c) ₹100000 (d) ₹9000

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) Let the marked price of mobile phone = ₹x

Cost price of mobile phone for Manish $= x\times\frac{50}{100} = ₹\frac{x}{2}$

$\therefore$ Selling price $= \left(\frac{100+35}{100}\right) \times \frac{x}{2}$

$8100 = \frac{135}{100} \times \frac{x}{2}$

$x = \frac{8100 \times 100 \times 2}{135} = ₹12000$

66. What is the maximum percentage of discount that sheela can give to her customers on the marked price 50 that she has neither profit nor loss on selling her goods, if she has already marked her product by25% more than the cost price?

(a) 25 (b) 20

(c) 30 (d) 40

RRB NTPC 19.04.2016 Shift : 2

Ans : (b) Let the cost price = ₹100

$\therefore$ Marked price = ₹125

$\because$ (neither profit, nor loss) In this case the discount given on selling price for selling goods is x%.

According to the question,

$$125 \times \frac{(100-x)}{100} = 100$$

$$(100-x) = \frac{100 \times 100}{125}$$

$\Rightarrow 100 - x = 80$

$\Rightarrow x = 100 - 80$

$\Rightarrow x = 20\%$

67. Even offer giving 40% discount on the marked price, a jacket sold for ₹600 at 20% profit. If it is sold at marked price, what will be the profit percent?

(a) 50% (b) 75%

(c) 100% (d) 125%

RRB NTPC 18.04.2016 Shift : 2

Ans : (c) $MP \times \left(\frac{100 - \text{discount}\%}{100}\right) = SP$

$$MP \times \frac{60}{100} = 600$$

$$MP = \frac{600 \times 100}{60}$$

$MP = 1000$

$$CP = SP \times \frac{100}{100+20}$$

$$CP = 600 \times \frac{100}{120}$$

$CP = 500$

If it is sold at marked price

Profit% = 1000 – 500 = 500

$$\text{Profit}\% = \frac{500}{500} \times 100 = 100\%$$

68. Ram Naresh buys a bag, whose marked price is ₹400, he buys it for ₹160 after two consecutive discounts. If the second discount is 20%, find the first discount?

(a) 40% (b) 30%

(c) 50% (d) 80%

RRB NTPC 16.04.2016 Shift : 1

Ans : (c) Let the first discount = D_1%

According to the question,

$$400 \times \left(\frac{100-D_1}{100}\right)\left(\frac{100-D_2}{100}\right) = 160$$

$$\Rightarrow 400\left(\frac{100-D_1}{100}\right) \times \left(\frac{100-20}{100}\right) = 160$$

$$\Rightarrow (100-D_1) = \frac{160 \times 100 \times 100}{400 \times 80}$$

$\Rightarrow (100 - D_1) = 50$

$D_1 = 100 - 50 = 50\%$

Hence, the first discount = 50%

69. Aparna changes the marked price of an item to 50% above its cost price. What % of discount is allowed (approximately) to gain 10%?

(a) 27% (b) 25%

(c) 35% (d) 37%

RRB NTPC 12.04.2016 Shift : 3

Ans : (a) Let the cost price of an item = ₹100

$\therefore$ Marked price = ₹150

And selling price on 10% profit = ₹110

$\therefore$ Discount %

$$\Rightarrow 150 \times \frac{(100-D)}{100} = 110$$

$$\Rightarrow (100-D) = \frac{110 \times 100}{150}$$

$$\Rightarrow 100 - D = \frac{220}{3}$$

$$\Rightarrow D = 100 - \frac{220}{3}$$

$$\Rightarrow D = \frac{300-220}{3}$$

$$\Rightarrow D = \frac{80}{3} = 26.66$$

$\Rightarrow D \approx 27\%$ (Approx)

70. A trader marked 50% higher price on an item and later gave 20% discount on it. What percentage of profit did the merchant get after giving a discount?

(a) 30% (b) 125%

(c) 25% (d) 20%

RRB NTPC 09.04.2016 Shift : 3

Ans : (d) Let the cost price of an item = ₹100

Then the marked price = $100 \times \frac{150}{100} = ₹150$

Selling price $= 150 \times \frac{80}{100} = ₹120$

Hence, the required profit percent

$$= \frac{120-100}{100} \times 100 = 20\%$$

71. The marked prices of large and small note books are ₹15 and ₹10 respectively. A student bought 5 dozen small and 10 dozen large note books at a total discount of 5%. Find the total discount amount.

(a) ₹100 (b) ₹110
(c) ₹120 (d) ₹130

RRB NTPC 06.04.2016 Shift : 2

Ans : (c)

Total price of small note books = 5 × 12 × 10 = ₹600

Total price of large note books = 10 × 12 × 15 = ₹1800

$\therefore$ Amount of discount $= (600 + 1800) \times \frac{5}{100}$

$$= 2400 \times \frac{5}{100} = ₹120$$

72. A box of 20 items was purchased after a discount of 20% at ₹6400. What is the price of each item?

(a) ₹300 (b) ₹350
(c) ₹ 400 (d) ₹450

RRB NTPC 27.04.2016 Shift : 2

Ans : (c)

$$\text{Cost price of one item} = \frac{6400}{20} = ₹320$$

$$\text{Marked price of one item} = \frac{320 \times 100}{80} = ₹400$$

73. Charlie buys a bed after a discount of 22% for ₹16725. He later finds that the same store was selling that bed online for ₹15685 after a 15% discount. What is the difference between marked price of store bed and marked price of online bed? (Rounded off to nearest₹)?

(a) ₹2989 (b) ₹2785
(c) ₹2897 (d) ₹2888

RRB NTPC 28.04.2016 Shift : 1

Ans : (a) Marked price of bed bought from store

$$= 16,725 \times \frac{100}{100-22}$$

$$= 16,725 \times \frac{100}{78}$$

$$= ₹21442.30$$

Marked price of bed bought from online

$$= 15,685 \times \frac{100}{100-15}$$

$$= 15,685 \times \frac{100}{85}$$

$$= ₹18452.94$$

Required difference = 21442.30 – 18452.94

= 2989.36 = ₹2989

74. A saree is sold for ₹5871 after a discount of 5%. Find its marked price?

(a) 5577
(b) 6880
(c) 6180
(d) 5734

RRB NTPC 28.04.2016 Shift : 1

Ans : (c) We know that,

$$\text{Marked Price} = \left(\frac{\text{Selling Price} \times 100}{100 - \text{discount}\%}\right)$$

$$\text{Marked price of saree} = 5871 \times \frac{100}{100-5}$$

$$= 5871 \times \frac{100}{95} = ₹6180$$

75. A shopkeeper buys a stereo system of marked ₹2000 at successive discount of 10% and 15% respectively. He spent ₹70 on the packaging and sold it for ₹2000. Find the percentage profit of the shopkeeper.

(a) Not profit (b) 25%
(c) 30% (d) 35%

RRB NTPC 29.04.2016 Shift : 2

Ans : (b) Cost price of stereo system for shopkeeper

$$= \frac{2000 \times (100-10)}{100} \times \left(\frac{100-15}{100}\right)$$

$$= 2000 \times \frac{90}{100} \times \frac{85}{100}$$

$$= ₹1530$$

Total expense = 1530 + 70 = 1600

Profit = 2000–1600 = 400

$$\text{Profit } \% = \frac{\text{Profit} \times 100}{\text{Cost price}} = \frac{400 \times 100}{1600} = 25\%$$

76. A shopkeeper gives his customers 10% discount on the marked price of an item, yet he gets 26% profit. If the marked price is ₹560, then calculate the cost price.

(a) ₹400
(b) ₹450
(c) ₹396
(d) ₹404

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans. (a) :

$$\text{Selling price} = \text{Marked price} \times \left(\frac{100 - \text{Discount}\%}{100}\right)$$

$$= 560 \times \left(\frac{100-10}{100}\right)$$

$$= 560 \times \frac{90}{100} = 504$$

$\therefore$ $$\text{Cost price} = \left(\frac{100}{100 + \text{Profit}\%}\right) \times \text{Selling price}$$

$$\text{Cost price} = \frac{100}{126} \times 504 = ₹400$$

09.

Ratio & Proportion

Type - 1

1. 64 students of Class 10 took part in a mathematics quiz. If the number of girls was 16 more than the number of boys, then find the ratio of the number of boys to the total number of students who took part in the quiz.

(a) 4 : 9 (b) 3 : 5
(c) 3 : 8 (d) 5 : 8

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (c) : Let, Number of boys = x
And, Number of girls = (x+16)
$\because$ x+x+16 = 64
2x = 48
x = 24

$$\text{Required Ratio} = \frac{24}{(24+40)} = \frac{3}{8}$$

2. An amount of ₹ 1,470 is shared between Anant and Mohan in the ratio 3:4. What is the amount received by Mohan?

(a) ₹ 1,050 (b) ₹ 630
(c) ₹ 1,650 (d) ₹ 840

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : Given, Amount

₹ 1,470

Anant : Mohan
3 : 4

$$\text{Mohan's Share} = \frac{4}{7} \times 1470 = ₹\ 840$$

3. x and y are in direct proportion and y = 92.5 when x = 37. What will be the value of y when x = 16?

(a) 32 (b) 40
(c) 48 (d) 24

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) : $k = \frac{x}{y} = \frac{37}{92.5} = \frac{1}{2.5}$

But x = 16

$\therefore \quad \frac{16}{y} = \frac{1}{2.5}$

y = 40

4. If ₹2,400 is to be distributed between A and B in the ratio of 7 : 5, then the share of B is :

(a) ₹ 1,000 (b) ₹ 1,600
(c) ₹ 1,300 (d) ₹ 1,900

RRB Group-D 08/09/2022 (Shift-I)

Ans. (a) : Given,
A : B = 7 : 5

$$\text{Share of B} = 2400 \times \frac{5}{12}$$

Share of B = ₹ 1000

5. A certain amount of money was divided between x and y in the ratio 4 : 3. If y's share is ₹2,400, the total initial amount is _____.

(a) ₹8,000 (b) ₹7,200
(c) ₹5,600 (d) ₹6,000

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (c) :
Let Amount found by x = 4a
and amount found by y = 3a
According to the question
3a = 2400
a = 800
Hence total initial amount = 7a = 7 × 800
= ₹ 5600

6. Two numbers are in the ratio 3 : 2. If 8 and 6 are subtracted from the first and the second number respectively, the ratio becomes 8 : 5. The numbers are :

(a) 32, 24 (b) 24, 16
(c) 40, 30 (d) 3, 2

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : Let the numbers be 3x and 2x respectively.
According to the question-

$$\frac{3x-8}{2x-6} = \frac{8}{5}$$

$15x - 40 = 16x - 48$
x = 8
Hence the first number = 3×8 = 24
And second number = 2×8 = 16

7. In a college, if 15% of the boys are the same in number as one-third of the girls, then find the ratio of the number of boys to that of girls in the college.

(a) 20 : 9 (b) 20 : 7
(c) 9 : 20 (d) 7 : 20

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (a) : If the number of boys in a college = x
No. of girls = y

$$\frac{x \times 15}{100} = \frac{1}{3}y$$

$$\frac{x}{y} = \frac{20}{9}$$

$\therefore$ Ratio of number of boys and girls = 20 : 9

8. Umesh and Kapil donated ₹750 and ₹975 respectively. The ratio of the amount of donation by Umesh to that by Kapil is:

(a) 13 : 10 (b) 10 : 13
(c) 3 : 1 (d) 1 : 3

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (b) : Given:
Amount donated by Umesh = ₹750
Amount donated by Kapil = ₹975
Ratio of the amount donated by Umesh and Kapil

$= \frac{750}{975} = \frac{30}{39} = \frac{10}{13}$

$= 10 : 13$

9. Dividing ₹742 into two parts in the ratio of 5 : 9 will give the two parts as :

(a) ₹260, ₹482 (b) ₹265, ₹477
(c) ₹275, ₹467 (d) ₹290, ₹452

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) : On dividing ₹742 in ratio 5 : 9
Let number $\Rightarrow$ 5x and 9x.

$5x + 9x = 742$
$14x = 742$
$x = 53$

Then numbers

$5x = 5 \times 53$
$= ₹265$
$9x = 9 \times 53 = ₹477$

10. The ratio of the number of females to that of male employees in a small company is 2 : 3 If the number of male employees in the company is 90, then the total number of employees working in the company is:

(a) 120 (b) 90
(c) 130 (d) 150

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the number of female and male employees in company = 2x and 3x
According to the question-
$3x = 90 \Rightarrow x = 30$
$\therefore$ Total number of employees in company $= (3x + 2x)$
$= 5 \times 30 = 150$

11. The difference of two numbers is equal to 30% of their sum find the ratio of the larger number to the smaller number.

(a) 15 : 7 (b) 13 : 7
(c) 2 : 1 (d) 17 : 15

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the larger number and smaller number be x and y respectively.
According to the question,

$(x - y) = (x + y) \times \frac{30}{100}$

$10(x-y) = 3(x+y)$
$10x-10y = 3x+3y$
$7x = 13y$
$x : y = 13 : 7$

12. The ratio of the incomes of two persons is 7:5 and the ratio of their corresponding expenses is 9:7. If they save 1700 Rs. and 1100 Rs. consecutively then find the corresponding income of each person?

(a) ₹ 5,000, ₹ 5,000, (b) ₹ 4,500, ₹ 3,500,
(c) ₹ 5,500, ₹ 4,500, (d) ₹ 3,500, ₹ 2,500,

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let,
Their income are 7x and 5x
and expenditure =9y, 7y
$\because$ Income = Expenditure + Savings
$\therefore$ According to the question,

$7x–9y=1700$ ……..(i)
$5x–7y=1100$ ……..(ii)

From equation (i) and (ii)-

$49x–63y=11900$
$-45x+63y=-9900$
$4x=2000$

$\Rightarrow x = 500$

Then corresponding income of each person,
$7x = 7\times500 = 3500$
$5x=5\times500=2500$

13. Two friend received a bonus of ₹2000 each in their bank accounts. They already have ₹47000 and ₹54000 in their respective bank account. Ratio of the amounts in their respective accounts will be:

(a) 47 : 54 (b) 47 : 56
(c) 7 : 8 (d) 49 : 54

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,
Required ratio = (47000+2000):(54000+2000)
=49000:56000
=7:8

14. If 10% of *x* = 15% of y, then what will be the value of x : y ?

(a) 2 : 3 (b) 2 : 1
(c) 3 : 2 (d) 1 : 2

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : $x \times \frac{10}{100} = y \times \frac{15}{100}$

$10x = 15y$

$\frac{x}{y} = \frac{15}{10}$

$\frac{x}{y} = \frac{3}{2}$

or $x : y = 3 : 2$

15. The sum of two numbers is 80 and their difference is 8. The ratio of the first number to the second number will be:

(a) 13 : 9 (b) 12 : 11
(c) 13 : 11 (d) 11 : 9

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the numbers is a and b

According to the question,

$a + b = 80$ ...(i)

$a - b = 8$ ...(ii)

From equation (i) and (ii),

$2a = 88$

$a = 44$

and,

$b = 36$

then, $a : b = 44 : 36 = 11 : 9$

16. If $\frac{3}{5}$ of a bottle is filled, what is the ratio of the filled part to the empty part of the bottle?

(a) 3:5 (b) 5:3

(c) 3:2 (d) 2:3

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (c) : Filled part of the bottle $= \frac{3}{5}$

Empty part of the bottle $= 1-\frac{3}{5}=\frac{2}{5}$

Ratio of the filled part to the empty part of the bottle.

$$\frac{\frac{3}{5}}{\frac{2}{5}}=\frac{3\times5}{2\times5}=\frac{3}{2}=3:2$$

17. John and Joseph have ₹19,000 and ₹ 26,000. If Joseph gives ₹ 1,000 to John. Then find the ratio of the amounts presents with John and Joseph respectively.

(a) 2 : 3 (b) 20 : 27

(c) 4 : 5 (d) 19 : 26

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (c) : Given-

John has = ₹ 19,000

Joseph has = ₹ 26,000

According to the question,

Joseph gives ₹ 1000 to John.

then John has = ₹ 20,000

Joseph has = ₹ 25,000

Hence, required ratio $= \frac{20,000}{25,000} = 4 : 5$

18. What is the sub-duplicate ratio of 225 : 144 ?

(a) 12 : 5 (b) 5 : 12

(c) 12 : 15 (d) 15 : 12

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (d) : The sub-duplicate ratio of 225 : 144

$$=\sqrt{\frac{225}{144}}=\frac{15}{12}=15:12$$

19. If (m + n) : (m – n) = 7 : 3, then ($m^3 + n^3$) : ($m^3 – n^3$) = ?

(a) 133 : 117 (b) 117 : 13

(c) 117 : 133 (d) 17 : 133

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

$$\frac{m+n}{m-n}=\frac{7}{3}$$

On putting,

$m + n = 7$ and $m - n = 3$

$m = 5$ and $n = 2$

then, $\frac{m^3+n^3}{m^3-n^3}=\frac{(5)^3+(2)^3}{(5)^3-(2)^3}$

$$=\frac{125+8}{125-8}$$

$$\frac{m^3+n^3}{m^3-n^3}=\frac{133}{117}$$

Hence, $(m^3 + n^3) : (m^3 – n^3) = 133 : 117$

20. If 25% of the first number is three times of 50% of the second number then what will be the ratio of the first number and the second number?

(a) 3 : 1 (b) 6 : 1

(c) 2 : 3 (d) 1 : 6

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the first number A and the second number B -

According to the question,

$$\frac{A\times25}{100}=\frac{B\times50}{100}\times3$$

$$\frac{A}{B}=\frac{6}{1}$$

$A : B = 6 : 1$

21. If (3x+2y) : (3x-2y) = 5 : 3 then find x : y.

(a) $\frac{4}{3}$ (b) $\frac{32}{3}$

(c) $\frac{16}{3}$ (d) $\frac{8}{3}$

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{3x+2y}{3x-2y}=\frac{5}{3}$

$$9x+6y=15x-10y$$

$$16y=6x$$

$$\frac{x}{y}=\frac{16}{6} \text{ or } \frac{x}{y}=\frac{8}{3}$$

22. The ratio of two weights, 27kg and 108 g, is:

(a) 250 : 1 (b) 300 : 1

(c) 270 : 1 (d) 240 : 1

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (a) :

$$\text{Required ratio} = \frac{27\times1000\,\text{gm}}{108\,\text{gm}}$$

$$=\frac{1000}{4}=250:1$$

23. If $a^3 + b^3 : a^3 - b^3 = 185 : 158$ then a : b = ?

(a) 5 : 4 (b) 2 : 3
(c) 10 : 2 (d) 7 : 3

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : From the question,

$$\frac{a^3 + b^3}{a^3 - b^3} = \frac{185}{158}$$

$$158\,a^3 + 158\,b^3 = 185\,a^3 - 185\,b^3$$

$$185\,a^3 - 158\,a^3 = 158\,b^3 + 185\,b^3$$

$$27\,a^3 = 343\,b^3$$

$$\frac{a^3}{b^3} = \frac{343}{27}$$

$$\frac{a}{b} = \sqrt[3]{\frac{343}{27}}$$

$$\frac{a}{b} = \frac{7}{3}$$

Hence, $\boxed{a : b = 7 : 3}$

24. Find the ratio of 3 days with 30 hours

(a) 7 : 6 (b) 12 : 5
(c) 6 : 7 (d) 5 : 12

RRB RPF Constable -19/01/2019 (Shift-II)

Ans. (b) : $\because$ One day = 24 hours

$\therefore$ 3 days = $24 \times 3 = 72$ hours

Required ratio = 72 : 30 = 12 : 5

25. Which of the following ratio is the largest?

(a) 5 : 7 (b) 2 : 3
(c) 3 : 4 (d) 3 : 5

RRB JE - 02/06/2019 (Shift-II)

Ans. (c) From options-

(a) 5/7 = 0.714
(b) 2/3 = 0.666
(c) 3/4 = 0.75
(d) 3/5 = 0.6

So option (c) is the largest

26. A bag contained red, green and pink tokens. The ratio between red and green tokens was 15 : 32 while the ratio between pink and red tokens was 18 : 25. What was the ratio between green and pink tokens?

(a) 80 : 27 (b) 192 : 125
(c) 16 : 9 (d) 25 : 28

RRB RPF SI -05/01/2019 (Shift-II)

Ans : (a) Green : Red = 32 : 15

Red : Pink = 25 : 18

Green : Red : Pink = 800 : 375 : 270

So Green : Pink = 800 : 270 = 80 : 27

27. The ratio of the number of marbles that Tulip and Devansh had was 7 : 9 while the ratio of the number of marbles that Sheetal and Devansh had was 7 : 15. Find the ratio of number of marbles available with Tulip and Sheetal.

(a) 5 : 3 (b) 5 : 7
(c) 7 : 5 (d) 2 : 3

RRB RPF Constable -17/01/2019 (Shift-III)

Ans. (a) : $\frac{\text{Tulip}}{\text{Devansh}} = \frac{7}{9}$

And $\frac{\text{Sheetal}}{\text{Devansh}} = \frac{7}{15}$

So $\frac{\text{Tulip}}{\text{Sheetal}} = \frac{7}{9} \times \frac{15}{7} = \frac{5}{3}$ Required ratio = 5 : 3

28. If a : b = 32 : 35 and b:c = 21 : 32. Then a : c ?

(a) 1 : 1 (b) 5 : 7
(c) 3 : 5 (d) 5 : 3

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (c)

$$\frac{a}{b} = \frac{32}{35} \text{ ..... (i)}$$

$$\frac{b}{c} = \frac{21}{32} \text{ ..... (ii)}$$

From the equation (i) and (ii)

$$\frac{a}{b} \times \frac{b}{c} = \frac{32}{35} \times \frac{21}{32}$$

$$\frac{a}{c} = \frac{3}{5}$$

29. Two numbers are 30% and 60% higher than the third number respectively. What is the ratio of both the numbers ?

(a) 14 : 13 (b) 16 : 13
(c) 22 : 23 (d) 13 : 16

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (d) Let the third number = 100

$\therefore$ First number and second number = 130, 160

So required ratio = $\frac{130}{160} = 13 : 16$

30. The ratio of Sand and Macadam in a mixture is 41 : 30. While the mixture of Macadam and cement is 6 : 7. What is the ratio of sand and cement in the mixture?

(a) 8 : 6 (b) 11 : 7
(c) 77 : 48 (d) 41 : 35

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (d)

$$\frac{\text{Sand}}{\text{Macadam}} = \frac{41}{30} \text{ and } \frac{\text{Cement}}{\text{Macadam}} = \frac{7}{6} = \frac{7 \times 5}{6 \times 5} = \frac{35}{30}$$

$$\text{So } \frac{\text{Sand}}{\text{Cement}} = \frac{\text{Sand}}{\text{Macadam}} \times \frac{\text{Macadam}}{\text{Cement}} = \frac{41}{30} \times \frac{30}{35} = \frac{41}{35}$$

$= 41 : 35$

31. Red, green and pink tokens are kept in a bag, the ratio of red and green tokens is 5 : 11 while the ratio of pink and red tokens is 7 : 15. What will be the ratio of green and pink tokens?

(a) 77 : 75 (b) 11 : 7
(c) 33 : 7 (d) 75 : 77

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (c) Pink : Red = 7 : 15

Red : Green = 5 : 11

Then, Pink : Red : Green = $7 \times 5 : 5 \times 15 : 15 \times 11$

= 35 : 75 : 165

Green : Pink = 165 : 35 = 33 : 7

32. If A : B = 5 : 8 and B : C = 18 : 25 then find A : C.

(a) 8 : 5 (b) 9 : 20
(c) 5 : 8 (d) 20 : 9

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (b**) :** Given,

$$\frac{A}{B}=\frac{5}{8} \text{ and } \frac{B}{C}=\frac{18}{25}$$

$$\text{Then } \frac{A}{C}=\left(\frac{A}{B}\times\frac{B}{C}\right)=\left(\frac{5}{8}\times\frac{18}{25}\right)=\frac{90}{200}$$

So, A : C = 9 : 20

33. The ratio of soil and gravel in a mixture is 11 : 8 while the ratio of gravel and cement is 6 : 7. What is the ratio of soil and cement in the mixture?

(a) 77 : 48 (b) 33 : 28
(c) 8 : 6 (d) 11 : 7

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans : (b)

(i) Soil (S) Gravel (B)
11 : 8

(ii) Gravel (B) Cement (C)
6 : 7

S : B = 11 : 8 = 66 : 48
B : C = 6 : 7 = 48 : 56
S : B : C = 66 : 48 : 56
Soil : Cement = 66 : 56
= 33 : 28

34. If the ratio of a : b is 45 : 56 and the ratio of b : c is 16 : 35, then what is the ratio of a : c?

(a) 9 : 7 (b) 18 : 49
(c) 7 : 2 (d) 7 : 9

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (b) Given,

a : b = 45 : 56
b : c = 16 : 35

$$\therefore a:c=\frac{a}{c}=\frac{a}{b}\times\frac{b}{c}=\frac{45}{56}\times\frac{16}{35}$$

$$=\frac{18}{49}=18:49$$

35. Suraj's amount is 4 times that of Ravi's amount. Ravi's amount is 16 times the amount of Aditya's amount. What is the ratio of Aditya's and Suraj's amount?

(a) 64 : 1 (b) 1 : 64
(c) 1 : 24 (d) 1 : 16

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (b**)** According to the question

Let Aditya's amount = ₹ x
and Ravi's amount = ₹ 16x
Suraj's amount = ₹ 64x

Ratio of amount of Aditya, Ravi and Suraj
= x : 16x : 64x

Ratio of amount of Aditya and Suraj
= x : 64x = 1 : 64

36. If a : b = 2 : 3 and a : c = 10 : 21, then what is b : c?

(a) 5 : 7 (b) 15 : 14
(c) 14 : 15 (d) 7 : 5

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (a) Given,

$$\frac{a}{b}=\frac{2}{3},\quad \frac{a}{c}=\frac{10}{21}$$

$$\frac{c}{b}=\frac{a}{b}\times\frac{c}{a}=\frac{2}{3}\times\frac{21}{10}$$

c : b = 7 : 5
b : c = 5 : 7

37. If A : B = 2 : 5 and B : C = 3 : 4, then A : C = ?

(a) 1:2 (b) 3:10
(c) 2:3 (d) 5:4

RRB NTPC 28.03.2016 Shift : 2

Ans : (b) A : B = 2:5.....(i)
B : C = 3:4.....(ii)

Multiplying by 3 in equation (i) and by 5 in equation(ii)
A : B = 6:15
B : C = 15:20

Required ratio, A : B : C = 6:15:20

So A : C = 6:20
A : C = 3:10

38. Two numbers are 40% and 60% more than the third number respectively, what is the ratio of the first number to the second number?

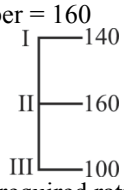
(a) 7 : 9 (b) 8 : 9
(c) 8 : 7 (d) 7 : 8

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) Let the third number = 100

According to the question

I number = 140
II number = 160



Hence, required ratio

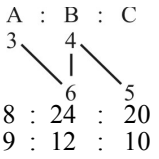
$$=\frac{I_{num}}{II_{num}}=\frac{140}{160}=\boxed{7:8}$$

39. If A : B = 3 : 4 and B : C = 6 : 5, then A : (A + C) = ?

(a) 9:11 (b) 9:10
(c) 9:19 (d) 6:7

RRB NTPC 16.04.2016 Shift : 3

Ans : (c)



Hence, $\frac{A}{A+C}=\frac{9}{9+10}=\frac{9}{19}$

40. If a/b = 1/4, b/c = 1/8 and a = 2 then the value of c is-

(a) 8 (b) 16
(c) 32 (d) 64

RRB NTPC 27.04.2016 Shift : 3

Ans : (d) $\frac{a}{b}=\frac{1}{4}\Rightarrow\frac{2}{b}=\frac{1}{4}\quad(\because a=2)$

$b = 2 \times 4$
$b = 8$

and $\frac{b}{c}=\frac{1}{8}\Rightarrow\frac{8}{c}=\frac{1}{8}$

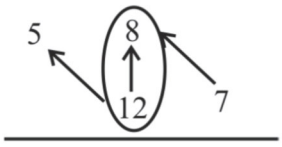
$c = 8 \times 8 \Rightarrow c = 64$

41. The ratio of the number of marbles that Joyee and Minit had was 5 : 8 while the ratio of the number of marbles that Jacob and Minit had was 7 : 12. What is the ratio of the number of marbles that Joyee and Jacob had ?

(a) 7 : 5 (b) 2 : 3
(c) 15 : 14 (d) 5 : 7

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (c) Joyee : Minit : Jacob



Joyee : Minit : Jacob = 60 : 96 : 56
= 30 : 48 : 28
= 15 : 24 : 14

Hence, the ratio of the number of marbles Joyee and Jacobs had = 15:14

42. The ratio of sand to gravel in a mixture is 7:8 while that of gravel and cement is 6:7. What is the ratio of sand to cement in the mixture?

(a) 49 : 48 (b) 7 : 7
(c) 8 : 6 (d) 3 : 4

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (d)

$$\therefore \quad \frac{\text{Sand}}{\text{Gravel}} = \frac{7}{8} \text{ and } \frac{\text{Gravel}}{\text{Cement}} = \frac{6}{7}$$

$$\therefore \quad \frac{\text{Sand}}{\text{Cement}} = \frac{\text{Sand}}{\text{Gravel}} \times \frac{\text{Gravel}}{\text{Cement}}$$

$$= \frac{7}{8} \times \frac{6}{7} = \frac{6}{8} = 3:4$$

43. The ratio 1 : 5 can be expressed in decimal as:

(a) 0.5 (b) 0.2
(c) 0.02 (d) 0.1

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b) $1:5 = \frac{1}{5} = 0.2$

44. In a bag containing red, green and pink tokens, the ratio of red to green tokens was 5 :12 while the ratio of pink to red tokens was 7 : 15. What was the ratio of green to pink tokens ?

(a) 25 : 28 (b) 36 : 7
(c) 28 : 25 (d) 12 : 7

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (b) Given,
Green tokens : Red tokens =12 : 5
Red tokens : Pink tokens =15 : 7
Then, Green tokens : Red tokens : Pink tokens = 12×15 : 15×5 : 7×5
180 : 75 : 35
Green tokens : Pink tokens
180 : 35 = 36 : 7

45. The ratio of sand to gravel in a mixture is 17 : 8 while that between gravel and cement is 6 : 17. What is the ratio of sand to cement in the mixture?

(a) 17 : 17 (b) 289 : 48
(c) 8 : 6 (d) 3 : 4

RRB ALP & Tec. (09-08-18 Shift-III)

Ans : (d) Sand : Gravel = 17:8, Gravel : Cement=6 : 17
Sand : Gravel : Cement = 102 : 48 : 136
Then ratio of Sand and Cement in the mixture
= 102 : 136 = 3 : 4

46. If a : b = $\frac{3}{2} : \frac{7}{3}$ and b : c = $\frac{1}{5} : \frac{1}{7}$ Then find a : b : c ?

(a) 14:9:10 (b) 4:5:7
(c) 9:14:10 (d) 10:9:14

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (c) $a : b = \frac{3}{2} : \frac{7}{3} = 9:14$

$b : c = \frac{1}{5} : \frac{1}{7} = (7:5) \times 2 = 14:10$

$\therefore a : b : c = 9 : 14 : 10$

47. a : b = 7 : 9, b : c = 5 : 11. Then find a : b : c ?

(a) none of these (b) 99 : 45 : 35
(c) 45 : 35 : 99 (d) 35 : 45 : 99

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (d) Given
a : b = 7 : 9
b : c = 5 : 11
Hence, a : b : c = 7 × 5 : 9 × 5 : 9 × 11 = 35 : 45 : 99

48. If a : b = 3 : 5 , c : b = 3 : 2 , c : d = 5 : 6 then find a : d = ?

(a) 12 : 36 (b) 12 : 15
(c) 1 : 3 (d) 11 : 36

RRB NTPC 18.04.2016 Shift : 3

Ans : (c) a : b = 3 : 5, c : b = 3 : 2, c : d = 5 : 6
b : c = 2 : 3

$$\therefore a : d = \frac{a}{b} \times \frac{b}{c} \times \frac{c}{d}$$

$$= \frac{3}{5} \times \frac{2}{3} \times \frac{5}{6} = \frac{1}{3}$$

49. If a : b = 3 : 4 and b : c = 5 : 7, then a : c = ?

(a) 28 : 10 (b) 28 : 15
(c) 15 : 28 (d) 10 : 28

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (c) a : b = 3 : 4
b : c = 5 : 7
a : c = ?

a : b : c
3 : 4 : 4
5 : 5 : 7
15 : 20 : 28

Hence,
a : c = 15 : 28

50. If a : b = 3 : 4 and d : b = 4 : 3, then find the ratio of a to d.

(a) 9 : 16 (b) 3 : 4
(c) 4 : 3 (d) 16 : 9

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (a) : a : b = (3 : 4) × 3
d : b = (4 : 3) × 4
a : b : d
9 : 12 : 16
Hence, a : d = 9 : 16

51. Income and expenditure of a person are in the ratio of 9 : 5. If the income of the person is Rs. 27,000, then find his savings.

(a) Rs. 10,000 (b) Rs. 13,564
(c) Rs. 12,000 (d) Rs. 9,678

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the income of a person = 9x
Expenditure of a person = 5x
We know that :
Income = Expenditure + Savings
9x = 5x + Savings
Savings = 4x
According to the question,
9x = 27000
x = 3000
Savings = 4x = 4×3000 = ₹12000

52. In a class, the ratio of girls and boys is 13:12. Find the percentage of the girls in the class.

(a) 25% (b) 48%
(c) 13% (d) 52%

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (d) : Ratio of girls and boys = 13 : 12
$\therefore$ Total number of the students in the class = 25
$\therefore$ Percentage of girls $= \frac{13}{25} \times 100$
$= 13 \times 4 = 52\%$

53. The average of salaries of husband and wife is ₹65,000 and ratio of their salaries is 15:11 respectively. How much is the salary of the wife?

(a) ₹ 32,500 (b) ₹ 75,000
(c) ₹ 27,500 (d) ₹ 55,000

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let the salary of husband = 15x
and the salary of wife = 11x
According to the question,
$\frac{15x + 11x}{2} = 65,000$
$26x = 65000 \times 2$
$x = \frac{65000 \times 2}{26}$
$x = 5,000$
Hence, the salary of wife = 11x = 11 × 5000
= ₹55,000

54. In a class of 40 students, the number of girls is three fifth of the number of boys. Then find the number of boys in the class.

(a) 18 (b) 25
(c) 14 (d) 15

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the number of boys be x.
Then the number of girls $= x \times \frac{3}{5}$
Total number of students in the class $= x + \frac{3}{5}x = 40$
$\frac{8}{5}x = 40$
$x = 40 \times \frac{5}{8} = 25$
Hence, the number of boys in the class x = 25.

55. If a = 2b/3, b = 2c/3, and c = 2d / 3 what is the ratio of b and d ?

(a) 8/9 (b) 4/9
(c) 4/3 (d) 5/27

RRB NTPC 19.04.2016 Shift : 2

Ans : (b) Given
$a = \frac{2b}{3}, b = \frac{2c}{3}, c = \frac{2d}{3}$
$\Rightarrow \frac{a}{b} = \frac{2}{3}, \frac{b}{c} = \frac{2}{3}, \frac{c}{d} = \frac{2}{3}$
$\Rightarrow \frac{a}{b} = \frac{8}{12}, \frac{b}{c} = \frac{12}{18}, \frac{c}{d} = \frac{18}{27}$
$\Rightarrow a : b : c : d = 8 : 12 : 18 : 27$
$\therefore \frac{b}{d} = \frac{12}{27} \quad \Rightarrow \boxed{\frac{b}{d} = \frac{4}{9}}$

Type - 2

56. A pole is 405 m long. It is painted in saffron, white and green colour one above the other in the ratio 8:9:10 respectively. What is the length of the white part of the pole (in meters)?

(a) 130 m (b) 120 m
(c) 140 m (d) 135 m

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (d) : Length of white part of the pole
$= \frac{\text{Total length of pole}}{\text{Sum of ratio of pole}} \times \text{Ratio of white paint}$
$= \frac{405}{8+9+10} \times 9$
$= \frac{405}{27} \times 9$
= 135 meters

57. A sum of ₹x is divided among A, B and C such that the ratio of their shares is 2:3:5. If the positive difference between the shares of B and C is ₹5,940, then what is the value of x?

(a) ₹ 22,680 (b) ₹23,220
(c) ₹25,920 (d) ₹29,700

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (d) : Let the shares of A, B and C are 2n, 3n and 5n respectively
The positive difference between B and C
= 5n – 3n = 2n
According to the question,
2n = 5940
$n = \frac{5940}{2}$
= 2970

Value of x = 2n + 3n + 5n
= 10n
= 10 × 2970
= 29700

58. If a : b = 2 : 3 and b : c = 3 : 4, then a : b : c = ?
(a) 3 : 4 : 2 (b) 3 : 2 : 4
(c) 2 : 4 : 3 (d) 2 : 3 : 4

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (d) : Given,
a : b = 2 : 3 and b : c = 3 : 4
a : b = 2 : 3
b : c = 3 : 4
a : b : c = 6 : 9 : 12
or a : b : c = 2 : 3 : 4

59. A sum of ₹4,800 is divided between A, B and C such that the ratio of the share of A to the combined share of B and C is 3 : 5 and C receives 5/7 of what A and B together receive. The difference (in ₹) of A's share and B's share is :
(a) 900 (b) 800
(c) 1,000 (d) 850

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) : A : (B+C) = 3 : 5

$$A = \frac{4800 \times 3}{8} = ₹1800$$

$$B + C = \frac{4800 \times 5}{8} = ₹3000$$

B + C = 3000 ..... (i)

$$C = (A + B) \times \frac{5}{7}$$

7C = 5 (A+B)
7C – 5B = 5A
7C – 5B = 5 × 1800
7C – 5B = 9000 ..... (ii)
Multiplying equation (i) by 7 and substracting equation (ii)
7C + 7B = 21000
7C – 5B = 9000
– + –
12B = 12000
B = 1000
The difference of A's share and B's share
= ₹1800 – ₹1000
= ₹800

60. If the income of A is 15% more than of B and the income of B is 20% less than that of C, then the income of A, B and C respectively are in the ratio:
(a) 23 : 20 : 25 (b) 25 : 23 : 20
(c) 20 : 23 : 25 (d) 23 : 25 : 20

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

$$A = B \times \frac{115}{100}$$

$$\frac{A}{B} = \frac{23}{20}$$

$$B = C \times \frac{80}{100}$$

$$\frac{B}{C} = \frac{20}{25}$$

Hence, A : B : C = 23 : 20 : 25

61. If A is 80% more than B and B is 20% less than C, then what will be the value of A : B :C?
(a) 36 : 25 : 20 (b) 36 : 20 : 25
(c) 36 : 5 : 20 (d) 20 : 25 : 36

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) : ∵ B is 20% less than C,
Let, C → 100
B → 80
A is 80% more than B,

$$\therefore \quad A \rightarrow 80 \times \frac{180}{100}$$

→ 144
A : B : C = 144 : 80 : 100
On dividing by 4,
A : B : C = 36 : 20 : 25

62. Seats for Mathematics, Physics and Chemistry in a school are in the ratio of 7:8:9. There is a proposal to increase the seats by 30%, 40% and 50% respectively. What will be the ratio of increased seats?
(a) 91 : 112: 135 (b) 135 : 112 : 91
(c) 35 : 37 :91 (d) 112 : 91: 135

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : Ratio = 7 : 8 : 9
Increase = 30%, 40%, 50%
Let the ratio → 70 : 80 : 90
According to the question,

$$\text{Number of seats in Mathematics} = \frac{70 \times 130}{100} = 91$$

$$\text{Number of seats in Physics} = \frac{80 \times 140}{100} = 112$$

$$\text{Number of seats in Chemistry} = 90 \times \frac{150}{100} = 135$$

Ratio of increased seats = 91 : 112 : 135

63. If 15% of x = 25% of y = 50% of z Then find the value of x : y : z.
(a) 3:5:10 (b) 10:6:3
(c) 10:5:3 (d) 3:2:1

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,

$$x \times \frac{15}{100} = y \times \frac{25}{100} = z \times \frac{50}{100}$$

3x = 5y = 10z = k (Let)

$$3x = k$$

$$x = \frac{k}{3}$$

Same as,

$$y = \frac{k}{5}$$

$$z = \frac{k}{10}$$

$$x : y : z = \frac{k}{3} : \frac{k}{5} : \frac{k}{10}$$

$$x : y : z = \frac{10k : 6k : 3k}{30}$$

$$\boxed{x : y : z = 10 : 6 : 3}$$

64. If $\frac{A}{4} = \frac{B}{5} = \frac{C}{6}$, then A : B : C is:

(a) 4 : 5 : 6 (b) 5 : 6 : 4
(c) 4 : 6 : 5 (d) 4 : 8 : 9

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given, $\frac{A}{4} = \frac{B}{5} = \frac{C}{6}$

Let, $\frac{A}{4} = \frac{B}{5} = \frac{C}{6} = k$

Then, A = 4k, B = 5k and C = 6k

$\therefore$ A : B : C = 4k : 5k : 6k

= 4 : 5 : 6

65. If $\frac{1}{3}$ of A = $\frac{3}{4}$ of B = $\frac{1}{6}$ of C, then what is A : B : C ?

(a) 9 : 18 : 4 (b) 4 : 9 : 18
(c) 9 : 4 : 18 (d) 18 : 9 : 4

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let,

$$\frac{1}{3}\text{ of } A = \frac{3}{4}\text{ of } B = \frac{1}{6}\text{ of } C = K$$

$$\frac{A}{3} = \frac{3B}{4} = \frac{C}{6} = K$$

then, A = 3K

$$B = \frac{4}{3}K$$

C = 6K

Hence, $A : B : C = 3K : \frac{4}{3}K : 6K$

= 9K : 4K : 18K

A : B : C = 9 : 4 : 18

66. On dividing of ₹ 3900 in between L, K and J by the ratio of $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$, what amount will k get?

(a) ₹ 1,450 (b) ₹ 30
(c) ₹ 1,200 (d) ₹ 900

RRB RPF Constable -18/01/2019 (Shift-III)

Ans : (c) Ratio between L, K and J $= \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

= 6 : 4 : 3

So amount received by $K = 3900 \times \frac{4}{13} =$ ₹ 1200

67. In an alloy of German Silver the ratio of Copper and Zinc was 21 : 16, while the ratio of Nickel and Zink was 7 : 24. What was the ratio of Copper, Zink and Nickel in the alloy?

(a) 63:48:14 (b) 21:6:7
(c) 17:21:4 (d) 68:28:21

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) : Copper : Zinc = 21 : 16

Nickel : Zinc = 7 : 24

Copper : Zinc : Nickel $= 21 \times 24 : 16 \times 24 : 7 \times 16$

$= 3 \times 21 : 3 \times 16 : 2 \times 7$

$= 63 : 48 : 14$

68. In an alloy of German Silver the ratio of Copper and Zinc was 19 : 6 while the ratio of Nickel and Zinc was 7:4. Then what was the ratio of Copper, Zinc and Nickel?

(a) 19 : 44 : 4 (b) 19 : 24 : 7
(c) 38 : 12 : 21 (d) 133 : 42 : 24

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (c) Copper : Zinc = 19 : 6

Nickel : Zinc = 7 : 4

Copper : Zinc : Nickel = 19 : 6

4 : 7

= 76 : 24 : 42

= 38 : 12 : 21

69. In an alloy of German Silver the ratio of Copper to Zinc was 17 : 7 while that of Nickel to Zinc was 4 : 3. The ratio of Copper to Zinc to Nickel in the alloy was:

(a) 17 : 21 : 4 (b) 51 : 21 : 28
(c) 68 : 28 : 21 (d) 17 : 28 : 3

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (b) Copper : Zinc = 17 : 7, Nickel : Zinc = 4 : 3

or Zinc : Nickel = 3 : 4

Copper : Zinc : Nickel = 51 : 21 : 28

70. The ratio of Copper, Zinc and Nickel in German Silver is 4:3:2. How many kilograms of Zinc should be added to this metal of 54 kg so that the new ratio becomes 2:5:1.

(a) 50 (b) 48
(c) 36 (d) 42

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (d) Copper : Zinc : Nickel = 4 : 3 : 2

Let quantity is 4x, 3x and 2x kg respectively.

According to the question,

4x + 3x + 2x = 54

9x = 54

x = 6

$\therefore$ Copper = 4 × 6 = 24 kg

Zinc = 3 × 6 = 18 kg

Nickel = 2 × 6 = 12 kg

Let the new ratio will be 2:5:1 by adding y kg of Zinc

$\frac{24}{18 + y} = \frac{2}{5}$

120 = 36 +2y

84 = 2y

y = 42 kg

So adding zinc in new metal = 42 kg

71. The ratio of marks obtained by a student in three subject is 1 : 2 : 3 . The school has decided to 5% grace marks for each subject. Find the student's new ratio.

(a) 1:2:3 (b) 2:3:4
(c) 2:3:1 (d) 3:2:1

RRB NTPC 06.04.2016 Shift : 1

Ans : (a) Let the marks obtained by students in 3 subject is x, 2x and 3x
According to the question

$$x \times \frac{100+5}{100} : 2x \times \frac{100+5}{100} : 3x \times \frac{100+5}{100}$$

x : 2x : 3x
1:2:3
Hence, the new ratio is 1 : 2 : 3

72. Divide ₹169 in the ratio 2 : 5 : 6 the rupees in the respective ratios are given by:

(a) 26, 66, 77 (b) 26, 65, 78
(c) 25, 67, 78 (d) 26, 70, 73

RRB NTPC 19.01.2017 Shift : 3

Ans : (b) First share $= \frac{169 \times 2}{13} = 26$

Second share $= \frac{169 \times 5}{13} = 65$

Third share $= \frac{169 \times 6}{13} = 78$

Divided amount = 26, 65, 78

73. If the ratio of three positive number is 3:7:8 and the sum of their squares is 7808, Then find the smallest number among them.

(a) 24 (b) 27
(c) 30 (d) 36

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the numbers are 3x, 7x and 8x.
According to the question,

$$(3x)^2 + (7x)^2 + (8x)^2 = 7808$$
$$9x^2 + 49x^2 + 64x^2 = 7808$$
$$122x^2 = 7808$$
$$x^2 = 64$$
$$x = 8$$

The smallest number = 3x = 3 × 8 = 24

74. If three numbers are in the ratio of 4 : 3 : 8 and the smallest of these numbers is 42, find the largest of these numbers.

(a) 96 (b) 104
(c) 120 (d) 112

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : Ratio of number = 4 : 3 : 8
Let, the numbers are = 4x, 3x, 8x
∵ Smallest number = 42 (Given)
∴ 3x = 42
x = 14
Largest number = 8x
= 8 × 14
= 112

75. The product of three numbers is 10290. The numbers are in ratio 3 : 5 : 2. Find the largest number among the three numbers.

(a) 60 (b) 35
(c) 75 (d) 21

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (b) : Let the three numbers are 3x, 5x and 2x
According to the question,

$$3x \times 5x \times 2x = 10290$$
$$30x^3 = 10290$$
$$x^3 = \frac{10290}{30}$$
$$x^3 = 343 \Rightarrow x = 7$$

Hence, the largest number = 5x = 5 × 7 = 35

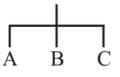
Type - 3

76. Three friends A, B and C divide ₹ 5,525 amongst them in such a way that if ₹ 50, ₹ 100 and ₹ 75 are removed from the sums that A, B and C received respectively, then the share of the sums that they get would have been in the ratio of 11 : 18 : 24. How much did C initially receive?

(a) ₹ 1,900 (b) ₹ 1,150
(c) ₹ 2,325 (d) ₹ 2,475

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : According to the question,
= ₹ 5,525 – (50 + 100 + 75)
Remaining amount = 5300



11 : 18 : 24

Share of C $= \frac{24}{53} \times 5300 = 2400$

Hence, share of C initially = 2400 + 75
= ₹ 2,475

77. The salaries of A and B are in the ratio 3 : 4. On increasing the salaries of both A and B by ₹ 3000 each, the new ratio of their salaries becomes 18 : 23. Find the salary of A after the increase.

(a) ₹12,000 (b) ₹23,000
(c) ₹21,000 (d) ₹18,000

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : Let the salaries of A and B are 3x and 4x respectively.
According to the question

$$\frac{3x+3000}{4x+3000} = \frac{18}{23}$$

$\Rightarrow$ 69x + 69000 = 72x + 54000
$\Rightarrow$ 3x = 15000
$\Rightarrow$ x = 5000
The salary of A after the increase = 5000 × 3 + 3000
= ₹18000

78. Two numbers are in the ratio 5 : 8. If the first number increases by 40% and second number decreases by 15%, the new ratio becomes _____.

(a) 35 : 34 (b) 23 : 26
(c) 37 : 39 (d) 12 : 17

RRB Group-D 01/09/2022 (Shift-I)

Ans. (a) : Let the first number = 5x
and the second number = 8x
According to the question

$$\text{New ratio} = 5x \times \frac{140}{100} : 8x \times \frac{85}{100}$$

$$= 35 : 34$$

79. The ratio of two numbers is 2 : 3. When 4 is added to the numbers, the ratio becomes 7:10. The difference between the numbers is:

(a) 10 (b) 24
(c) 12 (d) 08

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the numbers are 2x and 3x

According to the question, $\frac{2x+4}{3x+4} = \frac{7}{10}$

$$20x + 40 = 21x + 28$$
$$x = 12$$
$$\text{Difference} = 3x - 2x$$
$$\Rightarrow x = 12$$

80. Two numbers are in the ratio 3 : 2. If 8 is subtracted from the first number and 6 is subtracted from the second number, the ratio becomes 5 : 4. The numbers are:

(a) 24, 16 (b) 3, 2
(c) 2, 3 (d) 16, 24

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let the first number and second number are 3x and 2x respectively.
According to the question,

$$\frac{3x-8}{2x-6} = \frac{5}{4}$$
$$12x - 32 = 10x - 30$$
$$12x - 10x = -30 + 32$$
$$2x = 2$$
$$x = 1$$

Hence the numbers $3x = 3 \times 1 = 3$

$$2x = 2 \times 1 = 2$$

81. Two numbers are in the ratio of 9 : 11 If 4 is subtracted from each of the numbers, then their ratio becomes 7 : 9. The sum of these two numbers is:

(a) 45 (b) 40
(c) 35 (d) 30

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let the first number = 9x
Second number = 11x
According to the question,

$$\frac{9x-4}{11x-4} = \frac{7}{9}$$
$$\Rightarrow 81x - 36 = 77x - 28$$
$$\Rightarrow 81x - 77x = -28 + 36$$
$$\Rightarrow 4x = 8$$
$$\Rightarrow x = 2$$
$$\therefore \text{First number} = 9 \times 2 = 18$$
$$\text{Second number} = 11 \times 2 = 22$$

Hence the sum of both numbers = 18 + 22 = 40

82. What should be added to each term of the ratio 7 : 11 to make it equal to 4 : 5 ?

(a) 18 (b) 9
(c) 11 (d) 16

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let the required number = x
According to the question,

$$\frac{7+x}{11+x} = \frac{4}{5}$$
$$35 + 5x = 44 + 4x$$
$$x = 9$$

Hence the required number = 9

83. The ratio of A's salary to that of B was 4 : 5. A's salary got increased by 10% and B's salary got increased by 20%. What is the ratio of A's salary to that of B now?

(a) 15 : 14 (b) 14 : 11
(c) 11 : 14 (d) 11 : 15

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let, A's salary = 4x
And B's salary = 5x
According to the question-
When A's salary is increased by 10%,

$$= 4x + 4x \times \frac{10}{100}$$
$$= \frac{22}{5}x$$

When B's salary is increased by 20%,

$$= 5x + 5x \times \frac{20}{100}$$
$$= 6x$$

Hence, required ratio $= \frac{\frac{22}{5}x}{6x} = 11/15$

$$= 11 : 15$$

84. How much should we add to each of 7 and 9 so that the ratio of the two numbers thus formed is 13 : 14.

(a) 19 (b) 17
(c) 18 (d) 16

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the required number is x
According to the question,

$$\frac{7+x}{9+x}=\frac{13}{14}$$

$$98+14x=117+13x$$

$$x=117-98$$

$$x=19$$

85. What number has to be added to each term of 3 : 5 to make the ratio 5 : 6?

(a) 7 (b) 6
(c) 11 (d) 5

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the number x be added.

$$\frac{3+x}{5+x}=\frac{5}{6}$$

$$18+6x=25+5x$$

$$x=25-18$$

$$\boxed{x=7}$$

86. In a firm the ratio of male and female members was 4 : 5. The firm decided to increase the number of males by 80% and the number of female by 60% then now in firm the new ratio of male and female members will be :

(a) 8 : 10 (b) 18 : 15
(c) 9 : 10 (d) 15 : 16

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (c) : Ratio of male and female in the firm = 4 : 5

$$\text{Ratio after increment} = 4\times\frac{180}{100}:5\times\frac{160}{100}$$

$$= 9 : 10$$

87. In a school, the number of boys and girls were in the ratio 5 : 7. Eight more boys were admitted during the session. The new ratio of girls and boys is 1:1. In the beginning the difference between the number of boys and that of girls was :

(a) 12 (b) 08
(c) 02 (d) 10

RRB NTPC 07.01.2021 (Shift-I) Stage I[st]

Ans. (b) : Suppose no. of boys in school = 5x
and number of girls in school = 7x
According to the question eight more boys were admitted,

$$\therefore \quad \frac{5x+8}{7x}=\frac{1}{1}$$

$$2x=8$$

$$x=4$$

Required difference = 7x – 5x
= 2x
= 2 × 4
= 8

88. In a firm, the ratio of male and female officers is in the ratio of 4 : 7. If 50 male officers and 100 female officers are shifted to another firm, then the ratio of male and female officers becomes 7 : 12. Find the number of male officers before shifting in the firm.

(a) 450 (b) 400
(c) 300 (d) 500

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (b) : Let-
The number of male is 4x and the number of female in the firm is 7x.
According to the question-

$$\frac{4x-50}{7x-100}=\frac{7}{12}$$

$$48x-600=49x-700$$

$$x=100$$

Hence, the number of male officers in the firm before shifting = 4x = 4 × 100 = 400.

89. The ratio of the sum of money Arun and Ahaan had is 9 : 5. If Arun gives ₹12 from his share to Ahaan, then the ratio will change to 4 : 3. How much money did Arun have initially?

(a) ₹144 (b) ₹126
(c) ₹108 (d) ₹90

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (c) : Let the sum of money Arun and Ahaan be ₹9x and ₹5x respectively.
According to the question,

$$\frac{9x-12}{5x+12}=\frac{4}{3}$$

$$27x - 36 = 20x + 48$$

$$7x = 48 + 36$$

$$7x = 84$$

$$x=\frac{84}{7}$$

$$\boxed{x=12}$$

Hence the money with Arun = 9x
= 9 × 12
= ₹108

90. Two quantities are in the ratio 3 : 5. If each quantity is decreased by 9 then the ratio becomes 5 : 9. Find the smaller quantity?

(a) 51 (b) 54
(c) 52 (d) 53

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (b) Let the two quantities are 3x and 5x
According to the question,

$$\frac{3x-9}{5x-9}=\frac{5}{9}$$

$$27x - 81 = 25x - 45$$

$$2x = 81 - 45 = 36$$

$$x = 18$$

The smaller quantity = 3x = 3 × 18 = 54

91. The ratio of two positive integer is 3 : 4. Their sum is 70, how much should be added to each integer so that their ratio become 5 : 6 ?

(a) 10 (b) 20
(c) 30 (d) 40

RRB RPF SI -12/01/2019 (Shift-III)

Ans : (b) First integer $= \frac{3}{7} \times 70 = 30$

Second integer $= \frac{4}{7} \times 70 = 40$

Suppose x be added to each integer, ratio will be 5:6

Hence,

$$\frac{30+x}{40+x} = \frac{5}{6}$$

$\Rightarrow 180 + 6x = 200 + 5x$

$\Rightarrow 6x - 5x = 200 - 180 \Rightarrow x = 20$

92. The ratio of two number is 3 : 5, If each number is increased by 10, the ratio become 5 : 7 find the smallest number?

(a) 8 (b) 12

(c) 15 (d) 18

RRB RPF SI -11/01/2019 (Shift-I)

Ans : (c) Let numbers are 3x and 5x

$$\therefore \frac{3x+10}{5x+10} = \frac{5}{7}$$

$21x + 70 = 25x + 50$

$4x = 20$ or $x = 5$

$\therefore$ Smallest number $= 3x = 3 \times 5 = 15$

93. The salary of Charan and Rajat is in the ratio of 5 : 4 If the salary of each is increased by 3,000 then their new ratio become 6 : 5. What is salary of Charan.

(a) ₹ 15,000 (b) ₹ 12,000

(c) ₹ 8,000 (d) ₹ 20,000

RRB RPF Constable -20/01/2019 (Shift-I)

Ans : (a) Charan : Rajat

5x : 4x

According to the question,

$$\frac{5x+3000}{4x+3000} = \frac{6}{5}$$

$25x + 15000 = 24x + 18000$

$25x - 24x = 18000 - 15000$

$x = 3000$

Salary of Charan $= 5x = 5 \times 3000$

$= ₹ 15000$

94. The ratio of two number are 5 : 9. If 6 is added in both numbers then their ratio become 2 : 3. The original number are.

(a) 25, 45 (b) 10, 18

(c) 15, 27 (d) 5, 9

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (b) : Suppose both numbers are 5x and 9x respectively.

According to the question,

$$\frac{5x+6}{9x+6} = \frac{2}{3}$$

$15x + 18 = 18x + 12$

$6 = 3x$

$x = 2$

Original numbers $= 5 \times 2$ and 9×2

$= 10$ and 18

95. A number is divided into a ratio of 7 : 11 when 6 is added to each number, the ratio is changed to 5 : 7. What was the larger number among the initial number.

(a) 22 (b) 11

(c) 33 (d) 44

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (a) Suppose numbers are 7x and 11x respectively. Then

$$\frac{7x+6}{11x+6} = \frac{5}{7}$$

$49x + 42 = 55x + 30$

$42 - 30 = 55x - 49x$

$12 = 6x \Rightarrow x = \frac{12}{6} = 2$

$\boxed{x = 2}$

So numbers

$7x = 7 \times 2 = 14$

$11x = 11 \times 2 = 22$

Hence larger number $= 22$

96. The ratio between two number are 11 : 18. If 4 is added to both numbers, then the ratio between them becomes 13 : 20, what will be original number.

(a) 21, 36 (b) 26, 21

(c) 22, 36 (d) 32, 23

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (c) Let two number be 11x and 18x respectively.

Then $\frac{11x+4}{18x+4} = \frac{13}{20}$

$220x + 80 = 234x + 52$

$28 = 14x$

$x = 2$

Putting x=2 in 11x and 18x, respectively we get the numbers 22 and 36

97. The ratio of two numbers is 3 : 4. If 3 is added in each of them, then their ratio become 10 : 13. Find the original number.

(a) 9, 12 (b) 12, 16

(c) 20, 25 (d) 27, 36

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (d) Let the numbers is 3x and 4x

According to the question,

$$\frac{3x+3}{4x+3} = \frac{10}{13}$$

$39x + 39 = 40x + 30$

$x = 9$

Hence, original number $= 3x$ and $4x$

$= 3 \times 9$ and 4×9

$= \boxed{27, 36}$

98. The initial ratio of sugar and flour in a dough was 4 : 7 Justin added more flour in that 22 kg dough to make the ratio of sugar and flour 2:5 how much flour did Justin later added?

(a) 2 kg (b) 4 kg

(c) 8 kg (d) 6 kg

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (d) : Quantity of flour in dough of 22kg

$= 22 \times \frac{7}{11} = 14\text{kg}$

Quantity of sugar $= 22 - 14 = 8$ kg

Let mixed quantity of flour = x kg
According to the question

$$\frac{8}{14+x}=\frac{2}{5}$$

$40 = 28 + 2x$
$2x = 12$
$x = 6$
Hence mixed quantity of flour = 6 kg

99. A number is divided in the ratio of 9 : 5 when 8 is added to each number, the ratio becomes 5 : 3 which will be the largest number among the two?
(a) 80 (b) 72
(c) 69 (d) 81

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (b) Let the number is 9x and 5x respectively.
According to the question,

$$\frac{9x+8}{5x+8}=\frac{5}{3}$$

$27x + 24 = 25x + 40$
$2x = 40 – 24$
$2x = 16$
$x = 8$
So, the largest number = 9 × 8 = 72

100. The ratio of red ball and green ball in a bag is 15 : 26. If 12 more green balls are put in the bag then the ratio of red ball and green ball become 1 : 2. How many red ball are in the bag?
(a) 60 (b) 30
(c) 45 (d) 15

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (c) : Red : Green = 15:26
Suppose the number of red balls = 15x and green balls = 26x
On putting 12 more green balls

$$\frac{15x}{26x+12}=\frac{1}{2}$$

$30x = 26x + 12$
$4x = 12$
$x= 3$
Hence the number of red ball in the bag = 15×3 = 45

101. An amount was divided between Ethen and Jen in the ratio of 4 : 7. If Jen gives Ethen 1 rupee, then the ratio changes to 7 : 12. What is the total amount?
(a) ₹ 209 (b) ₹ 190
(c) ₹ 198 (d) ₹ 220

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (a) : Suppose amount of Ethen and Jen = 4x, 7x respectively.
Ratio after giving 1 ₹ to Ethen $= 4x+1 : 7x-1 = 7 : 12$
$\Rightarrow 48x + 12 = 49x – 7$
$\Rightarrow x = 19$
Amount of Ethen = 4x = 4 × 19 = ₹ 76
Amount of Jen = 7x = 7 × 19 = ₹ 133
Total amount = 76 + 133 = ₹ 209

102. The ratio of two number are is 17 : 28, if 6 is added to smaller number, then the ratio changes to 13 : 20. What is the value of larger number?
(a) 112 (b) 140
(c) 98 (d) 126

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (b) Let the first number = 17x
Second number = 28x
According to the question

$$\frac{17x+6}{28x}=\frac{13}{20}$$

$$\frac{17x+6}{7x}=\frac{13}{5}$$

$85x + 30 = 91x$
$6x = 30$
$x = 5$
So, larger number = 28x = 28 × 5 = 140

103. Any amount is divided between Shivani and Parineeta in the ratio of 5 : 7, if Parineeta gives ₹ 5 to Shivani, then the ratio will be changed to 3 : 4 what is divided amount?
(a) ₹ 432 (b) ₹ 420
(c) ₹ 396 (d) ₹ 408

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (b) : Let distributed amount between Shivani and Parineeta = 5x and 7x
According to the question,

$$\frac{5x+5}{7x-5}=\frac{3}{4}$$

$\Rightarrow 20x + 20 = 21x – 15$
$x = 35$
Hence, the divided amount = 5x + 7x = 12x
= 12 × 35 = ₹ 420

104. The ratio of two number are 2 : 3. If 12 is subtracted from both numbers then the ratio becomes 5 : 8. Find the number.
(a) 16 and 24 (b) 35 and 56
(c) 72 and 108 (d) 20 and 48

RRB NTPC 04.04.2016 Shift : 1

Ans : (c) Let the number are 2x and 3x respectively.
According to the question,

$$\frac{2x-12}{3x-12}=\frac{5}{8}$$

$16x – 96 = 15x – 60$
$x = 36$
Hence, the numbers will be 72 and 108

105. The ratio of two numbers are 7:12. If 7 is added in both numbers then ratio becomes 7:11. Find the smallest number.
(a) 7 (b) 28
(c) 35 (d) 12

RRB NTPC 29.03.2016 Shift : 2

Ans : (b) Suppose smaller number and larger number is 7x and 12x respectively.
From the question,

$$\frac{7x+7}{12x+7}=\frac{7}{11}$$

$\Rightarrow 77x + 77 = 84x + 49$
$7x = 28 \Rightarrow x = 4$
Hence, the smallest number = 7x = 7 × 4 = 28

106. The ratio of boys and girls in the class are 4:5. If 4 new boys are included in class then the number of boys increases by 20%. Find the number of girls in the class.
(a) 30 (b) 35
(c) 20 (d) 25

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) Let the number of boys = 4x
and the number of girls = 5x
According to the question,

$$4x + 4 = 4x \times \frac{120}{100}$$

$$\Rightarrow 4x + 4 = \frac{24x}{5}$$

$$20x + 20 = 24x$$

$$20 = 4x \quad \boxed{x = 5}$$

Number of girls = $5x = 5 \times 5 = 25$

107. In a mixture of 25 litre, the ratio of milk and water is 4:1. How much litre milk should be added more so that the ratio becomes 16:1?

(a) 21 (b) 25
(c) 60 (d) 36

RRB NTPC 19.04.2016 Shift : 2

Ans : (c) Amount of milk in mixture of 25 litre

$$= 25 \times \frac{4}{5} = 20 \text{ litres}$$

Amount of water = 25–20 = 5*l*
Let amount of milk added be x*l*,
According to the question,

$$\frac{20 + x}{5} = \frac{16}{1} \qquad \Rightarrow 20 + x = 16 \times 5$$

$$\Rightarrow x = 80 - 20 \qquad \Rightarrow x = 60 \text{ liters}$$

108. The ratio of two numbers are 5:6. When 6 is added to both numbers the ratio becomes 7:8 then the numbers are.

(a) 10, 12 (b) 20, 24
(c) 15, 18 (d) 5, 6

RRB NTPC 18.04.2016 Shift : 1

Ans : (c) Let numbers are 5x and 6x respectively.
According to the question,

$$\frac{5x + 6}{6x + 6} = \frac{7}{8}$$

$$40x + 48 = 42x + 42$$

$$2x = 6 \qquad x = 3$$

$\therefore$ Both the numbers are 5x and 6x
$= 5 \times 3$ and $6 \times 3 = 15$ and 18

109. The ratio of girls and boys in 504 students of a school are 11:13. If 12 more girls are admitted then find the new ratio.

(a) 31:51 (b) 91:81
(c) 81:91 (d) 51:31

RRB NTPC 18.04.2016 Shift : 2

Ans : (c) Total students = 504
girls : boys = 11:13

$$\text{Total number of girls} = \frac{11}{24} \times 504 = 231$$

Total number of boys = 504 − 231 = 273
On adding 12 more girls
231 + 12 = 243
Hence, required ratio = 243 : 273 = 81: 91

110. The ratio of two numbers are 4 : 5. If 5 is subtracted from both, then the new ratio becomes 3 : 4. Find the largest number.

(a) 30 (b) 25
(c) 20 (d) 15

RRB NTPC 26.04.2016 Shift : 1

Ans : (b) Let the numbers are 4x and 5x respectively.
On subtracting 5 from both numbers the ratio will be

$$\frac{4x - 5}{5x - 5} = \frac{3}{4}$$

$$\Rightarrow 16x - 20 = 15x - 15$$

$$\Rightarrow 16x - 15x = -15 + 20$$

$$x = 5$$

The largest number = $5x = 5 \times 5 = 25$

111. The ratio of two numbers are 3 : 4. When 3 is subtracted from both the numbers, the ratio becomes 2 : 3. Find the sum of the numbers.

(a) 16 (b) 20
(c) 21 (d) 22

RRB NTPC 27.04.2016 Shift : 3

Ans : (c) Let the numbers are 3x and 4x respectively.
According to the question,

$$\frac{3x - 3}{4x - 3} = \frac{2}{3}$$

$\Rightarrow$ $9x - 9 = 8x - 6$

$\Rightarrow$ $9x - 8x = 9 - 6$

$x = 3$

$\therefore$ Sum of the numbers = 3x + 4x = 7x = 7 × 3 = 21

112. A number is divided in the ratio of 3 : 2. When 8 is added to each of the numbers then the ratio changes to 7 : 5. So which of the two numbers will be larger?

(a) 42 (b) 48
(c) 27 (d) 69

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (b) Let the numbers be 3x and 2x respectively.
According to the question,

$$\frac{3x + 8}{2x + 8} = \frac{7}{5}$$

$$15x + 40 = 14x + 56$$

$$x = 16$$

Now the numbers = 3×16, 2×16
= 48, 32
Hence, the larger number = 48

113. The ratio of red balls and green balls in a bag is 4 : 9. If 7 more red balls are added to the bag, the new ratio of red and green balls will becomes 5 : 6. How many green balls are there in the bag ?

(a) 9 (b) 18
(c) 12 (d) 27

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b) Let the number of red balls in the bag = 4x
and number of green balls = 9x
Ratio on adding 7 more red balls in the bag is 5:6

$$\therefore \frac{4x + 7}{9x} = \frac{5}{6}$$

$$24x + 42 = 45x$$

$$21x = 42$$

$$x = 2$$

$\therefore$ Number of green balls in the bag will be
$= 9x = 9 \times 2 = 18$

114. In 9 kg of the dough the initial ratio of sugar and flour is 2 : 7. If John added more sugar in that then the ratio of the mixture becomes 2 : 5. How much sugar did John added later?

(a) 750 g (b) 1.2 kg
(c) 1kg (d) 800 g

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (d) Ratio of sugar and flour in dough of 9 kg = 2:7
Then sum of the proportional parts = 2 + 7 = 9

So the quantity of sugar $= \frac{2\times 9}{9} =$ 2 kg

The quantity of flour $= \frac{7\times 9}{9} = 7$ kg

Suppose that quantity of sugar added later by John is x kg then-

$\frac{2+x}{7} = \frac{2}{5}$

or $10 + 5x = 14$

$5x = 4$

$x = \frac{4}{5} = 0.8$ or $0.8 \times 1000 = 800$ gram

Type - 4

115. 8 : 4 :: 3.2 : x and 3 : 6 :: 6 : y. What is the ratio of x to y ?

(a) 3 : 8 (b) 2 : 15
(c) 4 : 19 (d) 1 : 3

RRB Group-D 08/09/2022 (Shift-I)

Ans. (b) : 8 : 4 : : 3.2 : x and 3 : 6 :: 6 : y

$8 \times x = 4 \times 3.2$ $3 \times y = 6 \times 6$

$x = 1.6$ $y = 12$

Then,

$\frac{x}{y} = \frac{1.6}{12} = \frac{16}{120} = \frac{2}{15}$

$\therefore$ x : y = 2 : 15

116. Find the ratio between the third proportion of 20 and 50 and the median proportion of 9 and 16

(a) 25 : 2 (b) 12 :125
(c) 2 :25 (d) 125 :12

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : Third proportion of 20 and 50 -

$c = \frac{b^2}{a}$

$= \frac{50\times 50}{20}$

$= 125$

Median proportion of 9 and 16 -

$b = \sqrt{ac}$

$b = \sqrt{9\times 16}$

$b = \sqrt{144}$

$b = 12$

Required ratio = 125 : 12

117. If 49 : x :: x : 81, and 64 : y :: y : 169, wherw x and y are both natural numbers, then find the value of 2x + 3y.

(a) 348 (b) 438
(c) 126 (d) 312

RRB Group-D 30-08-2022 (Shift-II)

Ans. (b) : According to the question,

$\Rightarrow$ 49 : x : : x : 81

$\frac{49}{x} = \frac{x}{81} \Rightarrow x^2 = 49\times 81$

x = 63

And 64 : y :: y : 169

$\frac{64}{y} = \frac{y}{169} \Rightarrow y^2 = 64\times 169$

y = 104

$\therefore$ 2x + 3y $\Rightarrow$ 2 × 63 + 3 × 104 $\Rightarrow$126 + 312 $\Rightarrow$ 438

118. The third proportion of 10 and 50 is

(a) 300 (b) 1250
(c) 250 (d) 125

RRB Group-D 24-08-2022 (Shift-I)

Ans. (c) : Third proportion = $\frac{b^2}{a}$

$\therefore$ Third proportion = $\frac{50\times 50}{10} = 250$

119. Find the third proportion of 18 and 72.

(a) 388 (b) 588
(c) 288 (d) 488

RRB Group-D 06/09/2022 (Shift-I)

Ans. (c) : The third proportion of 18 and 72 -

$= \frac{(72)^2}{18}$

$= \frac{72\times 72}{18}$

$= 72 \times 4$

$= 288$

120. If 6, 18, 39, and x are in proportion, then find the value of x.

(a) 117 (b) 112
(c) 139 (d) 115

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (a) : Given, 6, 18, 39 and x are in proportion

$\therefore$ 6 : 18 ::39 : x

$\therefore$ 6 × x= 18 × 39

$x = \frac{18\times 39}{6} = 3\times 39 = 117$

121. If 100 : 250 :: 250 : x, then what is the value of x?

(a) 250 (b) 6.25
(c) 625 (d) 25

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (c) : According to the question,

$100 : 250 :: 250 : x$

$\frac{100}{250} = \frac{250}{x}$

$x = 25 \times 25$

$x = 625$

122. If y : 196 :: 196 : 784, then what is the value of y?

(a) 16 (b) 49

(c) 7 (d) 4

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (b) : Given,

$y : 196 :: 196 : 784$

$\frac{y}{196} = \frac{196}{784}$

$y = \frac{196 \times 196}{784}$

$\boxed{y = 49}$

123. If 144 : y :: y : 225, and y > 0, find the value of y.

(a) 130 (b) 210

(c) 120 (d) 180

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (d) : Given,

$144 : y :: y : 225$

$y \times y = 144 \times 225$

$y = \sqrt{144 \times 225}$

$y = 12 \times 15$

$y = 180$

124. If 144 : b :: b : 36, and b > 0, find the value of b.

(a) 12 (b) 36

(c) 27 (d) 72

RRB Group-D 30/08/2022 (Shift-II)

Ans. (d) : From question,

$144 : b :: b : 36$

$\Rightarrow \frac{144}{b} = \frac{b}{36}$

$\Rightarrow b^2 = 144 \times 36$

$b = \sqrt{144 \times 36}$

$b = 12 \times 6 = 72$

125. If 1.6 : 0.6 :: 0.6 : x, find the value of x.

(a) 0.98 (b) 0.25

(c) 0.275 (d) 0.225

RRB Group-D 02/09/2022 (Shift-II)

Ans. (d) : From question,

$1.6 : 0.6 :: 0.6 : x$

$1.6 \times x = 0.6 \times 0.6$

$x = 0.225$

126. Find the fourth proportion of the 15, 10 and 12.

(a) 6 (b) 12

(c) 10 (d) 8

RRB Group-D 06/09/2022 (Shift-III)

Ans. (d) : The fourth proportion of the 15, 10 and 12

The fourth proportion of a, b and c = $\frac{b \times c}{a}$

$= \frac{10 \times 12}{15} = 8$

127. If 48 : x :: x : 75, and x > 0, then what is the value of x?

(a) 60 (b) 63

(c) 57 (d) 51

RRB Group-D 23/08/2022 (Shift-II)

Ans. (a) : $48 : x :: x : 75$

$\frac{48}{x} = \frac{x}{75}$

$x^2 = 48 \times 75$

$x = 60$

128. What is the compound ratio of 45 : 75, 3 : 5, 51 : 68 and 256 : 81?

(a) $\frac{64}{75}$ (b) $\frac{32}{45}$

(c) $\frac{128}{75}$ (d) $\frac{75}{32}$

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (a) : $45 : 75,\ 3 : 5,\ 51 : 68,\ 256 : 81$

$\text{Compound ratio} = \frac{\text{Product of } 1^{st} \text{ term}}{\text{Product of } 2^{nd} \text{ term}}$

$= \frac{45 \times 3 \times 51 \times 256}{75 \times 5 \times 68 \times 81} = \frac{3 \times 1 \times 51 \times 64}{5 \times 5 \times 17 \times 27}$

$= \frac{3 \times 3 \times 64}{5 \times 5 \times 27} = \frac{64}{75}$

129. What will be the third proportional of 16 and 40?

(a) 10 (b) 100

(c) 640 (d) 40

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let third proportional is x.

$16 : 40 :: 40 : x$

$16 \times x = 40 \times 40$

$x = 10 \times 10$

$x = 100$

130. The fourth proportional to 4, 9, 12 is: _____

(a) 48 (b) 36

(c) 27 (d) 72

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the fourth proportional is x.

$4 : 9 :: 12 : x$

$4x = 9 \times 12$

$x = 9 \times 3 = 27$

Hence the fourth proportional = 27

131. If 12, x, 48 are in ratio, then find the value of x.
(a) 24 (b) 21
(c) 36 (d) 16
RRB RPF Constable -19/01/2019 (Shift-III)

Ans : (a)
$\because$ 12, x and 48 are in consecutive ratio
$\therefore$ 12 : x : : x : 48
$\Rightarrow \quad \frac{12}{x} = \frac{x}{48}$
$x^2 = 12 \times 48$
$x^2 = \overline{2\times2} \times 3 \times \overline{2\times2} \times \overline{2\times2} \times 3$
$x = 2 \times 2 \times 2 \times 3 = 24$

132. find the value of x : 1/18 : : 3/5 : 5/9.
(a) 4/25 (b) 3/50
(c) 3/25 (d) 7/9
RRB RPF SI -06/01/2019 (Shift-II)

Ans : (b) $x : \frac{1}{18} : : \frac{3}{5} : \frac{5}{9}$
$x \times \frac{5}{9} = \frac{1}{18} \times \frac{3}{5}$
$x = \frac{1}{18} \times \frac{3}{5} \times \frac{9}{5}$
So, $x = \frac{3}{50}$

133. The first three terms of any ratio are 3, 5 and 21 respectively. Find its fourth term.
(a) 25 (b) 35
(c) 30 (d) 20
RRB RPF Constable -22/01/2019 (Shift-I)

Ans. (b) : Let the fourth term is x.
3 : 5 :: 21: x
$\frac{3}{5} = \frac{21}{x}$
$3x = 21 \times 5$
$x = \frac{21\times5}{3} = 7 \times 5 = 35$

134. Which of the following should be added to each of the four numbers 4, 8, 12, 22 to make then proportional?
(a) $\frac{4}{3}$ (b) $\frac{3}{4}$
(c) $\frac{8}{3}$ (d) $\frac{5}{6}$
RRB Group-D – 29/10/2018 (Shift-III)

Ans : (a) Let the number be added is k.
Then,
4 + k : 8 + k : : 12 + k : 22 + k
$\frac{4+k}{8+k} = \frac{12+k}{22+k}$
$88 + 4k + 22k + k^2 = 96 + 12k + 8k + k^2$
$88 + 26k = 96 + 20k$
$6k = 8$
$k = \frac{8}{6} = \frac{4}{3}$
So $k = \frac{4}{3}$ should be added to each number.

135. If 25, 35 and P are consecutive ratio then, find the value of P.
(a) 60 (b) 50
(c) 75 (d) 49
RRB Group-D – 03/10/2018 (Shift-II)

Ans : (d) $\because$ 25, 35 and P are in consecutive ratio
So, $\frac{25}{35} = \frac{35}{P}$
$P = \frac{35\times35}{25}$
$P = 7 \times 7 = 49$

137. Find the fourth proportional of 3, 4 and 9 ____
(a) 11 (b) 12
(c) 16 (d) 10
RRB Group-D – 03/10/2018 (Shift-III)

Ans : (b) Let the fourth proportion is x
Then, 3 : 4 :: 9 : x
$\frac{3}{4} = \frac{9}{x}$
$3x = 9 \times 4$
$x = \frac{9\times4}{3}$
$x = 12$

137. If 5 : 9 : : x : 27 then what is value of x ?
(a) 6 (b) 3
(c) 18 (d) 15
RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (d) Given, 5 : 9 : : x : 27
$\frac{5}{9} = \frac{x}{27}$
$\boxed{x = 15}$

138. If p : 18 : : 5 : 3, then find the value of p
(a) 60 (b) 30
(c) 25 (d) 50
RRB Group-D – 17/09/2018 (Shift-III)

Ans. (b) : Proportion-
p : 18 : : 5 : 3
$\therefore \quad p \times 3 = 18 \times 5$
$p = \frac{18\times5}{3}$
$p = 6 \times 5$
$p = 30$

139. If 7 : 9 : : x : 36 then find the value of x.
(a) 21 (b) 35
(c) 7 (d) 28
RRB Group-D – 16/11/2018 (Shift-I)

Ans. (d)
7 : 9 : : x : 36
$9x = 36 \times 7$
$9x = 252$
$x = 28$

140. Find the fourth proportional number of 2, 4 and 8.
(a) 15 (b) 14
(c) 16 (d) 18
RRB NTPC 17.01.2017 Shift-3

Ans : (c) Let the fourth proportional number = x

$\therefore$ 2 : 4 : : 8 : x

$2 \times x = 4 \times 8$ (by proportional law)

$x = \frac{4\times 8}{2} \Rightarrow \boxed{x = 16}$

141. Find the value of k in $\frac{26}{21} : \frac{24}{9} :: k : \frac{14}{13}$.

(a) $\frac{1}{3}$ (b) 2

(c) $\frac{1}{2}$ (d) 3

RRB NTPC 18.01.2017 Shift : 1

Ans : (c) $\frac{26}{21} : \frac{24}{9} :: k : \frac{14}{13}$

$\Rightarrow \frac{26}{21} \times \frac{14}{13} = \frac{24}{9} \times k$

$\Rightarrow k = \frac{26\times 14\times 9}{21\times 13\times 24}$ $\Rightarrow k = \frac{1}{2}$

142. Find the value of x if the three numbers 2.6, 1.3 and x are in certain ratio.

(a) 1.95 (b) 1.83

(c) 3.9 (d) 0.65

RRB NTPC 18.01.2017 Shift : 2

Ans : (d) 2.6 : 1.3 : : 1.3 : x

$\frac{2.6}{1.3} = \frac{1.3}{x}$

$x = \frac{1.3\times 1.3}{2.6}$ $\boxed{x = 0.65}$

143. Find the fourth proportional of 9, 17 and 27?

(a) 57 (b) 48

(c) 51 (d) 53

RRB NTPC 06.04.2016 Shift : 1

Ans : (c) Let the fourth proportional of 9, 17 and 27 is x.

$\therefore 9 : 17 :: 27 : x$

$9 \times x = 17 \times 27 \Rightarrow x = \frac{17\times 27}{9}$

$\Rightarrow x = 17 \times 3 = 51$

144. If 14, x and 56 are in consecutive ratio, find the value of x.

(a) 28 (b) 21

(c) 8 (d) 42

RRB NTPC 30.04.2016 Shift : 1

Ans : (a) $\because$ 14, x and 56 are in consecutive ratio

$\therefore$ 14 : x :: x : 56

$x^2 = \sqrt{14\times 56}$

$x^2 = \sqrt{7\times 2\times 2\times 2\times 2\times 7}$

$x = 7\times 2\times 2 = 28$

145. The mean proportional between 0.16 and 0.64 is:

(a) 0.27 (b) 0.48

(c) 0.40 (d) 0.32

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (d) Let the mean proportional between 0.16 and 0.64 be x.

$\therefore$ 0.16 : x : : x : 0.64

According to the question,

$\frac{0.16}{x} = \frac{x}{0.64}$

$x^2 = 0.16\times 0.64$

$x = 0.4\times 0.8$

$x = 0.32$

146. Find the mean proportional between 2 and 98?

(a) 13 (b) 14.5

(c) 16 (d) 14

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (d) The mean proportion between 2 and 98

$= \sqrt{2\times 98} = \sqrt{2\times 7\times 14} = \sqrt{14\times 14} = 14$

Type - 5

147. A bag contain ₹2, ₹5 and ₹10 coins in the ratio 5 : 7 : 8, amounting to a total of ₹1250. The number of ₹5 coins in the bag are:

(a) 84 (b) 78

(c) 70 (d) 91

RRB Group-D 05/09/2022 (Shift-II)

Ans. (c) : Let the number of coins of ₹2, ₹5 and ₹10 are 5x, 7x and 10x respectively.

According to the question

$(2\times 5x) + (5\times 7x) + (10\times 8x) = 1250$

$10x + 35x + 80x = 1250$

$125x = 1250$

$x = 10$

Number of coins of ₹5 $= 7x = 7\times 10 = 70$

148. Krishna has a few coins of 1 rupee, 50 paisa and 25 paisa in the ratio $\frac{1}{4} : \frac{1}{2} : \frac{1}{2}$. If the number of 25 paise coins is 100, then the total amount with Krishan is :

(a) ₹100 (b) ₹75

(c) ₹125 (d) ₹120

RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) : The ratio of 1 rupee, 50 paisa and 25 paisa

$= \frac{1}{4} : \frac{1}{2} : \frac{1}{2} = 1 : 2 : 2$

Let Krishna has the number of coins of ₹1, 50 paisa and 25 paisa be x, 2x and 2x respectively.

According to the question

Number of coins of 25 paisa (2x) = 100

$x = \frac{100}{2} = 50$

Total amount with Krishna

$= 50\times 1 + 2\times 50\times \frac{1}{2} + 50\times 2\times \frac{1}{4}$

50 + 50 + 25 = ₹ 125

149. The price of an article X increases by 40 paise per year, while that of another article Y increases by 25 paise per year. If in the year 2002 the price of X is 5.20 and that of Y is 6.30, then in which year will the cost of article X to be 40 paise more than that of Y ?

(a) 2010 (b) 2013
(c) 2011 (d) 2012

RRB NTPC 11.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let, after Z year the cost of article X to be 40 paise more than that of Y.
Then,

$(5.20+0.40Z)-(6.30+0.25Z) = 0.40$
$5.20+0.40Z-6.30-0.25Z=0.40$
$0.40Z-0.25Z=0.40-5.20+6.30$
$0.15Z=6.7-5.20$

$$Z = \frac{1.5}{0.15} = 10$$

Hence, after 10 years in 2012 the cost price of article X is 40 paise more than that of article Y.

150. In a box containing one rupee, 50 paise and 25 paise coins in the ratio 1 : 2 : 3. The number of 50 paise coins was eighty. How much money was there in the box.

(a) 100 (b) 105
(c) 108 (d) 110

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : Ratio of coins = x : 2x : 3x
According to the question,

$2x = 80$
$x = 40$

$\therefore$ Total number of coins 40, 80, 120

$$\text{Values (in Rs.)} = 40\times1+\frac{40}{2}\times2+\frac{40\times3}{4}$$

$40 + 40 + 30 = ₹\ 110$

151. ₹110 are contained in a box which consists of one rupee, 50 paise and 25 paise coins in the ratio 1:2:3. What is the number of 50 paise coins?

(a) 80 (b) 77
(c) 78 (d) 79

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a**) :** Let the ratio of 1 rupee, 50 paise and 25 paise coins is x, 2x and 3x respectively.
According to the question,

$$x+\frac{2x}{2}+\frac{3x}{4}=110$$
$$4x+4x+3x=110\times4$$
$$11x=110\times4$$
$$x=40$$

Hence, number of 50 paise coins $= 2x = 2\times40 = 80$

152. A bag contains 25 paise, 10 paise and 5 paise coins are in the ratio 1:2:3. If the bag has ₹ 30 in total then how many coins of 5 paise are there?

(a) 100 (b) 200
(c) 150 (d) 50

RRB JE - 22/05/2019 (Shift-I)

Ans : (c**)** Let number of coins of 25 paise, 10 paise and 5 paise are x, 2x and 3x respectively.
$25 \times x + 10 \times 2x + 5 \times 3x = 3000$
$25x + 20x + 15x = 3000$
$60x = 3000$
$x = 50$
So the number of coins of 5 paise $= 3x = 3 \times 50 = 150$

153. A boy has total of ₹ 60 in which the coin of ₹1, 50 paise and 25 paise are included in the ratio of 5:6:8. Find the no. of coins of 25 paise?

(a) 30 (b) 48
(c) 32 (d) 42

RRB RPF SI -12/01/2019 (Shift-II)

Ans : (b**)** Let the number of coins of ₹ 1, 50 paise and 25 paise are 5x, 6x and 8x respectively

$$\text{value of coins} \Rightarrow ₹\ \left(\frac{5x}{1}+\frac{6x}{2}+\frac{8x}{4}\right)$$

$\Rightarrow ₹\ (5x + 3x + 2x)$
$= 10x$
but total cost $= ₹\ 60$ (given)
$\therefore\ 10x = 60$
$x = 6$
So number of coins of 25 paise $= 8 \times 6 = 48$

154. In a bag, the coins of 50 paise, 25 paise and 10 paise are in the ratio of 5:4:3. If the value of coins is ₹ 171. Find the number of each types of coins.

(a) 200, 250, 150 (b) 225, 180, 135
(c) 140, 150, 280 (d) 200, 360, 160

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (b**)** Let the number of coins of 50 paise, 25 paise and 10 paise in the bag are 5x, 4x, 3x respectively

$$\text{Ratio of coins} = \frac{5x}{2}:\frac{4x}{4}:\frac{3x}{10}$$

According to the question,

$$\frac{5x}{2}+\frac{4x}{4}+\frac{3x}{10}=171$$
$$50x + 20x + 6x = 3420$$
$$76x = 3420,$$
$$x = 45$$

Hence the number of coins $= 5x = 5 \times 45 = 225$
$= 4x = 4 \times 45 = 180$
$= 3x = 3 \times 45 = 135$
i.e. coins of 50 paise, 25 paise and 10 paise are 225, 180, 135 respectively.

155. The ratio of the numbers of red and blue balls in the bag is constant. When there were 44 red balls in it the number of blue balls was 36. If the number of blue balls is 54, then what will be the number of red balls in the bag?

(a) 66 (b) 62
(c) 64 (d) 68

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (a) Let number of red balls = x
According to the question,

$$\frac{44}{36}=\frac{x}{54}$$

$$x = \frac{44 \times 54}{36}$$
$$x = 66$$

Hence number of red balls in the bag will be 66.

156. Suraj have the coin of 50 paise, ₹ 1 and ₹ 5 in the ratio of 8:5:9. Suraj have total amount of ₹ 648. How many coins of 50 paise does he has?

(a) 96 (b) 84
(c) 60 (d) 108

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (a) :
Suppose number of coins of 50 paise, ₹ 1, ₹ 5 is 8x, 5x and 9x respectively

Then total value of coins $= ₹ \left(\frac{8x}{2} + 5x \times 1 + 9x \times 5\right)$

$= ₹ \left(4x + 5x + 45x\right) = ₹ \ 54x$

$\therefore \ 54x = 648$

$x = 12$

Number of coins of 50 paise $= 8x = 8 \times 12 = 96$

157. Ramesh have the coins of 50 paise, ₹ 1 and ₹ 5 in the ratio of 2:3:5 respectively. He has a total amount of ₹ 116. How many coins of 50 paise he has?

(a) 12 (b) 6
(c) 4 (d) 8

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (d) : Suppose number of coins of 50 paise, ₹1, ₹5 are 2x, 3x, 5x respectively

Then total value of coins $= \frac{1}{2} \times 2x + 1 \times 3x + 5 \times 5x$

According to the question,

$x + 3x + 25x = 116$

$29x = 116$

$x = 4$

Hence number of coins of 50 paise $= 2x = 2 \times 4 = 8$ coins

158. Raju has ₹ 210 in the form of coins 20% of the coins in ₹ 5, 25% ₹ 10 and 15% in ₹ 2 and remaining ₹ 1 are in the denominations. Find the number of coins of ₹ 1.

(a) 24 (b) 22
(c) 25 (d) 20

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (d) Raju has a total of ₹ 210 as coins
Let the total ratio of the number of coins of Raju is 100%

₹ 5	₹10	₹ 2	₹ 1
20%	25%	15%	40%

Ratio of number of coins $= \frac{1}{5} : \frac{1}{4} : \frac{3}{20} : \frac{2}{5}$

$= 4 : 5 : 3 : 8$

Let the number of coins $= 4x, 5x, 3x, 8x$

Value of total number of coins $=$

$4x \times 5 + 5x \times 10 + 3x \times 2 + 8x \times 1 = 210$

$20x + 50x + 6x + 8x = 210$

$84x = 210$

$x = \frac{210}{84} = \frac{10}{4}$

Hence, the number of coins of ₹ 1 $= 8x = 8 \times \frac{10}{4} = 20$

159. An amount of ₹ 110 is in the form of ₹ 2, ₹ 1 and 50 paise, coins in the ratio of 1:2:3 respectively. How many coins of 50 paise are there?

(a) 20 (b) 40
(c) 60 (d) 80

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (c) Let the number of coins of ₹ 2, ₹ 1 and 50 paise is x, 2x and 3x respectively.

Total amount $=$ ₹ 110

According to the question,

$(x \times 2) + (2x \times 1) + (3x \times 0.50) = 110$

$\Rightarrow 2x + 2x + 1.5x = 110$

$\Rightarrow 5.5 \ x = 110$

$\Rightarrow x = \frac{110}{5.5} = 20$

$\Rightarrow x = 20$

Hence, the number of coins of 50 paise $= 3x = 3 \times 20 = 60$

160. In a bag of ₹ 10, ₹ 20 and ₹ 50 notes are kept in the ratio of 1:3:5 if the total value of money kept in the bag is ₹ 1920. What is the total number of ₹ 20 notes?

(a) 6 (b) 30
(c) 18 (d) 12

RRB NTPC 18.01.2017 Shift : 2

Ans : (c)
Let number of notes of ₹ 10, Rs, 20, ₹ 50 = x, 3x, 5x
According to the question,
Total cost = $10 \times x + 20 \times 3x + 50 \times 5x = 1920$

$\Rightarrow 320x = 1920$

$\Rightarrow x = 6$

Total number of notes of ₹20 $= 3x$

$= 3 \times 6 = 18$

161. The value of coins of ₹ 1, 50 paise and 25 paise is ₹ 93.75 and the ratio of their number is 3:4:5. Find the no. of coins of each type.

(a) 42, 56, 70 (b) 45, 60, 75
(c) 40, 70, 75 (d) 46, 58, 75

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (b) Let the number of coins of ₹1, 50 paise and 25 paise is 3x, 4x and 5x respectively
According to the question,

$3x + \frac{4x}{2} + \frac{5x}{4} = 93.75$

$\Rightarrow \frac{12x + 8x + 5x}{4} = 93.75$

$25x = 93.75 \times 4$

$x = \frac{375}{25} \Rightarrow x = 15$

Number of coins of ₹ 1 $= 3 \times 15 = 45$
Number of coins of 50 paise $= 4 \times 15 = 60$
Number of coins of 25 paise $= 5 \times 15 = 75$

Type - 6

162. The ratio of savings and expenditure of Kiran is 7:13 and his monthly income is 1,80,000. The savings are divided in the ratio of 4:3 between Mutual Funds and Equity. What is the amount of money saved in the form of Mutual Funds?

(a) ₹63,000 (b) ₹36,000
(c) ₹45,000 (d) ₹39,000

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : Given,
Savings : Expenditure = 7:13
Income = Savings + Expenditure
= 7+13
=20
Mutual funds : Equity = 4:3
According to the question,
20 = 180000
1= 9000
4=9000×4
=36000
Hence, savings money in mutual funds = ₹36000

163. The ratio of incomes of A and B is 5 : 7 and the ratio of their savings is 2 : 3. If A and B spend ₹35,400 and ₹48,600, respectively, then what is the difference (in ₹) between the incomes of B and A ?

(a) 18000 (b) 17600
(c) 18600 (d) 20000

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given,
Ratio of income of A and B = 5 : 7
Let the income of A and B are = 5x, 7x
Ratio of saving of A and B = 2 : 3
Let the saving of A and B are = 2y : 3y
According to the question,
5x – 2y = 35400 ——— (i)
7x – 3y = 48600 ——— (ii)
On multipying equation (i) ×3 and equation (ii) ×2 and substracting them

$$15x - 6y = 106200$$
$$14x - 6y = 97200$$
$$- \quad + \quad -$$
$$x = ₹9000$$

∴ Difference between the income of B and A =7x–5x
= 2x
= 2 × 9000
= ₹18000

164. The ratio of the income of seema and Darshan is 7 : 5. They save ₹12,000 and ₹9000 respectively. If the ratio of their expenses is 17:12, then find the total expenditure (in ₹) of Seema and Darshan.

(a) 93,000 (b) 81,000
(c) 87,000 (d) 75,000

RRB Group-D 06/09/2022 (Shift-I)

Ans. (c) : Let the income of Seema and Darshan is ₹ 7x and ₹ 5x and their expenditure is ₹17y and ₹12y.
According to the question -
7x – 17y = 12000 ..... (i)
5x – 12y = 9000 ..... (ii)
On solving eq. (i) and eq. (ii)
x = 9000
y = 3000
So total expenditure of Seema and Darshan
= (17+ 12) × 3000
= 29 × 3000
= ₹ 87000

165. If (a + b) : (b + c) : (c + a) is 6 : 7 : 8 and also a + b + c = 14, then what is the value of c?

(a) 8 (b) 10
(c) 6 (d) 12

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (c) : $(a+b):(b+c):(c+a) = 6:7:8$
a+ b +c = 14
Let $(a+b) = 6x$ ... (1)
$(b+c) = 7x$ ... (2)
$(c+a) = 8x$ ... (3)
On adding equation (1), (2) and (3) –

$$(a+b)+(b+c)+(c+a) = 6x+7x+8x$$
$$2(a+b+c) = 21x$$
$$a+b+c = \frac{21}{2}x$$
$$6x + c = \frac{21}{2}x \quad \text{(from equation (1) ... (4)}$$
$$a+b+c = 14 \quad \text{(Given)}$$
$$\frac{21}{2}x = 14$$
$$\boxed{x = \frac{28}{21}}$$

On putting the value of x in equation (4)

$$6\times\frac{28}{21} + c = \frac{21}{2}\times\frac{28}{21}$$
$$c = \frac{21}{2}\times\frac{28}{21} - 6\times\frac{28}{21}$$
$$c = \frac{28}{21}\left[\frac{21}{2} - 6\right]$$
$$c = \frac{28}{21}\times\frac{9}{2}$$
$$c = 6$$

166. If A : B = 2 : 3, B : C = 2 : 3 and C : D = 3 : 4, then A : D = ?

(a) 2 : 4 (b) 3 : 1
(c) 1 : 2 (d) 1 : 3

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (d)

$A : B = 2 : 3 = \frac{A}{B} = \frac{2}{3}$

$B : C = 2 : 3 = \frac{B}{C} = \frac{2}{3}$

$C : D = 3 : 4 = \frac{C}{D} = \frac{3}{4}$

and

$\frac{A}{B} \times \frac{B}{C} \times \frac{C}{D} = \frac{2}{3} \times \frac{2}{3} \times \frac{3}{4}$

$= \frac{A}{D} = \frac{1}{3}$

or A : D = 1 : 3

167. If X : Y = 4 : 5, Y : Z = 5 : 7 and Z : W = 7 : 9, then X : W is equal to:

(a) 2 : 9 (b) 3 : 11
(c) 3 : 7 (d) 4 : 9

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (d) :

X : Y = 4 : 5
Y : Z = 5 : 7
Z : W = 7 : 9
X : W = 4 : 9

168. If a : b = c : d = e : f = g : h = 1 : 3 then find out the name of following
(pa + qc + re + sg) : (pb + qd + rf + sh)

(a) 1:3 (b) 1:2
(c) 1:5 (d) 1:4

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) : $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{g}{h} = \frac{1}{3}$

$\frac{pa}{pb} = \frac{qc}{qd} = \frac{re}{rf} = \frac{sg}{sh} = \frac{1}{3}$

$\frac{a}{b} = \frac{c}{d} = k \Rightarrow k = \frac{a+c}{b+d}$

$\because \frac{pa + qc + re + sg}{pb + qd + rf + sh} = \frac{1}{3}$

(pa+qc+re+sg):(pb+qd+rf+sh)=1:3

169. What is the difference between $\frac{3}{5}$ of 200 and $\frac{1}{2}$ of 300?

(a) 30 (b) 100
(c) 60 (d) 200

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (a) : $\frac{3}{5}$ of $200 = 200 \times \frac{3}{5}$

=120

$\frac{1}{2}$ of $300 = 300 \times \frac{1}{2}$

=150

Required difference =150–120=30

170. If $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$ then find the value of $\frac{a+b+c}{c}$

(a) 2 (b) 10
(c) 12 (d) 5

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (a) : $\frac{a}{2} = \frac{b}{3} = \frac{c}{5} = k$ (Let)

$a = 2k$
$b = 3k$
$c = 5k$

$\because \frac{a+b+c}{c} = ?$

$\frac{2k+3k+5k}{5k} = ?$

$\boxed{2 = ?}$

171. If a, b, c and d are in continued proportion, then $(ma^3 + nb^3 - rc^3) : (mb^3 + nc^3 - rd^3) = ?$

(a) d : a (b) b : c
(c) a : d (d) c : b

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (c) : a, b, c and d are in continued proportion.

Let-

$\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = k$

then $c = dk$, $b = ck$, $a = bk$

$b = (dk)\,k$

$b = dk^2$

$\because a = bk$

$\Rightarrow a = \left(dk^2\right)k$

$\frac{a}{d} = k^3$.....(i)

Now,

$$\frac{ma^3 + nb^3 - rc^3}{mb^3 + nc^3 - rd^3} = \frac{m\left(dk^3\right)^3 + n\left(dk^2\right)^3 - r\left(dk\right)^3}{m\left(dk^2\right)^3 + n\left(dk\right)^3 - rd^3}$$

$$= \frac{d^3k^3\left(mk^6 + nk^3 - r\right)}{d^3\left(mk^6 + nk^3 - r\right)}$$

$$\frac{ma^3 + nb^3 - rc^3}{mb^3 + nc^3 - rd^3} = k^3$$

$\because$ From equation (i)-

Hence $\frac{ma^3 + nb^3 - rc^3}{mb^3 + nc^3 - rd^3} = \frac{a}{d} = a : d$

172. Some fruits were divided amongst A, B, C and D in the ratio 3 : 4 : 5 : 7. If A got 192 fruits, then how many fruits did B and C together get?

(a) 576 (b) 756
(c) 567 (d) 675

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

A : B : C : D = 3 : 4 : 5 : 7

∵ A got 192 fruits

∴ 3 units = 192

$\therefore$ 1 unit $= \frac{192}{3} = 64$

Number of fruits of both B and C = 4+5 = 9 unit

= 9×64 = 576 fruits

173. Are the numbers 30, 40, 45 and 60 in proportion?

(a) Yes, they are in proportion
(b) Only 30 and 40 are in proportion
(c) Only 45 and 40 are not in proportion
(d) No, they are not in proportion

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (a) : Ratio of 30 and 40 $= \frac{30}{40} = 3:4$

Ratio of 45 and 60 $= \frac{45}{60} = 3:4$

∵ 30 : 40 = 45 : 60

Hence, the numbers are in proportion.

174. A is twice of B. B is half of D. D is three times of C. A is how many times of D?

(a) 0.5 (b) 4
(c) 3 (d) 1

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,

A : B = 2 : 1

B : D = 1 : 2

D : C = 3 : 1

By merging–

A : B : D : C = 6 : 3 : 6 : 2

A : D = 6 : 6

= 1 : 1

Therefore, A is equal to one time of D.

175. The ratio of the working efficiencies of P, Q, R and S in doing a work is 2 : 3 : 5 : 4. The wages given for task is ₹ 4200, who got the highest amount and how much?

(a) P, ₹ 2000 (b) Q, ₹ 2000
(c) S, ₹ 1600 (d) R, ₹ 1500

RRB JE - 25/05/2019 (Shift-I)

Ans : (d) Total wages = ₹ 4200

Share of P $= \frac{4200\times 2}{2+3+5+4} = \frac{4200\times 2}{14} =$ ₹ 600

Share of Q $= \frac{4200\times 3}{14} =$ ₹ 900

Share of R $= \frac{4200\times 5}{14} =$ ₹ 1500

Share of S $= \frac{4200\times 4}{14} =$ ₹ 1200

So R got the highest amount of ₹ 1500.

176. If ₹ 176 is divided in the ratio of 2:5:6:9 the rupees will be.

(a) 16, 40, 49 and 71 (b) 16, 40, 47 and 73
(c) 16, 40, 48 and 72 (d) 16, 41, 47 and 72

RRB NTPC 07.04.2016 Shift : 1

Ans : (c) Let the ratio of amount = 2x : 5x : 6x : 9x

$\Rightarrow$ 2x + 5x + 6x + 9x = 176

22x = 176

$x = \frac{176}{22}$

x = 8

first part = 2 × 8 = 16

second part = 5 × 8 = 40

third part = 6 × 8 = 48

fourth part = 9 × 8 = 72

177. Divide 1870 into three parts. So that half of the first part, 1/3 of the second part and 1/6 of the third part are equal. What will be the all three parts ?

(a) 360, 510, 1000 (b) 340, 510, 1020
(c) 340, 490, 1040 (d) 360, 490, 1020

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (b) According to the question,

Half of first part = 1/3 of second part = 1/6 of third part

$\frac{I}{2} = \frac{II}{3} = \frac{III}{6}$

I : II : III = 2 : 3 : 6

I part $= 1870\times\frac{2}{11} = 340$

II part $= 1870\times\frac{3}{11} = 510$

III part $= 1870\times\frac{6}{11} = 1020$

Hence all three parts are 340, 510 and 1020

178. ₹ 13,680 is divide into three part such that first part is 3/5 of third part, and and the ratio between second third part is 4 : 7. How much will be the first part?

(a) 3780 (b) 6300
(c) 1600 (d) 4800

RRB NTPC 29.03.2016 Shift : 1

Ans : (a) Let first, second and third part is x, y and z respectively.

$\therefore x = \frac{3}{5}z \Rightarrow x : z = 3:5$

$y : z = 4:7 \Rightarrow z : y = 7:4$

x z y

3 5

7 4

21 : 35 : 20

Hence, the first part $= \frac{21}{76}\times 13680 = 3780$

10.

Partnership

Type - 1

1. A started a business with a capital of ₹ 50,000. After 3 months, B jointed him with a certain amount of capital. At the end of a year of A's starting the business, the profit was shared in the ratio 3 : 2. How much (in ₹) did B invest ?

(a) 3,60,000 (b) 3,20,000
(c) 4,00,000 (d) 4,20,000

RRB Group-D 08/09/2022 (Shift-III)

Ans. (c) : According to the question,

$50000 \times 12 : B \times 9 = 3 : 2$

A's invest total amount the end of year

$= 50000 \times 12$

$= 60000$

Let profit of A and B are 3x and 2x respectively

$3x = 600000$

$x = 200000$

Hence B invest

$= 2x$

$= 2 \times 200000$

$= 400000$

2. An amount of 48,000 is divided between two brothers Anil and Aditya in the ratio 11 : 13. What is the share of Aditya?

(a) ₹24,000 (b) ₹26,000
(c) ₹2,000 (d) ₹22,000

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (b) : $\therefore$ Share of Anil and Aditya = 11 : 13

$\text{Share of Aditya} = \frac{13}{24} \times 48000$

$= ₹26000$

3. A and B have together ₹2,300. If $\frac{2}{5}$ of A's amount is equal to $\frac{8}{26}$ of B's amount, How much amount (in ₹) does B have?

(a) 1,300 (b) 1,150
(c) 1,200 (d) 1,000

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : $\frac{2}{5}$ of A's Amount $= A \times \frac{2}{5}$

$\frac{8}{26}$ of B's Amount $= B \times \frac{8}{26}$

$\therefore$ According to the question,

$\frac{2A}{5} = \frac{8B}{26}$

$\frac{A}{B} = \frac{10}{13} = \frac{10x}{13x}$

$\Rightarrow 23x \rightarrow ₹2300$

$x = ₹100$

On putting the value of x.

B's Amount is $= 13x = 13 \times 100 = ₹1300$

4. A certain sum of money is divided among A, B and C. A gets one-third of the amount. B gets thrice as much as what C gets, and C gets ₹1200 less than what A gets find the share of A (in ₹)?

(a) 1,200 (b) 3,600
(c) 4,800 (d) 2,400

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let total amount = ₹ x

Amount received by A = ₹ $\frac{x}{3}$

Amount received by C = ₹ $\left(\frac{x}{3} - 1200\right)$

Amount received by B $= 3\left(\frac{x}{3} - 1200\right) =$ ₹ $(x - 3600)$

$\therefore$ Total amount $= \frac{x}{3} + \frac{x}{3} - 1200 + x - 3600 = x$

$\frac{5x}{3} - 4800 = x$

$\frac{2x}{3} = 4800$

$x = 2400 \times 3$

$x =$ ₹ 7200

$\Rightarrow$ So, share of A = $\frac{x}{3}$

On putting the value of x.

$\therefore$ Share of A $= 7200 \times \frac{1}{3} =$ ₹ 2400

5. ₹21,150 is distributed among A, B and C. The share of A is $\frac{4}{5}$ of the share of B, and the share of B is $\frac{3}{4}$ of the share of C. After receiving their respective sums, C gives some money out of her share to A so that after the transfer, the ratio of the sums A and C have 7:9. What part of her initial share did C transfer to A?

(a) $\frac{1}{5}$ (b) $\frac{1}{12}$

(c) $\frac{1}{8}$ (d) $\frac{1}{10}$

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question-

$A = \frac{4}{5}B$

$\frac{A}{B} = \frac{4}{5}$ ……..(i)

and $B = \frac{3}{4}C$

$\frac{B}{C} = \frac{3}{4}$ ……..(ii)

A : B : C = 12 : 15 : 20

And A + B + C = 12 + 15 + 20 = 47

Now, share of A = $21150 \times \frac{12}{47} = ₹5400$

and share of C $= 21150 \times \frac{20}{47} = 9000$

If C gives x to A

Again according to question-

$\frac{5400 + x}{9000 - x} = \frac{7}{9}$

$9(5400 + x) = 7(9000 - x)$

$48600 + 9x = 63000 - 7x$

$16x = 63000 - 48600$

$x = \frac{14400}{16} = 900$

Hence, part of money given by C to A.

$= \frac{900}{9000} = \frac{1}{10}$ part

6. A, B and C are partners in a business with a total capital of ₹33,000. The profit at the end of the year is ₹15,000 that is to be divided in proportion to their capitals. A receives ₹4,500 and B receives ₹5,500 as their shares in profit. Find C's capital (in ₹)?

(a) ₹ 11,000 (b) ₹ 13,000

(c) ₹ 12,000 (d) ₹ 14,000

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

Profit of C = Total profit − Profit of (A + B)

= 15000 – (4500 + 5500)

= 15000 – 10000

= ₹5000

Ratio of profit (A : B : C) = 4500 : 5500 : 5000

A : B : C = 9 : 11 : 10

and A + B + C = 9 + 11 + 10 = 30

Capital of C = Total Capital $\times \frac{\text{Share of C}}{\text{Share of (A + B + C)}}$

$= 33000 \times \frac{10}{(9 + 11 + 10)}$

$= 33000 \times \frac{10}{30}$

= 11000

Hence, C's capital = ₹11000.

7. Two employees Anita and Sarita are paid a total amount of Rs. 6600 per month. If Anita is paid 120% of the amount given to Sarita, then what amount will Sarita get ?

(a) ₹3000 (b) ₹30000

(c) ₹5000 (d) ₹4500

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the amount given to Sarita = ₹ x

Then the amount given to Anita as per the question

$= x \times \frac{120}{100} = ₹\ 1.2x$

Total amount = x + 1.2x = 6600

2.2 x = 6600

$x = \frac{6600}{2.2} = 3000$

So the Sarita get amount per month is = ₹ 3000

8. Shweta and Harish completed a project with an income of ₹28,000. In this project Shweta worked for 20 days and Harish worked for 30 days. If their daily wages are in the ratio of 5 : 6, then Shweta's share is:

(a) ₹ 12,000 (b) ₹ 16,000

(c) ₹ 10,000 (d) ₹ 18,000

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (c) : Ratio of workdone by Shweta & Harish

$= 20 \times 5 : 30 \times 6$

$= 100 : 180$

$= 5 : 9$

Shweta's share

And sum of shares of shweta and Harish = 5 + 9 = 14

$= 28000 \times \frac{5}{14}$

$= 2000 \times 5$

= ₹ 10,000

9. A certain sum of money was divided among three friends : Rajeev, Kewal and Amit in the ratio of 2 : 3 : 7. If Amit's share is ₹ 15 more than that of Kewal, then what is the sum of money which was divided:?

(a) ₹45 (b) ₹57
(c) ₹27 (d) ₹180

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let, Share of Rajeev, Kewal and Amit are 2x, 3x and 7x.

According to the question-

$7x = 3x + 15$

$4x = 15$

$x = \frac{15}{4}$

Divided money $= 2x + 3x + 7x$

$= 12x$

$= 12 \times \frac{15}{4}$

$= ₹45$

10. An amount of money is to be divided between A, B and C in the ratio of 5 : 2 : 8. If the difference between the shares of A and C is Rs. 7,740. Then what will be the total amount?

(a) ₹28,976 (b) ₹35,875
(c) ₹38,700 (d) ₹30,983

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let A's share $= 5x$

B's Share $= 2x$

C's share $= 8x$

Given the difference of A's and C's shares = 7740

$\Rightarrow 8x - 5x = 7740$

$3x = 7740$

$x = 2580$

On putting the value of x in A and B shares

A's share $= 5 \times 2580 = 12900$

B's share $= 2 \times 2580 = 5160$

C's share $= 8 \times 2580 = 20640$

Total amount $= 38700$

11. A shopkeeper divided a sum of ₹250,000 between his three sons in a proportion of 30%, 45% and 25% respectively. How much did each son inherit?

(a) ₹75, 000, ₹1,14,500 and ₹60,500
(b) ₹75,000, ₹1,13,500 and ₹61,500
(c) ₹75,000, ₹1,12,000 and ₹63,000
(d) ₹75,000, ₹1,12,500 and ₹62,500

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : Ratio of amount-

30% : 45% : 25%

6 : 9 : 5

$\because (6+9+5) \rightarrow 250000$

$20 \rightarrow 250000$

$1 \rightarrow 12500$

$\therefore$ The amount received by the first son $= 6 \times 12500$

$= ₹75,000$

The amount received by the second son $= 9 \times 12500$

$= ₹1,12,500$

The amount received by the third son $= 5 \times 12500$

$= ₹62,500$

12. If 330 pencils were distributed among Rajesh, Suresh and Chandan in the ratio of $\frac{1}{4} : \frac{2}{3} : \frac{1}{3}$ respectively, then how many pencils did Chandan get?

(a) 48 (b) 56
(c) 88 (d) 78

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) :

Given ratio $= \frac{1}{4} : \frac{2}{3} : \frac{1}{3} = \frac{3:8:4}{12} = 3:8:4$

Pencil received by Chandan,

$= 330 \times \frac{4}{(3+8+4)} = 330 \times \frac{4}{15} = 88$

13. Grandfather of Sukhdev and Baldev divided an amount of ₹ 2150 between them in the ratio 20 : 23. They both donated ₹ 100 each for charity out of their Shares. What will be the new ratio of their respective amounts?

(a) 80:77 (b) 6:7
(c) 19:22 (d) 120:123

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (b**) :** According to question –

Share of Sukhdev $= \frac{2150 \times 20}{43} = 1000$

Share of Baldev $= \frac{2150 \times 23}{43} = 1150$

Ratio after donating ₹ 100

$= (1000 - 100) : (1150 - 100)$

$\Rightarrow$ So, the new ratio is

$= 900 : 1050 = 6 : 7$

14. Mr. A starts a business with investment of ₹28000. Mr. B joins the business after 5 months. After two months that Mr. C also joins. If after 1 year the ratio of their profit is 4:2:3 then what was the amount investment by Mr. B and Mr. C?

(a) Rs.24000, Rs.50,400
(b) Rs.20,000, Rs.30,000
(c) Rs.12,000, Rs.25,200
(d) Rs.50,000, Rs.20,000

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (a) We know that formula

Profit = money × time

By partnership rule-

$A \times 12 : B \times 7 : C \times 5 = 4 : 2 : 3$

$28000 \times 12 : B \times 7 : C \times 5 = 4x : 2x : 3x$ (suppose)

On comparing

$28000 \times 12 = 4x$

$\boxed{x = 84000}$

$7B = 2x$ and $5C = 3 \times 84000$

$7B = 2 \times 84000$ $\boxed{C = Rs.50400}$

$B = 24000$

So amount of Mr. B = ₹24000

and amount of Mr. C = ₹50400

15. 5 year ago a company had as loss of 60% of its capital investment. In the next year they recovered the amount loss in 2 phase. In phase I they recover ₹1,00,000 and in phase 2, they recover ₹80,000, what was their initial capital investment.

(a) ₹3,60,000 (b) ₹3,00,000

(c) ₹2,40,000 (d) ₹1,60,000

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (b) Suppose total initial capital = ₹x

Recovery of loss amount in first and second phase

= 100000 + 80000 = Rs.180000

According to the question,

$x \times 60\% = 180000$

$x = \frac{180000 \times 100}{60}$

x = ₹300000

So initial capital = ₹300000

16. P invests ₹3500 in the business. After 5 month Q join with some investment. If the profit of Q is 50% more than the profit of P, then find the investment of Q?

(a) Rs.7000 (b) Rs.5000

(c) Rs.9000 (d) Rs.6500

RRB JE - 26/05/2019 (Shift-III)

Ans : (c) Let investment of Q = ₹x

Profit ratio of P and Q = (3500 ×12) : (x×7) = 6000 : x

∴ from the question,

Investment of Q.

$x = 6000 \times \frac{150}{100} = Rs.9000$

17. In an occupation P invests half of Q and Q invests half of R. If the Rs.7000 monthly profit is shared between them, then what is the share of R?

(a) Rs.2000 (b) Rs.3000

(c) Rs.1000 (d) Rs.4000

RRB JE - 29/05/2019 (Shift-III)

Ans : (d) Let the amount invested by R = x Rs.

Amount invested by $Q = \frac{x}{2}$ Rs.

Amount invested by P = ₹$\frac{x}{4}$

(ratio of profit)

$R : Q : P = x : \frac{x}{2} : \frac{x}{4}$

$= 4x : 2x : x$

Hence, the share of R $= 7000 \times \frac{4x}{7x} =$ ₹4000

18. X, Y and Z bougth a field on an annual rent of ₹415. If X graze 25 cows in that field for 6 month. Y grazed 40 cows for 8 months and Z graze 30 cows for the whole year, then what is the share of the rent given by Y in the rent.

(a) ₹120 (b) ₹154

(c) ₹150 (d) ₹160

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (d) Ratio of partnership of X, Y and Z =

X	:	Y	:	Z
25×6	:	40×8	:	30×12
15	:	32	:	36

∵ Total rent ₹415

∴ Rent of $Y = \frac{32}{15+32+36} \times 415 = 32 \times 5$

= ₹160

19. P, Q and R enters into a partnership investing, ₹35000, ₹45000 and ₹55000 respectively: The respective shares of P, Q and R corresponding share in the annual profit of 40500 are.

(a) ₹10500, ₹13500, ₹19500

(b) ₹10500, ₹13500, ₹18500

(c) ₹10500, ₹13500, ₹17500

(d) ₹10500, ₹13500, ₹16500

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (d) The ratio of profit between P, Q and R

= 35000 × 1 : 45000 × 1 : 55000 × 1

= 7 : 9 : 11

Total profit = ₹40500

So, P's share $= \frac{40500 \times 7}{7+9+11} = \frac{40500 \times 7}{27} =$ ₹10500

Q's share $= \frac{40500 \times 9}{27} =$ ₹13500

R's share $= \frac{40500 \times 11}{27} =$ ₹16500

So, the respective shares of P, Q and R in profit is ₹10500, ₹13500 and ₹16500

20. A sports accessories shop organises a running event. With on entry fee of ₹ 200 to be registered on the spots. They were expecting 300 entries and on the event's day only 200 turned up. How much less money did they receive in the entry compared with their initial expectation of 300 entries?

(a) Rs.5,000 (b) Rs.15,000

(c) Rs.12,000 (d) Rs.20,000

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (d) Entry fee for registration = ₹200

Total fee of 300 entries = 300 × 200

= ₹60,000

Total fee of 200 entries = 200 × 200

= ₹40,000

Difference = 60,000 – 40,000 = Rs.20,000

So they got ₹ 20,000 less in admission as compared to the initial expectation of entries.

21. Raveena and Suniti have a total of ₹127. Suniti and Avinash have ₹153, while Avinash and Raveena have ₹160. How much money does Raveena have.

(a) ₹93 (b) ₹60

(c) ₹67 (d) ₹70

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (c)

Raveena + Suniti = 127 ..... (i)

Suniti + Avinash = 153 ..... (ii)

Avinash + Raveena = 160 ..... (iii)

From the equation (i) and equation (ii)

Avinash – Raveena = 153 – 127 = 26 ..... (iv)

equation (iii) + equation (iv)

2 × Avinash = 160 + 26 = 186

Avinash = 93

Raveena = 160 – 93 = ₹67

Raveena have money = ₹67

22. N has p more amount than K. Total amount of N and K together is ₹q. How much amount does K have?

(a) $\frac{q}{2}+p$ (b) 2(p + q)

(c) $\frac{(p+q)}{2}$ (d) $\frac{(q-p)}{2}$

RRB NTPC 17.01.2017 Shift-2

Ans :(d) N = K + p …… (i)

N + K = q

Putting the value of N from the equation (i)

K + p + K = q

2K = q – p,

So, $K=\frac{q-p}{2}$

23. XYZ company distributes its profit or loss to ratio of its partners X, Y and Z in the ratio of 1/3, 1/2, 1/6 respectively. If Z gets ₹1,76,802 in his share, then find the amount received by Y.

(a) Rs.5,30,406 (b) Rs.88,401

(c) Rs.3,53,604 (d) Rs.2,65,203

RRB NTPC 28.04.2016 Shift : 1

Ans : (a) Ratio of share of X, Y and $Z=\frac{1}{3}:\frac{1}{2}:\frac{1}{6}$

= 2 : 3 : 1

∵ Z's share = ₹1,76,802

∴ Received amount by $Y=\frac{3}{1}\times 176802$

= ₹5,30,406

24. Divide 1600 into three parts in such a way that the 7th part of I st, 5th part of 2nd and 4th part of 3rd are equal.

(a) 900, 500, 300 (b) 700, 500, 400

(c) 700, 600, 300 (d) 800, 500, 400

RRB NTPC 03.04.2016 Shift : 3

Ans : (b) Suppose the first part, second part, and third part is x, y, and z respectively.

According to the question,

$\frac{x}{7}=\frac{y}{5}=\frac{z}{4}=k$ (Suppose)

x = 7k

y = 5k, z = 4k

Sum of x + y + z = 7k + 5k + 4k = 16k

First part $x=1600\times\frac{7k}{16k}$

$=1600\times\frac{7}{16}=700$

Second part $y=1600\times\frac{5k}{16k}$

$=1600\times\frac{5}{16}=500$

Third part $z=1600\times\frac{4k}{16k}$

$=1600\times\frac{4}{16}=\mathbf{400}$

= 700, 500 , 400

25. Divide 3740 into three parts in such a way that half of the first part one third of the second and one sixth part of the third part is equal.

(a) 700, 1000, 2040 (b) 340, 1360, 2040

(c) 680, 1020, 2040 (d) 500, 1200, 2040

RRB NTPC 02.04.2016 Shift : 2

Ans : (c) Let the parts are x, y and z.

then,

$\frac{x}{2}=\frac{y}{3}=\frac{z}{6}=a$ (suppose)

x = 2a, y = 3a and z = 6a

According to the question,

So, 2a + 3a + 6a = 3740

11a = 3740

a = 340

First part = 2a = 2 × 340 = 680

Second part = 3a = 3 × 340 = 1020

Third part = 6a = 6 × 340 = 2040

= 680, 1020, 2040

26. Mr. Sharma, Mr. Gupta and Ms. Sinha invested ₹4,000, ₹8,000 and ₹6,000 respectively, in a business Mr. Sharma left after 6 months. If after 8 months, there was a gain of ₹34,000, then what will be the share of Mr. Gupta?

(a) ₹14,000 (b) ₹12,000
(c) ₹20,000 (d) ₹16,000

RRB Group-D 22/08/2022 (Shift-III)

Ans. (d) : According to the question,

Mr. Sharma : Mr. Gupta : Ms. Sinha

$4000 \times 6 : 8000 \times 8 : 6000 \times 8$

$3 : 8 : 6$

$(3 + 8 + 6) = 17$ unit $\longrightarrow$ 34000

1 unit $\longrightarrow$ 2000

Thus, Mr. Gupta Share in the profit = 8×2000 = ₹ 16000

27. A, B and C entered into partnership. A invested 3 times as much as B and B invested $\frac{2}{3}$ times of what C invested. At the end of the year the total profit was ₹6,600. B's share in the profit is?

(a) ₹1,600 (b) ₹1,200
(c) ₹1,800 (d) ₹2,400

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : A's investment = 3 times of B's investment

$A = B \times 3$

$\frac{A}{B} = \frac{3}{1}$ ...(i)

B's investment = $\frac{2}{3}$ times of C's investment

$B = C \times \frac{2}{3}$

$\frac{B}{C} = \frac{2}{3}$ ... (ii)

From, equation (i) and (ii),

A : B : C = 6 : 2 : 3

Let, investment money by A, B and C are 6x, 2x and 3x.

According to the question-

$$\text{B's share} = \frac{2x}{(6x + 2x + 3x)} \times 6600$$

$$= \frac{2x}{11x} \times 6600$$

$$= ₹1200$$

28. A and B start a business by investing ₹1,00,000 and ₹ 1,50,000 respectively. Find the respective share of each out of a total profit of ₹24,000.

(a) ₹9300 and ₹14,100 (b) ₹9400 and ₹14,000
(c) ₹9500 and ₹14,200 (d) ₹9600 and ₹14,400

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : Total investment = A+ B = ₹1,00,000 + ₹150,000 = ₹250000

Total profit = ₹24000

$$\text{Share of A} = \frac{100000}{250000} \times 24000$$

$$= ₹\ 9600$$

$$\text{Share of B} = \frac{150000}{250000} \times 24000$$

$$= ₹14400$$

Hence, option (d) is correct.

29. Three persons invested an amount of money in a business in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$. At the end of a year, the total profit was ₹15600. The largest share received in profit will be:

(a) ₹7200 (b) ₹7000
(c) ₹7500 (d) ₹8000

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (a) : Given that,

$\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

On multiplying by 12-

6 : 4 : 3

According to the question-

13 unit = ₹15600

1 unit = ₹1200

The largest share of profit = 6 unit

1 unit = ₹1200

The largest share received in profit is

6 unit = ₹7200

30. Mahesh and Hareesh have invested ₹ 20,000 and ₹ 30,000 respectively, in a business. If after 3 months, Hareesh withdrew ₹ 5,000 from his investment, then the ratio in which they divide the profits will be?

(a) 16 : 21 (b) 16 : 22
(c) 16 : 20 (d) 16 : 23

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to question

Profit ratio of Mahesh and Hareesh

$= (20000 \times 12) : (30000 \times 3 + 25000 \times 9)$

$= 240 : (90 + 225)$

$= 240 : 315$

$= 16 : 21$

31. A and B entered into a partnership investing ₹20000/- and ₹16000/-, respectively. After 3 months, C joined them with an investment of ₹15000/-. What is B's share (in ₹) if the half yearly profit is ₹4350/-

(a) ₹1,760 (b) ₹20,00
(c) ₹1,600 (d) ₹1,850

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) : A : B : C

A and B invest for six month while C invests after three months.

$\because$ Capital × Time = Dividend

Hence,

A B C

₹20000×6 month : ₹16000×6 month : ₹15000×3 month

20×6 : 16×6 : 15×3

120 : 96 : 45

40 : 32 : 15

Total unit = 40 + 32 + 15 = 87 unit Dividend

87 unit = 4350

1 unit = $\frac{4350}{87}$

So, B'S share, 32 unit = $\frac{4350}{87}\times 32$

= 50 × 32 = ₹1600

32. Ramani started a business with a capital of ₹8000. Vanita joined the business after 4 months with a capital of ₹6000. At the end of one year of business if they earned a profit of ₹3600, then the share of Vanita is.

(a) ₹2400 (b) ₹1800

(c) ₹1200 (d) ₹1500

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (c) : Ratio of profit of Ramani and Vanita at the end of year $= 8,000\times 12 : 6,000\times(12-4)$

$= 8,000\times 12 : 6,000\times 8 \quad = 2:1$

Part of Vanita in the earned profit $= 3600\times\frac{1}{3} = ₹1,200$

33. Two partners A and B have started business with the capitals of ₹6,000 and ₹8,000 respectively. If they made profit of ₹5,600 then the share (in ₹) of A is:

(a) ₹2,800 (b) ₹2,100

(c) ₹3,200 (d) ₹2,400

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,

Ratio of capital A and B = 6000 : 8000

A : B = 6 : 8

A : B = 3 : 4

Share of A = Total profit $\times \frac{\text{Share of A}}{\text{Share of (A + B)}}$

$= 5600\times\frac{3}{(3+4)}$

$= 5600\times\frac{3}{7}$

$= 2400$

Hence, share of A = ₹2400.

34. Sita, Gita and Rita invested ₹20,000, ₹50,000 and ₹40,000 respectively, in a business. The net profit for the year was ₹12,100, which was divided in proportion to their investments. Find the share of profit earned by Rita?

(a) ₹4,300 (b) ₹4,100

(c) ₹4,400 (d) ₹4,200

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (c) : Ratio of profit of Sita, Gita and Rita = Ratio of capital invested for the given time.

= 20,000 : 50,000 : 40,000

= 2 : 5 : 4

Hence share of Rita in earned profit

$= 12,100\times\frac{4}{11} = ₹4,400$

35. X and Y started a business. X invested Rs.8000 and Y invested Rs.10,000. After 6 months Z also joined that business with an investment of ₹6000. If there is a profit of Rs.9,660 in 3 year. What is the share of Z.

(a) Rs.1,500 (b) Rs.2,100

(c) Rs.1,900 (d) Rs.1,200

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) : The ratio of investment ratio of X, Y and Z =

8000 × 3 : 10000 × 3 : 6000 × 2.5

24000 : 30000 : 15000

8 : 10: 5

Profit = ₹9660

Share of Z = $\frac{5}{8+10+5}\times 9660 = \frac{5}{23}\times 9660 = ₹2100$

36. Tejal has a 40% stake and Ashank has a 60% stake in a partnership firm. On an average, if Tejal earns a profit of ₹10,00,000 annually how much profit will Ashank make.

(a) ₹24 Lakh (b) ₹25 Lakh

(c) ₹30 Lakh (d) ₹15 Lakh

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (d) : Ratio of profit of Tejal and Ashank = ratio of their partnership = 40:60 = 2:3 = 2x:3x (suppose)

According to the question,

profit of Tejal = 2x = 10,00,000

x = 500000

Profit of Ashank = 3x = 3×500000 = ₹1500000

= Rs.15 Lakh

37. Purva invested ₹8000 for 7 month in a business and Durba invested ₹7000 for 8 months. The ratio of profit earned by them will be

(a) 64 : 49 (b) 8 : 7

(c) 1 : 1 (d) 7 : 8

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (c) : We know that

Profit = capital × time

Profit of Purva		: Profit of Durba	
⇒	8000 × 7	:	7000 × 8
⇒	56000	:	56000
	1	:	1

Hence the ratio of profit earned by them will be 1:1.

38. A and B start a business in partnership by investing ₹12,000 and ₹6000 respectively. After 8 month C with a capital of ₹15,000 also joins that business. After 2 years how much C's share will be in the profit of ₹33600.

(a) ₹15,000 (b) ₹12,000

(c) ₹10,000 (d) ₹22,000

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (b) : The ratio of profit of A, B and C

$= 12{,}000 \times 24 : 6{,}000 \times 24 : 15{,}000 \times (24\text{-}8)$

$= 12 \times 24 : 6 \times 24 : 15 \times 16$

$= 6 : 3 : 5$

Hence C's share in profit $= \frac{5}{6+3+5} \times 33{,}600$

$= \frac{5}{14} \times 33{,}600$

$= ₹12{,}000$

39. Surbhi invested ₹ 6000 for 5 months and Urba invested ₹ 5000 for 6 months in a venture. Find the ratio in which they will share the profit.

(a) 36 : 25 (b) 6 : 5

(c) 5 : 6 (d) 1 : 1

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (d)

Total capital invested by Surbhi in the industry

$= 5 \times 6000 = 30000$

Total capital invested by Urba in the industry

$= 6 \times 5000 = 30000$

∵ Capital invested by Surbhi and Urba in the industry is equal.

∴ The ratio profit of both = 30000 : 30000 = 1 : 1

40. P and Q enter into a partnership with an investment of ₹1400 and ₹1800 respectively. They share half of the profit equally for running the business and the remaining profit in the ratio of their investments. If the difference at their part in profit is 47. Find the total profit?

(a) Rs.752 (b) Rs.804

(c) Rs.954 (d) Rs.504

RRB JE - 22/05/2019 (Shift-III)

Ans : (a) We know that formula,

Profit = Capital × Time

Capital's ratio of P and Q = 1400 : 1800 = 7 : 9

Suppose total profit is x

∴ Profit ratio of P and Q $= \frac{7x}{2} : \frac{9x}{2}$

According to the question,

$\frac{9x}{2} - \frac{7x}{2} = 47$

$2x = 47 \times 2$

$x = 47$

∴ Total profit of P and Q = (7x + 9x) = 16x

$= 16 \times 47 = ₹752$

41. A, B and C invested capital in the ratio of 2:3:5. The time periods of their investments being in the ratio 4 : 5 : 6. In what ratio would the profits be distributed?

(a) 08: 15: 20 (b) 05: 15: 30

(c) 08: 15:30 (d) 07: 15: 30

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (c)

Capital investment ratio = A : B : C

= 2 : 3 : 5

Ratio of invested time = 4 : 5 : 6

So profit ratio

$= 2 \times 4 : 3 \times 5 : 5 \times 6$

$= 8 : 15 : 30$

42. Urmi and Lokesh started a partnership with an investment of ₹11,250 and ₹13125. But due to financial crisis one of them had to withdraw his investment after 8 months of his investment. In what ratio should the profit of the first 12 months be divided into both?

(a) 7 : 9 (b) 9 : 7

(c) 7 : 6 (d) 6 : 7

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (b) Profit ratio of both of them-

Urmi : Lokesh $= 11250 \times 12 : 13125 \times 8$

$= 2250 \times 12 : 2625 \times 8$

$= 450 \times 12 : 525 \times 8$

$= 18 \times 12 : 21 \times 8$

$= 6 \times 3 : 7 \times 2$

$= 9 : 7$

43. Tarun and Tapan started a partnership with investments of ₹13000 and ₹19500 respectively but due to some financial emergency Tapan had to with draw his investment after 8 months. In what ratio should the profit of the first 12 months be shared among them?

(a) 1 : 2 (b) 3 : 2
(c) 1 : 1 (d) 2 : 3

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (c) Ratio of profit first 12th month = (13,000 × 12) : (19, 500 × 8)
= 1,56, 000 : 1,56, 000
= 1 : 1

44. Umar and Avinash started a partnership with investment of ₹10,000 and ₹15,000, respectively but due to a financial emergency Avinash has to withdraw his investment after 8 months. In what ratio should the profit of the first twelve months be divided in to both?

(a) 3 : 2 (b) 2 : 3
(c) 1 : 1 (d) 1 : 2

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (c) ∵ Ratio of invested capital = ratio of profit
∴ Profit's ratio of Umar and Avinash
= 10000 × 12 : 15000 × 8
⇒ Required profit ratio = 120:120 = 1 : 1

45. Suman, Sakshi and Mayank form a partnership. Suman invests 5 times of Sakshi and Sakshi invests $\frac{3}{5}$ of mayank's investment. The total profit at the end of the year was ₹23000. Find the share of Sakshi

(a) Rs.5000 (b) Rs.3000
(c) Rs.4000 (d) Rs.4500

RRB NTPC 18.04.2016 Shift : 2

Ans : (b) Let the investment by Sakshi = ₹x
Then Suman's investment = ₹5x

$$\text{Mayank} \times \frac{3}{5} = x \Rightarrow \text{Mayank} = \frac{5x}{3}$$

Profit ratio of Sakshi, Suman and Mayank

$$= x : 5x : \frac{5x}{3}$$

$$= 3 : 15 : 5$$

$$\therefore \text{Share of profit of Shakshi} = \frac{3}{23} \times 23000 = ₹3000$$

Type - 3

46. Laxman and Bharat start a business by investing ₹48,000 and ₹72,000, respectively. What is Bharat's share out of an annual profit of ₹6,530?

(a) ₹3,918 (b) ₹2,612
(c) ₹3,080 (d) ₹2,450

RRB Group-D 30/08/2022 (Shift-I)

Ans. (a) : Investment Ratio
Laxman : Bharat
= 48000 ×12 : 72000×12
= 2 : 3
Annual Profit = ₹ 6530

$$\text{Bharat's share} = 6530 \times \frac{3}{5} = ₹\ 3918$$

47. P, Q and R jointly start a business. It was agreed that P would invest ₹25,000 for 6 months. Q ₹44,000 for 5 months and R ₹50,000 for 3 months. Out of total profits of ₹1,04,000, the amount received by P will be:

(a) ₹27,900 (b) ₹40,920
(c) ₹33,780 (d) ₹30,000

RRB Group-D 23/08/2022 (Shift-II)

Ans. (d) : P:Q:R = 6 × 25000 : 5 × 44000 : 3 × 50,000
= 30 : 44 : 30
= 15 : 22 : 15

$$\text{The amount received by P} = \frac{15}{52} \times 104000$$

$$= ₹\ 30,000$$

48. A, B and C started a business. They partnered for 6 months. 12 months and 14 months respectively. If their profit is in ratio 5 : 4 : 7 respectively, then the ratio of their respective investments is _____

(a) 5 : 2 : 3 (b) 2 : 3 : 5
(c) 2 : 3 : 7 (d) 1 : 5 : 3

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (a) : According to the question :
A : B : C
Time → 6 : 12 : 14
Profit→ 5 : 4 : 7
We know that ,

$$\boxed{\text{Profit} = \text{Time} \times \text{Investment}}$$

$$\text{Investment} = \frac{\text{Profit}}{\text{Time}}$$

$$= \frac{5}{6} : \frac{4}{12} : \frac{7}{14}$$

$$= \boxed{5:2:3}$$

49. Raja started a vegetable business with a capital of ₹4400. After a few months Ranga joined this business with a capital of ₹2400. Out of the total annual profit of ₹1200. Raja's share is ₹800. When did Ranga join this business as a partner?

(a) 2 Months before the end of the year
(b) 2 Months after Raja started the business
(c) 1 Month after Raja started the business
(d) 1 Month after the year ended

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (c) : Let Ranga join the business after x months.

Ratio of profit of both in business = 4400×12 :2400×(12–x)

$= 22: (12-x)$

According to the question,

$$\text{Raja's share} = 800 = 1200 \times \frac{22}{22+12-x}$$

$22 + 12 - x = 33$

$34 - x = 33$

$x = 1$ month

So, Ranga joined the business 1 month after Raja started the business.

50. Suraj and Vimal started a business. They earned ₹ 8,400 as profit. At the end of the year, Suraj got ₹4,500 as his share of profit. What is the ratio of the amounts invested by Suraj and Bimal for the business :

(a) 13 : 15 (b) 28 : 13
(c) 15 : 13 (d) 15 : 28

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : Total profit in 1 year = ₹8400

Share of the profit of Suraj = ₹4500

∴ Share of the profit of Vimal

= 8400 – 4500 = ₹3900

Hence Required ratio = 4500 : 3900 = 15 : 13

51. Mohan invested ₹10,00,00 in the textile business. After a few month, Sohan invest ₹40000 to become his partner. At the end of the year, the total profit was divided between them in ratio 3:1. After how many month did Sohan join the business.

(a) 3 (b) 2
(c) 4 (d) 5

RRB NTPC 16.04.2016 Shift : 1

Ans : (b) : Let Sohan join in the business is after x months

According to the question,

$$\frac{100000 \times 12}{40000 \times (12-x)} = \frac{3}{1}$$

$\Rightarrow 1200000 = 120000 \times (12-x)$

$\Rightarrow 10 = 12 - x$

$\Rightarrow x = 12-10 = 2$ months.

Hence after 2 month Sohan was joined the business.

52. P and Q invested in a business in the ratio of 5 : 13. Q withdrew his amount after 6 months. If they shared their profit in the ratio 25:26, then, how long was the amount of P was used for the industry?

(a) 8 months (b) 15 months
(c) 18 months (d) 12 months

RRB JE - 24/05/2019 (Shift-III)

Ans : (b) Suppose P invested for x months

Q invested for 6 months

According to the question,

$$\frac{5 \times x}{13 \times 6} = \frac{25}{26}$$

$$\frac{x}{3} = 5$$

x = 15 months

53. A and B enter into a partnership with ₹ 50,000 and ₹ 60,000 respectively. C joins them after x months contributing ₹ 7000 and B leaves x months before the end of the year. If they share the profit in the ratio of 20 : 18 : 21, then the value of x is-

(a) 4 (b) 6
(c) 5 (d) 3

RRB JE - 28/05/2019 (Shift-II)

Ans : (d) In any business A invests C_A capital for t_A time, B invests C_B capital for t_B time, C invests C_C capital for t_C time then x ratio of profit-

$P_A : P_B : P_C = C_At_A : C_Bt_B : C_Ct_C$

$20 : 18 : 21 = 50000 \times 12 : 60000 \times (12-x) : 70000 \times (12-x)$

$20 : 18 : 21 = 60 : 6(12-x) : 7(12-x)$

$$\frac{20}{18} = \frac{60}{6(12-x)}$$

x = 3

54. Ramdas invested ₹90000 in the cosmetic business. After few months later, Shyamdas became a partner in the business with an investment of ₹30000. At the end of the year total profit was divided between them in the ratio of 4:1. After how many months would Shyamdas joined in business?

(a) 4 (b) 3
(c) 1 (d) 6

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) Let Shyamdas joined the business after x months

Ratio of share of both in the business

$= 90000 \times 12 : 30000 \times (12-x)$

$= 36 : (12-x)$

$$\therefore \frac{36}{12-x} = \frac{4}{1} \text{ or } 12 - x = 9 \text{ or } x = 3$$

11.

Work & Time

Type - 1

1. Paras can complete 40% of the work in 8 days while Deepti & Paras together can complete 10% of the work in a day. Find the time taken by Deepti alone to complete the work.

(a) 23 days (b) 21 days

(c) 22 days (d) 20 days

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : Paras can complete 40% of work in 8 day then,

Time taken by Paras to complete whole work

$$= 8 \times \frac{100}{40}$$

$$= \frac{5}{2} \times 8$$

$$= 20 \text{ days}$$

(Deepti + Paras) can do 10% of work in 1 day.

$\therefore$ Then, they can complete whole work $= 1 \times \frac{100}{10}$

$$= 10 \text{ days}$$

According to the question,

Then, $$\frac{1}{10} = \frac{1}{20} + \frac{1}{\text{Deepti}}$$

$$\frac{1}{\text{Deepti}} = \frac{1}{10} - \frac{1}{20} = \frac{2-1}{20} = \frac{1}{20}$$

Hence Time taken by Deepti to complete the whole work = 20 days

2. Namita alone completes $33\frac{1}{3}\%$ of a work in 16 days and the remaining work is completed by bobby alone. The whole work is completed in total 28 days. In how many days Namita and Bobby working together can complete $\frac{11}{16}$th of the original work ?

(a) 6 days (b) 9 days

(c) 12 days (d) 8 days

RRB Group-D 26/08/2022 (Shift-I)

Ans. (b) : 16 day's work of Namita $= \frac{100}{3}\% = \frac{1}{3}$ part

1 day's work of Namita $= \frac{1/3}{16} = \frac{1}{48}$ part

Remaining work $= 1 - \frac{1}{3} = \frac{2}{3}$ part

Bobby does $\frac{2}{3}$ part of work = 28 – 16 = 12 days

1 day's work of Bobby $= \frac{2/3}{12} = \frac{1}{18}$ part

Time taken by Namita and Bobby to complete the work

$$= \frac{1}{\frac{1}{48} + \frac{1}{18}}$$

$$= \frac{1}{11/144} = \frac{144}{11} \text{ days}$$

Hence the time taken by Namita and Bobby to complete $\frac{11}{16}$ part of work $= \frac{144}{11} \times \frac{11}{16}$

= 9 days

3. A and B together can complete a work in 12 days. A alone can complete it in 20 days. If B does not work only for the first half of the day daily, then in how many days will A and B together complete the work?

(a) 15 days (b) $\frac{43}{2}$ days

(c) $\frac{40}{3}$ days (d) $\frac{22}{3}$ days

RRB Group-D 26/08/2022 (Shift-III)

Ans. (a) : According to the question,

B's 1 day's work $= \left(\frac{1}{12} - \frac{1}{20}\right) = \frac{1}{30}$ part

B's half day's work $= \frac{1}{30 \times 2} = \frac{1}{60}$ part

Now, (A+B)'s 1 day's work $= \frac{1}{20} + \frac{1}{60} = \frac{4}{60} = \frac{1}{15}$ part

[$\because$ B works for half day only]

Hence, A and B together will complete the work in 15 days.

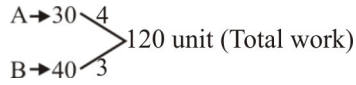
4. A and B can do a work alone in 30 days and 40 days, respectively. In how many days will the work be completed if they work on alternate days, starting with B on the first day?

(a) $17\frac{1}{7}$ days (b) $17\frac{1}{3}$ days

(c) $34\frac{1}{3}$ days (d) $34\frac{2}{3}$ days

RRB Group-D 05/09/2022 (Shift-II)

Ans. (c) : According to the question,



2 day's work of A + B = 7 units

2 × 17 = 34 day's work of A + B = 7 × 17 = 119 unit

Remaining work = 120 – 119 = 1 unit

The time taken by B to do 1 unit work = $\frac{1}{3}$ days

Hence the total time taken to complete the work

$= 34\frac{1}{3}$ days

5. A can do a piece of work in 15 day and B can do the same work in 20 days. The time taken by them working together to do the same work is:

(a) $7\frac{4}{7}$ days (b) $10\frac{4}{7}$ days

(c) $8\frac{4}{7}$ days (d) $9\frac{4}{7}$ days

RRB Group-D 02/09/2022 (Shift-I)

Ans. (c) : From the question,

1 day's work of A = $\frac{1}{15}$ part

1 day's work of B = $\frac{1}{20}$ part

1 day's work of (A + B) = $\left(\frac{1}{20}+\frac{1}{15}\right)$

$= \frac{7}{60}$ part

Hence the time taken by A and B together to do the same work = $\frac{60}{7}$ days

$= 8\frac{4}{7}$ days

6. Pankaj can do one-fifth of a piece of work in 6 days and Jagath can do one-fourth of the same work in 8 days. find the number of days taken to complete the work if both work together. (Round the answer to one decimal place.)

(a) 14.5 (b) 15.5

(c) 16.5 (d) 15.8

RRB Group-D 28-09-2022 (Shift-II)

Ans. (b) : Pankaj can do 1/5 the piece of work in 6 days

$\therefore$ Pankaj will complete the whole work = $\frac{6}{1/5} = 30$ days

Jagath can do 1/4th piece of work in 8 days

$\therefore$ Jagath can complete the work = $\frac{8}{1/4} = 32$ days.

One day's work of Pankaj and Jagath = $\left(\frac{1}{30}+\frac{1}{32}\right)$ part

$= \frac{16+15}{480} = \frac{31}{480}$

Hence, both pankaj and Jagath can complete the work 480/31 = 15.5 days

7. A and B can complete a piece of work in 10 days and 12 days respectively. If they work on alternate days beginning with A, then in how many days will the work be completed?

(a) 10 (b) $10\frac{1}{2}$

(c) $10\frac{1}{4}$ (d) $10\frac{5}{6}$

RRB Group-D 26/08/2022 (Shift-III)

Ans. (d) : According to the question -

LCM of 10 and 12 = 60

Total work = 60 unit

1 day's work of A = 6 unit

1 day's work of B = 5 unit

2 day's work of (A + B) = 11 unit

$\times 5 \quad = \times 5$

By A+B $\rightarrow$ 10 days = 55 unit

Remaining work = 60 – 55

= 5 unit

Time taken by A to complete 5 unit work = $\frac{5}{6}$ day

Hence required time = $\left(10+\frac{5}{6}\right)$ days

$= 10\frac{5}{6}$ days

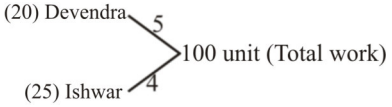
8. Devendra can complete a work in 20 days, while Ishwar can complete the same work in 25 days. If they work alternately starting from Devendra leaving one day each, then in how many days will the work be completed ?

(a) 22 days (b) $22\frac{1}{5}$ days

(c) 23 days (d) $22\frac{1}{3}$ days

RRB Group-D 26/08/2022 (Shift-II)

Ans. (b) : From the question,



work of 2 day's work of Devendra and Ishwar = 9 unit

2 × 11 = 22 day's work of Devendra and Ishwar

= 9 × 11

= 99 unit

Remaining work = 100 – 99 = 1 unit

Time taken by Devendra to do 1 unit work $= \frac{1}{5}$ days

complete the work $= \left(22+\frac{1}{5}\right)$ work

$= 22\frac{1}{5}$ days

9. Rama packs 36 boxes in 1 h. Her sister needs 3 h to pack the same number. How much time will they together take to pack these 36 boxes ?

(a) 40 min (b) 38 min

(c) 45 min (d) 42 min

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (c) : ∵ Rama packs 36 boxes in 60 minutes.

$\therefore$ 1 minute $= \frac{36}{60} = \frac{3}{5}$

And his sister packs 36 boxes in 180 minutes

$\therefore$ 1 minute $= \frac{36}{180} = \frac{1}{5}$

$\therefore$ Boxes packed by both in 1 minute $= \frac{3}{5}+\frac{1}{5}$

$= \frac{4}{5}$

$\therefore$ Time taken by both to pack 36 boxes $= \frac{36}{4/5}$

$= \frac{36\times 5}{4} = 45$ minutes

10. Ranga and Raju together can complete a task in 6 days. If Ranga alone can complete the same task in 18 days, then how many days will Raju take to complete the task?

(a) 9 (b) 7

(c) 8 (d) 6

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : Let Raju complete that work in x days.

One day work of Ranga and Raju $= \frac{1}{6}$ part

One day work of Ranga $= \frac{1}{18}$ part

According to the question–

$$\frac{1}{x}+\frac{1}{18}=\frac{1}{6} \Rightarrow \frac{1}{x}=\frac{1}{6}-\frac{1}{18}$$

$$\frac{1}{x}=\frac{3-1}{18}$$

$$\frac{1}{x}=\frac{1}{9}$$

Hence, Raju will complete this work in 9 days.

11. A and B together can do a piece of work in 6 days and A alone can do the same work in 9 days. In how many days will B alone complete the same work?

(a) 16 (b) 20

(c) 12 (d) 18

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (d) : Work done by A in one day $= \frac{1}{9}$ part

Work done by (A+B) in one day $= \frac{1}{6}$ part

Work done by B in one day $= \frac{1}{6}-\frac{1}{9}$

$= \frac{3-2}{18}$

$= \frac{1}{18}$ part

Hence, B alone can complete the same work in 18 days.

12. A can complete a task in 40 days. If A and B can complete it together in 30 days, then in how many days can B alone complete the task?

(a) 150 days (b) 100 days

(c) 125 days (d) 120 days

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : B's one day work $= \frac{1}{A+B}-\frac{1}{A} = \frac{1}{30}-\frac{1}{40}$

$= \frac{4-3}{120} = \frac{1}{120}$

Hence, B alone can complete the task in 120 days.

13. A man and a boy, working together, can finish a task in 24 days. If, for the last 6 days, the man works alone, then the task can be finished in 26 days. In how many days can the boy alone finish the task?

(a) 72 (b) 54

(c) 48 (d) 36

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let, boy completed work in x days and man completed in y days.

According to the question,

$$\frac{1}{x}+\frac{1}{y}=\frac{1}{24} \quad -----(1)$$

$$\frac{20}{x}+\frac{26}{y}=1 -----(2)$$

On subtracting equation, from equation (1) × 26

$$\frac{26}{x}+\frac{26}{y}=\frac{26}{24}$$

$$\frac{20}{x}+\frac{26}{y}=1$$

$$\frac{6}{x}=\frac{2}{24}$$

$$x = 72$$

Hence, the boy alone can finish the task in 72 days.

14. X can copy 60 pages in 4 minutes, X and Y together can copy 750 pages in 30 minutes. In how many minutes can 'Y' copy 100 pages?

(a) 8 (b) 16

(c) 10 (d) 5

RRB NTPC 19.04.2016 Shift : 3

Ans : **(c)** 1 minute work of X $= \frac{60}{4} = 15$ pages

1 minute work of X and Y $= \frac{750}{30} = 25$ pages

$\therefore$ One minute work of Y $= 25 - 15 = 10$ pages

$\therefore$ Time taken by Y to copy 100 pages

$= \frac{100}{10} = 10$ minutes

15. Amrit has twice capacity of painting than Kushal. Together they complete a work in 6 days. In how many days Kushal will complete that work alone?

(a) 10 (b) 12

(c) 24 (d) 18

RRB NTPC 17.01.2017 Shift-3

Ans : **(d)** Efficiency ratio of Amrit and Kushal = 2 : 1

$\therefore$ Ratio of time = 1 : 2

Let the time taken by Amrit and Kushal to finish the work is x and 2x days respectively.

According to the question-

$$\frac{x \times 2x}{x + 2x} = 6$$

$$\frac{2x^2}{3x} = 6 \Rightarrow x = \frac{6 \times 3}{2}$$

$$\boxed{x = 9 \text{ days}}$$

So time taken by Kushal to complete the work = 9 × 2 = 18 days

16. Himanshu is twice as capable as Ankit as a wood cutter and together they finish a work in 16 days. In how many days will Ankit alone complete the same work?

(a) 32 (b) 48

(c) 64 (d) 40

RRB NTPC 26.04.2016 Shift : 3

Ans : (b) Let Ankit complete the work in 2x days and Himanshu in x days.

According to the question,

$$\frac{1}{x} + \frac{1}{2x} = \frac{1}{16}$$

$$\frac{2+1}{2x} = \frac{1}{16}$$

$$2x = 48$$

$$x = 24$$

Hence, time taken by Ankit to complete the work (2x) = 24 × 2 = 48 days

17. X does 25% of a work in 20 days. Y joins up with X and they together do the remaining work in 15 days. So in how many days can Y alone do the same work?

(a) 30 days (b) $25\frac{1}{2}$ days

(c) $26\frac{2}{3}$ days (d) $26\frac{1}{3}$ days

RRB NTPC 27.04.2016 Shift : 2

Ans : **(c)** X can complete 25% of a work $= \frac{1}{4}$ part in 20 days

$\therefore$ X will complete whole work = 80 days

Remaining work $= 1 - \frac{1}{4} = \frac{3}{4}$ part

Both complete $\frac{3}{4}$ part of work together in 15 days

$\therefore$ Both will complete whole work together $= 15 \times \frac{4}{3} = 20$ days

$\therefore$ One day work of Y $= \frac{1}{20} - \frac{1}{80} = \frac{4-1}{80} = \frac{3}{80}$ part

Y will complete the work $= \frac{80}{3} = 26\frac{2}{3}$ days

18. As a sailar, Anirudh is twice as fast as Ashwin and together they finish a work in 14 days. In how many days Ashwin alone can complete the work.

(a) 28 (b) 42

(c) 56 (d) 35

RRB NTPC 30.04.2016 Shift : 3

Ans : **(b)** Let Anirudh and Ashwin finish the work in x days and 2x days respectively.

Then one day work of Anirudh $= \frac{1}{x}$ part

And one day work of Ashwin $= \frac{1}{2x}$ part

According to the question,

Then $\frac{1}{x} + \frac{1}{2x} = \frac{1}{14}$ part

$$\frac{2+1}{2x} = \frac{1}{14}$$

$$\frac{3}{2x} = \frac{1}{14}$$

$$x = 21$$

So time taken by Ashwin alone can complete the work

$= 2x = 2 \times 21 = 42$ days

19. Ishan is twice as good as a worker as Kamal and both together finish a work in 29 days. In how many days will Kamal alone can do this work.

(a) 58 (b) 70

(c) 87 (d) 116

RRB NTPC 17.01.2017 Shift-1

Ans : **(c)** Let Kamal do the work in x days

And Ishan do that work in $\frac{x}{2}$ days

According to the question,

Work done by both in a day =

$$\frac{1}{x} + \frac{2}{x} = \frac{1}{29}$$

$$\frac{3}{x} = \frac{1}{29}$$

$$x = 29 \times 3$$

$$x = 87 \text{ days}$$

So, Kamal will complete that work 87 days

20. Reeta and Meena together can complete a work in 10 days, while Reeta alone can complete the same work in 15 days. In how many days will Meena complete this work alone.

(a) 38 days (b) 32 days
(c) 28 days (d) 30 days

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (d) One day work of Reeta and Meena $= \frac{1}{10}$ part

Work done by Reeta in 1 day $= \frac{1}{15}$ part

Work done by Meena in 1 day

$= \frac{1}{10} - \frac{1}{15} = \frac{3-2}{30} = \frac{1}{30}$ part

So Meena will complete that work in 30 days.

21. Rohan and Rohit together can finish a work in 10 days while Rohan can do the same work in 15 days alone. In how many days will Rohit alone do the same work?

(a) 32 days (b) 30 days
(c) 25 days (d) 35 days

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) According to the question,

Work done by Rohan and Rohit in 1 day $= \frac{1}{10}$ part

Work done by Rohan in one day $= \frac{1}{15}$ part

Work done by Rohit in one day $= \frac{1}{10} - \frac{1}{15}$

$= \frac{3-2}{30}$

$= \frac{1}{30}$ part

So Rohit will complete the work in 30 days.

22. P and Q together can finish a work in 6 days. Q alone can finish the same work in 10 days. In how many days can P alone do the same work?

(a) 15 days (b) 11 days
(c) 14 days (d) 12 days

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (a) Suppose P alone can complete this work in n days

1 day work of (P + Q) $= \frac{1}{6}$ part

1 day work of Q $= \frac{1}{10}$ part

1 day work of P $= \frac{1}{n}$ part

According to the question,

So, $\frac{1}{10} + \frac{1}{n} = \frac{1}{6}$

$\frac{1}{n} = \frac{1}{6} - \frac{1}{10}$

$\frac{1}{n} = \frac{1}{15}$

1 day work of P $= \frac{1}{15}$

So time taken by P to finish the work = 15 days

23. As an airman, Lohit, is twice as capable as Ayush and together they finish a work in 17 days. In how many days does Ayush alone finish the same work?

(a) 34 days (b) 51 days
(c) 68 days (d) 40 days

RRB RPF SI – 13/01/2019 (Shift-II)

Ans :(b) Efficiency ratio of Lohit and Ayush = 2:1

$\therefore$ Ratio of time = 1:2

Let the time taken by Lohit to complete the work = x days

And time taken by Ayush to complete the work = 2x days

From the question,

$\frac{1}{2x} + \frac{1}{x} = \frac{1}{17}$

$\frac{1+2}{2x} = \frac{1}{17}$

$\frac{3}{2x} = \frac{1}{17}$

$2x = 51$

Time taken by Ayush to complete the work $= 2x = 51$ days

24. P takes 50% more time than Q. If they work together, the work will be done in 18 days. In how many days will Q alone complete the work?

(a) 30 days (b) 22 days
(c) 24 days (d) 25 days

RRB JE - 31/05/2019 (Shift-II)

Ans : (a) Let the time taken by Q = x days

Then time taken by P = 1.5x days

One day work of (P + Q)

$\frac{1}{x} + \frac{1}{1.5x} = \frac{1}{18}$

$\frac{1.5+1}{1.5x} = \frac{1}{18}$

$\frac{2.5}{1.5x} = \frac{1}{18}$

$x = \frac{18 \times 2.5}{1.5} = 30$

So Q alone will complete that work in 30 days.

25. D can complete a work in 18 days and E can do the same work in half time of D. If they both work together, how long will they take to finish the work?

(a) 5 (b) 4 (c) 7 (d) 6

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (d) According to the question,
Time taken by D = 18 days

Time taken by E $= \frac{1}{2} \times 18 = 9$ days

Time taken by both $= \frac{18 \times 9}{18+9} = \frac{18 \times 9}{27} = 6$ days

26. If Ram can do a task in 20 days and Krishna can do it in 30 days, then the time taken by both to complete the task working together is:

(a) 10 days (b) 8 days
(c) 15 days (d) 12 days

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (d) : Ram can do the work in 20 days.

Work done by Ram in one day $= \frac{1}{20}$

Work done by Krishna in one day $= \frac{1}{30}$

According to the question,
Work done by both Ram and Krishna in one day

$= \frac{1}{20} + \frac{1}{30} = \frac{5}{60} = \frac{1}{12}$

Therefore, total work done by Ram and Krishna in 12 days.

27. Raju is thrice as good as a workmen as Vinod and together they can finish a task in 21 days. In how many days can Vinod alone complete the work?

(a) 84 (b) 28
(c) 78 (d) 76

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let tiem taken by Raju to complete the work = x days
Time taken by Vinod to complete the work = 3x days

1 day work of Raju and Vinod $= \frac{1}{21}$ unit

Raju's 1 day work + Vinod's 1 day work $= \frac{1}{21}$ unit

$$\frac{1}{x} + \frac{1}{3x} = \frac{1}{21}$$

$$\frac{3+1}{3x} = \frac{1}{21}$$

$\Rightarrow x = 28$ days

$\because$ Time taken by Raju to complete the work = 28 days.

$\therefore$ Time taken by Vinod to complete the work = 3 × 28 = 84 days

28. A and B together can complete a piece of work in 35 days. A alone can complete the same work in 60 days. B alone will be able to complete same work in:

(a) 96 days (b) 72 days
(c) 42 days (d) 84 days

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,

Work done by A and B in one day $= \frac{1}{35}$

$\because$ Work done by B in one day = Work done by A and B in one day – Work done by A in one day

$= \frac{1}{35} - \frac{1}{60} = \frac{12-7}{420} = \frac{5}{420} = \frac{1}{84}$

$\therefore$ Time taken by B alone to do the total work = 84 days

Type - 2

29. Anmol can complete a piece of work in 25 days. Together with Garima he can complete the same work in 15 days. While Anmol and Aseema working together can complete the same work in 20 days. In how many days can Garima and Aseema working together complete the same work?

(a) 30 (b) 29
(c) $\frac{300}{11}$ (d) $\frac{250}{9}$

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (c) : From the question,

Anmol → 25 days
Anmol + Garima → 15 days
Anmol + Aseema → 20 days

12, 20, 15 → 300 (Total Work)

Efficiency of Garima = 20 – 12 = 8
Efficiency of Aseema = 15 – 12 = 3

According to the question,

Required Time $= \frac{300}{8+3} = \frac{300}{11}$ Days.

30. If A can do a piece of work in 8 days, B can do it in 10 days and C can do it in 20 days, then in how many days can A, B and C together do the same work?

(a) $3\frac{7}{11}$ (b) 3
(c) 4 (d) $2\frac{7}{11}$

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : According to the question,
One day's work of A, B and C

$$= \frac{1}{8} + \frac{1}{10} + \frac{1}{20}$$

$$= \frac{5+4+2}{40}$$

$$= \frac{11}{40} \text{ part}$$

$(A+B+C)$ can finish the word $= \frac{40}{11}$ days $= 3\frac{7}{11}$ Days

31. A and B together can do a piece of work in 30 days. Together with C they can complete the same work in 24 days. In how many days can C alone complete the same work?

(a) 96 (b) 150

(c) 90 (d) 120

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (d) :

One day's work of $(A + B) = \frac{1}{30}$ days

$(A + B + C)$'s 1 day work $= \frac{1}{24}$ days

According to the question,

$$\frac{1}{24} = \frac{1}{30} + \frac{1}{C}$$

1 day's work of $C = \frac{1}{24} - \frac{1}{30}$

$$= \frac{5-4}{120}$$

$$= \frac{1}{120} \text{ part}$$

Hence, C alone can complete the work in 120 days.

32. A and B together can do piece of work in 10 days. If A alone can do the same work in 15 days and C alone can do the same work in 20 days, then in how many days can B and C together do the same work?

(a) 12 (b) 11

(c) $12\frac{1}{5}$ (d) $11\frac{3}{4}$

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : (A + B) together do the work = 10 days

Time taken by A alone = 15 days

According to the question,

$$\frac{1}{(A+B)} = \frac{1}{A} + \frac{1}{B}$$

$$\frac{1}{10} = \frac{1}{15} + \frac{1}{B}$$

$$\frac{1}{B} = \frac{1}{10} - \frac{1}{15}$$

$$= \frac{3-2}{30}$$

B = 30 days

Time taken by C to do the same work = 20 days

Then time taken by $(B + C) = \frac{30 \times 20}{50}$

$$= \frac{60}{5}$$

= 12 days

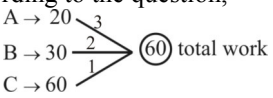
33. A, B, and C can do a piece of work in 20, 30 and 60 days, respectively. In how many days can 'A' complete the work if he is assisted by B and C on every third day?

(a) 15 days (b) 13 days

(c) 24 days (d) 12 days

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : According to the question,



Worked done by A, B and C in 3 day = 3A + B + C

$= 3 \times 3 + 2 + 1$

= 12 unit

(15 days) work done $= 12 \times 5 = 60$ unit

Hence work will be completed in 15 days

34. Meenu along can do a work in 16 days. Simi alone can do it in 12 days. If Raj joins them, they three together can complete the work in 4 days. How long will Raj alone take to finish the work ?

(a) $\frac{111}{2}$ days (b) $\frac{12}{7}$ days

(c) $\frac{48}{5}$ days (d) 23 days

RRB Group-D 29/08/2022 (Shift-I)

Ans. (c) : One day's work of Meenu = 1/16 part

One day's work of Simi = 1/12 part

Let one day's work of Raj = 1/x part

According to the question,

$$\frac{1}{16} + \frac{1}{12} + \frac{1}{x} = \frac{1}{4}$$

$$\frac{1}{x} = \frac{1}{4} - \frac{1}{16} - \frac{1}{12}$$

$$\frac{1}{x} = \frac{12-3-4}{48}$$

$$\frac{1}{x} = \frac{5}{48}$$

Hence the time taken by Raj to finish the work alone = 48/5 days

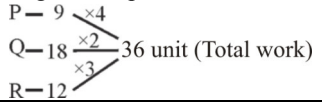
35. P, Q and R can do a place of work in 9 days, 18 days and 12 days, respectively. They start the work, with P working on Day 1, Q working on Day 2 and R working on Day 3, and then continuing with this cycle till the work got is completed. How many days will be needed to complete this work in this manner?

(a) 11 days (b) 15 days

(c) 16 days (d) 12 days

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : According to the question,



3 day's work of P, Q and R = 4 + 2 + 3 = 9 unit Time taken to complete 9 unit work = 3 days

Time taken to complete the whole work (36 unit)

$$= \frac{3}{9} \times 36$$

$$= 12 \text{ days}$$

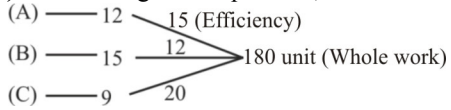
36. A can do a piece of work in 12 days, B can do the same work in 15 days. C can do the same work in 9 days. The time taken by them to finish the same work if they work together is :

(a) $4\frac{39}{47}$ days (b) $2\frac{39}{47}$ days

(c) $5\frac{39}{47}$ days (d) $3\frac{39}{47}$ days

RRB Group-D 08/09/2022 (Shift-I)

Ans. (d) : According to the question,



1 day's work of (A + B + C) = (15 + 12 + 20) = 47 unit

Hence the time taken by (A + B + C) to complete the work $= \frac{180}{47} = 3\frac{39}{47}$ days

37. A, B and C can complete a piece of work in 20, 24 and 30 days, respectively. The number of days they take to finish it if they work together will be :

(a) 8 days (b) 5 days

(c) 6 days (d) 7 days

RRB Group-D 09/09/2022 (Shift-III)

Ans. (a) : One day's work of A $= \frac{1}{20}$ part

One day's work of B $= \frac{1}{24}$ part

One day's work of C $= \frac{1}{30}$ part

One day's work of (A + B + C) $= \frac{1}{20} + \frac{1}{24} + \frac{1}{30}$

$$= \frac{6+5+4}{120} = \frac{15}{120}$$

$$= \frac{1}{8} \text{ part}$$

Hence then time taken by A, B and C to Complete the work $= \frac{1}{1/8} = 8$ days

38. A and B can do a work in 18 days. B and C can do the same work in 15 days. While A and C can do the work in 12 days. Working together, how much time will they take to complete the work ?

(a) $8\frac{27}{37}$ (b) $11\frac{27}{37}$

(c) $9\frac{27}{37}$ (d) $10\frac{27}{37}$

RRB Group-D 06/09/2022 (Shift-III)

Ans. (c) : One day's work of (A + B) $= \frac{1}{18}$ part

One day's work of (B + C) $= \frac{1}{15}$ part

One day's work of (C + A) $= \frac{1}{12}$ part

One day's work of 2 (A + B + C) $= \frac{1}{18} + \frac{1}{15} + \frac{1}{12}$

One day's work of (A + B + C) $= \frac{37}{180} \times \frac{1}{2} = \frac{37}{360}$ part

Time taken by (A + B + C) to complete the work

$$= \frac{1}{37/360}$$

$$= 9\frac{27}{37} \text{ part}$$

39. A can complete a piece of work alone in 10 days and B can complete the same piece of work alone in 15 days. Working together A, B and C can completes this work in 4½ days. If B does not work, while A and C work on alternate days, starting with C, then in how many days will the work be completed ?

(a) $13\frac{1}{9}$ (b) 13

(c) $12\frac{2}{3}$ (d) $13\frac{1}{5}$

RRB GROUP-D – 26/09/2022 (Shift-III)

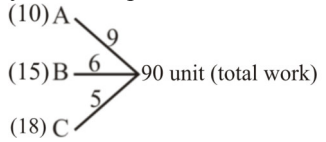
Ans. (a) : One day's work of C $= \frac{2}{9} - \left(\frac{1}{10} + \frac{1}{15}\right)$

$$= \frac{2}{9} - \left(\frac{3+2}{30}\right)$$

$$= \frac{2}{9} - \frac{1}{6}$$

$$= \frac{4-3}{18} = \frac{1}{18} \text{ part}$$

Time taken by C to complete the work = 18 days



2 day's work of (A + C) = (9 + 15) = 14 unit

(2 × 6) = 12 day's work of (A + C) = (14 × 6) = 84 unit

Remaining work = 90 – 84 = 6 unit

work done by C on 13th day's = 5 unit
Remaining work = 6 – 5 = 1 unit

Time taken by A to do 1 unit work $= \frac{1}{9}$ days

Hence the total time taken by A and C to complete the total work $= 13 + \frac{1}{9}$

$= 13\frac{1}{9}$ days

40. P can complete a work in 4 hours. Q and R together can complete the same work in 3 hours, while P and R can complete it in 2 hours. If Q alone does this work then how much time will he take to complete this work?

(a) 12 hours (b) 8 hours
(c) 10 hours (d) 15 hours

RRB JE - 23/05/2019 (Shift-II)

Ans : (a) 1 hour work of P $= \frac{1}{4}$ part .....(i)

1 hour work of (Q + R) $= \frac{1}{3}$ part .....(ii)

1 hour work of (P + R) $= \frac{1}{2}$ part .....(iii)

From the equation (i) and (iii),

$P + R = \frac{1}{2} \Rightarrow \frac{1}{4} + R = \frac{1}{2} \Rightarrow R = \frac{1}{2} - \frac{1}{4} = \frac{2-1}{4} = \frac{1}{4}$

$\therefore$ From the equation (ii),

$Q + R = \frac{1}{3} \Rightarrow Q = \frac{1}{3} - \frac{1}{4} = \frac{1}{12}$

So time taken by Q to complete the work = 12 hours

41. Srinivas can complete a work in 15 days and Ramesh can complete the same work in 9 days, with Ravi they completed the work in 3 days. In how many days Ravi can complete the same work alone?

(a) $6\frac{3}{7}$ days (b) 10 days
(c) $6\frac{2}{5}$ days (d) $6\frac{1}{5}$ days

RRB JE - 29/05/2019 (Shift-III)

Ans : (a) Let Ravi will complete the work in x days
According to the question,

$\frac{1}{x} + \frac{1}{15} + \frac{1}{9} = \frac{1}{3}$

$\frac{1}{x} = \frac{1}{3} - \frac{1}{15} - \frac{1}{9}$

$\frac{1}{x} = \frac{15-3-5}{45} = \frac{15-8}{45}$

$\frac{1}{x} = \frac{7}{45}$

$x = \frac{45}{7} = 6\frac{3}{7}$ days

So Ravi will complete the work in $6\frac{3}{7}$ days

42. Arjun alone can do a work in 12 days and Bheem alone can do the same work in 15 days with the help of Chetan, they together complete that work in 5 days. How many days will Chetan alone take to do that work ?

(a) 20 days (b) 24 days
(c) 15 days (d) 16 days

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) According to the question,

One day work of Arjun $= \frac{1}{12}$ part

One day work of Bheem $= \frac{1}{15}$ part

Let, one day work of Chetan $= \frac{1}{x}$ part

One day work of all three $= \frac{1}{12} + \frac{1}{15} + \frac{1}{x}$

$\frac{1}{5} = \frac{5+4}{60} + \frac{1}{x}$

$\frac{1}{x} = \frac{1}{5} - \frac{9}{60}$

$\frac{12-9}{60} = \frac{1}{x}$

$\frac{1}{x} = \frac{3}{60} = \frac{1}{20}$

So time taken by Chetan to finish the work alone = 20 days

43. A and B can complete a work in 50 days, B and C can complete it in 37.5 days while C and A together can complete the same work in 30 days. In how many days can each of A, B and C individually complete the same work?

(a) 50, 150 and 75 (b) 40, 60 and 120
(c) 60, 120 and 40 (d) 75, 150 and 50

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : One day work of (A + B) $= \frac{1}{50}$ part

One day work of (B + C) $= \frac{1}{37.5}$ part

One day work of (C + A) $= \frac{1}{30}$ part

One day work of 2(A + B + C) $= \left(\frac{1}{50} + \frac{10}{375} + \frac{1}{30}\right)$ part

$2(A+B+C) = \left(\frac{1}{50} + \frac{2}{75} + \frac{1}{30}\right)$ part

$2(A+B+C) = \left(\frac{6+8+10}{300}\right)$ part

$A+B+C = \frac{12}{300} = \frac{1}{25}$ part

$\frac{1}{50} + C = \frac{1}{25}$

$C = \frac{1}{25} - \frac{1}{50} = \frac{2-1}{50} = \frac{1}{50}$ part

So, C can complete the work in 50 days

$A+\frac{2}{75}=\frac{1}{25}$

$A=\frac{1}{25}-\frac{2}{75}=\frac{3-2}{75}=\frac{1}{75}$ part

So, A can complete the work in 75 days

$\frac{1}{30}+B=\frac{1}{25}$

$B=\frac{1}{25}-\frac{1}{30}=\frac{6-5}{150}=\frac{1}{150}$ part

So, B can complete the work in 150 days

Hence, A, B and C can complete the work in 75 days, 150 days and 50 days respectively.

44. A and B together can finish a piece of work in 10 days. B and C together can finish it in 15 days. A and C together can finish it in 18 days. In how many days will A, B and C finish it together?

(a) 7 days (b) 8 days

(c) 9 days (d) 10 days

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

$A+B=\frac{1}{10}$ ..... (i)

$B+C=\frac{1}{15}$ ..... (ii)

$C+A=\frac{1}{18}$ ..... (iii)

Adding equation (i), (ii) and (iii) ,

$2[A+B+C]=\frac{1}{10}+\frac{1}{15}+\frac{1}{18}=\frac{9+6+5}{90}=\frac{20}{90}$

Hence work done by A, B, and C in a day

$=\frac{20}{90\times 2}$

Hence, total time taken by A, B and C to complete the work

$=\frac{90\times 2}{20}=9$ days

45. A can do a piece of work alone in 32 days, while together with B she can do the work in 24 days. If C alone can do the work in 64 days, in how many days can B and C together do the work.

(a) $38\frac{4}{5}$ days (b) $38\frac{3}{5}$ days

(c) $38\frac{4}{5}$ days (d) $38\frac{2}{5}$ days

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : Work done by A in one day $=\frac{1}{32}$ part

Work done by A and B in one day $=\frac{1}{24}$ part

Work done by B in one day $=\frac{1}{24}-\frac{1}{32}$

$=\frac{4-3}{96}=\frac{1}{96}$

Work done by C in one day $=\frac{1}{64}$ part

Work done by B and C in 1 day

$=\frac{1}{96}+\frac{1}{64}$

$=\frac{2+3}{192}=\frac{5}{192}$ part

Time taken by B and C to complete the total work $=\frac{192}{5}=38\frac{2}{5}$ days

46. A and B can finish a project in 10 days, B and C can finish it in 20 days, and C and A can finish it in 30 days. If A, B and C work together, then they will finish the project in:

(a) $\frac{120}{11}$ days (b) $\frac{110}{7}$ days

(c) $\frac{120}{7}$ days (d) $\frac{130}{11}$ days

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (a) : Total work = LCM of 10, 20 and 30 = 60

	Time	Total work	Efficiency
A+B	10	60	6
B+C	20		3
C+A	30		2

Efficiency of (A + B + C)

= 2 (A + B + C) = 11

$A+B+C=\frac{11}{2}$

Hence, time taken by A, B and C to complete the work

$=\frac{60}{11/2}=\frac{120}{11}$ days

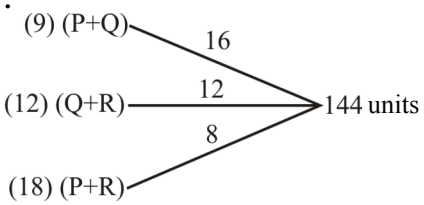
47. P and Q can reap a field in 9 days, Q and R can reap it in 12 days and P and R in 18 days. Find how many days will they take to reap the field if all three work together?

(a) 39 days (b) 4 days

(c) 8 days (d) 19.5 days

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (c) :



Work done by 2 (P + Q + R) in one day = (16+12+8)

= 36 units

Work done by (P + Q + R) in one day $=\frac{36}{2}=18$ units

Time taken by (P + Q + R) to complete the work

$=\frac{144}{18}=8$ days

48. A, B and C can complete a piece of work in 10 days, 15 days and 20 days respectively. If they work together, then the work will be completed in:

(a) $4\frac{7}{13}$ days (b) $4\frac{6}{13}$ days

(c) $4\frac{9}{13}$ days (d) $4\frac{8}{13}$ days

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question-

$\therefore$ A's 1 day work $= \frac{1}{10}$ part

B's 1 day work $= \frac{1}{15}$ part

C's 1 day work $= \frac{1}{20}$ part

$\because$ (A, B and C)'s 1 day work $= \frac{1}{10}+\frac{1}{15}+\frac{1}{20}$

$= \frac{6+4+3}{60} = \frac{13}{60}$

$\therefore$ Time taken by A, B and C to complete the whole work $= \frac{60}{13} = 4\frac{8}{13}$ days

49. Ramu and Somu together can complete a task in 10 days. Somu and Dhamu together can complete it in 12 days. Dhamu and Ramu together can complete it in 15 days. If Ramu, Somu and Dhamu work together, in how many days will they complete the task?

(a) 8 (b) 6

(c) 9 (d) 7

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (a) : One day work of (Ramu+Somu) $= \frac{1}{10}$

One day work of (Somu+Dhamu) $= \frac{1}{12}$

One day work of (Dhamu+Ramu) $= \frac{1}{15}$

One day work of 2 (Ramu+Somu+Dhamu)

$= \left(\frac{1}{10}+\frac{1}{12}+\frac{1}{15}\right)$

$= \frac{6+5+4}{60}$

$= \frac{15}{60} = \frac{1}{4}$

One day work of (Ramu+Somu+Dhamu)

$= \frac{1}{4\times 2} = \frac{1}{8}$

$\because \frac{1}{8}$ of the work done by (Ramu+Somu+Dhamu) in one day.

Hence, total time taken by (Ramu+Somu+Dhamu) to complete the work in 8 days.

50. A and B working together can complete a piece of work in 24 days. They did this work for 18 days and then C completed the remaining work in 10 days. In how many days can A, B and C together complete the work?

(a) 34 days (b) 24 days

(c) 32 days (d) 15 days

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) (A+B)'s one day work $= \frac{1}{24}$ part

(A+B)'s 18 days work $= \frac{18}{24} = \frac{3}{4}$ part

Remaining work $= 1-\frac{3}{4}$ part $= \frac{1}{4}$ part

$\therefore$ Time taken by C to complete the work = 40 days

C's one day work $= \frac{1}{40}$ part

(A+B+C)'s one day work $= \frac{1}{24}+\frac{1}{40}$

$= \frac{5+3}{120}$

$= \frac{8}{120}$ part $= \frac{1}{15}$ part

$\therefore$ Time taken by (A+B+C) to complete the work = $1\times 15 = 15$ days

51. A and B can finish a work in 9 days, B and C can finish it in 12 days and A and C can finish it in 18 days. In how many days can A, B and C finish the work together?

(a) 9 (b) 8

(c) 7 (d) 6

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : The work done by (A+B) in one day $= \frac{1}{9}$ part

The work done by (B + C) in one day $= \frac{1}{12}$ part

The work done by (A + C) in one day $= \frac{1}{18}$ part

The work done by 2(A+B+C) in one day $= \frac{1}{9}+\frac{1}{12}+\frac{1}{18}$

2 (A + B + C) $= \frac{4+3+2}{36}$

2 (A + B + C) $= \frac{9}{36}$

(A + B + C) $= \frac{9}{72} = \frac{1}{8}$ part

Therefore, (A + B + C) can complete the work in 8 days.

52. If P and Q together can complete a work in 15 days, Q and R together can do the same work in 12 days and P and R together can do it in 20 days, then in how many days will all three together complete the same work.

(a) 10 days (b) 14 days

(c) 4 days (d) 6 days

RRB JE - 26/05/2019 (Shift-I)

Ans : (a)

One day work of $(P + Q) = \frac{1}{15}$ part

One day work of $(Q + R) = \frac{1}{12}$ part

One day work of $(P + R) = \frac{1}{20}$ part

Work done by 2 (P + Q + R) in 1 day

$$= \frac{1}{15} + \frac{1}{12} + \frac{1}{20}$$

Work done by (P+Q+R) in 1 day

$$= \frac{4+5+3}{60\times 2} = \frac{12}{60\times 2} = \frac{1}{5\times 2} = \frac{1}{10}$$

So time taken by (P + Q + R) to complete the work = 10 days.

53. P and Q can complete a work in 8 days. Q and R can complete the same work in 12 days. P, Q and R together can complete the same work in 6 days. In how many days P and R together can do that work?

(a) 6 days (b) 8 days

(c) 5 days (d) 4 days

RRB JE - 26/05/2019 (Shift-II)

Ans : (b)

Work done by (P + Q) in 1 day $= \frac{1}{8}$ part

Work done by (Q + R) in 1 day $= \frac{1}{12}$ part

Work done by (P + Q + R) is 1 day $= \frac{1}{6}$ part

Work done by R in 1 day $= \frac{1}{6} - \frac{1}{8}$

$$= \frac{4-3}{24} = \frac{1}{24}$$

Work done by P in 1 day $= \frac{1}{6} - \frac{1}{12}$

$$= \frac{4-2}{24} = \frac{2}{24} = \frac{1}{12} \text{ part}$$

Work done by (P + R) in 1 day $= \frac{1}{24} + \frac{1}{12}$

$$= \frac{1+2}{24} = \frac{3}{24} = \frac{1}{8} \text{ part}$$

Hence, P and R together can do that work in 8 days.

54. A and B together can complete a work in 10 days B and C together in 12 days and C and A together in 15 days. How much time will A take to complete this work alone?

(a) 34 days (b) 24 days

(c) 20 days (d) 30 days

RRB RPF Constable – 18/01/2019 (Shift-I)

Ans : (b) One day work of $(A + B) = \frac{1}{10}$ part

One day work of $(B + C) = \frac{1}{12}$ part

One day work of $(C + A) = \frac{1}{15}$ part

One day work of $2(A + B + C) = \frac{1}{10} + \frac{1}{12} + \frac{1}{15}$

$$= \frac{6+5+4}{60} = \frac{15}{60}$$

One day work of $(A + B + C) = \frac{1}{4\times 2} = \frac{1}{8}$

So, one day work of A $= \frac{1}{8} - \frac{1}{12} = \frac{3-2}{24} = \frac{1}{24}$

Hence, A will finish the work alone in 24 days

55. A and B can complete a task in 40 days, B and C can complete in 30 days while C and A can complete the same task together in 24 days. How many days will each of A, B and C take to complete the task individually?

(a) 48, 96 and 32 (b) 32, 48 and 96

(c) 60, 120 and 40 (d) 40, 120 and 60

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (c) One day work of $(A + B) = \frac{1}{40}$ part

One day work of $(B + C) = \frac{1}{30}$ part

One day work of $(C + A) = \frac{1}{24}$ part

One day work of $2(A + B + C) = \frac{1}{40} + \frac{1}{30} + \frac{1}{24}$

One day work of (A + B + C)

$$= \left(\frac{3+4+5}{120}\right)\frac{1}{2} = \frac{1}{10}\times\frac{1}{2} = \frac{1}{20} \text{ part}$$

One day work of A $= \frac{1}{20} - \frac{1}{30} = \frac{3-2}{60} = \frac{1}{60}$ part

So, A will complete the work in 60 days

One day work of B $= \frac{1}{20} - \frac{1}{24} = \frac{6-5}{120} = \frac{1}{120}$ part

So, B will complete the work in 120 days

One day work of C $= \frac{1}{20} - \frac{1}{40} = \frac{2-1}{40} = \frac{1}{40}$ part

So, C will complete the work in 40 days

Hence, A, B and C can complete the work in 60 days, 120 days and 40 days respectively.

56. A, B and C can complete a work in 81 days. A and B together can complete the same work in 97.2 days. B and C together can complete the same work in 162 days. In how many days can B complete that work alone?

(a) 243 (b) 234

(c) 261 (d) 225

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (a) One day work of A, B and C $= \frac{1}{81}$ part

One day work of A and B $= \frac{1}{97.2}$ part

One day work of B and C $= \frac{1}{162}$ part

According to the question,

$$\frac{1}{A}+\frac{1}{B}+\frac{1}{C}=\frac{1}{81} \quad .....(i)$$

$$\frac{1}{A}+\frac{1}{B}=\frac{10}{972} \quad .....(ii)$$

$$\frac{1}{B}+\frac{1}{C}=\frac{1}{162} \quad .....(iii)$$

From the equation (i) and (ii),

$$\frac{1}{C}=\frac{1}{81}-\frac{10}{972}$$

$$\frac{1}{C}=\frac{972-810}{81\times 972}=\frac{162}{81\times 972}=\frac{1}{486}$$

From equation (iii),

$$\frac{1}{B}+\frac{1}{486}=\frac{1}{162}$$

$$\frac{1}{B}=\frac{1}{162}-\frac{1}{486}=\frac{3-1}{486}$$

$$\frac{1}{B}=\frac{2}{486}=\frac{1}{243}$$

$B = 243$

So, B alone will complete the work in 243 days.

57. A and B can do a work in 40 days, B and C can do the same work in 56 days, while C and A together can do the same work in 70 days. How many days will C take to complete the work alone?

(a) 210 (b) 175
(c) 245 (d) 280

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (d)

One day work of A and B $= \frac{1}{40}$ part ..... (1)

One day work of B and C $= \frac{1}{56}$ part .....(2)

One day work of C and A $= \frac{1}{70}$ part .....(3)

To adding equation (1), (2) and (3),

$$2(A+B+C)=\frac{1}{40}+\frac{1}{56}+\frac{1}{70}=\frac{7+5+4}{280}=\frac{16}{280}$$

$$(A+B+C)=\frac{16}{2\times 280}=\frac{8}{280}=\frac{1}{35}.....(4)$$

From equation (4) and equation (1),

One day work of C $= \frac{1}{35}-\frac{1}{40}=\frac{8-7}{280}=\frac{1}{280}$ part

So, time taken by C to complete the work = 280 days

58. A can do a work in 6 days. B takes 8 days to complete the work. C takes the same time complete the work as the time taken by A and B working together. If B and C work together how much time to take them to complete the work?

(a) $\frac{14}{5}$ days (b) $\frac{13}{5}$ days
(c) $\frac{11}{5}$ days (d) $\frac{12}{5}$ days

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (d) : One day work done of A $= \frac{1}{6}$ part

One day work done of B $= \frac{1}{8}$ part

One day work done of C $= \frac{1}{6}+\frac{1}{8}$ part

$$=\frac{4+3}{24}=\frac{7}{24} \text{ part}$$

One day work of B and C together

$= \frac{1}{8}+\frac{7}{24} = \frac{10}{24}=\frac{5}{12}$ part

So, time taken by B and C to complete the work together $= \frac{12}{5}$ days

59. Ali can complete a piece of work in 8 days. Balvinder can complete the same work in 10 days. In order to complete the work in 4 days, they asked Chander to join them and were able to finish the work in time. In how many days can Chander alone finish the work?

(a) 20 days (b) 40 days
(c) 14 days (d) 12 days

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let Chander's one day work = $\frac{1}{x}$ unit

Ali's one day work = $\frac{1}{8}$ unit

Balvinder's one day work = $\frac{1}{10}$ unit

According to the question-

$$\frac{1}{8}+\frac{1}{10}+\frac{1}{x}=\frac{1}{4}$$

$$\frac{1}{x}=\frac{1}{4}-\frac{1}{8}-\frac{1}{10}$$

$$\frac{1}{x}=\frac{10-5-4}{40}$$

$$\boxed{\frac{1}{x}=\frac{1}{40}}$$

$\therefore$ Chander alone can complete the work in 40 days.

60. A and B together can do a piece of work in 21 days. With the help of C, they can finish it in 14 days. In how many days will C alone be able to finish the work?

(a) 7 days (b) 42 days

(c) 35 days (d) $\frac{35}{2}$ days

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (b) : One day work of (A + B) = $\frac{1}{21}$

One day work of (A + B + C) = $\frac{1}{14}$

$\therefore$ One day work of C = $\frac{1}{14}-\frac{1}{21}$

$= \frac{3-2}{42}$

$= \frac{1}{42}$

Hence C will complete the work alone in 42 days.

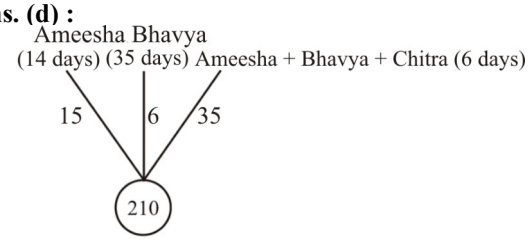
61. Ameesha can complete a task by herself in 14 days, while it takes Bhavya 35 days to complete it alone. Together with Chitra, they can complete the task in 6 days. How many days will Chitra need to complete the task alone?

(a) 43 (b) 14

(c) 28 (d) 15

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) :



$\because$ One day work capacity of Ameesha, Bhavya and Chitra = 35

One day work capacity of Chitra = 35-(15+6)=14

Total time taken by Chitra to complete the work $= \frac{210}{14} = 15$ days

62. A, B and C can complete a work in 81 days. A and B together can complete the same work in 97.2 days. B and C together can complete the same work in 162 days. In how many days can B complete the work alone?

(a) 225 (b) 234

(c) 243 (d) 261

RRB RPF SI – 10/01/2019 (Shift-III)

Ans : (c) According to the question,

Work done by A, B and C in one day = $\frac{1}{81}$ part

$A+B+C=\frac{1}{81}$ ..... (i)

Then, 1 day work of A + B = $\frac{1}{97.2}$ part

$A+B=\frac{10}{972}$

$A+B=\frac{5}{486}$ ..... (ii)

On putting the value of equation (ii) in equation (i),

$C=\frac{1}{81}-\frac{5}{486}$

$C=\frac{6-5}{486}=\frac{1}{486}$ part

One day work of (B + C) = $\frac{1}{162}$ part

$B+\frac{1}{486}=\frac{1}{162}$

$B=\frac{1}{162}-\frac{1}{486}$

$B=\frac{3-1}{486}=\frac{1}{243}$ part

Hence, B will complete that work alone in 243 days.

63. Ashok and Kiran complete a work in 10 hours Kiran and Rohan complete the same work in 15 hours, while Ashok and Rohan complete it in 12 hours. How many hours will it take for Kiran to do this work alone?

(a) 26 hours (b) 15 hours

(c) 24 hours (d) 30 hours

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (c) Work done by Ashok and Kiran in 1 hour

$= \frac{1}{10}$ .....(i)

Work done by Kiran and Rohan in 1 hour $= \frac{1}{15}$ .....(ii)

Work done by Ashok and Rohan in 1 hour $= \frac{1}{12}$ .....(iii)

On adding the equation (i), (ii) and (iii),

Work done by 2(Ashok, Kiran and Rohan) in 1 hour

$= \frac{1}{10}+\frac{1}{15}+\frac{1}{12}$

Work done by Ashok, Kiran and Rohan in 1 hour

$= \frac{12+8+10}{120\times 2}=\frac{30}{240}=\frac{1}{8}$ part

So, 1 hour work of Kiran

$= \frac{1}{8}-\frac{1}{12}=\frac{3-2}{24}=\frac{1}{24}$ part

So, Kiran will take 24 hours to complete the work alone.

64. A, B and C together can complete a work in 10 days. A alone can complete the work in 20 days and B alone can complete the work in 30 days. How many days will C take to complete that work alone?

(a) 30 days (b) 20 days

(c) 10 days (d) 60 days

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (d) 1 day work of A, B and C $= \frac{1}{10}$ part

1 day work of A and B $= \left(\frac{1}{20}+\frac{1}{30}\right)$ part

Hence, 1 day work of C $= \frac{1}{10}-\left(\frac{1}{20}+\frac{1}{30}\right)$

$=\frac{1}{10}-\left(\frac{3+2}{60}\right)=\frac{6-5}{60}=\frac{1}{60}$ part

Hence, time taken by C to complete the work alone

$=\frac{1}{1/60}=60$ days

65. A and B can complete a work in 28 days, B and C can complete the same work in 35 days. While C and A can complete the same work in 42 days. How many days will C take to complete this work alone?

(a) 125 (b) 120
(c) 124 (d) 122

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (b) : One day work of (A + B) $= \frac{1}{28}$ part .....(i)

One day work of (B + C) $= \frac{1}{35}$ part ..... (ii)

One day work of (C + A) $= \frac{1}{42}$ part .....(iii)

One day work of (A+B+B+C+C+A) $=\frac{1}{28}+\frac{1}{35}+\frac{1}{42}$

One day work of 2(A+B+C) $=\frac{15+12+10}{420}$

One day work of (A+B+C) $= \frac{37}{840}$ part ..... (iv)

On subtracting equation (i) from equation (iv),

One day work of C $= \frac{37}{840}-\frac{1}{28}=\frac{37-30}{840}$

One day work of C $= \frac{7}{840}=\frac{1}{120}$ part

Hence, C will finish the entire work alone in 120 days.

66. A, B and C together can complete a work in 45 days. If only A and B worked, then they take 54 days to complete the work and if only B and C worked, they take 90 days to complete the work. If B worked alone then how many days did he take to complete the work?

(a) 145 (b) 125
(c) 135 (d) 130

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (c) : One day work of (A+B+C) $= \frac{1}{45}$ part .....(i)

One day work of (A+B) $= \frac{1}{54}$ part .....(ii)

One day work of (B+C) $= \frac{1}{90}$ part .....(iii)

From equation (ii) + equation (iii),

$A+B+B+C=\frac{1}{54}+\frac{1}{90}$

$B+(A+B+C)=\frac{1}{54}+\frac{1}{90}$

From the equation (i),

$B=\left(\frac{1}{54}+\frac{1}{90}\right)-\frac{1}{45}$

$B=\frac{5+3-6}{270}=\frac{2}{270}=\frac{1}{135}$ part

Hence B will take 135 days to complete the work alone.

67. A and B can finish a work in 10 days, B and C can finish the same work in 15 days and A and C can finish the same work in 20 days. In how many days can B finish this work alone?

(a) $\frac{20}{7}$ (b) $\frac{24}{7}$
(c) $\frac{120}{7}$ (d) $\frac{60}{7}$

RRB NTPC 12.04.2016 Shift : 1

Ans : (c) One day work done of (A+B+C)

$=\frac{1}{2}\left(\frac{1}{10}+\frac{1}{15}+\frac{1}{20}\right)=\frac{1}{2}\times\left(\frac{6+4+3}{60}\right)=\frac{13}{120}$ part

$\therefore$ One day work of B

= One day work of (A+B+C) – One day work of (A+C)

$=\frac{13}{120}-\frac{1}{20}$

$=\frac{13-6}{120}$

$=\frac{7}{120}$ part

Hence B alone will finish the work in $\frac{120}{7}$ days.

68. A, B and C together can finish a work in 10 days. A and B together can finish the work in 12 days. While B and C together can finish the same work in 20 days. If B worked alone, how many days will he take to finish the work ?

(a) 30 (b) 22
(c) 45 (d) 20

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (a) One day work of (A+B+C) $=\frac{1}{10}$ ..... (i)

One day work of (A + B) $=\frac{1}{12}$ ..... (ii)

One day work of (B + C) $=\frac{1}{20}$ ..... (iii)

From equation (ii) + equation (iii)

$B+(A+B+C)=\frac{1}{12}+\frac{1}{20}$

$\Rightarrow \quad B+\frac{1}{10}=\frac{1}{12}+\frac{1}{20}$ {From equation (i)}

$\Rightarrow \quad B=\frac{1}{12}+\frac{1}{20}-\frac{1}{10}$

$\Rightarrow \quad B=\left(\frac{5+3-6}{60}\right)$

$\Rightarrow \quad B=\frac{2}{60}$

$\Rightarrow \quad B=\frac{1}{30}$

Hence B will complete the work in 30 days.

69. A and B can do a piece of work in 12 days B and C and do the same work in 15 days, while A and C can do the same work in 36 days. In how many days all the three together can do the same work?

(a) 11.15 days (b) 11.20 days
(c) 11.25 days (d) 10.75 days

RRB ALP CBT-2 Trade (Fitter) 21-01-2019 (Shift-I)

Ans. (c) : One day work of (A + B) = $\frac{1}{12}$ part

One day work of (B + C) = $\frac{1}{15}$ Part

One day work of (A + C) = $\frac{1}{36}$ part

One day work of (A+B) + (B+C) + (A+C) = $\frac{1}{12}+\frac{1}{15}+\frac{1}{36}$

One day work of 2(A + B + C) = $\frac{15+12+5}{180}$

One day work of (A + B + C) = $\frac{32}{180\times 2}$

= $\frac{8}{90}$ part

Hence, time taken by (A + B + C) to complete the work

= $\frac{1}{8/90}$

= $\frac{90}{8}$

= 11.25 days.

Type - 3

70. 12 men can build a wall in 24.5 days. How many men would be able to build five such walls in 49 days ?

(a) 40 (b) 30
(c) 50 (d) 28

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (b) : Given,

$M_1 = 12$, $M_2 = ?$

$D_1 = 24.5$, $D_2 = 49$

$W_1 = 1$ wall $W_2 = 5$ wall

Then,

$$\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\frac{12\times 24.5}{1} = \frac{M_2\times 49}{5}$$

$M_2 = 30$ Men

71. 6 men and 8 women could finish a work in 14 days where as 8 men and 12 women could finish the same work in 10 days. How much time would be taken to finish the same work if one man worked alone

(a) 140 days (b) 175 days
(c) 210 days (d) 280 days

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : According to the question,

(6M + 8W) × 14 = (8M + 12W) × 10

42M + 56W = 40M + 60W

2M = 4W

M : W = 2 : 1 (efficiency)

Total work = (6M + 8W) × 14

= (6 × 2 + 8 × 1) × 14

= 20 × 14

= 280 unit

Hence, one man can complete work = $\frac{280}{2\times 1}$ = 140days

72. 8 men and 6 women can complete a piece of work in 5 days while 6 men and 8 women can also complete the same work in 5 days. In how many days will 7 men and 7 women complete the same work ?

(a) 3 days (b) 6 days
(c) 2 days (d) 5 days

RRB Group-D 01/09/2022 (Shift-I)

Ans. (a) : Let the working Efficiency of 1 man = x

and the working Efficiency of 1 woman = y

According to the question,

(8x + 6y) × 5 = (6x + 8y) × 5

40x + 30y = 30x + 40y

40x – 30x = 40y – 30y

10x = 10y

x : y = 1 : 1

Hence the total work = (8x + 6y) × 5

= (8 × 1 + 6 × 1) × 5

= 70 unit

Let 7 men and 7 women do the work in D days,

then (7x + 7y)D = 70

(7 × 1 + 7 × 1)D = 70

D = $\frac{70}{14}$

D = 5 days

73. 3 men and 2 women can complete a work in 8 days, while 2 men and 3 women can complete the same work in 10 days. In how many days can 2 men and 1 woman complete the same work ?

(a) 12.5 (b) 15
(c) 13 (d) 13.5

RRB Group-D 06/09/2022 (Shift-III)

Ans. (a) : Let the working efficiency of 1 man = x
and the working effieiency of 1 woman = y
According to the question,

$(3x + 2y)8 = (2x + 3y)10$

$24x + 16y = 20x + 30y$

$24x - 20x = 30y - 16y$

$4x = 14y$

$\frac{x}{y} = \frac{14}{4}$

$x : y = 7 : 2$

Total work $= [(3 \times 7) + (2 \times 2)] \times 8$

$= (21 + 4) \times 8$

$= 25 \times 8$

$= 200$ unit

Let 2 men and 1 woman do the work in D days.

then $(2x + 1y)D = 200$

$(2 \times 7 + 2)D = 200$

$D = \frac{200}{16}$

$D = 12.5$ days

74. Seven men can complete a work in 12 days. They start the work and after 5 days, 3 men leave. In how many days will the remaining work be completed by the remaining men?

(a) $13\frac{1}{4}$ (b) $12\frac{1}{4}$

(c) 14 (d) 12

RRB Group-D 29/08/2022 (Shift-II)

Ans. (b) : Let the remaining work complete in D days
According to the question,

$\because M_1 D_1 = M_2 D_2$

$(7M) \times 12 = (7M) \times 5 + (4M) \times D$

$84M = 35M + 4MD$

$4D = 84 - 35$

$4D = 49$

$D = 12\frac{1}{4}$ day.

75. Twelve men can complete a task in 16 days. Thirty-two women can complete the same task in 12 days. Eight men and eight women together worked for 12 days, after which the women dropped and 8 men joined. In how many days the men will be able to complete the remaining task?

(a) 9 days (b) 2 days

(c) 3 days (d) 10 days

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,
MD = WD [M – Man, W – Woman]
$12M \times 16 = 32W \times 12$
$M = 2W$
$\because 32W \times 12 = 12(8M + 8W) + (8M + 8M) \times day$
$32W \times 12 = 12(16W + 8W) + 32W \times day$
$32 \times 12 = 12 \times 24 + 32 \times day$
$48 = 36 + 4 \times day$
$day = \frac{12}{4} = 3$
So, remaining work will be completed in 3 days.

76. A group of men decided to complete a work in 10 days, but five of them remained absent. If the rest of the group completed the work in 12 days, find the original number of men.

(a) 30 men (b) 25 men

(c) 24 men (d) 40 men

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the no.of men = x
Formula- $M_1d_1 = M_2d_2$
$x \times 10 = (x - 5) \times 12$
$5x = 6x - 30$
$\boxed{x = 30}$
Hence the no. of men will be 30.

77. 10 men can complete a task in 18 days. After 6 days, 5 more men join. In how many days the remaining work will be completed?

(a) 8 (b) 10

(c) 12 (d) 6

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (a) : As per the question,
From $M_1D_1 = M_2D_2$ (Where M→ man, D→day)
$10 \times 18 = 10 \times 6 + (10+5) \times D_2$
$180 = 60 + 15D_2$
$15D_2 = 180 - 60 = 120$
$D_2 = 8$ days

78. 15 men or 25 women can reap a field in 22 days. How many days will 9 men and 18 women take to reap it?

(a) $16\frac{2}{3}$ (b) $17\frac{2}{3}$

(c) $15\frac{2}{3}$ (d) $18\frac{2}{3}$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (a) :
$15M = 25F$
$\frac{M}{F} = \frac{5}{3}$
$3M = 5F \Rightarrow 9M = 15F$
$15M \times 22 = (9M + 18F) \times d_2$
$25F \times 22 = 33F \times d_2$
$\frac{50}{3} = d_2$
$d_2 = 16\frac{2}{3}$

79. Sixteen men can complete a work in 24 days. Twenty four women can complete the same work in 32 days. Sixteen men and sixteen women together worked for twelve days, after which women dropped. How many more men are to be taken to complete the remaining work in 2 days?

(a) 32 (b) 24
(c) 64 (d) 48

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

$M \longrightarrow 16\times24$

$W \longrightarrow 24\times32$ $\Big\rangle$ $24\times32=768$

$16M \times 24 = 24\ W \times 32$

$\frac{M}{W}=\frac{2}{1}$

$(16\ M + 16\ W) \times 12 + (16\ M + XM) \times 2 = 768$

$48 \times 12 + (32 + 2X) \times 2 = 768$

$576 + (64 + 4X) = 768$

$4X = 768 - 640$

$4X = 128$

$X = 32$

80. A certain number of men can complete a task in 50 days. If there are 5 men more, then it can be finished in 10 days less. How many men are there?

(a) 30 (b) 10
(c) 40 (d) 20

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

Men	Time (days)
x ↓	50
x+5 ↓	40

$\frac{x}{x+5}=\frac{40}{50}$

$5x = 4(x+5)$

$5x = 4x + 20$

$x = 20$ men

81. 2 men and 3 boys can complete a piece of work in 18 days while 3 men and 2 boys can complete the same work in 15 days. In how many days will 4 men and 2 boys complete the work?

(a) $11\frac{16}{19}$ days (b) $1\frac{1}{19}$ days
(c) $11\frac{6}{19}$ days (d) $1\frac{16}{19}$ days

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

$(2M + 3B)\times18 = (3M+2B)\times15$

{Where M = Man, B = Boy}

$36M + 54B = 45M + 30B$

$24B = 9M$

$B = \frac{3}{8}M$

Let 4 men and 2 boys can complete the work in x days

Now, $(4M + 2B)x = (3M + 2B)\times15$

$(4M + \frac{6}{8}M)x = (3M + \frac{6}{8}M)\times15$

$38x = 30\times15$

$x = \frac{225}{19}$

$x = 11\frac{16}{19}$ days

82. 8 boys and 12 girls together can finish a project work in 5 days. If it takes 50 days for one boy alone to finish the same project, how many days are required for one girl to complete the same project work ?

(a) 300 (b) 150
(c) 200 (d) 275

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (a) : By formula, $\boxed{M_1 \times D_1 = M_2 \times D_2}$

[D = day, M = Man]

According to the question,

$(8B+12G)\times5=50B$

$8B+12G=10B$

$12G=2B$

$\boxed{1B = 6G}$

Let 1 girl complete the work in x days.

According to the question,

$1B\times50=1G\times x$

$6G\times50= x\times G\ (\because 1B=6G)$

$x=50\times6$

$\boxed{x = 300\ \text{days}}$

83. 15 men can complete a task in 30 days. In how many days can 20 men complete that task?

(a) 26 (b) 22.5
(c) 24 (d) 28.5

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

$M_1 = 15$ $M_2 = 20$

$D_1 = 30$ $D_2 = ?$

From, $M_1 \times D_1 = M_2 \times D_2$

$15 \times 30 = 20 \times D_2$

$D_2 = 22.5$

20 men will take 22.5 days to complete the work.

84. 15 male employees or 20 female employees of a company can complete a project in 26 days. How many days will 30 male employees and 12 female employees together take to complete the project?

(a) 8 days (b) 10 days
(c) 12 days (d) 14 days

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (b) : As per the question-

$15\ M = 20\ W$

$M : W = 4 : 3$

Let 30 male and 12 female complete the total work in x days.

According to the question-

$(30\ M + 12\ W) \times x = 15\ M \times 26$

$(30 \times 4 + 12 \times 3) \times x = 15 \times 4 \times 26$

$(120 + 36) \times x = 60 \times 26$

$x = \frac{60 \times 26}{156} = 10$

85. A man and a woman can complete a work in 8 and 12 days respectively. How many women must assist 2 men to complete the work in 2 days?

(a) 3 (b) 2

(c) 4 (d) 5

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (a) : $\because$ M $\rightarrow$ Man

W $\rightarrow$ Women

$\because$ One day work of one man = 1/8

One day work of one woman= 1/12

$\Rightarrow$ M : W = 3 : 2 $\Rightarrow$ 2 M = 3 W ...(i)

Let x woman need with two males

According to the question,

$1W \times 12 = (3W + xW) \times 2$ $\{\because 2M = 3W\}$

$\Rightarrow 12W = 6W + 2xW$

$\Rightarrow 6 + 2x = 12$

$\Rightarrow 2x = 6$

$\Rightarrow x = 3$

86. 8 men working 9 hours a day can complete a task in 20 days. How long will 7 men working 10 hours a day take to complete the same task.

(a) $\frac{103}{55}$ days (b) $\frac{21}{2}$ days

(c) 21 days (d) $\frac{144}{7}$ days

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d**) :** Formula,

$M_1D_1H_1 = M_2D_2H_2$

$8 \times 9 \times 20 = 7 \times 10 \times x$

$x = \frac{144}{7}$ days

87. 25 women can complete a task in 60 days. After how many days from the start of the task should 5 more women join them so that the task is complete in 55 days?

(a) 20 (b) 30

(c) 25 (d) 27

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let after x days from the start of the task 5 more women should join-

$M_1D_1 = M_1D_1 + M_2D_2$

$25 \times 60 = 25 \times x + (25 + 5) \times (55 - x)$

$1500 = 25x + 1650 - 30x$

$5x = 1650 - 1500$

$5x = 150$

$x = 30$

88. 3 boys and 5 girls can finish a project in 6 days, while 2 boys and 7 girls can finish it in 8 days. In how many days will 8 girls complete it?

(a) 33 (b) 30

(c) 36 (d) 35

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) Let a boy do that work in x days and a girl can do that work in y days.

According to the question,

$\frac{3}{x} + \frac{5}{y} = \frac{1}{6}$.....(i) , $\frac{2}{x} + \frac{7}{y} = \frac{1}{8}$.....(ii)

By subtracting eq (i) $\times 2$ and eq (ii) $\times 3$,

$\frac{6}{x} + \frac{10}{y} = \frac{1}{3}$

$\frac{6}{x} + \frac{21}{y} = \frac{3}{8}$

$\frac{10}{y} - \frac{21}{y} = \frac{1}{3} - \frac{3}{8}$

$-\frac{11}{y} = \frac{8-9}{24}$

$-\frac{11}{y} = -\frac{1}{24}$

$y = 264$

$\because$ Time taken by 8 girl to complete the work

$= \frac{264}{8} = 33$ days

89. When 5 men can build a wall in 12 days, to build a wall 50% more than the original wall in 10 days, the number of men required is:

(a) 8 (b) 9

(c) 7 (d) 4

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) :

From, $\frac{M_1 \times D_1 \times H_1}{W_1} = \frac{M_2 \times D_2 \times H_2}{W_2}$

According to the question,

$\frac{5 \times 12}{1} = \frac{M_2 \times 10}{\frac{3}{2}}$

$\frac{5 \times 12 \times 3}{2 \times 10} = M_2$

$M_2 = 9$ Men

90. 36 men can do a work in 24 days. 4 workers left work after 8 days. Since then how many days will it take to complete the work?

(a) 18 (b) 16

(c) 12 (d) 20

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (a) According to the question,
After 8 days-
Remaining men = 32
Remaining days = 16
From $M_1D_1 = M_2D_2$
$\therefore 36 \times 16 = 32 \times D_2$
$D_2 = 18$ days

91. 30 men can do a work in 20 days, After 6 days how many people should leave this job so that the entire work is done in 26 days?
(a) 9 (b) 12
(c) 8 (d) 7

RRB NTPC 19.04.2016 Shift : 1

Ans : (a) Let the number of persons who left the work is x.
According to the question,
$30 \times 20 = 6 \times 30 + (26-6) \times (30-x)$
$600 = 180 + 20\,(30-x)$
$600 - 180 = 20(30-x)$
$(30-x) = \frac{420}{20}$
$(30-x) = 21$
$x = 9$
Hence, the number of people who left the work = 9

92. 45 people can make 40,000 bulbs in 12 days. How many additional people will be required to make 100000 bulbs in 9 days?
(a) 100 (b) 105
(c) 110 (d) 120

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (b) : Let x additional people will be required to make 100000 bulbs in 9 days.
Formula $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$
$M_1 = 45 \qquad M_2 = (45+x)$
$D_1 = 12 \qquad D_2 = 9$
$W_1 = 40,000 \qquad W_2 = 100,000$
$\frac{45 \times 12}{40,000} = \frac{(45+x) \times 9}{100,000}$
$150 = 45 + x$
$\boxed{x = 105}$
Hence 105 additional people will be required.

93. In a company 12 employees can make 111 candles in a given time. How many people will have to be employed to make 148 candles at the same time?
(a) 18 persons (b) 12 persons
(c) 16 persons (d) 10 persons

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (c) Formula
$\frac{M_1}{W_1} = \frac{M_2}{W_2}$
$\frac{12}{111} = \frac{M_2}{148}$
$M_2 = \frac{12 \times 148}{111} = 16$ persons

94. 34 men can do a work in 12 days. How many days will 51 men take to do it ?
(a) 10 (b) 5
(c) 8 (d) 6

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (c) From $M_1D_1 = M_2D_2$
$34 \times 12 = 51 \times D_2$
$D_2 = 8$ days

95. If 2 men or 3 women can complete a work in 30 days, then in how many days will 6 men and 1 woman be able to complete the same work?
(a) 4 days (b) 6 days
(c) 5 days (d) 9 days

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (d) : According to the question,
(M = Men W = Women)
$2M \times 30 = 3W \times 30$
$2M = 3W$
$1M = \frac{3}{2}W$
$6M + 1W = 6 \times \frac{3}{2}W + 1W = 10W$
From $M_1D_1 = M_2D_2$
$3 \times 30 = 10 \times D_2$
$\therefore D_2 = \frac{3 \times 30}{10} = 9$ days

96. 10 men and 5 women complete a work in 60 days. If a man can do the work of two women, then how much time will 5 men and 20 women take to complete half of that work?
(a) 25 (b) 36
(c) 27 (d) 50

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) $\because \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$
According to the question,
$$\frac{(10M+5W)60}{1} = \frac{(5M+20W) \times D_2}{\frac{1}{2}} \text{.....(i)}$$
$\because$ 1M = 2W (Given)
On putting, 1M = 2W in equation (i),
$\frac{(10 \times 2W + 5W) \times 60}{1} = \frac{(5 \times 2W + 20W) 2 \times D_2}{1}$
$25W \times 60 = 30W \times 2 \times D_2$
$D_2 = 25$ days

97. 12 people can complete a work in X days, now 8 more people are employed. The entire work was completed in 60 days. Find the value of X.
(a) 80 (b) 100
(c) 55 (d) 45

RRB NTPC 18.04.2016 Shift : 3

Ans : (b) Given-
$M_1 = 12$ Men, $D_1 = X$ days
$M_2 = 12 + 8 = 20$ Men, $D_2 = 60$ days
From $M_1D_1 = M_2D_2$
$12 \times X = 20 \times 60$
$X = \frac{20 \times 60}{12}$
X = 100 days

98. In a project a team of 54 members can do a work in 35 hours. In how many hours can 18 members do the same work?

(a) 90 (b) 120
(c) 105 (d) 110

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) $M_1 = 54$ members
$H_1 = 35$ hours
$M_2 = 18$ members
$H_2 = ?$
We know that;

$$H_2 = \frac{M_1 \times H_1}{M_2}$$

$$= \frac{54 \times 35}{18}$$

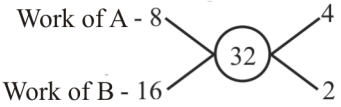
$= 105$ hours

99. P and Q can do a piece of work separately in 8 and 16 days respectively. They worked together and complete the work, what is the ratio of the work done by P and Q?

(a) 2 : 5 (b) 3 : 2
(c) 2 : 1 (d) 2 : 3

RRB JE - 23/05/2019 (Shift-II)

Ans : (c)



$\therefore$ A : B = 4 : 2 = 2 : 1

100. A piece of work, which 20 women can complete in 16 days while 16 men can complete the same work in 15 days. Find the ratio of the efficiency of a man to a woman.

(a) 5:6 (b) 3:4
(c) 6:7 (d) 4:3

RRB JE - 26/05/2019 (Shift-III)

Ans : (d) Formula, $M_1 D_1 = M_2 D_2$
$20W \times 16 = 16M \times 15$

$$\frac{1M}{1W} = \frac{20 \times 16}{16 \times 15} = \frac{4}{3}$$

M : W = 4 : 3

101. If 12 men and 6 boys can do a work in 4 days and 4 men and 14 boys can do the same work in 8 days, then find the ratio of the efficiency of a man and a boy.

(a) 2:11 (b) 11:2
(c) 3:7 (d) 2:5

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans. (b) According to the question, (M = man B = Boy)
From $M_1D_1 = M_2D_2$
$(12\ M + 6\ B) \times 4 = (4\ M + 14\ B) \times 8$
$12\ M + 6\ B = 8\ M + 28\ B$
$4\ M = 22\ B$
$2\ M = 11\ B$
M : B = 11 : 2

Type - 4

102. A can complete 12% of the work in 15%, of the allotted time. A and B worked for the entire period of the allotted time and the work got completed on time. What portion of the work was done by B?

(a) 25% (b) 20%
(c) 10% (d) 15%

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : A will work to complete in allotted time

$$= \frac{12}{15} = \frac{4}{5} \text{ part, remaining } \frac{1}{5} \text{ part done by B}$$

$$= \frac{1}{5} \times 100 = 20\% \text{ part will be completed by B}$$

103. A can do 75% of the work in 30 days while B can do 50% of the same work in 18 days. If they work together. What fraction of the work will be done in 1 day?

(a) $\frac{7}{120}$ (b) $\frac{1}{19}$
(c) $\frac{19}{360}$ (d) $\frac{1}{20}$

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (c) : A can do 75% of the work = 30 days
A can do 100% of the work = 40 days
B can do 50% of the work = 18 days
B can do 100 % of work = 36 days

$$\text{One day's work of (A + B)} = \frac{1}{40} + \frac{1}{36}$$

$$= \frac{9+10}{360}$$

$$= \frac{19}{360} \text{ unit}$$

104. A can do a piece of work in 24 days and B can do $\frac{2}{5}$ of the same work in 12 days. Both work together for 6 days. How much work in still left?

(a) $\frac{17}{20}$ (b) $\frac{13}{20}$
(c) $\frac{11}{20}$ (d) $\frac{9}{20}$

RRB NTPC (Stage-II) –14/06/2022 (Shift-II)

Ans. (c) :
Time taken to complete the work by A = 24 days

$$\text{Time taken to complete the work by B} = \frac{5}{2} \times 12$$

= 30 days

According to the question,
Work done by A and B in six days

$$\frac{6}{24}+\frac{6}{30}$$
$$=\frac{1}{4}+\frac{1}{5}$$
$$=\frac{5+4}{20}$$
$$=\frac{9}{20}\text{part}$$

So, remaining work $=1-\frac{9}{20}$

$$=\frac{11}{20}$$

105. P can do a work in 10 days. Q can do the same work in 15 days. If they work together for 5 days, how much of the work will they complete?

(a) 1/2 (b) 2/3
(c) 1/3 (d) 5/6

RRB NTPC 30.03.2016 Shift : 1

Ans : (d) Work done by both P and Q in one day

$$=\frac{1}{10}+\frac{1}{15}=\frac{3+2}{30}=\frac{5}{30}=\frac{1}{6}\text{part}$$

So work done by both in 5 days $=\frac{5}{6}$

106. A can do $\frac{1}{3}$th part of work in 5 days and B can do $\frac{2}{5}$th of that work in 10 days. In how many days the work will be completed if they work together?

(a) $9\frac{3}{8}$ days (b) $8\frac{31}{8}$ days
(c) $7\frac{1}{8}$ days (d) $4\frac{1}{4}$ days

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (a) : A completes $\frac{1}{3}$ of work in 5 days.

A completes full work = 3 × 5 = 15 days

B completes $\frac{2}{5}$ of work in 10 days.

B completes full work $=\frac{5}{2}\times 10=25\,\text{days}$

Work done by A and B in one day $=\frac{1}{15}+\frac{1}{25}$

$$=\frac{5+3}{75}$$
$$=\frac{8}{75}\text{part}$$

So, the time taken by A and B to complete the work

$$=\frac{75}{8}\text{days}$$
$$=9\frac{3}{8}\text{days}$$

107. A alone can complete 2/5 of a task in 12 days, while B alone can complete 3/4 of the same task in 25 days. In how many days can they complete the task if they work together?

(a) $\frac{150}{19}$ (b) $\frac{300}{19}$
(c) $\frac{75}{19}$ (d) $\frac{1}{19}$

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : Time taken by A to complete the whole work $=12\times\frac{5}{2}=30$ days

Time taken by B to complete the whole work $=25\times\frac{4}{3}=\frac{100}{3}$ days

One day work of A and B $=\left(\frac{1}{30}+\frac{3}{100}\right)$ part

$$=\frac{10+9}{300}=\frac{19}{300}\text{part}$$

Hence, both can complete the work in $\frac{300}{19}$ days.

108. Brij alone can paint a wall in 7.2 days while Madhu takes 10.8 days to do the same work. Working together how many days will they take to paint 5/6 part of the wall?

(a) 4.2 (b) 3.6
(c) 3.9 (d) 4.8

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (b) Let they take t days to paint the 5/6 part of the wall.

According to the question,

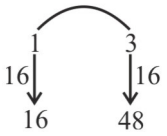
$$\Rightarrow\frac{t}{7.2}+\frac{t}{10.8}=\frac{5}{6}$$
$$\Rightarrow\frac{10t}{72}+\frac{10t}{108}=\frac{5}{6}$$
$$\Rightarrow\frac{30t+20t}{216}=\frac{5}{6}$$
$$\Rightarrow\frac{50t}{216}=\frac{5}{6}$$
$$\Rightarrow t=\frac{5\times 216}{6\times 50}$$
$$\Rightarrow t=\frac{36}{10}$$
$$\boxed{t=3.6\,\text{days}}$$

109. Medini can paint the entire wall alone in 16 days while Yuki takes three times longer than this. In how many days will they paint half of the wall if they work together?

(a) 12 (b) 3
(c) 6 (d) 9

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (c) Medini Yuki



One day work of both $= \frac{1}{16} + \frac{1}{48}$

$= \frac{3+1}{48} = \frac{4}{48} = \frac{1}{12}$ part

Time taken by both to complete the work = 12 days

So, time taken by both to complete half of the work $= \frac{12}{2} = 6$ days

110. Mahesh takes 18 days to complete a task alone while Kishore takes 36 days to complete the same task alone. If they work together for 6 days then what percentage of the work will remain?

(a) 50% (b) 30%

(c) 40% (d) 60%

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans. (a) : One day work of Mahesh $= \frac{1}{18}$ part

One day work of Kishore $= \frac{1}{36}$ part

One day work of both (Mahesh + Kishore) $= \frac{1}{18} + \frac{1}{36}$

$= \frac{3}{36} = \frac{1}{12}$ part

Six days work of both $= \frac{6}{12} = \frac{1}{2}$ part

Remaining work $= 1 - \frac{1}{2} = \frac{1}{2}$ part

Remaining work in % $= \frac{1/2}{1} \times 100 = \frac{1}{2} \times 100 = 50\%$

111. P and Q can complete a work in 12 days and 16 days respectively. They work together for 4 days. How much of the work is left?

(a) 3/4 (b) 7/12

(c) 5/12 (d) 6/7

RRB JE - 27/05/2019 (Shift-I)

Ans : (c) One day work of P $= \frac{1}{12}$ part

One day work of Q $= \frac{1}{16}$ part

Four days work of (P + Q) $= \left(\frac{1}{12} + \frac{1}{16}\right) \times 4$

$= \frac{(4+3)}{48} \times 4 = \frac{7}{48} \times 4 = \frac{7}{12}$ part

Remaining work $= 1 - \frac{7}{12}$

$= \boxed{\frac{5}{12} \text{ part}}$

112. A can finish a work in 30 days and B can finish the same work in 20 days. A and B do the work together for 6 days and after that A left the work. In how many days B will complete the remaining work?

(a) 15 days (b) 16 days

(c) 10 days (d) 18 days

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (c) According to the question,

LCM of A and B = 60

So total work = 60 units

Work done by A in one day $= \frac{60}{30} = 2$ units

Work done by B in one day $= \frac{60}{20} = 3$ units

One day work of both (A + B) = 2 + 3 = 5 units

6 day work of both = 5 × 6 = 30 units

Remaining work = 60–30 = 30 units

Time taken by B to do the remaining work = $\frac{30}{3} = 10$ days

113. A alone can finish a work in 3 days. B alone can finish this work in 7 days. If A and B work together for 2 days, then what part of work will be left?

(a) $\frac{1}{7}$ (b) $\frac{4}{21}$

(c) $\frac{2}{21}$ (d) $\frac{1}{21}$

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (d)

One day work of A $= \frac{1}{3}$ part

One day work of B $= \frac{1}{7}$ part

One day work of both (A + B) $= \left(\frac{1}{3} + \frac{1}{7}\right)$

$= \frac{7+3}{21} = \frac{10}{21}$ part

Two days work of (A + B) $= \frac{10 \times 2}{21} = \frac{20}{21}$ part

So, remaining part of the work $= 1 - \frac{20}{21}$

$= \frac{1}{21}$ part

114. Ranjit can complete a work in 25 days while Anji can finish it in 20 days. They work together for 5 days and then Ranjit leaves. How many days will Anji take to finish the remaining work?

(a) 10 days (b) 9 days

(c) 11 days (d) 15 days

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (c) According to the question,

One day work of Ranjit $= \frac{1}{25}$ part

One day work of Anji $= \frac{1}{20}$ part

$\therefore$ One day work of both (Ranjit + Anji) $= \frac{1}{25} + \frac{1}{20}$

$= \frac{4+5}{100} = \frac{9}{100}$ part

$\therefore$ 5 days work of (Ranjit + Anji) $= 5 \times \frac{9}{100} = \frac{9}{20}$ part

So, Anji will complete the remaining work

$= \left(1 - \frac{9}{20}\right) \times 20 = \frac{11}{20} \times 20 = 11$ days

115. A and B working together can complete a work in 10 days. C alone can complete the same work in 14 days. If A, B and C work together, then how many days will they take to complete three - fifth of the same work?

(a) 3 (b) $\frac{7}{2}$

(c) $\frac{7}{3}$ (d) $\frac{35}{6}$

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,

Work done by (A+B) in one day = $\frac{1}{10}$ part

Work done by 'C' in one day = $\frac{1}{14}$ part

Work done by (A+B+C) in 1 day $= \frac{1}{10} + \frac{1}{14}$

$= \frac{7+5}{70}$

$= \frac{12}{70}$ part

Time taken by (A+B+C) to complete the work $= \frac{70}{12}$

Time taken by (A+B+C) to complete $\frac{3}{5}$ part of the work

$= \frac{3}{5} \times \frac{70}{12}$

$= \frac{7}{2}$ days

116. A alone can do a piece of work in 35 days and B alone can do it in 14 days. If both of them work on it together for 5 days, then the work, how much is left?

(a) Three quarters (b) One third

(c) Half (d) Quater

RRB ALP CBT-2 Mec. - Diesel 23-01-2019 (Shift-I)

Ans. (c) : Work done by A in 1 day = $\frac{1}{35}$ part

Work done by B in 1 day = $\frac{1}{14}$ part

Work done by (A +B) in 1 day = $\frac{1}{35} + \frac{1}{14}$

$= \frac{2+5}{70} = \frac{1}{10}$ part

Work done by (A + B) in 5 day = $\frac{5}{10} \Rightarrow \frac{1}{2}$

Hence, the remaining work = $1 - \frac{1}{2} = \frac{1}{2}$ or half

117. 2/5 of a set of notebook is sold on the first day. 3/4 of the remaining was sold on the second day. If there are still 75 notebooks left, then how many notebook were put up for sale?

(a) 1000 (b) 500

(c) 250 (d) 750

RRB RPF SI – 16/01/2019 (Shift-II)

Ans. (b) Let there are 100 notebooks were put up for sale.

According to the question,

Number of notebooks is sold in first day = $100 \times \frac{2}{5} = 40$

Left notebook = 100 – 40 = 60

Number of notebooks in second day = $60 \times \frac{3}{4} = 45$

Left notebook = 100 – (40 + 45)

75 = 100 – 85 = 15

15 = 75

$100 = \frac{75}{15} \times 100 = 500$

Hence, number of total notebooks = 500

Type - 5

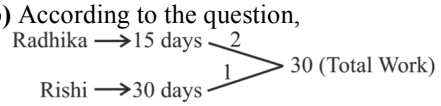
118. Radhika can complete a work in 15 days and Rishi can complete the same work in 30 days. Radhika started the work alone and left after 2 days of work. Then Rishi continued the work. Find the time taken by Rishi to complete the remaining work.

(a) 23 days (b) 26 days

(c) 25 days (d) 24 days

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) According to the question,



Two day's work of Radhika = 2×2 = 4

Time taken the Remaining work done by Rishi

$= \frac{26}{1} = 26$ days

119. A and B can do a piece of work in 45 and 40 days respectively. They began the work together but A left the the work after some days and B alone finished the remaining work in 23 days. After how many days did A leave?

(a) 12 days (b) 10 days
(c) 11 days (d) 9 days

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (d) : Let A left the work after x days
According to the question,

Total work of A = $\frac{x}{45}$ Part

Total work of B = $\frac{x+23}{40}$ Part

Total work of (A + B) = $\frac{x}{45}+\frac{x+23}{40}=1$

$$\frac{8x+9x+207}{360}=1$$

$$\frac{17x+207}{360}=1$$

$$17x = 360 - 207$$

$$x = \frac{153}{17}$$

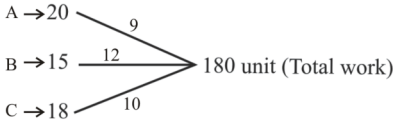
$$x = 9 \text{ days}$$

120. A can complete a piece of work alone in 20 days. B can do it alone in 15 days and C can complete it alone in 18 days. B and C started the work together but both were forced to leave after 4 days. The remaining work was done by A in:

(a) 12 day (b) $14\frac{2}{45}$ day
(c) $9\frac{2}{45}$ day (d) $10\frac{2}{9}$ day

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (d) : According to the question,



According to the question,
(B+C)'s 4 day's work = 4×(10+12) = 4×22 = 88 unit
Remaining work = 180–88 = 92 unit
Time taken by A to complete remaining work

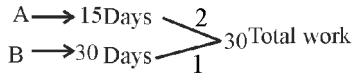
$$= \frac{92}{9}=10\frac{2}{9}\text{ days}$$

121. A can do a certain work in 15 days and B can do one-third of the same work in 10 days. A and B work together for 6 days and then A leaves. B completes the remaining work with C in 8 days A and C together can complete the original work in:

(a) 12 days (b) 9 days
(c) 15 days (d) 18 days

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (a) : According to the question,



(A + B)'s 6 day's work = 6×3 = 18 unit
B's 8 day's work = 8 unit
Remaining work = 30–(18+8) = 4 unit

Efficiency of C = $\frac{4}{8}=0.5$

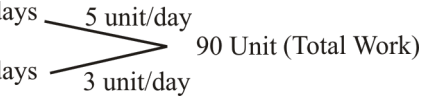
Time taken by (A + C) complet the work = $\frac{30}{2.5}$
= 12 days

122. X and Y can complete a certain work in 18 days and 30 days respectively. Z is 50% more efficient than Y. Z and Y started the work but both had to leave after 4 days. The remaining work was completed by X with the assistance of P in the next 4 days. P alone can complete the original work in:

(a) 9 days (b) 8 days
(c) 10 days (d) 12 days

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) :



∴ Efficiency of Z = $\frac{3\times(100+50)}{100}=4.5$ unit/day
According to the question,
(Z+Y)'s 4 day's work = (3+4.5)×4 = 30 unit
∴ (X+P)×4 = Remaining work
(5+P)×4 = 90–30
4P = 60–20
P = 10 unit/day

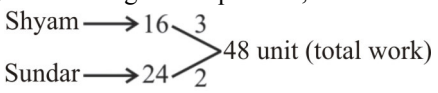
∴ P can complete the original work = $\frac{90}{10}=9$ days

123. Shyam and Sundar can do a piece of work in 16 days and 24 days, respectively. Shyam started the work alone and after 10 days Sundar joined him and the do worked together till the completion of the work. What was the total time taken for the work to be completed?

(a) $13\frac{3}{5}$ days (b) $12\frac{3}{5}$ days
(c) $15\frac{3}{5}$ days (d) $10\frac{3}{5}$ days

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (a) : According to the question,



According to the question,

work done by Shyam in 101 days = 3 × 10
= 30 unit

Time taken by Shyam and Sundar to complete the remaining work $= \frac{(48-30)}{5} = \frac{18}{5}$

$= 3\frac{3}{5}$ दिन

Hence the total time taken to complete the work

$= 10 + 3\frac{3}{5}$

$= 13\frac{3}{5}$ days

124. Aditya can complete a piece of work alone in 8 days and Bhagawan can complete the same piece of work alone in 12 days. They started the work together, but Aditya had to leave 3 days before the completion of the work. In how many days will the work complete?

(a) $6\frac{3}{5}$ days (b) $6\frac{4}{5}$ days

(c) $6\frac{1}{5}$ days (d) $6\frac{2}{5}$ days

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (a) : Let the work will complete in x days

According to the question,

$\frac{x-3}{8} + \frac{x}{12} = 1$

$\frac{3x-9+2x}{24} = 1$

$5x - 9 = 24$

$5x = 24 + 9$

$x = \frac{33}{5}$

$x = 6\frac{3}{5}$ days

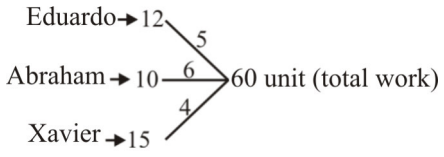
125. Eduardo, Abraham and Xavier can finish a certain piece of work in 12, 10 and 15 days, respectively. All three of them started the work together. Eduardo left the work after 2 days and Abraham left just three days before the work was completed. Find the total number of days taken for the work to be completed.

(a) 7.8 (b) 8.6

(c) 8 (d) 6.8

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (d) :



work done by all the three persons in 2 days

= (5 + 6 + 4) × 2

= 15 × 2

= 30 Unit

Remaining work = 60 – 30 = 30 unit

work done by xavier in last three days

= 4 × 3 = 12 unit

Remaining work = 30 – 12

= 18 unit

Time taken by Abraham and xavier to complete 18 unit of work = $\frac{18}{10}$ = 1.8 days

Hence total number of days taken to complete the work

= 2 + 3 + 1.8

= 6.8 days

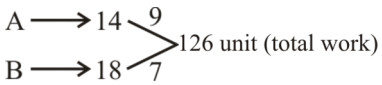
126. A and B can do a job in 14 days and 18 days, respectively. A works alone for 6 days and leaves. The number of days required by B to complete the remaining job is:

(a) $10\frac{2}{7}$ (b) $10\frac{4}{7}$

(c) $10\frac{3}{7}$ (d) $10\frac{5}{7}$

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (a) :



work done by A in 6 days = 6 × 9 = 54 unit

Remaining work = 126 – 54 = 72 unit

Time taken by B to do the remaining work $= \frac{72}{7} = 10\frac{2}{7}$ days

127. A alone can finish a task in 30 days. He works for 6 days on the same task and then B finishes it in 24 days. In how many days can A and B together finish the task?

(a) 25 (b) 10

(c) 20 (d) 15

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

A's 1 day work $= \frac{1}{30}$ part

A's 6 days work $= \frac{6}{30} = \frac{1}{5}$ part

$\because$ Remaining work = $1 - \frac{1}{5} = \frac{4}{5}$ part

$\therefore$ $\frac{4}{5}$ part of work done by B = 24 days

Time taken by B to complete the work = 30 days

∴ Time taken by both (A + B) to complete the work

$$= \frac{1}{\left(\frac{1}{30}+\frac{1}{30}\right)} = \frac{1}{\frac{1+1}{30}}$$

= 15 days

128. A can complete a piece of work in 24 days. He worked for 21 days and then B finished the remaining work in 5 days. In how many days can A and B together finish the work?

(a) 24 days (b) 40 days
(c) 15 days (d) 45 days

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : Work done by A in 1 day = $\frac{1}{24}$ part

Work done by A in 21 days = $\frac{21}{24} = \frac{7}{8}$ part

Remaining work = $1-\frac{7}{8}=\frac{1}{8}$

∴ Time taken by 'B' to complete the total work = 5×8 = 40 days

B's one day work = $\frac{1}{40}$ part

Work done by A and B in one day = $\frac{1}{24}+\frac{1}{40}$

$$=\frac{5+3}{120}=\frac{8}{120}=\frac{1}{15}\text{ part}$$

Hence, the time taken by A and B to complete the work

$$=\frac{1}{\frac{1}{15}} = 15 \text{ days.}$$

129. A can complete a piece of work in 60 days. He worked for 15 days and B finished the remaining work in 30 days. If they work together then the work will the completed in:

(a) 25 days (b) 10 days
(c) 24 days (d) 12 days

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

A's 1 day work = $\frac{1}{60}$ part

A's 15 days work = $15\times\frac{1}{60}=\frac{1}{4}$ part

Remaining work = $1-\frac{1}{4}=\frac{3}{4}$ part

Time taken by B to complete $\frac{3}{4}$ part of the work = 30days

Total time taken by B to complete the whole work = $30\times\frac{4}{3}=40$ days

Work done by A and B in one day = $\frac{1}{60}+\frac{1}{40}=\frac{1}{24}$ part

So, A & B together will complete the work in 24 days.

130. P and Q can do a work in 12 days and 16 days respectively. P started working alone. After how many days should Q work with P, so that the work is finished in 9 days?

(a) 4 (b) 3
(c) 2 (d) 5

RRB JE - 27/05/2019 (Shift-I)

Ans : (d) One day work of P = $\frac{1}{12}$ part

One day work of Q = $\frac{1}{16}$ part

Let Q work with P after X days.

As per the question,

$$\frac{9}{12}+\frac{(9-x)}{16}=1$$

$$\frac{36+27-3x}{48}=1$$

$$63 - 3x = 48$$

$$15 = 3x$$

$$\boxed{x = 5}$$

131. P can do a piece of work in 10 days. After working for 4 days P left the work and Q completes the remaining work in 9 days. If they had worked together from the beginning. How many days would they have taken to complete the work?

(a) 9 days (b) 7 days
(c) 6 days (d) 8 days

RRB JE - 27/05/2019 (Shift-III)

Ans : (c) One day work of P = $\frac{1}{10}$ part

4 days work of P = $\frac{4}{10}=\frac{2}{5}$ part

Remaining work = $1-\frac{2}{5}=\frac{3}{5}$ part

Work done by Q in 9 days = $\frac{3}{5}$ part

Work done by Q in 1 day = $\frac{3}{5\times9}=\frac{1}{15}$ part

Work done by (P + Q) in 1 day

$$=\frac{1}{10}+\frac{1}{15}=\frac{3+2}{30}=\frac{5}{30}=\frac{1}{6}\text{ part}$$

Hence, time taken by (P + Q) to complete the work

$$=\frac{1}{1/6} = 6 \text{ days.}$$

132. Janaki and Mansi, working separately can paint the wall in 45 and 72 days respectively. They started working together but Janaki left work 33 days before the work was completed. How many days did it take to complete the work?

(a) 49 (b) 48
(c) 46 (d) 47

RRB RPF SI – 16/01/2019 (Shift-III)

Ans : (b) One day work of Janaki $= \frac{1}{45}$ part

One day work of Mansi $= \frac{1}{72}$ part

Let work will continue till x days

According to the question,

$$\frac{x}{72} + \frac{x-33}{45} = 1$$

$$\frac{45x + 72x - 2376}{3240} = 1$$

$$117x = 3240 + 2376$$

$$x = \frac{5616}{117} = 48 \text{ days}$$

133. A can finish a work in 5 days while B takes 10 days to do the same work. They started working together but A has to leave the work 4 days before the end of work. How many days did A work?

(a) 1 (b) 1.5

(c) 2 (d) 2.5

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (c)

One day work of A $= \frac{1}{5}$ part

One day work of B $= \frac{1}{10}$ part

Let B work for x days

Then A work for (x – 4) days

According to the question

$$\frac{(x-4)}{5} + \frac{x}{10} = 1$$

$$\frac{2(x-4)+x}{10} = 1$$

$$2x - 8 + x = 10$$

$$3x - 8 = 10$$

$$3x = 18$$

$$\boxed{x = 6}$$

Time taken by A to complete the work = (x – 4)

= 2 days

134. A and B takes 25 and 45 days respectively to complete a task. A started working alone and after a few days B started working together. It took a total of 20 days to complete the work. After how many days did B start working?

(a) 10 (b) 11

(c) 12 (d) 9

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (b) : Let B started work after x days.

According to the question,

$$\frac{20}{25} + \frac{20-x}{45} = 1$$

$$\frac{4}{5} + \frac{20-x}{45} = 1$$

$$\frac{20-x}{45} = 1 - \frac{4}{5}$$

$$\frac{20-x}{45} = \frac{1}{5}$$

$$20 - x = 9$$

$$x = 20 - 9$$

$$x = 11 \text{ days}$$

135. A can do a work in 15 days and B can do it in 25 days. A and B started working together but B left the work 7 days before the work completed. How many days did they work together?

(a) 6 (b) 5

(c) 8 (d) 9

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (b) According to the question,

One day work of A $= \frac{1}{15}$ part

One day work of B $= \frac{1}{25}$ part

One day work of (A+B) $= \left(\frac{1}{15} + \frac{1}{25}\right) = \frac{8}{75}$ part

Then 7 days work of A $= 7 \times \frac{1}{15} = \frac{7}{15}$

Remaining work

$$= \left(1 - \frac{7}{15}\right) = \frac{8}{15} \text{ part}$$

Time taken by (A + B) to complete $\frac{8}{15}$ part of work

$$= \frac{8}{15} \times \frac{75}{8} = 5 \text{ day}$$

Hence, A and B worked together for 5 days.

136. A and B together can complete a work in 35 days. If A works alone and completes $\frac{4}{7}$ part of the work and left the remaining work for B. Thus if it takes 114 days to complete the work. So how many days will A who is more efficient in both, complete the work alone?

(a) 45 (b) 42

(c) 48 (d) 40

RRB RPF SI – 10/01/2019 (Shift-III)

Ans. (b) : Suppose A can complete the work in A days and B can complete the same work in B days.

Time taken by A to do $\frac{4}{7}$ part work $= \frac{4}{7}$A

And time taken by B to do remaining $\left(1 - \frac{4}{7} = \frac{3}{7}\right)$ part of work

$$= \frac{3}{7} \text{ B}$$

According to the question,

$$\frac{1}{A} + \frac{1}{B} = \frac{1}{35} \quad \text{----- (i)}$$

$\frac{4}{7}A+\frac{3}{7}B=114$ ----- (ii)

On solving the equation (i) and (ii)

A = 42 days

B = 210 days

So, time taken by A to complete the work = 42 days

137. A and B together can complete a work in 1.2 days. Although if A leaves after complete half of the work alone, then B alone completes the remaining half of the work. Thus it takes 2.5 days to complete the work. If B is 50% more efficient than A and B alone finished the whole work, then how many days will he take?

(a) 1.5 (b) 2.2

(c) 2.0 (d) 1.8

RRB RPF Constable – 19/01/2019 (Shift-III)

Ans. (c) : Let A can complete any work in x days.

$\therefore$ Work efficiency of A = $\frac{1}{x}$

$\therefore$ Work efficiency of B = $\frac{1}{x}\times\frac{150}{100}=\frac{3}{2x}$

According to the question,

$$\frac{1}{x}+\frac{3}{2x}=\frac{1}{1.2}$$

$$\frac{2+3}{2x}=\frac{1}{1.2}$$

$$2x=6$$

$$x=3$$

So, B alone will complete that work in 2 days.

138. Working together, Sandra and Mayuri can complete a work in 45 days. However, Mayuri works alone and leaves after completion of one third of the work and then Sandra finishes the remaining work by herself. As a result, both are able to complete the work in 104 days. If Mayuri worked faster than her. So in how many days Sandra alone will complete the work?

(a) 72 (b) 60

(c) 240 (d) 120

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (d) Let Sandra will complete that work in x days and Mayuri will complete that work in y days

One day work of both $=\frac{1}{x}+\frac{1}{y}=\frac{1}{45}$

$$\frac{1}{y}=\frac{1}{45}-\frac{1}{x}\Rightarrow\frac{x-45}{45x}$$

1 day work of Sandra $=\frac{1}{x}$ part

1 day work of Mayuri = $\frac{x-45}{45x}$

According to the question,

$$\frac{15x}{x-45}+\frac{2x}{3}=104$$

$$45x+2x^2-90x=312(x-45)$$

$$2x^2-357x+14040=0$$

$$(2x-117)(x-120)=0$$

$$x=\frac{117}{2}\text{ or }120$$

$\because$ Sandra worked slow so $x = 120$

$\therefore$ Sandra will complete that work in 120 days.

139. A and B can complete a work in 40 days and 60 days respectively. They work together for some days and B leaves the job. If A completes the rest of the work in 10 days, find for how many days B worked.

(a) 15 days (b) 14 days

(c) 18 days (d) 16 days

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (c) : A's 1 day work = $\frac{1}{40}$ part

B's 1 day work = $\frac{1}{60}$ part

Let-

B leave the work after working x days, then the work done by B in x days = $\frac{x}{60}$ part

And work done by A in (x + 10) days = $\frac{x+10}{40}$ part

Now,

$$\frac{x}{60}+\frac{(x+10)}{40}=1$$

$$\frac{2x+3(x+10)}{120}=1$$

$$2x+3x=120-30$$

$$5x=90$$

$$x=18$$

Hence, B worked for 18 days.

140. A alone can do a task in 39 days, whereas B alone can do it in 52 days. The duo start working together, but A leaves 3 days before the task gets over. For how many days did they do work together?

(a) $20\frac{1}{3}$ (b) $19\frac{2}{7}$

(c) 21 (d) 20

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let- A and B can complete the work together in x days.

According to the question,

$$\frac{x}{39}+\frac{x+3}{52}=1$$

$$\frac{4x+3(x+3)}{156}=1$$

$7x + 9 = 156$

$x = \frac{147}{7}$

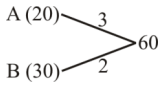
$x = 21$ days

141. A can complete a piece of work in 20 days and B alone can complete the work in 30 days. Due to some other work, A had to leave the work before completion and for the last 5 days B alone did the work. The total time taken to complete the work is:

(a) 12 days (b) 18 days
(c) 20 days (d) 15 days

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (d) :



A's efficiency = 3
B's efficiency = 2
Work done by B in 5 days = 5 × 2 = 10
Remaining work = 60 – 10 = 50
Time taken by (A+B) to complete the remaining work

$= \frac{50}{3+2} = 10$

Total time taken to complete the work = 10 + 5 = 15 days.

142. A and B can complete a piece of work in 56 and 70 days respectively. They began the work together but A left after some days and B finished the remaining work in 34 days. After how many days did A leave?

(a) 16 (b) 12
(c) 15 (d) 9

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let A left the work after x days
According to the question,

$\frac{x}{56} + \frac{x+34}{70} = 1$

$5x + 4x + 136 = 280$

$9x = 144$

$x = 16$ days.

143. A can do a piece of work in 18 days and B can do the same work in 15 days. They started working together but 7 days before the end of the work B left, for how many days did A and B work together?

(a) 8 (b) 5
(c) 12 (d) 7

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (b) : A's work for one day $= \frac{1}{18}$ part

B's work for one day $= \frac{1}{15}$ part

Let the time taken by A to finish the work = x days
According to the question,

$\frac{x}{18} + \frac{x-7}{15} = 1$

$\frac{5x + 6x - 42}{90} = 1$

$11x = 90 + 42$

$x = \frac{132}{11}$

$x = 12$ days

So, A and B worked together for 5 days.

144. Vicky can complete a piece of work in 40 days. He worked for 8 days, then Gurpreet Singh finished it in 32 days. In how many days can Vicky and Gurpreet Singh together complete the work?

(a) 25 days (b) 10 days
(c) 15 days (d) 20 days

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : Time taken by Vicky to complete the work in 40 days.

$= \frac{8}{40} = \frac{1}{5}$ part

According to the question,
Remaining work finished by Gurpreet Singh

$\frac{4}{5}$ part = 32 days

1 part = 40 days

Both work together $= \frac{1}{\frac{1}{40} + \frac{1}{40}} = 20$ days.

145. Amit alone can complete a piece of work in 15 days and Balbir alone can do the same work in 10 days. If Amit alone works for 3 days after which Balbir joins him, then the work will be finished in how many days?

(a) $\frac{1}{6}$ days (b) $4\frac{4}{5}$ days
(c) $7\frac{4}{5}$ days (d) $\frac{4}{5}$ days

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let- the work will be finished in x days.

Amit's one day work $= \frac{1}{15}$ unit

Balbir's one day work $= \frac{1}{10}$ unit

According to the question,

$\frac{x}{15} + \frac{x-3}{10} = 1$

$2x + 3x - 9 = 30$

$5x = 39$

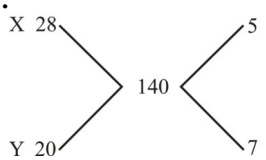
$x = \frac{39}{5} = 7\frac{4}{5}$ days

146. X and Y can complete a task in 28 days and 20 days, respectively. X started the task alone. After 4 days Y joined him till the completion of the task. How long did the task last?

(a) 8 days (b) 10 days
(c) 14 days (d) 12 days

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (c) :



Work done by X in 4 days = 4 × 5 = 20
Remaining task = Total task – Task done by X in 4 days = 140 – 20 = 120
Time taken by X and Y to complete the remaining task $= \frac{120}{5+7} = \frac{120}{12} = 10\,\text{days}$
Total task = 4 days work/task by X + 10 days work by X and Y = 14

147. A and B together can complete a work in 15 days, while A alone can complete the work in 18.75 days. They start working together but A leaves work 12.5 days before the work is completed. How long did A and B work together

(a) 10 (b) 13.75
(c) 11.25 (d) 12.5

RRB RPF SI – 12/01/2019 (Shift-III)

Ans. (d) : One day work of A + B $= \frac{1}{15}$ part

One day work of B =

$\frac{1}{15} - \frac{1}{18.75} = \frac{18.75-15}{15\times18.75} = \frac{3.75}{15\times18.75} = \frac{0.2}{15} = \frac{2}{150} = \frac{1}{75}$

One day work of B = $\frac{1}{75}$ part

12.5 days work of B = $\frac{12.5}{75} = \frac{125}{750} = \frac{1}{6}$ part

Remaining work = $1 - \frac{1}{6} = \frac{5}{6}$ part

Time taken by (A+B) to complete $\frac{5}{6}$ part of work = $15\times\frac{5}{6}$

=12.5 days

So, A and B worked together for 12.5 days.

148. A and B can do a work in 45 hours. If A works alone and completes the 3/8 part of the work, then leaves the remaining work to be done by B. It takes a total of 102 days to complete the work. In how many days A will complete the work, which is more efficient between them to complete the work alone?

(a) 170 (b) 96
(c) 72 (d) 120

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (c) Let A can complete total work in x days

Time taken by A to complete $\frac{3}{8}$ part of the work = $\frac{3x}{8}$ days

Time taken by B to complete $\frac{5}{8}$ part of the work $= \left(102 - \frac{3x}{8}\right)$ days

Time taken by B to complete the whole work $= \left(102 - \frac{3x}{8}\right)\frac{8}{5}$ days

According to the question,

$\frac{1}{x} + \frac{1}{\left(102 - \frac{3x}{8}\right)\frac{8}{5}} = \frac{1}{45}$

$\frac{1}{x} + \frac{5}{816-3x} = \frac{1}{45}$

$\frac{816-3x+5x}{(816-3x)x} = \frac{1}{45}$

$15\,(816 + 2x) = x\,(272 - x)$

$12240 + 30x = 272x - x^2$

$x^2 - 272x + 30x + 12240 = 0$

$x^2 - 242x + 12240 = 0$

$x^2 - 72x - 170x + 12240 = 0$

$(x - 72)\,(x - 170) = 0$

$x = 72,\ 170$

$\because$ A is more efficient between them to complete the work.

So, A will complete the whole work in 72 days.

149. A and B can complete a work in 12 days. Although alone A completed 1/5 of the work and left the work. Then B started working alone and completed the remaining work. It take a total of 22 days to complete. Work the if B is more efficient than A, how many days did B take to complete the work alone?

(a) 16.5 (b) 16.5 or 20
(c) 30 or 44 (d) 20

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (b) According to the question,

$\frac{1}{A} + \frac{1}{B} = \frac{1}{12}$ ----(i)

Suppose A takes x days to complete $\frac{1}{5}$ part of work.

Time taken by A to complete the whole work = 5x days

Time taken by B to complete $\frac{4}{5}$ part of work = (22 – x) days

Time taken by B to complete the whole work = $(22-x)\frac{5}{4}$ days

From the equation (i),

$\Rightarrow \quad \frac{1}{5x} + \frac{4}{5(22-x)} = \frac{1}{12}$

$\Rightarrow \quad \frac{110-5x+20x}{25x(22-x)} = \frac{1}{12}$

$\Rightarrow \quad \frac{110+15x}{25x(22-x)} = \frac{1}{12}$

$\Rightarrow \quad \frac{(22+3x)}{5x(22-x)} = \frac{1}{12}$

$\Rightarrow \quad 264 + 36x = 110x - 5x^2$

$\Rightarrow \quad 5x^2 - 74x + 264 = 0$

$\Rightarrow \quad 5x^2 - 30x - 44x + 264 = 0$

$\Rightarrow \quad 5x(x-6) - 44(x-6) = 0$

$\Rightarrow \quad (x-6)(5x-44) = 0$

$x = 6, x = \frac{44}{5} = 8.8$

Time taken by B to complete the whole work $= (22-x) \times \frac{5}{4}$ days

$= (22-6) \times \frac{5}{4}$

$= 16 \times \frac{5}{4} = 20$ days

or

$= (22-8.8) \times \frac{5}{4}$

$13.2 \times \frac{5}{4} = 16.5$ days

150. A can do a work in 8 days, while B takes 10 days to complete the same work. They started working together but A left the work 1 day before the work completed. Then how many days A worked?

(a) 3.5 (b) 4
(c) 2 (d) 3

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (b) : Work done by A in 1 day $= \frac{1}{8}$ part

Work done by B in 1 day $= \frac{1}{10}$ part

Work done by (A + B) in 1 day $= \frac{1}{8} + \frac{1}{10} = \frac{9}{40}$ part

Let both A and B worked together for x days.

According to the question,

$\frac{9x}{40} + \frac{1}{10} = 1$

$\Rightarrow \frac{9x}{40} = 1 - \frac{1}{10}$

$\Rightarrow x = \frac{9}{10} \times \frac{40}{9}$

$x = 4$ days

So, A worked for 4 days.

151. 28 days of food items are available for 1200 soldiers posted in a fort. After 4 days some soldiers left the fort, due to which the available food item lasts for 32 days. How many soldiers left the fort?

(a) 300 (b) 280
(c) 320 (d) 290

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (a) Number of posted soldiers = 1200

Let x soldiers leave after 4 days

We know that $M_1 \times D_1 = M_2 \times D_2$

$1200 \times 28 = 1200 \times 4 + (1200 - x) \times 32$

$1200 \times 24 = (1200 - x) \times 32$

$28800 = 38400 - 32x$

$32x = 38400 - 28800$

$32x = 9600$

$x = 300$

152. Sunita can embroider a saree in 15 days while her sister Neha can complete the same work in 10 days. They started working together, but Neha leaves the work after two days. After that how many days will Sunita take to complete the embroidery alone?

(a) 10 days (b) 20 days
(c) 16 days (d) 12 days

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (a) Let the time taken by Sunita to complete the whole work in x days.

According to the question,

$\frac{x}{15} + \frac{2}{10} = 1$

$\frac{x}{15} = 1 - \frac{2}{10}$

$\Rightarrow \quad \frac{x}{15} = \frac{8}{10}$

$\Rightarrow \quad x = 15 \times \frac{4}{5}$

$x = 12$

$\therefore$ Whole work will finish in 12 days.

So, Sunita will take 12-2 = 10 days to complete the remaining work alone.

153. A cleaning company employs 42 sweepers to clean a building in 25 days. 10 days later, 12 sweepers left the job. If the cleaning work is finished in 10 days then how many more sweepers need to be hired?

(a) 30 (b) 32
(c) 33 (d) 21

RRB NTPC 28.04.2016 Shift : 1

Ans : (c) Suppose the number of extra employees = x

According to the question,

From, $M_1 \times D_1 = M_2 \times D_2$

$(25 - 10) \times 42 = (30 + x) \times 10$

$15 \times 42 = 10 \times (30 + x)$

$30 + x = \frac{630}{10} \Rightarrow 63$

$x = 63 - 30$

$\boxed{x = 33}$

154. A and B can complete a work together in 35 days. If A works alone and completes $\frac{5}{7}$ of the work and then leaves the remaining work for B, it will take a total of 90 days to complete the work. How many days would take A, who is more efficient among them to complete the entire work?

(a) 40 (b) 45
(c) 48 (d) 42

Ans : (d) Let A complete the entire work in x days

Person	Work	Time
A	1	x days
A	$\frac{5}{7}$	$\frac{5}{7}x$ days
B	$\frac{2}{7}$	$\left(90-\frac{5}{7}x\right)=\frac{(630-5x)}{7}$
B	1	$\left(\frac{630-5x}{7}\right)\times\frac{7}{2}=\left(\frac{630-5x}{2}\right)$

According to the question,

$$\frac{1}{A}+\frac{1}{B}=\frac{1}{35}$$

$$\frac{1}{x}+\frac{2}{(630-5x)}=\frac{1}{35}$$

$$35(630-5x+2x)=x(630-5x)$$

$$7(630-3x)=(126x-x^2)$$

$$4410-21x=126x-x^2$$

$$x^2-147x+4410=0$$

$$x^2-105x-42x+4410=0$$

$$(x-105)(x-42)=0$$

$x = 42,\ x \neq 105$ (From the given options)

So, A will take 42 days to complete the work.

155. A and B can complete a work together in 12 days while A alone can do it in 15 days. They start working together but A leaves 10 days before the completion of the work. For how many days did A and B work together?

(a) 9 (b) 11

(c) 8 (d) 10

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (d) 1 day work of A + B $= \frac{1}{12}$ part

1 day work of A $= \frac{1}{15}$ part

1 day work of B $= \frac{1}{12}-\frac{1}{15}$

$$=\frac{5-4}{60}=\frac{1}{60}\text{ part}$$

Let A and B did work together for x days.

$$x.A+x.B+10B=1$$

$$x(A+B)+10B=1$$

$$x\left(\frac{1}{12}\right)+\frac{10}{60}=1$$

$$\frac{x}{12}=1-\frac{1}{6}$$

$$\frac{x}{12}=\frac{5}{6}$$

$x = 10$ days

156. A and B together can complete a work in 12 days. However, if A works alone, to complete half the work and leaves then B works alone and completes the remaining work. It takes 25 days to complete the work. If B is more efficient than A, then in how many days will B do the work alone ?

(a) 18 (b) 22

(c) 20 (d) 15

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (c) Let A and B can complete the work in x and y days.

Then, $\frac{1}{x}+\frac{1}{y}=\frac{1}{12}$

$$\frac{y+x}{xy}=\frac{1}{12}$$

$$xy=12(x+y) \quad \text{..... (i)}$$

According to the question-

$$\frac{x}{2}+\frac{y}{2}=25$$

$$x+y=50 \quad \text{..... (ii)}$$

From the equation (i) and (ii),

$$xy=12\times50$$

$$xy=600 \quad \text{..... (iii)}$$

On taking x = 30 and y = 20 third equation will be satisfied.

$\because$ B is more efficient than A.

$\therefore$ Time taken by B to complete the work = 20 days

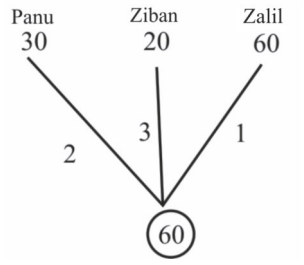
157. Panu, Ziban and Zalil separately can finish a work in 30, 20 and 60 days respectively. Ziban started working and Panu and Zalil agreed to assist Panu on every third day. How long will it take to complete that work?

(a) 14 (b) 13

(c) 15 (d) 12

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (c)



Total work = 60 units

$\because$ Ziban does 3 units work in a one day

Ziban will do in 2 days = 3 × 2 = 6 units

Panu and Zalil assist Ziban on the third day

Work of three days = (Ziban's 2 days work) + (Panu + Zalil + Ziban)

= 2 × 3 + 2 + 1 + 3 = 12 units

Time	Work
3 days	12 units
×5	×5
15 days	60 units

158. A can do a work in 10 days, B in 15 days and C in 20 days. A and B worked together for 4 days and then C replaced A. In how many days the entire work was finished?

(a) 16 days (b) 48/7 days

(c) 42/7 days (d) 18/7 days

RRB NTPC 16.04.2016 Shift : 2

Ans : (b) 1 day work of A and B $= \frac{1}{10}+\frac{1}{15}=\frac{1}{6}$ part

$\therefore$ 4 days work of A and B $= \frac{4}{6}=\frac{2}{3}$ part

Remaining work $= 1-\frac{2}{3}=\frac{1}{3}$ part

1 day work of B and C $= \frac{1}{15}+\frac{1}{20}=\frac{7}{60}$ part

$\therefore$ Time taken by B and C to complete $\frac{1}{3}$ part of work

$$= 1\times\frac{60}{7}\times\frac{1}{3}=\frac{20}{7}\text{ days}$$

Total time $= \frac{20}{7}+4=\frac{48}{7}$ days

159. A, B and C can finish a work separately in 8, 9 and 12 days respectively. C starts working alone and after one day B joins him. A also joins them even three days after the start of the work. In how many days the entire work will be finished?

(a) $3\frac{7}{29}$ (b) $3\frac{23}{29}$

(c) $4\frac{15}{23}$ (d) $1\frac{6}{23}$

Ans. (c) : Let C alone worked for x days

$$\frac{x-3}{8}+\frac{x-1}{9}+\frac{x}{12}=1$$

$$\frac{9x-27+8x-8+6x}{72}=1$$

$$23x-35=72$$

$$23x=72+35$$

$$23x=107$$

$$x=\frac{107}{23}$$

$$x=4\frac{15}{23}$$

Hence entire work will be finished in $4\frac{15}{23}$ days

160. Rathin and Bratin together can do a work in 12 days. They start working together but Rathin has to leave the work 5 days before the end of the work. As a result, it took a total of 15 days to finish the work. If Bratin works alone, how many days will it take to finish this work?

(a) 30 (b) 28

(c) 20 (d) 24

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (a) Suppose Rathin finish the work in R days and Bratin in B days.

According to the question,

$$\frac{1}{R}+\frac{1}{B}=\frac{1}{12}\text{.....(i)}$$

And

$$\frac{10}{R}+\frac{15}{B}=1\text{ .....(ii)}$$

From equation (i) × 10 – equation (ii)

$$\frac{10}{B}-\frac{15}{B}=\frac{10}{12}-1$$

$$\Rightarrow \frac{-5}{B}=\frac{-2}{12}$$

B = 30 days

Type - 6

161. 20 women can complete a work in 15 days, 16 men can complete the same work in 15 days. Find the ratio between the work efficiency of a men to a women.

(a) 5 : 3 (b) 3 : 2

(c) 4 : 3 (d) 5 : 4

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (d) : 20 Women can complete a work in 15 days

$\therefore$ In 1 day 20 women will complete the work = $\frac{20}{15}$ part

Now 16 men can complete this work in 15 day

$\therefore$ In 1 day 16 men will complete the work = $\frac{16}{15}$ part

$\therefore$ Ratio between the work efficiency of a men to a women

$$= \frac{20}{15}:\frac{16}{15}$$

$$= 20:16$$

$$= 5:4$$

162. 12 skilled, 14 semi-skilled and 10 unskilled workers complete a job for ₹13189. If their individual wages be in the ratio of 9:5:4, then the total money (in ₹) earned by 10 unskilled workers is :

(a) 3,240 (b) 2,420

(c) 2,240 (d) 3,420

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) : The ratio of wages of 12 skilled, 14 semi-skilled and 10 unskilled workers

$= (12\times9):(14\times5):(10\times4) = 108:70:40$

Total money earned by 10 unskilled workers

$$= 13189\times\frac{40}{218}$$

$$= ₹\ 2420$$

163. Sudhir is 4.5 times as efficient as Aarav. If they work together, they can complete a piece of work in 8 days. How many days will Aarav take to do the same work alone?

(a) 40 (b) 36

(c) 44 (d) 48

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (c) : Ratio of work capacity

Sudhi : Aarav = 4.5 : 1

= 45 : 10 = 9 : 2

Total work = (9 + 2)×8 = 88 unit

Then time taken by Aarav Alone to complete the same work

$= \frac{88}{2} = 44$ days

164. X can do a certain work in 84 days, Y is 50% less efficient than X while Z takes 28 days to do the same work, To complete the work, Y started the work, X joined him after 3 days and Z joined them after 7 days from the beginning. For how many days did Z work to complete the work?

(a) 15 (b) 16

(c) 17 (d) 14

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (c) : Work efficiency ratio

X : Y = 100 : 50

= 2 : 1

Time taken ratio

X : Y = 1 : 2

According to the question,

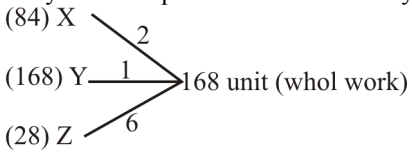
1 = 84 days

2 = 2 × 84 = 168 days

Time taken by Y to complete the work = 168 days

Given that

Time taken by Z to complete the work = 28 days



3 day's work of Y = 3 × 1 = 3 unit

4 day's work of (X + Y) = (2 + 1) × 4 = 12 unit

Remaining work = 168 – (6 + 12) = 168 – 15

= 153 unit

153 unit work will be completed by (X + Y + Z).

Time taken by (X+Y+Z) to complete the 153 unit work

$= \frac{153}{(2+1+6)} = 17$ days

Therefore Z did the work for 17 days.

165. A can complete a piece of work in 10 days, B is 25% more efficient than A. How many days will B alone take to complete the same work?

(a) 7 days (b) 6 days

(c) 9 days (d) 8 days

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : A : B {∴ 100 : 125 = 4 : 5}

Efficiency = 4 : 5

Time 5 : 4

⇒ Time taken by A = 5x (Let)

Time taken by B = 4x

According to the question,

∴ 5x = 10

x = 2

∴ Time taken by B = 4x

= 4 × 2

= 8 days

166. A and B undertake to complete a piece of work for ₹600. A alone can complete it in 4 days while B alone can complete it in 6 days. With the help of C, they finish the work in 2 days. Find the share of C in the payment received.

(a) ₹100 (b) ₹200

(c) ₹300 (d) ₹78

RRB Group-D 23-08-2022 (Shift-II)

Ans. (a) : According to the question,

$\frac{W}{4} + \frac{W}{6} + \frac{W}{C} = \frac{W}{2}$

$\frac{1}{4} + \frac{1}{6} + \frac{1}{C} = \frac{1}{2}$

$\Rightarrow \frac{1}{C} = \frac{1}{12}$

$\Rightarrow \frac{\text{work by C}}{\text{Total work}} = \frac{\frac{W}{12}}{\frac{W}{2}} = \frac{1}{6}$

So, C will get 1/6 of the salary $= \frac{1}{6} \times 600 = ₹100$

167. A can complete a piece of work in 35 days. B is 30% less efficient than A. C is 25% more efficient that B. B and C work together for 10 days. A alone will complete the remaining work in :

(a) 19 day (b) $19\frac{1}{4}$ day

(c) 20 day (d) 18 day

RRB Group-D 08/09/2022 (Shift-II)

Ans. (b) : Let the working efficiency of A = 100 unit

Ratio of working efficiency of A, B and C

$A : B : C = 100 : 70 : 70 \times \frac{125}{100}$

$= 100 : 70 : \frac{175}{2}$

= 200 : 140 : 175

Ratio of time taken by A, B and C

$A : B : C = \frac{1}{200} : \frac{1}{140} : \frac{1}{175}$

A : B : C = 7 : 10 : 8

Let the time taken by A, B and C to complete the work be 7x, 10x and 8x days respectively.

According to the question,

7x = 35

x = 5

Hence time taken by B = $10 \times 5 = 50$ days

and time taken by C = $8 \times 5 = 40$ days

10 day's work of (B + C) $= 10\left(\frac{1}{50}+\frac{1}{40}\right)$

$= 10\left(\frac{4+5}{200}\right)$

$= \frac{9}{20}$ part

Remaining work = $1-\frac{9}{20}=\frac{11}{20}$ part

Time taken by A to do $\frac{1}{35}$ part of work = 1 days

Hence the time taken to complete $\frac{11}{20}$ part of work

$= 35\times\frac{11}{20}=\frac{77}{4}$ days

$= 19\frac{1}{4}$ days

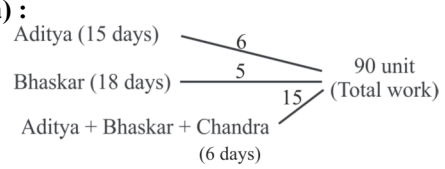
168. Aditya and Bhaskar undertake to do a piece of work for ₹ 15,000. Aditya alone can do it in 15day while Bhaskar alone can do it in 18 days. With the help of Chandra, they finish it in 6 days. What is Chandra's share?

(a) 4,000 (b) 7,000

(c) 5,000 (d) 6,000

RRB Group-D 30-08-2022 (Shift-III)

Ans. (a) :



According to the qeustion

Efficiency of Chandra - 15 – (6 + 5) = 4 unit/day

$\therefore$ Share of chandra $= \frac{1500\times\text{efficiency of chandra}}{\text{Total efficiency of all three}}$

$= \frac{15000\times 4}{15} = ₹\ 4000$

169. C is twice as efficient as A, while B takes thrice as many days as C to do the same work A takes 10 days to do the work alone. If they work in pairs [like (A, B), (B, C) and (C, A)], with (A, B) working on the first day, then (B, C) working on the second day and (C, A) working on the third day and continuing the cycle till the work gets completed, then how many days will be required to complete this work ?

(a) 8 days (b) $8\frac{3}{4}$ days

(c) 4 days (d) $4\frac{3}{8}$ days

RRB Group-D 02/09/2022 (Shift-II)

Ans. (d) :

Ratio of working efficiency of A and C = 1 : 2

And Ratio of time taken by A and C = 2 : 1

Let the time taken by A and C to do the work be 2x and x days respectively.

Time taken by B to complete the work = 3x days

According to the question,

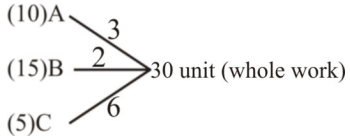
2x = 10

x = 5 days

Hence time taken by A = 10 days

Time taken by B = $3 \times 5 = 15$ days

and time taken by C = 5 days



According to the question,

work of (A + B) on first day = 3 + 2 = 5 unit

work of (B + C) on second day = 2 + 6 = 8 unit

work of (C + A) on third day = 6 + 3 = 9 unit

Again, work of (A + B) on fourth day = 3 + 2 = 5 unit

total work of 4 day's = 5 + 8 + 9 + 5 = 27 unit

Remaining work = 30 – 27 = 3 unit

Time taken by (B + C) to complete 3 units of work $= \frac{3}{8}$ days

Thus, the total time taken to complete the work

$= 4+\frac{3}{8}$ days

or $4\frac{3}{8}$ days

170. A, B and C together can complete a certain work in 40 days. B and C together can complete the same work in 60 days. B is 25% more efficient than A. A, B and C work together for 30 days. B alone will complete the remaining work in:

(a) 30 days (b) 20 days

(c) 32 days (d) 24 days

RRB Group-D 05/09/2022 (Shift-II)

Ans. (b) :

1 day's work of (A + B + C) $= \frac{1}{40}$ part

1 day's work of (B + C) $= \frac{1}{60}$ part

1 day's work of A $= \frac{1}{40}-\frac{1}{60}=\frac{3-2}{120}=\frac{1}{120}$ part

Time taken by A to complete the work = 120 days

working efficiency = A : B = 100 : 125

= 4 : 5

Ratio of time taken (A : B) = 5 : 4

Let the time taken by A and B to complete the work be 5x and 4x days respectively

According to the qeustion,

$5x = 120$

$x = 24$

$4x = 24 \times 4 = 96$

time taken by B to complet the work = 96 days

30 day's work of (A + B + C) $= 30 \times \left(\frac{1}{40}\right) = \frac{3}{4}$ part

Remaining work $= 1 - \frac{3}{4} = \frac{1}{4}$ part

1 day's work of B $= \frac{1}{96}$ part

Time taken by B to complete $\frac{1}{96}$ part of work = 1 day

Hence the time taken by B to complete $\frac{1}{4}$ part of work

$= 96 \times \frac{1}{4} = 24$ days

171. A can complete a task in 20 days. B is 75% more efficient than A. The number of days B will take to complete the same work is:

(a) $10\frac{3}{7}$ days (b) $11\frac{3}{7}$ days

(c) $1\frac{3}{17}$ days (d) $1\frac{3}{7}$ days

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let, efficiency of A = 100

Then, efficiency of B = 175

Ratio of efficiency of A and B

$\Rightarrow \frac{A}{B} = \frac{100}{175} = \frac{4}{7}$

Let B can complete the work in x days.

The ratio of the number of days required by A and B to complete the work

$\Rightarrow \frac{A}{B} = \frac{20}{x}$

$\because$ Efficiency is inversely proportional to the number of days.

$\therefore \frac{4}{7} = \frac{x}{20}$

$\Rightarrow x = 11\frac{3}{7}$

Hence, B will complete the same work in $11\frac{3}{7}$ days.

172. If A, B and C can complete a task alone in 15 days, 20 days and 25 days respectively, then in how many days can they complete the same task if they work together?

(a) $\frac{150}{47}$ days (b) $\frac{225}{47}$ days

(c) $\frac{300}{47}$ days (d) $\frac{75}{47}$ days

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

Work done by A in 1 day = $\frac{1}{15}$ part

Work done by B in 1 day = $\frac{1}{20}$ part

Work done by C in 1 day = $\frac{1}{25}$ part

Work done by (A+B+C) in 1 day $= \left(\frac{1}{15} + \frac{1}{20} + \frac{1}{25}\right)$ part

$= \left(\frac{20+15+12}{300}\right)$ part

$= \frac{47}{300}$ part

Hence, they can complete the work in $\frac{300}{47}$ days.

173. A and B can complete a piece of work in 20 days. B and C can complete it in 30 days. A is twice as good as C in completing the work. Find in how many days will B alone complete it.

(a) 60 days (b) 50 days

(c) 55 days (d) 65 days

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (a) : One day work of A and B = $\frac{1}{20}$ part

One day work of B and C = $\frac{1}{30}$ part

Let-

A completes the work in x days.

Then, C will do the work in 2x days. ($\because$ A is twice as good as C.)

And B completes the work in y days.

Hence, $\frac{1}{x} + \frac{1}{y} = \frac{1}{20}$ (1)

And $\frac{1}{2x} + \frac{1}{y} = \frac{1}{30}$

$\frac{1}{y} = \frac{1}{30} - \frac{1}{2x}$ -----(2)

From equation (1) and (2),

$\frac{1}{x} + \frac{1}{30} - \frac{1}{2x} = \frac{1}{20}$

$\frac{1}{x} - \frac{1}{2x} = \frac{1}{20} - \frac{1}{30}$

$\frac{1}{2x} = \frac{3-2}{60}$

$x = 30$

By putting the value of x in equation (1),

$$\frac{1}{30}+\frac{1}{y}=\frac{1}{20}$$

$$\frac{1}{y}=\frac{1}{20}-\frac{1}{30}$$

$$\frac{1}{y}=\frac{1}{60}$$

$$\boxed{y=60\,\text{days}}$$

Hence, B alone will complete the work = y days
= 60 days.

174. A works twice as fast as B. If both of them together can finish a job in 12 days, then how many days will B take to finish the job alone?

(a) 12 (b) 48
(c) 36 (d) 24

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let A do the work in x days and B do the same work in 2x days.
According to the question,

$$\frac{1}{x}+\frac{1}{2x}=\frac{1}{12}$$

$$\frac{3}{2x}=\frac{1}{12}$$

x = 18 days
Therefore, the work done by B = 2x days
= 2×18 = 36 days

175. Kamal can complete a work in 14 days. Vimal is 40% more efficient than Kamal. The number of days Vimal will take to complete the same piece of work is:

(a) 14 days (b) 12 days
(c) 10 days (d) 15 days

RRB NTPC 13.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let, efficiency of Kamal = 100
According to the question,

	Vimal		Kamal
Efficiency →	140	:	100
	7	:	5
Time →	5	:	7
	×2		×2
	10 days		14 days

Hence, the time taken by Vimal to complete the same piece of work = 10 days.

176. A alone can finish a job in 12 days, while B alone can finish it in 15 days. Which the help of C, they can finish the same job in 5 days. If they are paid ₹2880 for the whole job, what will be the share of C?

(a) ₹760 (b) ₹740
(c) ₹720 (d) ₹700

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : A's 1 day work = $\frac{1}{12}$ unit

B's 1 day work = $\frac{1}{15}$ unit

Let C's 1 day work = $\frac{1}{x}$ unit

According to the question,

$$\frac{1}{12}+\frac{1}{15}+\frac{1}{x}=\frac{1}{5}$$

$$\frac{1}{x}=\frac{1}{20}$$

Work of A, B and C = $\frac{1}{12}:\frac{1}{15}:\frac{1}{20}$

$$=120\times\frac{1}{12}:120\times\frac{1}{15}:120\times\frac{1}{20}$$

= 10 : 8 : 6

Hence, share part of C = $\frac{6}{24}\times 2880$

= ₹720

177. Anil is twice as efficient as Balu and together, they can complete a task in 12 days. In how many days can Anil alone complete the task?

(a) 7 (b) 18
(c) 15 (d) 25

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (b) : Suppose Anil complete the task in x days.
Time taken by Balu to complete the task = 2x days
According to the question,

$$\frac{1}{x}+\frac{1}{2x}=\frac{1}{12}$$

$$\frac{2+1}{2x}=\frac{1}{12}$$

$$\frac{3}{2x}=\frac{1}{12}$$

2x = 36
x = 18 days

178. If Raju is thrice as good workman as Ravi and takes 20 days less than him to complete a piece of work, then find the time taken by Ravi to complete the work:

(a) 20 days (b) 10 days
(c) 30 days (d) 40 days

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c) : $\left[\text{Time} \propto \frac{1}{\text{Efficiency}}\right]$

	Raju		Ravi
Work Efficiency →	3	→	1
Time →	1	→	3

(3–1) units = 20
2 units = 20
1 unit = 10
3 units = 30 days

179. Karan works twice as fast as Shyam. Working together, they can complete a task in 20 days. In how many days will Karan alone complete the same task?

(a) 26 days (b) 32 days
(c) 28 days (d) 30 days

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d)

Karan : Shyam

Efficiency- 2 : 1 [Working efficiency $\propto$ 1/time]

Time - 1 : 2

If two people A and B will do same work together, then the time taken by them = $\frac{A \times B}{A + B}$

Karan and Shyam work together = $\frac{1 \times 2}{3} = \frac{2}{3}$ unit

While both work together in 20 days

$= \frac{20}{\frac{2}{3}} \times$ Karan's time

$= \frac{20}{\frac{2}{3}} \times 1$

$= \frac{20 \times 3}{2} = 30$ days

180. Rajesh can finish a task in 4 days while Mahesh can finish the same task in 3 days. If both of them finish the task together and get paid ₹350 in total, then find the share of Rajesh –

(a) ₹ 100 (b) ₹ 140
(c) ₹ 200 (d) ₹ 150

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (d) : One day work of Rajesh = $\frac{1}{4}$ part

One day work of Mahesh = $\frac{1}{3}$ part

Ratio of efficiency = $\frac{1}{4} : \frac{1}{3}$

= 3 : 4

A T Q,

$3x + 4x =$ ₹ 350

$7x =$ ₹ 350

$x =$ ₹ 50

Share of Rajesh = $3x$

$= 3 \times 50$

= ₹ 150

181. A alone can complete a work in 10 days and B can complete it in 15 days. A and B undertake the work for ₹4800. With the help of C, they complete the work in 5 days. What amount is to be paid to C?

(a) ₹800 (b) ₹600
(c) ₹1,200 (d) ₹700

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (a) :

Work done by A in one day = $\frac{1}{10}$ part

Work done by B in one day = $\frac{1}{15}$ part

Work done by C in one day = $\frac{1}{5} - \left(\frac{1}{10} + \frac{1}{15}\right)$

$= \frac{1}{5} - \left(\frac{3+2}{30}\right)$

$= \frac{1}{5} - \frac{5}{30}$

$= \frac{1}{5} - \frac{1}{6}$

$= \frac{6-5}{30}$

$= \frac{1}{30}$ part

Efficiency ratio = $\frac{1}{10} : \frac{1}{15} : \frac{1}{30}$

= 3 : 2 : 1

Amount paid to C = $\frac{4800 \times 1}{6}$ = ₹800

182. P and Q can separately do a work in 6 and 8 days respectively with the help of R they complete the work in 3 days. If total wages is Rs. 3200 then what is the amount given to R?

(a) Rs. 320 (b) Rs. 1200
(c) Rs. 400 (d) Rs. 375

RRB JE - 23/05/2019 (Shift-III)

Ans : (c) One day work of P = $\frac{1}{6}$ part

One day work of Q = $\frac{1}{8}$ part

According to the question,

$\frac{1}{P} + \frac{1}{Q} + \frac{1}{R} = \frac{1}{3}$

$\Rightarrow \frac{1}{6} + \frac{1}{8} + \frac{1}{R} = \frac{1}{3}$

$\Rightarrow \frac{1}{R} = \frac{1}{3} - \left(\frac{7}{24}\right)$

$\frac{1}{R} = \frac{1}{24}$

Efficiency ratio of P, Q and R = $\frac{1}{6} : \frac{1}{8} : \frac{1}{24} = \frac{4:3:1}{24}$

P : Q : R = 4 : 3 : 1

Wages of R = $3200 \times \frac{1}{8}$ = Rs. 400

183. A can finish a work in 5 days and B can finish the same work in 8 days. If both work together and earn Rs. 6760. Find the share of A.

(a) Rs. 4,160 (b) Rs. 3,600
(c) Rs. 5,070 (d) Rs. 4,056

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : **(a)** One day work of A $= \frac{1}{5}$ part

One day work of B $= \frac{1}{8}$ part

Efficiency ratio of A and B $= \frac{1}{5} : \frac{1}{8}$

$\boxed{A : B = 8 : 5}$

So, share of A $= \frac{6,760}{13} \times 8 = 520 \times 8 = ₹\ 4,160$

184. A takes twice as long as B and C together to do a work, C takes thrice the time taken by A and B together. If A, B and C working together take 6 days to complete the work, in how many days will A alone complete the same work?

(a) 20 days (b) 18 days
(c) 24 days (d) 15 days

RRB Group-D – 02/11/2018 (Shift-I)

Ans. (b) According to the question,

Work done by B and C = Work done by 2 × A

$B + C = 2A$ ...(i)

Work done by A and B = Work done by 3 × C

$A + B = 3C$ ...(ii)

∵ One day work of part A, B and C

$$A + B + C = \frac{1}{6}$$

On putting the value of B + C from equation (i),

$$A + 2A = \frac{1}{6}$$

$$3A = \frac{1}{6} \Rightarrow \boxed{A = \frac{1}{18}}$$

So A will complete this work alone in 18 days

185. P can do 2/5 part of a work in 10 days. If P and Q can do 1/3 part of the same work in 5 days, find the ratio of their efficiency.

(a) 3 : 4 (b) 4 : 3
(c) 3 : 2 (d) 2 : 3

RRB JE - 27/06/2019 (Shift-III)

Ans : (c) 10 days work of P = 2/5 part

Then P will complete the work $= 10 \times \frac{5}{2} = 25$ days

From the question-

$$\frac{(P+Q)5}{\frac{1}{3}} = \frac{P \times 25}{1} \qquad \left[\because \frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}\right]$$

$15P + 15Q = 25\ P$

$15\ Q = 10P$

$$\frac{P}{Q} = \frac{15}{10}$$

$$\frac{P}{Q} = \frac{3}{2}$$

Ratio of efficiency = 3 : 2

186. A and B together can do a work in 40 days. The ratio of their working rate is 8:5 In how many days will A alone complete the same work.

(a) 65 days (b) 40 days
(c) 72 days (d) 104 days

RRB NTPC 02.04.2016 Shift : 1
RRB NTPC 29.04.2016 Shift : 3

Ans : (a) Let A and B can complete work separately in 5x and 8x days respectively.

$\therefore$ Work done by both in 1 day $= \frac{1}{40}$ part

According to the question,

$$\frac{1}{5x} + \frac{1}{8x} = \frac{1}{40}$$

$$\frac{13}{40x} = \frac{1}{40}$$

$$x = 13$$

$\therefore$ A will complete that work alone in 65 days.

187. 5 women can do a work in 36 days. If the ratio of the efficiency of a man and a woman is 3:1, then find how many days will take 5 men to complete the same work?

(a) 12 days (b) 15 days
(c) 18 days (d) 108 days

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) Given-

	man		woman	
Ratio of efficiency	3	:	1	$\left\{\because \text{Efficiency} \propto \frac{1}{\text{time}}\right\}$

$\therefore$ Ratio of time = 1 : 3

∵ 5 women can complete the work in 36 days.

$\therefore$ Time taken by 5 men to complete the work $= 36 \times \frac{1}{3}$

= 12 days

188. Carpenters A and B work together then they can complete a work in 10 days. Carpenter A is twice faster than carpenter B. If carpenter B works alone, how long will he take to complete this work?

(a) 30 (b) 15
(c) 20 (d) 10

RRB NTPC 29.04.2016 Shift : 1

Ans : (a) Efficiency ratio of carpenter A and carpenter B = 2:1

Let time taken by A and B is x and 2x days respectively.

$\therefore$ Ratio of time = 1: 2

According to the question,

$$\frac{1}{x} + \frac{1}{2x} = \frac{1}{10} \qquad \left[\text{Time} \propto \frac{1}{\text{Efficiency}}\right]$$

$$\frac{2+1}{2x} = \frac{1}{10}$$

$$\frac{3}{2x} = \frac{1}{10}$$

$2x = 30$

$x = 15$

$x = 15$ days

$2x = 15 \times 2 = 30$ days

189. Together Rahul and Raghav can pluck 260 flowers in 1 hour. Their flower plucking efficiency are in the ratio of 8:5 Find the number of flowers to be plucked by Raghav.

(a) 100 (b) 130
(c) 78 (d) 80

RRB NTPC 30.04.2016 Shift : 1

Ans : (a) Efficiency ratio of Rahul and Raghav = 8:5
Number of flowers plucked by Raghav
$= 260 \times \frac{5}{13} = 100$

Type - 7

190. A father can complete a task in 8 days, while the son can do it in 7 days. If they work on alternate days, with the father starting, then in how many days will the task be completed?

(a) $7\frac{1}{2}$ (b) 6
(c) 7 (d) $6\frac{1}{2}$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (a) : Father's 1 day work $= \frac{1}{8}$ th part

Son's 1 day work $= \frac{1}{7}$ th part

(Father + Son)'s two days work $= \frac{1}{8} + \frac{1}{7} = \frac{15}{56}$

(Father + Son)'s 2 × 3 days work $= \frac{15}{56} \times 3 = \frac{45}{56}$

Remaining work $= 1 - \frac{45}{56} = \frac{11}{56}$

The remaining work after the work done by the father on 7th day

$$= \frac{11}{56} - \frac{1}{8} = \frac{4}{56} = \frac{1}{14}$$

$\because$ On 8th day son will do $\frac{1}{14}$ of the work in $\frac{1}{2}$ day

$\therefore$ Total time $= 7 + \frac{1}{2} = 7\frac{1}{2}$ days.

191. Four persons A, B, C and D completed a task in $\frac{2}{3}$h, $\frac{3}{4}$h, $\frac{4}{5}$h and $\frac{1}{5}$h respectively. Who among the following took the highest amount of time to complete the task?

(a) D (b) C
(c) A (d) B

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) According to the question,

Time taken by A to complete the task $= \frac{2}{3}\text{h} = 0.67\text{h}$

Time taken by B to complete the task $= \frac{3}{4}\text{h} = 0.75\text{h}$

Time taken by C to complete the task $= \frac{4}{5}\text{h} = 0.8\text{h}$

Time taken by D to complete the task $= \frac{1}{5}\text{h} = 0.2$

It is clear that C has taken the highest amount of time.

192. A can do $\frac{1}{5}$ of some work in 12 days, B can do 20% of the same work in 10 days, C can do $\frac{1}{6}$ of the work in 8 days and D can do $\frac{1}{5}$ of the work in 12 days. Who will complete the work first if all four started to work at the same time?

(a) C (b) B
(c) A (d) D

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

Time taken by A to complete the work

$$= \frac{12}{\frac{1}{5}} = 12 \times 5 = 60 \text{ days}$$

And time taken by B to complete the work

$$= \frac{10}{20\%} = \frac{10}{20} \times 100 = 50 \text{ days}$$

Same as time taken by C $= \frac{8}{\frac{1}{6}} = 8 \times 6 = 48$ days

And time taken by D to complete the work $= \frac{12}{1/5} = 12 \times 5 = 60$ days

$\because$ C took minimum time to complete the work

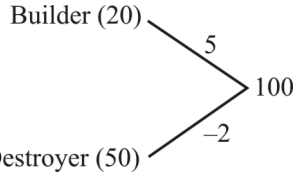
$\therefore$ C will complete the work first.

193. In a computer game, a builder can build a wall in 20 hours, while a destroyer can completely demolish the wall in 50 hours. Both builder and destroyer were initially set to work on level ground. But after 30 hours the destroyer was taken out. How long did it take to build the wall?

(a) 32 hours 40 minutes (b) 33hours 20 minutes
(c) 32 hours 20 minutes (d) 32 hours

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,



Work done by Builder and Destroyer in 1 hour = 5–2 = 3.

Work done by Builder and Detroyer in 30 hours = 3 × 30 = 90

Remaining work = 100–90 =10

Time taken by the Builder to complete the remaining work = $\frac{10}{5}$ = 2 hours

Total time = 30 + 2 = 32 hours

194. A man can complete a work in 5 days working 4 hours per day in the first 5 days, 5 hours per day in the next 5 days and 6 hours per day in the last 5 days. If he works 8 hours a day with half an hour launch break, in how many days will he complete the work ?

(a) 7.5 days (b) 12 days

(c) 10 days (d) 8 days

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

Total work = 5 × 4 + 5 × 5 + 5 × 6

= 75 units

After half an hour break = 8 hours – 30 min

= 7 : 30 hours

According to the question,

75 = 7.5 × D

D = 10 days

195. A can complete 25% of a task in 10 days. B can complete 40% of the task in 40 days and C can complete $\frac{1}{3}$ of the task in 13 days. Who among them has the fastest speed to complete the same task?

(a) C (b) All have the same speed

(c) B (d) A

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : ∵ Time taken by A to complete $\left(\frac{1}{4}\right)^{th}$ part of work = 10 days

∴ Time taken by A to do total work = 4×10 = 40 days

∵ Time taken by B to complete $\left(\frac{2}{5}\right)^{th}$ part of work = 40 days

∴ Time taken by B to do total work = $40\times\frac{5}{2}$ = 100 days

∵ Time taken by C to do $\left(\frac{1}{3}\right)^{th}$ part of work = 13 days

∴ Time taken by C to do total work = 3 × 13 = 39 days

So, it is clear that C has the fastest speed to complete the same task.

196. Working together Sandra and Mayuri can complete a task in 60 days. Although Mayuri works alone and leaves after completing one third of the work and then Sandra finishes the remaining work alone. Thus, both of them completed the work in 150 days. If Mayuri worked faster than Sandra then in how many days Sandra can do that work alone?

(a) 240 (b) 180

(c) 165 (d) 225

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (b)

Let time taken by Sandra to complete the work = x days

Let time taken by Mayuri to complete the work = y days

∴ One day work of both = $\frac{1}{x}+\frac{1}{y}=\frac{1}{60}$.....(i)

Time taken by Mayuri to complete $\frac{1}{3}$ of work = $\frac{y}{3}$ days

Remaining work = $1-\frac{1}{3}=\frac{2}{3}$

Time taken by Sandra to complete $\frac{2}{3}$ part of work

= $x\times\frac{2}{3}=\frac{2x}{3}$ days

Time taken by both to complete the work

$\frac{2x}{3}+\frac{y}{3}=150$

2x + y = 450

y = 450 – 2x

On putting value of y in equation (i),

60 (x + y) = xy

60 (x + 450 – 2x) = x (450 – 2x)

60 (450 – x) = 450x – $2x^2$

60 × 450 – 60x = 450x – $2x^2$

$2x^2$ – 510x + 60 × 450 = 0

x^2 – 255x + 13500 = 0

x^2 – (180 + 75) x + 13500= 0

x^2 – 180x – 75x + 13500 = 0

x (x–180) – 75 (x–180) = 0

(x–180) (x–75) = 0

x = 180, 75

So Sandra (Sandra works slower than Mayuri) alone will take time to complete the work = 180 days

197. A completes 2/5 part of a work in x days. After then he calls B and they together finish the remaining work in 6 days. If B alone takes 100/6 days. Then find the value of x.

(a) 10 days (b) 50/3 days

(c) 20 days (d) 40 days

RRB NTPC 18.04.2016 Shift : 2

Ans : (a)

X days work of A = $\frac{2}{5}\Rightarrow$ complete work = $\frac{5}{2}$x

Remaining work = $1-\frac{2}{5}=\frac{3}{5}$

Time taken by A and B together to finish $\frac{3}{5}$ part of work = 6 days

Time taken by A and B to finish the whole work together

$$= 6 \times \frac{5}{3} = 10 \text{ days}$$

According to the question,

$$\frac{1}{\frac{5}{2}x} + \frac{1}{\frac{100}{6}} = \frac{1}{10}$$

$$\frac{2}{5x} + \frac{6}{100} = \frac{1}{10} \Rightarrow \frac{40+6x}{100x} = \frac{1}{10}$$

$40 + 6x = 10x$

$4x = 40$

$x = 10$ days

198. P, Q and R can do a work separately in 10, 12 and 15 days respectively. They start working together and after 2 days P quits working. Q quit working 3 days before the work was completed. In how many days will the work be completed?

(a) 6 (b) 7

(c) 5 (d) 8

RRB JE - 29/05/2019 (Shift-II)

Ans : (b) Let total work will be completed in x days

According to the question,

$$\frac{2}{10} + \frac{x-3}{12} + \frac{x}{15} = 1$$

$$\frac{1}{5} + \frac{x-3}{12} + \frac{x}{15} = 1$$

$$\frac{5(x-3)+4x}{60} = \frac{4}{5}$$

$9x - 15 = 48$

$9x = 63$

$x = 7$ days

So, work will be completed in 7 days

199. A can do a work alone in 11 days while B takes 16.5 days to do it alone. It takes 5.5 days for them to complete the work together with C. If 'C' and 'D' work together then they can complete it in 22 days. Then in how many days can D alone finish the work?

(a) 44 (b) 55

(c) 77 (d) 66

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (d) : One day work of A $= \frac{1}{11}$ part

One day work of B $= \frac{1}{16.5}$ part

One day work of (A+B+C) $= \frac{1}{11} + \frac{1}{16.5} + \frac{1}{C} = \frac{1}{5.5}$ part

One day work of C $= \frac{1}{5.5} - \left(\frac{1}{11} + \frac{1}{16.5}\right)$

$$= \frac{1}{5.5} - \left(\frac{2.5}{16.5}\right)$$

$$= \frac{3-2.5}{16.5} = \frac{0.5}{16.5} = \frac{1}{33} \text{ part}$$

$\because$ One day work of (C + D) $= \frac{1}{22}$ part

$\therefore$ One day work of D $= \frac{1}{22} - \frac{1}{33} = \frac{3-2}{66} = \frac{1}{66}$ part

So, D will complete the work in 66 days

200. P, Q and R together complete a task. P and Q finish 70% of the work while Q and R finish 50% of the work. If they work separately, who will finish the work first?

(a) R

(b) P

(c) can not determine

(d) Q

RRB JE - 26/05/2019 (Shift-III)

Ans : (b)

1 day work of P and Q $= 70\% = \frac{7}{10}$ part

1 day work of Q and R $= 50\% = \frac{1}{2}$ part

$\therefore$ One day work of R $= 1 - \frac{7}{10} = \frac{3}{10}$ part

So, R will complete the work alone $= \frac{10}{3} = 3\frac{1}{3}$ days

One day work of P $= 1 - \frac{1}{2} = \frac{1}{2}$ part

So, P will complete the work alone in 2 days.

1 day work of Q $= \frac{1}{2} - \frac{3}{10} = \frac{2}{10} = \frac{1}{5}$ part

So, Q will complete the work alone in 5 days

Hence, P will complete the work first.

201. A hostel has a stock of 6,190.80 kg of wheat for 105 students for 22 days. After 5 days, 14 more students join the hostel. If all the students eat the same food, then for now many days the remaining wheat will be enough for the students?

(a) 15 days (b) 11 days

(c) 1 days (d) 17 days

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (a) Suppose remaining wheat will be enough for x days.

From, $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$

$$\frac{105 \times 22}{6190.80} = \frac{105 \times 5}{6190.80} + \frac{(105+14)x}{6190.80}$$

$105 \times 22 = 105 \times 5 + (105 + 14)x$

$105 \times 22 = 105 \times 5 + 119x$

$2310 = 525 + 119x$

$2310 - 525 = 119x$

$\frac{1785}{119} = x$

$\boxed{x = 15}$ days

202. In a village Under Mission Kakatiya, 38 men working 6 hours per day can do a piece of work in 12 days. Find the number of days in which 57 men working in 8 hours per day can do twice as much work. Assume that 2 men of the first group do as much work in 1 hours as 3 men of the second group do in $1\frac{1}{2}$ hours.

(a) 27 days (b) 28 days
(c) 24 days (d) 32 days

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (a) Work efficiency ratio of men of both group

$= 3 \times 1\frac{1}{2} : 2 \times 1 = \frac{9}{2} : 2 = 9 : 4$

Formula

$$\frac{M_1 D_1 H_1 E_1}{W_1} = \frac{M_2 D_2 H_2 E_2}{W_2}$$

$$\frac{38 \times 12 \times 6 \times 9}{1} = \frac{57 \times D_2 \times 8 \times 4}{2}$$

$D_2 = 27$ days

Required number of days = 27 days.

203. The working efficiency ratio of P and Q is 5:7 find the ratio of days taken by them to finish a work.

(a) 7:5 (b) 3:4
(c) 4:3 (d) 5:7

RRB NTPC 06.04.2016 Shift : 2

Ans : (a) Efficiency ratio of P and Q = 5:7

Ratio of days $= \frac{1}{5} : \frac{1}{7}$ $\left(\because \text{time} \propto \frac{1}{\text{efficiency}}\right)$

= 7 : 5

204. Adil and Viren together can complete a task in 20 days. Viren and Chirag together can complete the same task in 50 days. Adil and Chirag together can complete the same task in 40 days. If the same task was to be done by them separately, what would be the ratio of the time taken by Adil to the time taken by Viren?

(a) 11 : 9 (b) 11 : 3
(c) 7 : 9 (d) 9 : 11

RRB NTPC 28.04.2016 Shift : 2

Ans : (d) According to the question,

One day work of (Adil + Viren) $= \frac{1}{20}$ part .....(i)

One day work of (Viren + Chirag) $= \frac{1}{50}$ part .....(ii)

One day work of (Adil + Chirag) $= \frac{1}{40}$ part .....(iii)

On adding equation (i), (ii) and (iii),

One day work of 2(Adil + Viren + Chirag)

$= \frac{1}{20} + \frac{1}{50} + \frac{1}{40}$

$= \frac{10 + 4 + 5}{200} = \frac{19}{200}$ part

One day work of (Adil + Viren + Chirag) = $\frac{19}{400}$ part

$\therefore$ One day work of Adil $= \frac{19}{400} - \frac{1}{50}$

$= \frac{19 - 8}{400} = \frac{11}{400}$ part

$\therefore$ Time taken by Adil alone to complete the work $= \frac{400}{11}$ days

One day work of Viren $= \frac{19}{400} - \frac{1}{40}$

$= \frac{19 - 10}{400} = \frac{9}{400}$ part

$\therefore$ Time taken by Viren to complete the work

$= \frac{400}{9}$ days

$\therefore$ Required ratio $= \frac{400}{11} : \frac{400}{9} = 9 : 11$

205. The bill for a satellite airtime for 2 minutes 30 seconds is Rs. 25, then what will be the price of 3 minutes 20 seconds in rupess? (up to one decimal place)

(a) 33.3 (b) 33.2
(c) 33.4 (d) 33.1

RRB NTPC 07.04.2016 Shift : 1

Ans : (a) 2 minutes 30 seconds or (120 + 30) seconds. The bill of 150 sec = 25

The bill 1 second $= \frac{25}{150} = \frac{1}{6}$

Then

3 minutes 20 seconds = 180 + 20 = 200 seconds

The bill of 200 seconds $= \frac{1}{6} \times 200 = \frac{100}{3} = 33.33$

206. Type 1 workers are 2.5 times more efficient than type 2 workers. 12 Type 1 workers can do a piece of work in 10 days. In how many days will 4 workers of Type 1 and 15 workers of type 2 take to complete the same work?

(a) 13 (b) 10
(c) 12 (d) 11

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (c) Let it will take x days to complete the work

According to the question,

$10 \times 12 = \left(4 + \frac{15}{2.5}\right) \times x$

$10 \times 12 = \left(\frac{10 + 15}{2.5}\right) \times x$

$2.5 \times 10 \times 12 = 25 \times x$

$25 \times 12 = 25 \times x$

$x = 12$

Hence, it will take 12 days to complete the work.

12.

Alligation

Type - 1

1. How much water should be added to 90 ml of a 38% sugar solution so that it becomes a 17.1% sugar solution?

(a) 81 ml (b) 95 ml
(c) 110 ml (d) 100 ml

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (c) : Quantity of sugar in 90 ml

$$= 90 \times \frac{38}{100} = 34.2\text{ml}$$

Let x ml water is added

According to the question,

$$\frac{34.2}{90+x} \times 100 = 17.1$$

$$90 + x = 200$$

$$x = 110 \text{ ml}$$

2. In a mixture of 90 litres, the ratio of milk to water 4 : 1 , In another mixture of 90 litres, the ratio of milk to water is 3 : 2, What is the positive difference between the quantities of milk in the two mixtures ?

(a) 22 litres (b) 18 litres
(c) 23 litres (d) 16 litres

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : Amount of milk in Ist mixture-

$$90 \times \frac{4}{5} = 72 \text{ litre}$$

Amount of milk in second mixture

$$90 \times \frac{3}{5} = 54 \text{ litre}$$

Intended difference = (72 – 54) = 18 litres

3. A shopkeeper mixes 30 kg of rice which he purchased at ₹30/kg and 40 kg of rice which he purchased at ₹28/kg and he sells the entire mixture at ₹28/kg. What is the profit or loss percentage (approximated to nearest integer)?

(a) 7% profit (b) 6% loss
(c) 3% loss (d) 5% profit

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (c) : Cost price of rice : Selling price of rice

$$(30\times30+28\times40) : 28\times(30+40)$$

$$(900+1120) : 28\times70$$

$$(90+112) : 196$$

$$202 : 196$$

$$\Rightarrow \text{CP : SP} = 101 : 98$$

$$\text{Loss \%} = \frac{3}{101} \times 100 = 2.97 \approx 3\%$$

4. In a mixture of 80 litres, the ratio of milk to water is 3 : 1 . If this ratio is to be 2 : 3, then the quantity of water to be further added is :

(a) 30 litres (b) 20 litres
(c) 70 litres (d) 50 litres

RRB Group-D 02/09/2022 (Shift-I)

Ans. (c) : In 80 litres mixture

$$\text{Amount of milk} = \frac{3}{4} \times 80 = 60l$$

amount of water = 80 – 60 = 20*l*

Let adding x m*l* water then ratio will be 2 : 3.

So, $\frac{60}{20+x} = \frac{2}{3}$

$$180 = 40 + 2x$$

$$2x = 180 - 40$$

$$x = \frac{140}{2}$$

$$x = 70l$$

5. An alloy is made of aluminium and nickel in the ratio 3 : 4. The quantity (in kg) of nickel required to be melted with 36 kg of aluminium is _____.

(a) 18 (b) 32
(c) 48 (d) 3

RRB GROUP-D–14/09/2022 (Shift-II)

Ans. (c) : Let quantity of aluminium in mixture = 3x

and quantity of Nickel = 4x

According to the question,

$$3x = 36 \text{ kg}$$

$$x = 12 \text{ kg}$$

quantity of aluminimum = 4 × 12 = 48 kg

So, formixture 36 kg aluminimum and 48 kg Nickel will be melt.

6. Out of 10 liters of solution, 2 liters of water is evaporated. The remaining solution contains 6% salt. What is the amount of salt percentage in the original solution ?

(a) 4.8% (b) 5.6%
(c) 5% (d) 5.4%

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) : Amount of solution = 10 litres
According to question, amount of salt in solution =
$(10-2)\times\frac{6}{100}$
$=\frac{48}{100}=0.48$ litres
Amount of salt in the original solution (in %)
$=\frac{0.48}{10}\times100=4.8\%$

7. If mixture contains acid and alcohol in the ratio 3 : 2. On adding 10 ltr of alcohol to this mixture, the ratio of acid to alcohol becomes 3 : 5. What was the amount of acid (in ltr) in original mixture.
(a) 10 (b) 5.5
(c) 5 (d) 4.5

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) : Let the quantity of acid in the original mixture = 3x litres
Quantity of alcohol in the original mixture = 2x litres
According to question –
On adding 10 litres of alcohol to the mixture

$$\frac{3x}{2x+10}=\frac{3}{5}$$
$15x = 6x+30$
$9x = 30$
$\boxed{x=\frac{10}{3}}$
Hence the quantity of acid in the original mixture=3x
$=3\times\frac{10}{3}$
= 10 litres

8. A liquid mixture contains $\frac{1}{5}$ part acid, $\frac{3}{5}$ part alcohol and rest is water. If the total mixture is 20 ltr, find the amount of water (in ltr).
(a) 12 (b) 8
(c) 4 (d) 15

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (c) : Let, the total amount of the mixture = x liters
The amount of acid in the mixture= $\frac{x}{5}$ part
The amount of alcohol in the mixture = $\frac{3x}{5}$ part
Then amount of water in the mixture
$=x-\left(\frac{x}{5}+\frac{3x}{5}\right)=\frac{x}{5}$ part
According to question –

$$\frac{x}{5}+\frac{3x}{5}+\frac{x}{5}=20$$
$\frac{5x}{5}=20$
x = 20 litres
Hence, the amount of water in the mixture
$=\frac{x}{5}=\frac{20}{5}=4$ litres.

9. The ratio of water and milk in a 72 L of mixture is 4 : 5. Then what amount of milk is to be added to this mixture is make the ratio 3 : 6?
(a) 24 L (b) 12 L
(c) 72 L (d) 36 L

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question-
$\frac{W}{M}=\frac{4}{5}\Rightarrow W=\frac{4}{5}M$
$W+M=72$ (where W = water & M = milk)
$\frac{4}{5}M+M=72$

$\frac{9M}{5}=72$
M = 40 litres
then W = 32 litres
Let x liters amount of milk to be added to this mixture
$\frac{32}{40+x}=\frac{3}{6}$
$32\times6 = 120+3x$
$72 = 3x$
x = 24 litres
Hence, 24 litres of milk has to be added to the mixture.

10. How much of an 80% orange juice drink must be mixed with 36 litres of a 25% concentration orange juice drink to concentration obtain a mixture that has 60% orange juice?
(a) 63 litres (b) 60 litres
(c) 40 litres (d) 72 litres

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (a) : Quantity of Juice = $\frac{36\times25}{100}=9$ litres
$\therefore$ Quantity of water = 36 – 9 = 27 litres
Let consider x litre juice of 80% concentration is mixed.
$\therefore$ Quantity of Juice = $=\frac{x\times80}{100}=\frac{4x}{5}$
According to question, $9+\frac{4x}{5}=(36+x)\frac{60}{100}$
$\left(\frac{45+4x}{5}\right)\times10=216+6x$
$90 + 8x = 216 + 6x$
$2x = 126$
x = 63 litres

11. A sample of milk from a vessel contains 4% water. What quantity of pure milk should be added to 8 L of milk in the vessel to reduce the water content to 2%?
(a) 7 L (b) 7.5 L
(c) 8 L (d) 6.5 L

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the m liters of pure milk be added to 8 liters sample of milk.
Let m liters milk should be added.
Therefore, on equalizing only the percentage of water in the mixture.

$8\times4\% = (8+m)2\%$
$32 = 16+2m$
$2m = 32-16$
$2m = 16$
$m = 8$

Therefore, you add 8 liters milk to the mixure, then the 2 percent water available in the mixture.

12. A mixture contains alcohol and water in the ratio of 5 : 4. If 9 liters of water is added to the mixture, the ratio of alcohol to water becomes 4 : 5. Find the quantity of alcohol in the mixture.

(a) 16 liters (b) 24 liters
(c) 28 liters (d) 20 liters

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let quantity of alcohol is 5x liters and quantity of water is 4x liters in the mixture.
According to the question,

$$\frac{5x}{4x+9}=\frac{4}{5}$$
$25x = 16x+36$
$9x = 36$
$x = 4$

Hence, quantity of alcohol $= 5x = 4\times5 = 20$ liters

13. In a bucket, milk and water are mixed in the ratio 2 : 1. If the ratio of milk to water is to be 1 : 2, the quantity of water to be added to the mixture is:

(a) $\frac{1}{3}$ of the bucket. (b) On full bucket.
(c) $\frac{1}{4}$ of the bucket. (d) Half of the bucket.

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let x liters of water be mixed in the bucket.
According to the question,

$$\frac{2}{1+x}=\frac{1}{2}$$
$1 + x = 4$
$x = 3$

Hence, $\frac{\text{Added amount of water}}{\text{Initial total quantity}} = \frac{3}{2+1}=\frac{3}{3}=1$

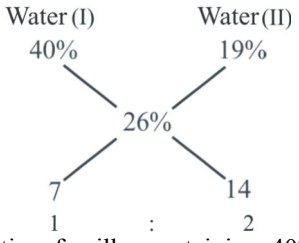
$\therefore$ A full bucket of water was mixed.

14. A jar of milk contains 40% water. A part of it is replaced by another milk containing 19% water. Now the percentage of water is 26%. What quantity of milk was replaced?

(a) 2/3 (b) 2/5
(c) 1/5 (d) 1/3

RRB JE - 25/05/2019 (Shift-II)

Ans : (a)



Hence, The ratio of milks containing 40% water and 19% water respectively = 1 : 2
Therefore, the parts of milk contains 40% milk = $\frac{1}{1+2}=\frac{1}{3}$
The replaced part of milk contains 40% milk $=\frac{2}{3}$

15. How many liters of water must be added to 16 litres of milk containing 10% water to dilute it with 20% water?

(a) 2 litre (b) 4 litre
(c) 1 litre (d) 3 litre

RRB JE - 01/06/2019 (Shift-I)

Ans : (a) Let the quantity of water added in the solution be x liters
Quantity of milk at beginning = quantity of milk at last
$16 \times 90 = (16 + x) \times 80$
$144 = 128 + 8x$
$144 - 128 = 8x$
$16 = 8x$
$x = 2$ liters

16. 4/5 of the mixture of milk and water was milk. If 5 litres of water is added to this mixture of 20*l*, then the percentage of milk in the new mixture will be

(a) 64 (b) 75
(c) 36 (d) 44

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (a) : According to the question,
Quantity of milk in mixture $= 20\times\frac{4}{5}=16\ l$
Quantity of water in mixture $= 20-16 = 4\ l$
The ratio of milk and water after adding 5 l water in Mixture $= 16 : (4 + 5) = 16 : 9$
Milk percentage in new mixture

$$\frac{16}{25}\times100 = 16\times4 = 64\%$$

17. There is 6% of sugar in the 5 litres mixture of sugar, out of which 1 litre of water vaporizer. find the percentage of sugar in this mixture.

(a) 5% (b) 7.5%
(c) 6% (d) 4%

RRB NTPC 28.03.2016 Shift : 3

Ans : (b) Quantity of sugar $=\frac{5\times6}{100}=0.3$ gram
After vaporisation of 1*l* of water remaining mixture = 4 litres

Percentage of sugar in remaining mixture

$$=\frac{0.3}{4}\times 100 = 7.5\%$$

18. Two liquids A and B are mixed an a bucket in the ratio 7:5. If 9 liters of the mixture is replaced by 10 liters of liquids B, the ratio of both the liquids becomes 7:9. How many liters of liquid A was in the bucket.

(a) 25 (b) 22.75
(c) 31 (d) 21

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (b) According to the first condition-
Let liquid A and B is 7x *l*, 5x *l*
Total mixture remaining after removing 9 *l* is (12x–9) *l*
quantity of A in this mixture

$$=(12x-9)\times\frac{7}{12}=\left(\frac{28x-21}{4}\right)l$$

and quantity of $B=(12x-9)\times\frac{5}{12}$

On filling 10 liters liquid

$$=(12x-9)\times\frac{5}{12}+10=\frac{(60x-45)}{12}+10=\frac{60x-45+120}{12}$$

$$=\frac{60x+75}{12}=\left(\frac{20x+25}{4}\right)$$

According to the second condition-

$$\because \left(\frac{28x-21}{4}\right)\times\frac{4}{20x+25}=\frac{7}{9}$$

$$\Rightarrow 7(20x+25)=9(28x-21)$$

$140x + 175 = 252x - 189$
$175 + 189 = 252x - 140x$
$364 = 112x$

$\boxed{x = 3.25}$

Quantity of liquid A was in the bucket = 7x
$= 7\times 3.25 = 22.75\ l$

19. 30 litres of salt solution contains 5% salt. How many litres of water must be added so as to get a resulted solution containing 3% salt?

(a) 20 *l* (b) 25 *l*
(c) 30 *l* (d) 35 *l*

RRB NTPC 16.04.2016 Shift : 3

Ans : (a)

Quantity of salt in 30*l* solution $=30\times\frac{5}{100}=\frac{3}{2}=1.5\ l$

Suppose quantity of mixed water = x *l*
from the question-

$$(30+x)\times\frac{3}{100}=1.5$$

$30 + x = 50 \Rightarrow x = 20\ l$

20. $\frac{2}{3}$ of a milk-water mixture was milk. There was 21 litres of the mixture. If 4 litres of water is added to it, the percentage of milk in the new mixture will be:

(a) 44 (b) 56
(c) 14 (d) 11

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (b) Quantity of milk in mixture $=\frac{2}{3}\times 21 = 14\ l$
and quantity of water $= 7\ l$
According to the question-

$$\text{Percentage of milk} = \frac{\text{quantity of milk}}{\text{quantity of total mixture}}\times 100$$

[$\because$ total mixture after adding 4 *l* of water $= 21 + 4 = 25\ l$]

$$=\frac{14}{25}\times 100$$

Percentage of milk = 56%

21. The ratio of honey and water in 2 containers are 4:3 and 6:7 respectively. How much of the mixture from the second container is to be taken and added with 3.5 litres of mixture from the first container to get the same ratio of honey and water in the new mixture.

(a) 6 *l* (b) 6.5 *l*
(c) 7 *l* (d) 7.5 *l*

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (b) : Suppose the total mixture taken from the second container be x liters.
According to the question-

$$\frac{3.5\times\frac{4}{7}+\frac{6x}{13}}{3.5\times\frac{3}{7}+\frac{7x}{13}}=1$$

$$\frac{2+\frac{6x}{13}}{\frac{3}{2}+\frac{7x}{13}}=1$$

$$\frac{26+6x}{39+14x}=\frac{1}{2}$$

$$52+12x=39+14x$$

$$2x=13$$

$$x=6.5\ l$$

22. The initial ratio of sugar and flour in recipe was 17:28. With 27 kg of the recipe, Elizabeth added more flour to make the sugar to flour ratio 2:5. How much flour did Elizabeth added later?

(a) 8.5 kg (b) 8.7 kg
(c) 8.3 kg (d) 8.1 kg

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (b) : Total quantity of food items = 27 kg.
Ratio of sugar and flour = 17:28

$$\therefore \text{ Quantity of sugar} = \frac{17\times 27}{17+28}=\frac{17\times 27}{45}=\frac{51}{5}\text{ kg.}$$

$$\therefore \text{ Quantity of flour} = \frac{28\times 27}{17+28}=\frac{28\times 27}{45}=\frac{84}{5}\text{ kg.}$$

Suppose x kg of flour is added to it

$$\frac{\frac{51}{5}}{\frac{84}{5}+x}=\frac{2}{5} \quad =\frac{51}{84+5x}=\frac{2}{5}$$

$\Rightarrow 168+10x=255$

$\Rightarrow 10x=255-168=87$

or $\boxed{x=8.7 \text{ kg.}}$

23. A bakery sells breads cakes, puffs and all grain biscuits every day, they use 9 kg of all purpose flour to make useful items. If 20 percent of all purposes of flour is used to make more cakes, so what is the actual quantity of all purpose flour used for making cakes?

(a) 1800 (b) 2000

(c) 1500 (d) 1000

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (a) Suppose, actual quantity of flour for making a cake = x kg

$$x=\frac{9\times 20}{100}=\frac{9}{5}=1.8\text{kg}$$

= 1800 gm

Type - 2

24. 2 litres of a liquid having milk and water in the ratio 3 : 2 is mixed with 3 litres of a liquid having milk and water in the ratio 2 : 3. Find the ratio of milk to water in the new mixure.

(a) 1 : 1 (b) 12 : 13

(c) 5 : 6 (d) 9 : 4

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : Quantity of water and milk-

In 2 litre quantity < quantity of milk $2\times\frac{3}{5}=\frac{6}{5}$ litre; quantity of water $2\times\frac{2}{5}=\frac{4}{5}$ litre

In 3 litre quantity < quantity of milk $3\times\frac{2}{5}=\frac{6}{5}$ litre; quantity of water $3\times\frac{3}{5}=\frac{9}{5}$ litre

$$\text{Intended ratio}=\frac{\frac{6}{5}+\frac{6}{5}}{\frac{4}{5}+\frac{9}{5}}=\frac{12}{13}=12:13$$

25. In a blend of apple juice and orange juice 20% was apple juice. In another blend of the two juices 30% was orange juice. The two blends are mixed in a certain ratio so that the ratio of apple juice and orange juice in the mix was 4:3. Find the ratio of the first blend and the second blend, in that order in the final mix.

(a) 10:29 (b) 5:14

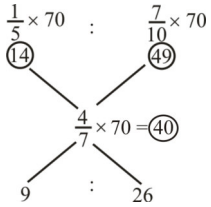
(c) 2:7 (d) 9:26

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (d) :

Mixture I	Mixture II
Apple : Orange	Apple : Orange
20% : 80%	70% : 30%
1 : 4	7 : 3

According to the question,



Hence, the ratio of the initial and final mixture = 9 : 26

26. Two mixtures A and B have the following compositions.

Mixture A has copper and tin in the ratio 1 : 2

Mixture B has copper and tin in the ratio 1 : 3

If equal quantities of mixtures A and B are used for producing mixture C, then find the ratio of copper and tin in mixture C.

(a) 7 : 17 (b) 7 : 12

(c) 2 : 5 (d) 1 : 5

RRB Group-D 28-09-2022 (Shift-II)

Ans. (a) : Quantity of copper,

In Mixture A $=\frac{1}{3}$

And in Mixture B $=\frac{1}{4}$

Quantity of tin

In mixture A $=\frac{2}{3}$

In mixture B $=\frac{3}{4}$

The ratio of copper and tin in mixture C $=\frac{\frac{1}{3}+\frac{1}{4}}{\frac{2}{3}+\frac{3}{4}}$

$$=\frac{4+3}{12}\times\frac{12}{8+9}$$

$$=\frac{7}{12}\times\frac{12}{17}$$

= 7 : 17

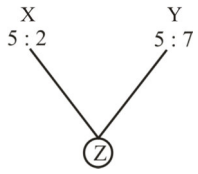
27. X and Y are two alloys of Gold and Platinum prepared by mixing the metals in the ratio of 5 : 2 and 5 : 7, respectively. If we melt equal quantities of the alloys to form a third alloy Z, then the ratio of the quantity of Gold to the quantity of Platinum in Z will be :

(a) 84 : 73 (b) 73 : 95

(c) 95 : 73 (d) 95 : 84

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (c) : According to the question,



$$\text{quantity of gold in 'Z' alloy} = \frac{5}{7}+\frac{5}{12}$$

$$=\frac{60+35}{84}$$

$$=\frac{95}{84}$$

$$\text{quantity of platinum in Z alloy} = \frac{2}{7}+\frac{7}{12}$$

$$=\frac{24+49}{84}$$

$$=\frac{73}{84}$$

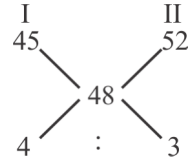
$$\therefore \text{ The required ratio} = \frac{95}{84}:\frac{73}{84} = 95:73$$

28. In what ratio should sugar costing ₹45 per kg be mixed with sugar costing ₹52 kg so that selling at mixture at ₹55.20 per kg, there is a profit of 15%?

(a) 4 : 3 (b) 5 : 4
(c) 3 : 2 (d) 2 : 1

RRB Group-D 01/09/2022 (Shift-II)

Ans. (a) : CP of mixture = $55.20 \times \frac{100}{115} = 48$ per kg



Hence, Ratio = 4 : 3

29. The ratio of milk and water in two vessels is 2:3 and 7:3. Find the ratio of milk and water in the new mixture obtained by mixing the mixture of both the vessels pots (in the third now vesel).

(a) 2:1 (b) 11:9
(c) 3:2 (d) 2:3

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) Required ratio $= \left(\frac{2}{5}+\frac{7}{10}\right):\left(\frac{3}{5}+\frac{3}{10}\right)$

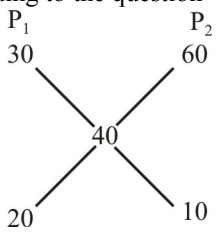
$$=\frac{11}{10}:\frac{9}{10} = 11:9$$

30. In what ratio should 30% potassium nitrate should be mixed with 60% potassium nitrate Solution of get result as solution becomes 40% potassium nitrate in the solution.

(a) 2:1 (b) 3:1
(c) 1:3 (d) 4.5

RRB NTPC 18.04.2016 Shift : 2

Ans : (a) According to the question-



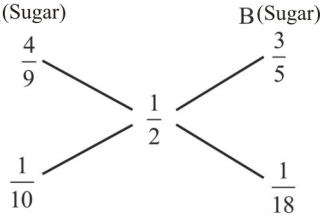
Required ratio = 20 : 10 = 2 : 1

31. Two vessels A and B contain a mixture of sugar and water in the ratio 4:5 and 3:2. In what ratio can these two mixtures be mixed to obtain a new mixture of half sugar and half water.

(a) 2 : 3 (b) 9 : 5
(c) 7 : 5 (d) 2 : 7

RRB NTPC 22.04.2016 Shift : 3

Ans : (b) According to the question-



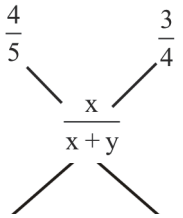
Required ratio $= \frac{1}{10}:\frac{1}{18} = 9:5$

32. Two different mixtures of water and squash in which water squash in the ratio 4 : 1 and 3 : 1 respectively are mixed in the ratio 1 : 2. What is the ratio of water and squash in the final mixture.

(a) 19 : 11 (b) 23 : 7
(c) 17 : 13 (d) 4 : 3

RRB ALP & Tec. (20-08-18 Shift-III)

Ans : (b) Let the ratio of water and squash in the final mixture be x : y.



$$\left(\frac{3}{4}-\frac{x}{x+y}\right):\left(\frac{x}{x+y}-\frac{4}{5}\right) = 1:2$$

$$=\frac{\frac{3}{4}-\frac{x}{x+y}}{\frac{x}{x+y}-\frac{4}{5}} = \frac{1}{2}$$

$$=\frac{3}{2}-\frac{2x}{x+y} = \frac{x}{x+y}-\frac{4}{5}$$

$= \frac{3x}{x+y} = \frac{3}{2} + \frac{4}{5}$

$= \frac{3x}{x+y} = \frac{23}{10}$

$= \frac{x}{x+y} = \frac{23}{30}$

x = 23 and x + y = 30

23 + y = 30

y = 7

Hence, the required ratio = x : y = 23 : 7

33. Two water-squash mixtures, the first with a water-to-squash ratio of 5 : 1 and the latter with a ratio of 3 : 1 are blended in the ratio 3 : 2. What is the final water and squash ratio in the blend ?

(a) 5 : 3 (b) 10 : 9

(c) 6 : 1 (d) 4 : 1

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (d) According to the question-

Required ratio $= \left(\frac{5}{6}\times 3 + \frac{3}{4}\times 2\right) : \left(\frac{1}{6}\times 3 + \frac{1}{4}\times 2\right)$

$= \left(\frac{5}{2} + \frac{3}{2}\right) : \left(\frac{1}{2} + \frac{1}{2}\right) = \frac{8}{2} : \frac{2}{2} = 4 : 1$

34. Four vessels of the same size are filled with a mixtures of milk and water. The milk content in all four vessels are 80%, 75%, 60% and 50% respectively. If all four mixtures are mixed together then what will be the ratio of water and milk in the resultant mixture?

(a) 13 : 27 (b) 27 : 53

(c) 3 :5 (d) 29 : 51

RRB JE - 26/05/2019 (Shift-I)

Ans : (b)

	I	II	III	IV
(M) milk →	80	75	60	50
(W) water →	20	25	40	50
	M : W	M : W	M : W	
	I = 80 : 20 = 4 : 1	II = 75 : 25 = 3 : 1	III = 60 : 40 = 3 : 2	

M : W

IV = 50 : 50 = 1 : 1

According to the question,

$M : W = \left(\frac{4}{5} + \frac{3}{4} + \frac{3}{5} + \frac{1}{2}\right) : \left(\frac{1}{5} + \frac{1}{4} + \frac{2}{5} + \frac{1}{2}\right)$

$\therefore M : W = \left(\frac{16+15+12+10}{20}\right) : \left(\frac{4+5+8+10}{20}\right)$

= 53 : 27

Hence, Required ratio = W : M = 27 : 53

35. From a container of 50 litres pure milk, 10 liters is taken out and replaced by 10 liter of water. If this process is repeated three times, then what is the ratio of water and milk finally.

(a) 7: 16 (b) 9: 16

(c) 61 : 64 (d) 1 : 4

RRB JE - 27/05/2019 (Shift-III)

Ans : (c) Quantity of pure milk in container

$= 50\left(1 - \frac{10}{50}\right)^3 = 50\left(1 - \frac{1}{5}\right)^3$

$= 50 \times \frac{4}{5} \times \frac{4}{5} \times \frac{4}{5} = \frac{128}{5}$ liter

Quantity of water $= 50 - \frac{128}{5}$

$= \frac{250 - 128}{5} = \frac{122}{5}$

water : milk $= \frac{122}{5} : \frac{128}{5} = 61 : 64$

36. The ratio of milk and water in a mixture of 35 litres is 4:1. If we add 7 litres of water to the mixture then how much will be the ratio of milk.

(a) 2 : 7 (b) 2 : 1

(c) 2 : 3 (d) 1 : 3

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (b) : According to the question-

quantity of milk in the mixture $= \frac{4}{5}\times 35 = 28\ l$

quantity of water in mixture $= \frac{1}{5}\times 35 = 7\ l$

On adding 7*l* water

milk : water

28 : (7 + 7)

or 28: 14

or 2 : 1

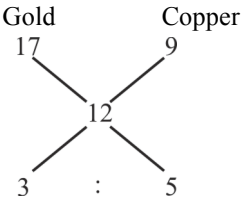
37. Gold is 17 times as heavy as water and 9 times as heavy as copper. The ratio in which these two metals be mixed so that mixture is 12 times as heavy as water is.

(a) 4 : 3 (b) 7 : 1

(c) 3 : 5 (d) 3 : 2

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (c) According to the question-



Hence, it will be mix in the ratio of 3 : 5

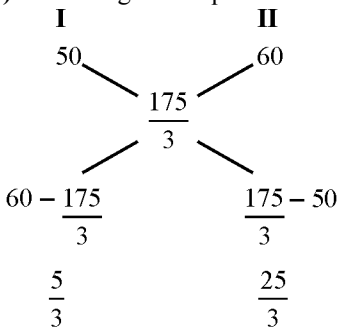
38. The two varieties of rice each costing Rs. 50 per kg and Rs. 60 per kg respectively are mixed in some ratio and the mixed rice is sold at Rs. 70 per kg to get 20% profit. What is the ratio in which the two varieties are mixed?

(a) 3 : 5 (b) 2 : 5

(c) 1 : 5 (d) 2 : 7

RRB JE - 31/05/2019 (Shift-I)

Ans : (c) According to the question-



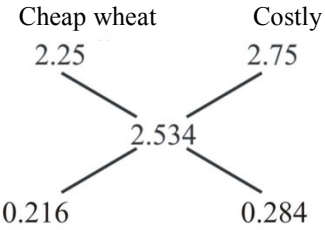
Hence, the required ratio = I : II = 1 : 5

39. In what ratio should a grocer mix wheat at Rs. 2.25 per kg and Rs. 2.75 per kg so that the obtained mixture becomes (approximately) Rs. 2.534 per kg.

(a) 2:3
(b) 3:2
(c) 5:3
(d) 3:4

RRB NTPC 18.04.2016 Shift : 3

Ans : (d) According to the question,



Required ratio = 0.216 : 0.284

$$= \frac{216}{284} = \frac{54}{71}$$

$$\approx \frac{54}{72} = \frac{3}{4} \quad = 3 : 4$$

40. In what ratio should Darjeeling tea costing Rs. 400 per kg be mixed with Assam tea costing Rs. 300 per kg so that by selling the mixture at Rs. 408 per kg there is a profit of 20%.

(a) 1 : 2
(b) 2 : 3
(c) 2 : 5
(d) 1 : 6

RRB NTPC 16.04.2016 Shift : 1

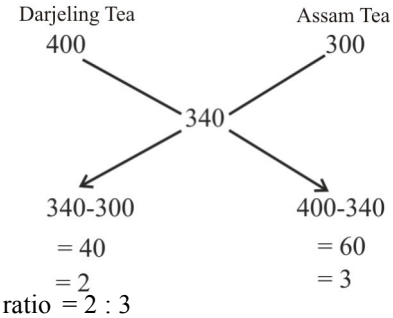
Ans : (b) Selling price of tea = Rs. 408 per kg
and profit = 20%

$$\text{So cost price of tea per kg} = \frac{\text{selling price}}{100 + \text{profit}\,\%} \times 100$$

$$= \frac{408}{100+20} \times 100 \quad = \frac{408}{120} \times 100$$

= Rs. 340 per kg

From the rule of mixture



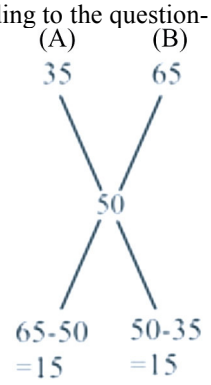
Required ratio = 2 : 3

41. Quality A and B, rice costing Rs. 35 per kg and Rs. 65 per kg respectively are mixed. The new average cost of the mixture obtained is Rs. 50 per kg. the ratio of the quantity of A and B in the mixture will be:

(a) 1:2 (b) 1:3
(c) 1:1 (d) 1:5

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) According to the question-



$$\frac{\text{quantity of A}}{\text{quantity of B}} = \frac{15}{15}$$

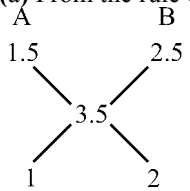
Hence, the required ratio = 1:1

42. The amount of alcohol in two different medicines is 1.5% and 2.5%. In what ratio they should be mixed so that the amount of alcohol in the new obtained mixture is 3.5%

(a) 1 : 2 (b) 2 : 1
(c) 3 : 2 (d) 2 : 3

RRB NTPC 12.04.2016 Shift : 3

Ans : (a) From the rule of mixture,



Hence, the required ratio = 1 : 2

43. The acid and water in the two containers are mixed in the ratio is 3:1 and 5:3 respectively. In order to get a new mixture in which the ratio of acid and water is 2:1, what should be the ratio of both the types of mixture?

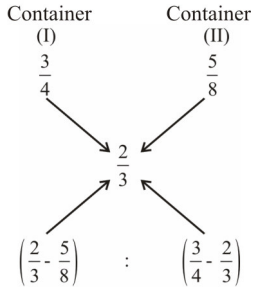
(a) 1:2 (b) 2:1
(c) 2:3 (d) 3:2

RRB NTPC 22.04.2016 Shift : 1

Ans : (a) Acid in first container $= \frac{3}{1+3} = \frac{3}{4}$

Acid in second container $= \frac{5}{3+5} = \frac{5}{8}$

Acid in new mixture $= \frac{2}{1+2} = \frac{2}{3}$



$= \frac{1}{24} : \frac{1}{12} = \boxed{1:2}$

44. Two alloys P and Q are made by miring silver and Aluminium metals in the ratio of 5:3 and 7:9 respectively. If the equal quantity of both alloy are melt to form a new alloy R, then what will be the ratio of silver and aluminium in R?

(a) 17 : 15 (b) 15 : 17

(c) 13 : 17 (d) 17 : 13

RRB NTPC 22.04.2016 Shift : 3

Ans : (a) Ratio of Silver and Aluminium in new alloy R

$= \left[\frac{5}{8} + \frac{7}{16}\right] : \left[\frac{3}{8} + \frac{9}{16}\right] = \frac{17}{16} : \frac{15}{16} = 17 : 15$

45. A person makes a loss of 20% by selling type A tea at the rate of ₹ 160 per kg. By selling type B tea at the rate of ₹ 400 per kg to the same person, there is a profit of 20%. In what ratio should these two types of tea leaves A and B be sold together to get a profit of 25% on tea at the rate of ₹ 300 per kg?

(a) 4 : 5

(b) 3 : 2

(c) 2 : 1

(d) 1 : 2

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (c) Suppose there are x part of A and y part of B

According to the question-

$$\frac{160x + 400y}{x + y} \times \frac{125}{100} = 300$$

$$\frac{160x + 400y}{x + y} \times \frac{5}{4} = 300$$

$160x + 400y = 240 (x + y)$

$(240 - 160)x = (400 - 240)y$

$80x = 160y$

$x = 2y \ , \ \frac{x}{y} = \frac{2}{1}$

$x : y = 2 : 1$

46. There are two mixtures of juice, the ratio of water and juice in the first mixture is 4:3 and in the second mixture is 3:2, both are mixed in the ratio of 1:2 respectively. What will be the ratio of water and juice in the prepared mixture.

(a) 2 : 1 (b) 62 : 43

(c) 58 : 47 (d) 9 : 8

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (b) : Quantity of water in first mixture $= \frac{4}{7}$

and quantity of juice $= \frac{3}{7}$

Quantity of water in second mixture $= \frac{3}{5}$

And quantity of juice $= \frac{2}{5}$

According to the question-

On adding both mixture in the ratio of 1 : 2

Required ratio = 62 : 43

Type - 3

47. A dishonest shopkeeper claims to sell rice at the cost price of ₹95 per kg, but the weight he uses has 1 kg written on it, While it actually weight 950 gms. The profit he thus earns on selling rice having an actual weight of 100 kg rice is:

(a) ₹375 (b) ₹275

(c) ₹500 (d) ₹475

RRB Group-D 29/08/2022 (Shift-I)

Ans. (c) : 950gm → 95

1gm $\rightarrow \frac{95}{950}$

Sp of 1000 gm rice $= \frac{95}{950} \times 1000 =$ ₹ 100

Profit of 1 kg = 100 – 95 = ₹ 5

So, profit at 100 kg = 5 × 100 = ₹ 500

48. A shopkeeper mixes 30 kg wheat costing ₹13.56 per kg with 20 kg wheat costing ₹18.15 per kg. At what rate per kg should he sell the mixed variety of wheat to earn 30% profit (correct to the nearest rupee) ?

(a) ₹ 20 (b) ₹ 15

(c) ₹ 17 (d) ₹ 18

RRB Group-D 08/09/2022 (Shift-II)

Ans. (a) :

Total CP of wheat = 13.56 × 30 + 18.15 × 20

= 406.8 + 363

= ₹ 769.8

SP of total wheat for get 30% profit

$= 769.8 \times \frac{130}{100}$

$= ₹\ 1000.74$

So, Sp of wheat per kg $= \frac{1000.74}{50}$

$= ₹\ 20$ /kg.

49. If 140 g brass is mixed with copper to prepare an alloy having brass and copper in the ratio 4 :3 then how much copper has been taken to prepare the alloy?

(a) 60 g (b) 245 g

(c) 105 g (d) 80 g

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to question,

$\frac{\text{Brass}}{\text{Copper}} = \frac{4}{3}$

$\frac{140}{\text{Copper}} = \frac{4}{3}$

$\text{Copper} = \frac{140 \times 3}{4} = 105\text{g}$

50. A metallic part of a machine is made from a mixture of copper, zinc and lead mixed in the ratio of 13 : 6 : 1. If the weight of zinc in this part is 90 kg, then the total weight of the part will be:

(a) 285 kg (b) 195 kg

(c) 210 kg (d) 300 kg

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) : Let weight of copper in metallic part = 13x

Weight of zinc in metallic part = 6x

Weight of lead in metallic part = x

According to question

6x = 90 kg

x = 15 kg

Hence, Total weight = 13x + 6x + x

= 20x

= 20 × 15

= 300 kg

51. Initially the ratio of sand and cement in a mixture was 9 : 2. After adding 20 kg of sand and 10 kg of cement to the mixture, the ratio of sand and cement becomes 4 : 1. What was the maximum amount of cement in the mixture?

(a) 50 kg (b) 40 kg

(c) 20 kg (d) 30 kg

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : Let the initial quantity of cement = 2x kg

and quantity of sand = 9x kg

According to the question-

$\frac{9x + 20}{2x + 10} = \frac{4}{1}$

9x +20 = 8x + 40

x = 20 kg

So, the initial quantity of cement = 2x = 2×20 = 40 kg

52. Gold and silver are melted together in the ratio 8:12. If 30 kg of gold is consumed then find the weight of the melted mixture.

(a) 58 kg (b) 60 kg (c) 710 kg (d) 75 kg

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : The ratio of Gold and Silver melted together = 8 : 12 ..... (Given)

Let, the weight of gold and silver are 8 x kg and 12x kg respectively.

As per question,

The amount of gold 8x = 30 kg

$x = \frac{30}{8}$ kg

Total weight of melted mixture = 8x + 12x = 20x

$= 20 \times \frac{30}{8} = 75$ kg

53. A container contains 80 litres of milk. From this container, 8 litres of milk is taken out and replaced by water. 8 litres of this mixture is now taken out and again replaced with water. This process is repeated once more. How much milk content in the mixture now?

(a) 58.32 litres (b) 52.12 litres

(c) 50.42 litres (d) 48.32 litres

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (a) :

Amount of milk present in the mixture $= \left(1 - \frac{x}{y}\right)^n \times y$

Where, n = Number of repeatation

x = Amount to be replaced at a time

y = Total amount of milk

∴ Amount of milk in the mixture/remaining amount

$= 80\left(1 - \frac{8}{80}\right)^3 = \frac{8 \times 9 \times 9 \times 9}{100} = 58.32$ liters

54. Two types of rice costing 38 per kg and 42 per kg are mixed in equal quantity is and sold at the rate of 45 per kg. Find the percentage profit.

(a) 10% (b) 12.5%

(c) 18% (d) 15%

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Price of first type of rice = Rs. 38/kg

Price of second type of rice = Rs. 42/kg

Cost price of both type of rice $\frac{38+42}{2}$ = Rs. 40/kg

Selling price of both type of rice = Rs. 45/kg

Profit = selling price − cost price

= 45 – 40 = Rs. 5

Profit % = $\frac{\text{profit}}{\text{cost price}} \times 100 = \frac{5}{40} \times 100 = 12.5\%$

55. What is the quantity of copper in 1 kg of alloy if the alloy contains 32% copper, 40% zinc and the rest is nickel?

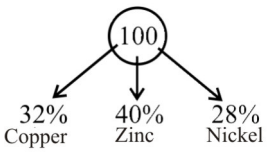
(a) 400 g (b) 280 g

(c) 240 g (d) 320 g

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (d) : Alloy = 1 kg = 1000 g

Let alloy = 100%



Quantity of copper $= 1000 \times \frac{32}{100} = 320\text{g}$

56. If the price of 1.25 kg potato and 2.015 kg tomato is Rs. 35.26, what will be the average price of potato and tomato together (up to two whole digits of decimal).

(a) Rs. 12.32 (b) Rs. 14.04

(c) Rs. 10.80 (d) Rs. 11.95

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (c)

Cost of 1.25 kg potato and 2.015 kg tomato = Rs. 35.26

Average cost $= \frac{35.26}{1.25+2.015}$

$= \frac{35.26}{3.265}$ = Rs. 10.792 = Rs. 10.80

57. The cost price of two varieties of salt T and S is Rs. 25 and 35 per kg respectively are mixed in the ratio of 4:6. The mixed variety is sold at Rs. 37 per kg. What is the profit percentage?

(a) 20% (b) 33%

(c) 25% (d) 38%

RRB NTPC 19.01.2017 Shift : 2

Ans : (a) Total cost of salt T = 25 × 4 = Rs. 100

Total cost of salt S = 35 × 6 = 210

Total cost price = Rs. 310

Total selling price = 37 × 10 = Rs. 370

According to the question-

$\text{selling price} = \frac{\text{cost price}(100 + \text{P/L})}{100}$

$\Rightarrow 370 = \frac{310 \times (100 + \text{P}\%)}{100}$

$\frac{3700 - 3100}{31} = \text{P}\%$

$\frac{600}{31} = \text{P}\%$

P% = 19.35%

P% = 20% (Approx)

58. A tea trader has 3 varieties of tea to sell. Brand A was sold at the rate of Rs. 252 per kg, brand B at Rs. 280 per kg and brand C at Rs. 316 per kg. At the end of the year he finds that now he has 274 kg of brand A, 197 kg of brand B and 54 kg of brand C. He mixes all three and sells the mixture at the rate of Rs. 283.50 per kg. What was his profit or loss on the sale?

(a) Rs. 7565.50 profit

(b) Rs. 7565.50 loss

(c) Rs. 8232.40 profit

(d) Rs. 8125.30 loss

RRB NTPC 28.04.2016 Shift : 1

Ans : (a) Total cost of brand A, B and C

= 252×274 +280×197 + 316×54

= 69048 + 55160 +17064 = 141272

Total price of mixture of brand A, B and C

= (274 + 197 + 54) × 283.50

= 525 × 283.50 = 148837.5

So total profit on the sale = 148837.5 – 141272

= Rs. 7565.50

13.

Pipe & Cistern

Type - 1

1. Two pipes A and B can fill a tank in 21 hours and 18 hours, respectively. If both the pipes are opened simultaneously, then the time taken to fill the tank is:

(a) $9\frac{27}{39}$ hours (b) $11\frac{27}{39}$ hours

(c) $10\frac{27}{39}$ hours (d) $8\frac{27}{39}$ hours

RRB Group-D 05/09/2022 (Shift-III)

Ans. (a) :

Part filled by pipe A in hour $= \frac{1}{21}$ part

Part filled by B in 1 hour $= \frac{1}{18}$ part

Part filled by both (A + B) in 1 hour

$$= \frac{1}{21} + \frac{1}{18} = \frac{6+7}{126} = \frac{13}{126}$$

So, time taken to fill the tank $= \frac{126}{13} = 9\frac{9\times3}{13\times3}$

$$= 9\frac{27}{39} \text{ hours.}$$

2. If two pipes A and B function simultaneously, an empty tank will be filled in 20 hours. If pipe A, working alone, fills this empty tank 9 hours faster than pipe B can fill working alone, then how many hours does it take pipe B to fill this empty tank while working alone?

(a) 45 hours (b) 39 hours

(c) 42 hours (d) 36 hours

RRB GROUP-D – 16/09/2022 (Shift-III)

Ans. (a) : Let pipe B can fill the tank in t hour
and pipe A can fill the tank in (t – 9) hour.
According to the question,

$$\frac{1}{t} + \frac{1}{t-9} = \frac{1}{20} \Rightarrow \frac{t-9+t}{t(t-9)} = \frac{1}{20}$$

$20t - 180 + 20t = t^2 - 9t$

$t^2 - 49t + 180 = 0$

$t^2 - 45t - 4t + 180 = 0$

$t(t - 45) - 4(t - 45) = 0$

$(t - 45)(t - 4) = 0$

$t = 45, 4$

$t = 4$ (neglect) [$\because (4 - 9)$ is a negative value]

So, pipe B will fill the tank in 45 hours.

3. Pipe 1 can empty a tank in 6 h while pipe 2 can do so in 18 h. If both are working together, in how much time they will empty the full tank?

(a) 10 h (b) 5 h

(c) 9 h (d) 4.5 h

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) :

Part of tank emptied by pipe 1 in one hour $= \frac{1}{6}$ part

Part of tank emptied by pipe 2 in one hour $= \frac{1}{18}$ part

Part of tank emptied by both the pipe together $= \frac{1}{6} + \frac{1}{18}$

Hence, the time taken to empty the full tank $= \frac{18}{4} = 4.5$ hours

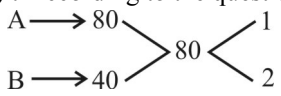
4. Pipe A can fill a tank in 80 mintes and pipe B can fill the tank in 40 mintes. If A and B are opened together, then in how many minutes will the tank be filled?

(a) $26\frac{1}{3}$ (b) $26\frac{2}{3}$

(c) 27 (d) 26

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,



Time taken by A & B to fulfill the tank. $= \frac{80}{3}$

$$= 26\frac{2}{3} \text{ minutes}$$

5. A jug has two holes. First hole empties the jug in 15 minutes. Second hole empties the jug in 20 minutes. If the leakage is taking place at a constant rate, then in how much time the jug will be emptied by the both holes ?

(a) $\frac{4}{7}$ (b) $7\frac{4}{7}$

(c) $8\frac{5}{7}$ (d) $8\frac{4}{7}$

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (d) Part of jug emptied by both holes in one minutes $= \frac{1}{15} + \frac{1}{20} = \frac{4+3}{60} = \frac{7}{60}$

Time taken to empty the jug by both holes $= \frac{60}{7}$

$$= 8\frac{4}{7} \text{ minutes}$$

6. Two pipes can fill a tank in 20 hrs and 30 hrs respectively. If both the pipes are opened, then in how much time the tank will be filled ?

(a) 10 Hours (b) 12 Hours
(c) 18 Hours (d) 15 Hours

RRB JE - 26/06/2019 (Shift-I)

Ans : (b)

Filled part in 1 hour by first pipe $= \frac{1}{20}$

And filled part in 1 hour by second pipe $= \frac{1}{30}$

Filled part in 1 hour by both pipes

$$= \left(\frac{1}{20}+\frac{1}{30}\right) = \left(\frac{3+2}{60}\right) = \left(\frac{5}{60}\right) = \frac{1}{12} \text{ part}$$

So, pipe will fill tank in 12 hours.

7. A tank can be filled by two pipes together in 45/4 minutes. Big pipe can fill the tank in 12 minute less as compared to small pipe. How much time will be taken by the big pipe alone to fill the tank ?

(a) 30 minute (b) 12 minute
(c) 18 minute (d) 24 minute

RRB RPF SI – 05/01/2019 (Shift-II)

Ans. (c) : Let time taken to fill the tank by big pipe = t
Time taken to fill the tank by small pipe = t + 12
As per the question,

$$\frac{1}{t}+\frac{1}{t+12} = \frac{1}{\frac{45}{4}} \Rightarrow \frac{t+12+t}{t(t+12)} = \frac{4}{45}$$

$$90t + 540 = 4t^2 + 48t$$
$$4t^2 - 42t - 540 = 0$$
$$2t^2 - 21t - 270 = 0$$
$$2t(t-18) + 15(t-18) = 0$$
$$(t-18)(2t+15) = 0$$
$$t - 18 = 0$$
$$t = 18 \text{ minute}$$

8. Two pipes A and B can fill a tank in 45 hrs and 36 hrs respectively. If both the pipes are opened together, then how long will it take to fill the tank ?

(a) 10 Hours (b) 20 Hours
(c) 2 Hours (d) 5 Hours

RRB RPF Constable – 25/01/2019 (Shift-III)

Ans : (b) Filled part by Pipe A in one hour $= \frac{1}{45}$

Filled part by Pipe B in one hour $= \frac{1}{36}$

Filled part by both (A+B) in one hour

$$= \frac{1}{45}+\frac{1}{36} = \frac{4+5}{180} = \frac{9}{180} = \frac{1}{20}$$

So the tank will be filled by both pipes together in 20 hours.

9. If two flood gates A and B work together then the reservoir will be filled in 6 hours gate A fills the reservoir 5 hour faster than gate B. The fast flood gate A will fill the reservoir in how many hours?

(a) 5 Hours (b) 10 Hours
(c) 7 Hours (d) 13 Hours

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (b) Suppose flood gate A will fill the reservoir in x hrs. So flood gate B will fill the reservoir in (x + 5) hrs.
As per the question,

$$\frac{1}{x}+\frac{1}{x+5} = \frac{1}{6}$$
$$\frac{x+5+x}{x^2+5x} = \frac{1}{6}$$
$$12x + 30 = x^2 + 5x$$
$$x^2 - 7x - 30 = 0$$
$$x^2 - 10x + 3x - 30 = 0$$
$$(x - 10)(x+3) = 0$$
$$\boxed{x = 10}$$

Hence fast flood gate A will fill the reservoir in 10 hours.

10. Pipe A can fill an empty pool in 14 hours. Together with pipe B it can fill the empty pool in 12 hours. So pipe B can fill the empty pool in ____ hours ?

(a) 84 (b) 75
(c) 78 (d) 77

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (a) Time taken to fill the pool by A =14 hours

Filled part by A in 1 hour $= \frac{1}{14}$ part

Time taken to fill the pool by A and B together = 12 hours

Filled part by A and B in 1 hour $= \frac{1}{12}$ part

Suppose B can fill pool in n hours then filled part by B in 1 hour $= \frac{1}{n}$ part

So,

$$\frac{1}{14}+\frac{1}{n} = \frac{1}{12}$$
$$\frac{1}{n} = \frac{1}{12} - \frac{1}{14}$$
$$\frac{1}{n} = \frac{7-6}{84} \Rightarrow \frac{1}{n} = \frac{1}{84} \Rightarrow \boxed{n = 84}$$

Hence time taken to fill the pool by B = 84 hours

11. A pipe can fill a tank in 12 hrs and the second pipe can fill it in 15 hrs. If both the pipes are opened at the same time, then how much time will it take to fill half of the tank ?

(a) $4\frac{2}{3}$ Hours (b) $3\frac{1}{3}$ Hours
(c) $6\frac{2}{3}$ Hours (d) $2\frac{1}{3}$ Hours

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (b) Filled part of tank by pipe A in 1 hour

$= \frac{1}{12}$ part

Filled part of tank by pipe B in 1 hour $= \frac{1}{15}$ part

Suppose half of the tank will be filled by both pipes in t hours.
As per the question,

$\Rightarrow \quad \frac{t}{12}+\frac{t}{15}=\frac{1}{2}$

$\Rightarrow \quad \frac{5t+4t}{60}=\frac{1}{2}$

$\Rightarrow \quad 9t=30$

$\Rightarrow \quad t=\frac{10}{3}$

$\Rightarrow \quad t=3\frac{1}{3}$ hours

Hence half part of cistern will fill in $3\frac{1}{3}$ hours.

12. Pipe J and K can fill a tank in 15 and 20 minutes respectively. If both the pipes are opened together then, what time will be taken to fill the tank ?

(a) $17\frac{1}{2}$ minute (b) $11\frac{3}{5}$ minute

(c) $15\frac{2}{3}$ minute (d) $8\frac{4}{7}$ minute

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (d) Filled part by pipe J in1 minute = $\frac{1}{15}$ part

Filled part by pipe K in 1 minute = $\frac{1}{20}$ part

Filled part by pipe J and K in 1 minute = $\frac{1}{15}+\frac{1}{20}$

$=\frac{4+3}{60}=\frac{7}{60}$ part

Time taken to fill the whole tank = $\frac{60}{7}=8\frac{4}{7}$ minute

13. Pipe A and B can fill an empty tank in 10 and 15 hrs respectively. Both can fill the tank in ___ hrs.

(a) 6:10 (b) 6

(c) 4 (d) 6:15

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (b) Filled part of tank by pipe A in 1 hour

$=\frac{1}{10}$ Part

Filled part of tank by pipe B in 1 hour $=\frac{1}{15}$ Part

Filled part of tank by pipe A and B in 1 hour $=\frac{1}{10}+\frac{1}{15}$

$=\frac{5}{30}=\frac{1}{6}$ Part

Hence time taken to fill the tank together = 6 hours

14. There are two pipes X and Y to fill an empty tank. Pipe X alone can fill 2/3 part of an empty tank in 10 hrs. Pipe Y alone can fill 1/6 part of an empty tank in 5 hrs. Both pipes following their own relative rate of flow will fill the tank in how many hours ?

(a) 30 Hours (b) 10 Hours

(c) 24 Hours (d) 15 Hours

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans. (b) : Time taken in filling $\frac{2}{3}$ part of tank by pipe X = 10 hours

$\therefore$ Time taken in filling whole tank by pipe X = $10\times\frac{3}{2}$

= 15 hours

Time taken in filling $\frac{1}{6}$ part by pipe Y = 5 hours

$\therefore$ Time taken in filling whole tank by pipe Y = 5 × 6 = 30 hours

Filled part of tank by both pipe X and Y together in 1 hour

$= \frac{1}{30}+\frac{1}{15}=\frac{1+2}{30}=\frac{3}{30}=\frac{1}{10}$

$\therefore$ Time taken in filling whole tank = 10 hours

15. Pipe A and pipe B can fill a tank in 4 and 16 hours respectively. Both can fill the tank in how many hours ?

(a) $\frac{4}{15}$ Hours (b) $\frac{17}{3}$ Hours

(c) $\frac{16}{5}$ Hours (d) $\frac{16}{7}$ Hours

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (c) Filled part by pipe A in 1 hour = $\frac{1}{4}$ Part

Filled part by pipe B in 1 hour = $\frac{1}{16}$ Part

Filled part by pipe A and B in 1 hour

$= \frac{1}{4}+\frac{1}{16}=\frac{4+1}{16}=\frac{5}{16}$ Part

Hence time taken to fill the whole tank = $\frac{1}{5/16}$

$=\frac{16}{5}$ Hours

16. Two pipes A and B can fill a tank in X minute and 6 minute respectively. If both the pipes are working together, then they fill the tank in 1.5 minute. Find the value of X ?

(a) 1 minute (b) 2 minute

(c) 4 minute (d) 5 minute

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (b) According to the question,

$\frac{1}{X}+\frac{1}{6}=\frac{1}{1.5}$

$\Rightarrow \frac{6+X}{6X}=\frac{1}{1.5}$

$\Rightarrow \quad 1.5(6+X)=6X$

$\Rightarrow \quad 9+1.5X=6X$

$\Rightarrow \quad 6x-1.5X=9$

$\Rightarrow \quad 4.5X=9$

$\Rightarrow X=\frac{9}{4.5}$

X = 2 minute

17. There are two holes in a water tank. Hole 1 alone takes 9 minutes to empty the tank and hole 2 alone can empty the tank in 6 minutes. If the leakage occurs at a fixed rate then by working the both pipes the tank will be emptied in how many minutes ?

(a) $3\frac{3}{5}$ (b) $\frac{3}{5}$

(c) $3\frac{1}{5}$ (d) $3\frac{2}{5}$

RRB NTPC 17.01.2017 Shift-1

Ans : (a) Emptied part of the tank by hole- 1 in 1 minute $= \frac{1}{9}$

Emptied part of the tank by hole-2 in 1 minute $= \frac{1}{6}$

Emptied part of the tank by hole-1 and hole-2 of tank in 1 minute

$$= \frac{1}{9}+\frac{1}{6} = \frac{9+6}{9\times 6} = \frac{15}{54}$$

Time taken by both hole together to empty the tank $=$

$$= \frac{54}{15} = \frac{18}{5} = 3\frac{3}{5} \text{ minutes}$$

18. A container has two holes. The first hole can empty the container individually in 15 minutes and the second hole can empty the container individually in 10 minutes. If the leakage occurs at a fixed rate in the container, then by the both holes opening together, the container will be emptied in how many minutes ?

(a) 6 (b) $\frac{1}{6}$

(c) $\frac{1}{7}$ (d) 7

RRB NTPC 17.01.2017 Shift-3

Ans : (a) Emptied part of the container by hole-1 in 1 minute $= \frac{1}{15}$ part

Emptied part of the container by hole-2 in 1 minute $= \frac{1}{10}$ part

Emptied part of the container by both holes in 1 minute

$$= \frac{1}{15}+\frac{1}{10} = \frac{25}{150} \text{ part}$$

Hence the time taken by hole-1 and holes 2 to empty the container $= \frac{150}{25} = 6$ minute

19. There are two holes in a tank. First hole empties the tank in 3 minutes. The second hole empties the tank in 5 minutes. If the leakage occurs at a fixed rate, then how much time will be taken by the both holes to empty the tank?

(a) $\frac{7}{8}$ (b) $2\frac{7}{8}$

(c) $1\frac{5}{8}$ (d) $1\frac{7}{8}$

RRB NTPC 26.04.2016 Shift : 2

Ans : (d) The tank emptied in 1 minute by the first hole $= \frac{1}{3}$ part

The tank emptied in 1 minute by the second hole $= \frac{1}{5}$ part

$\therefore$ Emptied part of the tank by both holes in 1 minute

$$= \frac{1}{3}+\frac{1}{5} = \frac{5+3}{15} = \frac{8}{15} \text{ part}$$

Hence the entire tank will be empty in $\frac{15}{8} = 1\frac{7}{8}$ minute

20. A bowl has two holes. First hole alone can empty the bowl in 4 minutes. The second hole alone can empty the bowl in 12 minutes. If the leakage occurs at a fixed rate, then both holes will empty the bowl in how much time?

(a) 1.33 (b) 3.5

(c) 4 (d) 3

RRB NTPC 30.04.2016 Shift : 3

Ans : (d) Emptied part of the bowl in 1 minute by both holes together $= \frac{1}{4}+\frac{1}{12}$

$$= \frac{3+1}{12} = \frac{4}{12} = \frac{1}{3}$$

Hence required time = 3 minute

21. Two pipes X and Y can individually fill a tank in 48 and 72 minutes, respectively. If they are opened simultaneously, how long will it take for the tank to fill?

(a) 39.4 minutes (b) 60 minutes

(c) 28.8 minutes (d) 24 minutes

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (c) : Filled part of the tank by pipes X and Y in 1 minute

$$= \frac{1}{48}+\frac{1}{72} = \frac{72+48}{48\times 72} = \frac{120}{3456} \text{ part}$$

Time taken by pipe X and Y to fill the whole tank

$$= \frac{3456}{120} = 28.8 \text{ minute}$$

22. Two pipes 'P' and 'Q' together can fill a tank in 4 hrs. When both the pipes are opened individually then Q takes 6 hours more as compared to P to fill the tank. P alone can fill the tank in how much time?

(a) 5 hours (b) 6 hours

(c) 8 hours (d) 7 hours

RRB JE - 02/06/2019 (Shift-I)

Ans : (b) Suppose pipe P takes x hours to fill the cistern then Q will take time to fill cistern $= x + 6$ hrs

filled part by (P + Q) in 1 hour $= \frac{1}{4}$

filled part by P in 1 hour $= \frac{1}{x}$

filled part by Q in 1 hour $= \frac{1}{x+6}$

According to the question,

$$\frac{1}{x}+\frac{1}{x+6} = \frac{1}{4}$$

$$\frac{(x+6)+(x)}{x(x+6)}=\frac{1}{4}$$

$(2x + 6) \times 4 = x^2 + 6x$

$8x + 24 = x^2 + 6x$

$x^2 - 2x - 24 = 0$

$x^2 - (6-4)x - 24 = 0$

$(x^2 - 6x) + (4x - 24) = 0$

$x(x - 6) + 4(x - 6) = 0$

$(x + 4)(x - 6) = 0$

$x - 6 = 0, x = 6$

Hence P can fill the tank in 6 hours

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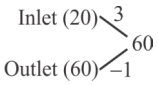
23. One pipe can fill the tank in 20 min while another pipe can empty it in 60 min. If both the pipes are operated together.

(a) 20 min (b) 10 min

(c) 40 min (d) 30 min

RRB Group-D 01/09/2022 (Shift-II)

Ans. (d) :



Work done by both pipe in 1 minute = 3–1 = 2 unit

Time taken by both pipe to fill the tank completely =

$$\frac{60}{2}=30 \text{ min}$$

24. A pipe can fill an empty tank in 15 minutes while another pipe can empty the same tank, when completely full, in 20 minutes. How much time (in minutes) will it take to completely fill the empty tank if both the pipes are opened simultaneously ?

(a) 54 (b) 60

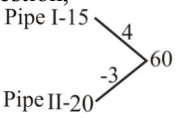
(c) 48 (d) 56

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Pipe 'I' fill the empty tank

Pipe 'II' empty the completely full the tank.

According to the question,



$\therefore$ Time taken to fill the tank completely $=\frac{60}{4-3}$

$$=\frac{60}{1}=60 \text{ min}$$

25. An inlet pipe can fill a tank in 4h and an outlet pipe can empty the tank in 6h. By mistake, both the pipe are kept open. Find the number of hours in which the tank will be half-full.

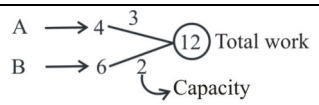
(a) 12 h (b) 10 h

(c) 6 h (d) 8 h

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let inlet pipe = A

Outlet pipe = B



$\because$ Time taken by both the pipes to fill the tank half-full. $=\frac{(12/2)}{3-2}=6$ hour

26. Pipe A can fill an empty tank in 14 hours. A and B can fill the same tank in 10 hours. Pipe B alone can fill this empty tank in how many hours ?

(a) 35 (b) 20

(c) 30 (d) 25

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (a) According to the question,

Pipe A fills the empty tank in 1 hour $=\frac{1}{14}$ Part

Empty tank fills by (A+B) in 1 hour $=\frac{1}{10}$ Part

Filled part of the tank by pipe B in 1 hr $=\frac{1}{10}-\frac{1}{14}$

$$=\frac{14-10}{140}$$

$$=\frac{4}{140}=\frac{1}{35} \text{ Part}$$

Hence pipe B alone will fill the tank in 35 hours.

27. A pipe can fill a tank in 20 minutes, but an outlet pipe can empty it in 28 minutes. When both the pipes are opened, then in how much time the tank will be filled?

(a) 72 minutes (b) 56 minutes

(c) 96 minutes (d) 70 minutes

RRB JE - 28/05/2019 (Shift-I)

Ans : (d) Filled part by first pipe in 1 minute $=\frac{1}{20}$

Emptied part by out let pipe in 1 minute $=\frac{1}{28}$

Filled part in 1 minute by both pipe $=\frac{1}{20}-\frac{1}{28}$

$$=\frac{28-20}{20\times 28}=\frac{8}{20\times 28}=\frac{1}{70} \text{ part}$$

So, time taken to filled the tank = 70 minute

28. $2/5^{th}$ part of tank A is filled with water. Pipe P can fill it in 10 minutes, while pipe Q can empty it in 6 minutes. If P and Q are opened together, then in how much time tank will be emptied?

(a) 6 minute (b) 6.5 minute

(c) 5.5 minute (d) 7 minute

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (a) 1 minute work of pipe P and Q $=\frac{1}{10}-\frac{1}{6}$

$$=\frac{3-5}{30}=\frac{-2}{30}=\frac{-1}{15} \text{ part}$$

Time taken by P and Q to empty 2/5 part of the tank

$$=\frac{\frac{2}{5}}{\frac{1}{15}}=\frac{2}{5}\times\frac{15}{1}=6 \text{ minute}$$

29. A tank can be filled in 9 hours but due to a leakage, it takes 1 hour more. If tank is completely full, then due to leakage it will be empty in how much time?

(a) 60 hours (b) 75 hours
(c) 30 hours (d) 90 hours

RRB JE - 01/06/2019 (Shift-III)

Ans. (d) Filled part of the tank in 1 hour $= \frac{1}{9}$ part

Filled part of the tank in 1 hour after leakage $= \frac{1}{10}$ part

Emptied part of the tank by leakage in 1 hour $= \frac{1}{9} - \frac{1}{10}$

$= \frac{10-9}{90} = \frac{1}{90}$

Hence tank will be empty by leakage in 90 hours.

30. 2/5 part of a water tank is filled. Pipe A can fill the tank in 12 minutes and pipe B can empty the same tank in 6 minute. If both pipes are opened together, then to fill the empty tank or to empty the full tank, what time will be taken?

(a) It will fill in 4.8 minutes.
(b) It will empty in 5.6 minutes.
(c) It will empty in 4.8 minutes.
(d) It will fill in 5.6 minutes.

RRB RPF SI – 10/01/2019 (Shift-II)

Ans. (c) Filled part of the tank by pipe A in 1 minute $= \frac{1}{12}$

Emptied part of the tank by pipe B in 1 minute $= \frac{1}{6}$

Suppose, time taken to fill tank completely or empty full tank $= t$ minute

According to the question,

Time taken by both pipe to empty or fill the tank

$= \frac{t}{12} - \frac{t}{6} = \frac{2}{5}$

$\Rightarrow \frac{t-2t}{12} = \frac{2}{5}$

$\Rightarrow \frac{-t}{12} = \frac{2}{5}$

$\Rightarrow t = -4.8$ minute

where (–) indicates of emptying the tank.

31. Pipe A can fill a tank in X hours. Pipe B can empty it in 15 hours. If both the pipers are opened together, then the tank will be filled in 7 hours and 30 minutes. Find the value of x?

(a) 8 (b) 5
(c) 10 (d) 9

RRB ALP CBT-2 Physics & Maths 21-01-2019 (Shift-II)

Ans. (b) : Part filled by pipe A in 1 hour $= \frac{1}{x}$

Part emptied by pipe B in 1 hour $= \frac{1}{15}$

According to the question,

$\frac{1}{x} - \frac{1}{15} = \frac{1}{7 \text{ hr } 30 \text{ minutes}}$

$\frac{1}{x} - \frac{1}{15} = \frac{1}{7 + \frac{1}{2}}$

$\frac{15-x}{15x} = \frac{2}{15}$

$2x = 15 - x$

$3x = 15$

$\boxed{x = 5 \text{ hours}}$

32. A pipe can fill an empty cistern in 7.8 hours while another can empty the cistern when full in 19.5 hours. Both the pipes were turned on when the cistern was half-empty. How long will it take for the cistern to be full?

(a) 5.2 hours (b) 3.9 hours
(c) 7.8 hours (d) 6.5 hours

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (d) : Filled part of the cistern by first pipe in one hour $= \frac{1}{7.8}$

Emptied part of the cistern by second pipe in one hour $= \frac{1}{19.5}$

Filled part of the cistern by both pipes in one hour

$= \frac{1}{7.8} - \frac{1}{19.5}$

$= \frac{19.5-7.8}{19.5 \times 7.8} = \frac{11.7}{152.1}$

Time taken to fill whole cistern $= \frac{152.1}{11.7}$ hour

Now time taken to fill remaining half part of cistern $= \frac{152.1}{11.7} \times \frac{1}{2}$

$= \frac{152.1}{23.4} = 6.5$ hours

33. A pipe can fill a tank in 7/4 hours while the other pipe can empty the full tank in 21/8 hours. Both pipes were opened at that time when the tank was 2/3 empty. How much time will be taken to fill the tank?

(a) 3 hours 20 minute (b) 3 hours 30 minute
(c) 3 hours 45 minute (d) 3 hours 15 minute

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (b) Suppose it takes t hours to fill the tank.

According to the question-

$\frac{t}{\frac{7}{4}} - \frac{t}{\frac{21}{8}} = \frac{2}{3}$

$\frac{4t}{7} - \frac{8t}{21} = \frac{2}{3}$

$\Rightarrow \frac{12t-8t}{21} = \frac{2}{3}$

$\Rightarrow \frac{4t}{21} = \frac{2}{3}$

$\Rightarrow t = \frac{2 \times 21}{3 \times 4}$

$\Rightarrow t = \frac{7}{2}h$

$\Rightarrow t = 3\frac{1}{2}$

$\Rightarrow t = 3 : \frac{1}{2} \times 60$

$\Rightarrow t = 3h : 30\,min$

Hence it will take 3 hours 30 minutes to fill the tank.

34. A tap can fill the tank in 25 minutes and the other can empty the tank in 50 minutes. If both the taps are opened simultaneously, then what time will the tank be filled in time?

(a) 1 hour, 5 minutes (b) 50 minutes
(c) 55 minutes (d) 1 hour, 5 minutes

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (b) : Suppose filling tank = A
Emptying tank = B

Filled part of tank by Tap A in 1 minute $= \frac{1}{25}$

Emptying part of tank by Tap B in 1 minute $= \frac{1}{50}$

Hence filled part of tank in 1 minute by both tap =

$$= \frac{1}{25} - \frac{1}{50} = \frac{2-1}{50} = \frac{1}{50}$$

Hence time taken to fill whole tank = 50 minute

35. A tank has two taps. One tap can fill the tank in 8 hours and the second tap can empty it in 10 hours. If the both taps were opened together, then what time will be taken to fill the tank?

(a) 40 (b) 20
(c) 30 (d) 50

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (a) $\therefore$ Filled part of tank in one hour

$$= \frac{1}{8} - \frac{1}{10} = \frac{1}{40}$$

$\therefore$ Time taken to fill the tank = 40 hours

36. A tank has two taps, first fills water in tank, and second empties the tank. Tank is filled in 4 hours, when only first tap opened and filled in 12 hours when both taps opened. How much time is taken to empty the full tank when only second tap is opened?

(a) 10 hours (b) 4 hours
(c) 6 hours (d) 8 hours

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (c) Filled part of tank in 1 hour by first tap

$$= \frac{1}{4} \text{ part}$$

Filled part of tank in 1 hour by both tap $= \frac{1}{12}$ part

$\therefore$ Filled part of tank in 1 hour by second tap

$$= \frac{1}{4} - \frac{1}{12} \text{ part}$$

$$= \frac{3-1}{12}$$

$$= \frac{2}{12} = \frac{1}{6} \text{ part}$$

Hence second tap will empty the filled part in 6 hours

37. Tank has two taps. Tap A is to fill the tank and tap B is to empty the tank. If only tap A can fill the tank in 35 hours, then only tap B can empty the full tank in 70 hours. Find the time taken to fill the half filled tank?

(a) 35 hours (b) 40 hours
(c) 70 hours (d) 55 hours

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (a) : Filled portion of tank in 1 hour by tap A $= \frac{1}{35}$

Emptied part of tank in 1 hour by tap B $= \frac{1}{70}$

Suppose time taken to fill half empty tank completely = t hours

According to the question-

$\frac{t}{35} - \frac{t}{70} = \frac{1}{2}$

$\frac{2t-t}{70} = \frac{1}{2}$

$\frac{t}{70} = \frac{1}{2}$

t = 35 hours

Hence It will take 35 hours to fill the half empty cistern completely.

38. A tap can fill a tank completely in 1 hour 30 min but due to leakage in the tank it takes 2 hours and 15 minutes. What time will be taken to empty the tank due to leakage?

(a) 45 minute (b) 4 hours 30 minute
(c) 1 hours 30 minute (d) 2 hours 45 minute

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (b) 1 hour 30 minute = 90 minute

2 hour 15 minute = 135 minute

According to the question-

Emptied part of tank in 1 minute because of leakage

$$= \frac{1}{90} - \frac{1}{135} = \frac{3-2}{270} = \frac{1}{270}$$

Hence time taken to empty the cistern = 270 minutes= 4 hours 30 minute

39. A tank has two pipes. Pipe M is to fill the tank and pipe N is to empty the tank. If pipe M takes 45 hours to fill the tank completely and N takes 90 hours to empty the tank completely. Then how much time will it take to fill the half empty tank?

(a) 45 hours (b) 35 hours
(c) 60 hours (d) 40 hours

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (a) Filled part of tank by pipe M and N in 1 hour

$$= \frac{1}{45} - \frac{1}{90} = \frac{2-1}{90} = \frac{1}{90}$$

Time taken by M and N to fill whole tank = 90 hours

$\therefore$ Time taken to fill half part of the tank $= \frac{90}{2} = 45$ hours

40. A tank normally gets filled in 8 hours, but due to leakage in its surface, it takes two hour more to get filled. If the tank is full, then the leakage will empty it in ____?

(a) 20 hours (b) 40 hours
(c) 30 hours (d) 10 hours

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (b)

Filled part in 1 hour $= \frac{1}{8}$

Due to leakage, time taken to fill whole tank $= 8 + 2 =$ 10 hours

Filled part of the tank in 1 hour after leakage $= \frac{1}{10}$

Emptied part of tank in 1 hour by leakage

$$= \frac{1}{8} - \frac{1}{10} = \frac{5-4}{40} = \frac{1}{40} \text{ part}$$

Hence due to leakage tank will empty in 40 hours.

41. A tube can fill a tank in 15 hours. Due to leakage in its bottom, it gets filled in 20 hours. If the tank is fully filled, then due to leakage it will get empty in how much time?

(a) 20 hours (b) 60 hours
(c) 32 hours (d) 40 hours

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (b) Time taken to fill the tank by the tube = 15 hours

Filled tank in 1 hour $= \frac{1}{15}$ part

Because of leakage time taken to fill tank = 20 hours

Hence, filled tank in 1 hour $= \frac{1}{20}$ part

Suppose tank will be empty in x hours by leakage

So, $\frac{1}{x} = \frac{1}{15} - \frac{1}{20}$

$\frac{1}{x} = \frac{4-3}{60} = \frac{1}{60}$

x = 60 hours

42. It takes 12.5 minute for an utensil to get fully filled with juice. By this utensil the children drink juice at a fixed rate due to which the utensil is emptied in 25 minutes. By the present rate how much time will be taken to fill the utensil?

(a) 20 minute (b) 12.5 minute
(c) 25 minute (d) 30 minute

RRB NTPC 18.01.2017 Shift : 3

Ans : (c) Filled part of the utensil in 1 minute.

$= \frac{1}{12.5} - \frac{1}{25} = \frac{10}{125} - \frac{1}{25} = \frac{10-5}{125}$

$= \frac{5}{125} = \frac{1}{25}$

Hence utensil will fill in 25 minutes.

43. An oil tank takes 15 minutes to be filled. The oil tank is emptied by an outlet pipe which can empty it in 30 minutes. If this outlet pipe remains open, then how much time will it take to fill the tank completely?

(a) 20 minute (b) 25 minute
(c) 30 minute (d) 40 minute

RRB NTPC 28.04.2016 Shift : 3

Ans : (c) If outlet pipe is open then filled part in 1 minute $= \frac{1}{15} - \frac{1}{30} = \frac{30-15}{15\times 30}$

Time taken to fill the tank $= \frac{30\times 15}{30-15} = \frac{30\times 15}{15} =$ 30 minute

44. A pump can fill a tank in 4 hours, but due to a leakage, the tank now gets filled in 5 hours. How long will it take the leakage to empty the tank when it is full?

(a) 20 hours (b) 9 hours
(c) 1 hour (d) 4.5 hours

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (a) Let it will take 't' hours to empty the full tank. Then-

$\frac{1}{4} - \frac{1}{t} = \frac{1}{5}$

$\frac{1}{t} = \frac{1}{4} - \frac{1}{5}$

$\frac{1}{t} = \frac{5-4}{20}$

$\frac{1}{t} = \frac{1}{20}$

Hence, tank will empty in 20 hours

45. One pipe can fill an empty cistern in 4 hours while another can drain the cistern when full in 10 hours. Both the pipes were turned on when the cistern was half-empty. How long will it take to fill the cistern completely?

(a) 6 hours 40 minutes (b) 5 hours 30 minutes
(c) 4 hours 20 minutes (d) 3 hours 20 minutes

RRB ALP & Tec. (13-08-18 Shift-III)

Ans : (d) According to the question-

Filled part by first pipe in 1 hour $= \frac{1}{4}$,

Emptied part in 1 hour by second pipe $= \frac{1}{10}$

Filled part in 1 hour by first and second pipe

$$= \left(\frac{1}{4} - \frac{1}{10}\right) = \frac{5-2}{20}$$

$$= \frac{3}{20} \text{ part}$$

$\because$ Half part of cistern is filled.

Hence remaining part of cistern $= 1 - \frac{1}{2} = \frac{1}{2}$

$\because$ Time taken to fill $\frac{3}{20}$ portion $=$ 1 hour

$\therefore$ Time taken to fill $\frac{1}{2}$ portion $= \frac{20}{3} \times \frac{1}{2} = \frac{10}{3}$ hours

$=$ 3 hours 20 minute

46. Pipe A can fill a tank in 12 hours. Pipe B can empty it in X hours. If both the pipes are opened simultaneously, the tank will be filled in 30 hours. Find the value of X:

(a) 24 (b) 20
(c) 15 (d) 25

RRB ALP CBT-2 Electrician 23-01-2019 (Shift-II)

Ans. (b) : Pipe A fill the tank in 1 hour $= \frac{1}{12}$ part

Pipe B empty the tank in 1 hour $= \frac{1}{X}$ part

Both pipe fill the tank in 1 hour $= \frac{1}{30}$ part

According to the question,

$$\frac{1}{12}-\frac{1}{X}=\frac{1}{30}$$

$$\frac{1}{X}=\frac{1}{12}-\frac{1}{30}$$

$$\frac{1}{X}=\frac{3}{60}=\frac{1}{20}$$

Hence, pipe B will enpty the tank in 20 hr.

Type - 3

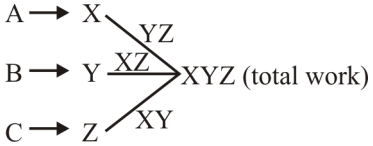
47. If pipe A can fill a cistern in X hours, pipe B can fill the same cistem in Y hours, and pipe C and empty the full cisten in Z hours, then the time taken to completely fill the cistern, if pipes A, B and C are opened to gather.

(a) $\frac{XYZ}{YZ+XZ-XY}$ (b) $\frac{XYZ}{YZ+XZ+XY}$

(c) $\frac{XYZ}{YZ-XZ-XY}$ (d) $\frac{XYZ}{YZ-XZ+XY}$

RRB Group-D 29-09-2022 (Shift-II)

Ans. (a) : According to the question,



Time taken to completely fill the tank, by

$$(A+B+C)=\frac{XYZ}{YZ+XZ+XY}$$

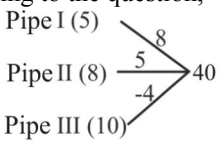
48. Two pipes A and B can fill a tank completely in 5 hours and 8 hours, respectively. Pipe C can empty the tank completely in 10 hours. If all three pipes are opened simultaneously in an empty tank, then how much time will it take to fill the tank completely ?

(a) $4\frac{4}{9}$ hours (b) 6 hours

(c) 3 hours (d) $4\frac{2}{9}$ hours

RRB GROUP-D – 19/09/2022 (Shift-II)

Ans. (a) : According to the question,



Time taken to fill the tank $= \frac{40}{8+5-4}=\frac{40}{9}$

$= 4\frac{4}{9}$ hours

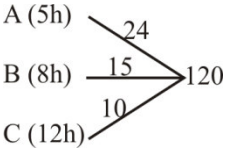
49. Three pipes A, B and C can fill a tank in 5 hours, 8 hours and 12 hours, respectively. If all the pipes are opened at the same time, then the time taken to fill the tank is:

(a) $4\frac{22}{49}$ hours (b) $2\frac{22}{49}$ hours

(c) $5\frac{22}{49}$ hours (d) $3\frac{22}{49}$ hours

RRB Group-D 05/09/2022 (Shift-I)

Ans. (b) : According to the question,



So, time taken to fill the tank by all three pipes

$= \frac{120}{24+15+10}=2\frac{22}{49}$ hours

50. A cistern has three pipes A, B and C. A and B alone can completely fill the cistern in 4 hours and 3 hours, respectively, and C can empty the completely filled cistern in 2 hours. If all the three pipes are opened simultaneously in the empty cistern, then the cistern will get completely full in:

(a) 16 hours (b) 12 hours

(c) 14 hours (d) 10 hours

RRB Group-D 05/09/2022 (Shift-III)

Ans. (b) : Part filled by pipe A in 1 hour $= \frac{1}{4}$ part

Part filled by pipe B in 1 hour $= \frac{1}{3}$ part

Part filled by pipe in 1 hour $= \frac{1}{3}$ part

Part filled by all three pipes in 1 hour $= \frac{1}{4}+\frac{1}{3}-\frac{1}{2}$

$$= \frac{3+4-6}{12}$$

$$= \frac{7-6}{12}$$

$$= \frac{1}{12}$$

So, time taken to fill the tank = 12 hours

51. Pipe A can fill a cistern in 6 hours and B can fill it in 30 hours. Both pipes were turned on but there was a leakage in the bottom of the cistern. So, the cistern took 30 minutes more to fill. The time that the leakage will take to empty the full cistern is :

(a) 54 hours (b) 65 hours
(c) 60 hours (d) 55 hours

RRB Group-D 09/09/2022 (Shift-I)

Ans. (d) : Part filled by pipe A in 1 hour $= \frac{1}{6}$

Part filled by pipe B in 1 hour

In intially stage, time taken by both pipe to fill the tank in 1 hour.

$$= \frac{1}{6} + \frac{1}{30} = \frac{5+1}{30} = \frac{6}{30} = \frac{1}{5}$$

Due to leakage let the time taken in x hours to empty the tank.

According to the question,

$$\frac{1}{6} + \frac{1}{30} - \frac{1}{x} = \frac{1}{5 + \left(\frac{30}{60}\right)}$$

$$\Rightarrow \quad \frac{5+1}{30} - \frac{1}{x} = \frac{1}{5 + \frac{1}{2}}$$

$$\Rightarrow \quad \frac{6}{30} - \frac{1}{x} = \frac{2}{11}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{6}{30} - \frac{2}{11}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{66-60}{30 \times 11}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{6}{30 \times 11}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{1}{5 \times 11}$$

$$\frac{1}{x} = \frac{1}{55}$$

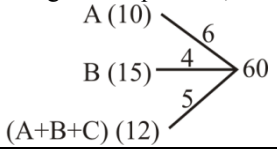
So, x = 55 hours

52. If three taps are opened together, a tank is filled in 12 hrs. One of the taps can fill it in 10 hrs and another in 15 hrs, whereas the third pipe is a drainpipe that empties the tank. In how much time can the third pipe can empty the filled tank when no other pipe is open?

(a) 9 hrs (b) 10 hrs
(c) 11 hrs (d) 12 hrs

RRB GROUP-D – 19/09/2022 (Shift-II)

Ans. (d) : According to the question,



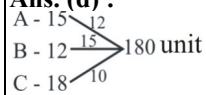
So, By third pipe 'C', time taken to empty the tank $= \frac{60}{5} = 12$ hours

53. Three pipes A, B, & C may fill a tank in 15 hrs, 12 hrs and 18 hrs respectively. If both pipes A and C are opened at same time, then how much time they will take to fill the tank.

(a) $6\frac{5}{9}$ (b) $9\frac{3}{5}$
(c) $7\frac{2}{3}$ (d) $8\frac{2}{11}$

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) :



On opening pipe A and pipe C together –

Time taken to fill the tank $= \frac{180}{12+10}$

$$= \frac{180}{22} = \frac{90}{11} = 8\frac{2}{11} \text{ hours}$$

54. Tap A can fill a tank in 6 h, whereas Tap B can fill it in 8h. Tap C can empty the same tank in 4h. If all the taps are opened together, how much time will it take to fill the tank?

(a) 26 h (b) 24 h
(c) 20 h (d) 22 h

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

In 1 hour, Tap A will fill tank $= \frac{1}{6}$ part

In 1 hour, Tap B will fill tank $= \frac{1}{8}$ part

In 1 hour, Tap C will empty the same tank $= \frac{1}{4}$ part

All taps are opened together, the part filled in 1 hour.

$$= \frac{1}{6} + \frac{1}{8} - \frac{1}{4} = \frac{4+3-6}{24}$$

$$= \frac{1}{24} \text{ part}$$

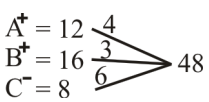
Hence, the tank will be filled completely in 24 hours when all the taps are opened together.

55. A tank has two inlet pipe A and B which can fill it in 12 hours and 16 hours respectively. An outlet pipe C can empty the filled tank in 8 hours. If all three pipes are opened together when the tank is empty, then how much time will it take to fill the tank?

(a) 20 hours (b) 40 hours
(c) 36 hours (d) 48 hours

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) :



Time taken to fill the tank

$= \frac{48}{(4+3)-6} = \frac{48}{1} = 48$ hours

56. A tank has two inlets A and B, which can fill it in 15 hours and 20 hours respectively. An outlet C can empty the full tank in 12 hours. If A, B and C are opened together when the tank is empty, then in how much time will the tank be filled?

(a) 30 hours (b) 35 hours

(c) 40 hours (d) 27 hours

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (a) : A part fulfill by A in one hour $= \frac{1}{15}$

A part fulfill by B in one hour $= \frac{1}{20}$

A part empty by C in one hours $= \frac{1}{12}$

A part fulfill by together (A + B + C) $= \frac{1}{15} + \frac{1}{20} - \frac{1}{12}$

$= \frac{4+3-5}{60} = \frac{2}{60} = \frac{1}{30}$

Therefore time taken = 30 hr

57. A tank have 3 tap to fill water. The first tap take 6 h, the second tap takes 1 day and the third tap takes 18h to fill the tank. But there was a hole at the bottom, capable of emptying the completely filled tank in 18h. The hole was detected after 1h and was immediately fixed. How long will it take to fill the tank using all the three taps?

(a) 3 h (b) $3\frac{15}{19}$h

(c) 4 h (d) $4\frac{4}{5}$h

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let three taps together fill the tank in x hours.

According to the question,

$$\frac{x}{6} + \frac{x}{24} + \frac{x}{18} - \frac{1}{18} = 1$$

$$\frac{12x + 3x + 4x}{72} = 1 + \frac{1}{18}$$

$$\frac{19x}{72} = \frac{19}{18}$$

x = 4 hours

58. Pipe A and B can fill a tank in 30 and 45 min. respectively, while pipe C can empty the whole tank in 60 minutes. If the all three pipes are opened together, then how long will it take to fill an empty tank.

(a) $\left(34 + \frac{1}{2}\right)$ minute (b) 60 minute

(c) $\left(18 + \frac{5}{7}\right)$ minute (d) $\left(25 + \frac{5}{7}\right)$ minute

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (d) Capacity of pipe A to fill in 1 hour $= \frac{1}{30}$

Capacity of pipe B to fill the tank in 1 hour $= \frac{1}{45}$

Capacity of pipe C to empty the tank in 1 hour $= \frac{1}{60}$

Filled part of the tank by all three pipes in 1 hour $= \frac{1}{30} + \frac{1}{45} - \frac{1}{60}$

$= \frac{6+4-3}{180}$

$= \frac{7}{180}$

Required time $= = \frac{180}{7} = \left(25 + \frac{5}{7}\right)$ min

59. There are three inlets in a tank when the first two are opened then it takes the same time to fill the tank as the third inlet takes to fill the tank. The second inlet takes 5 hours more as compared to first inlet one and as compared to third inlet it takes 4 hours less. First inlet alone can fill the tank in how many hours?

(a) 15 hours (b) 6 hours

(c) 12 hours (d) 10 hours

RRB JE - 26/06/2019 (Shift-I)

Ans : (a) Let the time taken by the first inlet to fill the tank is x hours.

the second inlet takes time to fill the tank = (x + 5) hours

The third inlet takes time to fill the tank = (x + 9) hours

According to the question-

$$\frac{1}{x} + \frac{1}{x+5} = \frac{1}{x+9}$$

$$\frac{2x+5}{x^2+5x} = \frac{1}{x+9}$$

$2x^2 + 5x + 18x + 45 = x^2 + 5x$

$x^2 + 18x + 45 = 0$

$x^2 + 15x + 3x + 45 = 0$

$x(x + 15) + 3(x + 15) = 0$

$(x + 15)(x + 3) = 0$

$x + 15 = 0$ or $x + 3 = 0$

$x = -15$ ($\because$ Time is not negative)

$\therefore$ x = 15 hours

Hence the time taken to fill the tank by the first inlet = 15 hours

60. Pipe P and Q when operated together can fill a pit in 12 minutes, Q and R together in 20 minutes and P and R together in 15 minutes. In how many minutes all the three pipe, when operated together can pits be filed.

(a) 2 minutes (b) 10 minutes

(c) 3 minutes (d) 4 minutes

RRB ALP CBT-2 Physics & Maths 21-01-2019 (Shift-III)

Ans. (b) :

Part filled by pipe (P + Q) in 1 minute = $\frac{1}{12}$

Part filled by pipe (Q + R) in 1 minute = $\frac{1}{20}$

Part filled by pipe (P + R) in 1 minute = $\frac{1}{15}$

Part filled by pipe (P + Q) + (Q +R) + (P + R) in 1 minute

$= \frac{1}{12}+\frac{1}{20}+\frac{1}{15}$

$2\,(P + Q + R) = \frac{5+3+4}{60}$

$P + Q + R = \frac{12}{60\times 2}$

$P + Q + R = \frac{1}{10}$

Part filled by pipe (P + Q + R) in 1 minute = $\frac{1}{10}$

Hence, time taken by pipe (P + Q + R) to fill the pits = 10 minutes

61. A tap can fill tank completely in 6 hours. After filling half of the tank three more such tanks are opened. How much time will it take to fill the tank?

(a) 2 hours 20 minutes
(b) 4 hours 30 minutes
(c) 3 hours 25 minutes
(d) 3 hours 45 minutes

RRB JE - 31/05/2019 (Shift-III)

Ans. (d) Filled part of tank in 1 hour by first tap $= \frac{1}{6}$

Filled part in 1 hour by 4 taps $= \frac{4}{6}=\frac{2}{3}$

Hence four tap can fill the tank in 3/2 hours or 90 minutes.

Time taken to fill the half tank $= \frac{90}{2} = 45$ minutes

Time taken by first tap to fill the half tank $= 3$ hours

So total time taken to fill the tank $= 3$ hours 45 minute

62. Pipe A and C can fill a empty tank in 7 hrs and 10.5 hours respectively while pipe B can empty the filled tank in 5.25 hours. If the three pipes are opened together when the tank is empty, how many hours will be taken to fill the 2/3 part of the tank?

(a) 14 (b) 21
(c) 12 (d) 15.75

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (a) Suppose three pipes will fill the 2/3 part of tank in x hours.

According to the question,

$\Rightarrow \frac{x}{7}+\frac{x}{10.5}-\frac{x}{5.25}=\frac{2}{3}$

$\Rightarrow \frac{x}{7}+\frac{10x}{105}-\frac{100x}{525}=\frac{2}{3}$

$\Rightarrow \frac{75x+50x-100x}{525}=\frac{2}{3}$

$\Rightarrow \frac{125x-100x}{525}=\frac{2}{3}$

$\Rightarrow \frac{25x}{525}=\frac{2}{3}$

$\Rightarrow \frac{x}{21}=\frac{2}{3}$

$\Rightarrow x=\frac{21\times 2}{3}=14$

$\Rightarrow$ x = 14 hours

63. Two pipes X and Y can fill a gas tank in 60 and 75 minutes respectively. There is an outlet Z. If all the three pipes are used together, then the tank gets full in 50 minutes. How much time will be taken by Z to empty the tank completely?

(a) 100 minutes (b) 75 minutes
(c) 90 minutes (d) 50 minutes

RRB RPF SI – 11/01/2019 (Shift-I)

Ans : (a) Suppose time taken by 'Z' is x minute

Filled part of tank by 'X' in 1 minute $= \frac{1}{60}$

Filled part of tank by 'Y' in 1 minute $= \frac{1}{75}$

Emptied part of tank by 'Z' in 1 minute $= \frac{1}{x}$

As per the question-

$\frac{1}{60}+\frac{1}{75}-\frac{1}{x}=\frac{1}{50}$

$\Rightarrow -\frac{1}{x}=\frac{1}{50}-\left(\frac{1}{60}+\frac{1}{75}\right)$

$\Rightarrow -\frac{1}{x}=\frac{1}{50}-\left(\frac{5+4}{300}\right)$

$\Rightarrow -\frac{1}{x}=\frac{1}{50}-\frac{9}{300}$

$\Rightarrow -\frac{1}{x}=\frac{6-9}{300}=-\frac{3}{300}$

$\Rightarrow -\frac{1}{x}=-\frac{1}{100}$

$\Rightarrow$ x = 100 minute

Hence, time taken by 'Z' to empty the whole tank $=$ 100 minute

64. Pipe A and B can fill a tank in 7 and 10 hours respectively while pipe C can empty the tank in 14 hrs. If all the pipes start together, then how much time will it take to fill the tank?

(a) $6\frac{1}{6}$ hours (b) $6\frac{2}{3}$ hours
(c) $5\frac{1}{2}$ hours (d) $5\frac{5}{6}$ hours

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans. (d) : Filled part of tank by pipe A in 1 hour $= \frac{1}{7}$

Filled part of tank by pipe B in 1 hour $= \frac{1}{10}$

Emptied part of tank by pipe C in 1 hour $= \frac{1}{14}$

From the question-

If all the three pipes are opened, then filled part of tank in 1 hour $= \frac{1}{7}+\frac{1}{10}-\frac{1}{14}$

$$=\frac{10+7-5}{70}=\frac{12}{70}=5\frac{5}{6}$$

Hence all three pipes will fill the tank in $5\frac{5}{6}$ hours

65. Two pipes working individually can fill a tank in 6.3 and 8.4 hours respectively, while the third pipe can empty filled tank in 4.8 hours. If all the 3 pipes are opened together when the tank is empty, then how much time will be taken to fill the tank completely?

(a) 13 hours 20 minutes
(b) 12 hours 18 minutes
(c) 14 hours 18 minutes
(d) 14 hours 24 minutes

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (d) : Filled part in 1 hour by all three pipes

$$= \frac{1}{6.3}+\frac{1}{8.4}-\frac{1}{4.8}$$
$$=\frac{10}{63}+\frac{10}{84}-\frac{10}{48}$$
$$=\frac{10(16+12-21)}{1008}$$
$$=\frac{10\times 7}{1008}=\frac{5}{72}$$

Hence time taken to fill the tank $=\frac{72}{5}=14\frac{2}{5}$ hours

$=14$ hours 24 minute

66. A, B and C are three valves connected to a tank. A, B together can fill the tank in 6 hours. B and C together can fill the tank in 10 hours. A and C together can fill the tank in $7\frac{1}{2}$ hours. A alone will take how much time to fill the tank?

(a) 10 hours (b) 12 hours
(c) 11 hours (d) 13 hours

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (a) Filled part by (A + B) in 1 hour $=\frac{1}{6}$

Filled part by (B + C) in 1 hour $=\frac{1}{10}$

Filled part by (C + A) in 1 hour $=\frac{2}{15}$

Hence

Filled part by (A + B + B + C + C+ A) in 1 hour

$=\frac{1}{6}+\frac{1}{10}+\frac{2}{15}$

Filled part by 2(A + B + C) in 1 hour $=\frac{12}{30}$

Filled part by (A + B + C) in 1 hour $=\frac{12}{60}=\frac{1}{5}$

Filled part by A in 1 hour $=\frac{1}{5}-\frac{1}{10}$

Filled part by A in 1 hour $=\frac{2-1}{10}=\frac{1}{10}$

Hence tank will fill by A in 10 hours.

67. There are three pipes connected to a tank. First pipe can fill the tank in 30 minutes and the second pipe can fill the tank in 45 minutes while the third pipe is to empty the tank. If it takes 27 minutes to fill the tank when all three pipes are opened. In what time the third pipe will empty the tank?

(a) 54 minutes (b) 52 minutes
(c) 50 minutes (d) 56 minutes

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (a) Time taken to fill the tank if three pipes are opened = 27 minute

Suppose third pipe empty the tank in x minute

So, $\frac{1}{30}+\frac{1}{45}-\frac{1}{x}=\frac{1}{27}$

$$\frac{1}{x}=\frac{1}{30}+\frac{1}{45}-\frac{1}{27}$$
$$=\frac{9+6-10}{270}$$
$$=\frac{15-10}{270}$$
$$=\frac{5}{270}$$
$$\frac{1}{x}=\frac{1}{54}$$
$$\boxed{x=54}$$

Hence third pipe will empty the tank in 54 minutes.

68. Tap A and Tap B can fill a tank in 2 and 8 hours respectively. Tap C can empty the tank in 4 hours. If all the taps are opened at a time, then how much time will be taken to fill the tank?

(a) $\frac{8}{3}$ hours (b) $\frac{9}{2}$ hours
(c) 3 hours (d) $\frac{3}{8}$ hours

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (a) Filled part of tank by tap A in 1 hour $=\frac{1}{2}$

Filled part of tank by tap B in 1 hour $=\frac{1}{8}$

Emptied part of tank by tap C in 1 hour $=\frac{1}{4}$

As per the question,

$\therefore$ (A+B+C) will fill the tank in 1 hour $= \frac{1}{2}+\frac{1}{8}-\frac{1}{4} = \frac{3}{8}$ part

$\therefore$ Time taken by all three taps to fill the tank $= \frac{8}{3}$ hours

69. There are two entrance in a tank, which can fill the tank in 6 hrs and 8 hrs respectively. By an exit gate the whole tank can be emptied in 10 hours. If all the three pipes are opened together in an empty tank, then how much time will be taken to fill the tank completely?

(a) $5\frac{5}{23}$ hours (b) $6\frac{5}{23}$ hours

(c) $6\frac{5}{46}$ hours (d) $5\frac{5}{46}$ hours

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (a) Filled part of the tank by (A+B+C) in 1 hour

$$= \frac{1}{6}+\frac{1}{8}-\frac{1}{10} = \frac{23}{120}$$

$\therefore$ Time taken to fill whole tank

$$= \frac{120}{23} = 5\frac{5}{23} \text{hours}$$

70. Two inlet pipes can completely fill a tank in 5 and 7 hours and an outlet pipe can empty the filled tank in 14 hours. If all the three pipes are opened together in an empty tank, then how much time will it take to fill the tank completely?

(a) $4\frac{11}{13}$ hours (b) $5\frac{11}{13}$ hours

(c) $3\frac{13}{19}$ hours (d) $5\frac{2}{13}$ hours

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (c) Filled part of tank by A in 1 hour $= \frac{1}{5}$

Filled part of tank by B in 1 hour $= \frac{1}{7}$

Emptied part of tank by C in 1 hour $= \frac{1}{14}$

Filled part by all three pipes in 1 hour $= \frac{1}{5}+\frac{1}{7}-\frac{1}{14}$

$$= \frac{14+10-5}{70} = \frac{19}{70}$$

Hence, tank can be filled by three pipes in $3\frac{13}{19}$ hours.

71. In the three pipes the first two pipes can fill a tank in 10.8 hours and 21.6 hours respectively. While the third pipe can empty the filled tank in 18 hours. If the tank is empty and all the three pipes are opened together, then the tank will be filled in how many hours?

(a) 13.2 (b) 12

(c) 14.4 (d) 15.6

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (b) Filled part by three pipes in 1 hour

$$= \frac{1}{10.8}+\frac{1}{21.6}-\frac{1}{18} = \frac{10}{108}+\frac{10}{216}-\frac{1}{18}$$

$$= \frac{20+10-12}{216} = \frac{18}{216} = \frac{1}{12} \text{ part}$$

Time taken by all the three pipes to fill the tank = 12 hour

72. Two pipes working together can fill a tank in 3.9 hours and 5.2 hours respectively, while a third pipe, can empty the full tank in 10.4 hours. When the tank is 1/12 filled, all three pipes are opened together. How much time will be taken to fill the tank completely?

(a) 2 hours 45 minutes (b) 2 hours 10 minutes

(c) 2 hours 11 minutes (d) 2 hours 36 minutes

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (d) Suppose required time is t to fill the remaining part of tank $= 1-\frac{1}{12} = \frac{11}{12}$ part

According to the question-

$$\frac{t}{3.9}+\frac{t}{5.2}-\frac{t}{10.4} = \frac{11}{12}$$

$$\frac{10t}{39}+\frac{10t}{52}-\frac{5t}{52} = \frac{11}{12}$$

$$\frac{40t+30t-15t}{156} = \frac{11}{12}$$

$$\frac{55t}{156} = \frac{11}{12}$$

$$t = \frac{13}{5} = 2 \text{ hours } 36 \text{ minute}$$

73. A tank is filled by two taps A and B in 12 hrs and 16 hrs respectively. Complete tank can be emptied by the third tap in 8 hours. If all the taps are opened together at a time then how long will it take to fill the tank?

(a) 24 hours (b) 40 hours

(c) 16 hours (d) 48 hours

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (d) Suppose time taken to fill the empty tank is T

Filled part of tank by A in 1 hour $= \frac{1}{12}$

Filled part of tank by B in 1 hour $= \frac{1}{16}$

Emptied part of tank by third tap in 1 hour $= \frac{1}{8}$

As per the question-

$$\therefore \frac{1}{T} = \frac{1}{12}+\frac{1}{16}-\frac{1}{8}$$

$$\Rightarrow \frac{1}{T} = \frac{4+3-6}{48}$$

$$\Rightarrow \frac{1}{T} = \frac{1}{48}$$

$$\Rightarrow T = 48 \text{ hours}$$

74. A tap can fill a reservoir in 4 hrs. After the reservoir is half filled 3 more taps of the same size are opened. How much time will be taken by all the taps to fill the tank completely?

(a) 2 hours 30 minutes (b) 2 hours
(c) 1 hours 30 minutes (d) 3 hours

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (a) Time taken to fill $\frac{1}{2}$ reservoir by one tap = 2 hour

Remaining part of reservoir = $1-\frac{1}{2}=\frac{1}{2}$

Suppose remaining reservoir is filled in x hour.
As per the question,

$$\frac{1}{2}+\frac{x}{4}+\frac{x}{4}+\frac{x}{4}+\frac{x}{4}=1$$

$$\frac{4x}{4}=\frac{1}{2} \Rightarrow x=\frac{1}{2} \text{ hour}$$

Total time taken to fill reservoir $= 2 + \frac{1}{2}$

= 2 hours 30 minutes

75. Pipes A and C can fill an empty tank in 60 hrs and 48 hrs, respectively while pipe B can empty the full tank in 24 hours, when the tank is full and all the three pipes are opened together then how much time will be taken to fill 1/3 part of the tank?

(a) 240 (b) 160
(c) 80 (d) 120

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (b) Filled part of tank by pipe A

$= \frac{1}{60}$ part

Filled part of tank by pipe C in 1 hour $= \frac{1}{48}$ part

Emptied part of tank by pipes B in 1 hour $= \frac{1}{24}$ part

So, emptied part by three pipe in 1 hour

$$= \frac{1}{24}-\left(\frac{1}{60}+\frac{1}{48}\right)$$

$$= \frac{10-(4+5)}{240}=\frac{1}{240} \text{ part}$$

So, time taken to empty the $\frac{2}{3}$ portion of tank = time taken to fill the $\frac{1}{3}$ portion of tank $= \frac{2/3}{1/240}=160$ hours

76. Two pipes can fill a tank in 5 hrs and 3 hrs respectively while the third pipe can empty the tank in 7.5 hours. When 1/10 part of the tank was filled then all the three pipes were opened together, then how long will it take to fill the tank?

(a) 2 hours 20 minutes (b) 2 hours
(c) 2 hours 15 minutes (d) 2 hours 30 minutes

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (c) :

Emptied part of the tank $= 1-\frac{1}{10}=\frac{9}{10}$ part

Filled part by three pipes in 1 hour

$$=\frac{1}{5}+\frac{1}{3}-\frac{1}{7.5}$$

$$=\frac{1}{5}+\frac{1}{3}-\frac{10}{75}$$

$$=\frac{15+25-10}{75}=\frac{30}{75}=\frac{2}{5} \text{ part}$$

Time taken to fill $\frac{2}{5}$ portion of the tank $= 1$ hour

Time taken to fill $\frac{9}{10}$ portion of the tank $= \frac{5}{2}\times\frac{9}{10}$

= 2 hours 15 minutes.

77. Pipes A, B and C are attached to an empty cistern. The first two can fill the cistern in 4 and 10 hours, respectively, the third can drain the filled cistern, in 6 hours. If all the three pipes are opened simultaneously when the cistern is half-filled, how many hours will be needed to fill the cistern?

(a) $\frac{30}{11}$ (b) $\frac{60}{11}$
(c) $\frac{120}{11}$ (d) $\frac{90}{11}$

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (a) Filled part of the cistern in 1 hour.

$$=\frac{1}{4}+\frac{1}{10}-\frac{1}{6}$$

$$=\frac{15+6-10}{60}=\frac{11}{60} \text{ part}$$

Time taken to fill whole cistern $=\frac{60}{11}$ hour

$\therefore$ Time taken to fill half-filled cistern

$$=\frac{60}{2\times11}=\frac{30}{11} \text{ hours}$$

78. Out of three pipes the first two can fill an empty tank in 9 and 18 hours, respectively while the third can drain the filled tank in 15 hours. If all the three pipes are opened when the tank is empty, after how many hours will the tank be fill?

(a) 10 (b) 12
(c) 11 (d) 13

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (a)

Filled part of tank by pipe A in 1 hour $=\frac{1}{9}$

Filled part of tank by pipe B in 1 hour $=\frac{1}{18}$

emptied part of tank by pipe C in 1 hour $=\frac{1}{15}$

$\therefore$ Filled part of cistern by (A+B+C) in 1 hour

$$= \frac{1}{9} + \frac{1}{18} - \frac{1}{15}$$
$$= \frac{10+5-6}{90}$$
$$= \frac{9}{90} = \frac{1}{10}$$

So, time taken to fill the whole cistern= 10 hours

79. Raghu's tanker can fill a cistern in 4 hours. After half cistern is filled, three more similar tankers are opened. what is the total time taken to fill the cistern completely ?

(a) 2 h 40 min (b) 2 h
(c) 3 h (d) 2 h 30 min

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (d)
Raghu's tanker fills half part of cistern in 2 hours.
When three more tankers are opened then time taken to fill $\frac{1}{2}$ portion of cistern = $\frac{4}{4} \times \frac{1}{2}\text{h} = 30$ minutes
Hence time taken to fill the whole cistern = 2 hours 30 minute

80. Pipes A and C can fill an empty cistern in 32 and 48 hours, respectively while Pipe B can drain the filled cistern in 24 hours. If the three pipes are turned on together when the cistern is empty, how many hours will it take to fill the cistern $\frac{2}{3}$ part of?

(a) 96 (b) 64
(c) 72 (d) 48

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (b) Filled part by pipe 'A' in 1 hour $= \frac{1}{32}$

Filled part by pipe 'C' in 1 hour $= \frac{1}{48}$

Emptied part by pipe 'B' in 1 hour $= \frac{1}{24}$

Filled part by three pipes in 1 hour $= \frac{1}{32} + \frac{1}{48} - \frac{1}{24}$
$$= \frac{3+2-4}{96} = \frac{1}{96}$$

$\because$ It takes 1 hour to fill $\frac{1}{96}$ part of cistern

$\therefore$ Time taken to fill $\frac{2}{3}$ part of cistern
$= 96 \times \frac{2}{3} = 64$ hours

81. Pipes A, B and C are attached to an empty cistern. The first two can fill the cistern in 4 and 10 hours, respectively, the third can drain the filled, cistern, in 6 hours. If all the three pipes are opened simultaneously when the cistern is three-fifth filled, how many hours will be needed to fill the cistern?

(a) $\frac{36}{11}$ (b) $\frac{48}{11}$
(c) $\frac{60}{11}$ (d) $\frac{24}{11}$

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (d) A, B and C will fill the cistern in 1 hour
$$= \frac{1}{4} + \frac{1}{10} - \frac{1}{6} = \frac{15+6-10}{60} = \frac{11}{60} \text{ part}$$

$\therefore$ All three pipes will fill the cistern completely
$$= \frac{60}{11} \text{ hour}$$

Remaining empty part of cistern $= 1 - \frac{3}{5} = \frac{2}{5}$ part

$\therefore$ Time taken to fill remaining empty part of cistern $= \frac{60}{11} \times \frac{2}{5} = \frac{24}{11}$ hour

Type - 4

82. Pipe P can fill $\frac{3}{4}$ part of a tank in 18 hours and pipe Q can fill $\frac{3}{5}$ part of the same tank in 12 hours. Both P and Q were kept open for 4 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in $5\frac{1}{2}$ hours. Pipes P, Q and R together can fill the empty tank in:

(a) 30 hours (b) 36 hours
(c) 35 hours (d) 40 hours

RRB Group-D 02/09/2022 (Shift-III)

Ans. (d) : Part filled by pipe P in 1 hour $= \frac{3}{4 \times 18} = \frac{1}{24}$

Part filled by pipe Q in 1 hour $= \frac{3}{5 \times 12} = \frac{1}{20}$

Part filled by (P + Q) in 4 hour $= 4\left(\frac{1}{24} + \frac{1}{20}\right)$
$$= 4\left(\frac{5+6}{120}\right)$$
$$= \frac{11}{30}$$

Part emptied by pipe R in 1 hour $= \frac{11}{30} \times \frac{2}{11}$
$$= \frac{1}{15}$$

Part filled by all three pipes in 1 hour $= \frac{1}{24} + \frac{1}{20} - \frac{1}{15}$

$$= \frac{5+6-8}{120} = \frac{3}{120}$$

Hence time taken to fill the tank $= \frac{120}{3} = 40$ hours

83. There are 4 pipes attached to a tank. Two to fill the tank and the other two to transfer the water into a cistern. The first two pipes can fill the tank in 40 sec and 80 sec. respectively, when opened alone while the last two can empty in 80 sec and 160 sec, respectively, when opened alone, If all the pipes are opened together, in how much time will the tank be filled?

(a) 53.33 sec (b) 24.44 sec
(c) 16.8 sec (d) 21.2 sec

RRB Group-D 01/09/2022 (Shift-III)

Ans. (a) : If all four pipes opened together, part filled in 1 sec. $= \frac{1}{40} + \frac{1}{80} - \frac{1}{80} - \frac{1}{160}$

$$= \frac{4+2-2-1}{160} = \frac{3}{160}$$

Hence, time taken to fill the tank

$$= \frac{160}{3} = 53.33 \text{ sec.}$$

84. Pipes A and B can fill an empty tank completely is 42 minutes and 56 minutes respectively. Pipe C alone can empty the full tank in 84 minutes. All the three pipes are opened together for 8 minutes and then C is closed. In how much time (in minutes) will A and B together fill the remaining part of the tank?

(a) $17\frac{1}{7}$ (b) 16
(c) 18 (d) $18\frac{2}{7}$

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (d) :

A → 42 — 4
B → 56 — 3 → 84×2=168 (Total work)
C → 84 — –2

Work done in 8 minutes = 8×(4+3–2) = 40 unit

Remaining work = 168 – 40 = 128

Required time = $\frac{128}{7} = 18\frac{2}{7}$ minute

85. Pipes A and B can fill an empty cistern in 16 minutes and 32 minutes, respectively. Both Pipe A and Pipe B are opened together. After how much time should Pipe A be turned off so that the empty cistern is completely filled in a total of 16 minutes?

(a) 8 min (b) 9 min
(c) 7 min (d) 6 min

RRB GROUP-D – 29/09/2022 (Shift-III)

Ans. (a) :

A (16) — 2
B (32) — 1 → 32

Let pipe 'A' closed after t min

$2 \times t + 1 \times 16 = 32$
$2t + 16 = 32$
$2t = 16$
$t = 8$ min

86. Two pipes X and Y can fill a cistern in 21 hours and 24 hours, respectively. The pipes are opened simultaneously and it is found that die to a leakage in the bottom it takes 48 minutes more to fill the cistern. When the cistern is full, in how much time will the leak empty it if no pipe is open during that time?

(a) 130 hours (b) 120 hours
(c) 144 hours (d) 168 hours

RRB Group-D 18/08/2022 (Shift-II)

Ans. (d) : According to question

Time taken to fill the tank by pipe 'X' = 21 hours

Time taken to fill the tank by pipe 'Y' = 24 hours

X - 21 — 8
168
Y - 24 — 7

By (X + Y) time taken to fill the tank $= \frac{168}{15} = 11.2$ hours

Due to leakage Z, it takes 48 minutes more to fill the tank

$\Rightarrow$ 11.2 hours $+ \frac{48}{60} = 12$ hours

X-21
Y-24 → 168 ← 8
(X+Y+Z)–12 — 7
14

So, By leakage 'Z' alone, time taken to empty the full tank $= \frac{168}{1} = 168$ hours

87. Two pipes A and B can fill a cistern in 36 minutes and 48 minutes, respectively. Both the pipes are opened at the same time and pipe B is closed after some time. If the cistern gets filled in half an hour, then after how many minutes was pipe B closed?

(a) 5 (b) 10
(c) 8 (d) 9

RRB Group-D 22/08/2022 (Shift-III)

Ans. (c) : According to question,

A (36) — 4
B (48) — 3 → 144

Let pipe 'B' closed after t min.

$4 \times 30 + 3 \times t = 144$
$\Rightarrow 120 + 3t = 144$
$\Rightarrow 3t = 144 - 120$
$\Rightarrow 3t = 24$
$\Rightarrow t = 8$ mins

88. Three pipes A, B and C together can fill a tank in 8 hours. Three pipes were opened for 2 hours, after that C was closed. Later A and B fill the remaining part in 9 hours. The number of hours taken by C alone to fill the tank is :

(a) 12 (b) 13
(c) 24 (d) 20

RRB Group-D 09/09/2022 (Shift-II)

Ans. (c) :

Part filled by (A + B + C) in 2 hours $= \frac{2}{8} = \frac{1}{4}$

Remaining part $= 1 - \frac{1}{4} = \frac{3}{4}$

Part filled by (A + B) in 9 hours $= \frac{3}{4}$

Part filled by (A + B) in 1 hour $= \frac{3}{4 \times 9} = \frac{3}{36}$

work of C in 1 hour = work of (A + B + C) in 1 hour – work of (A + B) in 1 hour

$$= \frac{1}{8} - \frac{3}{36}$$

$$= \frac{9-6}{72} = \frac{3}{72} = \frac{1}{24}$$

So time taken by 'C' alone,to fill the tank = 24 hours

89. Pipe A and B can fill a tanks in 12 and 16 minutes respectively. For four minutes both A and B are turned on and then A is turned off. How much time will B take to fill the tank completely.

(a) 6 minutes (b) $\frac{20}{3}$ minutes

(c) $\frac{21}{4}$ minutes (d) 7 minutes

RRB ALP CBT-2 Mec. - Diesel 23-01-2019 (Shift-III)

Ans. (b) : Pipe A can fill a tank in 12 minutes and pipe B can fill a tank in 16 minutes.

L.C.M. of (12, 16) = 48

Efficiency of pipe A = $\frac{48 \text{ unit}}{12 \text{ minutes}}$ = 4 unit/minute

Efficiency of pipe B = $\frac{48 \text{ unit}}{16 \text{ minutes}}$ =3 unit/minute

Efficiency of (A + B) = 4 + 3 = 7 unit/minute

∵ (A +B) is started for 4 minutes

Tank will be filled in 4 minutes = 7 unit/minute × 4 minute =28 unit

Remaining part of the tank = 48 unit – 28 unit = 20 unit

∴ B alone can fill tank = $\frac{20}{3}$ minutes

90. Pipes P and Q can fill a tank in 6 hrs and 4 hrs respectively. Pipe P is opened at 7 O'clock and P and Q is opened one by one for an hour. Tank will be filled in how many hours?

(a) 6 hours (b) 3 hours
(c) 4 hours 30 minutes (d) 5 hours

RRB JE - 29/05/2019 (Shift-II)

Ans : (d) L.C.M of 6 and 4 = 12 unit work

1 hour work of P = 2 unit

1 hour work of Q = 3 unit

2 hour work of (P + Q) = 5 unit

Hence 2 × 2 hours work = 5 × 2 = 10 unit

Remaining work = 2 unit

∵ The time taken by P to finish 2 unit work = 1 hour

∴ The time taken to fill the tank = 2 × 2 + 1 = 5 hours

91. A tank can be filled by a tap in 10 hours, although due to a leakage it takes 11 hours to fill the tank. The tap is closed when the tank is full. In how much time the tank will be emptied due to leakage?

(a) 130 (b) 110
(c) 100 (d) 50

RRB RPF Constable – 20/01/2019 (Shift-I)

Ans. (b) : Filled part in 1 hour by tap = $\frac{1}{10}$ part

Let it takes x hours to empty the tank due to leakage.

According to the question,

$$\frac{1}{10} - \frac{1}{x} = \frac{1}{11}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{10} - \frac{1}{11}$$

$$= \frac{11-10}{110}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{110}$$

x = 110 hours

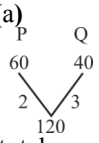
Hence the time taken for the tank to be emptied = 110 hours

92. Two taps P and Q individually take 60 min and 40 min to fill a tank. If tap Q is opened for the first half an hour and for remaining time tap P is opened, then how long will it take to fill the tank?

(a) 45 minutes (b) 32 minutes
(c) 36 minutes (d) 48 minutes

RRB JE - 30/05/2019 (Shift-I)

Ans : (a)



Let the total capacity of the tank is 120 liters.

[L.C.M of (60, 40) = 120]

∵ Q fills 3 liters of water in 1 minute.

∴ Q will fill in 30 minutes = 3 × 30 = 90 *l*

Remaining volume of the tank = 120 – 90 = 30 *l*

∵ P fills the remaining volume of the tank

$$\Rightarrow \frac{30}{2} = 15 \text{ min.}$$

Required time = 30 + 15 = 45 min.

93. Two pipes P and Q can fill a tank in 32 min and 48 min. Both pipes are opened and after some time pipe Q is closed, then tank gets filled in 24 minutes. When was pipe Q closed?

(a) 12 minutes (b) 15 minutes
(c) 10 minutes (d) 16 minutes

RRB JE - 01/06/2019 (Shift-III)

Ans. (a) Filled part in 1 minute by pipe P $= \frac{1}{32}$ part

Filled part in 1 minute by pipe Q $= \frac{1}{48}$ part

Pipe P will work from the starting to end.

Filled part by P in 24 min $= \frac{24}{32} = \frac{3}{4}$ part

Remaining part $= 1 - \frac{3}{4} = \frac{1}{4}$ part

Time taken to fill remaining part by Q

$= \frac{1}{4} \times 48 = 12$ min.

Hence pipe Q was closed after 12 min.

94. Tap P and Q can fill a bucket individually in 12 min and 15 min. Both the taps are opened, but after 3 minutes tap P is closed. What extra time will be taken by Q to fill the bucket?

(a) 6 minutes 15 sec. (b) 8 minutes 15 sec.
(c) 6 minutes 30 sec. (d) 9 minutes

RRB JE - 27/06/2019 (Shift-III)

Ans : (b) Let the extra time taken by tap Q to fill the bucket is t minutes.

According to the question,

$$\frac{3}{12} + \frac{3+t}{15} = 1$$

$$\frac{3+t}{15} = 1 - \frac{1}{4}$$

$$\frac{3+t}{15} = \frac{3}{4}$$

$$12 + 4t = 45$$

$$4t = 33$$

$$t = \frac{33}{4}$$

$$t = 8\frac{1}{4} = 8 \text{ min } 15 \text{ sec.}$$

95. Two pipes P and Q fill a tank in 15 min and 20 min respectively. Both are opened but after 4 minute P is closed. In how much time tank is filled from the beginning?

(a) 16 minutes
(b) 16 minutes 20 sec.
(c) 14 minutes 20 sec.
(d) 14 minutes 40 sec.

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (d) Let extra time taken by Q to fill the tank $=$ t min.

From question,

$$\frac{4}{15} + \frac{t+4}{20} = 1$$

$$\frac{16+3t+12}{60} = 1$$

$$3t + 28 = 60$$

$$3t = 32$$

$$t = 10 \text{ min. } 40 \text{ sec.}$$

Required time $=$ 10 min 40 sec. + 4 min.

$=$ 14 min. 40 sec.

96. Two pipes A and B can fill a tank in 12 min & 16 min respectively. Both pipes are opened together, but pipe A is closed 4 minutes before the tank is filled. In how many minutes the tank is completely filled?

(a) 9 minutes 8 sec (b) 10 minutes 9 sec
(c) 11 minutes 9 sec (d) 11 minutes 29 sec

RRB NTPC 29.04.2016 Shift : 2

Ans : (a) Let it takes T minute to fill the tank.

According to the question,

$$\frac{T-4}{12} + \frac{T}{16} = 1$$

$$\Rightarrow \quad \frac{4(T-4)+3T}{48} = 1$$

$$\Rightarrow \quad 4T - 16 + 3T = 48$$

$$\Rightarrow \quad 7T - 16 = 48$$

$$\Rightarrow \quad 7T = 48 + 16$$

$$\Rightarrow \quad 7T = 64$$

$$\Rightarrow \quad T = \frac{64}{7} = 9\frac{1}{7} \text{ minute} = 9 \text{ min.} \frac{1}{7} \times 60 \text{ sec.}$$

$= 9$ min 8.5 sec ≈ 9 min 8 sec.

97. Pipes A and B work together then they can fill an empty tank in 24 hours. If working together for 8 hours B is closed but A remains open, then it will take 28 hours to fill the tank. A alone will fill the tank in how much time?

(a) 30 hours (b) 31 hours
(c) 28 hours (d) 29 hours

RRB RPF SI – 12/01/2019 (Shift-III)

Ans. (a) : Let A will take t hours to fill the tank alone.

According to the question,

$$\frac{8}{24} + \frac{20}{t} = 1$$

$$\frac{20}{t} = 1 - \frac{1}{3}$$

$$\frac{20}{t} = \frac{2}{3}$$

$$t = 30 \text{ hours}$$

Hence A alone will take 30 hours to fill the tank.

98. Two pipes X and Y can fill a tank in 24 hrs and 32 hrs. If both the pipes are opened together then at what time first pipe should be closed that it may take only 16 hours to fill the tank?

(a) After 18 hours (b) After 10 hours
(c) After 15 hours (d) After 12 hours

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (d) : Let the first pipe should be closed after x hours.

According to the question,

$$\Rightarrow \quad \frac{x}{24} + \frac{16}{32} = 1$$

$\Rightarrow \quad \frac{x}{24}+\frac{1}{2}=1$

$\Rightarrow \quad \frac{x}{24}=\frac{1}{2}$

x = 12 hours

Hence first pipe should be closed after 12 hours.

99. Two gas filling tube A and B can fill a cylinder in 12 and 15 minutes respectively. But a third tube can empty it in 6 minutes. First two tubes are opened for 5 minutes and then the third tube is also opened. In what time cylinder will be empty?

(a) 70 minutes (b) 45 minutes
(c) 60 minutes (d) 30 minutes

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (b) Tube A $\rightarrow$ 12 minutes
Tube B$\rightarrow$15 minutes [L.C.M. of 12 and 15 = 60 unit]
Tube C $\rightarrow$ 6 minutes

Tube A $\rightarrow$ 12 min $\rightarrow$ 60 unit
A $\rightarrow$ 1 min $\rightarrow$ 5 unit
Tube B $\rightarrow$ 15 min $\rightarrow$ 60 unit
B $\rightarrow$ 1 min $\rightarrow$ 4 unit

Filled part by both tubes (A + B) in 1 minute = 9 unit
Both tubes (A + B) are opened for first 5 minutes, then work done = 5 × 9 = 45 unit

C will empty in 1 minute $= \frac{60}{6}$ = 10 unit

When the tube C is also opened
The work of (A + B – C) tube in 1 minute = 5 + 4 – 10
= –1 unit
Therefore it will take 45 minutes to empty 45 units.

100. Two inlet pipes A and B can fill an empty tank in 22 and 33 hours respectively. They were opened together but A is turned off 3 hours before tank is filled. How much time will be taken by both the pipes to fill the tank?

(a) 16.2 (b) 15
(c) 14.2 (d) 16

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) Let the time taken by both pipes to fill the tank in x hours.
From question,

$\frac{x-3}{22}+\frac{x}{33}=1$

$\frac{3x-9+2x}{66}=1$

5x – 9 = 66
5x = 75
x = 15
Therefore it takes 15 hours to fill the tank by both pipes.

101. Two pipes A and B can fill an empty tank in 1.8 hrs and 2.7 hrs respectively. In no other pipe is work in pipe C can empty the whole tank in 4.5 hrs. Initially, when the tank is empty, pipe A and pipe C are opened emptied. After some hours pipe A is closed and pipe B is opened. In this way total 5.5 hours is taken to fill the tank. For how much time pipe B remained open.

(a) 2.7 (b) 5
(c) 3 (d) 4.5

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (d) Filled part by pipe A in 1 hour $= \frac{1}{1.8}$

Filled part by pipe B in 1 hour $= \frac{1}{2.7}$

Emptied part by pipe C in 1 hour $= \frac{1}{4.5}$

Let pipe A is opened for x hours.
So, pipe B is opened for (5.5–x) hours

$\frac{x}{1.8}+\frac{(5.5-x)}{2.7}-\frac{5.5}{4.5}=1$

$\frac{15x+55-10x-33}{27}=1$

5x = 27 + 33 – 55
5x = 5
x = 1
Hence pipe A is opened for 1 hour
So, pipe B is opened for = (5.5–1) = 4.5 hours

102. Three flood gate A, B and C can fill a reservoir in 6 hours. After working for two hours together C was closed, remaining part is filled by flood gates A and B in 7 hours. What time will be taken by flood gate C to fill the reservoir?

(a) 16 (b) 12
(c) 14 (d) 10

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (c) Filled part by all the three flood gates A, B, C in 1 hour $= \frac{1}{6}$ part

$\therefore$ Filled part by all three flood gates in 2 hour = $\frac{1}{6}\times 2=\frac{1}{3}$ part

$\therefore$ Remaining part $= 1-\frac{1}{3}=\frac{2}{3}$ part

Filled part by A and B in 7 hours $= \frac{2}{3}$

Filled part by A and B in 1 hour $= \frac{2}{21}$ part

Filled part by C in 1 hour $= \frac{1}{6}-\frac{2}{21}$

$= \frac{7-4}{42}=\frac{3}{42}=\frac{1}{14}$

Time taken by C to fill the reservoir = 14 hours

103. There are two entrance pipes in a tank by which the tank can be filled in 4 hours and 6 hours respectively. By an exit pipe the whole tank can be emptied in 8 hours. Both the entrance pipes are opened for an hour and then closed. Then after all the three pipes are opened together. Remaining part of the tank can be filled in ___ hours.

(a) 3 hours (b) $3\frac{1}{4}$ hours
(c) 2 hours (d) $5\frac{1}{3}$ hours

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (c) Let the time taken to fill the remaining part of the tank = t hours

Tank filled in 1 hours by both entrance pipes $= \frac{1}{4}+\frac{1}{6}=\frac{5}{12}$ part

Remaining part $= 1-\frac{5}{12}=\frac{7}{12}$ part

According to the question,

$$\frac{t}{4}+\frac{t}{6}-\frac{t}{8}=\frac{7}{12}$$

$$\frac{6t+4t-3t}{24}=\frac{7}{12}$$

$$\frac{7t}{24}=\frac{7}{12}$$

$$t=\frac{7\times 24}{7\times 12}$$

t = 2 hours

Hence the remaining part of the tank will be filled in 2 hours.

104. Three pipes A, B and C can fill a tank in 4 hours. Pipe A and pipe B can together fill the tank in 9 hours. If the three pipes A, B and C are opened together and after 3 hours pipe A and B are closed, then how much time will be taken by pipe C alone to fill the tank?

(a) 2 (b) 1.8
(c) 2.25 (d) 1.5

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (b)

Filled part by (A+B+C) in 1 hour $= \frac{1}{4}$

Filled part by (A+B) in 1 hour $= \frac{1}{9}$

Filled part by C in 1 hour $= \frac{1}{4}-\frac{1}{9}=\frac{5}{36}$

Time taken to fill whole tank by pipe C $= \frac{36}{5}$ hour

Let pipe C will take t hours to fill the remaining part of the tank.

According to the question,

$$3\left(\frac{1}{A}+\frac{1}{B}+\frac{1}{C}\right)+\frac{t}{C}=1$$

$$\frac{t}{C}=1-\frac{3}{4}$$

$$t=\frac{36}{5}\times\frac{1}{4}=\frac{9}{5}$$

t = 1.8

The time taken by C to fill the remaining part is 1.8 hours

105. Inlet pipe P can fill any tank in 7 hrs while an outlet pipe Q can empty whole tank in 6 hrs. If only P is opened for first 3 hrs and then Q is also opened, then how many hours will be needed to empty the tank?

(a) 24 (b) 28
(c) 21 (d) 18

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (d) Time taken by P and Q to fill the tank $= \frac{7\times 6}{7-6}=42$ hours

Filled part of the tank by P in 1 hour $= \frac{1}{7}$ part

Filled part of the tank by P in 3 hours $= \frac{3}{7}$ part

Time taken to empty $\frac{3}{7}$ part of the tank by Q $= \frac{3}{7}\times 42$

= 18 hours

106. Two gas filling tube A and B can fill a gas cylinder in 15 min and 40 min respectively. Both the tubes are opened together but after 4 minutes tube A is closed. What will be the total time to fill the cylinder?

(a) 14 minutes 40 sec. (b) 10 minutes 10 sec.
(c) 20 minutes 10 sec. (d) 29 minutes 20 sec.

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (d) : Let the cylinder will be completely fill in time t.

According to the question,

$$\frac{4}{15}+\frac{t}{40}=1, \qquad \frac{32+3t}{120}=1$$

$$3t = 120-32$$

$$t=\frac{88}{3}$$

t = 29 min 20 sec.

107. Pipe A can fill an empty reservoir in 6.8 hrs while pipe B can fill it in 10.2 hrs. Only pipe B is opened for 1.7 hours, after which pipe A is also opened. What is the total time to fill the reservoir?

(a) 5 hours 6 minutes (b) 5 hours 10 minutes
(c) 5 hours 12 minutes (d) 5 hours 5 minutes

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (a) : Filled part by A in 1 hour $= \frac{1}{6.8}$

Filled part by B in 1 hour $= \frac{1}{10.2}$

Filled part by B in 1.7 hours $= \frac{1.7}{10.2}=\frac{1}{6}$

Remaining part $= 1-\frac{1}{6}=\frac{5}{6}$ part

Filled part by (A+B) in 1 hour

$$=\left(\frac{1}{6.8}+\frac{1}{10.2}\right)=\frac{25}{102}\text{ part}$$

Time taken by (A+B) to fill $\frac{5}{6}$ part $= \frac{5}{6}\times\frac{102}{25}$ part

$$=\frac{17}{5}=3.4\text{ hours}$$

Total time taken = 1.7+3.4= 5.1 hours

or 5 hours 6 minutes

108. Pipe C and D alone can fill a tank in 4 and 5 hrs respectively. If pipe C, is closed after 3 hours and at the same time pipe D is opened, then the tank will be filled in how many hours?

(a) 1.25 (b) 1
(c) 1.5 (d) 0.8

RRB Group-D – 28/09/2018 (Shift-I)

Ans : **(a)** Filled part by pipe C in 1 hour $= \frac{1}{4}$

Filled part by pipe C in 3 hours $= 3 \times \frac{1}{4} = \frac{3}{4}$

Remaining part $= 1 - \frac{3}{4} = \frac{1}{4}$ part

Time taken by pipe D to fill whole tank = 5 hours

Hence time taken by pipe D to fill remaining $\frac{1}{4}$ part

$= 5 \times \frac{1}{4} = \frac{5}{4} = 1.25$ hours

109. Pipe A alone can fill a tank in 10 hrs. Pipe B alone can fill the same tank in 12 hours. These pipes are opened together then it is found that due to a leakage at the bottom of the tank an extra time of $\frac{60}{231}$ hours will be taken to fill the tank completely. If both the pipes are closed, then calculate the time taken to empty the filled tank by the leakage?

(a) 110 hours (b) 132 hours
(c) 143 hours (d) 120 hours

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (d) Filled part of the tank by pipe A in 1 hour $= \frac{1}{10}$

Filled part of the tank by pipe B in 1 hour $= \frac{1}{12}$

Let the tank will be empty in x hours due to leakage.

$\therefore$ Empty part of tank in 1 hour due to leakage $= \frac{1}{x}$

Filled part of tank by (A + B) in 1 hour

$= \left(\frac{1}{10} + \frac{1}{12}\right) = \frac{11}{60}$

So pipes A and B together can fill the tank in $\frac{60}{11}$ hours

Total time taken to fill the tank due to leakage

$= \frac{60}{11} + \frac{60}{231} = \frac{1320}{231}$ hour

from question,

$\frac{1}{A} + \frac{1}{B} - \frac{1}{x} = \frac{231}{1320}$

$\frac{1}{10} + \frac{1}{12} - \frac{1}{x} = \frac{231}{1320}$

$\frac{1}{x} = \frac{11}{60} - \frac{231}{1320}$

$\frac{1}{x} = \frac{242 - 231}{1320} = \frac{11}{1320}$

$x = \frac{1320}{11} = 120$ hours

Hence the whole tank should be empty in 120 hours by leakage.

110. Two inlet pipe A and B can fill a reservoir in 2.5 and 15 hrs respectively, while pipe C can empty the filled reservoir in 7.5 hours. When the reservoir was empty pipe A, B and C were opened together, but pipe B was closed after sometime, due to which it took 3.5 hours to fill the reservoir. Pipe B was opened for how many hours?

(a) 1 hour (b) 2 hours
(c) 1.5 hour (d) 0.5 hour

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (a) Let pipe B was opened for x hours.

According to the question,

$\frac{1}{A} + \frac{1}{B} - \frac{1}{C} = 1$

$\frac{3.5}{2.5} + \frac{x}{15} - \frac{3.5}{7.5} = 1$

$\frac{7}{5} + \frac{x}{15} - \frac{7}{15} = 1$

$\frac{x}{15} = 1 - \frac{7}{5} + \frac{7}{15} = \frac{15 - 21 + 7}{15}$

$\frac{x}{15} = \frac{1}{15} \Rightarrow x = 1$ hour

111. Three pumps can fill a water tank individually in 15, 20 and 30 hrs respectively. All three pumps were opened together at 8 A.M. At that time 1/5 of tank was filled. After 4 hours first pump was closed. After next two hours the third pump was also closed. At which time tank will be fully filled?

(a) 2:30 p.m. (b) 2:40 p.m.
(c) 3:20 p.m. (d) 1:20 a.m.

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (b) : Filled part of tank by first pump in 1 hour $= \frac{1}{15}$ part

Filled part of tank by second pump in 1 hour $= \frac{1}{20}$ part

Filled part of tank by third pump in 1 hour $= \frac{1}{30}$ part

Pre-filled part of the tank $= \frac{1}{5}$ (given)

Remaining part $= 1 - \frac{1}{5} = \frac{4}{5}$

Let it will take x hours to fill the tank.

According to the question,

$\frac{4}{15} + \frac{x}{20} + \frac{6}{30} = \frac{4}{5}$

$\frac{16 + 3x + 12}{60} = \frac{4}{5}$

$28 + 3x = 48$

$3x = 20$

$x = \frac{20}{3}$ or 6 hour 40 minutes

Hence required time = 8 am + 6 hour 40 minutes = 2:40 pm

112. Pipe A can fill a tank in 15 hours while pipe B takes 25 hours to fill it. In the beginning only pipe A was opened for some time and again it then turned off and immediately pipe B was opened. Overall it takes 19 hours to fill the tank completely. Pipe A was opened for how much time?

(a) 9 hours (b) 6 hours
(c) 7.5 hours (d) 3 hours

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (a) Let the pipe A was opened for x hour.
According to the question,

$$\frac{x}{15}+\frac{19-x}{25}=1$$

$$\frac{5x+57-3x}{75}=1$$

$2x + 57 = 75$
$2x = 75 - 57$
$2x = 18$
$x = 9$

Hence pipe A was opened for 9 hours

113. Two inlet pipe and one outlet pipe is present in a tank. The tank can be filled in 6 and 8 hrs respectively by the inlets pipes individually and can be emptied in 10 hrs by the outlet pipe. If the inlet pipe is opened for 1 hour and then closed, and then all the three pipes are opened together, then how much time will be taken to fill the remaining part of the tank?

(a) 75/23 hours (b) 82/23 hours
(c) 85/23 hours (d) 72/23 hours

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (c) Let it will take n hour to fill the remaining part of the tank.
According to the question,

$$\frac{n+1}{8}+\frac{n+1}{6}-\frac{n}{10}=1$$

$$\Rightarrow \frac{6n+6+8n+8}{48}-\frac{n}{10}=1$$

$$\Rightarrow \frac{7n+7}{24}-\frac{n}{10}=1$$

$$\Rightarrow \frac{70n+70-24n}{240}=1$$

$$\Rightarrow \frac{35n+35-12n}{120}=1$$

$$\Rightarrow 23n+35=120$$

$23 n = 85$

$$\boxed{n=\frac{85}{23}\text{hours}}$$

114. Pipe A alone can fill a tank in 4.5 hours, while along with pipe B it can be filled in 2.25 hours. If only pipe A is opened for half an hour after that pipe B is also opened, then how much time will be taken to fill the tank?

(a) 2 hours 30 minutes
(b) 2 hours 15 minutes
(c) 2 hours
(d) 2 hours 20 minutes

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (a) : Let the pipe B will fill the tank in x hours

Filled part of the tank by A in 1 hour $=\frac{1}{4.5}$

Filled part of the tank by A and B in 1 hour $=\frac{1}{2.25}$

$$\therefore \quad \frac{1}{4.5}\times\frac{1}{2}+\frac{x}{2.25}=1$$

$$\frac{10}{90}+\frac{100x}{225}=1$$

$$\frac{1}{9}+\frac{4x}{9}=1$$

$$1+4x=9$$

$\boxed{x = 2}$ hours

Hence total time to fill the tank =
2 hour + 30 minutes = 2 hour 30 minutes

115. Pipe A can fill an empty cistern in 4 hours while along with Pipe B it can be filled in 3 hours. Only Pipe A is turned on for an hour after that Pipe B is also turned on. How much total time will it take to fill the cistern?

(a) 3 hours
(b) 3 hours 15 minutes
(c) 3 hours 25 minutes
(d) 3 hours 20 minutes

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (c) : Filled part of the cistern by pipe A in 1 hour $=\frac{1}{4}$ part

Filled part of the cistern by A and B in 1 hour $=\frac{1}{3}$ part

Remaining part of the cistern $=1-\frac{1}{4}=\frac{3}{4}$ part

$\frac{1}{3}$ part of the cistern can be filled by (A + B) = in 1 hour.

$\frac{3}{4}$ part of the cistern can be filled by both = $3\times\frac{3}{4}=2.25$

total time = 1 + 2.25 = 3.25 hours or 3 hours 25 minutes

116. Two pipes A and B can fill an empty cistern in 32 and 48 hours, respectively. Pipe C can empty the entire cistern in 64 hours when no other pipe is working. Initially, when the cistern was empty, Pipe A and Pipe C were turned on. After a few hours, Pipe A was turned off and Pipe B was turned on instantly. In all it took 112 hours to fill the cistern. For how many hours was Pipe B turned on ?

(a) 72 (b) 70 (c) 77 (d) 84

Ans : (a) Let tap A is closed after x hours and tap B is opened, so it can be assumed that tap A was opened for x hours, tap B was opened for (112-x) hours and C was opened for 112 hours.

then $\boxed{x.A+B(112-x)-C\times112=1}$

$$\Rightarrow \quad \frac{x}{32}+\frac{112-x}{48}-\frac{112}{64}=1$$

$$\Rightarrow \quad \frac{6x+(112-x)4-112\times3}{192}=1$$

$\Rightarrow$ 6x+448–4x–336 = 192
$\Rightarrow$ 2x+112 = 192
2x = 192–112
2x = 80
x = 40 hours

$\because$ Pipe B was turned on at 112-x hours.
Hence the required time = 112– x = 112 – 40 = 72 hours.

Type - 5

117. Pipe A can empty whole tank in 5.6 hours, while pipe B, can fill the same tank in 7 hours. In the situation of tank being full, if the pipes A and B is opened one by one for an hour, then how much time can be taken to empty the tank?
(a) 48 hours (b) 56 hours
(c) 55 hours (d) 47 hours

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (d)
A = (–)5.6 (–7) 39.2
B = (+) 7 (+5.6)
Work done by (A + B) in 2 hours = + 5.6 – 7
= – 1.4 unit
Work done by (A + B) in 46 hours = –1.4 × 23
= – 32.2 unit
Remaining work = 39.2 – 32.2 = 7 unit
Now in 47th hours, A will empty 7 unit water.
Total time taken to empty the tank = 46 + 1 = 47 hours

118. An inlet pipe and an outlet pipe are opened to fill and empty a cistern in the order of one hour each. When the cistern is empty inlet pipe is turned on. The inlet pipe takes 15 hours to fill the empty cistern completely, while the outlet pipe can empty the entire cistern in 21 hours. How many hours will it take to fill the cistern completely?
(a) 100 (b) 52.5
(c) 105 (d) 99

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (d) : Filled part of cistern in 2 hours
$$= \frac{1}{15} - \frac{1}{21} = \frac{7-5}{105} = \frac{2}{105}$$
On multiplying by 49.
Filled portion of cistern in 98 hours $= \frac{2}{105} \times 49 = \frac{14}{15}$
$\therefore$ Remaining part $= 1 - \frac{14}{15} = \frac{1}{15}$
Hence inlet pipe will now fill $\frac{1}{15}$ part in next 1 hour.
So, it will take total 99 hours to fill the entire cistern.

119. Pipe A can fill an empty tank in 1.5 hours while pipe B can empty a full tank in 2.4 hours. When the tank is empty then pipe A is opened for 1 hour and then closed. Now B pipe is opened for 1 hour to empty the tank and then closed. The pipes were opened and closed alternately for one hour each. How much time will it take to fill the tank completely?
(a) 4.75 hours (b) 6.375 hours
(c) 7 hours (d) 8 hours

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (d) : Filled part by pipe A in 1 hour = $\frac{1}{1.5}$ part
Emptied part by pipe B in 1 hour = $\frac{1}{2.4}$ part
filled part of the tank in 2 hours
$$= \frac{1}{1.5} - \frac{1}{2.4} = \frac{2.4-1.5}{3.60} = \frac{.9}{3.6} = \frac{9}{36} = \frac{1}{4} \text{ part}$$
Time taken to fill the whole tank =
$$\frac{4 \times 2}{1} = 8 \text{ hours}$$

120. Starting from the inlet pipe in the reservoir, an inlet pipe and an outlet pipe take an hour to fill and empty the reservoir. The inlet pipe takes 11.25 hours to fill the empty reservoir and the outlet pipe can empty the filled reservoir completely in 22.5 hours. How much time will be taken to fill the reservoir?
(a) 44 hours
(b) 45 hours
(c) 43 hours 50 minutes
(d) 42 hours 45 minutes

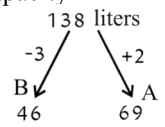
RRB Group-D – 19/09/2018 (Shift-III)

Ans. (d) Filled part of the tank by inlet pipe in 1 hour $= \frac{1}{11.25}$ part
Emptied part of the tank by outlet pipe in 1 hour $= \frac{1}{22.5}$ part
Filled part by both pipes in 2 hours
$$= \frac{1}{11.25} - \frac{1}{22.5} = \frac{2-1}{22.5}$$
$$= \frac{1}{22.5}$$
Fill part of the tank by both pipes in 2 × 21 hours
$$= \frac{1}{22.5} \times 21$$
Water filled in 42 hours $= \frac{42}{45}$ part
Remaining part of tank $= 1 - \frac{42}{45} = \frac{3}{45}$
Time taken to fill the $\frac{3}{45}$ part by inlet pipe
$$= \frac{3}{45} \times 11.25 = \frac{3}{4} \text{ hours}$$
$$= \frac{3}{4} \times 60 = 45 \text{ minute}$$
Total time = 42 hour 45 minutes

121. Pipe A is an inlet pipe which can fill an empty tank in 69 hours. Pipe B can empty a full filled tank in 46 hours. Starting with pipe B the pipes were opened sequentially for one hour filled tank. How much time will it take to empty the tank?
(a) 11 day 12 hours (b) 11 day 10 hours
(c) 1 day 13 hours (d) 11 day 7 hours

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (d) Let total capacity



Emptied in 2 hours = 1 lit.
Emptied in (2 × 135) hours = 135 lit.
The last 3 liters will be emptied by pipe B in 1 hour.
Hence total time taken = 271 = 11 day 7 hours

122. An inlet pipe and an outlet pipes are opened in an order of one hour to fill and to empty a tank. When the tank is empty, starting with inlet pipe to fill the empty tank inlet pipe takes 10.5 hours, and the outlet can empty the full tank in 35 hours. How much time will be taken to fill the tank?
(a) 28 hours 7 minutes
(b) 29 hours
(c) 30 hours
(d) 28 hours 42 minutes

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (d) Filled part of the tank by pipe A in 1 hour = $\frac{1}{10.5}$

Emptied part of the tank by pipe B in 1 hour = $\frac{1}{35}$

Filled part of the tank by (A – B) in 2 hours = $\frac{1}{10.5}-\frac{1}{35}$

$$= \frac{2}{21}-\frac{1}{35}$$

$$= \frac{70-21}{21\times 35} = \frac{49}{35\times 21} = \frac{7}{105} = \frac{1}{15}$$

Time taken to fill $\frac{1}{15}$ part of the tank = 2 hours

And filled part of tank in 2 × 14 hour. = $\frac{14}{15}$

$$\text{Remaining part} = 1-\frac{14}{15} = \frac{1}{15}$$

Now time taken to fill $\frac{1}{15}$ part by pipe A.

$$= \frac{1}{15}\times 10.5 = 0.7 \text{ hour}$$

$$= 60 \times 0.7 = 42 \text{ minute}$$

Hence total time taken to fill the tank = 28 hour 42 minute

123. Pipe A is an inlet pipe, which can fill a tank in 57 hours. Pipe B can empty the same tank in 38 hrs. When the tank is full filled, both pipes are opened alternately for one hour each time starting with A. How much total time will be taken to empty the tank?
(a) 9 day 13 hours (b) 9 day 10 hours
(c) 9 day 12 hours (d) 9 day 7 hours

RRB Group-D – 15/11/2018 (Shift-III)

Ans. :(c) Filled part by pipe A in 1 hour $= \frac{1}{57}$

Emptied part by pipe B in 1 hour $= \frac{1}{38}$

Emptied part by both pipes in 2 hours $= \frac{1}{38}-\frac{1}{57}$

$$= \frac{57-38}{57\times 38} = \frac{19}{57\times 38} = \frac{1}{114}\text{ part}$$

Time taken to empty $\frac{1}{114}$ part = 2 hours.

∴ Total time taken to empty the entire tank = 2 × 114 = 228 hours

228 hours = 9 day 12 hours

124. Pipe A can empty a filled tank in 32 hours, while B can fill this empty tank in 40 hours. If pipe A and B is opened alternately for 1 hours each time when the tank is filled, then what time will be taken to empty the tank?
(a) 315 hours (b) 320 hours
(c) 319 hours (d) 311 hours

RRB Group-D – 02/11/2018 (Shift-I)

Ans. (d) Filled part of the tank by pipe B in 1 hour = $\frac{1}{40}$

Emptied part of the tank by pipe A in 1 hour = $\frac{1}{32}$

Emptied part of the tank by both pipes in 2 hours = $\frac{1}{32}-\frac{1}{40} = \frac{5-4}{160} = \frac{1}{160}$

Time taken to empty the $\frac{1}{160}\times 155$ part of tank

= 2 × 155 hours
= 310 hours

Remaining part = $\frac{5}{160} = \frac{1}{32}$

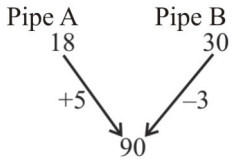
Time take to empty $\frac{1}{32}$ part = 1 hour

Hence total time taken to empty the entire tank
= 310 + 1 = 311 hours.

125. Pipe A can fill an empty cistern in 18 hours while Pipe B can empty a filled cistern in 30 hours. When the cistern is empty, Pipe A is turned on for an hour and then turned off. Now Pipe B is opened to drain out water from the cistern for an hour and then turned off. The pipes were alternately left open for an hour each time till the cistern was full. How much time did it take for the cistern to be full?
(a) 45 hours
(b) 90 hours
(c) 86 hours 40 minutes
(d) 86 hours 48 minutes

RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (d)



∴ Work done by pipe A and B alternately in 2 hours = +5 – 3 = 2 unit

∴ 1 Cycle (2 hours)→ 2 unit

↓ × 43 ↓ × 43

86 hours 86 unit

Time taken by pipe A to fill the reaming 4 units of work

$$= \frac{4}{5} \times 60 = 48 \text{ minutes}$$

Hence total time to fill the tank = 86 hour 48 min.

126. Two pipes, when working one at a time can fill a cistern in 2 hours and 3 hours, respectively while a third pipe can empty drain the cistern in 6 hours. All the three pipes were opened together when the cistern was $\frac{1}{6}$ filled. How long will it take for the cistern to be completely full ?

(a) 1 hour 15 minutes (b) 1 hour 30 minutes

(c) 1 hour 20 minutes (d) 1 hour

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (a) Filled part of the cistern by all three pipes in 1 hour $= \frac{1}{2} + \frac{1}{3} - \frac{1}{6}$

$$= \frac{3+2-1}{6} = \frac{4}{6} = \frac{2}{3} \text{ part}$$

∴ Remaining part of cistern $= 1 - \frac{1}{6} = \frac{5}{6}$

∴ Time taken to fill remaining part of cistern $= \frac{\frac{5}{6}}{\frac{2}{3}}$

$$= \frac{5}{6} \times \frac{3}{2} = \frac{5}{4} = 1\frac{1}{4} \text{ hours}$$

Time taken to fill cistern to completely = 1 h 15 min.

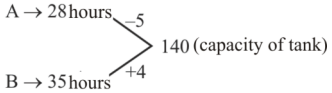
127. Pipe A can empty a filled tank in 28 hours while Pipe B can fill the same tank, when empty, in 35 hours. If alternately Pipes A and B are turned on for an hour each time, when the tank is full, how long will it take to empty the tank ?

(a) 279 hours (b) 271 hours

(c) 275 hours (d) 280 hours

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (b)



Emptied part by A in 1 hour = 1 × 5 = 5 units

Filled part by B in 1 hour = 1 × 4 = 4 units

∴ Tank emptied in 2 hours = – 5 + 4 = – 1 units

∵ 1 unit tank emptied in 2 hours.

∴ 135 units will be emptied by (A + B)

= 135 × 2 = 270 hours

And remaining 5 units will be emptied = In 1 hour (by A)

∴ Total time = 270 + 1 = 271 hours.

Type - 6

128. Pipe P can take out whole water from a tank in 20 hours. Another pipe Q can take out 20 liters per hours. If both the pipes are opened, then tank gets emptied in 12 hours, Find the capacity of the tank?

(a) 400 liters (b) 800 liters

(c) 650 liters (d) 600 liters

RRB JE - 02/06/2019 (Shift-II)

Ans. (d) Emptied part of the tank by pipe Q in 1 hour

$$= \frac{1}{12} - \frac{1}{20} = \frac{20-12}{240} = \frac{8}{240} = \frac{1}{30} \text{ Part}$$

Hence, time taken by pipe Q to empty the entire tank = 30 hours

Capacity of the tank = 30 × 20 = 600 liters

129. There is a hole in a tank, which can empty it in 8 hours. One more pipe has been planted for the tank which can fill 6 liters of water per hour. pipe is opened, but due to (leakage) hole the tank gets empty in 12 hours. What is the capacity of the tank?

(a) 80 liters (b) 120 liters

(c) 144 liters (d) 78 liters

RRB JE - 27/06/2019 (Shift-I)

Ans : (c) 1 hour pure filling work of second tap

$$= \left(\frac{1}{8} - \frac{1}{12}\right) = \frac{1}{24}$$

It there were no other holes, then the tank would be filled in 24 hours.

∴ Capacity of tank = 6 × 24 = 144 liters

130. If a bucket is filled 80% then it has two litre more water than when it is filled $66\frac{2}{3}\%$. Find the capacity of the bucket?

(a) 20 litre (b) 10 litre

(c) 15 litre (d) 12 litre

RRB JE - 27/06/2019 (Shift-III)

Ans : (c) $80\% - 66\frac{2}{3}\% = 2$ liters

$$\frac{240-200}{3}\% = 2 \text{ liters}$$

$$\frac{40}{3}\% = 2 \text{ liters}$$

$$100\% = \frac{2 \times 3}{40} \times 100 = 15 \text{ liters}$$

Hence capacity of Bucket = 15 liters

131. Kajipet, whose population is 4000, needs per person 9 liter water per day. It has tank of 15 m × 8m × 6m cuboid shaped. If the tank is fully filled with water, then the water of the tank will rest for how many days?

(a) 20 day (b) 25 day
(c) 10 day (d) 30 day

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (a) Number of days $= \frac{\text{Volume of cuboid}}{\text{Population} \times \text{Necessity}}$

$= \frac{15 \times 8 \times 6 \times 1000}{4000 \times 9}$ ($\because$ 1 m^3 = 1000 liters)

= 20 days

132. 3/5 of a vessel is filled with oil. When 20 litres of oil is used then it is 7/12 full. Find the capacity of the vessel?

(a) 1200 litres (b) 1400 litres
(c) 1600 litres (d) 1000 litres

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (a) Part of oil present in the vessel $= \frac{3}{5}$ part

Part of left oil after extracting 20 liters of oil from the Vessel $= \frac{7}{12}$ part

Therefore, the part which was filled with 20 liters of oil

$= \frac{3}{5} - \frac{7}{12}$

$= \frac{36-35}{60} = \frac{1}{60}$ part

$\because$ Quantity of oil present in the $\frac{1}{60}$ part of vessel = 20 liters

$\therefore$ Quantity of oil present in vessel

$= \frac{20 \times 60}{1} = 1200$ liters

Hence the capacity of vessel is 1200 liters.

133. A water container was 3/5 full, when 38 litres of water is taken out of it, then 1/8 part remains what is the total capacity of the container?

(a) 60 litres (b) 65 litres
(c) 75 litres (d) 80 litres

RRB NTPC 03.04.2016 Shift : 3

Ans : (d) Let the total capacity of the container be x *l*.
According to the question,

$\frac{3}{5}x - 38 = \frac{1}{8}x$

$\frac{3}{5}x - \frac{x}{8} = 38$

$\frac{24x - 5x}{40} = 38$

$19x = 38 \times 40$

$x = 2 \times 40$ $x = 80\ l$

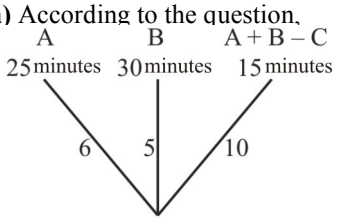
Hence total capacity of container is 80 *l*.

134. Two pipes namely A and B can fill a tank in 25 minutes and half an hour respectively and a pipe C can empty 3 gallons per minute. All the three pipes working together can fill the tank in 15 minutes. The capacity of the tank is:

(a) 450 gallons (b) 300 gallons
(c) 240 gallons (d) 600 gallons

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (a) According to the question,



L.C.M. of 25, 30, 15 = 150

or, A + B – C = 10

6 + 5 – C = 10

or C = 1

Hence time taken to empty the tank by C $= \frac{150}{1}$ min = 150 min

Thus the capacity of tank = 150 × 3 Gallon water = 450 Gallon

Type - 7

135. A tank can be filled by 5 pipes in 80 minutes. How long will it take to fill the tank by 8 pipes of same dimensions?

(a) 30 minutes (b) 78 minutes
(c) 128 minutes (d) 50 minutes

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\because$ Time taken to fill a tank by 5 pipes = 80 minutes

Then full tank = 80× 5

$\therefore$ Time taken to fill the tank by 8 pipes = $\frac{80 \times 5}{8}$ = 50 minutes

136. 44 pipes can fill a big tank of water in 21 hours. How much hours will be taken by 55 pipes to fill 5 such tanks?

(a) 63 (b) 84
(c) 72 (d) 54

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (b) As per the question,

$\frac{m_1 d_1}{w_1} = \frac{m_2 d_2}{w_2}$

$\frac{44 \times 21}{1} = \frac{55 \times x}{5}$

$\frac{44 \times 21}{1} = 11x$

$x = 4 \times 21$

$x = 84$ hours

137. When pipes A, B and C are opened together, they can fill a cistern in 4 hours. Pipe A fills water twice as fast as pipe B and pipe C fills water twice as fast as pipe A. In how much time will pipe A alone take to fill the tank completely.

(a) 7 hours (b) 30 hours
(c) 28 hours (d) 14 hours

RRB RPF SI – 12/01/2019 (Shift-II)

Ans. (d) : Let the time taken by pipe A to fill the tank = x hours

∴ The time taken by pipe B to fill the tank = 2x

∴ Time taken by pipe C to fill the tank = $\frac{x}{2}$

∴ Filled part of the tank by pipe A, B and C in 1 hour

$\Rightarrow \frac{1}{x}+\frac{1}{2x}+\frac{1}{\frac{x}{2}}=\frac{1}{4}$

$\Rightarrow \frac{1}{x}+\frac{1}{2x}+\frac{2}{x}=\frac{1}{4}$

$\Rightarrow \frac{1}{x}\left[1+\frac{1}{2}+2\right]=\frac{1}{4}$

$\Rightarrow \frac{1}{x}\left[\frac{2+1+4}{2}\right]=\frac{1}{4}$

$\Rightarrow \frac{1}{x}\times\frac{7}{2}=\frac{1}{4}$

$\Rightarrow x=\frac{7\times4}{2}$

$x = 7\times2 = 14$ hours

x = 14 hours

Hence the time taken by pipe A to fill the tank alone = 14 hours.

138. A tank can be filled by two pipes in which one pipe can fill with the thrice speed as compared to other. If both the pipes together fill the tank in 36 minutes, then the slow pipe alone can fill the tank in how much time?

(a) 81 minutes (b) 144 minutes
(c) 120 minutes (d) 108 minutes

RRB JE - 30/05/2019 (Shift-III)

Ans : (b) Let a slow-speed pipe fills the tank in x min.

then the high-speed pipe will fill it in $\frac{x}{3}$ min.

$\therefore \frac{1}{x}+\frac{3}{x}=\frac{1}{36}$

$\frac{4}{x}=\frac{1}{36}$

x = 144

Hence slow-speed pipe will fill the tank in 144 minutes

139. Pipe P works twice as fast as Q. Q pipes works twice faster as R. All three pipes together can fill any tank in 8 hrs. How long Q alone takes to fill the tank?

(a) 56 hours (b) 14 hours
(c) 25 hours (d) 28 hours

RRB JE - 26/06/2019 (Shift-I)

Ans : (d) According to the considered efficiency, the time taken by P, Q, R pipes to fill the tank is 4x, 2x and x hour respectively.

According to the question-

$\frac{1}{4x}+\frac{1}{2x}+\frac{1}{x}=\frac{1}{8}$

$\frac{1+2+4}{4x}=\frac{1}{8}$

$\frac{7}{4x}=\frac{1}{8}$

x = 14 hours

Hence time taken by Q to fill the tank = 2x

= 2 ×14 = 28 hours

140. Time taken by three taps P, Q and R individually to fill a tank is in the ratio of 2:1:6 which of the tap is fastest in these?

(a) can not be determined (b) P
(c) Q (d) R

RRB JE - 27/06/2019 (Shift-I)

Ans : (c)

	P		Q		R
Time	2	:	1	:	6
Efficiency	$\frac{1}{2}$	:	$\frac{1}{1}$	:	$\frac{1}{6}$

LCM of 2, 1, 6 = 6

$\frac{1}{2}\times6$: $\frac{1}{1}\times6$: $\frac{1}{6}\times6$

3 : 6 : 1

Hence the capacity of the tap Q is high then this tap will be the fastest.

141. Three pipes P, Q and R can fill a tank in 30 min, 20 min and 10 min. When the tank is emptied, then the three pipes are opened while they discharge three chemical solutions, S, T and U respectively. Find the ratio of the solution U in the material present in the tank after 3 minutes?

(a) 7/11 (b) 4/11
(c) 6/11 (d) 5/11

RRB JE - 28/06/2019 (Shift-III)

Ans. (c) Filled part by P, Q and R in 1 minute

$= \frac{1}{30}+\frac{1}{20}+\frac{1}{10}$

$\frac{2+3+6}{60}=\frac{11}{60}$

Filled solution by R in 3 minutes = $\frac{1}{10}\times3=\frac{3}{10}$

Ratio of solution U to total solution

$= \frac{\frac{3}{10}}{\frac{11}{20}}=\frac{3\times20}{11\times10}=\frac{6}{11}$

142. If pipe P fills a tank in 10 minutes. Five pipes, in which the capacity of each pipe is 20% of pipe P, can fill the tank in?

(a) 10 minutes (b) 50 minutes
(c) 130 minutes (d) 175 minutes

RRB RPF Constable – 20/01/2019 (Shift-III)

Ans : (a) Tank filled by pipe P = 10 minutes

∴ 1 min efficiency of P = $\frac{1}{10}$ part

20% efficiency of P = $\frac{1}{10}\times\frac{20}{100}=\frac{1}{50}$

Filled part of the tank by all 5 pipes in 1 minute

$= \frac{1}{50}+\frac{1}{50}+\frac{1}{50}+\frac{1}{50}+\frac{1}{50}$

$= \frac{5}{50} = \frac{1}{10}$

Hence, total time = 10 minutes

143. P, Q and R are the pipes through which solutions A, B and C discharged respectively in a tank. When P, Q and R when operated along can fill an empty tank in 30 min, 20 min and 10 min respectively. What will be the ratio of solution C in the tank after 3 minutes when the tank is empty and all the three pipes are opened.

(a) 6 (b) $\frac{5}{11}$

(c) 5 (d) $\frac{6}{11}$

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (d) The ratio of work done by P, Q and R in 3 minutes are as follows

$= \frac{3}{30}:\frac{3}{20}:\frac{3}{10} = \frac{1}{3}:\frac{1}{2}:\frac{1}{1} = 2:3:6$

i.e. the ratio of P, Q and R = 2 : 3 : 6

then the ratio of the solution $C = \frac{6}{2+3+6} = \frac{6}{11}$

144. One of the two water filling pipe in a tank works 1.5 times more efficiently than the other. If these two pipes works with such a draining pipe which alone can empty the tank in 12 hours, then the empty tank can be filled in 28 hours. How much time will be taken by the less efficient pipe to fill the tank?

(a) 21 (b) 18

(c) 24 (d) 15

RRB Group-D – 05/10/2018 (Shift-II)

Ans : (a) Let working efficiency of filling pipe A = 1

then, the working efficiency of second Pipe B = 1.5

A : B = 1 : 1.5 = 10 : 15 = 2 : 3

the ratio of times of A and B will be inversely proportional to their efficiencies.

hence ratio of times = 3 : 2

hence the time of A is 3x and time of B is 2x.

According to the question-

$\Rightarrow \frac{1}{2x}+\frac{1}{3x}-\frac{1}{12} = \frac{1}{28}$

$\Rightarrow \frac{5}{6x} = \frac{1}{28}+\frac{1}{12}$

$\Rightarrow \frac{5}{6x} = \frac{12+28}{28\times 12}$

$\Rightarrow \frac{5}{x} = \frac{40}{56}$ $\boxed{x = 7}$

time taken to fill the tank with less efficient pipe = 3x

= 3 × 7 = 21 hours

145. A water tank is filled with the help of three pipes X, Y and Z in 5 hours. Pipe Z is three times faster than pipe Y and pipe Y is two times faster than pipe X. How much time will be taken by the pipe X alone to fill the tank?

(a) 35 hours (b) 40 hours

(c) 60 hours (d) 45 hours

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (d)

Pipes –	**X**	**Y**	**Z**
Times –	**6t**	**3t**	**t**

According to question,

Time taken to fill the tank by X = 6t = 6 × 45/6 = 45 hr.

146. Two inlet pipe, in which the first inlet pipe is twice capable than the second pipe. One another outlet pipe which can empty the filled tank in 12.5 hours, working together can fill the empty tank in 2.5 hours. In how many hours the less capable inlet pipe will fill the tank?

(a) 7.5 (b) 6.25

(c) 5 (d) 8.75

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans : (b) Let there be three pipes A, B and C

$A = 2 \times B$

$C = \frac{1}{12.5}$ hr (Empties)

$A + B - C = \frac{1}{2.5}$

$A + B = \frac{1}{2.5}+\frac{1}{12.5} = \frac{10}{25}+\frac{10}{125}$

$A + B = \frac{50+10}{125} = \frac{60}{125}$

$\because A = 2B$

$3B = \frac{60}{125} \Rightarrow B = \frac{20}{125} = \frac{4}{25}$

Hence the time taken to fill the tank by less efficient pipe

$= \frac{25}{4} = 6.25$ hours.

147. One inlet pipe among the two inlet pipes works twice as efficient as the other inlet pipe. A drain pipe can empty a fully filled tank in 12 hours. If all the three pipes are opened together, then the empty tank is filled in 12 hours. In how many hours the less efficient inlet pipe will alone fill the empty tank?

(a) 15 (b) 18

(c) 12 (d) 9

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (b) Let the less efficient pipe fills the tank in x hours then first pipe will take $\left(\frac{x}{2}\right)$ hour

According to the question,

$\frac{1}{x/2}+\frac{1}{x}-\frac{1}{12} = \frac{1}{12}$

$$\frac{2}{x}+\frac{1}{x}-\frac{1}{12}=\frac{1}{12}$$
$$\Rightarrow \frac{3}{x}=\frac{1}{12}+\frac{1}{12}$$
$$\Rightarrow \frac{3}{x}=\frac{2}{12}$$
$$\Rightarrow x=18 \text{ hours.}$$

148. A tank is filled by three pipes X, Y and Z in 6 hours. If Z is three time faster than Y and Y is two time faster than X, then how many hours is needed by X to fill the tank?

(a) 27 hours (b) 54 hours
(c) 30 hours (d) 45 hours

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) Let the time taken by X, Y and Z is 6T, 3T and 2T respectively to fill the tank.

X : Y : Z
x : 2x : 6x → efficiency
6 : 3 : 1 → time

According to the question-

$$\frac{1}{6T}+\frac{1}{3T}+\frac{1}{T}=\frac{1}{6}$$
$$\Rightarrow \frac{1+2+6}{6T}=\frac{1}{6}$$
$$\Rightarrow T=9$$

Hence time taken to fill the tank by X $= 6T$
$= 6\times 9 = 54$ hours

149. Two inlet taps, in which one tap's capacity is 4.5 times more than the other, an outlet tap which can empty a tank in 9 hours, working together can fill an empty tank in 7.5 hours. How many hours will be taken by the less efficient pipe to fill the tank?

(a) 18 (b) 27
(c) 22.5 (d) 13.5

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (c) : Let pipe A fills a tank in x hours then pipe B will fill that tank in $\frac{x}{4.5}$ hours because the efficiency of B is 4.5 times more than A.

According to the question-

$$\left(\frac{1}{x}+\frac{4.5}{x}\right)-\frac{1}{9}=\frac{1}{7.5}$$
$$\frac{5.5}{x}-\frac{1}{9}=\frac{2}{15}$$
$$\frac{49.5-x}{9x}=\frac{2}{15}$$
$$\Rightarrow 5(49.5-x)=6x \Rightarrow 247.5-5x=6x$$
$$\Rightarrow 11x=247.5$$
$$\Rightarrow x=\frac{2475}{110}$$
$$\Rightarrow x = 22.5 \text{ hours}$$

150. Among the two inlet pipes A and B, A's efficiency is twice than that of B. Pipe C is an outlet pipe which takes three times the time taken by pipe A to empty the filled reservoir. If the three pipes are opened together when the reservoir is empty then it takes 6 hours to fill the reservoir. When A and C are working together, then how much time will be taken to fill the reservoir?

(a) 15.75 hours (b) 10.5 hours
(c) 21 hours (d) 42 hours

Ans. (b) : Let the time taken by A to fill the reservoir is x hours.

The time taken by B to fill the reservoir will be 2x hours

The time taken by C to empty the reservoir will be 3x hours

According to the question-

$$\frac{1}{x}+\frac{1}{2x}-\frac{1}{3x}=\frac{1}{6} \quad =\frac{6+3-2}{6x}=\frac{1}{6}$$

x = 7 hours

A = 7 hours, B = 14 hours, C = 21 hours

Filled part of the reservoir by A and C together in 1 hour $= \frac{1}{7}-\frac{1}{21}=\frac{2}{21}$

Hence time taken to fill the reservoir by A and C together $=\frac{21}{2}=10.5$ hours

151. A tap can fill a water tank in 4 hours. The tap was opened and 3/4 part of the tank was filled then two taps of same filling capacity were opened. Then after 15 minutes, another tap of a capacity of two times the first tap was opened to take out the water from the tank. Calculate the time which it takes to fill the tank.

(a) 4 hours 15 minutes
(b) 4 hours
(c) 3 hours
(d) 3 hours 30 minutes

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (d) According to the question,

Total filled part of the tank by pipes in 3 hour 15 min.

$$= \frac{3}{4}+\frac{1}{16}+\frac{1}{16}+\frac{1}{16}=\frac{15}{16}$$

Let the time taken to fill the remaining 1/16 part of the tank is x hours

$$\therefore \quad \frac{x}{4}+\frac{x}{4}+\frac{x}{4}-\frac{x}{2}=\frac{1}{16}$$
$$\frac{3x}{4}-\frac{2x}{4}=\frac{1}{16}$$
$$\frac{x}{4}=\frac{1}{16} \Rightarrow x = 15 \text{ minutes}$$

Time taken to fill the entire tank
$=$ 3h. 15m + 15 min = 3 hour 30 min.

152. In two inlet pipes, one is twice capable than the other. There is also a third outlet pipe which can empty the fully filled tank in 10 hours, it takes 2.5 hours to fill the tank completely. How many hours will be taken by the less efficient pipe to fill the tank alone?

(a) 6 (b) 7

(c) 8 (d) 5

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (a) : Let,

Time taken by A = 2n

Time taken by B = n

From question-

$$\frac{1}{2n}+\frac{1}{n}-\frac{1}{10}=\frac{10}{25}$$

$$\frac{1}{2n}+\frac{1}{n}=\frac{2}{5}+\frac{1}{10}$$

$$\frac{1+2}{2n}=\frac{4+1}{10}$$

$$\frac{3}{2n}=\frac{5}{10}$$

$$\boxed{n=3}$$

Time taken by less efficient pipe = 2n = 2 × 3 = 6 hours.

153. Pipe A fills the tank in 1/4 time of B. Pipe C takes three times more time as compared to A. To fill it all three pipes are opened together, they can fill an empty tank in 24 hours. If pipe C was not opened then how much time will be taken to fill the empty tank?

(a) 30.2 (b) 28.4

(c) 30.6 (d) 30.4

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (d) : Given-

A : B = 1 : 4

A : C = 1 : 3

A : B : C = 1 : 4 : 3

Let A, B, C fill the tank in x, 4x and 3x hours respectively.

According to the question-

The ratio of efficiencies= $A : B : C = 1 : \frac{1}{4} : \frac{1}{3}$

$= 12 : 3 : 4$

Total work = 19 × 24 = 456

Total time taken by (A + B) $= \frac{456}{15}$ = 30.4 hours

154. A pipe, working with its full speed, can fill an empty cistern in 1 hour. However, during the first hour it worked at one-twelth of its capacity, during the second hour at one-ninth of its capacity, during the third hour at one-sixth of its usual capacity, during the fourth hour at one-fourth of its usual capacity and during the fifth hour it was only one-third as efficient as it was supposed to be. A second pipe also shows similar performance, but it worked at full speed would have filled the empty cistern in 2 hours. Together with a drain pipe that drained water out of the tank at a constant rate, the empty cistern could be filled in 5 hours, with working together all the three pipes How many hours will it take the drain pipe to empty the filled cistern if no other pipe was working during the time?

(a) 16 (b) 12

(c) 10 (d) 15

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (b) Let drain pipe will be emptied the cistern in x hours

Filled part of cistern in 5 hours by first pipe

$$=\frac{1}{12}+\frac{1}{9}+\frac{1}{6}+\frac{1}{4}+\frac{1}{3}$$

$$=\frac{3+4+6+9+12}{36}=\frac{34}{36}$$

Then filled part of cistern in 5 hours by second pipe

$$=\frac{1}{2}\times\frac{34}{36}=\frac{17}{36}$$

When all three pipes are opened together-

$$\frac{34}{36}+\frac{17}{36}-\frac{5}{x}=1$$

$$\frac{51}{36}-1=\frac{5}{x},$$

$$\frac{15}{36}=\frac{5}{x},\quad x = 12 \text{ hours.}$$

155. The capacity of Sita's bucket is three times that of Ramu's bucket. Sita turns the bucket 60 times to fill an empty drum. If both Sita and Ramu start filling the drum together, then how many times they will have to fill bucket and over turn in drum.

(a) 45 (b) 40

(c) 50 (d) 30

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (a) Let the capacity of Ramu's bucket = x

Then capacity of Sita's bucket = 3x

Capacity of drum = 60 × 3x

= 180 x

Let both fill the bucket N times and turn into the drum

$\therefore$ N (3x+x) = 180x

$$N=\frac{180x}{4x}=45$$

14.

Simple Interest

Type - 1

1. The amount payable on maturity of a certain sum invested at a certain rate of simple interest per annum for one year was ₹ 1,484. If the rate of interest had been 2% higher, the amount would have been ₹ 26.50 more. What was the interest that was paid on the sum invested at the original rate?

(a) ₹ 152.50 (b) ₹ 161
(c) ₹ 157 (d) ₹ 159

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (d) : Let Principal = ₹ P
According to the question,
2% of P = 26.50

$$P = \frac{26.50 \times 100}{2}$$

$$= ₹\ 1325$$

Simple Interest = Amount – Principal
= 1484 - 1325= ₹159

2. Find the simple interest on ₹ 48750 at 16% per annum for 73 days of a non-leap year.

(a) ₹ 1560 (b) ₹ 1500
(c) ₹ 1600 (d) ₹ 1860

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (a) : Principal (P) = ₹ 48750
Rate (R) = 16% Annual

Time (t) = 73 days or $\frac{1}{5}$ years

$$S.I. = \frac{P \times R \times T}{100}$$

$$= \frac{48750 \times 16 \times 1}{100 \times 5} = ₹\ 1560$$

3. What is the simple interest (in ₹) on ₹540 at 6% per annum in $3\frac{1}{2}$ years?

(a) 113.40 (b) 213.40
(c) 13.40 (d) 313.40

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (a) : $SI = \frac{540 \times 6 \times 7}{200} = ₹\ 113.40$

4. What will be the interest on ₹6,250 for 3 years if interest accrues at 12% simple interest per annum?

(a) ₹2,250 (b) ₹2,050
(c) ₹2,450 (d) ₹2,150

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) :

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$= \frac{6250 \times 12 \times 3}{100} = ₹\ 2250$$

5. The simple interest on ₹1280 at 5% p.a. for 3 years is:

(a) ₹195 (b) ₹180
(c) ₹192 (d) ₹480

RRB Group-D 18/08/2022 (Shift-I)

Ans. (c) : Given,
P = ₹ 1280
R = 5%
T = 3 years

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

$$= \frac{1280 \times 5 \times 3}{100}$$

$$= ₹\ 192$$

6. Rani borrowed an amount of ₹2,00,000 from the bank to start a business, How much simple interest will she pay at the rate of 7% per annum after 2 years?

(a) ₹28,500 (b) ₹28,000
(c) ₹24,000 (d) ₹26,000

RRB Group-D 22/08/2022 (Shift-I)

Ans. (b) : $\text{Simple Interest} = \frac{P \times R \times T}{100}$

$$= \frac{200000 \times 7 \times 2}{100} = ₹28000$$

7. A sum, when invested at 12½% simple interest per annum, amounts to ₹ 8,250 after 2 years. What is the simple interest?

(a) ₹1,650 (b) ₹1,820
(c) ₹1,700 (d) ₹1,910

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : According to the question,

$$8250 - P = P \times \frac{25}{2 \times 100} \times 2$$

$$8250 - P = \frac{P}{4}$$

$$33000 = 5P$$

$$P = 6600$$

Hence, Simple interest = Amount – Principle
= 8250 – 6600 = ₹ 1650

8. If the principal amount is ₹13,000, then the simple interest for 4 years at a rate of 5% per annum is _____.

(a) ₹ 2,600 (b) ₹ 5,200
(c) ₹ 2,750 (d) ₹ 1,300

RRB GROUP-D – 19/09/2022 (Shift-II)

Ans. (a) : Given,
Principal = ₹ 13000
rate = 5%
time = 4 years

$$\text{Simple interest} = \frac{PRT}{100}$$

$$= \frac{13000 \times 5 \times 4}{100}$$

$$= ₹\ 2600$$

9. Find the simple interest on Rs. 2,000 at 8.25% per annum for the period from 7 February 2022 to 20 April 2022.

(a) Rs. 35 (b) Rs. 31
(c) Rs. 37 (d) Rs. 33

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (d) : Principle amount (P) = Rs. 2000
Rate of interest = 8.25% per annum
time = 7 February 2022 to 20th April 2022
= 22 + 31 (Days of March) + 20
= 73 days

$$\therefore \text{ Simple Interest} = \frac{P \times r \times t}{100}$$

$$= \frac{2000 \times 8.25 \times 73}{100 \times 365} = ₹\ 33$$

10. The compound interest on a sum of money at 5% per annum for 3 years is ₹ 6305 Find the simple interest (in ₹) for the same sum at the same rate of interest for the same number of years.

(a) ₹4,000 (b) ₹6,000
(c) ₹5,000 (d) ₹3,600

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let amount = ₹P
Given,
r = 5% yearly
n = 3 years

$$\text{C.I.} = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$$

$$6305 = P\left[\left(1+\frac{5}{100}\right)^3 - 1\right]$$

$$6305 = P\left[\frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} - 1\right]$$

$$6305 = P\left[\frac{9261-8000}{8000}\right]$$

$$6305 = P\left[\frac{1261}{8000}\right]$$

$$P = 5 \times 8000$$

$$P = ₹40,000$$

$$\text{S.I.} = \frac{P \times r \times t}{100}$$

$$= \frac{40000 \times 5 \times 3}{100} = ₹6000$$

11. What will be the simple interest on ₹ 10,000 at 12% per annum for 5 years ?

(a) ₹1,700 (b) ₹6,000
(c) ₹5,000 (d) ₹500

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (b) : Given,
P = 10000, R = 12%, T = 5

$$\text{S.I.} = \frac{P \times R \times T}{100}$$

$$\text{SI.} = \frac{10000 \times 12 \times 5}{100}$$

$$\text{S.I} = 100 \times 60 = ₹6000$$

12. A bank provides a loan at the rate of 5% per annum to a trader on an amount of ₹12,50,000 for 5 years. The simple interest to be paid is:

(a) ₹4,20,250 (b) ₹3,12,500
(c) ₹2,25,400 (d) ₹2,40,600

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (b) $\text{S.I.} = \frac{P \times R \times T}{100}$

$$\text{SI} = \frac{1250000 \times 5 \times 5}{100}$$

$$\text{SI} = ₹312500$$

13. The ratio of simple interest earned by a certain amount at the rate of 5% for 6 years and 8% for 3 years is:

(a) 2 : 3 (b) 4 : 5
(c) 3 : 2 (d) 5 : 4

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : Ratio of simple interest

$$= \frac{\frac{P \times 5 \times 6}{100}}{\frac{P \times 8 \times 3}{100}}$$

$$= \frac{30}{24}$$

$$= \frac{5}{4}$$

$$SI_1 : SI_2 = 5 : 4$$

14. The simple interest on ₹10000 for 6 months at the rate of 5 paisa per rupee per month is:

(a) ₹1000 (b) ₹1500
(c) ₹3000 (d) ₹2000

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (c) : Rate of 5 paise/rupee per month = 5% per month

The SI on the same rate on ₹10000 for 6 month

Simple Interest $= \frac{10,000 \times 5 \times 6}{100} = ₹3000$

15. What will be the simple interest earned on an amount of ₹ 16,800 in 9 months at the rate of $6\frac{1}{4}\%$ per annum?

(a) 787.50 (b) 812.50
(c) 158 (d) 860

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (a) :

(Given, $R = 6\frac{1}{4}\%$ yearly, T = 9 months, P = ₹ 16,800)

$S.I. = \frac{P \times R \times T}{100}$

$S.I. = \frac{16800}{100} \times \frac{25}{4} \times \frac{9}{12}$

S.I. = ₹ 787.50

16. What will be the amount of simple interest on ₹75,000 at the rate of $2\frac{5}{3}\%$ per annum for a period of 5 years?

(a) ₹13005 (b) ₹13000
(c) ₹13750 (d) ₹13050

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (c) : Principal amount = ₹ 75000

$r = 2\frac{5}{3}\% = \frac{11}{3}\%$

t = 5 years

$SI = \frac{P \times R \times T}{100}$

$SI = \frac{75000 \times 11 \times 5}{100 \times 3}$

SI = 250 × 55

SI = ₹ 13750

17. Mr. Ram invests an amount of ₹12,200 at the rate of 2% per annum for 4 years to obtain a simple interest. later he invests the principal amount as well as the amount obtained as simple interest for another 4 years at the same rate of interest. What amount of simple interest will be get at the end of the last 4 years?

(a) ₹ 1,054.08 (b) ₹ 1,054.00
(c) ₹ 1,056.07 (d) ₹ 1,055.08

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Shree Ram will get the amount after the first 4 years.

$= 12,200 + \frac{12200 \times 2 \times 4}{100}$

= 12200 + 976 = ₹13176

And Shree Ram will get amount in next 4 years

$= \frac{13176 \times 2 \times 4}{100}$

= ₹1054.08

18. What will be the simple interest on a sum of ₹2,000 for 4 years at a rate of 1 paisa per rupee per month?

(a) ₹690 (b) ₹609
(c) ₹960 (d) ₹900

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : $SI = \frac{P \times R \times T}{100}$

$= \frac{2000 \times 4 \times 12 \times 1}{100}$

= ₹ 960

19. After 10 years the simple interest on a sum of money will be ₹600. If the principal is increased thrice after 5 years, what will be the total interest after 10 years?

(a) ₹300 (b) ₹900
(c) ₹1200 (d) ₹600

RRB JE - 23/05/2019 (Shift-II)
RRB JE - 25/05/2019 (Shift-I)

Ans : (c) Simple interest of 10 years $= \frac{P \times R \times T}{100}$

$\therefore 600 = \frac{P \times R \times 10}{100} \Rightarrow PR = 6000$

According to the question,

Total simple interest = SI_1 for Five years + SI_2 for five years

$= \frac{5 \times P \times R}{100} + \frac{5 \times 3P \times R}{100} = PR\frac{20}{100}$

$= 6000 \times \frac{20}{100} = 1200$

Total Simple interest = ₹1200

20. What is the simple interest received on ₹2400 in 4 years 6 months at the rate of 4.5% per annum?

(a) ₹486 (b) ₹ 816
(c) ₹796 (d) ₹926

RRB JE - 24/05/2019 (Shift-I)

Ans : (a) Given-

Principal (P) = ₹ 2400

Rate (R) = 4.5%

Time (T) = 4 years 6 months $= \frac{9}{2}$ years

Simple interest (S.I) $= \frac{P \times R \times T}{100}$

$= \frac{2400 \times 4.5 \times 9}{100 \times 2} =$ ₹ 486

21. Find the ratio of simple interest received from the same amount invested in two different schemes, at the same rate for 6 years and 10 years respectively.

(a) 4: 3 (b) 3:5
(c) 4: 5 (d) 3: 4

RRB JE - 29/05/2019 (Shift-I)

Ans : (b)

$$\Rightarrow \frac{S.I_1}{S.I_2} = \frac{\frac{P \times R \times 6}{100}}{\frac{P \times R \times 10}{100}}$$

$$\Rightarrow \frac{S.I_1}{S.I_2} = \frac{6}{10} = \frac{3}{5}$$

$S.I_1 : S.I_2 = 3 : 5$

22. Find the simple interest from 5 February 2017 to 19 April 2017 for an amount of ₹5000 at the rate of 6.25% annual interest.

(a) ₹ 62.50 (b) ₹ 48.50
(c) ₹ 64 (d) ₹ 80

RRB RPF SI – 10/01/2019 (Shift-I)

Ans : (a) Rate = 6.25%, Amount = ₹ 5000

5 February 2017 to 19 April 2017 = 73 Days

$= \frac{73}{365}$ Years

$$\text{Simple interest} = \frac{5000 \times 6.25 \times 73}{100 \times 365}$$

$$= \frac{50 \times 625 \times 73}{100 \times 365}$$

$$= \frac{1 \times 125 \times 73}{2 \times 73} = ₹\ 62.5$$

23. The interest earned on ₹ 3680 at 4% simple interest per annum for 2.5 years will be.

(a) ₹368 (b) ₹92
(c) ₹184 (d) ₹274

RRB RPF Constable – 17/01/2019 (Shift-III)

Ans. (a) : Principal = ₹ 3680

Rate = 4%

Time = 2.5 years

$$\text{Simple interest} = \frac{P \times R \times T}{100} = \frac{3680 \times 4 \times 2.5}{100}$$

$$= \frac{3680 \times 10.0}{100} = ₹\ 368$$

24. What will be the interest received in 2 years and 3 months on ₹2500 at the rate of 6% per annum?

(a) ₹ 423.50 (b) ₹ 445
(c) ₹ 337.50 (d) ₹ 375

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (c) : 2 year 3 months $= 2 + \frac{3}{12} = \frac{9}{4}$ Years

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$\text{Interest to be received} = \frac{2500 \times 6 \times \frac{9}{4}}{100}$$

$$= \frac{675}{2} = ₹\ 337.50$$

25. How much interest will be received on the amount of ₹1600 in 10 years, if the rate of intrest is 7.25% per annum?

(a) ₹ 1240 (b) ₹ 1160
(c) ₹ 1220 (d) ₹ 1180

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (b) : Principal = ₹1600

Time = 10 Years

Rate = 7.25%

$$\text{Simple interest} = \frac{P \times R \times T}{100} = \frac{1600 \times 7.25 \times 10}{100}$$

$$= 16 \times 10 \times 7.25 = ₹1160$$

26. Divide ₹6,600 into two parts such that the simple interest received on the first part at the rate of 10% per annum for 3 years is equal to the simple interest received on the second part at 9% per annum for 4 years.

(a) ₹3600, 3000 (b) ₹4000, 2600
(c) ₹5000, 1600 (d) ₹6000, 600

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (a) Suppose first part of ₹6600 be x then

Second part = ₹ (6600 – x)

According to the question,

$$x \times \frac{3 \times 10}{100} = (6600 - x) \times \frac{4 \times 9}{100}$$

$5x = 39600 - 6x$

$11x = 39600$

First part, x = ₹ 3600

Second part, 6600 – 3600 = ₹ 3000

27. Sarathi deposited ₹3125 in a bank on which 8% simple interest was payable annually by the bank. If sarathi kept the money in the bank for 5 years, how much interest will be earn?

(a) ₹ 1,290 (b) ₹ 1,250
(c) ₹ 1,240 (d) ₹ 1,280

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (b) :

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

According to the question-

$$\text{Simple interest} = \frac{3125 \times 8 \times 5}{100} = ₹\ 1250$$

28. What will be the interest on ₹4600 in 5 years at the rate of 4.5% per annual simple interest?

(a) ₹ 1,020 (b) ₹ 1,025
(c) ₹ 1,035 (d) ₹ 1,045

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (c) Principal = ₹ 4,600 , Rate = 4.5% Annual,

Time = 5 Years, Interest = ?

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$= \frac{4600 \times 4.5 \times 5}{100} = 46 \times 4.5 \times 5$$

$= ₹1035$

29. An amount of ₹ 3250 at the rate of 5.25% per annum simple interest will earn an interest of ---- for 8 years.

(a) ₹ 1,425 (b) ₹ 1,395
(c) ₹ 1,365 (d) ₹ 1,465

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (c) Interest Rate = 5.25%
Principal Amount = ₹ 3250
Time = 8 Years

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$= \frac{3250 \times 5.25 \times 8}{100}$$

= ₹ 1365

30. Find the total simple interest on ₹ 500 at 7% per annum, on ₹ 700 and 10% per annum and on ₹1000 at 4% per annum for 3 years.

(a) 435 (b) 500
(c) 700 (d) 1000

RRB NTPC 12.04.2016 Shift : 3

Ans : (a) $S.I. = \frac{PRT}{100}$

$$S.I._{(1)} = \frac{500 \times 7 \times 3}{100} = ₹105$$

$$S.I._{(2)} = \frac{700 \times 10 \times 3}{100} = ₹210$$

$$S.I._{(3)} = \frac{1000 \times 4 \times 3}{100} = ₹120$$

$\therefore$ S.I. = $S.I._{(1)}$ + $S.I._{(2)}$ + $S.I._{(3)}$
= 105 + 210 + 120 = ₹435

31. Rita invested a sum of money at the rate of 2.5% rate for 4 years. Sita invested the same amount at the same rate for 6 years. What is the ratio of the simple interest earned by Sita to that earned by Rita?

(a) 3 : 2 (b) 2 : 3
(c) 1 : 3 (d) 1 : 4

RRB NTPC 28.04.2016 Shift : 2

Ans : (a) Suppose the sum of money is ₹x

$\therefore$ Simple interest for Rita $= \frac{x \times 2.5 \times 4}{100} = ₹\frac{x}{10}$

Simple interest for Sita $= \frac{x \times 2.5 \times 6}{100} = ₹\frac{3x}{20}$

$\therefore$ Required ratio $= \frac{3x}{20} : \frac{x}{10} = 3 : 2$

32. What is the interest earned on an amount of ₹ 2000 invested for 6 years at 8.5% simple interest per annum?

(a) ₹935 (b) ₹1,020
(c) ₹510 (d) ₹1,275

RRB ALP & Tec. (31-08-2018 Shift-III)

Ans : (b) $\text{Simple interest} = \frac{P \times R \times T}{100}$

$$= \frac{2000 \times 8.5 \times 6}{100} = ₹1020$$

33. Saathi deposited Rs. 825 in a bank that promised 8% simple interest per annum. If Saathi kept the money with the bank for 5 years, she will earn an interest of :

(a) ₹280 (b) ₹330
(c) ₹290 (d) ₹480

RRB ALP & Tec. (20-08-2018 Shift-I)

Ans : (b) $\text{Simple interest} = \frac{P \times R \times T}{100}$

$$\text{Simple interest} = \frac{825 \times 8 \times 5}{100} = \frac{825 \times 2}{5} = \frac{1650}{5}$$

Simple interest = ₹330

34. What will be the amount received in 6 years on ₹1,640 at the rate of 7.5% simple interest per annum.

(a) ₹750 (b) ₹748
(c) ₹742 (d) ₹738

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (d) Principal = ₹ 1640
Rate = 7.5% Annual
Time = 6 Years

$\therefore$ $\text{Simple interest} = \frac{P \times R \times T}{100} = \frac{1640 \times 7.5 \times 6}{100}$

Simple interest = ₹ 738

35. Amount of ₹1250 becomes ₹1550 in 4 years. What is the rate of simple interest?

(a) 4% (b) 6%
(c) 8% (d) 1%

RRB ALP CBT-2 Mec. - Diesel 21-01-2019 (Shift-III)

Ans. (b) : According to the question,
Principal (P) = ₹1250
Amount (A) = ₹1550
Time (T) = 4 years
A = SI + P

$$1550 = \frac{P \times R \times T}{100} + 1250$$

$$1550 = \frac{1250 \times 4 \times R}{100} + 1250$$

$$1550 = \frac{5000 \times R}{100} + 1250$$

50R = 1550 – 1250

$$R = \frac{300}{50}$$

R = 6%

Type - 2

36. A person invested some amount at the rate of 12% per annum simple interest and some amount at the rate of 10% per annum simple interest. He received yearly interest of ₹125 from both the investments. But if he had interchanged the amounts invested, he would have received ₹3 more as interest. How much did he invest at 10 % per annum simple interest originally?

(a) ₹600 (b) ₹700
(c) ₹500 (d) ₹650

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (d) : Let the amount at the rate of 12% simple interest = ₹ x
Invested amount at the rate of 10% simple interest = ₹ y
According to the question,

$$\frac{x\times12\times1}{100}+\frac{y\times10\times1}{100}=125$$

$$6x+5y=6250 \text{ ———— (1)}$$

If interchanged the invested amount.

Then, $\frac{x\times10\times1}{100}+\frac{y\times12\times1}{100}=125+3=128$

$$5x+6y=6400 \text{ ——— (2)}$$

On solving the eqn. (1) and (2),

$$x=500,\ y=650$$

Hence, invested originally amount at the 10% simple interst = ₹ 650

37. A certain sum amounts to ₹16500 in 2 years at 5% p.a. simple interest. Find the sum.
(a) ₹ 14000 (b) ₹14500
(c) ₹ 15000 (d) ₹15500

RRB NTPC (Stage-II) –14/06/2022 (Shift-II)

Ans. (c) : Given that,
Total amount = ₹16500
Rate = 5% annual
Time = 2 years
Principal = ?
Let the Principal be ₹ P

Then, $P+\frac{P\times R\times T}{100}=16500$

$$P+\frac{P\times5\times2}{100}=16500$$

$$\frac{11P}{10}=16500$$

$$P=₹\ 15000$$

38. A sum of money, when invested at 14.5% p.a. simple interest amounts to ₹13,464 after 6 years. What was the sum invested?
(a) ₹7,200 (b) ₹7,600
(c) ₹7,450 (d) ₹70,800

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (a) : Given,
Amount (A) = ₹13464
Rate (R) = 14.5% p.a.
Time (T) = 6 years
Let the invested sum = ₹ p
Now,

$$A=P\left(1+\frac{RT}{100}\right)$$

$$13464=P\left(1+\frac{14.5\times6}{100}\right)$$

$$13464=P\left(1+\frac{87}{100}\right)$$

$$13464=P\left(\frac{187}{100}\right)$$

$$P=\frac{13464\times100}{187}$$

$$=₹7200$$

39. A sum of money invested at a certain rate of simple interest per annum amounts to ₹ 24500 in eight years and to ₹ 32000 in thirteen years. Find the sum invested.
(a) ₹ 12500 (b) ₹ 13000
(c) ₹ 12000 (d) ₹ 11500

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : Given,
Amount after 13 years = ₹32000
Amount after 8 years = ₹24500
Interest of 5 years = ₹7500

Interest of 1 year $=\frac{7500}{5}=₹1500$

Interest of 8 years = 1500×8 = ₹12000
Principal = Amount – Interest
= 24500 – 12000
= ₹ 12500

40. Out of a sum of ₹9200 some amount was lent at the rate of 5% p.a. and the rest at 8% p.a. both earning simple interest. Total interest received after 3 years was ₹ 1812. The sum (in ₹) lent at 5% p.a. was :
(a) ₹ 4,600 (b) ₹ 4,200
(c) ₹ 4,400 (d) ₹ 5,200

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (c) : Let amount lent at 5% rate is ₹x.
According to the question,

$$\frac{x\times5\times3}{100}+\frac{(9200-x)\times8\times3}{100}=1812$$

$\Rightarrow$ 15x + 9200×24 – 24x = 181200
$\Rightarrow$ 9x = 220800 – 181200
$\Rightarrow$ 9x = 39600
$\Rightarrow$ x = ₹ 4400

41. A certain sum amounts to ₹ 22494 in 7 years at x% per annum on simple interest. If the rate of simple interest per annum had been (x +4)% the amount payable after 7 years would have been ₹ 25917 . Find the sum invested.
(a) ₹ 12,275 (b) ₹ 12,225
(c) ₹ 12,175 (d) ₹ 11,975

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : Let the invested sum = ₹ P

According to the question,

$$(22494 - P) = \frac{P \times x \times 7}{100} \text{ ——— (i)}$$

$$(25917 - P) = \frac{P(x+4) \times 7}{100} \text{ ——— (ii)}$$

Substracting eq. (i) from eq. (ii)

$$3423 = \frac{P \times 7}{100} \times 4$$

$$489 = \frac{P}{25}$$

$$P = 489 \times 25 = ₹\ 12{,}225$$

Hence, Invested sum = ₹ 12,225

42. A sum of money was invested at simple interest at r% per annum for 3 years. Had the rate of interest been (r + 2)%, it would have fetched ₹ 84 more. Find the sum invested.

(a) ₹ 1,200 (b) ₹ 1,600

(c) ₹ 1,400 (d) ₹ 1,500

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (c) : Given,

Rate = r% Time (t) = 3 years

If rate is (r+2)% then interest fetched ₹84 more

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

According to the question,

$$\frac{P \times (r+2) \times 3}{100} - \frac{P \times r \times 3}{100} = 84$$

$$\frac{3P}{100}(r + 2 - r) = 84$$

$$6P = 8400$$

$$P = 1400$$

Hence, Sum invested = ₹ 1400

43. A certain sum invested at 12% simple interest per annum after 5 years yields an interest of ₹19,200. What is the sum invested?

(a) ₹ 28,000 (b) ₹ 30,000

(c) ₹ 32,000 (d) ₹ 38,000

RRB GROUP-D – 22/09/2022 (Shift-III)

Ans. (c) : Let the invested sum = ₹ P

According to the question,

Given,

R = 12%

SI = ₹ 19,200

T = 5 years

$$SI = \frac{P \times R \times T}{100}$$

$$19200 = \frac{P \times 12 \times 5}{100}$$

$$P = \frac{19200 \times 100}{12 \times 5}$$

$$= ₹\ 32{,}000$$

44. Ramesh invested a certain sum of money at 9% per annum simple interest. If he receives an interest of ₹20,250 after one year, the sum he invested is:

(a) ₹ 2,00,000 (b) ₹ 2,75,000

(c) ₹ 2,25,000 (d) ₹ 2,50,000

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (c) : Let the invested sum = ₹ P

$$SI = \frac{PRT}{100}$$

$$20250 = \frac{P \times 9 \times 1}{100}$$

P = ₹225000

45. A sum of money was invested at a certain rate of simple interest per annum for a period of 4 years. Had the rate of simple interest per annum been 2% more, the sum invested would have earned a total of ₹640 more as interest in these 4 years. What was the sum (in ₹) invested?

(a) 8,000 (b) 9,000

(c) 7,500 (d) 9,500

RRB GROUP-D – 16/09/2022 (Shift-III)

Ans. (a) : Let the invested sum = ₹ P

According to the question,

$$\frac{P \times 4 \times (R+2)}{100} - \frac{P \times 4 \times R}{100} = 640$$

$$\Rightarrow \frac{4P}{100}[R + 2 - R] = 640$$

$$\Rightarrow \frac{8P}{100} = 640$$

$$\Rightarrow P = \frac{640 \times 100}{8}$$

$$P = ₹\ 8000$$

46. If the simple interest on a certain sum for 18 months at 5.5% per annum exceeds the simple interest on the same sum for 14 months at 6% per annum by ₹62.50. then the sum is:

(a) ₹6,500 (b) ₹7,000

(c) ₹5,000 (d) ₹8,200

RRB Group-D 23/08/2022 (Shift-II)

Ans. (c) : Let the invested sum = ₹ P

According to the question,

$$\frac{P \times 5.5 \times 18}{12 \times 100} - \frac{P \times 6 \times 14}{100 \times 12} = 62.50$$

$$\frac{P \times 6}{1200}[16.5 - 14] = 62.50$$

$$\frac{P}{200}\times 2.5 = 62.50$$

$$P = \frac{62.50\times 200}{2.5}$$

$P = 25 \times 200$

$P = ₹\ 5000$

47. The simple interest on a principal amount is Rs. 192 for a period of 2 years at the rate of 8% per annum. The principal amount is :

(a) ₹ 1,000 (b) ₹ 1,400

(c) ₹ 1,200 (d) ₹ 1,600

RRB Group-D 13/09/2022 (Shift-II)

Ans. (c) : Let the principal amount be ₹ P

Given,

$R = 8\%$

$T = 2$ years

$SI = ₹\ 192$

$\because \quad SI = \frac{P\times R\times T}{100}$

$\Rightarrow \quad 192 = \frac{P\times 8\times 2}{100}$

$\Rightarrow \quad P = \frac{192\times 100}{16}$

$P = ₹\ 1200$

48. Ravi took a loan from a bank at the rate of 8% p.a. simple interest. After 5 years, he had to pay an interest of ₹6,400 for the period. Find the Principal amount borrowed by Ravi.

(a) ₹ 10,000 (b) ₹ 16,000

(c) ₹ 15,000 (d) ₹ 18,000

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) : Rate of interest (r) = 8%

Time (t) = 5 years

Simple interest (SI) = ₹6400

Principal (P) = ?

$$SI = \frac{P\times r\times t}{100}$$

$$6400 = \frac{P\times 8\times 5}{100}$$

$P = ₹16000$

49. A sum becomes ₹26,400 after 2 years at simple interest of 5% per annum. Find the sum.

(a) ₹29,040 (b) ₹2,640

(c) ₹2,400 (d) ₹24,000

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question-

Rate = 5%, Time = 2 years, Amount = `26,400

$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Time}\times\text{Rate}}{100}\right)$$

$$A = P\left(1+\frac{rt}{100}\right)$$

$$26400 = P\left(1+\frac{5\times 2}{100}\right)$$

$$26400 = P\left(1+\frac{10}{100}\right)$$

$$P = \frac{26400\times 10}{11}$$

Principal (P) = ₹ 24000

50. Manvi borrowed some money on simple interest, at the rate of 6% p.a. for the first three years, at the rate of 9% p.a. for the next five years and at the rate of 13% p.a. for the period beyond eight years. If the total interest paid by him at the end of eleven years is ₹8,160, how much money did he borrow?

(a) ₹11,000 (b) ₹10,000

(c) ₹8,000 (d) ₹12,000

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let borrowed amount by Manvi = ₹ P

According to the question,

$$\frac{P\times 6\times 3}{100}+\frac{P\times 9\times 5}{100}+\frac{P\times 13\times 3}{100} = 8160$$

$18P + 45P + 39P = 816000$

$102\ P = 816000$

$P = ₹8000$

51. A man invests money in three different schemes for 6 years, 10 years and 12 years, at 10%, 12% and 15% simple interest, respectively. If the completion of each scheme, he gets the same interest then the ratio of the respective investments is:

(a) 7 : 4 : 3 (b) 6 : 3 : 2

(c) 5 : 4 : 3 (d) 4 : 3 : 2

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) : The required ratio of the respective investments

$$= \frac{1}{10\times 6} : \frac{1}{10\times 12} : \frac{1}{15\times 12}$$

$$= 1 : \frac{1}{2} : \frac{1}{3}$$

$= 6 : 3 : 2$

52. If the annual rate of simple interest increases from 8% to $12\frac{1}{2}\%$, a person's yearly income from interest increases by ₹369 then what is the principal amount of his investment ?

(a) ₹8,150 (b) ₹8,200

(c) ₹8,100 (d) ₹8,500

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (b) ∵ The rate of interest increases from 8% to $12\frac{1}{2}\%$

∴ Increase = (12½ –8)%

= 4.5%

According to the question,

$\because$ $4.5\% = ₹\ 369$

$\therefore$ $1\% = \frac{369}{4.5}$

$\therefore$ $100\% = \frac{369}{4.5} \times 100$

$= ₹\ 8200$

Hence, principal will be ₹8200.

53. Certain amount becomes ₹230 in 3 years at 5% simple interest per annum. Then the principal amount (₹) is:

(a) 180 (b) 150

(c) 200 (d) 320

RRB NTPC 13.03.2021 (Shift-I) Stage I

Ans. (c) : Amount = Principal $\left[1 + \frac{R \times T}{100}\right]$

$230 = \text{Principal} \left[1 + \frac{5 \times 3}{100}\right]$

$230 = \text{Principal} \times \frac{23}{20}$

$\text{Principal} = \frac{230 \times 20}{23} = ₹200$

54. A man invested $\frac{1}{2}$ of his capital at 5% rate of interest per annum, $\frac{1}{3}$ of his capital at 8% per annum and the remaining at 10% rate of interest per annum. His total income from the three investments is ₹820.00 in a year. The total capital invested is

(a) ₹ 16000.00 (b) ₹ 6400.00

(c) ₹ 12000.00 (d) ₹ 8000.00

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c) : Let capital invest = ₹ X

$\text{Interest} = \frac{x \times \frac{1}{2} \times 5 \times 1}{100} + \frac{x \times \frac{1}{3} \times 8 \times 1}{100} + \frac{x \times \frac{1}{6} \times 10 \times 1}{100}$

$820 = \frac{\frac{5x}{2} + \frac{8x}{3} + \frac{10x}{6}}{100}$

$820 = \frac{\frac{30x + 32x + 20x}{12}}{100}$

$820 = \frac{82x}{1200}$

$x = ₹\ 12000$

55. A sum of money of ₹2600.00 was lent out in two parts in such a way that the simple interest on the first part at 10% per annum for 5 years is the same as the interest of the second part at 9% per annum for 6 years. The part lent out at 10% is -

(a) ₹1250.00 (b) ₹1350.00

(c) ₹1450.00 (d) ₹1150.00

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : Let, the amount lent at 10% = ₹x

Amount lent at 9% = ₹(2600–x)

According to the question-

$\frac{x \times 10 \times 5}{100} = \frac{(2600 - x) \times 6 \times 9}{100}$

$50x = 2600 \times 54 - 54x$

$104x = 140400$

$x = 1350$

56. Balaji invested $\frac{1}{7}$ of his total investment at 4%, $\frac{1}{2}$ at 5% and the rest at 6% for 1 year. He received a total interest of ₹730. What was the total sum invested?

(a) ₹7,000 (b) ₹24,000

(c) ₹14,000 (d) ₹38,000

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the money is ₹x.

According to the question,

$730 = \frac{x/7 \times 4 \times 1}{100} + \frac{5x/14 \times 6 \times 1}{100} + \frac{x/2 \times 5 \times 1}{100}$

$730 = \frac{8x + 30x + 35x}{1400}$

$730 \times 1400 = 73x$

$x = ₹14{,}000$

57. A person invested 2/3 of his capital at the rate of 6%, 1/5 at the rate of 10% and the remaining at the rate of 15%. If his annual income is ₹600, the capital will be.

(a) ₹2500 (b) ₹4500

(c) ₹5000 (d) ₹7500

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the capital of person be = ₹x

As per question,

$x \times \frac{2}{3} \times \frac{6}{100} + x \times \frac{1}{5} \times \frac{10}{100} + x\left[1 - \left(\frac{2}{3} + \frac{1}{5}\right)\right] \times \frac{15}{100} = 600$

$\frac{x}{25} + \frac{x}{50} + x\left[\frac{15 - (10 + 3)}{15}\right] \times \frac{15}{100} = 600$

$\frac{x}{25} + \frac{x}{50} + \frac{2x}{15} \times \frac{15}{100} = 600$

$\frac{x}{25} + \frac{x}{50} + \frac{2x}{100} = 600$

$\frac{4x + 2x + 2x}{100} = 600$

$\frac{8x}{100} = 600$

$x = ₹7500$

Total capital of person = ₹7500

58. The simple interest on a certain sum for 5 years at 13% per annum is ₹ 650. The sum is:

(a) ₹1,090 (b) ₹1,096

(c) ₹1,065 (d) ₹1,000

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : Given,

Rate= 13%

Time = 5 years

Interest = ₹650

$$SI = \frac{P \times R \times T}{100}$$

$$650 = \frac{P \times 13 \times 5}{100}$$

P = ₹1000

59. Kumar lent an amount to Arif at a simple interest rate of 10% p.a. for 3 years, and Arif lent this amount to Naresh at a simple interest rate of 20% p.a. for 3 years. If the interest Arif received was ₹1,560 after 3 years, then what was the amount that Kumar had lent to Arif?

(a) ₹5,400 (b) ₹5,600

(c) ₹6,200 (d) ₹5,200

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let the amount = ₹P

According to the question,

$$\frac{P \times 20 \times 3}{100} - \frac{P \times 10 \times 3}{100} = 1560$$

$60P - 30P = 1560 \times 100$

$30P = 156000$

$$P = \frac{156000}{30}$$

$\boxed{P = ₹\ 5200}$

60. The capital required to earn a monthly interest of ₹1500 at 12% per annum simple interest is:

(a) ₹1 lakh (b) ₹1.5 lakh

(c) ₹25 lakh (d) ₹15 lakh

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

SI = ₹1500

R = 12%

$$T = \frac{1}{12} \text{ years}$$

Then, $$S.I = \frac{P \times R \times T}{100}$$

$$1500 = \frac{P \times 12 \times 1}{100 \times 12}$$

$$P = \frac{1500 \times 100 \times 12}{12 \times 1}$$

P = ₹1,50,000

P = 1.5 lakh

61. If simple interest is paid per annum on an amount invested for five years and the amount payable on maturity after the expiry of five years is ₹2340. However, if the amount had been invested for only two years, the amount payable on maturity would have been Rs. 2016 what was the original amount invested?

(a) ₹2000/- (b) ₹1800/-

(c) ₹1600/- (d) ₹1750/-

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the Principal = ₹P

$$2340 - p = \frac{p \times r \times 5}{100} \quad \text{..... (i)}$$

$$2016 - p = \frac{p \times r \times 2}{100} \quad \text{..... (ii)}$$

Equation (i) ÷ (ii)

$$\frac{2340 - p}{2016 - p} = \frac{\frac{p \times r \times 5}{100}}{\frac{p \times r \times 2}{100}}$$

$$\frac{2340 - p}{2016 - p} = \frac{5}{2}$$

$4680 - 2p = 10080 - 5p$

$3p = 5400$

p = ₹ 1800

62. A sum of money invested for 4 years at 5% simple interest becomes ₹150/- on maturity. Find the amount invested?

(a) ₹180/- (b) ₹125/-

(c) ₹120/- (d) ₹175/-

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the principal = ₹ P

According to the question,

SI = 150 – P

$$\therefore\ 150 - P = \frac{P \times 5 \times 4}{100}$$

$750 - 5P = P$

$6P = 750$

P = ₹ 125

63. Rahim invested a certain sum at 5% simple interest for 3 years. His friend Hiralal invested the same sum for 2 years at 7% simple interest. Rahim got ₹30 more interest than Hiralal. What was the amount invested by them?

(a) ₹7, 000.00 (b) ₹3, 000.00

(c) ₹2, 000.00 (d) ₹5, 000.00

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

SI for Rahim – SI for Hiralal = ₹30

$$\frac{P \times 3 \times 5}{100} - \frac{P \times 2 \times 7}{100} = 30$$

$$\frac{P}{100} = ₹30$$

Principal (P) = ₹3000

64. A invests two equal amounts in two banks giving rates of simple interest at 10% per annum and 12% per annum respectively. At the end of the year, the interest earned in ₹1,650. The amount invested in each bank is:

(a) ₹ 1,650 (b) ₹ 7,500

(c) ₹ 750 (d) ₹ 15,000

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let the amount invested = ₹x

Principal (P_1) = Principal (P_2)

Interest rate (R_1) = 10%

$(R_2) = 12\%$

Time $(T) = 1$ year

Interest $= ₹1650$

$$\text{Simple interest} = \frac{P_1R_1T_1}{100} + \frac{P_2R_2T_2}{100}$$

$$1650 = \frac{x \times 10 \times 1}{100} + \frac{x \times 12 \times 1}{100}$$

$$1650 = \frac{22x}{100}$$

$$x = \frac{1650 \times 100}{22}$$

$$\boxed{x = ₹7500}$$

65. A sum of money lent at simple interest amounts to ₹720 after 2 years and to ₹1,020 after a further period of 5 years. What is the sum of money?

(a) ₹400 (b) ₹500

(c) ₹200 (d) ₹600

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : SI for 2 year (A) = ₹720

SI for 7 years (A) = ₹1020

∴ Simple Interest for 5 years

= 1020 – 720 = ₹ 300

$$\text{Per year simple snterest} = \frac{300}{5} = ₹60$$

SI after 2 years = ₹720

Simple interest for 2 years = ₹120

Hence principal amount = 720 - 120 = ₹600

66. The simple interest on a given sum of money for two years would have been ₹240 more had the rate of interest per annum been 3% higher. Find the initial sum invested.

(a) ₹3,000 (b) ₹3,600

(c) ₹8,000 (d) ₹4,000

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let the principal is ₹x

Rate= R %

Time = 1 year

According to the question,

$$\frac{x \times (R+3) \times 1}{100} - \frac{x \times R \times 1}{100} = 240$$

$$\frac{3x}{100} = 240$$

$$x = ₹\ 8000$$

67. A sum of money was invested at a fixed rate of simple interest for 10 years. Had it been invested at a 5% higher rate, the interest would have been ₹1200 more. Find the amount.

(a) ₹ 2500 (b) ₹ 2000

(c) ₹ 3000 (d) ₹ 2400

RRB JE - 26/06/2019 (Shift-I)

Ans. (d) Suppose Amount = ₹ x

Rate of Interest = r %

If the rate of interest are r% then,

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$= \frac{x \times r \times 10}{100} = \frac{rx}{10}$$

If the rate of interest are (r + 5)% then,

$$\text{Simple interest} = \frac{x \times (r+5) \times 10}{100} = \frac{rx + 5x}{10}$$

According to the question,

$$\frac{rx + 5x}{10} - \frac{rx}{10} = 1200$$

$$\frac{rx + 5x - rx}{10} = 1200$$

$$\frac{5x}{10} = 1200$$

$$x = ₹\ 2400$$

68. Simple interest on an amount 2 years is ₹400. Had 'r' been 4% more than the simple interest would have been ₹400 more. What is the principle amount.

(a) ₹ 4000 (b) ₹ 12000

(c) ₹ 5000 (d) ₹ 10000

RRB JE - 22/05/2019 (Shift-I)

Ans : (c) Suppose principal amount = ₹P, Rate = r%

According to the first condition

$$400 = \frac{P \times r \times 2}{100} \text{ ..... (i)}$$

According to the second condition -

$$400 + 400 = \frac{P \times (r+4) \times 2}{100}$$

$$800 = \frac{P \times (r+4) \times 2}{100} \text{ ..... (ii)}$$

By (i) ÷ (ii)

$$\frac{1}{2} = \frac{r}{r+4}$$

$r = 4\%$

So, $$P = \frac{SI \times 100}{t \times r} = \frac{400 \times 100}{2 \times 4} = ₹\ 5000$$

69. A sum of ₹26000 is divided into two amounts in such a way that the simple interest on one part for 5 years at the rate of 10% is equal to simple interest on the other part for 6 years at the rate of 9%. Find the amount invested for 5 years at the rate of 10%.

(a) ₹15000 (b) ₹12500

(c) ₹13500 (d) ₹14000

RRB JE - 24/05/2019 (Shift-II)

Ans : (c) Let first amount = ₹x

Time = 5 Years, Rate 10%

and second amount = ₹ (26000−x)

Time = 6 Years Rate = 9%

According to the question-

Simple interest of first amount = Simple interest of second amount

$$\frac{x \times 5 \times 10}{100} = \frac{(26000 - x) \times 9 \times 6}{100}$$

$50x = 26000 \times 54 - 54x$

$104x = 26000 \times 54$

$x = \frac{26000 \times 54}{104} = ₹13500$

Hence invested amount for 5 years at the rate of 10% = ₹13500

70. An investment of ₹16000 at 8% simple interest for 1 year and another investment at 18% simple interest for the same period, together fetch a return profit of 10% on the total investment. Find the total amount invested.

(a) ₹22000 (b) ₹20000
(c) ₹20500 (d) ₹18000

RRB JE - 27/05/2019 (Shift-III)

Ans : (b) Suppose second investment = ₹ P

From question−

$$\frac{16000 \times 8 \times 1}{100} + \frac{P \times 18 \times 1}{100} = \frac{(16000 + P)10}{100}$$

$$1280 + \frac{9P}{50} = 1600 + \frac{P}{10}$$

$$320 = \frac{9P}{50} - \frac{P}{10}$$

$$\frac{4P}{50} = 320$$

P = ₹4000

Total investment = 16000+P = 16000 + 4000 = ₹20000

71. If the simple interest on a certain sum for 15 months at 7.5% per annum exceeds the simple interest on the same sum for 8 months at 12.5% per annum. by ₹ 32.50, then find the sum.

(a) ₹ 3000 (b) ₹ 3060
(c) ₹ 3120 (d) ₹ 2900

RRB JE - 29/05/2019 (Shift-II)

Ans : (c) Suppose that Amount is ₹ P

$$\frac{P \times 7.5 \times 15}{100 \times 12} - \frac{P \times 12.5 \times 8}{100 \times 12} = 32.50$$

$$\frac{P}{100 \times 12}(112.5 - 100) = 32.50$$

$P \times 12.5 = 32.50 \times 100 \times 12$

$P \times 125 = 325 \times 100 \times 12$

$\therefore$ P = ₹ 3120

72. The simple interest received on a sum of money borrowed at the rate of 7% per annum in 2 years is the same as the amount received on a sum of ₹ 1750 in 4 years at the rate of 5% per annum. Find the amount.

(a) ₹1800 (b) ₹1600
(c) ₹ 2500 (d) ₹ 2400

RRB JE - 30/05/2019 (Shift-I)

Ans : (c) Let that amount is ₹x

According to the question,

$$\frac{x \times 7 \times 2}{100} = \frac{1750 \times 5 \times 4}{100}$$

$$x = \frac{1750 \times 5 \times 4}{7 \times 2} = ₹2500$$

73. P_1, P_2 and P_3 are invested at 4%, 6% and 8% respectively in such a way that the simple interest received from all the three amounts at the end of the year are equal. If the sum of the three invested amounts is ₹2600, find the values of P_1, P_2 P_3 respectively.

(a) ₹1100, ₹800, ₹ 700
(b) ₹1200, ₹ 600, ₹ 800
(c) ₹1000, ₹ 900, ₹ 700
(d) ₹1200, ₹ 800, ₹ 600

RRB JE - 28/05/2019 (Shift-II)

Ans : (d) Let simple interest (S.I) = ₹x

Time (T) = 1 Years

For P_1

$$S.I = \frac{P_1 \times R \times T}{100}$$

$$x = \frac{P_1 \times 4 \times 1}{100}$$

$P_1 = 25x$

For P_2

$$x = \frac{P_2 \times 6 \times 1}{100}$$

$$P_2 = \frac{50x}{3}$$

For P_3

$$x = \frac{P_3 \times 8 \times 1}{100}$$

$$P_3 = \frac{25x}{2}$$

$P_1 + P_2 + P_3 = 2600$

$$25x + \frac{50x}{3} + \frac{25x}{2} = 2600$$

$$\frac{150x + 100x + 75x}{6} = 2600$$

$325x = 2600 \times 6$

x = ₹48

$P_1 = 25x = 25 \times 48 = ₹1200$

$$P_2 = \frac{50x}{3} = \frac{50}{3} \times 48 = ₹800$$

$$P_3 = \frac{25x}{2} = \frac{25}{2} \times 48 = ₹600$$

74. A fixed sum of money was invested for 5 years at a fixed rate of simple interest. If had been invested at a 10% higher rate, it would have gained ₹2000 more. What was the principal invested?

(a) ₹3500 (b) ₹4000
(c) ₹4500 (d) ₹5000

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (b) Suppose Principal = ₹P Rate = R% Time = 5 Years

From question-

$$\frac{P \times (R + 10) \times 5}{100} - \frac{P \times R \times 5}{100} = 2000$$

$$\frac{5PR + 50P}{100} - \frac{5PR}{100} = 2000$$

$$\frac{5PR + 50P - 5PR}{100} = 2000$$

$$\frac{50P}{100} = 2000$$

$$P = 2000 \times 2 = ₹4000$$

75. A sum at the end of $3\frac{3}{4}$ years at 6% simple interest per annum, yields a total amount of ₹2940 is received. What was the amount invested?

(a) ₹2,350 (b) ₹2,400
(c) ₹2,550 (d) ₹2,600

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (b) Rate = 6%

Time = $3\frac{3}{4}$ Years = $\frac{15}{4}$ Years

Amount = ₹2940, Principal = P

$$\text{Amount} = \text{Principal}\left[\frac{\text{Rate} \times \text{Time}}{100} + 1\right]$$

$$2940 = P\left[\frac{6 \times \frac{15}{4}}{100} + 1\right] = P\left[\frac{90}{400} + 1\right]$$

$$= P \times \frac{49}{40}$$

$$\Rightarrow P = \frac{2940 \times 40}{49}$$

$$\Rightarrow P = 60 \times 40$$

$$\Rightarrow P = ₹\ 2400$$

Hence amount invested = ₹ 2400

76. The interest earned on the money invested for 6 years at a simple interest rate of 9.5% per annum was ₹456. What was the amount invested?

(a) ₹ 750 (b) ₹ 775
(c) ₹ 800 (d) ₹ 850

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans : (c) Given-

Simple interest = ₹ 456

Rate (R) = 9.5%

Time (T) = 6 Years

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$\Rightarrow 456 \times 100 = \text{Principal} \times 9.5 \times 6$$

$$\Rightarrow \text{Principal} = \frac{45600}{57}$$

Principal = ₹ 800

77. A sum of money becomes ₹457 in 5 years and ₹574 in 10 years at the same simple interest rate. Find the value (in rupees) of the sum.

(a) 500 (b) 280
(c) 340 (d) 420

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c) : Suppose Principal = ₹ P

and Rate = r % per annum

$$P + \frac{P \times 5 \times r}{100} = 457 \text{.....(i)}$$

$$P + \frac{P \times 10 \times r}{100} = 574 \text{.....(ii)}$$

On subtracting equation (ii) from equation (i)–

$$\therefore 117 = \frac{P \times r \times 5}{100}$$

$$\therefore 117 = \frac{P \times r}{20} \text{.....(iii)}$$

$\therefore$ from equation (i)

457 = P + 117

$\therefore$ P = 457 – 117

P = ₹ 340

78. On a certain sum, simple interest for $\frac{5}{2}$ years at an annual rate of 12% is ₹50 less than the interest on the same sum for $\frac{7}{2}$ years at an annual rate of 10%. Find the sum.

(a) ₹ 1,500 (b) ₹ 1,000
(c) ₹ 2,000 (d) ₹ 1,200

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (b) : Let Amount = ₹ P

$\therefore$ According to the question,

$$\frac{P \times 10 \times 7}{100 \times 2} - \frac{P \times 12 \times 5}{100 \times 2} = 50$$

$$\frac{P \times 35}{100} - \frac{P \times 30}{100} = 50$$

$$\frac{P \times 5}{100} = 50$$

P = ₹ 1000

79. At the rate of 8% simple interest, a amount becomes ₹924 in $6\frac{3}{4}$ years. What amount was deposited initially.

(a) ₹ 626 (b) ₹ 650
(c) ₹ 600 (d) ₹ 675

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (c) Rate = 8%, Time = $6\frac{3}{4}$ Years = $\frac{27}{4}$ Years

Amount = ₹ 924

$$A = P\left(1 + \frac{RT}{100}\right)$$

$$924 = P\left(1 + \frac{27 \times 8}{4 \times 100}\right)$$

$$924 = P\left(1 + \frac{27}{50}\right)$$

$$924 = \frac{77P}{50} \Rightarrow P = \frac{924 \times 50}{77}$$

P = ₹ 600

Deposite amount (Principal) in the starting = ₹ 600

80. The difference between the interest on a sum of money at 12% per annum simple interest for 4 years and the same sum at 9% per annum simple interest for 5 years is ₹ 412.50. What is the amount?

(a) ₹13,900 (b) ₹ 14,630
(c) ₹14,080 (d) ₹13,750

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (d) Suppose that amount is ₹x
According to the question-

$$\frac{12\times4\times x}{100}-\frac{9\times5\times x}{100}=412.50$$

$48x - 45x = 41250$
$3x = 41250$
$x = 13750$
So that amount is ₹13750.

81. A person has ₹2000. He gives a portion of the amount at 5% simple interest and the remaining amount at 4% simple interest. After one year he earns ₹96. What amount did he given at 4% interest?
(a) ₹500 (b) ₹480
(c) ₹400 (d) ₹420

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (c) Let amount given at 4% Interest Rate = ₹ x
∴ Amount given on 5% = (2000–x)
According to the question,

$$\frac{x\times4\times1}{100}+\frac{(2000-x)\times5\times1}{100}=96$$

$$\frac{4x}{100}+\frac{2000\times5-5x}{100}=96$$

$$\frac{-x}{100}+\frac{10000}{100}=96$$

$$\frac{x}{100}=4$$

Hence amount given at 4% interest rate = ₹ 400

82. ₹600 was given to two persons, of which to the first at 5% per annual and the second person at 10% per annual. After one year, the sum of their interest is ₹40. Find the amount given to the first person.
(a) ₹ 400 (b) ₹ 420
(c) ₹ 380 (d) ₹ 200

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (a) : Let the amount given to second person at 10% interest = ₹ x
Then the amount given to the first person at 5% interest rate = ₹(600 – x)
simple interest = ₹ 40
According to the question,

$$\Rightarrow\left(x\times\frac{10}{100}\times1\right)+\left\{(600-x)\times\frac{5}{100}\times1\right\}=40$$

$$\Rightarrow\frac{x}{10}+\left\{(600-x)\times\frac{1}{20}\right\}=40$$

$$\Rightarrow\frac{x}{10}+\left\{30-\frac{x}{20}\right\}=40$$

$$\Rightarrow\frac{x}{20}=40-30$$

$x = ₹ 200$
Amount given to the first person = 600 – x
= 600 – 200 = ₹400

83. An amount invested for 2 years 9 months at the rate of 8% simple interest per annum became ₹915 at the end of the period. How much amount was invested initially?
(a) ₹725 (b) ₹700
(c) ₹675 (d) ₹750

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (d) Let principal is ₹x

$$\text{Simple interest} = \frac{P\times R\times T}{100}$$

$$915-x=\frac{x\times8\times\frac{11}{4}}{100}$$

$91500 - 100x = 22x$
$122x = 91500$
$x = ₹750$

84. The interest received in 3.5 years on the amount invested at 16% simple interest rate per annum is equal to the interest received on investing another amount at 12.6% simple interest per annum for 5 years. What is the ratio of both the invested amounts?
(a) 14:9 (b) 8:7
(c) 9:8 (d) 6:5

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (c) : Simple interest = $\frac{P\times R\times T}{100}$
Let first invest amount = P_1
and second invest Amount = P_2
According to the question-

$$\frac{P_1\times16\times3.5}{100}=\frac{P_2\times12.6\times5}{100}$$

$$P_1\times16\times3.5=P_2\times12.6\times5$$

$$P_1\times11.2=P_2\times12.6$$

$$\frac{P_1}{P_2}=\frac{12.6}{11.2}$$

$$P_1:P_2=9:8$$

85. When an amount was invested for 5 years, it yielded an amount of ₹ 5250. Had the simple interest been 2% more per annum, the amount received would have been ₹5600. What was the amount of investment.
(a) ₹4,000 (b) ₹3,750
(c) ₹3,250 (d) ₹3,500

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (d)
Suppose principal be ₹x and Interest Rate be a %
According to the question,

$$\left\{x+\frac{x\times(a+2)\times5}{100}\right\}-\left\{x+\frac{x\times a\times5}{100}\right\}=5600-5250$$

$$\frac{10x}{100}=350$$

$\Rightarrow x = ₹ 3500$

86. When an sum of money is invested for 5 years, the amount becomes ₹3640. If the rate of simple interest is increased by 2% per annum, from earlier then this amount becomes ₹3920 what is the principal amount invested.

(a) ₹2,560 (b) ₹2,690
(c) ₹2,750 (d) ₹2,800

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (d) : Let rate x% and principal ₹ y
According to the question,

$$\frac{y\times(x+2)\times5}{100}-\frac{y\times x\times5}{100}=3920-3640$$

$$\frac{y\times2\times5}{100}=₹\,280$$

$$y=₹\,2800$$

87. The simple interest at the rate of y% of a principal for y years is ₹y. Find the principal.
(a) $100\div y$ (b) $100\times y$
(c) $100y^2$ (d) $100\div y^2$

RRB NTPC 16.04.2016 Shift : 1

Ans : (a) Let Principal = ₹P
From question,

$$\text{Simple interest}=\frac{P\times R\times T}{100}$$

$$y=\frac{P\times y\times y}{100}$$

$$P=\frac{100\times y}{y\times y}$$

$$P=₹\frac{100}{y}$$

88. ₹ x invested at 9% simple interest per annum for 5 years yields the same interest as that on ₹ y invested at 6.25% simple interest per annum for 8 years. Find x : y.
(a) 16 : 15 (b) 10 : 9
(c) 45 : 50 (d) 5 : 8

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (b) According to the question

$$\frac{5\times9\times x}{100}=\frac{8\times6.25\times y}{100}$$

$$\frac{x}{y}=\frac{8\times6.25}{5\times9}$$

$$=\frac{8\times1.25}{9}=\frac{8\times125}{900}=\frac{8\times125}{9\times100}$$

$$\frac{x}{y}=\frac{8\times5}{9\times4}=\frac{10}{9}$$

$$x:y=10:9$$

89. At 5% simple interest per annum a certain sum yields a total amount of ₹2,790 at the end of $3\frac{1}{4}$ years. The sum invested was :
(a) ₹ 2, 350 (b) ₹ 2, 400
(c) ₹ 2, 600 (d) ₹ 2, 550

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (b) $\text{S.I}=\frac{P\times R\times T}{100}=\frac{P\times5\times13}{100\times4}=\frac{65}{400}P$
According to the question,

$$P+\frac{65}{400}P=2790$$

$$\Rightarrow\frac{465P}{400}=2790$$

$$\Rightarrow P=\frac{2790\times400}{465}$$

$$\Rightarrow P=6\times400$$

$$\Rightarrow P=2400$$

So invested amount = ₹2400

90. At 6% simple interest per annum a sum of money became ₹834 in $6\frac{1}{2}$ years. The sum initially invested was :
(a) ₹ 600 (b) ₹ 626
(c) ₹ 675 (d) ₹ 650

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (a) Given-
Rate of simple interest = 6%

$$\text{Time}=6\frac{1}{2}=\frac{13}{2}\ \text{Years}$$

Simple amount = ₹ 834
Let investing Amount = ₹P
Simple interest = 834 – P

$$834-P=\frac{P\times6\times13}{100\times2}$$

$$834-P=\frac{39P}{100}$$

or 83400=139P
or P = ₹600

91. A sum of money was invested at the rate of 7.5% simple interest per annum for 4 years. If the investments were for 5 years, the interest earned would have been ₹ 375 more. What was the initial sum invested?
(a) ₹4,500 (b) ₹5,000
(c) ₹3,750 (d) ₹4,750

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (b) Let the principal amount is ₹x.
According to the question,

$$\frac{x\times7.5\times5}{100}-\frac{x\times7.5\times4}{100}=375$$

$$\{\because\ \text{simple interest}=\frac{P\times R\times T}{100}\}$$

$$\Rightarrow\ \frac{x\times7.5\times1}{100}=375$$

$$x=\frac{375\times100}{7.5}$$

$$x=50\times100=₹5000$$

Hence the amount invested will be ₹5000.

92. ₹ x invested at 8% simple interest per annum for 5 year yields the same interest as that on ₹ y invested at 7.5% simple interest per annum for 6 years. Find x : y.
(a) 9 : 8 (b) 5 : 6
(c) 16 : 15 (d) 40 : 45

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (a)

Simple interest $= \frac{P \times R \times T}{100}$

According to the question,

$$\frac{8 \times x \times 5}{100} = \frac{7.5 \times 6 \times y}{100}$$

$$\Rightarrow \frac{x}{y} = \frac{7.5 \times 6}{8 \times 5}$$

$$\Rightarrow \frac{4.5}{4} = \frac{45}{40} = \frac{9}{8}$$

$\therefore$ $x : y = 9 : 8$

Type - 3

93. A sum of ₹3680 is invested at 12.5% p.a. simple interest for 6 years. What will be the total amount payable on maturity?

(a) ₹6,420 (b) ₹6,440

(c) ₹6,480 (d) ₹6,460

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) :

$$\text{Amount (A)} = P + \frac{PRT}{100}$$

$$= P\left(1 + \frac{RT}{100}\right)$$

$$= 3680\left(1 + \frac{12.5 \times 6}{100}\right)$$

$$= 3680 \times \frac{175}{100} = ₹6440$$

94. A man invested Rs. 75, 000 at the rate of $7\frac{1}{2}$% per annum simple interest for 6 years. Find the amount he will receive after 6 years.

(a) ₹ 108,750 (b) ₹ 75,000

(c) ₹ 1,12,500 (d) ₹ 69,600

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (a) :

$$S.I = \frac{PRT}{100}$$

$$= \frac{75000 \times 15 \times 6}{100 \times 2} = ₹\ 33750$$

A = P + S.I

= 75000 + 33750

= ₹ 108750

95. If a sum of ₹2,000 amounts to ₹2,360 in 3 years at a certain rate of simple interest per annum, then will the same sum amount to in 5 years, if the rate of simple interest per annum remains the same?

(a) ₹ 2,605 (b) ₹ 2,650

(c) ₹ 2,600 (d) ₹ 2,500

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (c) : A = ₹ 2360

P = ₹ 2000

t = 3 years

$$A = P\left(1 + \frac{rt}{100}\right)$$

$$2360 = 2000\left(1 + \frac{3r}{100}\right)$$

$$\Rightarrow \quad \frac{2360}{2000} - 1 = \frac{3r}{100}$$

$$\Rightarrow \quad \frac{360}{2000} = \frac{3r}{100}$$

$$\boxed{r = 6\%}$$

For 5 years

$$A = 2000\left(1 + \frac{5 \times 6}{100}\right)$$

$$= 2000 \times \frac{130}{100} = ₹2600$$

96. A sum of ₹5,800 is invested at 6% per annum simple interest. How much will the sum become after 4 years ?

(a) 8,192 (b) 7,192

(c) 6,192 (d) 9,192

RRB Group-D 08/09/2022 (Shift-I)

Ans. (b) : Principal (P) = ₹5800

Rate (R) = 6%

Time (T) = 4 years

$$SI = \frac{5800 \times 6 \times 4}{100}$$

= ₹ 1392

total amount after 4 years = 5800 + 1392

= ₹7192

97. The simple interest on a certain sum for $4\frac{2}{5}$ years at the rate of 9.5% p.a. is ₹3,553. What will be the amount payable on the same sum at 8.4% p.a. simple interest in $7\frac{1}{2}$ years?

(a) ₹13,950 (b) ₹14,855

(c) ₹13,855 (d) ₹13,850

RRB Group-D 02/09/2022 (Shift-II)

Ans. (c) : According to question

$$S.I. = \frac{P \times R \times T}{100}$$

$$\Rightarrow \quad 3553 = \frac{P \times 22 \times 9.5}{100 \times 5}$$

$$\Rightarrow \quad P = \frac{3553 \times 100}{1.9 \times 22}$$

$$\Rightarrow \quad P = ₹\ 8500$$

$\because$ For years $7\frac{1}{2}$ at 8.4% p. a.

$$SI = \frac{8500 \times 8.4 \times 15}{100 \times 2} = ₹\ 5355$$

So paid amount = SI + P

= 5355 + 8500

= ₹ 13,855

98. A man deposits ₹8,000 at 10% rate of simple interest per annum. The total amount will be get at the end of 2 years is:

(a) ₹9,800 (b) ₹9,600

(c) ₹9,760 (d) ₹9,200

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (b) : Given

P = ₹8000

R = 10%

T = 2 years

$$SI = \frac{PRT}{100}$$

$$S.I. = \frac{8000 \times 10 \times 2}{100}$$

= ₹ 1600

so, amount A = P + S.I

= 8000 + 1600

= ₹ 9600

99. A sum of ₹1000 amounts to ₹1140 in 2 years at simple interest. If the interest rate is increased by 4%, the original sum would amount to:

(a) ₹1,160 (b) ₹1,180

(c) ₹1,220 (d) ₹1,200

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : Principal amount = ₹1000

Time = 2 years

Interest = 1140 – 1000 = 140

Rate = ?

$$\text{Simple Interest} = \frac{P \times T \times R}{100}$$

$$140 = \frac{1000 \times 2 \times R}{100}$$

Rate = 7%

After the increase of 4% in rate-

$$\text{Simple Interest} = \frac{1000 \times 2 \times 11}{100} = 220$$

Principal amount = 1000+220 = ₹1220

100. Bhawna borrowed ₹ 4,500 from a lender at the rate of 15% per annum simple interest on 26 March 2018 and cleared the loan on 7 June of the same year. What amount did she pay to clear her loan?

(a) ₹4,635 (b) ₹53,775

(c) ₹135 (d) ₹49,275

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given-

R = 15%

P = ₹4500

T = 26 March 2018 to 7 June 2018

= 5 + 30 + 31 + 7

= 73 days

$$SI = \frac{P \times R \times T}{100}$$

$$= \frac{4500 \times 15 \times 73}{100 \times 365}$$

$SI = 45 \times 3$

SI = 135

A = P + SI

= 4500 + 135

= ₹4,635

Hence, It is clear that she pays ₹4,635 to clear her loan.

101. A man deposits ₹5000 in his bank account for 5 years to earn a simple interest of 12% per annum. What amount will he get after 5 years?

(a) ₹ 7,500 (b) ₹ 8,000

(c) ₹ 3,500 (d) ₹ 2,500

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Principal (P) = ₹ 5000

Rate (R) = 12 %

Time (T) = 5 years

Amount = Principal + Simple interest

$$A = P + \frac{PRT}{100}$$

$$= 5000 + \frac{5000 \times 12 \times 5}{100}$$

$$= 5000 + 3000$$

= ₹8000

102. If ₹5000 becomes ₹5900 in one year, what will ₹8000 become at the end of 5 years at the same rate of simple interest?

(a) ₹15,200 (b) ₹15,000

(c) ₹16,000 (d) ₹16,200

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Simple interest received in one year,

= 5900 – 5000

= ₹ 900

According to the first condition –

$$SI = \frac{P \times R \times T}{100}$$

$$900 = \frac{5000 \times R \times 1}{100} \Rightarrow R = 18\%$$

According to the second condition –

$$SI = \frac{8000 \times 5 \times 18}{100} = ₹\ 7200$$

Amount = 8000 + 7200 = ₹ 15200

103. Dalip Rai borrowed ₹ 24000 from Amarjeet at simple interest of 9% per annum. Find the sum he will have to return after 3 years.

(a) ₹ 4,800 (b) ₹ 6,480
(c) ₹ 30,480 (d) ₹ 28,800

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

$$SI = \frac{24000 \times 9 \times 3}{100} = ₹6480$$

Amount $= 24000 + 6480$

$= ₹ 30480$

104. A sum of ₹800 becomes ₹920 in 3 years at simple interest. If interest is increased by 4%, then the amount will increase to:

(a) ₹1,050 (b) ₹999
(c) ₹1,016 (d) ₹216

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) : Simple interest for 3 yrs $= 920 - 800 = ₹ 120$

Simple interest for 1 yrs $= ₹ 40$

Rate of S.I. $= \frac{40}{800} \times 100 = 5\%$ $\left(\because R = \frac{SI \times 100}{P \times T}\right)$

New interest rate $= 5 + 4 = 9\%$

Rate of interest for three yrs $= 9 \times 3 = 27\%$

Hence, increased amount $= 800 + 800 \times \frac{27}{100} = ₹ 1016$

105. If ₹750 at a fixed rate of simple interest amounts to ₹1000 in 5 years then how much will it become in 10 years at the same rate of simple interest?

(a) ₹ 1750 (b) ₹ 2000
(c) ₹ 1250 (d) ₹ 1500

RRB JE - 02/06/2019 (Shift-II)

Ans. (c) simple interest $= \frac{P \times R \times T}{100}$

$$250 = \frac{750 \times R \times 5}{100}$$

$R = 20/3\%$

Second simple interest $= \frac{750 \times 20/3 \times 10}{100}$

Simple interest $= 500$

Total Amount $= 750 + 500 = ₹1250$

106. Sushmita takes ₹900, at 6% per annum simple interest, how much amount will she have to returan after 4 years?

(a) ₹261 (b) ₹1161
(c) ₹1116 (d) ₹216

RRB NTPC 26.04.2016 Shift : 2

Ans : (c) Simple interest $= \frac{P \times R \times T}{100}$

$$\cdot \frac{900 \times 6 \times 4}{100} = 216$$

Amount = Simple interest + Principal

$= 216 + 900 = ₹1116$

Type - 4

107. The amount payable on maturity of a certain sum which is invested for 5 years at a certain rate percent p. a is ₹ 9,800 and the amount payable on the same sum invested for 10 years at the same rate is ₹ 12,600 . If simple interest is offered in both cases, the rate of interest p.a . is.

(a) 7.8% (b) 10%
(c) 8.5% (d) 8%

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : ∵ Principal amount are equal in both and also same rate for each.

Simple interest of 5 years $= 12600 - 9800 = ₹ 2800$

∴ Simple interest of 1 year $= 2800/5 = ₹ 560$

Principal amount (P) $= (9800 - 2800) = ₹ 7000$

Then, annual interest rate $= \frac{560}{7000} \times 100 = 8\%$

108. At a certain rate of simple interest per annum a sum of money amount to $\frac{13}{8}$ of itself in 10 years. What is the rate of simple interest per annum?

(a) 5% (b) 7.5%
(c) 7.25% (d) 6.25%

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (d) : Given,

Time (T) = 10 years

Rate (R) = ?

Then,

According to the question,

$(N-1) \times 100 = R \times T$

$$\left(\frac{13}{8} - 1\right) \times 100 = R \times 10$$

$$\frac{5}{8} \times 100 = R \times 10$$

$$\frac{50}{8} = R$$

Rate (R) = 6.25%

109. A certain sum doubles itself in 8 years on simple interest per annum. Find the rate percentage of the interest.

(a) 11% (b) 12%
(c) 11.5% (d) 12.5%

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (d) : Given,

Time (T) = 8 Years

Rate (R) = ?

Then,

$(N-1) \times 100 = R \times T$

$(2-1) \times 100 = R \times 8$

$$R = \frac{100}{8}$$

Rate (R) = 12.5%

110. At what rate of simple interest per annum will a sum of money get doubled in 10 years?

(a) 8.5% (b) 10 %

(c) 15 % (d) 20 %

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (b) : Let the Principal amount = ₹P

Rate = r %

Time = 10 years

$$S.I = \frac{PRT}{100}$$

$$(2P - P) = \frac{P \times r \times 10}{100}$$

$$P = \frac{Pr}{10}$$

r = 10%

111. At simple interest, a certain sum of money amounts to Rs. 1,250 in 2 years and to Rs. 2,000 in 5 years. Find the rate of interest per annum (rounded off to two places of decimal)

(a) 27.27% (b) 33.33%

(c) 16.67% (d) 11.11%

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (b) : According to the question

$$P + 5SI = 2000$$

$$P + 2SI = 1250$$

$$3SI = 750$$

$$SI = 250$$

Now P = ₹ 750

Rate of Interest = $\frac{250}{750} \times 100 = \boxed{33.33\%}$

112. Bharat borrowed a sum of ₹10,000 at a certain rate of simple interest for 2 years. If he paid an interest of ₹2,000 at the end of the period, then find the rate of interest per annum.

(a) 15% (b) 25%

(c) 20% (d) 10%

RRB Group-D 30-08-2022 (Shift-I)

Ans. (d) : Given ⇒ P = ₹ 10000

Time = 2 year

SI = ₹ 2000

$\because SI = \frac{PRT}{100}$

$2000 = \frac{10000 \times R \times 2}{100}$, $\boxed{R = 10\%}$

113. At what rate of simple interest per annum will ₹ 7500 get ₹ 9250 in 7 years :

(a) $3\frac{1}{3}\%$ (b) $4\frac{1}{3}\%$

(c) $5\frac{1}{3}\%$ (d) $6\frac{1}{3}\%$

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : Amount = $P\left(1 + \frac{rt}{100}\right)$

$$9250 = 7500\left(1 + \frac{7r}{100}\right)$$

$$\frac{925}{750} - 1 = \frac{7r}{100}$$

$$\frac{7r}{100} = \frac{175}{750}$$

$$r = \frac{7}{30} \times \frac{100}{7}$$

$$r = \frac{10}{3}$$

$$r = 3\frac{1}{3}\%$$

114. A sum of ₹7,500 gives a simple interest of ₹1,800 in 4 years. What is the rate of interest per annum?

(a) 5% (b) 6%

(c) 4% (d) 3%

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (b) : $SI = \frac{PRT}{100}$

$$1800 = \frac{7500 \times r \times 4}{100}$$

$$r = \frac{1800}{75 \times 4}$$

r = 6%

115. At what rate of simple interest will a sum of money triple itself in 8 years?

(a) 30% (b) 20%

(c) 25% (d) 35%

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let amount P become 3P in 8 years by 8% annual rate then–

Simple Interest of 8 years = 3P – P = 2P

So, Simple Interest = $\frac{\text{Principal amount} \times \text{Rate} \times \text{Time}}{100}$

$$2P = \frac{P \times r \times 8}{100}$$

$$r = \frac{2 \times 100}{8} = 25\%$$

So, r = 25%

116. Anil Kumar took a loan of ₹24,000 with simple interest for as many years as the rate of interest. If he paid ₹19,440 as interest at the end of the loan period, what was the rate of interest?

(a) 8.5% (b) 10%

(c) 8% (d) 9%

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (d) : According to the question,

$P = ₹\ 24000$

$SI = ₹\ 19440$

$t = r$

$r = ?$

$$SI = \frac{P \times r \times t}{100}$$

$$19440 = \frac{24000 \times r \times r}{100}$$

$$r^2 = \frac{19440 \times 100}{24000}$$

$r^2 = 81$

$r = 9$

117. The rate at which a sum becomes 2 times of itself in 10 years at simple interest is :

(a) 25% (b) 15%

(c) 20% (d) 10%

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let principal = ₹ P

time (t) = 10 years

Rate = r %

Amount = Principal + SI

$$2P = P + \frac{Prt}{100}$$

$$2P - P = \frac{P \times r \times 10}{100}$$

$$P = \frac{Pr}{10}$$

$r = 10\%$

118. A sum of money invested at X% simple interest per annum amounts to ₹ 2,368 in 6 years and to ₹3,008 in 11 years. Find the value of X.

(a) 5 (b) 8

(c) 7.5 (d) 6

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (b) : Amount in 6 years = ₹ 2368

Amount in 11 years = ₹ 3008

Simple interest of 5 years = 3008 – 2368

= ₹ 640

Simple interest of 1 year $= \frac{640}{5} = 128$

Hence, principal amount= $2368 - 128 \times 6$

= ₹ 1600

According to the question-

$$\text{Simple interest} = \frac{P \times x \times t}{100}$$

$$128 = \frac{1600 \times x \times 1}{100}$$

$\boxed{x = 8\%}$

119. A woman borrowed some money on simple interest. After 4 years she returned $\frac{6}{5}$ of money to the lender. What was the rate of interest?

(a) 3% p.a. (b) 2% p.a

(c) 5% p.a. (d) 4% p.a

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (c) : Let the principal = P

$$\text{Amount} = \frac{6P}{5}$$

$$\therefore SI = \frac{6P}{5} - P$$

$$= \frac{P}{5}$$

$$\therefore \frac{P}{5} = \frac{P \times R \times 4}{100}$$

$R = 5\%$

120. The difference between the simple interest from two different rates on ₹1,200 for 3 years is ₹10.80. The difference between their rates of interest is.

(a) 0.03% (b) 1%

(c) 0.6% (d) 0.3%

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) Let the two interest rates be r_1 & r_2.

As per question,

$$\frac{1200 \times r_1 \times 3}{100} - \frac{1200 \times r_2 \times 3}{100} = 10.80$$

$$\frac{1200 \times 3}{100}(r_1 - r_2) = 10.80$$

$$r_1 - r_2 = \frac{10.80 \times 100}{1200 \times 3}$$

$r_1 - r_2 = 0.3\%$

Hence, difference between rate of interest $(r_1 - r_2)$ = 0.3%

121. An amount doubles itself on simple interest in 4 years. What is the percent per annum rate of interest?

(a) 100% (b) 25%

(c) 50% (d) 12.5%

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : Let amount = ₹P

And rate = r% yearly

$\therefore$ Simple interest = 2P–P = ₹P

Time = 4 years

$$\therefore P = \frac{P \times r \times 4}{100}$$

r = 25% per annum

122. A sum of ₹25000/- amounts to ₹31500/- in 4 years at a certain rate of simple interest. What is the rate of Interest.

(a) 4.5% (b) 5.5%

(c) 6.5% (d) 3.5%

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) : Principal amount = ₹25000, Final amount = ₹31500

Interest = Final amount – Principal amount

$= 31500 - 25000 = ₹6500$

The annualy interest increases equally in simple interest.

Interest of 4 years = 6500

$1 \text{ year} = \frac{6500}{4} = ₹1625$

$\text{Rate of interest} = \frac{\text{Interest for one year}}{\text{Principal amount}} \times 100$

$\text{Rate of interest} = \frac{1625}{25000} \times 100$

$= 6.5\%$

123. Simple interest on ₹50,000 at certain rate for 5 years is ₹20,000. The rate of interest is;

(a) 25% per annum (b) 5% per annum

(c) 4% per annum (d) 8% per annum

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) : Given,

Principal = ₹50,000 Interest = ₹20,000

Time = 5 years

$\because \quad SI = \frac{P \times r \times t}{100}$

$\Rightarrow 20,000 = \frac{50000 \times r \times 5}{100}$

$\Rightarrow$ Rate = 8% per annum

124. A sum of money amounts to ₹12000 after 6 years and ₹15000 after 9 years at the same rate of Simple Interest. What is the rate of interest per annum?

(a) $16\frac{2}{3}\%$ (b) $18\frac{2}{3}\%$

(c) $16\frac{1}{3}\%$ (d) 16%

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : Simple Interest of (9–6) years = ₹ (15000–12000)

Simple Interest of 3 years = ₹ 3000

Simple Interest of 6 years = ₹ 6000

Principal = ₹ 12000 – ₹ 6000 = ₹ 6000

Let, Rate = r % yearly

$SI = \frac{P \times r \times t}{100}$

$6000 = \frac{6000 \times r \times 6}{100}$

$\Rightarrow 100 = 6r$

$\Rightarrow r = \frac{100}{6} = 16\frac{2}{3}\%$

125. Vikas took a loan of ₹1,200 on simple interest that is equal to as many years as the rate of interest. If he paid ₹768 as interest at the end of the loan period, then what was the rate of interest?

(a) 8.5% (b) 73.8%

(c) 8.0% (d) 7.5%

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (c) : Principal = ₹1200

SI = ₹768

Given,

Time = Rate

t = r

$SI = \frac{P \times r \times t}{100}$

$768 = \frac{1200 \times r^2}{100}$

$\Rightarrow r^2 = \frac{768}{12} = 64$

$r = \sqrt{64}$

$r = 8\%$

126. Anil lent ₹ 7200 to Dubey for 3 years and ₹8400 to Raghav for 4 years on simple interest at the same rate of interest and received ₹ 4968 in total from them as interest. Find the rate of interest per year.

(a) 8% (b) 10%

(c) 12% (d) 9%

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let Rate of Interest is R% per annum

According to the question,

$\frac{7200 \times 3 \times R}{100} + \frac{8400 \times 4 \times R}{100} = 4968$

$\Rightarrow 216R + 336R = 4968$

$\Rightarrow 552R = 4968$

$\Rightarrow R = 9\%$

127. A sum becomes its double in 8 years. The annual rate of simple interest is

(a) 10% (b) $12\frac{1}{2}\%$

(c) 8% (d) $9\frac{1}{2}\%$

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let amount P become 2P in 8 years at the rate of r% per annum, then

$\text{Simple Interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

$2P - P = \frac{P \times r \times 8}{100}$

$r = \frac{100}{8} = \frac{25}{2} = 12\frac{1}{2}\%$

Hence rate $(r) = 12\frac{1}{2}\%$

128. At what percent rate per annum will the simple interest in 15 years on a sum of money be $\frac{3}{4}$ of the sum invested?

(a) 3% (b) 6%
(c) 5% (d) 4%

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (c) : As per the question, T = 15 years
Let the amount invested = ₹ x

$\therefore$ S.I. $= \frac{P \times R \times T}{100}$

$\frac{3}{4}x = \frac{x \times R \times 15}{100}$

R = 5%

129. Lalit gave a loan of ₹ 12,000 to his friend Tarun at simple interest for 2 years and got ₹1200 as interest. Find the rate of interest per annum.

(a) $5\frac{5}{9}$% Per annum (b) 10% Per annum
(c) 5% Per annum (d) 500% Per annum

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : SI $= \frac{P \times R \times T}{100}$

$1200 = \frac{12000 \times R \times 2}{100}$

R = 5% per annum

130. The simple interest on an amount of ₹3400 for 4 years is ₹680. The rate of interest is:

(a) 6% (b) 4%
(c) 8% (d) 5%

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (d) : Let Rate Interest = r% per annum
According to the question,

$680 = \frac{3400 \times r \times 4}{100}$

$r = \frac{68000}{3400 \times 4}$

r = 5% per annum

131. At what rate percent will an amount be doubled in 15 years?

(a) 50% (b) 25%
(c) $\frac{20}{3}$% (d) 33.33%

RRB Group-D – 16/11/2018 (Shift-III)

Ans. (c) : Let Principal = ₹ P, Amount = ₹ 2P , Interest = 2P–P = ₹P
Time = 15 Years, Rate = R%

Simple interest $= \frac{P \times R \times 15}{100}$

$P = \frac{P \times R \times 3}{20} \Rightarrow R = \frac{20}{3}$%

132. At what simple interest per annum. Will a certain sum of money double itself in 10 years?

(a) 7% (b) 8%
(c) 9% (d) 10%

RRB NTPC 05.04.2016 Shift : 2

Ans : (d) Let Principal = x , Amount = 2x

$\therefore$ Simple interest = Amount − Principal
= 2x – x = x

$\frac{x \times R \times 10}{100} = x$

Rate = 10%

133. At what rate of interest will an sum of money double itself in 30 years?

(a) $3\frac{1}{3}$% (b) 3%
(c) $3\frac{1}{2}$% (d) $3\frac{1}{4}$%

RRB JE - 26/05/2019 (Shift-III)

Ans : (a) Let principal (P) = x
Amount (A) = 2x
Simple interest (S.I.) = 2x – x = x

$\because$ S.I. $= \frac{PRT}{100}$

$x = \frac{x \times R \times 30}{100}$

$R = \frac{100}{30} = 3\frac{1}{3}$%

134. At what rate will a sum of money double itself in twelve years?

(a) 8% (b) $8\frac{1}{2}$%
(c) $8\frac{1}{3}$% (d) $8\frac{1}{4}$%

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (c) Let Principal = ₹ P
Amount = ₹ 2P
Rate = r % per annual
Time = 12 Years
Simple interest = 2P – P = ₹ P

$\therefore P = \frac{P \times r \times 12}{100}$

$r = \frac{100}{12} = \frac{25}{3}$

$r = 8\frac{1}{3}$%

135. At a certain rate of simple interest, ₹800 becomes ₹956 in 3 years. If this principal becomes ₹1052 in the same period, then what is the percentage of increase in the rate of interest?

(a) 7% (b) 4%
(c) 5% (d) 9.5%

RRB NTPC 16.04.2016 Shift : 2

Ans : (b) Interest = Amount − Principal
= 956 – 800 = ₹156

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$156 = \frac{800 \times 3 \times R}{100},\ R = \frac{52}{8}$$

According to the second condition, suppose the growth rate be r.

$$252 = \frac{800 \times 3 \times \left(\frac{52}{8} + r\right)}{100}$$

$$\frac{21}{2} = \frac{52}{8} + r$$

r = 10.5 – 6.5
r = 4%
Hence rate increaed by 4%.

136. The total amount of interest received on two deposits of ₹5000 for 4 years and ₹ 4000 for 5 years, made at the same simple rate of interest per annum was ₹2400. Find the rate of interest per annum.
(a) 4% (b) 7%
(c) 6% (d) 8%
RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (c) $\because SI = \frac{P \times R \times T}{100}$
According to the question

$$2400 = \frac{5000 \times 4 \times R}{100} + \frac{4000 \times 5 \times R}{100}$$

2400 = 200 R + 200R
2400 = 400R
R = 6%

137. An amount of ₹25000 becomes ₹32000 in 4 years. Find the annual rate of interest.
(a) 6.5% (b) 8%
(c) 7% (d) 6%
RRB JE - 25/05/2019 (Shift-III)

Ans : (c) Given,
simple interest = 32000 – 25000 = 7000

$$\text{simple interest} = \frac{P \times R \times T}{100}$$

$$7000 = \frac{25000 \times R \times 4}{100}$$

$$R = \frac{7000}{1000} = 7\%$$

138. On a certain amount, the compound interest for 2 years is ₹309 and the simple interest is ₹300. Find the annual rate of interest.
(a) 7% (b) 6%
(c) 9% (d) 8%
RRB JE - 22/05/2019 (Shift-III)

Ans : (b) Simple interest $= \frac{P \times R \times T}{100}$

$$300 = \frac{P \times R \times 2}{100}$$

PR = 15000 ..... (i)

Difference between in simple interest and compound interest for 2 years.

$$D = P\left(\frac{R}{100}\right)^2$$

$$309 - 300 = P \times \frac{R}{100} \times \frac{R}{100}$$

$$9 = \frac{15000 \times R}{100 \times 100}$$ (from the equation (i))

R = 6%

139. If an amount becomes 4 times itself in 20 years, then find the rate of simple interest.
(a) $13\frac{1}{3}\%$ (b) 10%
(c) 20% (d) 15%
RRB JE - 24/05/2019 (Shift-III)

Ans : (d) $4P = P\left(1 + \frac{R \times 20}{100}\right)$

$$4 - 1 = \frac{R}{5}$$

R = 15%

140. The loan of ₹2400 is cleared with an amount of ₹3264 at the end of the loan period, the period in years and the rate of interest being numerically equal. What is the rate of simple interest?
(a) 6% (b) 18%
(c) 5% (d) 10%
RRB JE - 27/05/2019 (Shift-III)

Ans : (a) Given− Rate (R) = Time (t)

$$\text{simple interest} = \frac{P \times R \times T}{100}$$

$$(3264 - 2400) = \frac{2400 \times R \times R}{100}$$

$864 = 24 \times R^2$

$$R^2 = \frac{864}{24}$$

$R^2 = 36$
R = 6%

141. An amount at the same rate of simple interest becomes ₹9800 in 5 years and ₹12005 in 8 years what is the rate of interest?
(a) 12% (b) 15%
(c) 8% (d) 5%
RRB JE - 31/05/2019 (Shift-I)

Ans : (a) According to the question,
Interest of three years
= amount of 8 Years – amount of 5 years
= 12005 – 9800 = 2205

$$\text{Interest of one year} = \frac{2205}{3} = 735$$

$$735 = \frac{\{9800 - (735 \times 5)\} \times \text{Rate} \times 1}{100}$$

73500 = (9800 – 3675)× R
73500 = 6125 × R
R = 12%

142. The amount of ₹800 becomes ₹956 in 3 years at a fixed rate of simple interest. Find the rate?

(a) 8.2% (b) 8%
(c) 7.5% (d) 6.5%

RRB JE - 31/05/2019 (Shift-III)

Ans. (d) Principal = ₹800, Time = 3 Years, Rate = r % (Let)

Amount = ₹956

simple interest = 956 – 800 = ₹156

$\Rightarrow \quad 156 = 800 \times \frac{r}{100} \times 3$

$\Rightarrow \quad r = \frac{156}{24} \quad \Rightarrow r = 6.5\%$ annual

143. Vimal lent loan of ₹ 5000 to kamal for 2 years and a loan of ₹ 3000 to Sumal for 4 years at the same rate of simple interest and received ₹ 2200 as interest from both. Calculate interest rate per annum.

(a) 13% (b) 15%
(c) 23% (d) 10%

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (d) The interest of both = ₹ 2200

$\frac{5000 \times 2 \times R}{100} + \frac{3000 \times 4 \times R}{100} = 2200$

100R + 120 R = 2200

220 R = 2200

$\boxed{R = 10\%}$

144. Find the simple interest rate at which a sum of money at the rate of simple interest becomes five times in 10 years.

(a) 40% (b) 35%
(c) 25% (d) 50%

RRB NTPC 18.04.2016 Shift : 2

Ans : (a) Time = 10 Years

Let Principal = ₹x

∴ Amount = 5x

Simple interest = 5x – x = 4x

Rate = R%

$\text{Simple interest} = \frac{PTR}{100}$

$4x = \frac{x \times 10 \times R}{100}$

R = 40%

145. Anuj invested some money in a scheme for 3 years at a simple interest rate of 12% per annum. In addition he invested three times in the second scheme for 2 years. If he has earned the same simple interest from both the schemes, what is the simple interest rate of the second scheme.

(a) 12% per year (b) 18% per year
(c) 6% per year (d) 9% per year

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (c) According to the question,

$\frac{P \times 12 \times 3}{100} = \frac{3P \times 2 \times R}{100}$

12×3 = 3×2×R

R= 6% per annum

146. ₹ 775, invested for 6 years given an interest of ₹ 372 then What is the annual rate of simple interest per annum?

(a) 7% (b) 8%
(c) 9% (d) 7.5%

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (b) Given– Principal = ₹775

Interest = ₹372

Time = 6 Years

$\text{Interest} = \frac{P \times R \times T}{100}$

$372 = \frac{775 \times R \times 6}{100}$

$\frac{6200}{775} = R$

R= 8%

so annual rate of simple interest will be 8%

147. Mani deposits ₹12500 in a bank and it becomes ₹15500 in 6 years at the rate of simple interest what is the rate of interest?

(a) 4% (b) 5%
(c) 3% (d) 6%

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (a) $\text{S.I.} = \frac{PRT}{100}$

S.I. = 15,500 – 12,500

S.I. = ₹3000

$3000 = \frac{12500 \times R \times 6}{100}$

R = 4%

148. An investment of ₹1125 for three months gave an interest of ₹27. What was the rate of simple interest per annum:–

(a) 7.2% (b) 12%
(c) 9.6% (d) 2.4%

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (c) Principal = ₹1,125

Time = 3 months or 3/12 Years

Simple interest = ₹ 27

Rate = ?

$\text{Rate} = \frac{\text{S.I} \times 100}{\text{principal} \times \text{time}}$

$\frac{27 \times 100}{1125 \times 3/12} = 9.6\%$

149. ₹ 1775, invested for 6 years given an interest of ₹852 .What is the rate of simple interest per annum?

(a) 8% (b) 9%
(c) 7% (d) 7.5%

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (a) :

$$\text{simple interest} = \frac{P \times R \times T}{100}$$

$$852 = \frac{1775 \times R \times 6}{100}$$

$$R = \frac{85200}{10650} = 8\%$$

150. What is the rate of simple interest per annum? If the cost of a bill of ₹600 becomes ₹660 in two years.

(a) 10% (b) 4%

(c) 6% (d) 5%

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (d) : Simple interest = 660 – 600 = ₹ 60

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$60 = \frac{600 \times \text{Rate} \times 2}{100}$$

$$\text{Rate} = \frac{60 \times 100}{600 \times 2}$$

$$\text{Rate} = 5\%$$

151. Simple interest on a fixed amount is 1/36 of the principal. If the rate of interest and number of years are equal, then what is the rate of interest?

(a) $\frac{6}{19}\%$ (b) $\frac{5}{3}\%$

(c) $\frac{10}{3}\%$ (d) $\frac{10}{12}\%$

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (b) Let Principal = ₹ P

$$\therefore \text{ Simple interest } = \frac{P}{36}$$

Let Time = n Years

$\therefore$ Rate = n %

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$\frac{P}{36} = \frac{P \times n \times n}{100}$$

$$n^2 = \frac{100}{36} = \frac{25}{9}$$

$$n = \frac{5}{3} \text{ Years}$$

$$\therefore \text{Rate } = \frac{5}{3}\%$$

152. An investment of ₹1080 for 3 months gave an ₹27 as interest. The rate of simple interest per annum was:

(a) 7.5% (b) 5%

(c) 2.5% (d) 10%

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (d) Given-

$$\text{Principal} = ₹\ 1080, \text{ Time} = 3 \text{ months} = \frac{3}{12} = \frac{1}{4} \text{Years}$$

Interest = ₹ 27

Rate = ?

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$27 = \frac{1080 \times r \times 1}{100 \times 4}$$

$$r = 10\%$$

153. ₹875 invested for 3 months earns ₹21 as interest what was the rate of simple interest per year?

(a) 12% (b) 2.4%

(c) 7.2% (d) 9.6%

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (d) : Given,

Interest = ₹ 21,

Principal = ₹ 875,

$$\text{Time } = \frac{3}{12} \text{ Years}$$

$$\text{simple interest} = \frac{P \times R \times T}{100}$$

$$21 = \frac{875 \times \text{Rate} \times 3}{100 \times 12}$$

$$\text{Rate} = \frac{21 \times 100 \times 4}{875} = 9.6\%$$

154. The simple interest is the 9/16th part of 'P' at a certain amount of 'P' and 'R'% per annum. If 'R' is equal to the number of years (N) then find the value of N.

(a) 8.5 (b) 7

(c) 7.5 (d) 6

RRB NTPC 17.01.2017 Shift-2

Ans : (c) Given–

$$R = N$$

$$\therefore \frac{9}{16}P = \frac{PRT}{100} \qquad \left[\text{S.I.} = \frac{PRT}{100}\right]$$

$$\Rightarrow \frac{9}{16}P = \frac{P \times N \times N}{100}$$

$$\Rightarrow N^2 = \frac{9}{16} \times 100 = \left(\frac{30}{4}\right)^2$$

$$\Rightarrow N = 7.5$$

155. The maturity value after 3 years and 5 years at the same rate of simple interest as a fixed sum of money is ₹8255 and ₹9425 respectively. Find the annual rate of interest.

(a) 9% (b) 8%

(c) 7% (d) 6%

RRB NTPC 31.03.2016 Shift : 1

Ans : (a) Simple interest of 2 years=9425–8255= ₹1170

Simple interest of 3 years $= \frac{1170}{2} \times 3 = 1755$

$\therefore$ Principal = 8255 – 1755 = ₹6500

$\because$ $S.I. = \frac{PRT}{100}$

$1755 = \frac{6500 \times R \times 3}{100}$, $R = \frac{1755}{65 \times 3} = 9\%$

156. Simple interest at the rate of 12% is added to the principal at the end of every six months. Then what will be the annual effective rate of interest?

(a) 12.34% (b) 12.26%

(c) 12.38% (d) 12.36%

RRB NTPC 30.03.2016 Shift : 2

Ans : (d) Let Principal = ₹100

$\therefore$ Interest of last six months $= \frac{100 \times 12 \times 6}{100 \times 12} = ₹6$

$\therefore$ Principal for next six months = 100 + 6 = ₹106

Interest $= \frac{106 \times 12 \times 6}{100 \times 12} = ₹6.36$

$\therefore$ Annual of effective rate of interest = 6+6.36 = 12.36%

157. Ram lent ₹6,000 to Shiva for 3 years and ₹8,000 to Krishna for 5 years at the same rate of simple interest per annum. He got total interest of ₹ 5,220 from both. Find the rate of interest per annum.

(a) 6% (b) 7%

(c) 8% (d) 9%

RRB NTPC 29.03.2016 Shift : 3

Ans : (d) Let annual rate of interest = R%

$\therefore \frac{6000 \times R \times 3}{100} + \frac{8000 \times R \times 5}{100} = ₹\ 5220$

180 R + 400R = ₹5220

580 R = ₹5220

$R = \frac{5220}{580} = 9\%$

158. The simple interest on a deposit of ₹8500 per annum for 3 years is ₹2040. Find the annual rate of interest.

(a) 8% (b) 8.5%

(c) 9% (d) 7.5%

RRB NTPC 18.01.2017 Shift : 1

Ans : (a)

$SI = \frac{P \times R \times T}{100}$

$2040 = \frac{8500 \times R \times 3}{100}$

$2040 = 85 \times R \times 3$

$R = \frac{2040}{85 \times 3} = 8\%$

159. The simple interest of ₹7800 for 2 years 8 months is ₹1976. Find the annual rate of interest.

(a) 8.5% (b) 9%

(c) 9.5% (d) 10%

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) Principal = ₹7800

Time- 2Year 8 months $= \left(2 + \frac{8}{12}\right)$ Years $= \frac{8}{3}$ Years

Rate = ?

Simple interest = ₹1976

$S.I. = \frac{P \times T \times R}{100}$

$1976 = \frac{7800 \times R \times 8}{300}$

$\frac{1976 \times 300}{7800 \times 8} = R$

$R = \frac{19}{2} = 9.5\%$

160. The numerical value of the percentage and time of the given rate of interest are equal and the simple interest on an amount is 9/16 of the principal. Find the rate of simple interest.

(a) 9/2% (b) 11%

(c) 15/2% (d) 12%

RRB NTPC 22.04.2016 Shift : 3

Ans : (c) Simple interest = Principal $\times \frac{9}{16}$

$\frac{\text{Simple interest}}{\text{Principal}} = \frac{9}{16}$

R = N

$\therefore$ Rate of Interest $(R) = \frac{100 \times 9}{16 \times R}$

$R^2 = \frac{900}{16}$

$R = \sqrt{\frac{900}{16}} = \frac{30}{4} = \frac{15}{2}\%$

161. If the interest earned over a period of 8 years is equal to the principal, what is the rate of simple interest applied?

(a) 8 (b) 10.5

(c) 12 (d) 12.5

RRB NTPC 29.04.2016 Shift : 1

Ans : (d) Time (T) = 8 Years

Rate (R) = ?

Principal (P) = Simple interest (SI)

P = SI

$\because$ $SI = \frac{PTR}{100}$

$\therefore \quad P = \frac{P \times 8 \times R}{100}$

$\Rightarrow \quad R = \frac{P \times 100}{P \times 8}$

$\Rightarrow \quad R = 12.5\%$

162. ₹ 750 invested for 3 months gave an interest of ₹ 18. What was the simple rate of interest per annum?

(a) 2.4% (b) 9.6%

(c) 7.2% (d) 12%

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (b) Simple interest $= \frac{P \times R \times T}{100}$

$$18 = \frac{750 \times R \times \frac{3}{12}}{100}$$

$$18 \times 100 = 750 \times R \times \frac{1}{4}$$

$$\frac{18 \times 100 \times 4}{750} = R$$

$$R = \frac{18 \times 2 \times 4}{15} = \frac{48}{5}$$

R = 9.6% per year

Type - 5

163. Suresh borrows ₹ 80,000 at 24% per annum simple interest and Ramesh borrows ₹ 91,000 at 20% per annum simple interest. In how many years will their amounts of debts be equal?

(a) 11 (b) 10

(c) 22 (d) 20

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) : Let time be T years

Given,

$P_1 = ₹\ 80{,}000$ $P_2 = ₹\ 91{,}000$

$R_1 = 24\%$ $R_2 = 20\%$

According to the question,

$$P_1 + \frac{P_1 \times R_1 \times T}{100} = P_2 + \frac{P_2 \times R_2 \times T}{100}$$

$$80000 + \frac{80000 \times 24 \times T}{100} = 91000 + \frac{91000 \times 20 \times T}{100}$$

$$19200\ T - 18200\ T = 91000 - 80000$$

$$1000\ T = 11000$$

$$T = 11 \text{ years}$$

164. A sum of ₹14500 was invested at 9% per annum simple interest for few years. The interest accrued during this period was ₹7830. What was the period of investment?

(a) 7 years (b) 5 years

(c) 4 years (d) 6 years

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (d) : Time $= \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Rate}\%}$

$$= \frac{7830 \times 100}{14500 \times 9}$$

$$= \frac{870}{145}$$

= 6 years

So the period of money invested = 6 years

165. Determine the number of months required to get ₹25.5 as simple interest on ₹850 at 3.6% per annum.

(a) 11 months (b) 9 months

(c) 10 months (d) 8 months

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,

Principal = ₹850, Rate = 3.6%

Simple Interest = ₹25.5

$\therefore \quad SI = \frac{P \times R \times T}{100}$

$\Rightarrow 25.5 = \frac{850 \times 3.6 \times T}{100}$

$\Rightarrow T = \frac{25.5 \times 100}{850 \times 3.6}$

$= \frac{5}{6}$ years

$= \frac{5}{6} \times 12$ Months

= 10 Months

166. In what time will a sum of ₹6,400 amount to ₹7,168 at 6% simple interest per annum?

(a) 2.5 years (b) 4 years

(c) 2 years (d) 3 years

RRB Group-D 27-09-2022 (Shift-II)

Ans. (c) : Given that,

P = ₹ 6400

A = ₹ 7168

R = 6%

T = ?

$SI = \frac{P \times R \times T}{100}$

$7168 - 6400 = \frac{6400 \times 6 \times T}{100}$

$T = \frac{768 \times 100}{6400 \times 6}$

$T = \frac{128}{64}$

$\boxed{T = 2 \text{ years}}$

167. In how much time will a sum of money double itself at 10 percent per annum rate of simple interest?

(a) 8 years (b) 12 years
(c) 5 years (d) 10 years

RRB GROUP-D – 25/08/2022 (Shift-II)

Ans. (d) : Let (P) = X

amount = P + SI

amount = 2X

S.I = 2X – X = X

rate = 10%

time = ?

$$S.I = \frac{P \times R \times T}{100}$$

$$X = \frac{X \times 10 \times T}{100}$$

$100X = 10XT$

$$\frac{100X}{10X} = T$$

time = 10 years

168. If the simple interest on ₹4,800 at 15% per annum for 'n' years is ₹2,160 then find the value of 'n'.

(a) 5 (b) 4
(c) 6 (d) 3

RRB Group-D 02/09/2022 (Shift-I)

Ans. (d) : Given,

P = ₹ 4800

SI = ₹ 2160

R = 15%

T = n years

$$\because SI = \frac{P \times R \times T}{100}$$

$$\Rightarrow \quad 2160 = \frac{4800 \times 15 \times n}{100}$$

$$\Rightarrow \quad n = \frac{2160}{48 \times 15}$$

n = 3

169. A certain sum of money amounts to ₹ 2613 in 6 years at 5% simple interest per annum. In how many years will it amount to ₹ 3015 at the same rate?

(a) 10 years (b) 15 years
(c) 18 years (d) 12 years

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the principal (P) = ₹ 100

$$\text{Amount} = \text{Principal} + \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$A = P\left(1 + \frac{rt}{100}\right)$$

$$2613 = P\left(1 + \frac{5 \times 6}{100}\right)$$

$$2613 = P \times \frac{130}{100}$$

$$P = \frac{2613 \times 100}{130}$$

P = ₹ 2010

Let time for simple interest = r years

$$\therefore \text{ Simple interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$(3015 – 2010) \times 100 = 2010 \times 5 \times t$

$1005 \times 10 = 201 \times 5 \times t$

$$t = \frac{1005 \times 10}{1005} = 10 \text{ years}$$

170. A sum of money amount to 3 time the original sum in 15 years. In how many years will the original sum amount to 5 times of itself at the same rate of simple interest.

(a) 35 (b) 30
(c) 25 (d) 20

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the Principal = ₹ P,

T = 15 years, Amount = 3P

SI = Amount – Principal

= 3P – P = 2P

According to the question,

$$SI = \frac{P \times R \times T}{100}$$

$$2P = \frac{P \times R \times 15}{100}$$

$$R = \frac{40}{3}\%$$

Again, $$SI = \frac{P \times R \times T}{100}$$

$$4P = P \times \frac{40}{3} \times \frac{T}{100}$$

T = 30 years

171. How many years will it take for an amount of ₹400 to yield ₹450 as interest at 5% per annum on simple interest?

(a) 23 (b) 21.5
(c) 22.5 (d) 22

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (c) : SI = ₹450, Principal = ₹400

Rate = 5 %, time = ?

$$\text{Time} = \frac{SI \times 100}{P \times R}$$

$$\text{Time} = \frac{450 \times 100}{400 \times 5} = \frac{90}{4} = \frac{45}{2}$$

Time = 22.5 years

172. Amount of ₹5,000 has been invested via simple interest at the rate of 10%. Then in how many years interest would be ₹1,500.

(a) 6 (b) 3

(c) 5 (d) 8

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (b) : From $SI = \frac{P \times R \times T}{100}$

$$1500 = \frac{5000 \times 10 \times T}{100}$$

$T = 3$ years

173. Abdul received ₹12,600 as simple interest on a sum of ₹70,000 at the rate of 12% per annum interest in certain period. Find the time?

(a) 3 years (b) $\frac{3}{2}$ years

(c) $\frac{2}{3}$ years (d) 15 years

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (b) : Given,

$P = ₹\ 70{,}000$, $R = 12\%$

$SI = ₹12{,}600$, $T = ?$

$$SI = \frac{PRT}{100}$$

$$T = \frac{SI \times 100}{P \times R}$$

$$= \frac{12600 \times 100}{70000 \times 12} = \frac{18}{12} = \frac{3}{2} \text{ years}$$

174. How long will it take a sum of money invested at 6% p.a. on simple interest to increase its value by 50%?

(a) 3 years (b) 8 years

(c) $8\frac{1}{3}$ years (d) $3\frac{1}{8}$ years

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let Principal (P) = ₹ 100

Time = T year

Rate (r) % = 6% Annualy

On increasing 50%

$SI = ₹\ 50$

$$\left[\because SI = \frac{P \times r \times T}{100}\right]$$

$$50 = \frac{100 \times 6 \times T}{100}$$

$$\frac{25}{3} = T$$

or $T = 8\frac{1}{3}$ years

175. If the simple interest for 8 years is equal to 40% of the principal amount, it will be equal to the principal amount at the same rate of interest after.

(a) 16 years (b) 20 years

(c) 18 years (d) 15 years

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let, Principal = ₹ x

Interest rate = R %

According to the question,

$$\therefore\ P = 40\% \text{ of } ₹\ x = \frac{40}{100}x$$

$$\frac{x \times R \times 8}{100} = \frac{40}{100} \times x$$

$$\boxed{R = 5\%}$$

Let, the principal amount will be equal to the simple interest in 't' years.

Now, $\frac{x \times 5 \times t}{100} = x \quad \Rightarrow \boxed{t = 20}$ years

So, the interest received in 20 years will be equal to the principal amount.

176. How long will it take a sum of money invested at 10% per annum at simple interest to increase its value by 40%?

(a) 8 years (b) 9 years

(c) 6 years (d) 4 years

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) : Let the principal be ₹ P

Amount = $P \times \frac{140}{100} = ₹\frac{7P}{5}$

Rate = 10% annually

Time = t years

According to the question,

$$\frac{7P}{5} = P + \frac{P \times 10 \times t}{100}$$

$$\frac{7P}{5} = \frac{100P + 10Pt}{100}$$

$$140P = 100P + 10Pt$$

$$10Pt = 40P$$

$$t = \frac{40}{10} = 4 \text{ years}$$

177. If the simple interest for 7 years is equal to 56% of the principal amount, it will be equal to the principal after :

(a) 12 years 6 months

(b) 10 years 9 months

(c) 9 years 8 months

(d) Seven years six months

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) : $S.I. = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

According to the question,

$$\frac{P \times 56}{100} = \frac{P \times 7 \times R}{100}$$

$R = 8\%$

Let the principal be equal to the simple interest after t_1 years.

$$S.I = \frac{P \times 8 \times t_1}{100} = P$$

$$8t_1 = 100$$

$t_1 = 12.5$ years

$t_1 = 12$ years 6 months

178. If an amount doubles itself in 4 years at a fixed rate then in how many years will it become 16 times itself at the same rate of simple interest?

(a) 25 Years (b) 16 Years
(c) 12 Years (d) 60 Years

RRB JE - 23/05/2019 (Shift-III)

Ans : (d) $T_1 = 4, n_1 = 2, n_2 = 16, T_2 = ?$

From, $T_2 = \frac{(n_2 - 1) \times T_1}{(n_1 - 1)}$, [T = Years, n = Double]

$T_2 = \frac{(16-1) \times 4}{(2-1)}$

$= 15 \times 4 = 60$ Years

179. In how many years will a certain sum of money doubled at the rate of 28.75% per annum.

(a) 6.00 (b) 3.47
(c) 3.00 (d) 3.90

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (b) Let Amount = ₹P Rate = 28.75%

Interest = ₹P

$\text{Interest} = \frac{P \times R \times T}{100}$

$P = \frac{P \times 28.75 \times T}{100}$

$T = \frac{10000}{2875} = 3.47$ Years

180. In how much time will the amount invested triple at the rate of $12\frac{1}{2}\%$ per annum simple interest?

(a) 12 Years (b) 8 Years
(c) 16 Years (d) 4 Years

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (c) The amount considered will triple in T years.

from the formula,

where

$\boxed{T = \frac{(n-1)100}{R}}$

T = year
n = number
R = rate

$T = \frac{(3-1)100}{\frac{25}{2}} = \frac{2 \times 100}{\frac{25}{2}}$

T = 16 Years

181. A sum of money becomes 3 times of itself in 5 years. In how many years will this sum become 5 times of itself at the same rate of interest?

(a) 5 year (b) 10 year
(c) 9 year (d) 8 year

RRB NTPC 12.04.2016 Shift : 2

Ans : (b) Let (Principal) = P, Rate = R%

Amount = 3P

∴ Interest = 2P, Time = 5 Years

$S.I = \frac{P \times T \times R}{100}$

$2P = \frac{P \times 5 \times R}{100} \Rightarrow R = \frac{200}{5}$

R = 40%

When S.I = 4P

$S.I = \frac{PTR}{100}$

$\frac{P \times T \times 40}{100} = 4P$

T = 10 Years

182. In how much time will an amount double annually if invested at a simple annual rate of 12.5%.

(a) 6 years (b) 7 years
(c) 9 years (d) 8 years

RRB RPF SI – 16/01/2019 (Shift-I)

Ans : (d) Let invested Amount = ₹x

$\text{Amount} = \text{Principal}\left(1 + \frac{\text{Rate} \times \text{Time}}{100}\right)$

$\Rightarrow 2x = x\left(1 + \frac{12.5 \times t}{100}\right)$

$\Rightarrow 2 = 1 + \frac{125 \times t}{1000}$

$\Rightarrow 1 = \frac{t}{8}$

Time (t) = 8 Years

183. If an amount becomes 4 times in 7 years. In what time will this amount become 16 times at the same rate of simple interest?

(a) 25 years (b) 28 years
(c) 20 years (d) 35 years

RRB JE - 27/06/2019 (Shift-III)

Ans : (d) Let Principal = ₹P

Amount = ₹4P

Interest = 4P – P = ₹3P

Time = 7 Years

$\text{Rate of Interest} = \frac{\text{Interest} \times 100}{\text{Time} \times \text{Principal}}$

$\frac{3P \times 100}{7 \times P} = \frac{300}{7}\%$

Time when the amount is 16 times $= \frac{15P \times 100}{\frac{300}{7} \times P}$

$= \frac{15 \times 100 \times 7}{300} = 35$ Years

184. If a loan increases 3 times in 6 years at simple interest, then how much time will it take to increase 8 times.

(a) 15 Years (b) 22 Years
(c) 20 Years (d) 21 Years

RRB JE - 29/05/2019 (Shift-II)

Ans : (d) Let Principal is ₹ x

$\therefore$ Amount = ₹ 3x

According to the first condition,

Simple interest = 3x – x = ₹ 2x

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$2x = \frac{x \times R \times 6}{100}$$

$$R = \frac{100}{3}\%$$

According to the second condition,

$$\text{Simple interest} = 7x = \frac{x \times R \times n}{100}$$

$$7 = \frac{100/3 \times n}{100}$$

n = 21 Years

185. Raghu has invested ₹1000 and received ₹1300 after x years at a simple interest rate of 6% per annum. Find the value of x?

(a) 2 Years (b) 5Years

(c) 3Years (d) 4Years

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (b) Interest = 1300 – 1000 = ₹ 300

$$\text{Interest} = \frac{P \times R \times T}{100}$$

$$300 = \frac{1000 \times 6 \times x}{100}$$

x = 5 Years

186. In what time will simple interest of ₹1800 at the rate of 5% per annum be ₹390.

(a) 5 years 3 months (b) 5 years 4 months

(c) 4 years 4 months (d) 4 years 2 months

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (c) Principal = ₹1,800

Rate = 5%

simple interest = ₹390

$$\text{simple interest} = \frac{P \times R \times T}{100}$$

$$390 = \frac{1800 \times 5 \times \text{time}}{100}$$

$$\text{Time} = \frac{78}{18} = \frac{26}{6} = \frac{13}{3} \text{ Years}$$

$$\text{Time} = 4\frac{1}{3} \text{ Years or 4 year 4 months}$$

187. Simple interest on a fixed amount is 9/4 of the principal amount. If the number of years and the rate of interest are equal then for what period was the amount deposited?

(a) 12 years (b) 5.5 years

(c) 15 years (d) 7.5 years

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (c) $\text{Simple interest} = \frac{P \times R \times T}{100}$

According to the question, Rate = Time

$$\frac{9P}{4} = \frac{P \times \text{Time} \times \text{Time}}{100}$$

$$\frac{9 \times 100}{4} = \text{Time} \times \text{Time}$$

$$\text{Time} = \sqrt{9 \times 25} = 15 \text{ Years}$$

188. In how much time simple interest will be ₹400 on ₹4000 (principal) at 6% per annum.

(a) 20 months (b) 22 months

(c) 14 months (d) 18 months

RRB NTPC 18.01.2017 Shift : 2

Ans : (a) $\text{Simple interest} = \frac{P \times R \times T}{100}$

$$400 = \frac{4000 \times 6 \times t}{100}$$

$$\text{Time} = \frac{40000}{4000 \times 6} = \frac{10}{6} \text{ years} = \frac{10}{6} \times 12 = 20 \text{ months}$$

189. In how much time will a sum of money become 7/6 of itself at the rate of 25% simple interest?

(a) 6 months (b) 8 months

(c) 9 months (d) 10 months

RRB NTPC 18.04.2016 Shift : 3

Ans : (b) Let Principal is ₹x and amount is ₹$\frac{7x}{6}$.

Then According to the question,

$$\frac{7x}{6} - x = \frac{x \times 25 \times \text{Time}}{100}$$

$$\Rightarrow \frac{x}{6} = \frac{x \times 25 \times \text{Time}}{100}$$

$$\Rightarrow \text{Time} = \frac{4}{6} \text{ Years} = \frac{4}{6} \times 12 \text{ months} = 8 \text{ months}$$

190. At what time will the simple interest of ₹8750 becomes 6/25 of the principal at an annual rate of 8%?

(a) 3 years (b) 4 years

(c) 2 years (d) 5 years

RRB NTPC 28.03.2016 Shift : 2

Ans : (a) From Question–

$$\text{Simple Interest} = 8750 \times \frac{6}{25} = ₹2100$$

$$\frac{8750 \times n \times 8}{100} = 2100$$

$$n = \frac{210000}{8750 \times 8}$$

n = 3 years

191. An interest on an amount borrowed at an annual rate of 6% in x years is 1/3 of its principal. Find x.

(a) $5\frac{5}{9}$ (b) $4\frac{2}{29}$

(c) $6\frac{3}{7}$ (d) $5\frac{3}{4}$

RRB NTPC 03.04.2016 Shift : 2

Ans : (a) Suppose Principal= P

from the question-

$$\frac{P\times 6\times x}{100}=\frac{1}{3}P$$

$$\Rightarrow \frac{6\times x}{100}=\frac{1}{3}\Rightarrow x=\frac{100}{6\times 3}$$

$$\Rightarrow x=\frac{50}{9}\Rightarrow x=5\frac{5}{9}$$

Type - 6

192. A trader owes a merchant ₹8,000 due in one year. The trader wants to settle the account after 2 months. If the rate of interest is 9% per annum, then how much should be pay (rounded off value)?

(a) ₹7,442 (b) ₹4,774

(c) ₹7,244 (d) ₹7,424

RRB Group-D 29/08/2022 (Shift-III)

Ans. (a) : Let the principal amount be ₹P. Amount after 1year = ₹ 8000

According to the question,

$$\text{Amount} = P+\frac{P\times R\times T}{100}$$

$$= P+\frac{P\times 9\times 1}{100}=8000\Rightarrow P=\frac{8000\times 100}{109}$$

$$P = ₹\ 7339.44$$

Again, to clear debt in 2 month,

$$\text{Amount to be paid} = 7339.44+\frac{7339.44\times 2\times 9}{100\times 12}$$

$$= 7339.44+110.09$$

$$= 7449.53 = ₹\ 7442 \text{ (Approx.)}$$

193. How much annual installment will discharge a debt of Rs. 9,600 in 5 years at 10% simple interest per annum?

(a) Rs. 1,550 (b) Rs. 1,600

(c) Rs. 1,500 (d) Rs. 1,450

RRB Group-D 13/09/2022 (Shift-I)

Ans. (b) : Given,

R = 10% time = 5 years, Annual installment = ?

Principal Amount = 9600

$$\text{Annual installment} = \frac{\text{Principal Amount}\times 100}{100\times T+\frac{RT(T-1)}{2}}$$

$$=\frac{9600\times 100}{100\times 5+\frac{10\times 5\times 4}{2}}$$

$$=\frac{9600\times 100}{600}$$

$$= ₹\ 1600$$

194. If an amount doubles in 5 years, at the rate of simple interest how many times of the original amount, will it be after 8 years with same rate of simple interest?

(a) $3\frac{3}{5}$ times (b) $2\frac{3}{5}$ times

(c) $2\frac{1}{5}$ times (d) $3\frac{2}{5}$ times

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let principal = ₹ P

Amount = ₹ 2P

Time (t) = 5 years

Rate of interest = r %

According to the question,

Amount = Principal + Interest

$$2P = P+\frac{P\times r\times 5}{100}$$

$$\Rightarrow P=\frac{P\times r}{20}$$

$$\Rightarrow r = 20$$

$$\therefore \text{Amount} = P+\frac{P\times 20\times 8}{100}$$

$$= P+\frac{8P}{5}$$

$$=\frac{13P}{5}=2\frac{3}{5}P$$

Hence at the rate of simple interest, this amount will become $2\frac{3}{5}$ times of itself after 8 years.

195. If a sum invested at simple interest, double itself in 8 years, how many times of itself will it be in 12 years?

(a) 3 times (b) 4 times

(c) 5 times (d) 3.5 times

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let the principal amount = ₹ P

Rate = R%

And time = T years

So interest of 8 years = 2P

According to the question-

$$2P=\frac{P\times R\times 8}{100}$$

$$R=\frac{200}{8}=25\%$$

Interest for 12 years-

$$\text{interest}=\frac{P\times 25\times 12}{100}$$

intesest = 3P

New amount = P + 3P = 4P

Hence, it will become 4 times of itself in 12 years.

196. At a certain rate of simple interest, the sum of ₹800 becomes ₹956 in 3 years, If the rate is increased by 4%. What will be the increase in investment?

(a) ₹ 108 (b) ₹ 96
(c) ₹ 1052 (d) ₹ 72

RRB JE - 28/06/2019 (Shift-III)

Ans. (b) S.I. $= \frac{P \times R \times T}{100}$

Amount − Principal $= 956 - 800 = \frac{800 \times R \times 3}{100}$

$156 = 8 \times R \times 3$

$R = \frac{52}{8} = \frac{13}{2}\%$

Again when rate is increased by 4% $= \frac{13}{2} + 4 = \frac{21}{2}\%$

$\therefore$ S.I. $= \frac{800 \times 21 \times 3}{100 \times 2} = ₹252$

Hence, increase in investment $= 252 - 156 = ₹96$

197. Akshay borrows ₹3000 for 2 years at the rate of 6% simple annual interest per annum and lent the same amount to his friend at 9% per annum simple interest for 2 years. How much profit will akshay make in a year?

(a) ₹ 90 (b) ₹ 180
(c) ₹ 120 (d) ₹ 150

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (a) Simple interest of amount taken by Akshay

Simple interest $= \frac{3000 \times 6 \times 2}{100}$

$= ₹360$

Simple interest on money given to a friend

$= \frac{3000 \times 9 \times 2}{100}$

$= ₹540$

Akshay's profit in two years $= 540 - 360$

$= ₹ 180$

Profit in one year $= \frac{180}{2} = ₹ 90$

198. A sum of money (P) becomes twice in 10 years. How much will this amount become in 20 years at the same rate of simple interest?

(a) P (b) 2P
(c) 3P (d) 4P

RRB NTPC 16.04.2016 Shift : 3

Ans : (c) Simple interest $= \frac{P \times R \times T}{100}$

According to the question, $P = \frac{P \times R \times 10}{100}$

$R = 10\%$

According to the second condition–

Total amount after 20 years = (P + SI)

$= P + \frac{P \times 20 \times 10}{100}$

$= P + 2P = 3P$

199. If an amount becomes ₹20720 in 4 years and ₹24080 in 6 years, find the amount and the rate of simple interest.

(a) ₹16000, 8% (b) ₹14000, 10%
(c) ₹14000, 12% (d) ₹16000, 12%

RRB RPF SI – 05/01/2019 (Shift-III)

Ans : (c) Let that amount be P and the rate of simple interest is x%

$A - P = \frac{P \times r \times t}{100}$

According to the question,

$20720 - P = \frac{P \times r \times 4}{100}$ .....(i)

$24080 - P = \frac{P \times r \times 6}{100}$ .....(ii)

On equation (i) divided by (ii)

$\frac{20720 - P}{24080 - P} = \frac{P \times r \times 4}{100} \times \frac{100}{P \times r \times 6}$

$\frac{20720 - P}{24080 - P} = \frac{2}{3}$

$62160 - 3P = 48160 - 2P$

$P = ₹14000$

Putting the value P in equation (i)

$20720 - 14000 = \frac{14000 \times r \times 4}{100}$

$6720 = 560\ r$

$r = 12\%$

200. If the simple interest is 12.5% more than the principal and the number of years. (n) and the rate (r) is numerically in a ratio of 2:1 then find the value of n and r.

(a) n = 12, r = 6% (b) n = 15, r = $7\frac{1}{2}\%$
(c) n=20, r=10% (d) n= 14, r = 7%

RRB JE - 24/05/2019 (Shift-I)

Ans : (b) Let Principal $= ₹ P$

Time $= 2x$ Years, Rate $= x\%$

$\therefore$ Simple interest $= \frac{112.5}{100} \times P$

Simple interest $= \frac{P \times R \times T}{100}$

$\frac{112.5}{100} \times P = \frac{P \times 2x \times x}{100}$

$112.5 = 2x^2$

$x^2 = 56.25$

$x = 7.5 = 7\frac{1}{2}$

Hence Rate $7\frac{1}{2}\%$ and Time (n) $= 2 \times 7\frac{1}{2} = 15$ Years

15.

Compound Interest

Type - 1

1. A sum of money invested at 10% compound interest per annum amounts to ₹10,164 in 2 years interest compounded annually, what was the sum invested ?

(a) ₹8,300 (b) ₹8,400
(c) ₹8,200 (d) ₹8,800

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : According to the question,

$$A = P\left(1+\frac{r}{100}\right)^n$$

(A = Amount, P = Principal, n = Time, r = Rate)

$$10164 = P\left(1+\frac{10}{100}\right)^2$$

$$\Rightarrow 10164 = P \times \frac{11}{10} \times \frac{11}{10}$$

$$\Rightarrow P = \frac{10164 \times 100}{121}$$

$$\therefore \quad \boxed{P = 8400}$$

2. Rahul invested a certain sum for two years at 60% p.a. compound interest compounded annually. If at the end of two years he received interest of ₹ 11,700, then how much did he initially invest?

(a) ₹ 8,000 (b) ₹ 7,250
(c) ₹ 7,750 (d) ₹ 7,500

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (d) : Let Principal = ₹ P

$$\text{Compound Interest} = \left[P\left(1+\frac{R}{100}\right)^t\right] - P$$

$$11700 = \left[P\left(1+\frac{60}{100}\right)^2\right] - P$$

$$11700 = \left[P\left(\frac{8}{5}\right)^2\right] - P$$

$$11700 = \frac{64P}{25} - P$$

$$11700 = \frac{64P - 25P}{25}$$

$$P = \frac{11700 \times 25}{39}$$

$$\therefore P = ₹\ 7500$$

3. A certain sum was invested at 40% p.a compound interest for two years and the interest was compounded annually. If the interest was compounded half-yearly, the amount payable of maturity after two years would have been ₹ 4,544 more. What was the sum invested?

(a) ₹ 42,500 (b) ₹ 40,000
(c) ₹ 42,000 (d) ₹ 37,500

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (b) : Let Amount = A

According to the question,

$$A_2 - A_1 = 4544$$

$$\Rightarrow \quad P\left(1+\frac{R_2}{100}\right)^{t_2} - P\left(1+\frac{R_2}{100}\right)^{t_1} = 4544$$

$$\Rightarrow \quad P\left(1+\frac{20}{100}\right)^4 - P\left(1+\frac{40}{100}\right)^2 = 4544$$

$$\Rightarrow \quad P\left(\frac{6}{5}\right)^4 - P\left(\frac{7}{5}\right)^2 = 4544$$

$$\Rightarrow \quad \frac{1296P}{625} - \frac{49P}{25} = 4544$$

$$\Rightarrow \quad \frac{1296P - 1225P}{625} = 4544$$

$$\Rightarrow \quad 71P = 4544 \times 625$$

$$\therefore \quad P = \frac{4544 \times 625}{71}$$

Hence, P = ₹ 40000

4. A sum of ₹ 22,100 was divided between Timir and Monali in such a way that if both invested their shares at 10% compound interest per annum, the amount payable on maturity to Monali after 18 years would be the same as the amount payable on maturity to Timir after 20 years. What was the share of Monali in the initial sum?

(a) ₹ 12,050 (b) ₹ 12,100
(c) ₹ 12,150 (d) ₹ 12,180

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (b) :

Share of Monali = K, Time = 18 years, Rate = 10%

Share of Timir = 22100–K, Time = 20 years,

Rate = 10%

According to the question,

$$K\left(1+\frac{10}{100}\right)^{18} = (22100 - K)\left[\left(1+\frac{10}{100}\right)^{20}\right]$$

$$\Rightarrow \quad \frac{K}{22100-K}=\frac{\left(\frac{11}{10}\right)^{20}}{\left(\frac{11}{10}\right)^{18}}$$

$$\Rightarrow \quad \frac{K}{22100-K}=\left(\frac{11}{10}\right)^{2}$$

$$\Rightarrow \quad \frac{K}{22100-K}=\frac{121}{100}$$

$$\Rightarrow \quad 22100\times121-121K=100K$$

$$\Rightarrow \quad 221K=22100\times121$$

$$\therefore \quad \boxed{K=12100}$$

Hence, Share of Monali = ₹12100.

5. Manish deposited a certain sum of money at 5% rate of interest per annum, compounded annually. At the end of 3 years, Manish received a total amount of ₹92,610. What was the sum of money deposited by Manish?

(a) ₹82,610 (b) ₹80,000
(c) ₹80,530 (d) ₹79,460

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (b) : Given :– Amount = ₹92610
Rate (r) = 5% Principal (P) = ?
Time (t) = 3 year
For compound interest,

$$\because \text{Amount} = P\times\left(1+\frac{R}{100}\right)^{t}$$

$$92610 = P\times\left(1+\frac{5}{100}\right)^{3}$$

$$92610 = P\times\left(\frac{21}{20}\right)^{3}$$

$$P=\frac{92610\times20\times20\times20}{21\times21\times21}$$

$$\boxed{P = ₹\ 80000}$$

6. At 10 month compoundly, a certain sum ₹ x at the rate 12% per annum get amount ₹ 50578 for $2\frac{1}{2}$ years. Find the value of x.

(a) 38,000 (b) 40,000
(c) 42,000 (d) 36,000

RRB Group-D 06/09/2022 (Shift-II)

Ans. (a) : Given
amount = ₹ 50,578

$$\text{rate} = 12\times\frac{10}{12}=10\%$$

$$\text{time}=\frac{5}{2}\times\frac{12}{10}$$

= 3 years

According to question,

$$50578 = x\left(1+\frac{10}{100}\right)^{3}$$

$$50578 = x\times\frac{1331}{1000}$$

$$\Rightarrow \quad x = 38000$$

7. What annual equal payment (in ₹) will discharge a debt of ₹ 28,700 due in 2 years at 5% p.a, interest compounded annually?

(a) 15,534 (b) 15,543
(c) 15,345 (d) 15,435

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (d) : According to question, annual equal payment

$$\Rightarrow \frac{x}{1+\frac{5}{100}}+\frac{x}{\left(1+\frac{5}{100}\right)^{2}}=28700$$

$$\Rightarrow \frac{20x}{21}+\frac{400x}{441}=28700$$

$$\Rightarrow \frac{420x+400x}{441}=28700$$

$$\Rightarrow \frac{820x}{441}=28700$$

$$\Rightarrow \frac{1435\times441}{41}$$

$$= 35\times441$$

$$= ₹\ 15435$$

8. A sum was invested for 3 years on compound interest at 6%, 12% and 18% in first, second and third year respectively. The sum amounts to ₹20,000 in 3 years. Find the principal amount

(a) ₹14,276.58 (b) ₹12,276.12
(c) ₹13,572.46 (d) ₹10,276.43

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (a) : Amount =

$$\text{Principal amount}\times\left(1+\frac{r_1}{100}\right)\left(1+\frac{r_2}{100}\right)\left(1+\frac{r_3}{100}\right)$$

$$20000 = \text{Principal amount}\times\left(1+\frac{6}{100}\right)\left(1+\frac{12}{100}\right)\left(1+\frac{18}{100}\right)$$

$$\text{Principal amount} = \frac{20000\times50\times25\times50}{53\times28\times59}$$

$$= ₹\ 14276.58$$

9. A sum of money, when invested at 10% compound interest per annum, amounts to ₹1,815 after 2 years. What is the original sum that was invested in the beginning?

(a) ₹1512.50 (b) ₹1,475.00
(c) ₹1,500.00 (d) ₹1,550.00

RRB NTPC 17.02.2021 (Shift-II) Stage I

Ans. (c) : Given,

r = 10%

t = 2 years

P = ?

From formula-

$$A = P\left(1+\frac{r}{100}\right)^{n}$$

$$1815 = P\left(1+\frac{10}{100}\right)^{2}$$

$$P = \frac{1815\times 100}{121}$$

$$P = ₹1,500$$

10. What is the principal amount which earns ₹154/- as a compound interest for the second year at 10% per annum?

(a) ₹1,400.00 (b) ₹1,200.00

(c) ₹1,540.00 (d) ₹2,750.50

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (a) : If the compound interest rate for the first year is 10%

From option (a)-

Compound interest for the first year = $\frac{1400\times 10}{100} = ₹140$

Principal amount for the second year = 140 + 1400

$= ₹1540$

Compound interest for the second year $= \frac{1540}{100}\times 10$

$= ₹154$

Therefore, option (a) is correct.

11. The present worth of ₹ 338 due in 2 years at 4% per annum compound interest is : _____

(a) ₹ 365.58 (b) ₹ 350.50

(c) ₹ 294.00 (d) ₹ 312.50

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : From formula-

$$A = P\left(1+\frac{R}{100}\right)^{T}$$

$$338 = P\left(1+\frac{4}{100}\right)^{2}$$

$$338 = P\left(\frac{26}{25}\right)^{2}$$

$$P = \frac{338\times 625}{676}$$

$= ₹312.50$

12. On what sum will the compound interest, at the rate of $12\frac{1}{2}$% per annum for 2 years compounded annually, be ₹6,800?

(a) ₹27,200 (b) ₹54,400

(c) ₹27,260 (d) ₹25,600

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let the principal is x Rs.

Given-

Rate (r) = $12\frac{1}{2}\% = \frac{25}{2}\%$

Time (t) = 2 years

Compound interest (CI) = ₹ 6800

$\therefore$ CI = A - P

$$6800 = x\left[\left(1+\frac{25}{200}\right)^{2}-1\right]$$

$$6800 = x\left[\frac{9}{8}\times\frac{9}{8}-1\right]$$

$$6800 = x\left[\frac{81}{64}-1\right]$$

$$6800 = \frac{17x}{64}$$

$$x = \frac{6800\times 64}{17}$$

$$x = ₹\ 25600$$

13. Divide ₹20609 between A and B, such that the amount (in ₹) of A after 7 years is equal to the amount (in ₹) of B after 9 years, if the interest being compounded yearly at 3 % per annum.

(a) A = ₹10,601, B = ₹10,008

(b) A = ₹10,609, B = ₹10,000

(c) A = ₹10605, B = ₹10,004

(d) A = 10,509, B = ₹10,000

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let A → x

B → (20609–x)

According to the question,

$$x\left(1+\frac{3}{100}\right)^{7} = (20609-x)\times\left(1+\frac{3}{100}\right)^{9}$$

$$x = (20609-x)\left(1+\frac{3}{100}\right)^{2}$$

$$x = 20609\times\frac{103}{100}\times\frac{103}{100}-\frac{103}{100}\times\frac{103}{100}\times x$$

$$\frac{(10609+10000)x}{10000} = 20609\times\frac{10609}{10000}$$

A = x = ₹10609

B = 20609 –10609 = ₹10000

14. Mohit invested ₹10000 in two different schemes NSC and PPF at an annual compound interest rate of 14% and 11% respectively. If the total amount of interest received in 2 years is ₹ 2726, then what was the amount invested in PPF?

(a) ₹5000 (b) ₹4000

(c) ₹6000 (d) ₹7000

RRB RPF SI – 06/01/2019 (Shift-II)

Ans : (b) Let invested amount in NSC = ₹ x

Invested amount in PPF = ₹ (10000 – x)

According to the question,

$$x\left(1+\frac{14}{100}\right)^{2}+(10000-x)\left(1+\frac{11}{100}\right)^{2} = 10000+2726$$

$$x\times\frac{114}{100}\times\frac{114}{100}+(10000-x)\frac{111}{100}\times\frac{111}{100}=12726$$

$$\frac{12996x}{10000}+(10000-x)\frac{12321}{10000}=12726$$

$$\frac{12996x}{10000}+\frac{123210000-12321x}{10000}=12726$$

$$12996x+123210000-12321x=127260000$$

$$675x=4050000$$

$$x=\frac{4050000}{675}=₹6000$$

Amount of PPF = 10000–6000 = ₹4000

15. A sum of ₹ 2000 at 40% per annum compounded annually. What is the interest for the third year at compound interest.

(a) ₹1500 (b) ₹1600
(c) ₹1568 (d) ₹1750

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans : (c) Principal = ₹2000
Rate = 40%

$$\text{Interest for three years} = 2000\left[\left(1+\frac{40}{100}\right)^3-1\right]$$

$$=2000\times\left(\frac{7}{5}\right)^3-2000$$

$$=5488-2000=3488$$

$$\text{Interest for two years} = 2000\times\left(1+\frac{40}{100}\right)^2-2000$$

$$=3920-2000=1920$$

Interest for third year = 3488 – 1920 = ₹1568

16. An amount of ₹16400 is borrowed and is to be repaid in 2 years in equal annual installments at the rate of 5% compound interest. Find the amount of annual payment.

(a) ₹ 7590 (b) ₹ 7495
(c) ₹ 7600 (d) ₹ 8820

RRB JE - 25/05/2019 (Shift-II)

Ans : (d) Let installment = ₹x

$$\text{Total amount} = \text{installment}\left[\frac{1}{\left(1+\frac{r}{100}\right)^1}+\frac{1}{\left(1+\frac{r}{100}\right)^2}\right]$$

$$16,400=x\left[\frac{1}{\left(1+\frac{5}{100}\right)^1}+\frac{1}{\left(1+\frac{5}{100}\right)^2}\right]$$

$$16,400=x\left[\frac{1}{\frac{21}{20}}+\frac{1}{\left(\frac{21}{20}\right)^2}\right]=x\left[\frac{20}{21}+\frac{400}{441}\right]$$

$$16,400=x\left[\frac{420+400}{441}\right]$$

$$16400=x\times\frac{820}{441}$$

$$x=20\times441=₹8820$$

17. A woman invested ₹200 at the beginning of each year at a 5% compound interest per annum. At the end of the second year her total investment amount will be.

(a) ₹431 (b) ₹430.5
(c) ₹435 (d) ₹430

RRB RPF SI – 11/01/2019 (Shift-I)

Ans : (b) For first year, Principal = ₹200
Rate = 5% Time = 1 Year

$$\text{Amount} = \text{Principal}\left(1+\frac{r}{100}\right)^t$$

$$=200\left(1+\frac{5}{100}\right)^1=200\times\frac{21}{20}=₹210$$

Again for second year,
Principal = ₹ 210 + ₹ 200 = ₹ 410
Rate = 5%, Time = 1 Year

$$\text{New amount} = 410\left(1+\frac{5}{100}\right)^1=410\times\frac{21}{20}$$

$$=₹430.50$$

18. A certain sum of money was invested at compound interest, compounded annually amounts to ₹338 at the rate of 4% per annum after 2 years Find the sum.

(a) ₹320 (b) ₹ 312.5
(c) ₹318.53 (d) ₹315

RRB JE - 25/05/2019 (Shift-III)

Ans : (b) Given-

P = ?, r = 4%, Amount = ₹338, t = 2 Years

As per the question-

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^t$$

$$338=P\left(1+\frac{4}{100}\right)^2$$

$$338=P\times\left(\frac{26}{25}\right)^2$$

$$P=\frac{211250}{676}$$

$$P=₹312.5$$

19. An amount is invested for two years at 20% compound interest. If the interest is payable on a half yearly basis, then it receives ₹482 more than that which was payable on an annual basis. Find the amount.

(a) ₹ 19500 (b) ₹ 20000
(c) ₹ 21800 (d) ₹ 30000

RRB JE - 26/06/2019 (Shift-I)

Ans. (b) Let principal amount = ₹x

Rate of compound interest = 20%

$$\text{Compound interest} = \text{Principal}\left[\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}-1\right]$$

$$= x\left[\left(1+\frac{20}{100}\right)^{2}-1\right]$$

$$= x\left[\left(1+\frac{1}{5}\right)^{2}-1\right]$$

$$= x\left[\left(\frac{6}{5}\right)^{2}-1\right]$$

$$= x\left[\frac{36}{25}-1\right]$$

$$= \frac{11x}{25}$$

If interest payable half yearly

∴ Rate of interest = 10%

Time = 4 Half yearly

$$\text{Compound interest} = \text{Principal}\left[\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}-1\right]$$

$$= x\left[\left(1+\frac{10}{100}\right)^{4}-1\right] \qquad = x\left[\left(\frac{11}{10}\right)^{4}-1\right]$$

$$= x\left[\frac{11\times11\times11\times11-10000}{10000}\right]$$

$$= x\left[\frac{14641-10000}{10000}\right] = \frac{4641x}{10000}$$

As per the question,

$$\frac{4641x}{10000}-\frac{11x}{25} = 482$$

$$\frac{4641x-4400x}{10000} = 482$$

$$\frac{241x}{10000} = 482$$

$$x = 2 \times 10000 = ₹20000$$

20. A person borrowed a sum of money at 9% simple interest and invested it at 10% compound interest for 3 years. After 3 years he received profit of ₹1952. How much money did he borrow?

(a) ₹ 30000 (b) ₹ 32000

(c) ₹ 33000 (d) ₹ 32543

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (b) : Suppose borrowed amount = ₹ x

Compound interest = Total Amount – Principal

Profit = Compound interest – Simple interest

As per the question,

$$x\left[\left(1+\frac{10}{100}\right)^{3}-1\right]-\left[\frac{x\times9\times3}{100}\right] = 1952$$

$$\Rightarrow x\left[\left(\frac{11}{10}\right)^{3}-1\right]-\left[\frac{x\times9\times3}{100}\right] = 1952$$

$$\Rightarrow x\left[\frac{1331}{1000}-1\right]-\left[\frac{x\times9\times3}{100}\right] = 1952$$

$$\Rightarrow x\left[\frac{1331-1000}{1000}\right]-\left[\frac{x\times9\times3}{100}\right] = 1952$$

$$\Rightarrow x\left[\frac{331}{1000}\right]-\frac{27x}{100} = 1952$$

$$\Rightarrow \frac{x(331-270)}{1000} = 1952$$

$$\Rightarrow \frac{x\times61}{1000} = 1952$$

$$\Rightarrow x = 32\times1000 = ₹32000$$

21. The money invested for two years which is to be compounded annually, at the rate of 20% per annum. At maturity it becomes ₹324. What was the initial amount invested.

(a) ₹240 (b) ₹200

(c) ₹250 (d) ₹225

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (d) Let principal = ₹ P

Time = 2 Years

Rate = 20% per annum

Amount = ₹324

From formula -

$$A = P\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$324 = P\left(1+\frac{20}{100}\right)^{2}$$

$$324 = P\times\frac{6}{5}\times\frac{6}{5}$$

$$P = \frac{324\times25}{36}, \qquad P = ₹225$$

22. Shyam deposits ₹x for 2 years at 8% per annum compounded interest annually, which is ₹72900. Then what is the value of x?

(a) ₹60,500 (b) ₹62,000

(c) ₹60,000 (d) ₹62,500

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (d) Rate (R) = 8%

Time (n) = 2 Years

A = ₹ 72,900

$$A = P\left(1+\frac{R}{100}\right)^{n}, \quad 72900 = P\left[1+\frac{8}{100}\right]^{2}$$

$$72900 = P\times\frac{108}{100}\times\frac{108}{100}$$

$$P = \frac{72900\times100\times100}{108\times108}$$

P = ₹ 62500

23. A person borrows a certain amount from a bank for 3 years at the rate of 7% compound interest annually. If he paid ₹85966 as total interest, then what was the amount borrowed?

(a) ₹462,000 (b) ₹382,000
(c) ₹354,000 (d) ₹428,000

RRB NTPC 04.04.2016 Shift : 1

Ans : (b) Let borrowed amount = ₹x
Amount (A) = Principal + Interest
= x + 85966

$$\because A = P\left(1+\frac{r}{100}\right)^n$$

$$x + 85966 = x\left(1+\frac{7}{100}\right)^3$$

$x + 85966 = x\,(1.07)^3$
$x + 85966 = 1.225043x$
$0.225043x = 85966$

$$x = \frac{85966}{0.225043}$$

$x = 381998.107$, $x = ₹382000$

24. A takes a fixed amount from a bank at the rate of 8% interest in which the interest compounded half yearly. If he paid ₹196851 after one and a half year, find the principal.

(a) ₹ 168,000 (b) ₹ 175,000
(c) ₹ 179,000 (d) ₹ 184,000

RRB NTPC 31.03.2016 Shift : 3

Ans : (b) Given- Rate (r) = 8% per annum, = 4% Half yearly
Time n = 1 Year = 2 Half yearly
1.5 Years = 3 Half yearly

$$\text{Principal} = \frac{196851}{\left(1+\frac{4}{100}\right)^3} = \frac{196851}{(26/25)^3}$$

$$= \frac{196851\times 25\times 25\times 25}{26\times 26\times 26}$$

$= 174999.82 = ₹175000$

25. A fixed amount becomes ₹7200 in 2 years at a compound interest rate of 20% per annum. Find the principal amount.

(a) ₹4800 (b) ₹6000
(c) ₹5400 (d) ₹5000

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) From formula-

$$\text{Compound amount} = P\left(1+\frac{r}{100}\right)^n$$

$$7200 = P\left(1+\frac{20}{100}\right)^2$$

$$7200 = P\left(1+\frac{20}{100}\right)^2$$

$$7200 = P\times\frac{36}{25}$$

$P = 200 \times 25 = ₹5000$

26. Mr. Akhil invested ₹13500 in a fixed deposit find the total money for 6 months at the rate of compound interest of 20% per annum if the interest is compounded quarterly.

(a) ₹ 14, 883.35 (b) ₹ 14,883.75
(c) ₹ 14,883.5 (d) ₹ 14,883

RRB NTPC 19.01.2017 Shift : 1

Ans : (b) When Rate is payable quarterly $= \frac{20}{4} = 5\%$
Time = 6 months = 2 quarters
As per the question,

$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$= 13500\left[1+\frac{5}{100}\right]^2$$

$$= 13500\times\frac{21\times 21}{20\times 20} = ₹14883.75$$

27. Calculate the principal if an amount of ₹ 441 is received on compound interest at the rate of 5% per annum after 2 years

(a) ₹400 (b) ₹390
(c) ₹380 (d) ₹350

RRB NTPC 27.04.2016 Shift : 3

Ans : (a) As per the question,

$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$441 = \text{Principal}\left(1+\frac{5}{100}\right)^2$$

$$441 = \text{Principal}\left(\frac{21}{20}\right)^2$$

$$441 = \text{Principal}\times\frac{441}{400}$$

$$\text{Principal} = \frac{441\times 400}{441} = ₹400$$

28. Gitesh took a loan for 4 years at 5% compound interest. If the total interest paid was ₹ 431.01, Calculate the principal.

(a) ₹2000 (b) ₹2050
(c) ₹2100 (d) ₹2150

RRB NTPC 27.04.2016 Shift : 3

Ans : (a) As per the question,

$$\text{Compound interest} = \text{Principal}\left[\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}} - 1\right]$$

$$431.01 = \text{Principal}\left[\left(1+\frac{5}{100}\right)^4 - 1\right]$$

$$431.01 = \text{Principal}\left[\frac{21}{20}\times\frac{21}{20}\times\frac{21}{20}\times\frac{21}{20} - 1\right]$$

$$431.01 = \text{Principal}\left[\frac{194481}{160000} - 1\right]$$

$431.01 = \text{Principal}\left[\frac{194481-160000}{160000}\right]$

$431.01 = \text{Principal} \times \frac{34481}{160000}$

$\text{Principal} = \frac{431.01\times160000}{34481} = 1999.99 = ₹\ 2000$

29. If a certain amount becomes ₹6655 at a compound interest rate of 10% in 3 years. Find the amount.

(a) ₹5000 (b) ₹5500
(c) ₹4500 (d) ₹4800

RRB NTPC 30.04.2016 Shift : 1

Ans : (a) From question,

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$6655 = P\left(1+\frac{10}{100}\right)^3$$

$$6655 = \frac{1331P}{1000}$$

$$P = \frac{1000\times6655}{1331} = ₹5000$$

30. Rakesh invested ₹10000 in two different schemes NSC and PPF at an, annual compound interest rate of 14% and 11% respectively. If the total interest for 2 years is ₹2726, then what was the amount invested in NSC?

(a) ₹5000 (b) ₹4000
(c) ₹6000 (d) ₹7000

RRB NTPC 30.04.2016 Shift : 2

Ans : (c) Let invested amount in NSC is ₹x, then invested amount in PPF will be ₹ (10000-x).
Total Amount = 10,000 + 2726 = ₹12726
As per the question,

$$12726 = x\left(1+\frac{14}{100}\right)^2 + (10,000-x)\times\left(1+\frac{11}{100}\right)^2$$

$$12,726 = x\times\frac{114\times114}{100\times100} + 10,000\times\frac{111\times111}{100\times100} - x\times\frac{111\times111}{100\times100}$$

$\Rightarrow 12,726\times10,000 = 12,996x + 12,321\times10,000 - 12,321x$

$\Rightarrow (12,726\times10,000 - 12321\times10,000) = 12996x - 12321x$

$10,000(405) = 675x$

$$x = \frac{40,50,000}{675} = ₹6000$$

Type - 2

31. What will be the amount payable on maturity if ₹ 2,000 is invested for a period of three years of 30% p.a. interest compounded yearly?

(a) ₹4,384 (b) ₹4,398
(c) ₹4,394 (d) ₹4,388

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (c) : Given,
P = ₹2000, r = 30%, t = 3 years

$$A = P\left(1+\frac{r}{100}\right)^t$$

$$A = 2000\left(1+\frac{30}{100}\right)^3$$

$$= 2000\times\frac{13}{10}\times\frac{13}{10}\times\frac{13}{10}$$

$$= 2\times2197$$

$\therefore$ A = ₹4,394

32. If the rate of interest is 20% per annum and interest is compounded half yearly, then in 3/2 years a sum of ₹4000 will amount to:

(a) ₹5,234 (b) ₹5,224
(c) ₹5,324 (d) ₹5,334

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (c) : R = 20% yearly = 10% half yearly

$$T = \frac{3}{2}\times2 = 3 \text{ half yearly}$$

$$A = P\left(1+\frac{R}{100}\right)^T$$

$$= 4000\left(1+\frac{10}{100}\right)^3$$

$$= 4000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$$

$$= ₹5324$$

33. The amount on a sum of ₹2,400 at 5% per annum compound interest, compounded annually, in 2 years will be:

(a) ₹2,646 (b) ₹3,646
(c) ₹4,646 (d) ₹5,646

RRB Group-D 05/09/2022 (Shift-II)

Ans. (a) : Given,
R = 5%
P = ₹ 2400
t = 2 years

$\therefore$ $$A = P\left(1+\frac{R}{100}\right)^2$$

$$= 2400\left(1+\frac{5}{100}\right)^2$$

$$= 2400\times\left(\frac{21}{20}\right)^2$$

$$= 2400\times\frac{441}{400}$$

$$= ₹\ 2,646$$

34. A sum of ₹36,000 deposited at a certain rate of compound interest, compounded annually, becomes three times itself after 6 years. How much will it become after 18 years at the same rate of compound interest?

(a) ₹10,72,000 (b) ₹8,72,000
(c) ₹7,72,000 (d) ₹9,72,000

RRB Group-D 01/09/2022 (Shift-III)

Ans. (d) :
A sum of ₹36000 becomes three times to itself then

$$36000\left(1+\frac{r}{100}\right)^6 = 36000\times 3.....(i)$$

after 18 years at same rate on ₹ 36000 amount

$$A = 36000\left(1+\frac{r}{100}\right)^{18}$$

$$A = 36000\left\{\left(1+\frac{r}{100}\right)^6\right\}^3$$

from eq (i)

$A = 36000\ (3)^3$

$= 36000 \times 27$

so, after 18 years sum will become ₹ 972000

35. A certain sum amounts to ₹98494 at the rate of 15% per annum in 2 years, interest compounded 8-monthly. What will be the amount payable (in ₹) on the same sum at the same rate and in the same time, if the interest is compounded yearly?

(a) 97,865 (b) 96,785
(c) 97,685 (d) 96,578

RRB Group-D 05/09/2022 (Shift-III)

Ans. (a) : At 8 month compound interest

$$r = 15\times\frac{2}{3} = 10\%$$

A = 98494

n = 24/8 = 3

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$98494 = P\left(1+\frac{10}{100}\right)^3$$

P = ₹ 74000

again, compound interest yearly

P = 74000, r = 15%, n = 2

$$A = 74000\left(1+\frac{15}{100}\right)^2$$

$$A = 74000\left(\frac{23}{20}\right)^2$$

A = ₹97865

Hence amount payable = 97865

36. If the rate of interest 20% per annum and interest is compounded half yearly then in 1 years a sum of ₹ 16000 will amount to :

(a) ₹ 19,480 (b) ₹ 19,720
(c) ₹ 19,360 (d) ₹ 19,200

RRB Group-D 06/09/2022 (Shift-III)

Ans. (c) : Given,

R = 10%

t = 2

P = ₹ 16000

According to question,

$$A = P\left(1+\frac{R}{100}\right)^t$$

$$= 16000\left(1+\frac{10}{100}\right)^2$$

$$= 16000\left(\frac{11}{10}\right)^2$$

= 160 × 121

= ₹ 19,360

37. The total amount payable after 3 years on a sum of ₹1,000 invested at 10% interest per annum compounded annually is :

(a) ₹1,331 (b) ₹1,300
(c) ₹1,376 (d) ₹1,390

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (a) : rate (r) = 10%

principal (P) = 1000

time (t) = 3 years

amount (A) = ?

According to the question,

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$= 1000\times\left(1+\frac{10}{100}\right)^3$$

$$= 1000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10} = ₹1331$$

38. A sum of ₹12,000.00 deposited at compound interest becomes double at the end of 5 years. At the end of 15 years the sum will be:

(a) ₹ 1,20,000.00 (b) ₹ 96,000.00
(c) ₹ 1,08,000.00 (d) ₹ 84,000.00

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to first condition,

Principal = ₹ 12,000

Time = 5 years

Let, Rate = r % (yearly)

$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$2\times 12000 = 12000\left(1+\frac{r}{100}\right)^5$$

unit $2=\left(1+\frac{r}{100}\right)^5$ .....(i)

According to second condition,

$$\text{Amount} = 12000\left(1+\frac{r}{100}\right)^{15}$$

$$= 12000\left[\left(1+\frac{r}{100}\right)^5\right]^3$$

From equation (i),

Amount $= 12000 \times 2^3$

$= 12000 \times 8 =$ ₹ 96000

39. If ₹ 2,000 is invested at the rate of 20% per annum, compounded half-yearly, then the amount after 18 months will be:

(a) ₹2,628 (b) ₹2,662

(c) ₹3,200 (d) ₹2,600

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (b) Principal (P) = ₹2000

Rate (r) = 20% per annum,

If half yearly interest is payable so, Rate (r) = $\frac{20}{2}=$ 10%,

Time (T) = 18 months = 3 Half yearly

Formula-

$$\text{Compound interest} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$= 2000\left(1+\frac{10}{100}\right)^3$$

$$= 2000\left(\frac{11}{10}\right)^3 = 2\times1331 = 2662$$

After 18 months amount will be ₹2662

40. What will be the amount of ₹5000 after 2 years. When there is an annual compound interest at the rate of 9% per annum.

(a) ₹5,940 (b) ₹9,950

(c) ₹5,970 (d) ₹5,936

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (a) Given- Principal (P) = ₹ 5000

Time (t) = 2

Rate (r) = 9%

$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$= 5000\left(1+\frac{9}{100}\right)^2$$

$$= 5000\times\frac{109}{100}\times\frac{109}{100}$$

$$= \frac{5\times109\times109}{10} = 5940.5 \approx ₹\ 5940$$

41. Mr. Marthi invested ₹16000 in a scheme. How much money will he get when he becomes an adult if he invests it for 9 months at a compound interest rate of 20% per annum.

(a) ₹ 18,523 (b) ₹ 18,521

(c) ₹ 18,524 (d) ₹ 18,522

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d) Rate of intersest quarterly $=\frac{20}{4}\% = 5\%$

Time = 9 months = 3 quarters

The amount received when Marthi becomes an adult.

$$= 16000\left[1+\frac{5}{100}\right]^3 \left\{\because\ A = P\left(1+\frac{r}{100}\right)^n\right\}$$

$$= 16000\left(\frac{21}{20}\right)^3 = \frac{16000\times21\times21\times21}{20\times20\times20} = ₹18522$$

42. Ganesh took a loan of ₹14000 which is to be paid after three years with compound interest with the rate of 10% per annum. What is the total amount he will have to pay after three years?

(a) ₹16200 (b) ₹18634

(c) ₹17940 (d) ₹18497

RRB JE - 31/05/2019 (Shift-III)

Ans. (b) Principal = ₹14000, Time = 3 Years

Rate = 10% per annum

According to the question,

$$\text{Amount} = 14000\left(1+\frac{10}{100}\right)^3$$

$$= 14000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10} = ₹18634$$

43. What will be the amount of ₹3000 after 2 years if interest is compounded annually at 12 percent per annum interest rate?

(a) ₹3,763 (b) ₹3,773

(c) ₹3,873 (d) ₹3,766

RRB RPF Constable – 19/01/2019 (Shift-I)

Ans. (a) :

Principal = ₹3000, Rate = 12%, Time = 2 Years

$$\therefore\quad \text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$

$$= 3000\left(1+\frac{12}{100}\right)^2$$

$$= 3000\times\frac{28}{25}\times\frac{28}{25}$$

$$= \frac{784\times24}{5}$$

$$= 3763.2 \approx ₹\ 3763$$

44. Satya invested some amount in a fixed deposit what amount will he get on maturity if he invested ₹14500 at a 20% per annum compound interest rate at quarterly compounding for 6 months compounded quarterly.

(a) ₹ 15,986.25 (b) ₹ 15, 986.5

(c) ₹ 15,986.35 (d) ₹ 15,986

RRB NTPC 17.01.2017 Shift-3

Ans : (a) Invested amount = ₹14500

Time = 6 months = 2 quarterly

Rate=20% per annum $=\frac{20}{4}\%$ quarterly = 5% quarterly

$\because A = P\left(1+\frac{r}{100}\right)^n$

$= 14500\left(1+\frac{5}{100}\right)^2 = 14500\left(\frac{21}{20}\right)^2 = 14500\times\frac{441}{400}$

$= ₹15986.25$

45. Manoj invested ₹15000 in a fixed deposit scheme for 3 years, at 5% per annum compounded annually. What amount will Manoj get on maturity of fixed deposit.

(a) ₹13,764, .37 (b) ₹17,463.37
(c) ₹17,643.37 (d) ₹17,364.37

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (d) From formula-

$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$

$= 15000\left(1+\frac{5}{100}\right)^3$

$= 15000\times\frac{21}{20}\times\frac{21}{20}\times\frac{21}{20}$

$= \frac{138915}{8} = ₹\ 17364.37$

So, Manoj will get ₹ 17364.37 on maturity of fixed deposit.

46. Mani deposits ₹8000 in a bank on which he gets 5% annual interest. If the interest is calculated annually, then after two years, what will be the amount in his amount?

(a) ₹ 8500 (b) ₹ 8700
(c) ₹ 8820 (d) ₹ 8600

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (c) : As per the question,

$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$

$= 8000\left(1+\frac{5}{100}\right)^2$

$= 8000\times\frac{21}{20}\times\frac{21}{20}$

$= 20\times441 = ₹8820$

47. If the interest is calculated annually, then the amount of ₹2000 will become approximately after 3 years at the rate of 10% compound interest per annum?

(a) ₹ 2510 (b) ₹ 2662
(c) ₹ 2520 (d) ₹ 2726

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (b) : As per the question,

$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$

$= 2000\times\left(1+\frac{10}{100}\right)^3$

$= 2000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$

$= 2\times1331$

$= ₹\ 2662$

48. A man deposits ₹ 500 at the beginning of each year for 2 years at 10% per annum compound annually. Find the maturity amount at the end of the 2nd year.

(a) ₹1,050 (b) ₹1,150
(c) ₹1,155 (d) ₹1,200

RRB NTPC 05.04.2016 Shift : 3

Ans : (c)

Amount at end of first year $= 500\times\left(1+\frac{10}{100}\right)^1$

$= 500\times\frac{11}{10} = ₹550$

Principal for second year $= 500+550 = ₹1050$

Amount at end of second year $= 1050\times\left(1+\frac{10}{100}\right)^1$

$= 1050\times\frac{11}{10} = ₹1155$

So maturity amount at end of second year = ₹1155

49. Calculate the amount on ₹ 37500 at 8% per annum compounded half yearly for $1\frac{1}{2}$ years.

(a) ₹42,182.40 (b) ₹42,000
(c) ₹42,120 (d) ₹42,812.40

RRB NTPC 28.03.2016 Shift : 1

Ans : (a) Given-

Principal (P) = ₹ 37500, r = 8% per annum = 4% Half yearly

Time (t) $= 1\frac{1}{2}$ Years $= 3$ Half yearly

$\text{Amount}(A) = P\left(1+\frac{r}{100}\right)^t$

$= 37500\left(1+\frac{4}{100}\right)^3$

$= 37500\times\frac{26}{25}\times\frac{26}{25}\times\frac{26}{25} = ₹42182.40$

50. If Ram deposits ₹2000 in his saving account on which he gets 20% annual interest compounded half yearly. How much amount will be in his account after one year?

(a) ₹3530 (b) ₹ 2420
(c) ₹2630 (d) ₹ 3870

RRB NTPC 18.01.2017 Shift : 3

Ans : (b) One year = 2 Half yearly

$\text{Rate} = \frac{20}{2} \Rightarrow 10\%$

$\text{Amount} = 2000\times\left(1+\frac{10}{100}\right)^2$

$= 2000\times\frac{11}{10}\times\frac{11}{10} = ₹2420$

51. ₹10000 is being compounded at 20% per annum. Calculate the amount after 2 years if the rate of interest is charged half yearly.

(a) ₹14600 (b) ₹12500
(c) ₹14642 (d) ₹14641

RRB NTPC 16.04.2016 Shift : 1

Ans : (d) Interest compounded half yearly

$\text{Rate} = \frac{20}{2} = 10\%$

$\text{Time} = 2 \times 2 = 4 \text{ Years}$

$\therefore \text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$

$= 10000\left(1+\frac{10}{100}\right)^4$

$= 10000\left(1+\frac{1}{10}\right)^4 = 10000\left(\frac{11}{10}\right)^4$

$= 10000 \times \frac{14641}{10000} = ₹14641$

52. Mr. Vagish invested money in FD. How much amount will he get at maturity, if ₹4500 invested for 6 months at a compound interest rate of 20% annually and the interest is compounded quarterly?

(a) ₹4961.5 (b) ₹4961.25
(c) ₹4961.35 (d) ₹4961

RRB NTPC 11.04.2016 Shift : 3

Ans : (b) Rate $(r) = \frac{20}{4} = 5\%$

Time $(n) = 2$ quarterly

$\text{Amount } (A) = P\left(1+\frac{r}{100}\right)^n = 4500\left(1+\frac{5}{100}\right)^2$

$= 4500 \times \frac{21}{20} \times \frac{21}{20} = ₹4961.25$

53. A person named Shri Ram invested ₹14000 in FD (fixed deposit) How much amount will he get on maturity if he invested it at 20% per annum compound interest for 6 compounded quaterly?

(a) ₹ 15,437 (b) ₹ 15,434
(c) ₹ 15,436 (d) ₹ 15,435

RRB NTPC 19.01.2017 Shift : 3

Ans : (d) Principal (P) = ₹14000

When rate is payable quarterly then rate

$= \frac{\text{Annual rate}}{4} = \frac{20}{4} = 5\%$

Time (n) = 6 months = 2 quarterly

$A = P\left(1+\frac{R}{100}\right)^n$

$A = 14000\left(1+\frac{5}{100}\right)^2 \Rightarrow A = 14000 \times \left(\frac{21}{20}\right)^2$

$\Rightarrow 14000 \times \frac{441}{400} = 441 \times 35 = \boxed{₹15435}$

54. The amount of a sum of ₹ 1500 becomes ₹ 1800 in 2 years at simple interest. If the rate of interest is increased by 5%, what will be the amount.

(a) ₹1500 (b) ₹1900
(c) ₹ 1950 (d) ₹2000

RRB NTPC 22.04.2016 Shift : 1

Ans : (c) Given –

Principal = ₹1500
Time = 2 Years
Amount = ₹1800

$\therefore$ Interest = Amount – Principal
= 1800 -1500 = ₹300

Formula-

$\text{Simple interest} = \frac{P \times R \times T}{100}$

$\Rightarrow 300 = \frac{1500 \times R \times 2}{100}$

$\Rightarrow R = 10\%$

New rate after increasing interest rate by 5% = 10% + 5% = 15%

$\text{New simple interest} = \frac{1500 \times 15 \times 2}{100} = ₹450$

New amount = Principal + Interest
= 1500 + 450
= $\boxed{₹1950}$

55. Mr. Yashwant invested money in FD. What will be the total amount on maturity if ₹10000 is invested at a rate of 20% compound interest annually for 6 months, compounded quarterly?

(a) ₹11025.25 (b) ₹11025
(c) ₹11025.75 (d) ₹11025.5

RRB NTPC 22.04.2016 Shift : 2

Ans : (b) Principal (P) = ₹10000, r = 20% annually

$= \frac{20}{4}\%$ quarterly, r = 5% quarterly

Time (n) = 6 months
= 2 quarterly

$\text{Amount} = P\left(1+\frac{r}{100}\right)^n$

$= 10,000\left(1+\frac{5}{100}\right)^2$

$= 10,000\left(1+\frac{1}{20}\right)^2$

$= 10,000\left(\frac{21}{20}\right)^2$

$= 10,000 \times \frac{21}{20} \times \frac{21}{20} = ₹11025$

56. Sanjeev invests in a fixed deposit. If ₹11000 is invested at the rate of 20% compound interest annually for 6 months and the interest is compounded quarterly, what is the total amount he will get on maturity?

(a) ₹12127.25 (b) ₹12127.50
(c) ₹12127.75 (d) ₹12127

RRB NTPC 26.04.2016 Shift : 2

Ans : (b) If interest is compounded quarterly, then

$$\text{Time} = \frac{6}{12} \times 4 = 2 \text{ quarterly}$$

$$\text{Rate} = \frac{20}{4} = 5\%$$

$$\text{Amount } (A) = P\left(1+\frac{r}{100}\right)^n$$

$$= 11000\left(1+\frac{5}{100}\right)^2$$

$$= 11000 \times \frac{21}{20} \times \frac{21}{20}$$

$$= ₹12127.50$$

57. A sum of ₹30,000 is invested on compound interest of $7\frac{1}{2}\%$ p.a. What is the sum at the end of the second year?

(a) ₹34,668 (b) ₹34,658.75
(c) ₹34,658 (d) ₹34,668.75

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) : Amount = Principal $\left(1+\frac{r}{100}\right)^{\text{Time}}$,

Amount at the end of the second year

$$= 30000\left(1+\frac{15}{200}\right)^2$$

$$= 30000\left(\frac{40+3}{40}\right)^2$$

$$= 30000 \times \frac{43}{40} \times \frac{43}{40}$$

$$= ₹34668.75$$

58. Find the total amount (in ₹) on ₹4,500 at 12% per annum for 2 years and 8 months compounded annually.

(a) ₹6,097.28 (b) ₹6,095.95
(c) ₹6,096.38 (d) ₹6,069.38

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

Principal = 4500, Time (t) = $\left(2+\frac{8}{12}\right) = \left(2+\frac{2}{3}\right)$ years

Rate (r) = 12%

$\because$ Amount (A) = $P\left(1+\frac{r}{100}\right)^t\left(1+\frac{rt}{100}\right)$

$$= 4500\left(1+\frac{12}{100}\right)^2\left(1+\frac{2/3\times12}{100}\right)$$

$$= 4500 \times \left(\frac{112}{100}\right) \times \frac{112}{100} \times \frac{108}{100} = ₹6096.38$$

59. What will be the amount (in ₹) of annual payment that will discharge a debt of ₹1,025 due in 2 years at the rate of 5% compound interest per annum?

(a) ₹ 551.60 (b) ₹ 549.23
(c) ₹ 551.25 (d) ₹ 550.0

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the compound interest is x.

According to the question,

$$1025 = \frac{x}{\left(1+\frac{5}{100}\right)} + \frac{x}{\left(1+\frac{5}{100}\right)^2}$$

$$1025 = \frac{x}{\left(1+\frac{1}{20}\right)} + \frac{x}{\left(1+\frac{1}{20}\right)^2}$$

$$1025 = \frac{20x}{21} + \left(\frac{20}{21}\right)^2 x$$

$$1025 = \frac{20}{21}x + \frac{400}{441}x$$

$$1025 = \frac{820}{441}x$$

$$x = \frac{1025 \times 441}{820}$$

$$x = ₹551.25$$

Type - 3

60. If T denotes the sum of money, M denotes the number of years and P denotes the rate of interest, then the compound interest is given by:

(a) $M\left(1+\frac{M}{100}\right)^P$ (b) $T\left(1+\frac{P}{100}\right)^M$

(c) $M\left(1+\frac{T}{100}\right)^P - T$ (d) $T\left(1+\frac{P}{100}\right)^M - T$

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : time (t) = M

principal (p) = T

rate (r) = P

Compound interest $P\left(1+\frac{r}{100}\right)^t - p$

Putting the value of t, r and p

Compound interest $= T\left(1+\frac{P}{100}\right)^M - T$

61. Find the compound interest on ₹100000 at 20% per annum for 3 years 3 months compounded annually.

(a) ₹ 81440 (b) ₹ 65000
(c) ₹ 71650 (d) ₹ 82360

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : $A = P = \left(1+\frac{R}{100}\right)^t$ Interest $(C_1) = A - P$

Given,

Principal = ₹100000, Rate (r) = 20%,

Time (t) = $3\frac{1}{4}$ Years

$$A = 100000\left(1+\frac{20}{100}\right)^3$$

$$= 100000\times\frac{216}{125}$$

$$= 172800$$

Interest of $\frac{1}{4}$ years $= \frac{P\times R\times T}{100} = \frac{172800\times 20\times 1}{100\times 4} = 8640$

Total Amount = 172800 + 8640

= 181440

Compound Interest = Amount – Principal

= 181440 – 100000 = ₹81440

62. A sum of ₹14000 amounts to ₹18515 in 2 years at a certain rate percent p.a., interest compounded yearly. What will be the compound interest on the same sum, in the same time and at the same rate, if the interest is compounded 8-monthly?

(a) ₹3,234 (b) ₹4,494

(c) ₹4,620 (d) ₹4,634

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (d) :

$$A = P\left(1+\frac{R}{100}\right)^t$$

$$18515 = 14000\left(1+\frac{R}{100}\right)^2$$

$$\frac{18515}{14000} = \left(1+\frac{R}{100}\right)^2$$

$$\frac{529}{400} = \left(1+\frac{R}{100}\right)^2$$

$$\left(\frac{23}{20}\right)^2 = \left(1+\frac{R}{100}\right)^2$$

$$\frac{R}{100} = \frac{3}{20}$$

R = 15%

If the interest is compounded 8-monthly

12 month = 15%

8 month = 10%

R = 10%, T = 3 (8 monthly)

$$C.I. = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$$

$$= 14000\left[\left(1+\frac{10}{100}\right)^3 - 1\right]$$

$$= 14000\left[\frac{1331}{1000} - 1\right]$$

$$= 14\times 331 = ₹4634$$

63. What is the compound interest on a sum of ₹ 19,500 invested for $1\frac{2}{5}$ years at 10% p.a. interest compounded annually?

(a) ₹ 2,808 (b) ₹ 2,608

(c) ₹ 2,880 (d) ₹ 2,480

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given,

Principal (P) = ₹19500,

Rate (R) = 10%,

Time (T) = $1\frac{2}{5}$

$$C.I. = 19500\left[\left(1+\frac{10}{100}\right)^1\left(1+\frac{10\times 2}{100\times 5}\right) - 1\right]$$

$$= 19500\left[\frac{11}{10}\times\frac{26}{25} - 1\right]$$

$$= 19500\left[\frac{286-250}{250}\right]$$

$$= 19500\times\frac{36}{250}$$

$$= ₹2808$$

64. Khan lends an amount of ₹10,000 to Irfan at 10% per annum compound for 5 year, compounded annually. What is the compound interest accrued for the 4th year?

(a) ₹ 1,762 (b) ₹ 1,540

(c) ₹ 1,331 (d) ₹ 1,745

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,

Principal (P) = ₹10000

Time (T) = 5 years

Rate (R) = 10%

$$\therefore A = P\left(1+\frac{R}{100}\right)^T$$

According to the question,

CI for 4th year

$$= 10000\left[\left(1+\frac{10}{100}\right)^4 - \left(1+\frac{10}{100}\right)^3\right]$$

$$= 10000\left[\left(\frac{11}{10}\right)^4 - \left(\frac{11}{10}\right)^3\right]$$

$$= 10000\left[\left(\frac{11}{10}\right)^3\times\left(\frac{11}{10}-1\right)\right]$$

$$= 10000\left[\frac{1331}{1000}\times\frac{1}{10}\right]$$

$$= ₹1331$$

65. What is the compound interest (in ₹) on a sum of ₹ 31600 for $1\frac{1}{3}$ years at 9% p.a., when the interest is compounded 8-monthly? (Nearest to a ₹)

(a) ₹ 3928 (b) ₹ 3916
(c) ₹ 3906 (d) ₹ 3896

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (c) : Given,

P = ₹ 31600

Rate (R) = 9% Annual

Rate as per 8 monthly basis = $\frac{8}{12}\times 9 = 6\%$

Time = $1\frac{1}{3}$ year = 2 (8-month)

According to the question,

$$\text{Amount (A)} = P\times\left(1+\frac{R}{100}\right)^t$$

$$= 31600\times\left(1+\frac{6}{100}\right)^2$$

$$= = 31600\times\frac{106}{100}\times\frac{106}{100}$$

A = 35505.76

Then,

Interest = Amount (A) − Principal (P)

= 35505.76 – 31600 =3905.76

= ₹ 3906

66. The compound interest paid when a sum of ₹20,000 is invested for 1 year 4 months at $7\frac{1}{2}$% compound interest per annum, compounded annually, is :

(a) ₹ 2,171.25 (b) ₹ 2,037.50
(c) ₹ 2,185.75 (d) ₹ 2,210.40

RRB Group-D 30-08-2022 (Shift-II)

Ans. (b) : Given,

Rate = $7\frac{1}{2}$ %

Rate for 1 year-

$\frac{15}{2}\times\frac{1}{100}=\frac{3}{40}$

Rate for 4 months-

$\frac{15}{2\times 3}\times\frac{1}{100}=\frac{1}{40}$

According to the question,

40———43

40———41

1600 1763

1600 = 20000

1 = 12.5

CI = 1763–1600 = 163

163 = 12.5 × 163 = 2037.5

67. If the simple interest on a sum of money at 8% per annum for 2 years is ₹1,000, find the compound interest on the same sum for the same period at the same rate in case of annual compounding

(a) ₹1,140 (b) ₹1,260
(c) ₹1,040 (d) ₹1,060

RRB Group-D 24-08-2022 (Shift-I)

Ans. (c) : $\text{S.I} = \frac{P\times R\times T}{100}$

$$1000 = \frac{P\times 8\times 2}{100}$$

$$P = \frac{100000}{16}$$

C.I for two years = $\left(8+8+\frac{8\times 8}{100}\right)\times$ Principal

$= \frac{16.64}{100}\times\frac{100000}{16} = \frac{16640}{16} = 1040$

68. Find Compound Interest on ₹11,000 in years at 4% p.a. interest compounded yearly.

(a) ₹897.60 (b) ₹906.50
(c) ₹786.60 (d) ₹875.80

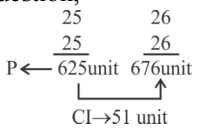
RRB Group-D 30-08-2022 (Shift-III)

Ans. (a) : Given = P = ₹11000

Rate $\Rightarrow 4\% = \frac{1}{25}$

Time = 2 years

According to the question,



$\because$ 625 unit = 11000

$\therefore$ 51 unit = $\frac{11000}{625}\times 51 \Rightarrow 897.60$

69. What is the compound interest, rounded to nearest rupee, on ₹82,000 for 3 years at 6% per annum compounded annually?

(a) ₹14,674 (b) ₹15,366
(c) ₹15,663 (d) ₹15,000

RRB Group-D 29-09-2022 (Shift-II)

Ans. (c) : Given, p = ₹ 82000, r = 6% time = 3years

$$\text{C.I.} = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$$

$$\text{C.I.} = 82000\left[\left(1+\frac{6}{100}\right)^3 - 1\right] = 82000\left[\left(\frac{53}{50}\right)^3 - 1\right]$$

$$\text{C.I.} = 82000\left[\frac{148877-125000}{125000}\right] = 82000\left[\frac{23877}{125000}\right]$$

$$\text{C.I.} = 82\times\frac{23877}{125} = 82\times 191.01 = 15663$$

70. What will be the interest on the amount of ₹25,000 compounded annually at the rate of 4%, 5% and 6% per annum for the first, second and third year respectively ?

(a) ₹3838 (b) ₹3839
(c) ₹3938 (d) ₹3939

RRB NTPC 13.03.2021 (Shift-I) Stage I

Ans. (c) : Amount

$$= \text{Principal} \times \left(1+\frac{r_1}{100}\right) \times \left(1+\frac{r_2}{100}\right) \times \left(1+\frac{r_3}{100}\right) .... \left(1+\frac{r_n}{100}\right)$$

$$\text{Amount} = 25000 \times \frac{104}{100} \times \frac{105}{100} \times \frac{106}{100}$$

$$= 28938$$

Compound interest = 28938 – 25000 = ₹3938

71. Calculate the interest on a sum of ₹1000 at 10% per annum for 1.5 years, when interest compounded half yearly.

(a) ₹167.36 (b) ₹157.63
(c) ₹150.25 (d) ₹160.55

RRB JE - 22/05/2019 (Shift-I)

Ans : (b) P = ₹1000, r = 10%, n = 1.5 Years = 3 Half yearly

$$CI = P\left(1+\frac{r}{200}\right)^n - P$$

$$= 1000\left(1+\frac{10}{200}\right)^3 - 1000$$

$$= 1000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} - 1000$$

$$= \frac{9261}{8} - 1000 = 1157.63 - 1000 = ₹\,157.63$$

72. If the interest is compounded half yearly basis, find the compound interest on the sum of ₹18500 at 40% per annum for 18 months.

(a) ₹ 13468 (b) ₹ 16280
(c) ₹ 16000 (d) ₹ 15469

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (a) P = ₹ 18500
R (Annual) = 40%
Rate = r/2% = 20% Half yearly
Time (n) = 3 [18 months = 3 Half yearly]

$$CI = P\left(1+\frac{r}{100}\right)^n - P$$

$$= 18500\left(1+\frac{40}{200}\right)^3 - 18500$$

$$= 18500\left(\frac{6}{5}\right)^3 - 18500$$

$$= 18500 \times \frac{216}{125} - 18500$$

= 31968 – 18500 = ₹13468

73. Find the compound interest accrued on ₹6000 in 1 year at rate of 10% compounded half yearly.

(a) ₹870 (b) ₹900
(c) ₹946 (d) ₹910

RRB JE - 27/06/2019 (Shift-III)

Ans : (c) ∵ Interest is half yearly

$$\therefore \ R = \frac{10}{2} = 5\%$$

$$n = 1\frac{1}{2} = \frac{3}{2} \times 2 = 3 \text{ half yearly}$$

$$C.I. = P\left[\left(1+\frac{R}{100}\right)^n - 1\right]$$

$$C.I. = 6000\left[\left(1+\frac{5}{100}\right)^3 - 1\right]$$

$$C.I. = 6000 \times \frac{(9261-8000)}{8000}$$

$$C.I. = 6 \times \frac{1261}{8} = \frac{7566}{8} = ₹945.75$$

Compound interest (approximate) ≈ ₹946

74. What will be the compound interest on a sum of ₹25,000 after 3 years at a rate of 12% per annum, compounded annually?

(a) ₹ 900.30 (b) ₹ 10,123.20
(c) ₹ 1,048.20 (d) ₹ 9,720

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (b) : Given, P = ₹ 25000
r = 12%
t = 3 years

$$A = P\left(1+\frac{r}{100}\right)^t$$

$$= 25000\left(1+\frac{12}{100}\right)^3$$

$$= 25000 \times \left(\frac{28}{25}\right)^3$$

$$= 25000 \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25}$$

$$= \frac{40 \times 21952}{25}$$

$$= 35123.2$$

$$C{\cdot}I = A - P$$

$$= 35123.2 - 25000$$

$$C{\cdot}I = ₹\,10,\,123.20$$

75. Find the compound interest when the principal is ₹6,000 at an interest of 10% per annum for 2 years.

(a) ₹1,240 (b) ₹1,250
(c) ₹1,260 (d) ₹1,230

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (c) : $A = P\left[1+\frac{r}{100}\right]^n$

$$A = 6000\left[1+\frac{10}{100}\right]^2$$

$$A = 6000 \times \frac{11}{10} \times \frac{11}{10}$$
$A = 60 \times 121$
$A = 7260$
$CI = A - P$
$= 7260 - 6000$
$= ₹1260$

76. Find the compound interest on ₹20000/- in 2 years at 8% per annum, if interest is compounded yearly?

(a) ₹3,220.00 (b) ₹3109.78
(c) ₹3328.00 (d) ₹3200.00

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) : Principal - 20000, Rate- 8%, Time- 2 years

Compound amount = Principal $\left(1+\frac{r}{100}\right)^t$

$$= 20000\left(1+\frac{8}{100}\right)^2$$
$$= 20000 \times \frac{108}{100} \times \frac{108}{100}$$
$= 23328$
$CI = A - P$
$= 23328 - 20000$
$= ₹3328$

77. ₹200 was invested for 2 years on 10% compound interest per year. If the rate of interest had been 20%, then how much more would the investor have received as interest for the same period?

(a) ₹46 (b) ₹48
(c) ₹40 (d) ₹44

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (a) : If, P = ₹200, R = 10% and T = 2 years

Then, $A = 200\left(1+\frac{10}{100}\right)^2$

$$A = 200 \times \frac{11}{10} \times \frac{11}{10}$$
$A = 2 \times 121$
$A = 242$
$CI = A - P$
$= 242 - 200$
$CI = ₹42$

Take the interest, R = 20%

Then, $A = 200 \times \left(1+\frac{20}{100}\right)^2$

$A = ₹288$
$CI = 288 - 200$
$= ₹88$

Extra interest $= 88 - 42 = ₹46$

79. The compound interest on a sum of ₹7,500 for 2 years at 4% p.a. is.

(a) ₹612 (b) ₹515
(c) ₹850 (d) ₹750

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (a) : Required rate of two years at 4% p.a.

$$4 + 4 + \frac{4 \times 4}{100} = 8.16\%$$

$$C.I = 7500 \times \frac{8.16}{100}$$

$= ₹ 612$

80. What is the difference between the compound interest on a sum of ₹5000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half-yearly ?

(a) ₹ 2.90 (b) ₹ 2.04
(c) ₹ 3.40 (d) ₹ 3.61

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Principal (P) = ₹ 5000

Rate (r) = 4%

Time (t) = $1\frac{1}{2}$ years

Yearly Compound Interest = A – P

$$= P\left(1+\frac{r}{100}\right)^t - P$$
$$= 5000\left(1+\frac{4}{100}\right)\left(1+\frac{4}{100}\times\frac{1}{2}\right) - 5000$$
$= 5304 - 5000$
$= ₹ 304$

Half yearly Compound Interest $\rightarrow$

r = $\frac{4\%}{2}$ = 2% Half- yearly

t = $1\frac{1}{2}$ years = 3 Half-yearly

$CI = A - P$

$$= 5000\left(1+\frac{2}{100}\right)^3 - 5000$$
$$= 5000 \times \frac{102}{100} \times \frac{102}{100} \times \frac{102}{100} - 5000$$
$= 5306.04 - 5000 = ₹ 306.04$

Difference of Compound Interest
$= 306.04 - 304 = ₹ 2.04$

81. Find the compound interest on the amount of ₹ 1200 at the rate of 12% p.a. for 6 months compounded quarterly.

(a) ₹71.08 (b) ₹74.08
(c) ₹72.08 (d) ₹73.08

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Given - P = ₹1200

r = 12% yearly = 3% quarterly

t = 6 months = 2 quarterly

Calculation of interest compounded quarterly, the amount

$$A = P\left(1+\frac{r}{100}\right)^{t}$$

$$A = 1200\left(1+\frac{3}{100}\right)^{2}$$

$$A = 1200\left(\frac{103}{100}\right)\left(\frac{103}{100}\right)$$

A = 1273.08

So, C.I = A – P

= 1273.08–1200

= ₹73.08

82. An amount of ₹100 was invested for two years at the rate of 10% compound interest per annum. If the rate of interest is increased to 20% for the same period, how much extra money will get the investor as interest.

(a) ₹23/- (b) ₹20/-

(c) ₹22/- (d) ₹24/-

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

Extra interest =

$$100\left[\left(1+\frac{20}{100}\right)^{2}-1\right]-100\left[\left(1+\frac{10}{100}\right)^{2}-1\right]$$

$$=100\left[\frac{6}{5}\times\frac{6}{5}-1\right]-100\left[\frac{11}{10}\times\frac{11}{10}-1\right]$$

$$=100\left[\frac{36-25}{25}\right]-100\left[\frac{121-100}{100}\right]$$

= 4 × 11 – 21

= 44 – 21

= ₹ 23

83. Find the interest (in ₹) on ₹ 8000 at 10% per annum compounded half yearly for $1\frac{1}{2}$ years.

(a) 1,263 (b) 1,264

(c) 1,261 (d) 1,260

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) :

Principal = ₹ 8000, Rate of interest =10%, Time (t) $=1\frac{1}{2}$ years

Interest is calculated half yearly

∴ R= 5%, t = 3 half yearly

$$\therefore A = P\left(1+\frac{R}{100}\right)^{t} = 8000\left(1+\frac{5}{100}\right)^{3} = 8000\times\frac{9261}{8000}$$

∴ A = ₹ 9261

∴ Compound interest = A –P = 9261–8000 = ₹ 1261

84. Find the compound interest on ₹5,000 at the rate of 6% per annum for 3 years, compounded annually (correct to the nearest integer).

(a) ₹ 900 (b) ₹ 618

(c) ₹ 956 (d) ₹ 955

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (d) : Given-

Time = 3 years

Rate = 6% yearly, Principal = ₹ 5000

$$\text{Amount} = 5000\times\left(1+\frac{6}{100}\right)^{3}$$

$$\Rightarrow 5000\times\frac{106\times106\times106}{100\times100\times100} = \frac{59550800}{10000} = ₹\ 5955.08$$

Compound Interest = Amount − Principal

= 5955.08 – 5000

= 955.08 or ₹ 955

85. Calculate the compound interest on ₹15,000 in one year at 4% per annum, if the interest is compounded half yearly.

(a) ₹600 (b) ₹5606

(c) ₹6060 (d) ₹606

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) : Principal = ₹15000

Rate = 2% per annum

Time = 2 half yearly

According to the question,

$$\text{Amount} = \text{Principal}\left(1+\frac{R}{100}\right)^{\text{Time}} \qquad (R \rightarrow \text{Rate})$$

$$= 15000\left(1+\frac{2}{100}\right)^{2}$$

$$= 15000\times\frac{102}{100}\times\frac{102}{100}$$

Amount = ₹15606

C.I. = Amount – Principal

= 15606 – 15000

= ₹606

86. Calculate the compound interest on a sum of ₹12,000 at 16% p.a. for 3 months, compounded quarterly.

(a) ₹ 480 (b) ₹ 1200

(c) ₹ 500 (d) ₹ 400

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given, time (t) = 1 quarterly,

rate (r) $= \frac{16}{4}$ = 4% quarterly

$$\text{Compound Interest (C.I.)} = P\left[\left(1+\frac{r}{100}\right)^{t}-1\right]$$

$$\text{C. I.} = 12000\left[\left(1+\frac{4}{100}\right)^{1}-1\right]$$

$$= 12000\times\frac{4}{100}$$

C.I. = ₹480

87. Ranjan borrows ₹7500 at an annual compound interest rate of 4%. What will be the compound interest for 2 years while the interest is compounded annually?

(a) ₹612 (b) ₹8112

(c) ₹8121 (d) ₹621

RRB RPF SI – 11/01/2019 (Shift-II)

Ans : (a) P = ₹7500, R = 4%, n = 2 Years

$$\text{C.I.} = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$$

$$= 7500\left[\left(1+\frac{4}{100}\right)^2 - 1\right] = 7500\left[\left(\frac{26}{25}\right)^2 - 1\right]$$

$$= 7500 \times \frac{676-625}{625} = 7500 \times \frac{51}{625} = ₹612$$

88. Find the compound interest on ₹ 15,625 for 1 year 6 months at 8% per annum, compound interest when compounded half-yearly?

(a) ₹1,951 (b) ₹1,950
(c) ₹1,900 (d) ₹1,952

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (a) Principal = ₹ 15,625

Rate = 8% Annually ⇒ 4% Half yearly

Time = 1 Year 6 months = 3 Half yearly

$$\text{Compound interest} = \left[15,625\left(1+\frac{4}{100}\right)^3 - 15625\right]$$

$$= 15625 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25} - 15625$$

$$= 17,576 - 15625 = ₹1951$$

89. What will be the compound interest on ₹ 31250 at 8% per annum for $2\frac{3}{4}$ years?

(a) ₹ 7300 (b) ₹ 7800
(c) ₹ 7337 (d) ₹ 7387

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (d) $A = P\left(1+\frac{R}{100}\right)^2\left(1+\frac{3R}{400}\right)$

$$A = 31250 \times \left(1+\frac{8}{100}\right)^2\left(1+\frac{3\times 8}{400}\right)$$

$$A = 31250 \times \frac{27}{25} \times \frac{27}{25} \times \frac{106}{100}$$

$$A = 27 \times 27 \times 53$$

$$A = ₹\ 38637$$

$\therefore$ Compound interest = 38637 – 31250 = ₹ 7387

90. A sum of money invested at a 4% per annum compound interest becomes ₹78030 at the end of 1 year, while the interest is compounded half yearly. The amount is–

(a) ₹76,000 (b) ₹71,400
(c) ₹72,500 (d) ₹75,000

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (d) When interest is compounded half yearly then,

$$r = \frac{4}{2}\% = 2\%$$

Time = 1 Year = 2 Half yearly

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^t$$

$$78030 = P\left(1+\frac{2}{100}\right)^2$$

$$78030 = P\left(1+\frac{1}{50}\right)^2$$

$$\left(\frac{51}{50}\right)^2 P = 78030$$

$$P = \frac{78030 \times 2500}{2601}$$

$$P = ₹75000$$

91. What will be the compound interest of ₹172000 for 3 years, at the rate of 8% (rounded off to the nearest ₹) per annum.

(a) ₹44,670 (b) ₹11,667
(c) ₹41,280 (d) ₹46,470

RRB NTPC 04.04.2016 Shift : 2

Ans : (a) Given-

Principal (P) = ₹172000,

Rate = 8% annually

Time (n)=3 Years

$$\text{C.I} = P\left(1+\frac{r}{100}\right)^n - P = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$$

$$= 172000\left[\left(1+\frac{8}{100}\right)^3 - 1\right]$$

$$= 172000\left[\left(\frac{27}{25}\right)^3 - 1\right]$$

$$= 172000\left[\frac{19683}{15625} - 1\right]$$

$$= 172000 \times \frac{19683-15625}{15625}$$

$$= 11.008 \times 4058 = 44,670$$

92. Find the compound interest at ₹7500 on the rate of 12% per annum for 2 years 4 months to the nearest rupee, this interest is calculated on an annual basis?

(a) 2284 (b) 2176
(c) 2097 (d) 2235

RRB NTPC 03.04.2016 Shift : 1

Ans : (a) Principal (P) = ₹ 7500 , $t = 2\frac{1}{3}$ Years, r = 12% per annum

$$\text{Amount (A)} = P\left(1+\frac{r}{100}\right)^t$$

$$= 7500\left(1+\frac{12}{100}\right)^{2\frac{1}{3}}$$

$$= 7500\left(1+\frac{3}{25}\right)^2\left(1+\frac{3}{25}\right)^{\frac{1}{3}}$$

$$= 7500 \times \frac{28}{25} \times \frac{28}{25} \times \left(1+\frac{1}{3}\times\frac{3}{25}\right)$$

$$= 7500 \times \frac{28}{25} \times \frac{28}{25} \times \frac{26}{25} = ₹\ 9784.32$$

Compound interest = ₹ 9784.32 – 7500 = ₹ 2284.32

So, compound interest will be rounded off to the nearest ₹2284.

93. What will be the compound interest on ₹24000 in 2 years at 25% per annum if the interest is compounded annually.

(a) ₹37,500 (b) ₹13,500
(c) ₹38,400 (d) ₹36,400

RRB NTPC 03.04.2016 Shift : 3

Ans : (b) From question,

$$\text{Compound interest } (C.I.) = \left[P\left(1+\frac{r}{100}\right)^{n} - P\right]$$

$$= 24000\left(1+\frac{25}{100}\right)^{2} - 24000$$

$$= 24000\left(1+\frac{1}{4}\right)^{2} - 24000$$

$$= 24000\left(\frac{5}{4}\right)^{2} - 24000 \quad = 24000\left[\frac{25}{16} - 1\right]$$

$$= 24000\left(\frac{25-16}{16}\right) = 24000 \times \frac{9}{16} = ₹13{,}500$$

94. If the interest is compounded annually, then what will be the compound interest on ₹ 4800 for 2 years at the rate of 20% per annum?

(a) ₹69,120 (b) ₹21,120
(c) ₹76,800 (d) ₹72,000

RRB NTPC 02.04.2016 Shift : 2

Ans : (b) Principal = ₹48000, Rate = 20%
Time = 2 years

$$\text{Amount } = P\left(1+\frac{r}{100}\right)^{T} = 48000\left(1+\frac{20}{100}\right)^{2}$$

$$= 48000\left(1+\frac{1}{5}\right)^{2} = 48000\left(\frac{6}{5}\right)^{2}$$

$$= 48000 \times \frac{6}{5} \times \frac{6}{5} = ₹69120$$

Compound interest = Amount – Principal
= 69120 – 48000 = ₹21120

95. Ibrahim barrowed ₹7500 at an annual compound interest rate of 5%. What will be the compound interest after 2 years if the interest compounded annually.

(a) ₹768.75 (b) ₹8268.75
(c) ₹8286.75 (d) ₹786.75

RRB NTPC 11.04.2016 Shift : 1

Ans : (a) Principal = ₹7500
Annual Rate (R) = 5%
Time (t) = 2 Years

$$\text{Compound interest } = P\left[\left(1+\frac{R}{100}\right)^{t} - 1\right]$$

$$= 7500\left[\left(1+\frac{5}{100}\right)^{2} - 1\right]$$

$$= 7500\left[\left(\frac{21}{20}\right)^{2} - 1\right] \quad = 7500\left[\frac{441}{400} - 1\right]$$

$$= 7500\left[\frac{441-400}{400}\right] \quad = 7500 \times \frac{41}{400}$$

$$= ₹768.75$$

96. Harsh borrowed ₹8000 at an annual rate of 4% compound interest. What will be the compound interest after 2 years if the interest is compounded annually.

(a) ₹ 652.8 (b) ₹ 8,652.8
(c) ₹ 8,625.8 (d) ₹ 625.8

RRB NTPC 07.04.2016 Shift : 2

Ans : (a)

$$\text{Compound interest} = \text{Principal}\left[\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}} - 1\right]$$

$$= 8000\left[\left(1+\frac{4}{100}\right)^{2} - 1\right]$$

$$= 8000\left[\left(\frac{26}{25}\right)^{2} - 1\right]$$

$$= 8000\left[\frac{676-625}{625}\right]$$

$$= 8000 \times \frac{51}{625}$$

$$= \frac{64 \times 51}{5}$$

$$= \frac{3264}{5}$$

$$= ₹\ 652.8$$

97. Mr. Ayush borrowed ₹3000 at the rate of 5% compound interest annually. What will be the compound interest for 2 years?

(a) ₹370.5 (b) ₹307.5
(c) ₹3307.5 (d) ₹3370.5

RRB NTPC 19.01.2017 Shift : 1

Ans : (b) $C.I. = P\left(1+\frac{r}{100}\right)^{n} - P$

$$C.I. = 3000\left(1+\frac{5}{100}\right)^{2} - 3000$$

$$= 3000\left[\left(\frac{21}{20}\right)^{2} - 1\right]$$

$$= 3000\left(\frac{441}{400} - 1\right)$$

$$= 3000 \times \frac{41}{400}$$

$$= 7.5 \times 41 = ₹307.5$$

98. Mr. Paritosh borrowed ₹4,500 at the rate of 5% compound interest. If the interest is compounded annually, what will be the compound interest for 2 years?

(a) ₹4961.25 (b) ₹461.25
(c) ₹4916.25 (d) ₹416.25

RRB NTPC 30.04.2016 Shift : 3

Ans : (b) P = 4500, r = 5%, t = 2 years, CI = ?

$$A = P\left(1+\frac{r}{100}\right)^{t}$$

$$A = 4500\left(1+\frac{5}{100}\right)^{2}$$

$$= 4500\left(1+\frac{1}{20}\right)^2$$
$$= 4500\left(\frac{21}{20}\right)^2$$
$$= 4500\times\frac{21}{20}\times\frac{21}{20}$$
$$= 4961.25$$
CI = A–P
CI = 4961.25 – 4500 = ₹461.25

99. The simple interest on a certain amount at 12% per annum for 3 years is ₹ 4,140. What is the compound interest on the same amount at 8% for two years?
(a) ₹2,012.40 (b) ₹1,840
(c) ₹1,913.60 (d) ₹1,886.50
RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (c) $\because$ $SI = \frac{P\times R\times t}{100}$
$$4140 = \frac{P\times 12\times 3}{100}$$
$$P = 115\times 100$$
$$P = 11500$$
According to the question,
$$CI = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$$
$$CI = 11500\left[\left(1+\frac{8}{100}\right)^2 - 1\right]$$
$$= 11500\left[\left(1+\frac{2}{25}\right)^2 - 1\right]$$
$$= 11500\left[\left(\frac{27}{25}\right)^2 - 1\right]$$
$$= 11500\left[\frac{729-625}{625}\right]$$
$$= 11500\left[\frac{104}{625}\right] = ₹1913.60$$

100. Find the compound interest on ₹ 62500 at 21% per annum for $1\frac{1}{2}$ years compounded half yearly?
(a) ₹20,687.5 (b) ₹19,687.5
(c) ₹21,638.5 (d) ₹20,695
RRB ALP & Tec. (13-08-18 Shift-III)

Ans : (a) Given −
Principal = ₹62500
Rate of interest = 21% Annually
Time $= \frac{3}{2}$ Years
Then, Amount $= 62500\left(1+\frac{21}{100}\right)^{\frac{3}{2}}$
$$= 62500\left(\frac{121}{100}\right)^{\frac{3}{2}}$$
$$= 62500\left(\frac{11}{10}\right)^3$$
$$\text{Amount} = \frac{62500\times 11\times 11\times 11}{1000}$$
$$= \frac{625\times 121\times 11}{10} = ₹83187.5$$
Now, Compound interest
= 83187.5 – 62500 = ₹20687.5

Type - 4

101. The interest received on a fixed amount at a rate of 10% in a year is ₹400. Compound interest for the same amount at the same rate and for the same period if the interest is compounded half yearly will be–
(a) ₹ 400 (b) ₹ 210
(c) ₹ 410 (d) ₹ 200
RRB Group-D – 05/11/2018 (Shift-I)

Ans. (c) Let principal = ₹ P, Rate = 10%, t = 1 Year
As per the question,
$$400 = \frac{P\times r\times t}{100}$$
$$400 = \frac{P\times 10\times 1}{100}$$
P = ₹ 4000
R = 10%, t = 2 Half yearly
$$\text{Amount} = P\left(1+\frac{r}{2\times 100}\right)^2$$
$$\Rightarrow P\left(1+\frac{r}{2\times 100}\right)^2$$
$$\Rightarrow 4000\left(1+\frac{10}{200}\right)^2$$
$$\Rightarrow 4000\left(\frac{21}{20}\right)^2$$
$$\Rightarrow 4000\times\frac{21}{20}\times\frac{21}{20}$$
$\Rightarrow$ ₹ 4410
Compound interest = Amount − Principal
Compound interest = 4410 – 4000 = ₹410

102. The simple interest on a sum of money for 3 years at 12% simple interest rate per annum is ₹6750. What will be the compound interest on the same sum at the same rate for the same period compounded annually?
(a) ₹ 7,092.40 (b) ₹ 7,000
(c) ₹ 7,592.40 (d) ₹ 7,500.40
RRB Group-D – 12/10/2018 (Shift-I)

Ans. (c) : From $SI = \frac{PRT}{100}$

$6750 = \frac{P \times 12 \times 3}{100}$

$P = \frac{6750 \times 100}{12 \times 3}$

$P = ₹\ 18750$

Amount $(A) = P\left(1 + \frac{R}{100}\right)^n$

$A = 18750\left(1 + \frac{12}{100}\right)^3$

$A = 18750 \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25}$

$A = ₹\ 26342.4$

Compound interest = Amount - Principal

= 26342.4-18750 = ₹7592.4

103. Hari invested ₹100 for three years at a simple interest rate of 11.03%. How much should tipu invest to get the same amount after three years but at the rate of 10% compound interest?

(a) ₹ 120 (b) ₹ 110

(c) ₹ 100 (d) ₹ 105

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (c) : As per the question–

$$\frac{11.03 \times 100 \times 3}{100} + 100 = P\left(1 + \frac{10}{100}\right)^3$$

$$33.09 + 100 = P \times \frac{11 \times 11 \times 11}{10 \times 10 \times 10}$$

$$\frac{133.09 \times 10 \times 10 \times 10}{11 \times 11 \times 11} = P$$

$$\frac{133090}{1331} = P$$

$= ₹\ 99.9925 \cong ₹100$

104. Mr. X invested ₹300 for 3 years at a simple interest rate of 11.03%. How much should Mr. Y invest after 3 years to get the same amount to return, but at a compound interest rate of 10%?

(a) ₹ 250 (b) ₹ 300

(c) ₹ 350 (d) ₹ 400

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (b)

Let the amount given on compound interest is $₹P_1$.

As per the question-

$$\left[P_1\left(1 + \frac{r}{100}\right)^n = \frac{P_2 \times R \times t}{100} + P_2\right]$$

$$P_1\left(1 + \frac{10}{100}\right)^3 = \frac{300 \times 3 \times 11.03}{100} + 300$$

$$P_1\left(\frac{11}{10}\right)^3 = 99.27 + 300$$

$$P_1\left(\frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}\right) = 399.27$$

$$P_1 = \frac{39927 \times 10}{1331} = 299.97 \approx ₹300$$

105. Sunil and Kamal took loan of ₹40,000 each for 1 year 6 months from a money lender who charged simple interest from Sunil a 11% per annum and compound interest from Kamal 10% per annum compounded semi-annually. Who paid more interest and by what amount?

(a) Kamal paid ₹305 more

(b) Kamal paid ₹195 more

(c) Sunil paid ₹295 more

(d) They paid equal interest

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (c) : Sunil for ₹40000 at the rate of simple interest,

$SI = \frac{40000 \times 11 \times 18}{100 \times 12} = 200 \times 11 \times 3 = ₹6600$

P = ₹40000, R = 10% yearly = 5% (half-yearly)

t = 1 year 6 months = 3 half-yearly

CI = A − P

$= 40000\left(1 + \frac{5}{100}\right)^3 - 40000$

$= 40000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} - 40000$

$= 5 \times 21 \times 21 \times 21 - 40000$

CI =46305– 40000 = ₹6305

The interest paid by Sunil and Kamal in 1 year 6 months (difference) = 6600–6305 = ₹295

Hence, Sunil paid ₹295 more interest.

106. If the simple interest of a certain sum of money for 3 years at 8% p.a. is half the compound interest on ₹ 4,000 for 2 years at 10% p.a. then the sum placed on simple interest is:

(a) ₹ 1,750 (b) ₹ 1,650

(c) ₹ 1,550 (d) ₹ 2,000

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the invested money at simple interest = ₹x

According to the question,

$$\frac{2x \times 8 \times 3}{100} = 4000\left(1 + \frac{10}{100}\right)^2 - 4000$$

$$\frac{48x}{100} = 4000 \times \frac{11 \times 11}{100} - 4000$$

$$\frac{48x}{100} = 4840 - 4000$$

$48x = 840 \times 100$

$x = \frac{84000}{48}$

$x = ₹\ 1,750$

Therefore, invested money at simple interest (x) = ₹ 1,750

107. If the compound interest on a certain sum of money for 3 years at 5% per annum is ₹3783, then what would be the simple interest on the same sum of money for the same period and at the same rate?

(a) ₹3,400 (b) ₹3,680

(c) ₹3,600 (d) ₹3,440

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : CI = ₹3783, R = 5%, T = 3 years

$$CI = A - P$$

$$3783 = P\left(1+\frac{5}{100}\right)^3 - P$$

$$3783 = P\left(\frac{21}{20}\right)\left(\frac{21}{20}\right)\left(\frac{21}{20}\right) - P$$

$$3783 = \frac{9261P - 8000P}{8000}$$

$$P = \frac{3783\times 8000}{1261}$$

$$P = ₹24000$$

For the same period at the same rate on the same sum of money.

$$\text{Simple interest} = \frac{P\times R\times T}{100}$$

$$= \frac{24000\times 5\times 3}{100}$$

$$= ₹3600$$

108. There is 60% increase in the amount in 6 years at simple interest. What will be the compound interest of ₹10000 after 3 years at the same rate?

(a) ₹13,300 (b) ₹3,310

(c) ₹13,500 (d) ₹3,500

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (b) : Rate of simple interest $= \frac{60\%}{6} = 10\%$

$$\text{C.I. of 3 years} = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$$

$$= 10000\left[\left(1+\frac{10}{100}\right)^3 - 1\right]$$

$$= 10000\left[\frac{1331}{1000} - 1\right]$$

$$= 10000\times\frac{331}{1000}$$

$$= ₹\ 3310$$

109. Zaved borrowed ₹10000 for 2 years on compound interest, compounded annually and paid ₹12544 at the end of 2 years. If he had borrowed the amount on simple interest, then how much money he would have saved?

(a) ₹144 (b) ₹12,400

(c) ₹4,944 (d) ₹2,400

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question –

$$\left(1+\frac{r}{100}\right)^2 = \frac{12544}{10000}$$

$$1+\frac{r}{100} = \frac{112}{100}$$

$$\frac{r}{100} = \frac{12}{100}$$

$$r = 12\%$$

$$\text{Compound interest} = 12544 - 10000 = ₹2544$$

$$\text{Simple interest} = \frac{10000\times 12\times 2}{100} = ₹2400$$

$$\text{Saved money} = 2544 - 2400$$

$$= ₹144$$

110. Amrit borrowed some amount at 10% per annum on simple interest for 1 year, Abhishek borrowed the same amount at the same rate on compound interest (compounded semi-annually) for the same period. If Abhishek paid ₹50 more than Amrit as interest what amount did each of them borrow :

(a) ₹20,010 (b) ₹19,950

(c) ₹20,050 (d) ₹20,000

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let principal = ₹P

Time for simple interest Time for compound interest

Rate = 10% yearly or 5% Half yearly

Time = 1 year Time = 1 year = 2 Half yearly

According to the question –

$$50 = P\left[\left(1+\frac{5}{100}\right)^2 - 1\right] - \frac{P\times 10\times 1}{100}$$

$$50 = P\left[\frac{21}{20}\times\frac{21}{20} - 1\right] - \frac{P}{10}$$

$$50 = P\left[\frac{441-400}{400}\right] - \frac{P}{10}$$

$$50 = P\left[\frac{41}{400} - \frac{1}{10}\right]$$

$$50 = P\left[\frac{41-40}{400}\right]$$

or, $P = 50\times 400 = ₹20,000$

111. The compound interest on a certain sum of money at the rate of 11% p.a. for 2 years is ₹4642. Find its simple interest at the same rate and for the same period.

(a) ₹4,200 (b) ₹3,500

(c) ₹4,500 (d) ₹4,400

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (d) : Compound Interest $= P\left(1+\frac{R}{100}\right)^t - P$

$$4642 = P\left[\left(1+\frac{11}{100}\right)^2 - 1\right]$$

$$4642 = P \times \frac{2321}{10000}$$

$$P = ₹20,000$$

$$\text{Simple interest} = \frac{20000 \times 11 \times 2}{100}$$

$$= ₹44,00$$

112. The simple interest on a sum of amount for 2 years at 10% per annum is ₹500. The compound interest on the same sum at the same rate for the same time is:

(a) ₹ 510 (b) ₹ 525

(c) ₹ 520 (d) ₹ 515

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Let principal amount = ₹ P

Rate= 10% annually

Time = 2 years

According to the question,

$$500 = \frac{P \times 10 \times 2}{100}$$

$$P = ₹2500$$

$$\text{Compound interest} = 2500\left[\left(1+\frac{10}{100}\right)^2 - 1\right]$$

$$= 2500\left[\frac{11}{10} \times \frac{11}{10} - 1\right]$$

$$= 2500\left[\frac{121-100}{100}\right]$$

$$= 2500 \times \frac{21}{100}$$

$$= ₹ 525$$

113. The simple interest on the amount of ₹ 'x' at the rate of 8% for 3 years equal to half of the compound interest on an amount of ₹ 4,000 at the rate of 10% for 2 years. Find the value of 'x'.

(a) ₹ 1750 (b) ₹ 1520

(c) ₹ 6000 (d) ₹ 1400

RRB JE - 28/06/2019 (Shift-III)

Ans. (a) Compound interest = Amount − Principal

$$= P\left(1+\frac{r}{100}\right)^n - P$$

$$= 4000\left(1+\frac{10}{100}\right)^2 - 4000$$

$$= 4000 \times \frac{121}{100} - 4000$$

$$= 4000 \times \frac{21}{100} = 840$$

As per the question–

$$\text{Simple interest} = \frac{\text{Compound interest}}{2}$$

$$\Rightarrow \quad \frac{x \times 8 \times 3}{100} = \frac{840}{2}$$

$$\Rightarrow \quad \frac{x \times 8 \times 3}{100} = 420$$

$$\Rightarrow \quad x = \frac{420 \times 100}{24} = \frac{7000}{4} = ₹1750$$

114. If the compound interest on a principal in 2 years at 5% per annum is ₹10 more than the simple interest on the same principal at the same time. Find the principal.

(a) ₹5,000 (b) ₹4,500

(c) ₹4,000 (d) ₹3,500

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (c) Difference between compound interest and simple interest for two years-

$$= \text{Principal}\left(\frac{r}{100}\right)^2$$

$$10 = \text{Principal}\left(\frac{5}{100}\right)^2 \qquad \begin{bmatrix}\text{Difference} = 10\\ r = 5\%\\ n = 2\%\end{bmatrix}$$

$$10 = \text{Principal}\left(\frac{1}{20}\right)^2$$

Principal = 10 × 4 00 = ₹4000

115. On a certain sum of money, the compound interest and simple interest at a certain rate for 2 years are ₹ 696.30 and ₹ 660 respectively. Find the principal amount?

(a) ₹ 3000 (b) ₹ 4000

(c) ₹ 3300 (d) ₹ 3600

RRB JE - 29/05/2019 (Shift-I)

Ans : (a) Given -

C.I = ₹ 696.30

S.I. = ₹ 660

T = 2 Years

P = ?

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$660 = \frac{P \times R \times 2}{100}$$

$$\frac{PR}{100} = 330 \qquad \text{— (i)}$$

$$\text{Compound interest} = P\left[\left(1+\frac{R}{100}\right)^2 - 1\right]$$

$$696.30 = P\left[1+\frac{R^2}{100}+\frac{2R}{100}-1\right]$$

$$696.30 = \frac{PR^2}{(100)^2} + \frac{2PR}{100}$$

From equation (i)–

$$696.30 = \frac{330R}{100} + 660$$

$696.30 - 660 = \frac{330R}{100}$

$36.30 = \frac{330R}{100}$

$R = \frac{363}{33}$

$R = 11\%$

On putting the value of R in equation (i)–

$\frac{PR}{100} = 330$

$P \times \frac{11}{100} = 330$

$P = \frac{330 \times 100}{11}$

$P = 30 \times 100$

$P = ₹\ 3000$

So, the principal will be ₹ 3000

116. The simple interest for 3 years at a 5% annual rate on a fixed amount is ₹1260. Find the compound interest amount for the same period.

(a) ₹1324.05 (b) ₹1384.05
(c) ₹1428.05 (d) ₹1448

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans : (a) Give–

Rate of interest (R) = 5%

Time (T) = 3 Years

Simple interest (S.I.) = ₹ 1260

$\text{Simple interest} = \frac{P \times R \times T}{100}$

$1260 = \frac{P \times 5 \times 3}{100}$

$P = \frac{126000}{15}$

$P = ₹\ 8400$

$\text{Compound interest} = \text{Principal}\left[\left(1+\frac{R}{100}\right)^T - 1\right]$

$= 8400\left[\left(1+\frac{5}{100}\right)^3 - 1\right]$

$= 8400\left[\left(\frac{21}{20}\right)^3 - 1\right]$

$= 8400\left[\frac{9261-8000}{8000}\right]$

$= 8400 \times \frac{1261}{8000}$

$= \frac{84 \times 1261}{80}$

$= ₹\ 1324.05$

117. The compound interest on a certain sum for 2 years at a rate of 10% is ₹2100. What will be the simple interest the same sum at the same rate and for the same period?

(a) ₹1600 (b) ₹1980
(c) ₹1800 (d) ₹2000

RRB JE - 26/05/2019 (Shift-II)

Ans : (d) $\text{Compound interest} = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$

$2100 = P\left[\left(1+\frac{10}{100}\right)^2 - 1\right]$

$2100 = P\left[\frac{121}{100} - \frac{1}{1}\right]$

$2100 = P\left[\frac{121-100}{100}\right]$

$2100 = P \times \frac{21}{100}$

$P = \frac{2100 \times 100}{21}$

Principal (P) = ₹ 10,000

As per the question,

$\text{Simple interest} = \frac{P \times R \times T}{100}$

$SI = \frac{10000 \times 10 \times 2}{100}$

$\boxed{SI = ₹\ 2000}$

So, the SI will be ₹2000.

118. An amount was deposited for 7 years at 8% simple interest rate of the matured amount was invested in a scheme with an annual rate of 10% compound interest, thereby earning an interest of ₹1638 in 2 years. Find the principal amount.

(a) ₹6200 (b) ₹5000
(c) ₹7500 (d) ₹8000

RRB JE - 27/05/2019 (Shift-I)

Ans : (b) Let, Principal = ₹ P

$\text{Simple interest} = P \times \frac{8}{100} \times 7 = \frac{56P}{100}$

$\text{Amount} = P + \frac{56P}{100} = \frac{156P}{100}$

As per the question,

Compound interest = ₹ 1638

$1638 = \frac{156P}{100}\left[\left(1+\frac{10}{100}\right)^2 - 1\right]$

$\frac{1638 \times 100}{156P} = \frac{21}{100}$

$P = \frac{1638 \times 100 \times 100}{156 \times 21}$

$P = ₹\ 5000$

119. On an amount, the simple interest for 2 years is ₹660, while the compound interest of two years is ₹696.30, the rate of interest being the same. Find the rate of interest?

(a) 13% (b) 11%
(c) 10% (d) 12.75%

RRB JE - 27/05/2019 (Shift-II)

Ans : (b) Simple interest $(SI) = \frac{PRT}{100}$

$660 = \frac{P \times R \times 2}{100}$

PR = 330 × 100

PR = 33000 ..... (i)

Difference between compound interest and simple interest for two years-

$= P\left(\frac{R}{100}\right)^2$

$696.30 - 660 = P \times \frac{R}{100} \times \frac{R}{100}$

$36.30 = \frac{33000 \times R}{100 \times 100}$ [PR = 33000

36.30 = 3.3 × R from the eq^n (1)]

$R = \frac{363}{33}$

$R = \frac{33}{3}$

R = 11%

120. An amount at a fixed rate of simple interest increases by 100% in 8 years What will be the compound interest for 2 years on ₹8000 at the same rate of interest?

(a) ₹2050 (b) ₹2075

(c) ₹2125 (d) ₹2025

RRB JE - 29/05/2019 (Shift-III)

Ans : (c) Let Principal = ₹P

Amount = ₹2P

Interest = 2P – P = P

Simple interest = $\frac{P \times R \times T}{100}$

$P = \frac{P \times R \times 8}{100}$

$R = \frac{25}{2}\%$

From question –

Compound interest $= P\left[\left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}} - 1\right]$

$= 8000\left[\left(1 + \frac{25}{200}\right)^2 - 1\right] = 8000 \times \frac{(81-64)}{64}$

$= 8000 \times \frac{17}{64} = ₹\ 2125$

121. Simple interest and compound interest on a certain amount for two years are ₹8400 and ₹8652 respectively. Find the rate of interest.

(a) 5% (b) 6%

(c) 4.5% (d) 5.5%

RRB JE - 29/05/2019 (Shift-III)

Ans : (b) When time is 2 years then–

$C.I. - S.I. = P\left(\frac{R}{100}\right)^2$

$8652 - 8400 = \frac{PR^2}{10000}$

$252 = \frac{PR^2}{10000}$.....(i)

$S.I. = \frac{P \times R \times 2}{100}$

$8400 = \frac{PR}{50}$

PR = 8400 × 50..... (ii)

From the equation (i) and (ii)–

$PR^2 = 252 \times 10000$

PR × R = 252 × 10000

$R = \frac{252 \times 10000}{PR}$

$R = \frac{252 \times 10000}{8400 \times 50}$

$R = \frac{21 \times 10}{7 \times 5}$

R = 6%

122. Find the simple interest on a sum at the rate of 12.5% for 2 years, if the compound interest on the same sum for the same period at the same rate is ₹510?

(a) ₹480 (b) ₹500

(c) ₹408 (d) ₹420

RRB JE - 30/05/2019 (Shift-III)

Ans : (a) Compound interest = Amount – Principal

$510 = P\left[1 + \frac{R}{100}\right]^T - P$

$510 = P\left[1 + \frac{12.5}{100}\right]^2 - P$

$510 = P\left[\frac{1125}{1000}\right]^2 - P$

$510 = P\left[\frac{9}{8}\right]^2 - P = P\left[\frac{81-64}{64}\right]$

$510 = \frac{P \times 17}{64}$

$P = \frac{510 \times 64}{17}$

P = ₹1920

Simple interest = $\frac{P \times R \times T}{100}$

Simple interest = $\frac{1920 \times 12.5 \times 2}{100}$

Simple interest = $\frac{1920 \times 25}{100}$

Simple interest = ₹480

123. Simple interest on a certain sum of money for 3 years at rate of 5% per annum is ₹ 5250. What will be the compound interest on that sum of money at the same rate for the same period?

(a) ₹5,510.88 (b) ₹5,516.88

(c) ₹5,512.88 (d) ₹5,517.88

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (b) Simple interest $= \frac{P \times R \times T}{100}$

$5250 = \frac{P \times 5 \times 3}{100}$

Principal $= \frac{5250 \times 20}{3}$

Principal = ₹35000

Compound interest = Principal $\left[\left(1+\frac{R}{100}\right)^{T}-1\right]$

$= 35000\left[\left(1+\frac{5}{100}\right)^{3}-1\right]$

$= 35000\left[\frac{21\times21\times21-20\times20\times20}{20\times20\times20}\right]$

$= 35000\left(\frac{9261-8000}{8000}\right)$

$= 35\times\frac{1261}{8}$

= 35 × 157.625 = ₹5516.88

124. Smita took a loan of ₹75000 at a simple interest rate of 15% per annum. She lent that money to her friend on the same day, at the same interest rate annual compounded annually interest rate. How much profit will she earn after 2 years?

(a) ₹ 1,887.5 (b) ₹ 1,867.5
(c) ₹ 1,786.5 (d) ₹ 1,687.5

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (d) Simple interest (SI) $= \frac{P\times R\times T}{100}$

$= \frac{75000\times15\times2}{100} =$ ₹ 22500

Compound amount

$A=P\left(1+\frac{R}{100}\right)^{T}$

$A = 75000 \times \frac{115}{100}\times\frac{115}{100}$

A = ₹ 99187.5

Compound interest = A – P

= 99187.5 – 75000 = ₹24187.5

Profit of Smita = 24187.5 – 22500 = ₹1687.5

125. Anjali borrowed ₹22500 for 2 years at the rate of 6% simple interest per annum and on the same day she lent this amount to Ashok at compound interest for the same interest rate and for the same time. How much loss or profit will she make?

(a) 73 Profit (b) 73 Loss
(c) 81 Loss (d) 81 Profit

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (d) Given that,

R = 6%

T = 2 years

P = ₹22500

$S.I. = \frac{22500\times6\times2}{100}$

S.I. = ₹2700

Amount = Principal + SI = 22500 + 2700

= ₹25200

$A = 22500\left(1+\frac{6}{100}\right)^{2} = 22500\times\frac{53}{50}\times\frac{53}{50}$

= ₹25281

Total Profit = 25281 – 25200 = ₹81

126. ₹100 is invested for one year in a scheme which gives simple interest at the rate of 10% per annum. Another ₹ 100 is invested in one year scheme which given 10% annual interest, but the interest is compounded half yearly. The interest received under second scheme is how much more than the first scheme?

(a) ₹ 1 (b) 50 Paisa
(c) 25 Paisa (d) No difference

RRB Group-D – 16/11/2018 (Shift-III)

Ans. (c) : Total interest received on investment of first scheme $= \frac{100\times10\times1}{100}$ = ₹ 10

Interest received on the compounded half yearly of the scheme.

$= 100\left(1+\frac{5}{100}\right)^{2}-100$

$= 100\times\left(\frac{21}{20}\right)^{2}-100$

$= 100\times\frac{441}{400}-100$

$= \frac{441}{4}-100 \Rightarrow \frac{441-400}{4} = \frac{41}{4}$ = ₹10.25

Required difference = 10.25 – 10 = 25 paisa

127. A simple interest of 8% on an amount for 1.5 years is ₹360. If the time is doubled according to the same interest rate on the same amount, find the compound interest?

(a) ₹ 778.13 (b) ₹ 779.13
(c) ₹ 779 (d) ₹ 778

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (b) As per the question,

Simple interest $= \frac{PRT}{100}$

$360 = \frac{P\times1.5\times8}{100}$

P = ₹3000

T = 2×1.5 years = 3 years

Compound interest $= P\left[\left(1+\frac{R}{100}\right)^{T}-1\right]$

$= 3000\left[\left(1+\frac{8}{100}\right)^{3}-1\right]$

$= 3000\left[\left(1+\frac{2}{25}\right)^{3}-1\right]$

$$= 3000\left[\left(\frac{27}{25}\right)^3 - 1\right] = 3000\left[\frac{19683}{15625} - 1\right]$$

$$= 3000\left[\frac{19683 - 15625}{625 \times 25}\right]$$

$$= \frac{4058 \times 3000}{625 \times 25} = \frac{4.8 \times 4058}{25} = \frac{19478.4}{25}$$

$= ₹\ 779.13$

128. The simple interest of 8 years at 8% per annum on a deposit is ₹16000.What will be the compound interest of 2 years at the rate of one fourth of this rate on the same amount.

(a) ₹ 1,020 (b) ₹ 980
(c) ₹ 1,010 (d) ₹ 1,015

RRB NTPC 17.01.2017 Shift-2

Ans : **(c)** Simple interest $= \frac{P \times R \times T}{100}$

Principal $= \frac{16000 \times 100}{8 \times 8} = ₹25000$

As per the question,

$$r = \frac{1}{4} \text{ of } 8\%$$

Compound interest $= 25000\left(1 + \frac{8 \times \frac{1}{4}}{100}\right)^2 - 25000$

$$= \frac{25000 \times 51 \times 51}{50 \times 50} - 25000 = 26010 - 25000 = 1010$$

So, Compound interest = ₹1010

129. Simple interest on a fixed sum of money is ₹1200 in 2 years at a fixed rate of interest. The compound interest of the same sum gets ₹1290 in 2 years at the rate of simple interest. What will be the Principal?

(a) ₹1200 (b) ₹16000
(c) ₹6000 (d) ₹4000

RRB NTPC 02.04.2016 Shift : 2

Ans : (d) Rate = R, Time (T) = 2 years
SI = ₹1200, CI = ₹1290
Difference between CI and SI for two years

Formula: $\boxed{D = P\left(\frac{R}{100}\right)^2}$

$$1290 - 1200 = P\left(\frac{R^2}{10000}\right)$$

$PR^2 = 90 \times 10000$

$PR^2 = 900000$ ……..(1)

$$SI = \frac{PTR}{100}$$

$$1200 = \frac{P \times 2 \times R}{100}$$

$$PR = \frac{1200 \times 100}{2}$$

PR = 60000 …….. (2)

From the equation (1)–

PR.R = 900000

60000 × R = 900000

$$R = \frac{900000}{60000}$$

R = 15%

From the equation (2)–

P × 15 = ₹60,000

$$P = \frac{60000}{15}$$ (Principal) P = ₹4000

130. A certain sum of money earns an interest of ₹2000 at a rate of 10% per annum simple interest in 2 years. If the compound interest accrues annually on this amount, what will be the effective rate of interest?

(a) 10.25 (b) 10.50
(c) 10.75 (d) 10.15

RRB NTPC 30.03.2016 Shift : 2

Ans : **(b)** Let principal = ₹x

Then,

$$2000 = x \times \frac{10}{100} \times 2$$

x = ₹10,000

$$CI = 10000\left(1 + \frac{10}{100}\right)^2 - 10000$$

$$= 10000\left(\frac{121}{100} - 1\right) = ₹2100$$

So, now interest rate on ₹2100

$$r = \frac{2100 \times 100}{10000 \times 2} = \frac{21}{2} = 10.5\%$$

131. Find the compound interest of that amount at the rate of 7% for 3 years, whose simple interest will be ₹18900 at the rate of 7% in 3 years. (Rounded off to nearest ₹)

(a) ₹19,746 (b) ₹18,390
(c) ₹20,254 (d) ₹21,053

RRB NTPC 28.04.2016 Shift : 1

Ans : **(c)** Simple interest (S.I) $= \frac{P \times R \times T}{100}$

$$18,900 = \frac{P \times 7 \times 3}{100}$$

$$P = \frac{18,900 \times 100}{7 \times 3} = 900 \times 100 = 90000$$

As per the question,

$$C.I. = 90000\left[\left(1 + \frac{7}{100}\right)^3 - 1\right]$$

$$= 90000\left[\left(\frac{107}{100}\right)^3 - 1\right]$$

$$= 90000\left(\frac{1225043}{1000000} - 1\right)$$

$$= 90000 \times \frac{225043}{1000000} = 9 \times \frac{225043}{100}$$

$$= 20253.87 = ₹20254$$

Type - 5

132. The difference between the compound interest and the simple interest earned on a certain sum of money in two years at 9% interest per annum is ₹97.2. Find the sum invested.

(a) ₹15,000 (b) ₹12,500

(c) ₹10,000 (d) ₹12,000

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (d) : Let Principal = ₹ P

$$CI - SI = \frac{Pr^2}{(100)^2}$$

$$97.2 = \frac{P \times 9 \times 9}{100 \times 100}$$

$$P = ₹12000$$

133. The difference between the compound interest (when interest is compounded annually) and the simple interest if ₹10,000 is deposited at 5% rate of interest per annum for 2 years is:

(a) ₹15 (b) ₹35

(c) ₹25 (d) ₹50

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (c) : Difference between S.I and C.I

$$= \frac{pr^2}{(100)^2}$$

$$= \frac{10,000 \times 25}{10000}$$

$$= ₹25$$

134. The difference between the simple interest and the compound interest on ₹5000/- at 10% per annum for 3 years is:

(a) ₹235 (b) ₹480

(c) ₹233 (d) ₹155

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : The difference between simple interest and compound interest for 3 years if the rates are same,

$$d = \frac{PR^2(300 + R)}{(100)^3}$$

$$d = \frac{5000 \times 100 \times 310}{100 \times 100 \times 100}$$

$$d = 5 \times 31 = 155$$

135. If the difference between the compound interest and the simple interest on a certain sum of money for 2 years at 5% per annum is ₹16.32, find the sum (in ₹)?

(a) ₹6,526 (b) ₹6,538

(c) ₹6,528 (d) ₹6,529

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (c) : Difference between simple interest and compound interest for 2 years-

$$D = \frac{PR^2}{(100)^2}$$

$$16.32 = \frac{P \times 25}{10000}$$

$$P = ₹ 6528$$

136. If the difference between the compound interest and the simple interest on a certain sum of money of 8% p. a. for 2 years is ₹240 , then the sum of money is :

(a) ₹37,000 (b) ₹38,500

(c) ₹38,000 (d) ₹37,500

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : The difference between C.I. and S.I.,

$$D = \frac{PR^2}{100^2} \text{ (for two years)}$$

$$240 = \frac{P \times 8 \times 8}{100 \times 100}$$

$$P = ₹37500$$

137. The difference between the compound interest and the simple interest on a principal sum of ₹24,000 in 2 years at same rate of interest is ₹60. The rate of interest is:

(a) 6% (b) 7%

(c) 5% (d) 8%

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let principal = (P), Time = (t), Compound interest (CI) and simple interest (SI)

The difference between the compound interest and the simple interest of for two years-

$$\text{Difference} = \text{Principal}\left(\frac{\text{Rate}}{100}\right)^2$$

$$60 = 24000 \times \frac{(\text{Rate})^2}{10000}$$

$$(\text{Rate})^2 = 5 \times 5$$

$$R = 5\%$$

138. The difference between compound interest and simple interest, at the same rate, on an amount of ₹15,000 for 2 years is ₹24. What is the rate of interest per annum?

(a) 10% (b) 4%

(c) 6% (d) 8%

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the annual rate of interest = r% and principal be Rs. P.

Difference between compound interest and simple interest for two years

$$= P\left(\frac{r}{100}\right)^2$$

$$= P \times \frac{r}{100} \times \frac{r}{100}$$

$= 15,000 \times \frac{r}{100} \times \frac{r}{100} = 24$

$r^2 = \frac{24 \times 10}{15} = 16$

$r = \sqrt{16} = 4\%$

139. The difference between the compound interest compounded annually and the simple interest on a certain sum of money for 2 years at 4% per annum is ₹20.00. The sum is?

(a) ₹ 12,500.00 (b) ₹ 10,500.00
(c) ₹ 8,500.00 (d) ₹ 11,500.00

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (a) : Rate on simple interest in two years
= 4% + 4% = 8%
Rate on compound interest in two years

$= 4\% + 4\% + \frac{4\% \times 4\%}{100} = 8.16\%$

Difference = 8.16% – 8%
= 0.16%
According to the question,
0.16% = ₹20

(Principal) $100\% = \frac{20 \times 100 \times 100}{16}$

= ₹12,500.00

140. A certain sum of money earns, simple interest of to ₹ 2,000 in two years at the rate of 10% p.a. if the interest on the same amount is compounded annually, then what will be the difference between the two types of interest?

(a) ₹200 (b) ₹220
(c) ₹100 (d) ₹120

RRB NTPC 29.03.2016 Shift : 3

Ans : (c) Let Principal = ₹x

$\because$ Simple interest $= \frac{P \times R \times T}{100}$

$\Rightarrow 2000 = \frac{x \times 10 \times 2}{100}$

x = ₹10000

$\therefore$ Compound interest for 2 years $= P\left[\left(1 + \frac{R}{100}\right)^T - 1\right]$

$= 10000\left[\left(1 + \frac{10}{100}\right)^2 - 1\right]$

$= 10000\left[\frac{121}{100} - 1\right]$

$= 10000 \times \frac{21}{100} = ₹2100$

$\therefore$ Difference between CI and SI = 2100 – 2000 = ₹100

141. The difference between compound interest and simple interest on a certain sum at 12.5% for 2 years is ₹45. Find the amount.

(a) ₹ 2880 (b) ₹ 3000
(c) ₹ 2000 (d) ₹ 2440

RRB JE - 22/05/2019 (Shift-I)

Ans : (a) r = 12.5% , t = 2 Years CI ~ SI = ₹45, P=?
Difference between CI and SI of two years

$= P \times \left(\frac{r}{100}\right)^2$

$45 = P \times \frac{(12.5)^2}{(100)^2}$

$P = \frac{45 \times 100 \times 100}{12.5 \times 12.5} = ₹ 2880$

142. On a certain sum of money the simple interest for 2 years is ₹ 140 at 4% per annum. Find the difference between the compound interest and the simple interest on the same sum at the same rate and the same period.

(a) ₹ 2.80 (b) ₹ 2.40
(c) ₹ 3 (d) ₹ 1.80

RRB JE - 23/05/2019 (Shift-I)

Ans : (a) Given–
R = 4%
Time (T) = 2 Years
Simple interest = ₹140

Simple interest $= \frac{P \times R \times T}{100}$

$140 = \frac{P \times 4 \times 2}{100}$

$P = \frac{7000}{4} = ₹1750$

As per the question –

$A = P\left(1 + \frac{R}{100}\right)^T$

$A = 1750\left(1 + \frac{4}{100}\right)^2$

$A = 1750 \times \frac{26}{25} \times \frac{26}{25}$

$A = 1892.8$

Interest = 1892.8 – 1750 = 142.8
Difference of interest = 142.8 – 140 = ₹ 2.80

143. Find the difference between compound interest and simple interest on an amount of ₹ 15000 at the rate of 8% per annum for 2 years.

(a) ₹100 (b) ₹96
(c) ₹108 (d) ₹12

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (b) Given-
P = ₹ 15000
R = 8%
Time (t) = 2 Years
The difference of compound interest and simple interest when time is 2 years.

From, $D = P\left(\frac{R}{100}\right)^2$,

$= 15000\left(\frac{8}{100}\right)^2 = 15000 \times \frac{4}{625} = ₹ 96$

144. On what principal will the difference between compound interest and simple interest at the rate of 10% for three years will be ₹620?

(a) ₹ 18000 (b) ₹ 25000
(c) ₹ 24000 (d) ₹ 20000

RRB JE - 24/05/2019 (Shift-III)

Ans : (d) Let Principal = ₹P

As per the question−

$$620 = \left[P\left(1+\frac{10}{100}\right)^3 - 1 \right] - \frac{P\times 10\times 3}{100}$$

$$620 = P\left[\left(\frac{1331-1000}{1000}\right) - \frac{10\times 3}{100}\right]$$

$$620 = P\left[\frac{331-300}{1000}\right]$$

$$620 = P\left[\frac{31}{1000}\right]$$

$$P = ₹20000$$

145. Find the difference between compound interest and simple interest, received in 4 years at the rate of 10% on the amount of ₹ 1000.

(a) ₹64.10 (b) ₹52
(c) ₹74 (d) ₹16.40

RRB JE - 26/05/2019 (Shift-III)

Ans. (a)

Amount after n years, $A = P\left(1+\frac{r}{100}\right)^n$

Amount after 4 years $= 1000\left(1+\frac{10}{100}\right)^4$

$$= 1000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10} = ₹1464.1$$

∴ Compound interest = 1464.1 – 1000 = 464.1

Simple interest after 4 years $= \frac{PRT}{100}$

$$= \frac{1000\times 10\times 4}{100} = ₹400$$

So, intended difference = 464.1 – 400 = ₹64.10

146. The difference between compound interest and simple interest of 2 years at a rate of 8% on a fixed amount is ₹8. Find the amount.

(a) ₹2000 (b) ₹1250
(c) ₹1500 (d) ₹1000

RRB JE - 02/06/2019 (Shift-I)

Ans : (b) Given−

Interest Rate = 8%

Time = 2 Years

Difference between compound interest and simple interest= ₹8

Let the amount = P [where D = difference]

From $D = P\left(\frac{R}{100}\right)^2$

$$8 = P\left(\frac{8}{100}\right)^2$$

$$8 = P\times\frac{4}{625}$$

$$P = ₹1250$$

147. The difference between simple interest and compound interest compounded a half yearly basis for 2 years at the rate of 10% per annum is ₹ 124.05. Find the amount.

(a) ₹ 8400 (b) ₹ 10000
(c) ₹ 8000 (d) ₹ 8200

RRB JE - 02/06/2019 (Shift-I)

Ans : (c) Given

Interest Rate = R/2 = 10/2 = 5% (Half yearly)

Time = 2 Years = 4 Half yearly

Let Principal = P

$$P\left[\left(1+\frac{R}{100}\right)^T - 1\right] - \left(\frac{P\times R\times T}{100}\right) = 124.05$$

$$P\left[\left(1+\frac{5}{100}\right)^4 - 1\right] - \left(\frac{P\times 5\times 4}{100}\right) = 124.05$$

$$P\left[\frac{21\times 21\times 21\times 21 - 20\times 20\times 20\times 20}{20\times 20\times 20\times 20}\right] - \left(\frac{P\times 5\times 4}{100}\right) = 124.05$$

$$P\left[\frac{194481-160000}{160000}\right] - \frac{P\times 5\times 4}{100} = \frac{12405}{100}$$

$$P\left[\frac{34481-32000}{160000}\right] = \frac{12405}{100}$$

$$P\left[\frac{2481}{1600}\right] = 12405$$

$$P = \frac{12405\times 1600}{2481} = ₹8000$$

148. The difference between simple interest and compound interest compounded annually on a sum of money at 4% per annum for 2 years is ₹8. Find that sum.

(a) ₹4000 (b) ₹10000
(c) ₹8000 (d) ₹5000

RRB JE - 01/06/2019 (Shift-III)

Ans. (d) For 2 Years, difference between SI and CI

Formula:– Compound interest – Simple interest

$$= \text{Principal}\left(\frac{\text{Rate}}{100}\right)^{\text{time}}$$

$$8 = \text{Principal}\left(\frac{4}{100}\right)^2$$

$$8 = \text{Principal}\times\frac{1}{25}\times\frac{1}{25}$$

Principal = 8 × 25 × 25

Principal = ₹5000

149. The difference between simple interest and compound interest on a certain amount for 3 years at the rate of 5% is ₹14.48. Find the amount.

(a) ₹ 1850 (b) ₹ 1999
(c) ₹ 1899 (d) ₹ 2160

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans : (c) Simple interest $= \frac{P \times R \times T}{100}$

Let P = ₹x

Simple interest $= \frac{x \times 5 \times 3}{100} = ₹\frac{3x}{20}$

Compound interest $= x\left[\left(1+\frac{5}{100}\right)^3 - 1\right]$

$= x\left[\left(1+\frac{1}{20}\right)^3 - 1\right] = x\left[\left(\frac{21}{20}\right)^3 - 1\right]$

$= x\left(\frac{9261-8000}{8000}\right) = \frac{1261}{8000}x$

As per the question,

$\frac{1261}{8000}x - \frac{3x}{20} = 14.48$

$\frac{1261x - 1200x}{8000} = 14.48$

$61x = 14.48 \times 8000$

$x = \frac{1448 \times 80}{61} = ₹1899$

150. Find the difference between compound interest and simple interest of ₹400 for 2 years at an interest rate of 5%.

(a) ₹10 (b) ₹4 (c) ₹3 (d) ₹1

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans. (d) When difference between simple interest and compound interest in two years,

Difference = Principal $\left(\frac{R}{100}\right)^2$

Difference = $P\left(\frac{R}{100}\right)^2$

R = 5%, P = ₹400

Difference $= 400\left(\frac{5}{100}\right)^2 = \frac{400}{20 \times 20} = ₹1$

151. Find the difference between simple interest and compound interest on ₹2000 for 2 years at 10% annual interest rate.

(a) ₹ 0 (b) ₹ 30

(c) ₹ 20 (d) ₹ 10

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (c) : Given-

t = 2 Years

P = ₹ 2000

R = 10%

Formula-

$D = P\left(\frac{R}{100}\right)^2$

$D = 2000\left(\frac{10}{100}\right)^2$

$D = 2000 \times \frac{1}{100}$

D = ₹20

152. The difference between compound interest and simple interest on sum at an interest rate of 5% for 2 years is ₹2. Find the principal amount.

(a) ₹650 (b) ₹920

(c) ₹800 (d) ₹700

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (c)

From the formula, $D = P\left(\frac{R}{100}\right)^2$

$2 = P\left(\frac{5}{100}\right)^2$

P = 2 × 20 × 20 = ₹ 800

153. Find the difference between compound interest and simple interest on ₹8000 at the interest rate of 5% for 3 years.

(a) ₹ 61 (b) ₹ 58

(c) ₹ 95 (d) ₹ 68

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a) $A = P\left(1+\frac{R}{100}\right)^T$

$A = 8000\left(1+\frac{5}{100}\right)^3$

$A = 8000 \times \frac{105}{100} \times \frac{105}{100} \times \frac{105}{100}$

A = ₹ 9261

Compound interest = Amount (A) – Principal (P)

= 9261 – 8000 = ₹ 1261

Simple interest (SI) $= \frac{P \times R \times T}{100}$

$= \frac{8000 \times 5 \times 3}{100} = ₹1200$

Difference between compound interest and simple interest for 3 years = 1261 – 1200 = ₹ 61

154. The difference between simple interest and compound interest on ₹20,000 in two years is ₹800. What is the annual rate of interest?

(a) 30% (b) 15%

(c) 25% (d) 20%

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (d) Difference between simple interest and compound interest for 2 years = ₹800

Formula $\boxed{d = \frac{PR^2}{100^2}}$

d = difference, P = Principal

R = Rate

$800 = \frac{20000 \times R^2}{100 \times 100}$

$R^2 = 400$

$\boxed{R = 20\%}$

155. The difference between simple interest and compound annual interest on a certain amount for 2 years at 15% per annum is ₹ 180 Find the principal amount.

(a) ₹ 9000 (b) ₹ 7000
(c) ₹ 8000 (d) ₹ 6000

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (c) Let Principal = ₹ P

Simple interest = $\frac{P\times15\times2}{100}$ ____(i)

Compound interest $= P\left[\left(1+\frac{15}{100}\right)^2-1\right]$

$= P\left[\left(\frac{23}{20}\right)^2-1\right]$

$= P\left[\frac{529-400}{400}\right]=\frac{P\times129}{400}$ _____(ii)

As per the question-

Compound interest ~ Simple interest = 180

$\frac{129P}{400}-\frac{30P}{100}=180$

$\frac{129P-120P}{400}=180$

$9P = 180 \times 400$

$P = 20 \times 400$

P = ₹8000

156. What will be the difference between simple interest and compound interest on ₹8500 at 10% interest rate for 2 years?

(a) ₹ 68 (b) ₹ 50
(c) ₹ 85 (d) ₹ 70

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (c) : Difference between simple interest and compound interest for 2 years,

$D = P\left(\frac{R}{100}\right)^2$

$D = \frac{8500\times10}{100}\times\frac{10}{100} = ₹85$

157. The difference between the simple interest and compound interest on the amount invested at 5% per annum for 2 years is ₹15. Find the amount.

(a) ₹ 4,980 (b) ₹ 3,000
(c) ₹ 4,800 (d) ₹ 6,000

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans : (d) Difference between simple interest and compound interest for 2 years,

$D = P\left(\frac{R}{100}\right)^2$

$15 = P\left(\frac{5}{100}\right)^2$

$P = 15 \times 20 \times 20 = ₹6000$

158. The difference between the compound interest and simple interest on an amount at the rate of 15% per annum for 3 years is ₹283.50. Find the amount.

(a) ₹ 4,040 (b) ₹ 4,000
(c) ₹ 4,400 (d) ₹ 4,444

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (b)

Difference = Compound interest – Simple interest

Difference $= \left[P\left(1+\frac{R}{100}\right)^3-P\right]-\left(\frac{PRT}{100}\right)$

$283.50 = P\left[\left(1+\frac{15}{100}\right)^3-\frac{15\times3}{100}-1\right]$

$\Rightarrow 283.50 = P\left[\frac{115}{100}\times\frac{115}{100}\times\frac{115}{100}-\frac{45}{100}-1\right]$

$\Rightarrow 283.50 = P\left[\frac{12,167-3600-8000}{8000}\right]$

$P = \frac{283.5\times8000}{567}$

P = ₹ 4000

159. Find the difference between simple interest and compound interest on principal of ₹4000 at an annual rate of 20% for 2 years.

(a) 160 (b) 120
(c) 90 (d) 110

RRB NTPC 09.04.2016 Shift : 3

Ans : (a) Principal (P) = ₹4000

Rate (R) = 20%

Difference between CI and SI for two years-

$D = P\times\left(\frac{R}{100}\right)^2$

$= 4000\times\left(\frac{20}{100}\right)^2 = 4000\times\frac{20}{100}\times\frac{20}{100} = ₹160$

160. The two amounts of ₹10,000 each were invested for 2 years (i) at the rate of 5% simple interest (ii) at the same rate of annual compound interest. What is the difference in their maturity value?

(a) ₹ 30 (b) ₹ 25
(c) ₹ 20 (d) ₹ 40

RRB NTPC 26.04.2016 Shift : 1

Ans : (b)

Difference between CI and SI for two **years**

$(D) = P\left(\frac{R}{100}\right)^2 = 10000\left(\frac{5}{100}\right)^2$

$= 10000\times\frac{25}{10000} = ₹25$

161. Find the difference between simple interest and compound interest of ₹23,465 received at the rate of 7.5% in the second year.

(a) 132 (b) 66
(c) 147 (d) 73.5

RRB NTPC 28.04.2016 Shift : 1

Ans : (a) Given,

Principal (P) = ₹23,465

Rate (r) = 7.5%

Difference (D) $= P\left(\frac{r}{100}\right)^2 = 23,465\left(\frac{7.5}{100}\right)^2$

$= 23465\left(\frac{75}{1000}\right)^2 = 23465\left(\frac{3}{40}\right)^2$

$= 23465 \times \frac{9}{1600} = \frac{211185}{1600} \Rightarrow 131.99 = ₹132$

Type - 6

162. A sum of ₹10,000 amounts to ₹11,025 in 2 years at a certain rate of interest per annum, compounded annually. The rate of interest per annum is:

(a) 4% (b) 5%

(c) 6% (d) 3%

RRB GROUP-D – 26/09/2022 (Shift-III)

Ans. (b) : Given,

A = ₹ 11025

P = ₹ 10000

t = 2 years

$A = P\left(1+\frac{R}{100}\right)^t$

$\Rightarrow \quad 11025 = 10000\left(1+\frac{R}{100}\right)^2$

$\Rightarrow \quad \frac{11025}{10000} = \left(1+\frac{R}{100}\right)^2$

$\Rightarrow \quad \left(\frac{105}{100}\right)^2 = \left(1+\frac{R}{100}\right)^2$

$\Rightarrow \quad \frac{105}{100} = \frac{100+R}{100}$

$\Rightarrow \quad R = 105 - 100$

$\Rightarrow \quad R = 5\%$

So, option (b) is right.

163. A sum is invested at compounded interest payable annually. The interest in two successive years was ₹225 and ₹236.25.

(a) 4% (b) 5.5%

(c) 4.5% (d) 5%

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (d) : From question,

Difference between two compound interest

= 236.25 – 225

= ₹11.25

Compound Interest annually = ₹11.25

$\therefore$ C.I. $= P\left[\left(1+\frac{\text{Rate}}{100}\right)^t - 1\right]$

$11.25 = 225\left[\left(1+\frac{R}{100}\right)^1 - 1\right] \qquad \left\{\begin{matrix}\because \text{Rate} = R \\ \text{Time} = 1\,\text{year}\end{matrix}\right\}$

$11.25 = 225 \times \frac{R}{100}$

R = 5%

164. The rate of compound interest p.a. which a sum of ₹1,200 will become ₹1,348.32 is 2 years is:

(a) 7% (b) 6%

(c) 5% (d) 8%

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given

Principal amount = ₹1,200

Compound amount = ₹1,348.32

Rate = R%

Time =2 years

$\because$ Amount = Principal $\left(1+\frac{R}{100}\right)^t$

$1348.32 = 1200\left(1+\frac{R}{100}\right)^2$

$\frac{1348.32}{1200} = \left(1+\frac{R}{100}\right)^2$

$\frac{44944}{40,000} = \left(1+\frac{R}{100}\right)^2$

$\frac{212}{200} = 1+\frac{R}{100}$

$\frac{R}{100} = \frac{12}{200}$

R = 6%

165. At what rate of compound interest per annum will a sum of ₹1500 become ₹1591.35 in 2 years?

(a) 3% (b) 2%

(c) 5% (d) 4%

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (a) : $A = P\left(1+\frac{R}{100}\right)^n$

$1591.35 = 1500\left(\frac{100+R}{100}\right)^2$

$\frac{1591.35}{1500} = \left(\frac{100+R}{100}\right)^2$

$\frac{15913500}{1500} = (100+R)^2$

$10609 = (100+R)^2$

$100 + R = 103$

R = 3%

166. At what annual rate of compound interest, compounded semi-annually, will ₹57,600 become ₹ 72,900 in one year?

(a) 6.25 % Annually (b) 12.5 % Annually

(c) 50 % Annually (d) 25 % Annually

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) : By given data–

Principal amount (P)= ₹ 57600

Compound amount (A) = ₹ 72900

∵ Interest, calculated semi-annually

∴ R = R/2% , Time (T) = 1 × 2

$\Rightarrow$ T = 2

$\therefore \quad A = P\left(1+\frac{R}{100}\right)^{T}$

$\Rightarrow \quad \frac{729}{576}=\left(1+\frac{R}{200}\right)^{2}$

$\Rightarrow \quad \left(\frac{27}{24}\right)^{2}=\left(1+\frac{R}{200}\right)^{2}$

$\Rightarrow \quad \left(1+\frac{R}{200}\right)=\frac{27}{24}\Rightarrow\frac{R}{200}=\frac{3}{24}$

$\Rightarrow$ R = 25% Annually

167. A sum of money becomes 8 times of itself in 3 years at compound interest compounded annually. The rate of interest is:

(a) 8% (b) 100%

(c) 5% (d) Data inadequate

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let principal = ₹P

Time = 3 years

According to the question,

$$8P = P\left(1+\frac{R}{100}\right)^{3}$$

$$(2)^{3}=\left(1+\frac{R}{100}\right)^{3}$$

$$2=\left(1+\frac{R}{100}\right)$$

$$2-1=\frac{R}{100}$$

R = 100%

168. A sum of money becomes ₹10648 after 3 years and ₹9680 after 2 years of compound interest computed yearly. What is the rate of interest?

(a) 10 % (b) 12%

(c) 8% (d) 9 %

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (a) : $A = P\left(1+\frac{r}{100}\right)^{n}$

According to the question,

$$10648 = P\left(1+\frac{r}{100}\right)^{3} \text{ ..... (1)}$$

$$9680 = P\left(1+\frac{r}{100}\right)^{2} \text{ ..... (2)}$$

From equation (1) and equation (2) -

$$\frac{10648}{9680}=\frac{P\left(1+\frac{r}{100}\right)^{3}}{P\left(1+\frac{r}{100}\right)^{2}}$$

$$\frac{1331}{1210}=\left(1+\frac{r}{100}\right)\Rightarrow\frac{121}{1210}=\frac{r}{100}$$

$$r=\frac{121\times100}{1210}=10\%$$

169. Find the rate of interest for a sum that becomes $\frac{14641}{10000}$ time of itself in 4 years compounded annually.

(a) 20% (b) 15%

(c) 12% (d) 10%

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let the rate of interest = R% per annum

$$\frac{14641}{10000}=\left(1+\frac{R}{100}\right)^{4}$$

$$\left(\frac{11}{10}\right)^{4}=\left(1+\frac{R}{100}\right)^{4}$$

On comparing both sides,

$$\frac{11}{10}=1+\frac{R}{100}$$

$$\frac{1}{10}=\frac{R}{100}$$

$$\boxed{R=10\%}$$

170. A sum of money amounts to ₹1600 in two years and ₹1700 in three years, at compounded interest, compounded annually. What is the rate of interest.

(a) 6.5% (b) 6.25%

(c) 6% (d) 7%

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : $A = P\times\left(1+\frac{r}{100}\right)^{t}$

According to the question,

$$1600 = P\left(1+\frac{r}{100}\right)^{2} \text{ \_\_\_\_\_(i)}$$

And $\quad 1700 = P\left(1+\frac{r}{100}\right)^{3}$ _____(ii)

From equation (i) ÷ equation (ii),

$$\frac{1600}{1700}=\frac{P\left(1+\frac{r}{100}\right)^{2}}{P\left(1+\frac{r}{100}\right)^{3}}$$

$$\frac{16}{17}=\frac{1}{\left(1+\frac{r}{100}\right)}$$

$$\frac{16}{17}=\frac{100}{100+r}$$

$1600 + 16r = 1700$

$16r = 100$

$r = 6.25\%$

171. If the interest is compounded annually an amount of ₹25,000 becomes ₹36,000 after 2 years.Then find the rate of interest.

(a) 22% (b) 20%

(c) 15% (d) 5%

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (b) :

From $A = P\left(1+\frac{r}{100}\right)^n$

$$36000 = 25000\left(1+\frac{r}{100}\right)^2$$

$$\Rightarrow\left(1+\frac{r}{100}\right)^2=\left(\frac{6}{5}\right)^2$$

$$\Rightarrow\frac{100+r}{100}=\frac{6}{5}$$

$\Rightarrow (100 + r)5 = 600$

$\Rightarrow 500 + 5r = 600$

$\Rightarrow 5r = 100$

$\boxed{r = 20\%}$

172. At what rate of compound interest per annum will a sum of ₹10,000 become ₹11,025 in 2 years?

(a) 6% (b) 4%

(c) 4.5% (d) 5%

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (d) : Principal = ₹10000

Amount = ₹11025

Time = 2 years

Rate (R) = ?

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$11025 = 10{,}000\left(1+\frac{r}{100}\right)^2$$

$$\frac{11025}{10{,}000}=\left(1+\frac{r}{100}\right)^2$$

$$\frac{441}{400}=\left(1+\frac{r}{100}\right)^2$$

$$\left(\frac{21}{20}\right)^2=\left(1+\frac{r}{100}\right)^2$$

$$\frac{21}{20}=1+\frac{r}{100},\ \frac{21}{20}-1=\frac{r}{100}$$

$$\frac{1}{20}=\frac{r}{100}\Rightarrow 20r=100$$

$r = 5\%$

173. If an investment of ₹1000 amounts to ₹1,440 in 2 years when compounded annually, then what is the rate of compound interest?

(a) 0.2% (b) 40%

(c) 30% (d) 20%

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

Principal (P) = ₹1000

Compound Amount (A) = ₹1440

Time (t) = 2 years

Rate (R) = ?

$$\text{Amount} = P\left(1+\frac{R}{100}\right)^t$$

$$1440=1000\left(1+\frac{R}{100}\right)^2$$

$$\left(1+\frac{R}{100}\right)^2=\frac{1440}{1000}$$

$$1+\frac{R}{100}=\frac{12}{10}$$

$$\frac{100+R}{100}=\frac{12}{10}$$

$R = 120 - 100$

$\boxed{R = 20\%}$

174. A sum of money was lent on compound interest. It became ₹500 at the end of the first year and ₹550 at the end of second year. Find the rate of compound interest per annum.

(a) 10% (b) 5%

(c) 15% (d) 20%

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : Money at the end of the first year = ₹ 500

Money at the end of the second year = ₹550

$$\%\ \text{Rate} = \frac{550-500}{500}\times 100$$

$= 10\ \%$

175. A sum of money becomes ₹6,400 in 2 years and ₹8,100 in 4 years on compound interest. Find the rate of compound interest.

(a) 14.5% (b) 10.5%

(c) 16.5% (d) 12.5%

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the price P and rate = r%

As per condition I,

Time (t) = 2 years

Amount (A_1) = ₹6400

$A_1 = P\left(1+\frac{r}{100}\right)^t$

$6400 = P\left(1+\frac{r}{100}\right)^2$ ——(i)

As per condition II,

Time (t) = 4 years

Amount (A_2) = ₹8100

$A_2 = P\left(1+\frac{r}{100}\right)^t$

$8100 = P\left(1+\frac{r}{100}\right)^4$ ——(ii)

On dividing equation (ii) by equation (i)–

$$\frac{8100}{6400} = \frac{P\left(1+\frac{r}{100}\right)^4}{P\left(1+\frac{r}{100}\right)^2}$$

$$\frac{(90)^2}{(80)^2} = \left(1+\frac{r}{100}\right)^2$$

$$\frac{r}{100} = \frac{9}{8} - 1$$

$$r = \frac{100}{8} = 12.5\%$$

176. The production in a factory increased from 6600 tons to 7986 tons in 2 years. Find the rate of increase if compounded annually.

(a) 14% (b) 10%

(c) 12% (d) 8%

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question-

$$A = P\left(1+\frac{R}{100}\right)^T$$

$$\frac{7986}{6600} = \left(1+\frac{R}{100}\right)^2 \qquad \left\{\begin{array}{l}\because A = 7986\,\text{tons}\\ P = 6600\,\text{tons}\\ T = 2\,\text{years}\end{array}\right\}$$

$$\left(\frac{11}{10}\right)^2 = \left(1+\frac{R}{100}\right)^2$$

On comparing power,

$$\frac{11}{10} - 1 = \frac{R}{100}$$

$$\frac{1}{10} = \frac{R}{100}$$

$$\boxed{R = 10\%}$$

177. A principal amount of ₹6,000 borrowed for compound interest is raised to ₹7,986 in 3 years. What is the rate of interest?

(a) 6% (b) 20%

(c) 7.5% (d) 10%

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (d) : Principal (P) = ₹6000

Amount (A) = ₹7986

Time (n) = 3 years

Rate (r) = ?

$$\text{Amount (A)} = \text{Principal (P)}\left(1+\frac{r}{100}\right)^n$$

$$7986 = 6000\left(1+\frac{r}{100}\right)^n$$

$$\frac{7986}{6000} = \left(1+\frac{r}{100}\right)^3$$

$$\frac{1331}{1000} = \left(1+\frac{r}{100}\right)^3$$

$$\left(\frac{11}{10}\right)^3 = \left(1+\frac{r}{100}\right)^3$$

$$\frac{11}{10} - 1 = \frac{r}{100}$$

$$\frac{1}{10} = \frac{r}{100}$$

$$\boxed{r = 10\%}$$

178. The amount lent at a fixed rate of compound interest becomes ₹1460 in 2 years and ₹1606 in 3 years Find the rate of interest.

(a) 11% (b) 12%

(c) 10% (d) 8%

RRB JE - 02/06/2019 (Shift-II)

Ans. (c) From $A = P\left(1+\frac{r}{100}\right)^n$

$$\frac{\text{Amount of 3 years}}{\text{Amount of 2 years}} = \frac{1606}{1460}$$

$$\frac{P\left(1+\frac{r}{100}\right)^3}{P\left(1+\frac{r}{100}\right)^2} = \frac{1606}{1460}$$

$$\frac{1606}{1460} = \left(1+\frac{R}{100}\right)^1$$

$$\frac{803}{730} = \left(1+\frac{R}{100}\right)^1$$

$$\frac{803}{730} - 1 = \frac{R}{100}$$

$$R = \frac{803-730}{730} = \frac{73}{730}\times 100 = 10\%$$

179. Deepa deposits an amount of ₹6250 in the bank which becomes ₹7840 in two years. compounded annually. The rate of interest is?

(a) 13% (b) 10%

(c) 12% (d) 11%

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (c) Principal = ₹ 6250
Time = 2 Years
Amount = ₹ 7840
Let Rate = R % Annual

$$\text{Amount} = \text{Principal} \times \left(1+\frac{R}{100}\right)^2$$

$$7840 = 6250 \times \left(1+\frac{R}{100}\right)^2$$

$$\frac{7840}{6250} = \left(\frac{100+R}{100}\right)^2$$

$$\left(\frac{28}{25}\right)^2 = \left(\frac{100+R}{100}\right)^2$$

$$\Rightarrow \frac{28}{25} = \frac{100+R}{100}$$

$\Rightarrow 28 \times 4 = 100 + R$
R = 112 – 100
R = 12% Annual

180. Raju invested ₹5000 on annual compound interest rate for 3 years After 3 years he received the ₹1655 more, then what is the rate of interest.
(a) 40 (b) 30
(c) 10 (d) 20

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (c) Principal = ₹ 5000
Compound interest = ₹ 1655
Amount = 5000 + 1655 = ₹ 6655
Time = 3 Years, Rate = R %
Formula–

$$\text{Amount} = \text{Principal}\left[1+\frac{\text{Rate}}{100}\right]^{\text{Time}}$$

$$= 6655 = 5000\left(1+\frac{R}{100}\right)^3$$

$$= \frac{6655}{5000} = \left(1+\frac{R}{100}\right)^3$$

$$= \frac{1331}{1000} = \left(1+\frac{R}{100}\right)^3$$

$$= \left(\frac{11}{10}\right)^3 = \left(1+\frac{R}{100}\right)^3$$

$$= \frac{11}{10} - 1 = \frac{R}{100}$$

$$= \frac{1}{10} = \frac{R}{100}$$

R = 10%

181. A loan of ₹ 305 was taken at a certain rate per annum of compound interest, for 3 years After three years the amount was ₹ 670, calculate the rate of compound interest.
(a) 30% (b) 35%
(c) 33% (d) 25%

RRB NTPC 27.04.2016 Shift : 1

Ans : (a) $\text{Amount } (A) = P\left(1+\frac{r}{100}\right)^n$

Time = 3Years

$$670 = 305\left(1+\frac{r}{100}\right)^3$$

$$\frac{670}{305} = \left(1+\frac{r}{100}\right)^3$$

$$2.197 = \left(1+\frac{r}{100}\right)^3$$

$$1+\frac{r}{100} = 1.3$$

$$\frac{r}{100} = 0.3$$

r = 30% Annual

Type - 7

182. In how many years will a sum of ₹ 10,000 become ₹ 13,310 at 10% compound interest per annum, compounded annually?
(a) 2 (b) 3
(c) 4 (d) 5

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : Given
Principal (p) = ₹10,000
Amount (A) = ₹13310
Rate (R) = 10%

$$13310 = 10,000\left(1+\frac{10}{100}\right)^T$$

$$\frac{1331}{1000} = \left(\frac{11}{10}\right)^T$$

$$\left(\frac{11}{10}\right)^T = \left(\frac{11}{10}\right)^3$$

T = 3 years

183. If a certain sum becomes two times itself in 6 years at compound interest in case of annual compounding, then the number of years in which it will become eight times of itself at the same rate of interest under annual compounding is :
(a) 18 years (b) 36 years
(c) 24 years (d) 12 years

RRB Group-D 09/09/2022 (Shift-I)

Ans. (a) : According to the question,

$$2P = P\left(1+\frac{R}{100}\right)^6$$

$$2 = \left(1+\frac{R}{100}\right)^6 \text{.....(i)}$$

and $$8P = P\left(1+\frac{R}{100}\right)^t$$

$$(2)^3 = \left(1+\frac{R}{100}\right)^t$$

$$\left[\left(1+\frac{R}{100}\right)^6\right]^3 = \left(1+\frac{R}{100}\right)^t \quad [\because \text{from eq. (i)}]$$

$$\left(1+\frac{R}{100}\right)^{18} = \left(1+\frac{R}{100}\right)^t$$

$$t = 18$$

Hence after 18 years will become 8 times to itself.

184. If a sum of money doubles itself in 10 years at compound interest, then in how many years will it become 16 times of itself at the same rate?

(a) 30 (b) 20
(c) 40 (d) 10

RRB Group-D 23-08-2022 (Shift-I)

Ans. (c) : Let the principal be ₹x
According to the question money gets doubled in 10year
Amount after 10 years = ₹2x

$$\Rightarrow 2x = x\left(1+\frac{r}{100}\right)^{10} \text{.....(i)}$$

Now,
We want the amount become 16 times
So,

$$\Rightarrow (2)^4 = \left[\left(1+\frac{r}{100}\right)^{10}\right]^4$$

$$\Rightarrow 16 = \left(1+\frac{r}{100}\right)^{40}$$

$\therefore$ Amount will become 16 times in 40 years.

185. Suman invested a sum of ₹20,000 at 10% per annum compound interest. If she received an amount of ₹26,620 after n years, the value of n is :

(a) 2.8 years (b) 2.5 years
(c) 3 years (d) 2 years

RRB Group-D 09/09/2022 (Shift-II)

Ans. (c) : Given
Principal (P) = Rs 20,000
Rate (R) = 10%
Amount (A) = Rs 26,620
According to question,

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$26620 = 20000\left(1+\frac{10}{100}\right)^n$$

$$\frac{2662}{2000} = \left(\frac{110}{100}\right)^n$$

$$\frac{1331}{1000} = \left(\frac{11}{10}\right)^n$$

$$\left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^n \quad \text{(equating the powers)}$$

Hence $\boxed{n = 3}$ years

186. An amount doubles itself at compound interest in five years. In how many years will it amount to sixteen times itself?

(a) 25 (b) 16
(c) 20 (d) 15

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let the principal ₹x and rate of interest = R% per annum.

$$A = P\left(1+\frac{R}{100}\right)^t$$

$$2x = x \times \left(1+\frac{R}{100}\right)^5$$

$$2 = \left(1+\frac{R}{100}\right)^5 \quad \text{...(i)}$$

Let, it become 16 times in t years-

$$16x = x \times \left(1+\frac{R}{100}\right)^t$$

$$(2)^4 = \left(1+\frac{R}{100}\right)^t$$

$$\left(1+\frac{R}{100}\right)^t = \left[\left(1+\frac{R}{100}\right)^5\right]^4 \quad \{\text{From eq}^n \text{ (i)}\}$$

$$\left(1+\frac{R}{100}\right)^t = \left(1+\frac{R}{100}\right)^{20}$$

Hence, $t = 20$ years

187. In what time will ₹3,200 invested at 10% per annum compounded quarterly become ₹3,362?

(a) $2\frac{1}{2}$ years (b) 2 years
(c) $\frac{1}{4}$ years (d) $\frac{1}{2}$ years

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (d) : Given-

Principal (P)= ₹ 3200

Amount (A)= ₹ 3362

Rate (r) =10% per annum $= \frac{5}{2}$ quarterly

Let time = n quarterly

Then, $A = P\left(1+\frac{r}{100}\right)^n$

$3362 = 3200\left(1+\frac{5}{200}\right)^n$

$\frac{3362}{3200} = \left(1+\frac{1}{40}\right)^n$

$\frac{1681}{1600} = \left(1+\frac{1}{40}\right)^n$

$\left(\frac{41}{40}\right)^2 = \left(\frac{41}{40}\right)^n$

On comparing the powers,

n =2 quarterly = 6 months

or $n = \frac{1}{2}$ year

188. In what time will ₹1000 become ₹1331 at an interest rate of 10% annum compounded annually?

(a) 2 years (b) 4 years

(c) $2\frac{1}{2}$ years (d) 3 years

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : Principal (P) = ₹ 1000

Rate (r) = 10 %

Time (t) = ?

Amount (A) = ₹1331

Amount (A) $= P\left(1+\frac{r}{100}\right)^t$

$1331 = 1000\left(1+\frac{10}{100}\right)^t$

$\frac{1331}{1000} = \left(\frac{11}{10}\right)^t$

$\left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^t$

t = 3 years

When bases are equal then their powers are also equal.

189. The compound interest on ₹20000 at 8% per annum is ₹3328. The period in years is:

(a) 2 (b) 3

(c) 5 (d) 4

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

Principal (P) = ₹ 20,000

CI = ₹ 3328

R = 8%

t = ?

$CI = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$

$3328 = 20000\left[\left(1+\frac{8}{100}\right)^t - 1\right]$

$\frac{3328}{20000} = \left(1+\frac{8}{100}\right)^t - 1$

$\frac{3328}{20000} + 1 = \left(1+\frac{8}{100}\right)^t$

$\frac{23328}{20000} = \left(1+\frac{8}{100}\right)^t$

$\frac{11664}{10000} = \left(\frac{108}{100}\right)^t$

$\left(\frac{108}{100}\right)^2 = \left(\frac{108}{100}\right)^t$

t = 2 years

190. A sum of money doubles itself at a compound interest in 15 years. In how many years will it become 8 times the original amount?

(a) 58 years (b) 40 years

(c) 52 years (d) 45 years

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

A = 2P , t = 15, Rate = R%

$\because A = P\left(1+\frac{R}{100}\right)^t$

$2P = P\left(1+\frac{R}{100}\right)^{15}$

$2 = \left(1+\frac{R}{100}\right)^{15}$

On cubed both sides–

$(2)^3 = \left[\left(1+\frac{R}{100}\right)^{15}\right]^3$

$8 = \left(1+\frac{R}{100}\right)^{45}$

On multiplying by P both sides,

$8P = P\left(1+\frac{R}{100}\right)^{45}$

Hence, principal amount will become 8 times in 45 years

191. A sum of money invested at compound interest doubles itself in 12 years. In how many years will it become 4 times at the same rate of interest?

(a) 36 (b) 24
(c) 18 (d) 20

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (b) : The amount invests at compound interest-

$\therefore$ Compound Money $= \left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$

$2P = P\left(1+\frac{R}{100}\right)^{12}$

$2 = \left(1+\frac{R}{100}\right)^{12}$ .....(i)

And $4P = P\left(1+\frac{R}{100}\right)^{\text{Time}}$

$(2)^2 = \left(1+\frac{R}{100}\right)^{\text{Time}}$

By equation (i),

$\left(\left(1+\frac{R}{100}\right)^{12}\right)^2 = \left(1+\frac{R}{100}\right)^{\text{Time}}$

$\left(1+\frac{R}{100}\right)^{24} = \left(1+\frac{R}{100}\right)^{\text{Time}}$

So, Time = 24 years

192. In how many years will a sum of ₹1,600 amount to ₹2,116 at 15% compound interest ?

(a) 4 (b) 2
(c) 3 (d) 1

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given that,
Principal (P) = ₹1600, Rate (R) = 15% , Amount (A) = ₹2116

$A = P\left(1+\frac{R}{100}\right)^n$

$\frac{2116}{1600} = \left(1+\frac{15}{100}\right)^n$

$\frac{529}{400} = \left(\frac{23}{20}\right)^n$

$\left(\frac{23}{20}\right)^2 = \left(\frac{23}{20}\right)^n$

On comparing the powers,
n = 2 years

193. In how many years ₹1728 will become ₹2197 at $8\frac{1}{3}$ annual rate of compound interest per annum.

(a) 2 Years (b) $1\frac{1}{2}$ Years
(c) 3 Years (d) $2\frac{1}{2}$ Years

RRB RPF SI – 16/01/2019 (Shift-III)

Ans : (c) Principal = ₹1728
Amount = ₹ 2197
Rate (R) = $8\frac{1}{3}$
Time (n) = ?

Amount = Principal $\left(1+\frac{R}{100}\right)^n$

$2197 = 1728\left(1+\frac{8\frac{1}{3}}{100}\right)^n = 1728\left(1+\frac{25}{300}\right)^n$

$\frac{2197}{1728} = \left(\frac{13}{12}\right)^n$

$\left(\frac{13}{12}\right)^3 = \left(\frac{13}{12}\right)^n$

n = 3 Years

194. In what time will ₹4400 become ₹4576 at 8% per annum interest compounded half yearly?

(a) 6 months
(b) 2 Years
(c) 7 months
(d) 1 Year

RRB ALP & Tec. (17-08-18 Shift-I)

Ans : (a) Let, Time = n years = 2n Half yearly
Given,

Amount (A) = ₹4576
Principal (P) = ₹4400

Rate $(r) = \frac{8\%}{2}$
= 4% Half yearly

As per the question,
Time = 2n Half yearly

From, $A = P\left(1+\frac{r}{100}\right)^n$

$\Rightarrow 4576 = 4400\left(1+\frac{4}{100}\right)^{2n}$

$\frac{4576}{4400} = \left(1+\frac{4}{100}\right)^{2n}$

$\left(\frac{26}{25}\right)^1 = \left(\frac{26}{25}\right)^{2n}$

$\Rightarrow \quad 2n = 1 \Rightarrow n = \frac{1}{2}$

So, required time = 6 months

195. Under a new scheme, a bank offers an interest of 30% per annum compounded annually. Suraj deposits ₹ 10,000 under this new scheme and at the end of the tenure receives ₹ 28,561. What was the tenure of the scheme that Suraj had chosen?

(a) 2 Years (b) 3.5 Years
(c) 4 Years (d) 4.5 Years

RRB NTPC 28.04.2016 Shift : 2

Ans : (c) A = ₹28,561

P = ₹10,000

r = 30%

n = ?

$\because A = P\left(1+\frac{r}{100}\right)^n$

$28561 = 10000\left(1+\frac{30}{100}\right)^n$

$\frac{28561}{10000} = \left(\frac{130}{100}\right)^n \Rightarrow \left(\frac{13}{10}\right)^n = \left(\frac{13}{10}\right)^4$

$\therefore$ n = 4 Years

196. In what time will the amount of ₹1000 becomes ₹1331 at the rate of 10% per annual compounded an annually?

(a) 4 Years (b) 3 Years
(c) 2 Years (d) 5 Years

RRB JE - 27/06/2019 (Shift-I)

Ans : (b) Principal (P) = ₹1000

Amount (A) = ₹1331

Rate (r) = 10%

Time (t) = ?

$A = P\left(1+\frac{r}{100}\right)^t$, $1331 = 1000\left(1+\frac{10}{100}\right)^t$

$\frac{1331}{1000} = \left(\frac{11}{10}\right)^t$

$\left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^t$

On comparing the powers,

t = 3 Years

Type - 8

197. A certain sum at compound interest amounts to ₹3,025 in 2 years and to ₹3,327.5 in 3 years, interest compounded annually. The sum and the rate of interest p.a. are respectively :

(a) ₹2,200 and 10% (b) ₹2,000 and 8.5%
(c) ₹2,800 and 9% (d) ₹2,500 and 10%

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (d) : Given that,

2 year's amount = ₹3025

3 year's amount = ₹3327.5

Rate (R) $= \frac{3327.5-3025}{3025}\times 100$

= 10%

Let principal = ₹P

Amount (A) $= P\left(1+\frac{R}{100}\right)^t$

$3025 = P\left(1+\frac{10}{100}\right)^2$

$3025 = P\times\frac{121}{100}$

$P = \frac{3025\times 100}{121}$

= ₹2500

Hence, the principal amount will be ₹2500 and the rate of interest will be 10%

198. Raghu invests ₹500000 in the name of his daughter, who is 16 years old, in a scheme that pays 5% compound interest per annum, compounded annually. What will be the total amount due to the daughter when she turns 18 years old?

(a) ₹5,51,520 (b) ₹5,52,150
(c) ₹5,51,250 (d) ₹5,15,250

RRB Group-D 26/08/2022 (Shift-III)

Ans. (c) : According to the question,

$\text{Rate\%} = 5 + 5 + \frac{5\times 5}{100}$

= 10 + 2.5 = 10.25%

Interest = $5,00,000 \times \frac{10.25}{100}$

= ₹51250

$\therefore$ Amount = 5,00,000 + 51250

= ₹5,51,250

Hence option (c) is correct.

199. On an amount of ₹10000 at 10% p.a. for 1 year. For, calculate by compounding yearly and half yearly difference between the amount of compound interest received.

(a) ₹25 (b) ₹10
(c) ₹5 (d) ₹50

RRB ALP CBT-2 Elec. - Mec. 21-01-2019 (Shift-II)

Ans. (a) : For yearly compound -

P = ₹10000

R = 10%

T = 1 year

For half-yearly compound -

P = ₹10,000

$r = \frac{10}{2} = 5\%$

t = 1 year = 2 Half yearly

Required difference =

$\left[P\left(1+\frac{R}{100}\right)^1 - P\right] \square \left[P\left(1+\frac{r}{100}\right)^2 - P\right]$

$$= \left[10,000\left(1+\frac{10}{100}\right)^{1} - 10000\right] \square \left[10,000\left(1+\frac{5}{100}\right)^{2} - 10000\right]$$

$$= \left[10000 \times \frac{11}{10} - 10000\right] \square \left[10000 \times \frac{21}{20} \times \frac{21}{20} - 10000\right]$$

$$= [11000 - 10000] \square [11025 - 10,000]$$

$$= 1000 \square 1025$$

$$= ₹25$$

200. A fixed amount becomes ₹2420 after two years at a certain rate of compound interest, and ₹2662 after three years, the interest, was calculated on an annual compound basis. Find the amount and rate of interest annually.

(a) ₹1000 and 12% (b) ₹ 2000 and 10%

(c) ₹ 2250 and 15% (d) ₹ 2500 and 5%

RRB JE - 31/05/2019 (Shift-II)

Ans : (b) Let that amount be P and interest rate be r%

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^{n}$$

According to the question-

$$2420 = P\left(1+\frac{r}{100}\right)^{2} \quad \text{----(i)}$$

$$2662 = P\left(1+\frac{r}{100}\right)^{3} \quad \text{----(ii)}$$

On dividing equation (ii) by (i)

$$1+\frac{r}{100} = \frac{2662}{2420}$$

$$r = 10\%$$

From equation (i) -

$$2420 = P\left(1+\frac{10}{100}\right)^{2}$$

$$P = 2420 \times \frac{10}{11} \times \frac{10}{11} = ₹2000$$

201. Divide ₹ 3364 between A and B, So that A's share at the end of 5 years may equal to B's share at the end of 7 years, compound interest being at 5%.

(a) ₹1564 (b) ₹1600

(c) ₹1764 (d) ₹1864

RRB JE - 27/06/2019 (Shift-I)

Ans : (c) Let A's share = ₹x

$\therefore$ B's share = ₹(3364 – x)

Amount of A -

$$\text{Amount} = \text{Principal}\left(1+\frac{r}{100}\right)^{t}$$

$$= x\left(1+\frac{5}{100}\right)^{5}$$

$$= x\left(\frac{21}{20}\right)^{5}$$

Amount of B -

$$\text{Amount} = (3364 - x)\left(1+\frac{5}{100}\right)^{7}$$

$$= (3364 - x)\left(\frac{21}{20}\right)^{7}$$

$$\therefore\ x\left(\frac{21}{20}\right)^{5} = (3364 - x)\left(\frac{21}{20}\right)^{7}$$

$$x = (3364 - x)\ \frac{21}{20} \times \frac{21}{20}$$

$$400x = 3364 \times 441 - 441x$$

$$841x = 3364 \times 441$$

$$x = \frac{3364 \times 441}{841} = ₹1764$$

202. Meena took a car loan for ₹275000 from the bank. She paid interest at an annual rate of 8% (p.a.) and paid full amount in 3 years. While paying, she gave her old scooter and ₹335000 to the bank. What was the total price of the scooter?

(a) ₹60, 000 (b) ₹6,000

(c) ₹66,000 (d) ₹6,600

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (b)

Amount of loan taken by Meena (P) = ₹275000

Rate(r) =8%, time (n) = 3Years

Cost of scooter = Amount-335000

$$= 275000 + \frac{275000 \times 8 \times 3}{100} - 335000$$

$$= 275000 + 66000 - 335000$$

$$= 341000 - 335000 = ₹6000$$

Hence, the cost of scooter is ₹6000

203. In a scheme ₹ 200 was invested for one year, which provides 10% annual simple interest. Another ₹ 200 invested for one year in an other scheme, which provides compound interest at 10% semi - annually. How much share will be the interest earned under the second plan?

(a) 50 paisa (b) ₹1

(c) 10 paisa (d) 25 paisa

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (a) Principal = ₹ 200, Rate = 10%, time = 1 Year

$$\text{Amount of first scheme} = 200\left(1+\frac{10 \times 1}{100}\right)$$

$$= \frac{200 \times 11}{10} = ₹220$$

Amount of second scheme

$$= \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{time}}$$

Principal = ₹ 200

$$\text{Rate} = \frac{10\%}{2} = 5\% \text{ (Half yearly Compound interest)}$$

time = 2 Half yearly

$$\text{Amount} = 200\times\left(1+\frac{5}{100}\right)^2$$
$$=\frac{200\times21\times21}{20\times20}=\frac{441}{2}=₹220.5$$
Profit earned under second scheme = Amount of second scheme – Amount of first scheme = 220.50 – 220 = 50 paisa

204. Due to an intense campaign against smoking, the percentage of smokers in an area is falling by 10% every year as compared to previous year. If currently the numbers of smokers is 8748, then what was the number of smokers 3 years ago?
(a) 12000 (b) 16253
(c) 11643 (d) 10000

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (a) : From the formula–
For the population of n year ago
$$A=\frac{P}{\left(1-\frac{r}{100}\right)^n}$$
$\because$ Given–
P = 8748 r = 10%
n = 3 Years
$$\therefore A=\frac{8748}{\left(1-\frac{10}{100}\right)^3}=\frac{8748}{\left(\frac{9}{10}\right)^3}$$
$$A=8748\times\frac{10}{9}\times\frac{10}{9}\times\frac{10}{9}=₹12000$$

205. Sita borrowed ₹180000 at a simple interest rate of 10% per annum. On the same day, she gave that amount to her friend at an annual compound interest rate. How much rupee did she gain at the end of 2 years?
(a) ₹ 2,000 (b) ₹ 1,600
(c) ₹ 2,200 (d) ₹ 1,800

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) : Rate = 10%, Principal = ₹ 180000,
Time = 2 Years
$$\text{Simple interest}=\frac{P\times R\times T}{100}$$
$$=\frac{180000\times10\times2}{100}$$
= ₹ 36000
$$\text{Amount} = \text{Principal}\left(1+\frac{\text{Rate}}{100}\right)^{\text{Time}}$$
$$\text{Amount} = 180000\times\left(1+\frac{10}{100}\right)^2$$
$$=180000\times\frac{11}{10}\times\frac{11}{10}$$
$$=1800\times121$$
= ₹ 217800
Compound interest = Amount - Principal
= 217800 – 180000
= ₹ 37800
Gain profit in two years
= Compound interest – Simple interest
= 37800 – 36000 = ₹ 1800

206. A person barrowed ₹32000 at a simple interest rate of 9% per annum and deposited the same amount the bank at a compound interest rate of 10% per annum. What will be the total increase in his wealth at the end of the third year?
(a) ₹1,940 (b) ₹1,952
(c) ₹926 (d) ₹2,904

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (b) Simple interest $=\frac{32000\times9\times3}{100}=27\times320$
Simple interest (S.I.) = ₹ 8,640
$$\text{Amount} = 32000\left(1+\frac{10}{100}\right)^3$$
$$=32000\left(\frac{11}{10}\right)^3$$
$$=32000\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$$
$$=32\times1331$$
= ₹ 42,592
Compound interest = Compound amount – Principal
= 42592 – 32000
= ₹ 10,592
Increase in amount
= Compound interest – Simple interest
= 10,592 – 8,640
= ₹ 1,952

207. The difference in simple interest paid by two banks for two years at ₹ 5000 is ₹25. Explain the difference between the interest rates of both the two banks.
(a) 0.25% (b) 0.60%
(c) 1% (d) 0.10%

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (a) Suppose the first bank gives interest at the rate of R_1% and the second bank gives interest at the rate of R_2%.
$$\text{Interest by first bank} = \frac{5000\times R_1\times2}{100}=100R_1 \text{ .....(i)}$$
Interest by second bank
$$=\frac{5000\times R_2\times2}{100}=100R_2 \text{ .....(ii)}$$
As per the question,
$100\ R_1-100\ R_2 = 25$
$100\ (R_1-R_2) = 25$
$$R_1-R_2=\frac{25}{100}=\frac{1}{4}=0.25\%$$

16.

Problems Based on Age

Type - 1

1. Ritesh is 12 years older than the Mohit. 17 years ago, Ritesh's age was four times of Mohit's age. Mohit's present age (in years) is:

(a) 24 (b) 27
(c) 18 (d) 21

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (d) : Let the present age of Ritesh be x years and the present age of Mohit be y years.
According to the question,
$x - y = 12$ ..... (i)
$x - 17 = 4(y - 17)$
$x - 4y = -51$..... (ii)
from eq. (i) and eq. (ii)
$3y = 63$
$y = 21$
Hence the present age of Mohit = 21 years

2. The age of a father six years ago was six times then the age of his daughter. Three years hence, the father will be thrice as old as his daughter. What is the present age of the daughter?

(a) 15 years (b) 12 years
(c) 17 years (d) 20 years

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (b) : Let the present age of father and daughter be x and y respectively.
According to first condition,
$x - 6 = 6(y-6)$
$x - 6 = 6y - 36$
$x - 6y = -30$ -------(i)
According to second condition,
$x + 3 = 3(y + 3)$
$x + 3 = 3y + 9$
$x - 3y = 6$ ------(ii)
On solving equation (i) and (ii)
$x = 42, y = 12$
Hence the present age of daughter (y) = 12 years.

3. Aruna has a younger sister whose age is 8 years less than that of Aruna. If Aruna's sister's age is 18 years, then Aruna's age is :

(a) 28 years (b) 26 years
(c) 10 years (d) 24 years

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (b) : Given that,
Age of Aruna's younger sister = 18 years.
$\because$ Aruna's younger sister's age is 8 years less than Aruna's
$\therefore$ Age of aruna = 18 + 8 = 26 years.

4. Kohli is younger than Rohit by 3 years. If the ages of Kohli and Rohit are in the ratio 7 : 8, how hold is Kohli?

(a) 18 years (b) 27 years
(c) 24 years (d) 21 years

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Let the age of Kohli and Rohit be 7x and 8x years respectively.
According to the question,
$7x + 3 = 8x$
$\Rightarrow x = 3$
Hence the age of Kohli
$= 7 \times 3 = 21$ years

5. A father is presently 3 times his daughter's age. After 10 years he will be twice as old as her. Find the daughter's present age.

(a) 15 years (b) 5 years
(c) 20 years (d) 10 years

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Let the present age of daughter = x years
then the present age of father = 3x years
According to the question,
After 10 years,
$2(x + 10) = 3x + 10$
$2x + 20 = 3x + 10$
$x = 10$ years

6. Three times the present age of P is 25 years more than the present age of Q. After 10 years, twice the age of Q will be 18 years less than thrice the age of P. Find the present age (in years) of Q.

(a) 21 (b) 16
(c) 19 (d) 17

RRB Group-D 08/09/2022 (Shift-II)

Ans. (d) : Let the present age of P be x years and the present age of Q be y years.
According to the question -
$3x - 25 = y$
$3x - y = 25$ ..... (i)
After 10 years age of P = (x + 10) years
After 10 years age of Q = (y + 10) years
$3(x + 10) = 2(y + 10) + 18$
$3x - 2y = 8$ ..... (ii)
on solving equation (i) and (ii) -
$6x - 2y = 50$ ..... (on multiplying 2 in equation (i))
$3x - 2y = 8$
$3x = 42$
$x = 14$
Putting the value of x in equation (i) -
$42 - y = 25$
or
$y = 17$ years
Hence the present age of Q is 17 years

7. Ramya got married 10 years ago. Now her age is $1\frac{1}{5}$ times her age at the time of marriage. Her daughter's age is one-tenth of her present age. Find her daughter's present age.

(a) 8 years (b) 6 years
(c) 20 years (d) 12 years

RRB Group-D 26/08/2022 (Shift-III)

Ans. (b) : Let present age of Ramya = x
At the time of marriage, Ramya's age = x – 10
According to the question,

$$x = 1\frac{1}{5}(x-10)$$

$$\Rightarrow \quad x = \frac{6}{5}x - 12$$

$$\Rightarrow \quad \frac{x}{5} = 12$$

$$\Rightarrow \quad x = 60$$

At present daughter's age = $\frac{1}{10} \times 60 = 6$
Hence, the present age of daughter is 6 years.

8. The difference between the ages of Radha and Rama is 6 years and the sum of their ages is 26. Find Radha's age, if she is older than Rama.

(a) 26 years (b) 32 years
(c) 16 years (d) 6 years

RRB Group-D 30-08-2022 (Shift-II)

Ans. (c) : According to the question,
Radha's age– Rama's age = 6 years ————(i)
Radha's age + Rama's age = 26 years ————(ii)
On adding equation (i) and (ii),
2 Radha's age = 32
Radha's age = 16 year

9. The sum of the ages of a mother, son and daughter is 70 years. If the mother is thrice as old as her son and the daughter is 5 years older than her brother, how old is the mother?

(a) 39 years (b) 35 years
(c) 42 years (d) 45 years

RRB Group-D 23-08-2022 (Shift-II)

Ans. (a) : Given,
The sum of the ages of a mother, son and daughter = 70
M + S + D = 70 ..... (i)
M = 3S
D = 5 + S
Putting value in eq^n (i)
3S + S + 5 + S = 70
S = 13
So, M = 39 and D = 18

10. The sum of the present ages of A and B is 30 years. The ratio of their ages after 5 years will be 3 : 2. The present age of A is :

(a) 11 years (b) 29 years
(c) 39 years (d) 19 years

RRB Group-D 09/09/2022 (Shift-I)

Ans. (d) : Let the present age of A = x years
And the present age of B = y years
According to first condition,
x + y = 30 ..... (i)
According to second condition,

$$\frac{x+5}{y+5} = \frac{3}{2}$$

2x + 10 = 3y + 15
2x – 3y = 5..... (ii)
from equation (i) × 4 and equation (ii) × 2
(x + y = 30) × 4 .....(iii)
(2x – 3y = 5) × 2 .....(iv)
from equation (iii) and equation (iv)
4x + 4y = 120
4x – 6y = 10
– + – on subtracting
10y = 110
y = 11
x = 30 – 11
= 19
Hence, the present age of A is 19 years

11. Rajani's father is three times older than Rajani and Rajani is twice as old as her sister Lavanya. Two years from now the sum of the given three person ages will be 60 years. Find the present age of Rajani.

(a) 12 years (b) 8 years
(c) 36 years (d) 13 years

RRB Group-D 05/09/2022 (Shift-III)

Ans. (a) : Let the present age of Lavanya be x years.
then the present age of Rajani = 2x
present age of father of Rajani = 6x
According to the question,
(x + 2) + (2x + 2) + (6x + 2) = 60
9x + 6 = 60
9x = 54
x = 6
Hence, the present age of Rajani = 2 × 6 = 12 years

12. Three years ago the age of a man was six times the age of his grandson. After three years, his age will be 6 more than four time the ago of his grandson. What is the present age of the grandson ?

(a) 8 years (b) 15 years
(c) 10 years (d) 12 years

RRB Group-D 09/09/2022 (Shift-II)

Ans. (b) : Let the age of Man = x
Age of Grandson = y
According to the first condition -
(x – 3) = 6(y – 3)
x – 6y = –15 ..... (i)
According to the second condition -
(x + 3) = 4(y + 3) + 6
x – 4y = 15 ..... (ii)
On solving equation (i) and (ii) -
y = 15
x = 75
Hence, the present age of Grandson is 15 years

13. The ratio of Kamal's to Kiran age is 4 : 5. Kamal will be 30 years old after 6 years. What is the present age of Kiran ?

(a) 28 years (b) 30 years
(c) 40 years (d) 24 years

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Let the present age of Kamal = 4x
then present age of kiran = 5x
According to the question,
age of kamal = 4x + 6 = 30
4x = 30 – 6
4x = 24
x = 6
The present age of kiran = 5x
= 5 × 6 = 30 years

14. Arun is the elder brother of Kiran. The difference in their ages is 20 years. If 5 years ago, Arun was 5 times as old as Kiran then was, then find the present age (in years) of Arun.

(a) 20 (b) 10
(c) 30 (d) 40

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (c) : Let the age of Arun = x
And the age of Kiran = y
According to the question,
x – y = 20 --------(i)
and x – 5 = (y – 5)5
x – 5y = –20--------(ii)
Substracting equation (i) and (ii)
x – y – x + 5y = 20 + 20
4y = 40
y = 10
putting the value of y in equation (i)
x – 10 = 20
x = 30 years

15. Two years ago, the ratio of the respective ages of subash and Pranav was 4 : 5. Three years hence, this ratio will become 5 : 6. The present age of Pranav is

(a) 22 years (b) 25 years
(c) 20 years (d) 27 years

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (d) : Let the ages of Subhash and Prananv 2 years ago be 4x and 5x years respectively.
Then,
The present age of Subhash = 4x + 2
The present age of Pranav = 5x + 2
According to the question,

$$\Rightarrow \frac{4x+2+3}{5x+2+3}=\frac{5}{6}$$

$$\Rightarrow \frac{4x+5}{5x+5}=\frac{5}{6}$$

$\Rightarrow 24x + 30 = 25x + 25$
$\Rightarrow 25x – 24x = 30 – 25$
$\Rightarrow x = 5$
Hence the present age of Pranav = 5 × 5 + 2
= 25 + 2
= 27 years

16. Shalini's age if four times the sum of the ages of her two sons. Six years hence, her age will be double the sum of their ages. What is Shalini's present age?

(a) 32 years (b) 40 years
(c) 26 years (d) 36 years

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (d) : Let the age of Shalini be z years and the ages of her two sons be x and y years respectively.
According to first condition,
z = (x+y) × 4 ..... (i)
According to second condition,
2(z+6) = (x+y+6+6) 2 × 2
2z + 12 = (x+y) 4 + 48
from equation (i)
2z + 12 = z + 48
z = 48 – 12
z = 36 years

17. Ravi's age is 5 years more than Gowri's age. The sum of their ages is 31 years. What is Gowri's age?

(a) 16 years (b) 18 years
(c) 15 years (d) 13 years

RRB Group-D 27-09-2022 (Shift-II)

Ans. (d) : Let the Gowri's age be 'x' years
and the Ravi's age be 'y' years.
According to the question,

$$y = x + 5 \quad .....(I)$$

$$x - y = -5$$

$$x + y = 31 \quad .....(II)$$

Adding equation (I) and (II),

$$x + y = 31$$

$$\underline{x - y = -5}$$

$$2x = 26$$

$$\boxed{x = 13} \text{ years}$$

Hence, the Gowri's age be '13' years.

18. Srinivas has just got married to a girl who is 4 year younger than him, After 5 years their average age will be 33 years. Find the present age of the girl.

(a) 35 years (b) 30 years
(c) 26 years (d) 31 years

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (c) : Let the present age of Srinivas is x years.
∴ Age of his wife = (x – 4)
After 5 years ages of Srinivas and his wife will be (x + 5) and {(x – 4) + 5} respectively.
According to question

$$\frac{(x+5)+\{(x-4)+5\}}{2}=33$$

x + 5 + x + 1 = 66
2x + 6 = 66
∴ 2x = 60
2x = 60
∴ x = 30
Girl is 4 years younger to Srinivas
∴ present age of girl = 30 – 4 = 26 years

19. The difference between the ages of Radha and Murari is 12 years. Five years ago, the sum of their ages was 28 years. If Radha is older than Murari, find Murari's present age (in years).

(a) 17 (b) 13
(c) 15 (d) 25

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (b) : Let the present age of Radha is x years and the present age of Murari is y years.

$x - y = 12$ ..... (i)

$x - 5 + y - 5 = 28$

$x + y = 38$ ..... (ii)

from equation (i) and (ii)

$x = 25$ years

$y = 13$ years

Hence the present age of Murari is 13 years.

20. Varun is three times as old as his sister. After six years from now the product of their ages will be 231. Find Varun's present age.

(a) 15 years (b) 39 years
(c) 13 years (d) 5 years

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let- Present age of Varun's sister = x years

And Varun's present age = 3x years

After 6 years,

Varun's sister age = (x + 6)

And Varun's age = (3x + 6)

According to the question-

$(x + 6)(3x + 6) = 231$

$3x^2 + 6x + 18x + 36 = 231$

$3x^2 + 24x - 195 = 0$

$x^2 + 8x - 65 = 0$

$x^2 + 13x - 5x - 65 = 0$

$x(x+13) - 5(x+13) = 0$

$(x+13)(x-5) = 0$

$x = -13, 5$

Hence, present age of Varun = $3x = 3 \times 5 = 15$ years

21. Age of A is 3 times more than that of B and half as that of C. If the sum of their ages is 120 years, what is the age (in years) of A?

(a) 34 (b) 26
(c) 65 (d) 36

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the age of B be *x* years.

According to the question,

Age of A = 3x

Age of C = 6x

As per question,

$3x + x + 6x = 120$

$10x = 120$

$x = 12$ years

$\therefore$ Age of A = $3 \times 12 = 36$ years

22. Ravi is 5 years older than his wife who is 5 times as old as her daughter. Three years ago her daughter's age was 4 years. Then the present age of Ravi is -

(a) 42 years (b) 24 years
(c) 40 years (d) 25 years

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the present age of his daughter is x years.

According to the question,

Present age of Ravi = (5x+5) years

Present age of Ravi's wife = 5x years

3 years ago–

$x - 3 = 4$

$x = 7$ years

$\therefore$ Present age of Ravi = $(5x+5) = 7 \times 5 + 5 = 40$ years

23. The ratio of the present ages of Alok and Anil is 3 : 4. If Alok's age after 20 years from now will be 62 years, then what is Anil's present age?

(a) 60 years (b) 64 years
(c) 52 years (d) 56 years

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the present ages of Alok and Anil be 3x and 4x respectively.

Age of Alok after 20 years = $3x+20 = 62$ years

$3x = 62 - 20 = 42$

$x = \frac{42}{3} = 14$ years

$\therefore$ Present age of Anil = $4x = 4 \times 14 = 56$ years

24. Six years from now, Kirti's age will be twice the age of her brother Kunal, but 4 years ago she was four times as old as Kunal was then, Find the present age of Kunal.

(a) 30 years (b) 9 years
(c) 24 years (d) 15 years

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : Let 6 years ago Kunal's age = X years

And Kirti's age = 2X years

At present,

Kunal's age = (X–6) years

And Kirti's age = (2X–6) years

According to the question-

4 years ago–

$(X-10) \times 4 = 2X-10$

$4X - 40 = 2X - 10$

$2X = 30$

$X = 15$ years

Hence, present age of Kunal = 15–6 = 9 years

25. Six years later Sunil will be twice as old as Kamal. Two years ago he was four times as old as Kamal find the present age of Kamal.

(a) 6 years (b) 4 years
(c) 18 years (d) 14 years

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (a) : Let the present age of Kamal is x years and present age of Sunil is y years.

According to the first condition,

$(y + 6) = 2(x + 6)$

$\Rightarrow \quad 2x - y = -6$ ...(i)

According to the second condition,

$(y - 2) = (x - 2) \times 4$

$\Rightarrow \quad 4x - y = 6$ ...(ii)

From equation (ii) and equation (i),

$2x = 12$

$\Rightarrow \quad x = 6$

Hence, present age of Kamal = 6 years

26. A is 6 years older than B. 10 years ago, B's age was three quarters of A's age. Find the present age (in years) of A.

(a) 34 (b) 28
(c) 38 (d) 24

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let B's age = x years
And age of A = (x+6) years
Before 10 years,
Age of B = (x–10) years
Age of A = [(x+6) –10] years
According to the question,

$$(x-10)=[(x+6)-10]\times\frac{3}{4}$$

$$x-10=(x-4)\times\frac{3}{4}$$

$$x-10=\frac{3}{4}x-3$$

$$x-\frac{3}{4}x=7$$

$$x=28 \text{ years}$$

So, the present age of A = 28 + 6 = 34 years

27. The ratio of ages of Keshav and Vipul is 9:10. After 12 years the ratio of the age will be 13 : 14. Find out the present age of Keshav?

(a) 27 years (b) 30 years
(c) 42 years (d) 39 years

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let the present age of Keshav is 9x and the present age of Vipul is 10x.
According to the question,

$$\frac{9x+12}{10x+12}=\frac{13}{14}$$

$$126x + 168 = 130x + 156$$

$$4x = 12$$

$$x = 3$$

Hence, the present age of Keshav = 9x = 9×3 = 27 years.

28. A son is 24 years younger than his father, and in 2 years, he will be half of the age of his father. What is the age of the father?

(a) 46 (b) 48
(c) 50 (d) 44

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let the age of his father = y years
And age of son = x years
According to the question,

$$x = y - 24 \quad \text{...(i)}$$

After 2 years-

$$y + 2 = 2(x + 2)$$

$$y + 2 = 2(y - 24 + 2) \quad \{\because \text{By equation (i)}\}$$

$$y + 2 = 2y - 44$$

$$2y - y = 44 + 2$$

$$\boxed{y = 46}$$

So, age of his father = 46 years

29. 10 years ago, the average age of a husband and his wife was 42 years. Now, the average age of the family consisting of the husband, wife and their son is 39 years. The present age of the son is:

(a) 20 years (b) 13 years
(c) 10 years (d) 15 years

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (b) : 10 years ago, the sum of ages of husband and wife = 42 × 2 = 84
Sum of age of husband & wife in present
= 84+20 = 104
Sum of age of husband, wife and son in present
= 39 × 3 = 117
∴ Present age of son = 117 − 104 = 13 years.

30. Lima's father is four times as old as Lima. Four years ago, his father was six times as old as he was then. Find the present age of his father

(a) 45 years (b) 30 years
(c) 35 years (d) 40 years

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the Lima's present age = x years
Present age of father = 4x years
4 years ago–

$$(4x - 4) = (x - 4) \times 6$$

$$4x - 4 = 6x - 24$$

$$2x = 20$$

$$x = 10$$

∴ Present age of his father = 4x
= 4 × 10 = 40 years

31. The present ages of Maya and Meera are in the ratio of 6 : 5 and after fifteen years the ratio will be 9 : 8. Meera's age is:

(a) 30 years (b) 35 years
(c) 20 years (d) 25 years

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let present age of Maya = 6x years
And present age of Meera = 5x years
According to the question,

$$\frac{6x+15}{5x+15}=\frac{9}{8}$$

$$48x + 120 = 45x + 135$$

$$3x = 15$$

$$x = 5$$

So, the present age of Meera = 5 × 5 = 25 years

32. The ages of Mahendra and Zahid are in the ratio 6 : 7. Fifteen years ago their ages were in the ratio 9 : 11. Mahendra's present age is :

(a) 10 years (b) 60 years
(c) 54 years (d) 18 years

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the present age of Mahendra and Zahid be 6x and 7x respectively.
According to the question,

$$\frac{6x-15}{7x-15}=\frac{9}{11}$$

$$66x–165 = 63x–135$$

$$3x = 30$$

$$x = 10$$

So, the present age of Mahendra = 6 × 10 = 60 years

33. 5 years ago, the age of Rohan's father was eight times that of Rohan. After 5 years, the ratio of Rohan's father's age to that of Rohan's age will be 10 : 3. What is Rohan's present age?

(a) 10 years (b) 8 years
(c) 15 years (d) 12 years

RRB ALP CBT-2 Physics & Maths 21-01-2019 (Shift-II)

Ans. (a) : Let Rohan's present age = (x + 5) years
And father's present age = (8x + 5) years
According to the question,

$$\frac{8x+5+5}{x+5+5}=\frac{10}{3}$$

$$\frac{8x+10}{x+10}=\frac{10}{3}$$

$24x + 30 = 10x + 100$
$14x = 70$
$x = 5$
Hence, Rohan's present age = x + 5 = 5 + 5 = 10 years

34. The sum of the present ages of father and son is 45 years. 5 years ago, the ratio of their ages was 6 : 1. Find the present age of the father.

(a) 25 years (b) 40 years
(c) 35 years (d) 30 years

RRB ALP CBT-2 Physics & Maths 21-01-2019 (Shift-III)

Ans. (c) : Let, father's present age = x years
And, son's present age = y years
According to the question,
$x + y = 45$ ____(i)
And, $\frac{x-5}{y-5}=\frac{6}{1}$
$x - 5 = 6y - 30$
$6y - x = 25$ ____ (ii)
On adding equation (i) and (ii),

$$\begin{array}{r} x+y = 45 \\ -x+6y = 25 \\ \hline 7y = 70 \end{array}$$

$y = 10$
From equation (i),
$x = 45 - y$
$= 45 - 10$
$= 35$
Hence, father's present age = 35 years

35. If the ratio of the present age of Leela and her mother 3 : 8. Leela's mother's age at the time of her birth was 25 years old. Find out the present age of his mothe:

(a) 52 (b) 40
(c) 56 (d) 48

RRB ALP CBT-2 Electrician 23-01-2019 (Shift-II)

Ans. (b) : Let, Leela's present age = 3x years
And her mother's present age = 8x years
According to the question,
$8x - 3x = 25$
$5x = 25$
$x = 5$
Hence, her mother's present age = 8x
$= 8 \times 5 = 40$ years

36. The difference of age of father and son is 24 years. Two years ago the age of father was as the twice of the present age of the son. What is the present age of the father?

(a) 46 (b) 42
(c) 44 (d) 38

RRB JE - 24/05/2019 (Shift-II)

Ans : (a) Let the present age of father = x years
And present age of son = y years
Difference between the age of father and son = 24 years
$x - y = 24$ ----(i)
According to the question,
$x - 2 = 2y$
$x - 2y = 2$ ----(ii)
From eq^n (i) and (ii)–
$x - y = 24$
$\underline{x - 2y = 2}$
$y = 22$ years
On putting the value of y in eq^n (i),
$x - y = 24$
$x - 22 = 24$
$x = 46$
Hence, present age of father = 46 years

37. The ratio of the ages of a mother and daughter is 9:2. The age of mother at the time of the birth of daughter was 28 years. What is the age of daughter?

(a) 12 years (b) 8 years
(c) 4 years (d) 6 years

RRB JE - 27/05/2019 (Shift-II)

Ans : (b) Let the age of daughter = 2x years
Age of mother = 9x years
According to the question,
$\therefore 9x - 2x = 28$
$7x = 28$
$x = 4$
$\therefore$ Age of daughter = $2x = 2 \times 4 = 8$ years

38. The difference between the age of a mother and a daughter is 20 years. After 5 years the age of daughter will be half of the present age of her mother. What is the age of the daughter?

(a) 15 years (b) 12 years
(c) 10 years (d) 8 years

RRB JE - 30/05/2019 (Shift-I)

Ans : (c) Let the present age of mother is x year and the present age of daughter is y year.
According to the question,
$x - y = 20$ ....(i)
After 5 years, $\frac{x}{2}=y+5$
$x - 2y = 10$ ....(ii)
By subtracting equation (ii) from equation (i),
$x - y = 20$
$x - 2y = 10$
$- \quad + \quad -$
$y = 10$
Hence, present age of daughter is 10 years.

39. After 4 years, the total age of the two members of a family will be 64 years. Four years ago the ratio of their age was 3 : 1. Find the age of the younger member.

(a) 10 (b) 16
(c) 12 (d) 15

RRB JE - 01/06/2019 (Shift-II)

Ans : (b) Let the age of younger member = y years
And age of elder member = x years
First condition-

$x + 4 + y + 4 = 64$

$x + y = 56$ ----(i)

Second condition-

$\frac{x-4}{y-4} = \frac{3}{1}$

$x - 4 = 3y - 12$

$x - 3y = -8$ ----(ii)

From equation (i) and (ii),

$x + y = 56$

$x - 3y = -8$

$\underline{- \quad + \quad +}$

$4y = 64$

$y = 16$

Hence, the age of younger member = y = 16 years

40. The sum and the difference of the ages of two children is 33 and 3 respectively. What is the age of the elder one?

(a) 15 years (b) 16 years
(c) 18 years (d) 24 years

RRB JE - 01/06/2019 (Shift-II)

Ans : (c) Let the age of elder child = x years
And age of younger child = y years
According to the question,

$x + y = 33$ ----(i)

$x - y = 3$ ----(ii)

From equation (i) and (ii),

$x + y = 33$

$\underline{x - y = 3}$

$2x = 36$

$x = 18$

Hence age of elder child = 18 years

41. The ratio of ages of three persons is 4:7:9. 8 years ago their total age was 56 years. What is present age of the eldest one?

(a) 28 (b) 32
(c) 36 (d) 42

RRB JE - 01/06/2019 (Shift-III)

Ans. (c) Let the present age of first person = 4x years
Present age of second person = 7x years
Present age of third person = 9x years
Before 8 years, the sum of ages of all three persons = 56 years

$4x - 8 + 7x - 8 + 9x - 8 = 56$

$20x = 80$

$x = 4$

Hence, present age of eldest person

$= 9x = 9 \times 4 = 36$ years

42. The father's age at the time of his sons' birth was equal to the present age of son. If the age of son is 20 years, then find the present age of the father.

(a) 39 years (b) 30 years
(c) 60 years (d) 40 years

RRB JE - 26/06/2019 (Shift-III)

Ans : (d) If present age of son = 20 years
So, present age of father = (20+20) = 40 years

43. P is 2 years older than Q, Q is 4 years younger than R. If the sum of their ages is 27 then the age of Q is:

(a) 8 years (b) 9 years
(c) 11 years (d) 7 years

RRB JE - 27/06/2019 (Shift-III)

Ans : (d) Let the age of Q = x years
Age of P = (x +2) years
Age of R = (x + 4) years
From question–

$(x + x + 2 + x + 4) = 27$

$3x + 6 = 27$

$3x = 21$

$x = 7$

$\therefore$ The age of Q is 7 years.

44. Six years ago, the ratio of the ages of two persons P and Q was 3 : 2. After four years, ratio of their ages will be 8:7. What is the age of P?

(a) 10 years (b) 12 years
(c) 14 years (d) 8 years

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans : (b)
Let 6 years ago the age of P and Q was 3x and 2x years.
Present age of P and Q is (3x+6) and (2x+6) years
According to the question,

$\frac{3x+10}{2x+10} = \frac{8}{7}$

$21x + 70 = 16x + 80$

$5x = 10$

$x = 2$

$\therefore$ Present age of P = $(3x+6) = 3\times2+6 = 12$ years

45. The ratio of the ages of Deepika and her mother is 3 : 11. After 3 years the ratio of their ages becomes 1:3. What is the age of Deepika.

(a) 15 years (b) 9 years
(c) 13 years (d) 11 years

RRB RPF SI – 11/01/2019 (Shift-I)

Ans. (b) : Let the age of Deepika and her mother is 3x and 11x years respectively.
According to the question,

$\frac{3x+3}{11x+3} = \frac{1}{3}$

$\Rightarrow 9x+9 = 11x+3$

$\Rightarrow 2x = 6$

$\Rightarrow x = 3$

Therefore, the age of Deepika = $3\times3 = 9$ years

46. The ratio of present ages of X and Y is 3 : 4. Five years ago the ratio of their ages was 5:7. Then what is the present age of Y.

(a) 50 years (b) 60 years
(c) 30 years (d) 40 years

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans. (d) : Let the present age of X and Y is 3x and 4x years respectively.
According to the question,

$$\frac{3x-5}{4x-5}=\frac{5}{7}$$

$21x - 35 = 20x - 25$
$21x - 20x = -25 + 35$
$x = 10$
So, present age of Y $= 4x = 4 \times 10 = 40$ years

47. The ratio of the ages of the father, mother and daughter is 22:20:9. After 10 years ratio this will be 27:25:14. Find the present age of the mother.
(a) 21 (b) 26
(c) 27 (d) 40

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (d) Let the age of father, mother and daughter is 22x, 20x and 9x years respectively.
According to the question,-

$$\frac{22x+10}{20x+10}=\frac{27}{25}$$

$550x + 250 = 540x + 270$
$10x = 20$
$x = 2$
$\therefore$ The present age of mother $= 20x$
$= 20 \times 2 = 40$ years

48. 6 years ago, the ratio of ages of Saina and Sagar was 6 : 5 therefore in the next four years the ratio of their ages will be 11:10. What is the present age of Sagar?
(a) 14 years (b) 16 years
(c) 12 years (d) 18 years

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (b)
Let 6 years ago the ages of Saina and Sagar was 6x and 5x year respectively.
The present age of Saina and Sagar = (6x + 6)years, (5x + 6) years
According to the question,-

$$\frac{6x+6+4}{5x+6+4}=\frac{11}{10}$$

$60x + 100 = 55x + 110$
$5x = 10$
$x = 2$
$\therefore$ Present age of Sagar $= 5x + 6 = 5 \times 2 + 6 = 16$ years

49. S is 7 years younger than R. If the ratio of their ages is 7:9, then what is the age of S.
(a) 16 years (b) 28 years
(c) 18 years (d) 24.5 years

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (d) Let the age of S = x years
Age of R = $(x + 7)$ years
According to the question,-

$$\frac{x}{x+7}=\frac{7}{9}$$

$\Rightarrow 9x = 7x + 49$
$\Rightarrow 2x = 49$
$\Rightarrow x = 24.5$ years
Therefore, age of S is 24.5 years.

50. The sum of the ages of 6 persons A, B, C, D E and F working in the same company is 105 years. There is a difference of 5 years between the birth of all of them. What is the age of the eldest person?
(a) 20 years (b) 25 years
(c) 30 years (d) 15 years

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (c) Let the age of eldest person = x years
Therefore, the age of All 6 persons is
x, (x –5), (x – 10), (x–15), (x – 20) and (x – 25) years
According to the question,
$x + x - 5 + x - 10 + x - 15 + x - 20 + x - 25 = 105$
$6x - 75 = 105$
$6x = 180$
$\boxed{x = 30}$
Therefore, the age of eldest person = 30 years.

51. The ratio of the present ages of Naresh and Suparna is 7:3, three years later from now the ratio of their ages will be 2:1. Present age of Naresh is ___ years.
(a) 10.5 (b) 28
(c) 14 (d) 21

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans : (d) Let the present age of Naresh = 7x years
Present age of Suparna = 3x years
According to the question,

$$\frac{7x+3}{3x+3}=\frac{2}{1} \Rightarrow 7x + 3 = (6x + 6)$$

$\Rightarrow x = 6 - 3$
$\Rightarrow \boxed{x = 3}$
$\therefore$ Present age of Naresh = $7 \times 3 = 21$ years

52. The ratio of the present ages of X and Y is 5:4. Three years later from now, the ratio of their ages will be 11:9. What is the present age of Y.
(a) 26 years (b) 22 years
(c) 27 years (d) 24 years

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (d) Let the present age of X and Y is 5x and 4x years respectively,
According to the question,

$$\frac{5x+3}{4x+3}=\frac{11}{9}$$

$45x + 27 = 44x + 33$
$x = 33 - 27$
$x = 6$
$\therefore$ Present age of Y = $4 \times 6 = 24$ years

53. The present ages of S and A are in the ratio of 5:4 respectively. Therefore after three years, the ratio of their ages will be 11:9 respectively. What is the present age of S?
(a) 24 (b) 30
(c) 40 (d) 27

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b) Let the present age of S = 5x years
Present age of A = 4x years

From question−

$$\frac{5x+3}{4x+3}=\frac{11}{9}$$

$45x + 27 = 44x + 33$

$x = 6$

Therefore, present age of S = $5x = 5 \times 6 = 30$ years

54. Aman is as younger than as Vinay and he is older than Arun. If the sum of the ages of Arun and Vinay is 40 years, then what is the age of Aman?

(a) 20 years (b) 22 years

(c) 25 years (d) 30 years

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (a) According to the question,

Age of Vinay – Age of Aman = Age of Aman – Age of Arun

Age of Vinay + Age of Arun = 2 × Age of Aman

2 × Age of Aman = 40

Age of Aman = 20 years

55. The ratio of present ages of J and K is 11:6. After 5 years the ratio of their ages will be 12 :7. What is the present age of K.

(a) 30 years (b) 60 years

(c) 55 years (d) 35 years

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (a) Let the present age of J and K is 11x and 6x years respectively.

According to the question,

$$\frac{11x+5}{6x+5}=\frac{12}{7}$$

$77x + 35 = 72x + 60$

$77x – 72x = 60 – 35$

$5x = 25$

$x = 5$

Therefore, present age of K = $6 \times 5 = 30$ years

56. The ratio of present age of Rekha and Rashmi is 7:4. Three years later from now the ratio of their ages will be 8:5. What is the present age of Rashmi (in years)?

(a) 15 (b) 9

(c) 8 (d) 12

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (d) : Let the present age of Rekha and Rashmi is 7x and 4x years respectively.

According to the question,

$$\frac{7x+3}{4x+3}=\frac{8}{5}$$

$35x + 15 = 32x + 24$

$3x = 9$

$x = 3$

Therefore, present age of Rashmi = $4x = 4 \times 3 = 12$ years

57. The ratio of present age of Meena and Seena is 4:3. After 6 years age of Meena will be 26 years. What is the present age of Seena?

(a) 12 years (b) 19 years 6 months

(c) 15 years (d) 21 years

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (c) Let the present age of Meena = 4x years

And present age of Seena = 3x years

According to the question,

$4x + 6 = 26$

$4x = 20$

$x = 5$

Present age of Seena = $3x = 3 \times 5 = 15$ years

58. When the age of father is 54 years then the difference between the ages of the two sisters is 4 years. Father is two years older than mother. The age of the younger sister is half of the age of the mother. Find the age of the elder sister.

(a) 26 (b) 27

(c) 29 (d) 30

RRB NTPC 06.04.2016 Shift : 1

Ans : (d) The age of father = 54 years

$\therefore$ Age of mother = 54 − 2 = 52 years

$$\text{Age of younger sister} = \frac{\text{Age of mother}}{2} = \frac{52}{2} = 26 \text{ years}$$

Age of elder sister – Age of younger sister = 4 years

Age of elder sister − 26 = 4 years

$\therefore$ Age of elder sister = 4 + 26 = 30 years

59. There is a difference of two years in the age of two sisters, while the age of her father is 52 years. Father is two years older than mother. If the age of the elder sister is half of the age of mother, find the age of the younger sister.

(a) 27 (b) 21 (c) 25 (d) 23

RRB NTPC 06.04.2016 Shift : 2

Ans : (d) Let the age of elder sister = x years

Then age of younger sister = (x – 2) years

Age of father = 52 years

Age of mother = 52 -2 =50 years

$$\frac{\text{Age of mother}}{2} = \text{Age of elder sister}$$

$$\frac{50}{2} = x$$

Age of elder sister (x) = 25 years

$\therefore$ The age of younger sister = x – 2 = 25 − 2 = 23 years

60. Sarika has three children. First is 5 years older than the second one and the second one is 4 years older than the third. The sum of their ages is 22 years. Find the age of the eldest child.

(a) 7 (b) 9 (c) 11 (d) 12

RRB NTPC 29.04.2016 Shift : 1

Ans : (d) Let the age of second child = x years

Then the age of third child = (x – 4) years

And the age of first child = (x + 5) years

According to the question,

$x – 4 + x + x + 5 = 22$

$3x + 1 = 22$

$3x = 21$

$x = 7$

$\therefore$ Age of eldest child = x + 5= 7 + 5 = 12 years

61. Neetu is 10 years elder to Meetu, and Meetu is 7 years elder to Geetu. If the sum of their ages is 48 years, what is Neetu's age (in years)?

(a) 25 (b) 22
(c) 28 (d) 27

RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (a) According to the question,

$N = M + 10$ .....(i)

Where
$N \Rightarrow$ Neetu
$M \Rightarrow$ Meetu
$G \Rightarrow$ Geetu

$M = G + 7$ .....(ii)
$N + M + G = 48$ .....(iii)
From equation (i), (ii) and (iii)–
$M + 10 + M + M - 7 = 48$
$3M = 45$
$M = 15$
Age of Meetu is 15 years,
$\therefore$ Age of Neetu = M + 10 = 25 years

62. Two third of my present age is equal to three fourth of my cousin's age. My age three years ago will be equal to my cousins's age four year from now. What is my present age.
(a) 72 (b) 63
(c) 54 (d) 81

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (b) If my present age = x years and present age of my cousin = y years
Then,
According to the first condition-
$\frac{2x}{3} = \frac{3y}{4}$
$8x - 9y = 0$ ..... (i)
According to second condition–
$x - 3 = y + 4$
$x - y = 7$
$y = x - 7$
On putting $(y = x - 7)$ in equation (i)–
$8x - 9(x-7) = 0$
$8x - 9x + 63 = 0$
$-x + 63 = 0$
$x = 63$ years
Hence, my present age (x) = 63 years

63. The difference between ages of two persons A and B is 16 years. If 6 years ago, the elder one was 3 times as old as the younger one, find the present age of the younger between A and B ?
(a) 15 years (b) 11 years
(c) 14 years (d) 12 years

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (c) Let Age of B = x years
$\therefore$ Age of A = (16 + x) years
According to the question,
$3(x-6) = (16 + x - 6)$
$3x - 18 = x + 10$
$2x = 28$
$x = 14$
Therefore, the age of younger person is 14 years.

64. Present ages of Sai and Sateesh are in the ratio of 5 : 4 respectively. After three years the ratio of their ages will be 11 : 9 respectively. What is the present age of Sateesh in years?
(a) 22 (b) 23
(c) 21 (d) 24

RRB ALP & Tec. (10-08-18 Shift-I)

Ans : (d) Let the present age of Sai and Sateesh is 5x years and 4x years respectively.
According to the question,
$\frac{5x+3}{4x+3} = \frac{11}{9}$
$\Rightarrow$ $9(5x+3) = 11(4x+3)$
$\Rightarrow$ $45x+27 = 44x+33$
$\Rightarrow$ $45x - 44x = 33 - 27$
$\Rightarrow$ $x = 6$
Therefore, present age of Sateesh = 6×4 = 24 years

65. Tom's father is three times older than Tom. 10 years ago, the age of Tom's father was 7 times that of his age. What is the Tom's present age?
(a) 15 years (b) 16 years
(c) 14 years (d) 17 years

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (a) Let the present age of Tom = x years
Then present age of Tom's father = 3x years
According to the question,
$7(x - 10) = (3x - 10)$
$7x - 70 = 3x - 10$
$4x = 60$, $x = 15$ years
Therefore, present age of Tom (x) = 15 years

66. Rajan was married 8 years ago. Then he was 5/6 of his present age. At the time of his marriage, his sister was 10 years younger than him. What is the present age of sister?
(a) 38 (b) 32
(c) 26 (d) 40

RRB JE - 22/05/2019 (Shift-I)

Ans : (a) Let the present age of Rajan = x years
Then present age of sister = (x – 10) years
According to the question,
$x - 8 = \frac{5}{6}x$
$x - \frac{5}{6}x = 8$
$\frac{x}{6} = 8$
$x = 48$ years
Therefore, present age of sister = 48 – 10 = 38 years

67. Raja is three times older than Arun. Three years ago, he was four times older than Arun. How old is Raja now?
(a) 6 (b) 15
(c) 27 (d) 12

RRB JE - 23/05/2019 (Shift-I)

Ans : (c) Let the age of Raja = 3x years
Age of Arun = x years
From question–
$(3x - 3) = 4(x - 3)$
$3x - 3 = 4x - 12$
$\boxed{x = 9}$
Present age of Raja = 3 × 9 = 27 years

68. Present age of a son is 2/5 of his mother's age. After 8 years his age will be half of his mother's age. What is his mother's present age?

(a) 36 (b) 42
(c) 40 (d) 50

RRB JE - 26/05/2019 (Shift-III)

Ans : (c) Let the present age of mother = x years

Present age of son $= \frac{2x}{5}$ years

$\therefore$ From question,

$$\frac{2x}{5} + 8 = \frac{x+8}{2}$$

$$\frac{2x+40}{5} = \frac{x+8}{2}$$

$$4x + 80 = 5x + 40$$

$$x = 40 \text{ years}$$

Hence, the present age of mother = 40 years

69. Three times of my age before three years subtracting from three times of my age after three years, then my present age is found. What is my present age.

(a) 21 years (b) 15 years
(c) 24 years (d) 18 years

RRB RPF SI – 06/01/2019 (Shift-II)

Ans. : (d) Let my present age is x years.

From question−

$$3(x+3) - 3(x-3) = x$$

$$3x + 9 - 3x + 9 = x$$

$$x = 18 \text{ years}$$

70. The ratio of ages of a brother and sister is 4:3. After 3 years the age of the sister will be double of her present age. What is present age of brother?

(a) 4 years (b) 12 years
(c) 6 years (d) 8 years

RRB JE - 29/05/2019 (Shift-I)

Ans : (a) Let the present age of brother and sister is 4x, 3x years respectively.

Age of sister after 3 years = (3x + 3) years

According to the question,

$(3x + 3) = 3x \times 2$

$3x + 3 = 6x$

$3 = 3x$

$\boxed{x = 1}$

$\therefore$ Present age of brother = $4x = 4 \times 1 = 4$ years

71. The sum of the ages of father and son is 45 years. Five years ago, the product of their ages was four times that of his father age at that time. What is the present age of father?

(a) 36 (b) 42
(c) 28 (d) 60

RRB JE - 27/06/2019 (Shift-III)

Ans : (a) Let the present age of son = x years

Present age of father = (45 – x) years

Age of son before 5 years = (x – 5) years

Age of father before 5 years = (40 – x) years

According to the question,-

$(x-5)(40-x) = 4(40-x)$

$x - 5 = 4$

$x = 9$

$\therefore$ Present age of father = 45 – x = 45 – 9 = 36 years

72. A father is 5 times older than his son. Five years ago, he was six times older than his son. Find the age of his son.

(a) 32 years (b) 35 years
(c) 25 years (d) 28 years

RRB JE - 27/06/2019 (Shift-III)

Ans : (c) Let the present age of son = x years

Present age of father = 5x years

Age of son before 5 years = x – 5

Age of father before 5 years = 5x – 5

from question−

$5x - 5 = 6(x - 5)$

$5x - 5 = 6x - 30$

$x = 25$

Therefore, the age of son will be 25 years.

73. A father's age is three times of his son's age and the son's age is 3/8 of his mother's age. If the difference between his mother's age and the father's age is 4 years, then find the age of the son.

(a) 10 years (b) 9 years
(c) 11 years (d) 12 years

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (d) Let the age of son = x years

$\therefore$ Age of father = 3x years

And age of mother $= \frac{8}{3}x$ years

According to the question,

$$3x - \frac{8}{3}x = 4$$

$$9x - 8x = 12$$

$$x = 12 \text{ years}$$

Therefore, age of son = 12 years

74. 17 years later from Chetna's age will be twice as Mahim's age. Before 5 years from today Mahim's age was one year less than 1/3 part of Chetna's age. What is the present age of Chetna?

(a) 65 years (b) 63 years
(c) 67 years (d) 61 years

RRB RPF SI – 05/01/2019 (Shift-II)

Ans : (a) Before 5 years,

Age of Chetna = x years

Age of Mahim $= \frac{x}{3} - 1 = \left(\frac{x-3}{3}\right)$ years

After 17 years,

$$x + 5 + 17 = \left(\frac{x-3}{3} + 5 + 17\right) \times 2$$

$$x + 22 = \left(\frac{x-3}{3} + 22\right) \times 2$$

$$x + 22 = \frac{2x-6}{3} + 44$$

$$x - \frac{2x-6}{3} = 22$$

$$3x - 2x - 6 = 66$$

$$x = 60$$

Hence, the present age of Chetna = 60 + 5 = 65 years

75. The sum of the present ages of the two cousins is 54 years. Before 11 years, the elder brother was three times old as the younger one. What is the present age of the elder brother.

(a) 36 years (b) 35 years
(c) 32 years (d) 34 years

RRB RPF SI – 13/01/2019 (Shift-II)

Ans : (b) Let the present age of first brother = x years (elder brother)
Then present age of second brother = (54–x) years
Age of both before 11 years would be–
(x–11)years, (54–x–11)years
According to the condition-
$x-11 = (43-x) \times 3$
$x - 11 = 129 - 3x$
$4x = 140$
$x = 35$ years
Therefore, present age of elder brother will be 35 years.

76. A's present age is 9 years more than B. After 10 years, A's age will be twice as old as B's was of 10 years ago. What is the present age of A?

(a) 48 (b) 39
(c) 36 (d) 23

RRB JE - 30/05/2019 (Shift-II)

Ans : (a) Let the present age of B = x years
Present age of A = (x + 9) years
According to the question,
$x + 9 + 10 = 2(x - 10)$
$x + 19 = 2x - 20$
$x = 39$
Therefore, present age of A = x + 9
= 39 + 9 = 48 years

77. Pinaki is 9 years younger than Bhaswati. After thirteen years Bhaswati's age will be 1.2 times of Pinaki's age. Find present age of Pinaki.

(a) 28 years (b) 32 years
(c) 30 years (d) 33 years

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (b) Let the present age of Bhaswati = x years
Present age of Pinaki = (x–9) years
Age of Bhaswati after 13 years = (x+13) years
Age of Pinaki after 13 years = (x–9+13) = (x+4) years
According to the question,
$(x+13) = 1.2(x+4)$
$x+13 = 1.2x+4.8$
$0.2x = 8.2$
$x = \frac{8.2}{0.2} = 41$
Therefore, present age of Pinaki = (x–9) = (41–9) = 32 years

78. Priyamvad's present age is five years more than twice the age of his cousin Ritika. 16 years later from now, Priyamvad's age will be 150% more than Ritika's age. At present what is the age of Priyamvad (in years)?

(a) 33 (b) 23
(c) 26 (d) 17

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (d) : Let the age of Ritika = x years
Present age of Priyamvad = (2x + 5) years
According to the question,
$\left(1+\frac{50}{100}\right)(x+16) = 2x+5+16$
$\frac{3}{2}(x+16) = 2x+21$
$3x + 48 = 4x + 42$
$\boxed{x = 6}$
Present age of Priyamvad = 2x+5 = 2×6+5 = 17 years

79. $3/7^{th}$ of my present age is same as $4/5^{th}$ of one of my cousin's age. My age before 3 years was equal to his age after 10 years from now. What is my present age?

(a) 42 (b) 35
(c) 21 (d) 28

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (d) : Let my present age = x years
And present age of cousin = y years
According to first condition -
$x \times \frac{3}{7} = y \times \frac{4}{5}$
$15x = 28y$ .....(i)
∴ My age before 3 years = (x-3) years
∴ The age of cousin after 10 years from now
= (y+10) years
According to second condition-
$(y+10) = (x-3)$
$x = y+13$
Putting x = y + 13 in equation (i),
$15(y+13) = 28y$
$15y+195 = 28y$
$13y = 195$
or y=15 years
Now, my present age = x = 15+13= 28 years

80. Shan's present age is 4 yrs less than 1.6 times of Udhalak's age. Before 26 yrs Udhalak's age was one year less than half of the Shan's age. What is the present age of Shan?

(a) 68 (b) 84
(c) 76 (d) 60

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (c) Let the present age of Udhalak = x years
∴ Present age of Shan = $(1.6x - 4)$ years
∴ Age of Udhalak before 26 years = $(x - 26)$
∴ Age of Shan before 26 years = $(1.6x - 4 - 26)$
= $(1.6x - 30)$
According to the question,
$\frac{1.6x-30}{2} - 1 = x - 26$
$1.6x - 30 - 2 = 2x - 52$
$0.4x = 52 - 32$
$0.4x = 20$

$x = \frac{20 \times 10}{4}$

$x = 50$

$\therefore$ Present age of Shan = 50 × 1.6 – 4 = 80 – 4 = 76 years

81. 18 years ago, Cyrus was 2.5 times older than Nikhil. The sum of their present ages is 92 years. What is the present age of Nikhil?

(a) 31 years (b) 32 years
(c) 34 years (d) 33 years

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (c) Let the age of Nikhil before 18 years = x years
Age of Cyrus before 18 years = $2.5x$ years
Present age of Nikhil = $(x + 18)$ years
Present age of Cyrus = $(2.5x + 18)$ years
According to the question,

$(x + 18) + (2.5x + 18) = 92$
$3.5x + 36 = 92$
$3.5x = 92 - 36$
$3.5x = 56$
$x = \frac{56}{3.5}$
$x = \frac{560}{35}$
$\boxed{x = 16}$

$\therefore$ Present age of Nikhil = x +18 = 16 + 18 = 34 years

82. Robin's father is 2.8 times older than him. Six years ago, age of Robin's father was 4 times of his age. What is Robin's present age?

(a) 16 years (b) 15 years
(c) 14 years (d) 17 years

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (b) Let the present age of Robin = x years
Present age of Robin's father = $2.8x$ years
Age of Robin before 6 years = (x – 6) years
Age of father before 6 years = (2.8x – 6) years
According to the question,

$(2.8x - 6) = 4(x - 6)$
$2.8x - 6 = 4x - 24$
$2.8x - 4x = -24 + 6$
$-1.2x = -18$
$x = \frac{180}{12}$
$x = 15$

Therefore, age of Robin = 15 years

83. After three years from now, Panna's age will be four years less than three times of Eugene's age. The sum of their present ages is 54 years. What is the present age of Panna?

(a) 36 years (b) 43 years
(c) 39 years (d) 41 years

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (d) Let the present age of Panna = x years
$\therefore$ Present age of Eugene = $(54 - x)$ years
After 3 years,
Age of Panna = $(x + 3)$ years
Age of Eugene = $(54 - x + 3)$
= $(57 - x)$ years

According to the question,

$3(57 - x) - 4 = x + 3$
$171 - 3x - 4 = x + 3$
$4x = 164$
$x = 41$ years

Therefore, present age of Panna = 41 years

84. The total age of mother and daughter is 50 years. After 5 years the mother's age will be 4 times more than the daughter's age. Find the present age of the daughter?

(a) 12 years (b) 10 years
(c) 7 years (d) 15 years

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (c) Let the present age of daughter = x years
Then present age of mother = (50 – x) years
Age of mother after 5 years = (50 – x + 5) years
= (55 – x) years
Age of daughter after 5 years = (x + 5) years
According to the condition—

$(55 - x) = 4(x + 5)$
$55 - x = 4x + 20$
$55 - 20 = 4x + x \Rightarrow 5x = 35$
$\Rightarrow x = 7$

Therefore, present age of daughter = 7 years

85. Anish is three times older than his son and the sum of their age is 48 years. Find age of Anish.

(a) 36 (b) 20
(c) 40 (d) 12

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (a) Let the age of son = x years
And age of Anish = 3x years
According to the question,

$3x + x = 48$
$x = 12$

Therefore, age of Anish = 3 × 12 = 36 years

86. Five years ago, the son's age was one third of his mother's age. If the sum of their present age is 70, find the present age of the mother.

(a) 45 (b) 55
(c) 50 (d) 60

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (c) Let the age of mother before 5 years = x years
$\therefore$ Present age of mother = $(x + 5)$ years
And age of son before 5 years = $\frac{x}{3}$ years
$\therefore$ Present age of son = $\left(\frac{x}{3} + 5\right)$ years
According to the question,

$x + 5 + \frac{x}{3} + 5 = 70$
$\frac{4x}{3} + 10 = 70$
$4x + 30 = 210$
$4x = 180$
$x = 45$
Present age of mother = $x + 5$ years
= 45 + 5 = 50 years

Therefore, present age of mother is 50 years.

87. Soham is 10 years younger than Parth. Before 8 years Soham's age was three times of his present age that was 4 years more than twice of the age of Parth. Find Soham's present age.

(a) 28 years (b) 32 years
(c) 30 years (d) 33 years

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (b) : Let the present age of Soham = x years
Present age of Parth = (x + 10) years
Age of Soham before 8 years = (x – 8)
Age of Parth before 8 years = x + 10 – 8 = (x + 2)
According to the question,

$3(x - 8) = 2(x + 2) + 4$
$3x - 24 = 2x + 4 + 4$
$x = 32$ years

∴ Present age of Soham = 32 years

88. Nilanjan is 11 years younger than Bharti. After Fifteen years later, Bharti's age will be 1.2 times as that of Nilanjan's age. What is Nilanjan's present age?

(a) 38 years (b) 40 years
(c) 42 years (d) 43 years

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (b) : Let the present age of Bharti = x years
Present age of Nilanjan = (x – 11) years
According to the question,

$(x + 15) = (x - 11 + 15)\ 1.2$
$(x + 15) = (x + 4) \times 1.2$
$(x + 15) = 1.2x + 4.8$
$15 - 4.8 = 0.2x$
$10.2 = 0.2x$
$x = 51$ years

∴ Present age of Nilanjan = 51 – 11 = 40 years

89. Srinivas is four times older than his daughter. Five years ago, Srinivas was nine times older than his daughter's age at that time. What is his daughter's present age?

(a) 8 years (b) 6 years
(c) 5 years (d) 10 years

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (a) : Let the present age of daughter = x years
Present age of Srinivas = 4x years
According to the question,

$9(x - 5) = 4x - 5$
$9x - 45 = 4x - 5$
$5x = 40$
$x = 8$

Therefore, present age of daughter = 8 years

90. Eight years ago, Ashwin's age was 1 year less than 3 times of Arpit's age. Six years ago Ashwin's age was 1 year more than twice of Arpit's age. What will be the age of Arpit after 7 years?

(a) 19 years (b) 15 years
(c) 16 years (d) 12 years

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (a) : Let the age of Arpit before 8 years = x years
Age of Ashwin before 8 years = (3 x – 1) years
Present age of Arpit = (x + 8) years
And present age of Ashwin = (3x + 7) years
According to the question,

$(3x + 7 - 6) = 2(x + 8 - 6) + 1$
$3x + 1 = 2x + 4 + 1$
$x = 4$

∴ Present age of Arpit = x + 8 = 4 + 8 = 12 years
And age of Arpit after 7 years = 12+7 = 19 years

91. After 19 years from now Vinod's age will be twice of Anand's age. Seven years ago, Anand's age was 1/4 of Vinod's age. What is Vinod's present age?

(a) 53 years (b) 57 years
(c) 55 years (d) 59 years

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (d) Let the age of Anand before 7 years = x years
The age of Vinod 7 before years = 4x years
Present age of Anand = (x + 7) years
Present age of Vinod = (4x + 7) years
According to the question,

$2(x + 7 + 19) = (4x + 7 + 19)$
$2x + 52 = 4x + 26$
$2x = 26$
$x = 13$

∴ Present age of Vinod $= 4x+7 = 4 \times 13 + 7 = 59$ years

92. After 11 years, Raghav's age will be 5 times of his 5 years before age. What is the present age of Raghav?

(a) 7 years (b) 8 years
(c) 4 years (d) 9 years

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : Let, the present age of Raghav = x years
Age of Raghav after 11 years = (x+11) years
Age of Raghav before 5 years = (x-5) years
According to the question,

$(x+11) = (x-5) \times 5$
$x+11 = 5x-25$
$36 = 4x$
$x = 9$

∴ Present age of Raghav = 9 years

93. Rani is two years older than Ragini, whose age is twice the age of Nag. If the age of Rani, Ragini and Nag is 27 years, then the age of Ragini will be?

(a) 9 (b) 8
(c) 10 (d) 7

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (c) Let the age of Ragini = x years
Age of Rani = $(x + 2)$ years

Age of Nag = $\frac{x}{2}$ years

According to the question,

$x + x + 2 + \frac{x}{2} = 27$
$2x + 2x + 4 + x = 54$
$5x = 50$
$x = 10$ years

Hence, age of Ragini = 10 years.

94. Vishal is 20 years younger than Arya. After 12 years Arya's age will be 1.25 times that of Vishal . Arya's age now is _____ years.

(a) 72 (b) 68
(c) 88 (d) 78

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (c) Let the age of Vishal = x years
Age of Arya = (x + 20) years
According to the question,

$$(x + 20 + 12) = (x + 12)\ \frac{5}{4}$$

$$x + 32 = \frac{5x + 60}{4}$$

$$4x + 128 = 5x + 60$$

$$x = 68$$

Therefore, present age of Arya = x+20
= 20+68 = 88 years

95. Five years ago, Rohit's age was 2/3 times of Rohan's age. After 5 years Rohan's age will be 5/4 times of Rohit's age. What is the present age of Rohit.
(a) 25 years (b) 20 years
(c) 10 years (d) 15 years

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (d) Let the present age of Rohit = x years
Present age of Rohan = y years
According to first condition,

$$(x-5) = (y-5)\times\frac{2}{3}$$

$$3x - 15 = 2y - 10$$

$$3x = 2y + 5$$

$$x = \frac{2y+5}{3} \quad .....(i)$$

According to second condition–

$$\frac{5}{4}\times(x+5) = (y+5)$$

$$5x + 25 = 4y + 20$$

$$5x - 4y = -5$$

or, $5x = 4y - 5$

$$x = \frac{4y-5}{5} \quad .....(ii)$$

From equation (i) and (ii),

$$\frac{2y+5}{3} = \frac{4y-5}{5}$$

$$10y + 25 = 12y - 15$$

$$2y = 40$$

$$y = 20 \text{ years}$$

Putting the value of y in equation (i),

$$x = \frac{2\times 20+5}{3}$$

$$x = \frac{45}{3} = 15 \text{ years}$$

Therefore, present age of Rohit = 15 years

96. Daliya is 20 years older than Neetu and after two years her age will be twice the age of Neetu. What is Neetu's present age.
(a) 18 years (b) 16 years
(c) 20 years (d) 22 years

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (a) Let the present age of Neetu = x years
Then present age of Daliya = (20 + x) years
According to the question,

$$[(20 + x) + 2] = 2(x+2)$$

$$22 + x = 2x + 4$$

$$\boxed{x = 18}$$

Therefore, present age of Neetu = x = 18 years

97. The sum of Daniel and Dinara's age is 115 years. Five years ago two times of Dinara's age was equal to three times Daniel's age. What is the present age of Dinara?
(a) 62 years (b) 64 years
(c) 66 years (d) 68 years

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (d) Let the present age of Daniel = x years
And present age of Dinara = y years
According to first condition–

$$x + y = 115 \quad .....(1)$$

According to second condition–

$$3(x-5) = (y-5) \times 2$$

$$3x - 15 = 2y - 10$$

$$3x - 2y = -10 + 15$$

$$3x - 2y = 5.....(2)$$

On multiplying by 2 in equation (i) and adding in equation (ii)-

$$2x + 2y = 230$$

$$\underline{3x - 2y = 5}$$

$$5x = 235$$

$$x = 47$$

Again from equation (i)–

$$y = 115-47$$

$$y = 68$$

Therefore, present age of Dinara = y = 68 years

98. The sum of father and mother's age is 7.5 times that of son's age. Mother's age is 35 years. If the father's age is 4 times the age of his son, then what is the son's age?
(a) 15 (b) 10
(c) 18 (d) 12

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (b) According to the question,
Age of father + Age of mother = 7.5 × Age of son ...(i)
Age of mother = 35years ...(ii)
Age of father = 4 × Age of son ...(iii)
Putting the value of equation (ii) and (iii) in equation (i)-

$$4\times\text{Age of son} + 35 = 7.5\times\text{Age of son}$$

$$(7.5 - 4) \times \text{Age of son} = 35$$

$$3.5 \times \text{Age of son} = 35$$

$$\text{Age of son} = 35/3.5 = 10 \text{ years}$$

99. The sum of the present ages of two persons is seven times the difference between their ages. After 5 years the sum of their ages will be nine times the difference between their ages. What is the present ages of the elder person?
(a) 32 years (b) 10 years
(c) 20 years (d) 35 years

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (c) Let the present age of both person is x and y years.
According to the first condition,
x + y = 7 (x – y)
x + y = 7x – 7y
6x = 8y

$$\frac{x}{y} = \frac{8}{6}$$

$\frac{x}{y}=\frac{4}{3} \Rightarrow x = 4k, y = 3k$

According to the second condition,

$(x + 5) + (y + 5) = 9 [x + 5 – (y + 5)]$

$x + y + 10 = 9 (x + 5 – y – 5)$

$x + y + 10 = 9 (x – y)$

$9x – x – 9y – y = 10$

$8x – 10y = 10$

Putting the value of x and y-

$\because x = 4k$

$y = 3k$

$32 k – 30 k = 10$

$2k = 10$

$k = 5$

$x = 4k$

$= 4 \times 5$

$= 20$ years

$y = 3 k$

$= 3 \times 5$

$= 15$ years

Therefore, age of elder person $= x = 20$ years

100. The product of the age of Anusha and Neelima is 240. If twice the age of Neelima is more than the age of Anusha, by 4 years then, what is the age of Anusha?

(a) 18 years (b) 16 years

(c) 20 years (d) 14 years

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (c) : Let the age of Anusha $= x$ years

Age of Neelima $= y$ years

According to the question,

$x \times y = 240$ ..... (i)

And, $x + 4 = 2y$

$y = \left(\frac{x+4}{2}\right)$ .....(ii)

Putting the value of y in equation (i),

$x \times \left(\frac{x+4}{2}\right) = 240$

$x^2 + 4x = 480$

$x^2 + 4x – 480 = 0$

$x^2 + (24 – 20)x – 480 = 0$

$x^2 + 24x – 20x – 480 = 0$

$x(x + 24) – 20(x + 24) = 0$

$(x + 24)(x – 20) = 0$

$x = –24, 20$

Therefore, age of Anusha $= x = 20$ years

101. 2/3 of my age is equal to 3/4 of my cousin's age. My age before 3 years was exactly what my cousin will be one year later. What is my present age (in years)?

(a) 36 (b) 18

(c) 45 (d) 27

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (a) Let my present age is x years and age of cousin is y years-

According to the question,

$\frac{2x}{3}=\frac{3y}{4}$

$8x – 9y = 0$ … (i)

And, $x – 3 = y + 1$

$x – y = 4$ … (ii)

On multiplying 9 in equation (ii) and subtracting from equation (i)–

$8x – 9y = 0$

$– \underline{9x – 9y = 36}$

$– x = –36$

$x = 36$ years

102. A man is 24 years older than his son. After four years, his age will be twice of his son's age. What is the present age of father?

(a) 40 years (b) 44 years

(c) 42 years (d) 48 years

RRB NTPC 04.04.2016 Shift : 3

Ans : (b) Let the present age of father = x years

$\therefore$ Present age of son $= (x – 24)$ years

Age of father after 4 years $= (x + 4)$ years

And age of son after 4 years $= (x – 20)$ years

According to the question,

$x + 4 = 2 \times (x – 20)$

$x + 4 = 2x – 40$

$2x – x = 4 + 40 \Rightarrow x = 44$

Therefore, present age of father is 44 years.

103. After five years, Mayank age will be 3/5th of his father's age. Five years ago the ratio of their age was 2:5. Find the present age of Mayank.

(a) 17 (b) 13

(c) 19 (d) 15

RRB NTPC 19.04.2016 Shift : 3

Ans : (b) Let before 5 years Mayank's age is 2x years and father's age is 5x years.

Then after 5 years,

$\frac{\text{Age of Mayank}}{\text{Age of father}}=\frac{3}{5}$

$\frac{2x+10}{5x+10}=\frac{3}{5}$

$10x + 50 = 15x + 30$

$5x = 20$

$x = 4$

Therefore, present age of Mayank $= 2x + 5$

$= 2 \times 4 + 5 = 13$ years

104. 6 years ago a man's age was 5 times of his son's age. After 10 years, he will be 3 times of his son. What is his son's present age?

(a) 20 (b) 18

(c) 24 (d) 22

RRB NTPC 18.04.2016 Shift : 3

Ans : (d) Let the present age of father and son is x and y respectively.

From question-

$x-6 = 5(y–6) \Rightarrow x–5y = –24$ .....(i)

And

$x+10 = 3(y+10) \Rightarrow x–3y = 20$ ..... (ii)

From equation (i) and (ii)–

$x = 86, y = 22$

Therefore, Present age of son is 22 years.

105. The product of Sapna and Anubha's age is 150. If 4 times the age of Anubha is 10 years more than the age of Sapna. Find the age of Sapna.

(a) 20 (b) 27
(c) 19 (d) 17

RRB NTPC 22.04.2016 Shift : 1

Ans : (a) Let the age of Sapna = x years
Age of Anubha = y years
According to the question,

$xy = 150$ .....(i)

$4y = x + 10$ .....(ii)

From equation (i), $y = \frac{150}{x}$

The value of y is equation (ii),

$4 \times \frac{150}{x} = x + 10$

$600 = x^2 + 10x$

$x^2 + 10x - 600 = 0$

$x^2 + 30x - 20x - 600 = 0$

$x(x+30) - 20(x+30) = 0$

$(x+30)(x-20) = 0$

$x + 30 = 0$

$x = -30$ (Invalid)

$x - 20 = 0$

$x = 20$

Therefore, age of Sapna = 20 years

106. Bipul is 16 years younger than Saibal. After 12 years from now, Saibal's age will be 1.5 times that of Bipul. Saibal is now _____ years old.

(a) 42 (b) 45
(c) 40 (d) 36

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (d) Let the present age of Saibal = x years
Then, present age of Bipul = (x–16) years
Age of Saibal after 12 years = (x+12) years
Age of Bipul after 12 years = (x–16+12) = (x–4) years
According to the question,

(x+12) = 1.5 (x–4)

x+12 = 1.5x–6

0.5x = 18

$x = \frac{18}{0.5}$

x = 36 years

Therefore, Saibal's present age is 36 years.

107. 15 years ago, Shyam was twice as old as Prabhat. After 5 years from now Prabhat's age will be $\frac{5}{8}$ of Shyam's age. What is Shyam's present age?

(a) 72 years (b) 75 years
(c) 80 years (d) 64 years

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (b) Let the present age of Prabhat = x years
Present age of Shyam = y years
According to the question,

2(x–15) = (y–15)

2x–30 = y–15

2x–y = 15 ..... (1)

Age of both after 5 years from present,

$(x+5) = \frac{5}{8}(y+5)$

8x+40 = 5y+25

8x–5y = –15 ..... (2)

Multiplying by 5 in equation (1)

(2x–y)5 = 15×5

10x–5y = 75 ..... (3)

On subtracting equation (3) from equation (2)–

8x–5y = –15
10x–5y = 75
– + –
–2x = –90

x = 45

Putting the value of x in equation (1)–

2 × 45 – y = 15

y = 90–15

y = 75 years

Therefore, present age of Shyam is 75 years.

108. Jina is 24 years younger than her mother. After eight years, her mother's age will be $\frac{5}{3}$ times her age. What is Jina's present age (in years)?

(a) 24 (b) 22
(c) 26 (d) 28

RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (d) Let the present age of Jina = x years
Present age of mother = (x + 24) years
Age of Jina after 8 years = (x + 8) years
Age of mother after 8 years = (x+24+8) years
According to the question,

$x + 32 = \frac{5}{3}(x+8)$

3x + 96 = 5x + 40

2x = 56

x = 28

Therefore, present age of Jina = 28 years

109. Priyankur's present age is seven years less than thrice the age of his cousin Rihana. After sixteen years from now Priyakur's age will be 150% of that of Rihana. What is Priyankur's present age (in years)?

(a) 17 (b) 23
(c) 20 (d) 26

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (b) Let the present age of Rihana = x years
Then present age of Priyankur = (3x–7) years
According to the question,

$(3x - 7 + 16) = (x+16) \times \frac{150}{100}$

$(3x+9) = (x+16) \times \frac{3}{2}$

6x+18 = 3x+48

6x–3x = 48–18

3x = 30

x = 10

∴ Present age of Priyankur = 3x–7 = 3×10–7
= 30–7= 23 years

110. Jeremy is 26 years younger than his father. From now Eight years his father's age will be two years less than twice his age. What is Jeremy's present age (in years)?

(a) 20 (b) 24
(c) 22 (d) 18

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (a) Let the present age of Jeremy = x years
Then, present age of father = (x + 26) years
According to the question,
$2(x + 8) - 2 = (x + 26 + 8)$
$2x + 16 - 2 = x + 34$
$x = 34 - 14$
$x = 20$ years
Hence, present age of Jeremy = 20 years.

111. Satish is two years older than Gautam who is twice as old as Sai. If the sum of the ages of Satish, Gautam and Sai is 27, then how old is Gautam?

(a) 12 (b) 10
(c) 11 (d) 13

RRB ALP & Tec. (20-08-18 Shift-III)

Ans : (b) Let the age of Sai = x years
Age of Gautam = 2x years
And age of Satish = (2x+2) years
According to the question,
$x+2x+2x+2 = 27$
$5x = 27-2$
$x = \frac{25}{5} = 5$
So, age of Gautam = 2x = 2×5= 10 years

112. John is 15 years younger than Jill. 12 years ago, Jill's age was 1.5 times that of John. Jill is now .....years old.

(a) 57 (b) 45
(c) 30 (d) 42

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (a) Let the age of John is x years and age of Jill is y years.
According to the question,
$y - x = 15$ .....(i)
And $(y-12) = (x - 12)\ 1.5$
$y - 12 = 1.5x - 18$
$y - 1.5x = -6$ .....(ii)
From equation (i) and (ii)−
$y - x - (y - 1.5x) = 15 - (-6)$
$y - x - y + 1.5x = 15 + 6$
$0.5x = 21$
$x = \frac{21}{0.5}$
$x = 42$
Putting the value of x in equation (i)−
$y - 42 = 15$
$y = 15+42 = 57$
So, present age of Jill is 57 years.

113. Roshan's present age is three years less than 1.5 times that of Usha. 12 years ago Usha's age was three years more than half of Roshan's age. What is Roshan's present age in years?

(a) 42 (b) 39
(c) 33 (d) 30

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (a) Let the present age of Roshan is x years and present age of Usha is y years.
According to first condition−
$x = 1.5y - 3$ ..... (i)
According to second condition−
$\frac{x-12}{2} + 3 = y - 12$ ..... (ii)
Putting the value of x in equation (ii) from equation (i),
$\frac{(1.5y-3)-12}{2} + 3 = y - 12$
$1.5y-15+6 = 2y-24$
$0.5y = 15$
$y = 30$
Putting y = 30 in equation (i),
$x = 1.5\times30-3$
$x = 45.0-3$
$x = 42$ years
So, present age of Roshan = 42 years.

114. 13 years ago Ram was twice as old as Sunny. After three years from now Sunny's age will be $\frac{3}{5}$ of Ram's age. What is Ram's present age?

(a) 64 years (b) 72 years
(c) 80 years (d) 77 years

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (d) Let present age of Ram = x years
And present age of Sunny = y years
Age of Ram and Sunny before 13 years would be (x-13) and (y-13) respectively–
According to the first condition,
$(x-13)=(y-13)\times2$
$x-13=2y-26$
$x-2y=-13$ .....(i)
Age of Ram and Sunny after 3 years will be (x+3) and (y+3) respectively.
According to the second condition,
$(x+3)\times\frac{3}{5} = y+3 \Rightarrow 3x + 9 = 5y + 15$
or $3x-5y=6$ .....(ii)
On multiplying by 3 in equation (i) and subtracting from equation (ii)−
$3x - 5y = 6$
$3x-6y = -39$
$- \quad + \quad +$
$y = 45$ years
Putting the value of y in equation (i),
$x-2\times45 = -13$
$x-90 = -13$
$x = 77$ years

115. Three years from now Dharitri's age will be eight years less than twice the age of Yunees. The sum of their present ages is 61 years. What is Dharitri's present age?

(a) 43 years (b) 36 years
(c) 41 years (d) 39 years

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (d) Let the present age of Dharitri and Yunees is x and y years respectively.
According to the question,

$x + 3 = 2(y + 3) - 8$
$x + 3 = 2y + 6 - 8$
$x + 3 = 2y - 2$
$x - 2y = -5$ .....(i)
Given, $x + y = 61$ .....(ii)
On subtracting equation (ii) from equation (i),
$x - 2y = -5$
$\underline{x + y = 61}$
$-3y = -66$
$y = 22$
On putting $y = 22$ in equation (ii),
$x + 22 = 61$
$x = 39$
So, present age of Dharitri is 39 years.

116. After seven years from now Virat will be twice as old as Mohindar. Five years ago Mohindar's age was one years less than $\frac{2}{5}$ of Virat's age. What is Virat's present age?
(a) 53 years (b) 51 years
(c) 57 years (d) 55 years

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (d) Let the age of Virat before 5 years = x years
Age of Mohindar before 5 years $= \left(\frac{2x}{5} - 1\right)$ years
Present age of Virat = (x + 5) years
Present age of Mohindar $= \left(\frac{2x}{5} + 4\right)$ years
According to the question,
$$x + 5 + 7 = 2\left(\frac{2x}{5} + 4 + 7\right)$$
$5(x + 12) = 4x + 110, \quad x = 50$
$\therefore$ Present age of Virat $= x + 5 = 50 + 5 = 55$ years

117. The sum of one third of Poojitha's age of three years ago and half of her present age after two years is 20 years. What is her present age?
(a) 23 years (b) 24 years
(c) 26 years (d) 25 years

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (b) Let the present age of Poojitha = x years
Age of Poojitha before 3 years = (x – 3) years
Age of Poojitha after 2 years = (x + 2) years
According to the question,
$$\left(\frac{x-3}{3}\right) + \left(\frac{x+2}{2}\right) = 20$$
$$\frac{2x - 6 + 3x + 6}{6} = 20$$
$$\frac{5x}{6} = 20$$
$x = 6 \times 4$
$x = 24$ years
$\therefore$ Present age of Poojitha = 24 years

118. 3/5th of my present age is same as 5/6th of one of my cousin's age. My age before ten years will be his four years later age from now. What is my present age?
(a) 55 (b) 45
(c) 60 (d) 50

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (d) Let my present age = x years
Age of cousin = y years
According to the question,
$$\frac{3x}{5} = \frac{5y}{6}$$
$18x = 25y$
$18x - 25y = 0$ ---------- (I)
And, $x - 10 = y + 4$
$x - y = 14$ ----------(II)
From equation (II) × 25 – equation (I)
$25x - 25y = 350$
$18x - 25y = 0$
$- \quad + \quad -$
$7x = 350$
$x = 50$ years
Therefore, my present age is 50 years.

Type - 2

119. Five years from now, father's age will be three times the age of his son. Five years ago, father was seven times as old as his son. Their present ages are:
(a) 30 and 10 (b) 30 and 5
(c) 40 and 5 (d) 40 and 10

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : Let the age of the son 5 years ago = x years
$\therefore$ Age of Father = 7x year
$\therefore$ Their present ages = (x + 5) and (7x + 5)
According to the question, After 5 years,
$3(x + 5 + 5) = (7x + 5 + 5)$
$3(x + 10) = (7x + 10)$
$3x + 30 = 7x + 10$
$4x = 20$
$x = 5$
$\therefore$ The present age of Father and Son
= (7 × 5 + 5) and (5 + 5)
= 40 and 10

120. Five years hence, the age of Jacob will be four times that of his son. Three years ago, jacob's age was seven times that of his son. Their present ages are:
(a) 59 and 21 (b) 59 and 11
(c) 69 and 11 (d) 49 and 21

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (b) : Let the age of Jacob and his Son be x years and y years respectively.
According to the first condition -
$(x + 5) = 4(y + 5)$
$x - 4y = 15$ ..... (i)
According to the second condition,
$(x - 3) = (y - 3) \times 7$
$x - 7y = -18$ ..... (ii)

from equation (i) and (ii) -
x = 59 years
y = 11 years

121. At present, Ram is 4 times of his son's age. After 5 years he will be 3 times the age of his son. Find their present age?
(a) 60,15 (b) 40,10
(c) 20,5 (d) 32,8
RRB NTPC 28.03.2016 Shift : 1

Ans : (b) Let the present age of Ram's son = x years
Present age of Ram = 4x years
According to the question,
$4x+5=3(x+5)$
$\Rightarrow 4x+5=3x+15 \quad \Rightarrow x=10$
$\therefore$ Present age of Ram = 4×10 = 40 years
Therefore, present age of Ram and his son is 40 years and 10 years respectively.

122. My age is 5 times more than my son's age. After six years, my age will be three times of my son's age. After two years what will be ours age.
(a) 30 years and 10 years
(b) 32 years and 8 years
(c) 26 years and 12 years
(d) 28 years and 14 years
RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) : Let the present age of son = x years
$\therefore$ Present age of father = 5x years
According to the question,-
$(5x+6)=(x+6)\times 3$
$5x+6=3x+18$
$2x=12$
$x=6$
Present age of father $\rightarrow$ 5x= 5 × 6 = 30 years
Age of father after 2 years = 30 + 2 =32 years
Age of son after 2 years = 6 +2
= 8 years

123. 5 years ago a man was 7 times older than his son. Now after 5 years, he will be 3 times older than his son. What was their age before two years?
(a) 26 years and 10 years
(b) 36 years and 12 years
(c) 38 years and 8 years
(d) 30 years and 6 years
RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (c) Let the age of father before 5 years = 7x years
Age of son before 5 years = x years
Present age of father = (7x + 5) years
Present age of son = (x + 5) years
According to the question,
7x + 5 + 5 = 3 (x + 5+ 5)
7x + 10 = 3x + 30
4x = 20
x = 5
Present age of father = 7 × 5 + 5 = 40 years
Present age of son = 5 + 5 = 10 years
Age of father before 2 years from now = 40–2 = 38 years
Age of son before 2 years from now = 10–2 = 8 years

124. A person is 9 times older than his son. After two years, the father will be one year less than 6 times of his son. Find their present age?
(a) 27 years and 3 years
(b) 30 years and 6 years
(c) 26 years and 10 years
(d) 36 years and 12 years
RRB Group-D – 10/10/2018 (Shift-III)

Ans : (a) Let the present age of son = x years
$\therefore$ Present age of father = 9x years
From question−
(9x + 2) = 6 (x+2) –1
9x + 2 = 6x + 12 – 1
9x – 6x = 12 – 1–2
3x = 9
$\boxed{x=3}$
Age of father = 9x = 9 × 3 = 27 years
Age of son = x = 3 years

125. John is twice as old as Jean. After 3 years, the sum of their ages will be 66 years. What are the present ages of Jean and John respectively?
(a) 20 and 40 years (b) 24 and 48 years
(c) 40 and 20 years (d) 42 and 84 years
RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let present age of Jean = x years
Present age of John = $2x$ years
After 3 years–
Age of Jean =(x + 3) years
Age of John = ($2x$ + 3) years
Sum of their ages = 66 years
$x + 3 + 2x + 3 = 66$
$3x + 6 = 66$
x = 20 years
Present age of Jean = 20 years
Present age of John = $2x$ = 20 × 2 = 40 years

126. The ages of A and B are in the ratio 3:1. Fifteen years hence, the ratio will be 2:1. Their present ages are respectively:
(a) 30 years, 10 years (b) 21 years, 7 years
(c) 60 years, 20 years (d) 45 years, 15 years
RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (d) : Let, the present ages of A & B is 3x and x respectively.
According to the question,
$\frac{3x+15}{x+15}=\frac{2}{1}$
3x + 15 = 2x +30
x = 15
Present age of A = 3x = 3 × 15 = 45 years
Present age of B = x = 15 years

127. Narendra mother is four times as old as Narendra. Four years ago, his mother was six times as old as Narendra was. What are their present ages?
(a) 7 years, 28 years (b) 10 years, 40 years
(c) 5 years, 20 years (d) 20 years, 80 years
RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let Narendra's present age = x years
And mother's present age = 4x years.
4 year ago,
Narendra's age = (x – 4) years
Mother's age = (4x – 4) years
According to the question:–

$$6 \times (x - 4) = (4x - 4)$$
$$6x - 24 = 4x - 4$$
$$2x = 20$$
$$x = 10$$

Hence, Narendra's present age is 10 years and mother's present age is 40 years.

128. The ratio of present ages of Ram and Shyam is 7:8. After nine years this ratio will be 8:9. What is the present ages of Ram and Shyam (in years respectively)?
(a) 64, 73 (b) 63, 72
(c) 72, 63 (d) 73, 64

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (b) : Let the present ages of Ram and Shyam is 7x and 8x respectively.
According to the question-

$$\frac{7x+9}{8x+9} = \frac{8}{9}$$

64x+72=63x+81
x=9
Then, the present age of Ram and Shyam, 7x = 7×9 = 63 years, 8x = 8×9 = 72 years respectively.

129. Neeraj's age is half of Suraj's age. If 8 years is subtracted from Neeraj's age and 5 years is added in Suraj's age then Suraj's age will be 5 times more than Neeraj. Two years ago Suraj's and Neeraj's age was -
(a) 30 years and 15 years
(b) 28 years and 14 years
(c) 26 years and 12 years
(d) 28 years and 13 years

RRB RPF SI – 16/01/2019 (Shift-II)

Ans. (d) : Let the present age of Suraj is x years and present age of Neeraj is $\frac{x}{2}$ years.
According to the question,

$$5\left(\frac{x}{2} - 8\right) = (x + 5)$$
$$\Rightarrow \quad \frac{5x}{2} - 40 = x + 5$$
$$\Rightarrow \quad \frac{5x}{2} - x = 5 + 40$$
$$\Rightarrow \quad \frac{3x}{2} = 45$$
$$\Rightarrow \quad x = 30 \text{ years}$$

Age of Suraj before 2 years = 30 – 2 = 28 years
Age of Neeraj before 2 years = 15 – 2 = 13 years

130. The ratio of ages of A and B is 3:2. After 10 years the sum of their age will be 80. What is their present age?
(a) 27, 28 (b) 36, 24
(c) 42, 28 (d) 45, 30

RRB JE - 23/05/2019 (Shift-I)

Ans : (b) Let the present age of A = 3x years
Present age of B = 2x years
According to the question,
3x + 10 + 2x + 10 = 80
5x = 60
x = 12
Present age of A = 3 × 12 = 36 years
Present age of B = 2 × 12 = 24 years

131. One year ago the ratio of ages of two sisters was 2:3. Sum of their present age is 12. Find their present age.
(a) 9, 3 (b) 7.5, 4.5
(c) 8, 4 (d) 5, 7

RRB JE - 23/05/2019 (Shift-III)

Ans : (d) Let the present age of both sisters is x years and y years respectively.
According to first condition,
x + y = 12 ..... (i)
According to second condition,

$$\frac{x-1}{y-1} = \frac{2}{3}$$

$\Rightarrow$ 3x – 3 = 2y – 2
$\Rightarrow$ 3x – 2y = 1 ..... (ii)
On solving equation (i) and (ii),
x = 5
On putting the value of x in equation (i),
x + y = 12
5 + y = 12
y = 7
Therefore, their present ages = 5 years and 7 years

132. The ratio of the sum and difference of ages of two brothers is 5 : 1. If the product of their ages is 96 then find their age.
(a) 8, 12 (b) 6, 16
(c) 6, 10 (d) 24, 4

RRB JE - 26/06/2019 (Shift-III)

Ans : (a) Let the age of both brothers is x, y years
According to the question,

$$\frac{x+y}{x-y} = \frac{5}{1}$$
$$x + y = 5x - 5y$$
$$6y = 4x$$
$$y = \frac{2}{3}x$$
$$\because \quad xy = 96 \qquad \text{....(i)}$$
$$x \times \frac{2}{3}x = 96$$
$$x^2 = 96 \times \frac{3}{2}$$
$$x = \sqrt{144}$$
$$x = 12$$

On putting the value of x in equation (i),
12 × y = 96
y = 8
Therefore, their ages are 8 and 12 years.

133. The sum of the age of Sindu and Bindu is 30 years. The product of their age is 221. What is their age?

(a) 17 years, 13 years (b) 16 years, 14 years
(c) 15 years, 15 years (d) 18 years, 12 years

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (a) : Let the age of Sindu is x years and age of Bindu is (30-x) years.
According to the question,

$x \times (30 - x) = 221$

$30x - x^2 = 221$

$x^2 - 30x + 221 = 0$

$x^2 - 17x - 13x + 221 = 0$

$x(x - 17) - 13(x - 17) = 0$

$(x - 17)(x - 13) = 0$

If $x - 17 = 0$

x = 17, then, Bindu's age = 30-17=13 years
If x-13=0
x =13, then, Bindu's age = 30-13 = 17 years

134. Sudha's age is twice as of Radha. If 6 years is subtracted from Radha's age and 4 years is added to Sudha's age, then Sudha's age will be four times of Radha's age, Two years before from now, what will be the ages of Sudha and Radha?

(a) 30 years and 14 years
(b) 26 years and 12 years
(c) 34 years and 20 years
(d) 30 years and 16 years

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (b) : Let the present age of Radha is x years and present age of Sudha is 2x years.
According to the question,

$4(x - 6) = (2x + 4)$

$\Rightarrow 4x - 24 = 2x + 4$

$\Rightarrow 4x - 2x = 28$

$\Rightarrow 2x = 28$

$\Rightarrow x = 14$

$\therefore$ Age of Sudha before 2 years $= 2x - 2$
$= 2 \times 14 - 2$
$= 28 - 2 = 26$ years

And age of Radha before 2 years = 14 – 2 = 12 years

135. Kiran said to Varun that her brother Abhi is 4 years younger as compared to her. She also told that the sum of their ages was 32. Help Varun in finding out the ages of Kiran and Abhi.

(a) Kiran's age is 18 years and Abhi's age is 14
(b) Kiran's age is 16 years and Abhi's age is 12
(c) Kiran's age is 12 years and Abhi's age is 16
(d) Kiran's age is 10 years and Abhi's age is 14

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (a) Let the age of Kiran = x years
Then age of Abhi = (x–4) years
$\because$ x + x – 4 = 32
$\therefore$ 2x = 36, $\Rightarrow$ x = 18
Age of Kiran (x) = 18 years
Age of Abhi = (x – 4) years = 18 – 4 = 14 years

136. A man says to his son seven years ago that I was 7 times of your age and after three years, I will be three times of your age. Find their age.

(a) 42, 12 (b) 52, 12
(c) 40, 14 (d) 20, 42

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (a) Let the age of father is y years and age of son is x years.
According to the first conditon,
7 (x – 7) = (y – 7)
7x –49 = y – 7
7x – y = 42 .....(i)
According to the second conditon,
3(x + 3) = (y + 3)
3x + 9 = y + 3
3x – y = –6 .....(ii)
From equation (i) and (ii),

$7x - y = 42$

$3x - y = -6$

$- \quad + \quad +$

$4x = 48$

x = 12
From equation (i),
7x – y = 42
7 × 12 – y = 42
84 – 42 = y
y = 42
Therefore, age of father = 42 years
And age of son = 12 years

137. Ankita is two years younger than Anu. Four years later from now, Anu's age will be twice the age of Ankita 3 years ago. Find the present age of Ankita and Anu.

(a) 14 years and 16 years
(b) 15 years and 17 years
(c) 12 years and 14 years
(d) 13 years and 15 years

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) : Let the present age of Anu = x years
Then present age of Ankita = (x – 2) years
According to the question,
(x + 4)= (x – 2 – 3) × 2
x + 4 = (x – 5) × 2
x + 4 = 2x – 10
x = 14
Present age of Ankita = x – 2
= 14 – 2 = 12 years
Therefore, the present age of Ankita and Anu is 12 years and 14 years respectively.

138. The sum of present age of Nitya and Satya is 40 years.The product of their ages is 351. What is their present age in years?

(a) 27 and 13 (b) 28 and 12
(c) 25 and 15 (d) 26 and 14

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (a) Let the present age of Nitya = a years
Present age of Satya = b years
According to the question, a + b = 40 .....(i)
ab = 351 .....(ii)

From formula-
$(a-b)^2 = (a+b)^2 - 4ab$
$= (40)^2 - 4 \times 351$
$= 1600 - 1404$
$a - b = \sqrt{196} = 14$
$a - b = 14$ .....(iii)
From equation (i) and (iii),
$a = 27, b = 13$
Their present age will be 27 years and 13 years respectively.

139. Father's age is four times the age of the son. After 20 years his age will be twice of his son's age. Find their age?
(a) 36 years, 9 years
(b) 44 years, 11 years
(c) 40 years, 10 years
(d) 60 years, 15 years

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (c) : Let the present age of son = x years
Present age of father = 4x years
According to the question,
$2(x+20) = 4x + 20$
$2x + 40 = 4x + 20$
$40 - 20 = 4x - 2x$
$2x = 20$
$x = 10$ years
Therefore, present age of son = 10 years
Present age of father = $4 \times 10 = 40$ years

140. The ratio of age of two brothers is 5:8 and the difference of their age is 12 years, find their age.
(a) 20, 32 (b) 16, 28
(c) 18, 30 (d) 22, 34

RRB NTPC 31.03.2016 Shift : 3

Ans : (a) Let the age of both brothers is 5x and 8x years respectively.
From question–
$8x - 5x = 12$
$3x = 12 \Rightarrow x = 4$
Therefore, the age of both brothers is 20 years and 32 years respectively.

141. The difference in ages of Sunita and Sheela is 12 years. If 9 years ago the elders age was 4 times than that of younger one, then what is their present age?
(a) 11 and 23 (b) 15 and 27
(c) 13 and 25 (d) 23 and 35

RRB NTPC 18.04.2016 Shift : 2

Ans : (c) Let the present age of Sunita = x years
Present age of Sheela = (x – 12) years
According to the question,
$x - 9 = 4(x - 12 - 9)$
$x - 9 = 4(x - 21)$
$x - 9 = 4x - 84$
$4x - x = 84 - 9$
$3x = 75$
$x = 25$
Present age of Sunita = x = 25 years
Present age of Sheela = x – 12 = 25 – 12 = 13 years

142. The difference of the ages of Vinay and Vijay is 20 years. If 5 years ago the age of elder boy was 5 times of younger boy. Then what is their present age?
(a) 15 and 35 (b) 5 and 25
(c) 10 and 30 (d) 8 and 28

RRB NTPC 22.04.2016 Shift : 3

Ans : (c) Let the present age of Vijay = x years
Present age of Vinay = (x+20) years
According to the question,
$x + 20 - 5 = 5(x - 5)$
$x + 15 = 5x - 25$
$4x = 40$
$\therefore x = 10$
Present age of Vijay = 10 years
Present age of Vinay = (x+20) = (10+20) = 30 years
Therefore, their present age is 10 and 30 years respectively.

Type - 3

143. 14 years ago, the age of a father was three times the age of his son. Now, the father is twice as old as his son. What is the sum of the present ages of the father and the son?
(a) 42 years (b) 56 years
(c) 98 years (d) 84 years

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (d) : 14 years ago
Let the age of son = x years
the age of father= 3x years
Present age of the son = (x + 14) years
Present age of the father = (3x + 14) years
According to the question,
$2(x + 14) = (3x + 14)$
$2x + 28 = 3x + 14$
$x = 14$
Sum of the present ages of the father and the son
$= x + 3x + 28$
$= 4x + 28$
$= 56 + 28$
$= 84$ years

144. The sum of two times the present age of A and three times the present age of B is 106 years. Four times the present age of B exceeds three times the present age of A by 11 years. What will be the sum of the ages (in years) of A and B, 4 years from now?
(a) 49 (b) 43
(c) 51 (d) 47

RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) : Let the present age of A and B be x and y respectively.
According to the question,
$2x + 3y = 106$ ....(i)
$4y - 3x = 11$ ..... (ii)
Equation (i) and (ii) multiply 3 and 2 respectively.
$-6x + 8y = 22$
$17y = 340$
$y = 20$ years

Putting the value of y in equation (i)

$2x = 106 - 60$

$x = 23$ years

Hence the sum of the ages of A and B, 4 years from now = 20 + 23 + 8 = 51 years

145. A is twice as old as B, B is 1/3 as old as C. The sum of ages of A, B and C is 42 years, find the sum of the ages of A and B.

(a) 12 years (b) 15 years

(c) 21 years (d) 23 years

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (c) : According to the question :

$$A:B = [2:1]$$
$$B:C = [1:3]$$
$$A:B:C = 2:1:3$$

New the sum of ages = 42

then, $2x + x + 3x = 42$

$6x = 42 \Rightarrow x = 7$

sum of the ages of A and B

$= (2x + x)$

$= 3x$

$= 3 \times 7$

$= \boxed{21 \text{ years}}$

146. The sum of the present ages of Aditi, Aditya and Aadya is 120 years. What was the sum of their ages 3 years ago?

(a) 111 (b) 114

(c) 112 (d) 118

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question–

Sum of present ages of Aditi, Aditya and Aadya =120 years

3 years ago sum of their ages $= 120 - 3 \times 3$

$= 120 - 9$

$= 111$ years

147. The ratio of present ages of mother and daughter is 8:3. After 12 years the ratio of their ages will be 2:1. What is the sum of the present age of mother and daughter.

(a) 66 years (b) 74 years

(c) 71 years (d) 69 years

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (a) Let the present age of mother and daughter is 8x years and 3x years respectively.

According to the question,

$$\frac{8x+12}{3x+12} = \frac{2}{1}$$

$8x + 12 = 6x + 24$

$2x = 12$

$x = 6$

$\therefore$ Present age of (mother + daughter) $= (8x + 3x) = 11x$

$= 11 \times 6 = 66$ years

148. The ratio of the ages of father and son is 3:1 and the product of their ages is 147. Find the sum of their age.

(a) 28 (b) 32

(c) 36 (d) 35

RRB JE - 24/05/2019 (Shift-I)

Ans : (a) Let the age of father = 3x years

Age of son = x years

According to the question,

$3x \times x = 147$

$x^2 = 49$

$x = 7$

Sum of ages of father and son $= 3x + x = 4x$

$= 4 \times 7 = 28$ years

149. The ratio of the ages of mother and daughter is 12:5. After 10 years, mother's age will be twice to the age of daughter. What is the sum of their present age?

(a) 60 (b) 75

(c) 65 (d) 85

RRB JE - 27/05/2019 (Shift-II)

Ans : (d) Let the present age of mother is 12x years and present age of daughter is 5x years.

According to the question,

After 10 years the age of mother will be twice to the age of daughter

$12x + 10 = 2 \times (5x + 10)$

$12x + 10 = 10x + 20$

$2x = 10$

$x = 5$

Sum of their present age $= 12x + 5x$

$= 17x$

$= 17 \times 5$

$= 85$ years

150. A's age is twice of B. Sum of their present age is 60 years. What will be the sum of their age after 5 years?

(a) 70 (b) 80

(c) 65 (d) 75

RRB JE - 31/05/2019 (Shift-I)

Ans : (a) Let the age of B = a years

Age of A = 2a years

According to the question,

$2a + a = 60$

$3a = 60$

$a = 20$

Sum of their ages after 5 years $= 2a + 5 + a + 5$

$= 2 \times 20 + 5 + 20 + 5$

$= 40 + 30 = 70$ years

151. The difference between the ages of A and B is 6. Their ratio is 3:5. Find the sum of their age.

(a) 24 (b) 40

(c) 16 (d) 32

RRB JE - 31/05/2019 (Shift-III)

Ans. (a) Let the age of A = 3x years

And age of B = 5x years

According to the question,

$5x - 3x = 6$

$2x = 6$

$x = 3$

Age of A $= 3 \times 3 = 9$ years

Age of B $= 5 \times 3 = 15$ years

Sum of their ages $= 9 + 15 = 24$ years

152. If P's age is twice of Q's age and after 5 years the sum of their age is 70, then find their present age (in years).

(a) 60 (b) 40
(c) 30 (d) 50

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (a) Let the age of Q is x years and age of P is 2x years.
According to the question,
$2x + 5 + x + 5 = 70$
$3x = 60$
$x = 20$
Sum of ages of P and Q $= 2x + x = 40 + 20 = 60$ years

153. The ratio of the ages of P and D is 3 : 4 while the ratio of the ages of D and A is 5:6. After 15 years from now, the ratio of the ages of P and D will be 4:5. What is the sum of the present age of all three?

(a) 180 years (b) 183 years
(c) 177 years (d) 175 years

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (c)
P : D and D : A
3 : 4 5 : 6

P : D : A
3 : 4
5 : 6
P:D:A =15 : 20 : 24
Let the present age of P, D and A is 15x, 20x and 24x respectively.
After 15 years
Age of P = (15x + 15)
Age of D = (20x + 15)
According to the question,
$\frac{15x+15}{20x+15} = \frac{4}{5}$
$75x + 75 = 80x + 60$
$5x = 15$
$\boxed{x = 3}$
Sum of present age of all three people
$= 15 \times 3 + 20 \times 3 + 24 \times 3$
$= 45 + 60 + 72 = 177$ years

154. The difference between the ages of Waqar and Nasima is 8 years. 30 years ago when they got married then the four times of Waqar's age was equal to 5 times of Nasima's age. Find the sum of their present age.

(a) 130 years (b) 134 years
(c) 132 years (d) 135 years

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (c) : Let the present age of Nasima = x year
So, present age of Waqar = (x + 8) year
Before 30 years,
Age of Nasima = (x – 30) years
Age of Waqar = (x + 8 – 30) years
= (x –22) years
According to the question,
$4 (x – 22) = 5 (x – 30)$
$4x – 88 = 5x – 150$
$5x – 4x = 150 – 88$
$x = 62$
∴ Present age of Nasima = 62 years
Present age of Waqar = 62 + 8 = 70 years
Sum of their ages = 62 + 70 = 132 years

155. The ratio of the present ages of X and Y is 3 : 8 while the ratio of the present ages of Y and Z is 4:5. Two years ago the ratio of the ages of X and Y was 1:3. The sum of present ages of all three is___?

(a) 126 years (b) 63 years
(c) 84 years (d) 105 years

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c)

X	:	Y	:	Z
3	:	8		
		4	:	5
12	:	32	:	40

Let the present age of X and Y is 12x and 32x respectively.
$\frac{12x-2}{32x-2} = \frac{1}{3}$
$36x – 6 = 32x – 2$
$4x = 4$
$x = 1$
Sum of present ages of X, Y and Z = 12 + 32 + 40
= 84 years

156. 28 months ago A's age was 3.5 times of B's age. 4 months later from now A's age will be 2.5 times of B's age. What is the sum of their present age?

(a) 23 years
(b) 22 years 8 months
(c) 23 years 2 months
(d) 22 years 10 months

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (b) Let the present age of A is x month and present age of B is y month.
According to the question,
$x – 28 = 3.5 (y–28)$
$x – 3.5y = 28 – 98$
$x – 3.5 y = –70$ .....(i)
After 4 years
$x + 4 = 2.5 (y + 4)$
$x – 2.5y = 10–4$
$x – 2.5 y = 6$ .....(ii)
On subtracting equation (ii) from equation (i),
$x – 3.5y = –70$
$x – 2.5y = 6$
– + –
$– y = -76$
$y = 76$

From equation (ii),

$x - 2.5 \times 76 = 6$

$x - 190 = 6 \Rightarrow x = 196$

$\therefore$ Sum of present age of A and B

$= x + y = 76 + 196 = 272$ months

$= 22$ years 8 months

157. At present the ratio of ages of Teertha and Pradeep is 2:3 while the ratio of present ages of Pradeep and Umar is 4:5. Four years ago the ratio of ages of Teertha and Pradeep was 5: 8. What is the sum of ages of all three?

(a) 140 years (b) 120 years

(c) 90 years (d) 105 years

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (d)

Teertha : Pradeep = 2 : 3

Pradeep : Umar = 4 : 5

Teertha : Pradeep : Umar

2 : 3

4 : 5

8 : 12 : 15

Let the present age of Teertha, Pradeep and Umar is 8x, 12x and 15x years respectively.

Before 4 years,

Age of Teertha = (8x–4) years

Age of Pradeep = (12x–4) years

According to the question,

$$\frac{8x-4}{12x-4}=\frac{5}{8}$$

$64x - 32 = 60x - 20$

$4x = 12$

$x = 3$

The sum of present age of all three people

$= 8 \times 3 + 12 \times 3 + 15 \times 3$

$= 24 + 36 + 45 = 105$ years

158. 15 years ago Chavan's age was 4 times of Pawan's age. Pawan's present age is 1/3 of Sunil's age two years ago, while Chavan's present age is 3/5 of Sunil's present age. What is the sum of the present ages of all three?

(a) 130 years (b) 120 years

(c) 128 years (d) 125 years

RRB Group-D – 16/11/2018 (Shift-III)

Ans. (d) : Let the present ages of Sunil = x years

$\therefore$ Present age of Chavan $= \frac{3}{5}x$ years

So, present age of Pawan $= \frac{(x-2)}{3}$ years

According to the question,

$$\frac{3}{5}x-15=4\left(\frac{(x-2)}{3}-15\right)$$

$$\frac{3x-75}{5}=4\left(\frac{x-2-45}{3}\right)$$

$3(3x - 75) = 20 (x - 47)$

$9x - 225 = 20x - 940$

$20x - 9x = 940 - 225$

$11x = 715$

$x = \frac{715}{11}$

$x = 65$

Sum of present age of all three people

$$= x+\frac{3}{5}x+\frac{(x-2)}{3}$$

$$=\frac{15x+9x+5x-10}{15}$$

$$=\frac{29x-10}{15}$$

$$=\frac{29\times65-10}{15}=\frac{1885-10}{15}=\frac{1875}{15}=125 \text{ years}$$

159. 9 months ago, Trisha's age was three times of Rishabh's age who is 4 months older than Yawan. After 25 months from now 20 times the age of Yawan will be equal to 9 times age of Trisha. What is the sum of their present age of her?

(a) 19 years 11 months (b) 19 years 9 months

(c) 19 years 5 months (d) 18 years 9 months

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (c) Let before 9 months

Age of Yawan = x months

$\therefore$ Age of Rishabh = (x + 4) months

$\therefore$ Age of Trisha = (x + 4) × 3 = (3x + 12) months

In present,

Age of Yawan = (x + 9) months

Age of Rishabh = (x + 13) months

Age of Trisha = (3x + 21) months

According to the question,

After 25 months–

$(3x + 46) \times 9 = (x + 34) \times 20$

$27x + 414 = 20x + 680$

$7x = 266$

$x = 38$

Therefore, present age of Yawan = x + 9 = 47 months

Present age of Rishabh = x + 13 = 51 months

Present age of Trisha = 3x + 21 = 135 months

Sum of present age of all people

= 233 months or 19 years 5 months

160. Ten months ago, Tiyasha's age was 2.5 times of Rishi's age, who is 15 months older than Shravan's. After 30 months from now, 16 times of Shravan's age will be 7 times of Tiyasha's age. What is the sum of the present ages of Tiyasha, Rishi and Shravan?

(a) 30 years 9 months

(b) 31 years 9 months

(c) 31 years 3 months

(d) 31 years 11 months

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (c) Before 10 months,

Let the age of Shravan = x months

$\therefore$ Age of Rishi = (x + 15) months

Age of Tiyasha = (x + 15) × 2.5 = (2.5x + 37.5) months

In present,

Age of Shravan = (x + 10) months

Age of Rishi = (x + 25) months

Age of Tiyasha = (2.5x + 47.5) months

According to the question,
After 30 months,
$(x + 10 + 30) \times 16 = (2.5x + 47.5 + 30) \times 7$
$(x + 40) \times 16 = (2.5x + 77.5) \times 7$
$16x + 640 = 17.5x + 542.5$
$1.5x = 97.5$
$x = 65$
Therefore, Present age of Shravan = (x+10) = 75 months
Present age of Rishi = (x + 25) = 90 months
Present age of Tiyasha = (2.5x + 47.5) = 210 months
Sum of present age of all people = 75+90+210
= 375 months
375 months = 31 years 3 months

161. Biju's age is 28 years less than three times of Shubham's age. Subham's age is 16 years more than 4/5 of Amir's age. Kaveri is 10 years younger than Amir and half of the age of Shubham. What is the sum of their ages?
(a) 196 years (b) 182 years
(c) 180 years (d) 188 years

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (b) : Let the age of Shubham = x years
Age of Kaveri $= \frac{x}{2}$ years
Age of Amir $= \left(\frac{x}{2} + 10\right)$ years
Age of Biju = y years
According to first condition,
$y = 3x - 28$
$3x - y = 28$ ---------- (i)
According to second condition,
$$16 + \left(\frac{x}{2} + 10\right)\frac{4}{5} = x$$
$$16 + \frac{2x}{5} + 8 = x$$
$$24 = x - \frac{2x}{5}$$
$$24 = \frac{5x - 2x}{5}$$
$$24 = \frac{3x}{5}$$
$x = 40$ years
On putting the value of x in equation (i),
$3x - y = 28$
$3 \times 40 - y = 28$
$y = 92$ years
Age of Shubham = x years
= 40 years
Age of Kaveri $= \frac{x}{2} = \frac{40}{2} = 20$ years
Age of Amir $= \frac{x}{2} + 10 = \frac{40}{2} + 10 = 30$ years
Age of Biju = 92 years
Sum of age of all people
$= 40 + 20 + 30 + 92 = 182$ years

162. 7 children with the same birth date were born in seven successive years. The sum of the ages of the eldest three children is 93 years. How many years will be the sum of the ages of the youngest three children?
(a) 81 (b) 90
(c) 87 (d) 84

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (a) Let the age of all seven children = x, (x + 1), (x + 2), (x + 3), (x + 4), (x + 5), (x + 6) years respectively.
From question,
Sum of ages of eldest three children = 93
$(x + 4) + (x + 5) + (x + 6) = 93$
$3x + 15 = 93$
$3x = 93 - 15$
$3x = 78$
$\boxed{x = 26}$
So,
Sum of age of youngest three children = x+(x+1)+(x+2)
= 3x + 3
On putting the value of x,
$= 3 \times 26 + 3 = 78 + 3 = 81$ years

163. Seven children with the same birth date were born in 7 successive years. The sum of the ages of the eldest three children is 63 years. How many years will be the sum of the ages of the youngest three children?
(a) 57 (b) 54
(c) 51 (d) 60

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (c) : Let the age of all seven children = x, (x + 1), (x + 2), (x + 3), (x + 4), (x + 5), (x + 6) years respectively.
From question,
Sum of ages of eldest three children
= (x+4)+(x+5)+(x+6)
$63 = 3x + 15$
$3x = 48$
$x = 16$
Sum of ages of youngest three children
$= x + (x + 1) + (x + 2) = 3x + 3$
On putting the value of x,
$= 16 \times 3 + 3 = 51$ years

164. The difference between the ages of Peter and Preeti is 5 years. When they married each other 35 years ago, 4 times Peter's age was the same as 5 times the age of Preeti. What is the sum of their present ages?
(a) 105 years (b) 110 years
(c) 115 years (d) 112 years

RRB ALP & Tec. (13-08-18 Shift-I)

Ans : (c) If the present age of Peter is x years and age of Preeti is y years then,
$x - y = 5$ .....(i)
According to the question,
Before 35 years,
$4(x - 35) = 5(y - 35)$
$4x - 140 = 5y - 175$
$4x - 5y = -35$.....(ii)

On multiplying by 4 in equation (i) and subtracting the equation (i) and (ii),

$4x - 4y = 20$

$4x - 5y = -35$

$- \quad + \quad +$

$y = 55$ years

On putting the value of y in equation (i),

$x - y = 5$

$x = 55 + 5 = 60$ years

Sum of present ages of both = $x+y = 60+55 = 115$ years

165. The difference between the ages of Charles and Shriya's is 6 years. When they married each other 30 years ago, 4 times of Charles's age was equal to 5 times the age of Shriya. What is the sum of their present age?

(a) 112 years (b) 114 years

(c) 115 years (d) 110 years

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (b) Let the age of Shriya = x years

So, age of Charles = (x+6) years

According to the question,

$(x-30) \times 5 = (x+6-30) \times 4$

$5x - 150 = 4x - 96$

$x = 150 - 96$

$x = 54$ years

$\therefore$ Age of Charles = $x+6 = 54+6 = 60$ years

Sum of their ages = 60+54 =114 years

166. Aman's great-grandfather age is 105 years old. Aman's father Ram Singh's age is 1/3 of his grand father. Five years ago, when Aman was born, Ram Singh's mother was double the age of Ram Singh. What is the difference of age between Aman and Ram Singh?

(a) 25 years (b) 30 years

(c) 20 years (d) 35 years

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (b**) :** Aman's great grandfather age = 105 years

Aman's father Ram Singh's age = $\frac{105}{3}$ = 35 years

Ram Singh's mother age when Aman was born

= $30 \times 2 = 60$ years

Present age of Aman = 5 years

Present age of his father Ram Singh = 35 years

Difference = 35 – 5 = 30 years

167. A father's age is twice the age of his son, twenty years ago, the age of the father was 12 times that of his son then find the difference (in years) of the present ages of father and son.

(a) 44 (b) 12

(c) 2 (d) 22

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let the present age of son = x years

Then the present age of the father = 2x years

According to the question-

$2x - 20 = 12(x-20)$

$2x - 20 = 12x - 240$

$10x = 220$

$x = 22$

Hence, present age of son = **x** = 22 years

And present age of father = $2\mathbf{x} = 2 \times 22 = 44$ years

Required difference = 44 – 22 = 22 years

168. Four years ago, the ratio of the age of Ram to that of Shyam was 13 : 9. Eight years from now, their ages will be in the ratio 4 : 3. The difference (in years) between their present ages is:

(a) 18 (b) 17

(c) 19 (d) 16

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : Let four years ago, the age of Ram and Shyam be 13x and 9x years respectively.

According to the question,

$$\frac{13x+4+8}{9x+4+8} = \frac{4}{3}$$

$$\frac{13x+12}{9x+12} = \frac{4}{3}$$

$39x + 36 = 36x + 48$

$3x = 48 - 36$

$$x = \frac{12}{3}$$

$x = 4$

Difference of their present ages = $(13x + 4) - (9x + 4)$

$= 4x = 4 \times 4 = 16$ years

169. The age of A and B are in the ratio of 5 : 3. After 5 years the ratio of their ages will be 10 : 7. What is the difference between present ages of A and B (in years)?

(a) 5 (b) 6

(c) 4 (d) 3

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the present age of A and B is 5x and 3x respectively.

As per question,

$$\frac{5x+5}{3x+5} = \frac{10}{7}$$

$35x + 35 = 30x + 50$

$5x = 15$

$x = 3$

Present age of A = $5x = 5 \times 3 = 15$

Present age of B = $3x = 3 \times 3 = 9$

Difference between present age of A and B = 15– 9 = 6 years

170. The average age of 4 persons is 42 years. If their age are in the ratio of 1:3:4:6 respectively. Find the difference between the age of the youngest and the eldest person.

(a) 61 years (b) 60 years

(c) 70 years (d) 59 years

RRB JE - 26/05/2019 (Shift-II)

Ans : (b**)** Let the age of all 4 persons = x, 3x, 4x and 6x years

Average age of 4 persons = 42 years

Sum of ages of all 4 persons = $42 \times 4 = 168$ years

$x + 3x + 4x + 6x = 168$

$14x = 168$

$$x = \frac{168}{14}$$

$$\boxed{x = 12}$$

Age of the eldest person = 6x
= 6 × 12
= 72 years
Age of youngest person = 12 years
Age difference between both of them = 72 – 12 = 60 years

171. When Asha was born at that time her father's age was 38. When her brother who is 4 years younger than her was born her mother's age was 36 years. Find the age difference of their parents.
(a) 8 years (b) 6 years
(c) 4 years (d) 2 years

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Let the present age of Asha = x years
Present age of father = (x + 38) years
Present age of brother = (x – 4) years
Present age of mother = (36 + x – 4) years
= (32 + x) years
Age difference between father and mother
= (x+38) – (32+x) = 6 years

172. When the age of mother was 43 years, there was a difference of 21 years between the age of mother and son. If the father is 3 years older than mother, when the father's age will be 50 years, what will be the difference between the age of father and son?
(a) 21 (b) 22
(c) 23 (d) 24

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (d) Age of mother = 43 years,
Age of son = 43–21 = 22 years
Age of father = 46 years
Age difference b/w father and son after 4 years=
= 50 – 26 = 24 years

173. Monica's father was 38 years old when Monica was born, while her mother age was 36 when her four year younger sister was born. What is the difference between the ages of their parents?
(a) 2 years (b) 8 years
(c) 4 years (d) 6 years

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (d) : Monica's father's age when Monica's 4 years younger sister was born = 38 + 4 = 42 years
Age of her mother at that time = 36 years
∴ Age difference of mother and father = 42-36 = 6 years

174. The ratio of the present ages of X and Y is 2:1. After 14 years the ratio of their ages ratio will be 29:18. What is the difference between the present age of X and Y.
(a) 22 years (b) 11 years
(c) 9 years (d) 13 years

RRB NTPC 19.04.2016 Shift : 3

Ans : (a) Let the present age of X and Y is 2x and x respectively.
According to the question,

$$\frac{2x+14}{x+14} = \frac{29}{18}$$

36x + 252 = 29x + 406
7x = 154
x = 22
∴ Age difference = 2x – x = x = 22 years

175. The average age of P and Q is 24 years. Average age of P, Q and R is 22 years. Find the sum of their age in the previous year?
(a) Data is insufficient (b) 90
(c) 87 (d) 95

RRB JE - 27/05/2019 (Shift-III)

Ans : (a) P + Q = 24 × 2 ..... (i)
P + Q + R = 22 × 3 ..... (ii)
On subtracting equation (i) from equation (ii)–
R = 66 – 48 = 18 years
The different ages of P and Q are not knwon so the data is insufficient to answer the question.

Type - 4

176. In a school, the average age of boys and girls together is 16.8 years, the average age of boys is 15.4 years, and the average age of girls is 18.2 years. The ratio of number of boys to girls in the school is:
(a) 3 : 2 (b) 1 : 1
(c) 3 : 5 (d) 2 : 3

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : Let number of girls = x
Number of boys = y
According to the question,
$(x+y)\times 16.8 = y\times 15.4 + x\times 18.2$
$16.8x + 16.8y = 15.4y + 18.2x$
16.8y–15.4y = 18.2x – 16.8x
1.4y = 1.4x

$$\frac{y}{x} = \frac{1}{1} = 1:1$$

177. Ten years ago, X was 5 years old and his age was half of the age of Y. At that time, Z was 8 years younger than his brother P. Z was 18 years old at that time. What is the ratio of the respective ages of Z and P at present?
(a) 14 : 19 (b) 4 : 5
(c) 7 : 9 (d) 9 : 7

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (c) : Before 10 years,
Age of X = 5 years
Age of Y = 10 years
Age of Z = 18 years
Age of P = 26 years
Present age
Age of Z = 18 + 10 = 28
Age of P = 26 + 10 = 36
Required ratio = 28 : 36 = 7 : 9

178. The ratio of the age of Naresh and Suresh is 6 : 5 and the sum of their ages is 44 years. The ratio of their respective ages after 15 years will be:

(a) 34 : 39 (b) 39 : 34
(c) 39 : 35 (d) 30 : 35

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : Let the age of Naresh and Suresh be 6x and 5x.
According to the question-

$6x + 5x = 44$

$11x = 44$

$x = 4$

The ratio of their ages after 15 years $= \frac{6x+15}{5x+15} = \frac{6\times4+15}{5\times4+15} = \frac{39}{35}$

179. If the present age of P is 15 years and after 6 years the age of Q will becomes 26 years, then what is the ratio of their present age?

(a) 4 : 1 (b) 2 : 3
(c) 2 : 1 (d) 3 : 4

RRB RPF Constable – 25/01/2019 (Shift-III)

Ans. (d) : Present age of P = 15 years
Let present age of Q = x years
According to the question,
$x + 6 = 26$
$x = 20$ years
Present age of Q = 20 years
Ratio of the present ages of P and Q = 15 : 20 = 3 : 4

180. The age of A, B and C are in the ratio of 2:4:5 and the sum of their ages is 77. Find the ratio of the ages of A and B after 10 years.

(a) 10 : 17 (b) 12 : 19
(c) 13 : 18 (d) 11 : 14

RRB JE-24/05/2019 (Shift-I)

Ans : (b) Let the age of A = 2x years
Age of B = 4x years
Age of C = 5x years
According to the question,
$2x + 4x + 5x = 77$
$11x = 77$
$x = 7$
∴ Ratio of ages of A and B after 10 years
$= 2x + 10 : 4x + 10$
$= 2 \times 7 + 10 : 4 \times 7 + 10$
$= 24 : 38$
$= 12 : 19$

181. The daughter's age is one-fourth of her father's age. Five years later, she will be one third of her father's age. After 5 years, what will be the ratio of her and her father's age?

(a) 2 : 5 (b) 3 : 5
(c) 3 : 4 (d) 5 : 2

RRB JE - 27/05/2019 (Shift-I)

Ans : (a) Let the present age of father = x years
∴ Present age of daughter $= \frac{x}{4}$ years
According to the question,

$\frac{1}{3}(x+5) = \left(\frac{x}{4}+5\right)$

$\frac{x}{3}+\frac{5}{3} = \frac{x}{4}+5$

$\frac{x}{12} = \frac{10}{3}$

x = 40 years (Age of father)

Age of daughter $= \frac{x}{4} = \frac{40}{4} = 10$ years

Age of both after 10 years =
40 + 10 = 50 years and 10 + 10 = 20 years
∴ Age of daughter : Age of father = 20 : 50
= $\boxed{2:5}$

182. Seven years ago, the ratio of the ages of Ajit and Ganesh was 5:7. If the product of their present age is 616, then find the ratio of their present age.

(a) 15: 17 (b) 17: 15
(c) 12: 13 (d) 11: 14

RRB JE - 28/05/2019 (Shift-I)

Ans : (d) Let 7 years ago,
Age of Ajit = 5x years
Age of Ganesh = 7x years
According to the question,
$(5x+7)(7x+7) = 616$
$35x^2 + 35x + 49x + 49 = 616$
$35x^2 + 84x - 567 = 0$
$5x^2 + 12x - 81 = 0$
$5x^2 + 27x - 15x - 81 = 0$
$x(5x+27) - 3(5x+27) = 0$
$(5x+27)(x-3) = 0$
$x = 3$
Ratio of their present age =

$\frac{5x+7}{7x+7} = \frac{5\times3+7}{7\times3+7} = \frac{22}{28} = \boxed{\frac{11}{14}}$

183. The ages of A, B and C are in the ratio of 2:3:8. The sum of their ages is 108. What will be the ratio of their ages after 12 years?

(a) 2 : 5 : 6 (b) 1 : 2 : 3
(c) 1 : 3 : 5 (d) 3 : 4 : 5

RRB JE - 29/05/2019 (Shift-III)

Ans : (d) Let the age of A, B and C = 2x, 3x, 4x years respectively.
From question−
$2x + 3x + 4x = 108$
$9x = 108$
$\boxed{x = 12}$
Ratio of their ages after 12 years
$= 2x + 12 : 3x + 12 : 4x + 12$
$= 24 + 12 : 36 + 12 : 48 + 12$
$= 36 : 48 : 60$
Ratio of their ages = 3 : 4 : 5

184. The father's age is 3 times more than his son. After 8 years his age becomes 2.5 times of son's age what will be the age ratio of his and his son after 8 years?

(a) 5 : 2 (b) 3 : 1
(c) 2 : 1 (d) 11 : 4

RRB JE - 29/05/2019 (Shift-III)

Ans : (a) Let the age of son = x years
Age of father = 3x years
Age of son after 8 years = (x + 8)
Age of father after 8 years = (3x + 8)
From question–

$3x + 8 = 2.5 (x+8)$

$3x + 8 = 2.5x + 20$

$0.5x = 12$

$x = \frac{12}{0.5}$

$\boxed{x = 24}$

Age of father after 8 years = 3x + 8
= 3 × 24 + 8 = 72 + 8 = 80 years
Age of son after 8 years = x + 8 = 24 + 8 = 32 years
Ratio of their ages = 80 : 32 = 5 : 2

185. Before ten years, mother's age was three times of her son's age. After 10 years her age will becomes twice of the age of the son. Find the ratio of their present age.
(a) 7 : 4 (b) 4 : 3
(c) 7 : 3 (d) 3 : 2

RRB JE - 30/05/2019 (Shift-II)

Ans : (c) Let the age of son before 10 years = x years
∴ Age of mother before 10 years = 3x years
Present age of son = (x + 10) years
Present age of mother = (3x + 10) years
According to the question,

$3x + 10 + 10 = 2 (x + 10 + 10)$

$3x + 20 = 2x + 40$

$x = 20$

$\therefore$ Ratio of their present age $= \frac{3x+10}{x+10}$

$= \frac{3\times 20+10}{20+10} = \frac{70}{30} = 7 : 3$

186. Before four years, the ratio of age of A and B was 2:1. After four years, this ratio will becomes 3:2. Find the ratio of their present age.
(a) 5 : 2 (b) 2 : 5
(c) 5 : 4 (d) 5 : 3

RRB JE - 28/05/2019 (Shift-II)

Ans : (d) Let the age of B before 4 years = x years
And age of A = 2x years
Present age of A = (2x + 4) years
Present age of B = (x + 4) years
According to the question,
After 4 years,

$\frac{2x+4+4}{x+4+4} = \frac{3}{2}$

$\frac{2x+8}{x+8} = \frac{3}{2}$

$4x + 16 = 3x + 24$

$x = 8$

Present age of A = 2x + 4
= 2 × 8 + 4 = 20 years
Present age of B = x + 4
= 8 + 4 = 12 years
Ratio of their present age = A : B = 20 : 12 = 5 : 3

187. Pooja's age before 4 years is equal to Deepa's age after 4 years. The ratio of Pooja's age afore 4 years and Deepa's age before 4 years is 3:1. What is the ratio of their present age?
(a) 5 : 7 (b) 5 : 2
(c) 4 : 7 (d) 5 : 3

RRB JE - 31/05/2019 (Shift-I)

Ans : (d) Let the present age of Pooja = x years
And present age of Deepa = y years
First condition,

$x - 4 = y + 4$

$x - y = 8$ -----(i)

Second condition,

$\frac{x+4}{y-4} = \frac{3}{1}$

$x + 4 = 3y - 12$

$x - 3y = -16$ -----(ii)

From equation (i) and (ii)-

$x - y = 8$

$x - 3y = -16$

$\underline{- \quad + \quad +}$

$2y = 24$

$y = 12$

On putting the value of y in equation (i),

$x = 20$

Therefore, the ratio of present age of Pooja and Deepa
= 20 : 12 = 5 : 3

188. The ratio of present age of P and Q is 6:7. Q is 4 years older than P. The ratio of their age after 4 years will be–
(a) 7 : 9 (b) 7 : 8
(c) 5 : 8 (d) 8 : 3

RRB JE - 02/06/2019 (Shift-III)

Ans : (b) Let the present age of P = x years
Present age of Q = (x + 4) years
According to the question,

$\frac{x}{x+4} = \frac{6}{7}$

$7x = 6x + 24$

$x = 24$

Present age of P = 24 years
Present age of Q = 24 + 4 = 28 years
Ratio of age of P and Q after 4 years–

$\frac{24+4}{28+4} = \frac{28}{32} = \frac{7}{8} = 7 : 8$

189. Before five years, the ratio of the ages of P and Q was 7:9, after 10 years this ratio will be 5:6. Find the ratio of their age present.
(a) 6 : 7 (b) 5 : 4
(c) 2 : 1 (d) 4 : 5

RRB JE - 01/06/2019 (Shift-I)

Ans : (d) Let the age of P before 5 years = 7x years
Age of Q = 9x years
Present age of P = (7x + 5) years
Present age of Q = (9x + 5) years
Age of P after 10 years = (7x + 5 + 10) years
= (7x + 15) years
Age of Q after 10 years = (9x + 5 + 10) years
= (9x + 15) years

According to the question,

$$\frac{7x+15}{9x+15}=\frac{5}{6}$$

$42x + 90 = 45x + 75$

$3x = 15$

$x = 5$

Present age of P $= 7x + 5$

$= 7 \times 5 + 5$

$= 40$

Present age of Q $= 9x + 5$

$= 9 \times 5 + 5$

$= 50$

The ratio of their present age−

P : Q = 40 : 50

= 4 : 5

190. y years ago Mauma's age was 1/5th of Saumi's age. Affer y years from now, Mouma's age will be 1/4th of Saumi's age. What is the ratio of the present ages of Mauma and Saumi?

(a) 16 : 25 (b) 4 : 5

(c) 7 : 31 (d) 2 : 9

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (c) Let the present age of Mauma = a years

Present age of Saumi = b years

Before y years,

$$a - y = (b - y)\frac{1}{5}$$

$5a – 5y = b – y$

$5a – b = 4y$ ...(i)

After y years,

$$a + y = (b + y)\frac{1}{4}$$

$4a + 4y = b + y$

$4a – b = –3y$ ...(ii)

On solving equation (i) and (ii),

$5a – b = 4y$

$4a – b = –3y$

$– \quad + \quad +$

$a = 7y$

Therefore,

$5a – b = 4y$

$5 \times 7y – b = 4y$

$b = 35y – 4y$

$b = 31y$

$a : b = 7y : 31y$

$a : b = 7 : 31$

191. Before y years Juthika's age was one fourth of Ruby's age. After y years from today Juthika's age will be 1/3 of Ruby's age. What will be the ratio of present ages of Juthika and Ruby?

(a) 5 : 17 (b) 9 : 16

(c) 3 : 4 (d) 2 : 7

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (a) Let the age of Ruby before y years = x years

Age of Juthika $= \frac{x}{4}$ years

Present age of Ruby $= (x + y)$ years

And present age of Juthika $= \left(\frac{x}{4}+y\right)$ years

According to the question,

After y years,

$$\left(\frac{x}{4}+y\right)+y=\frac{1}{3}[(x+y)+y]$$

$$\frac{x+4y+4y}{4}=\frac{x+2y}{3}$$

$3x + 12y + 12y = 4x + 8y$

$3x – 4x = 8y – 12y – 12y$

$x = 16y$

$\therefore$ Present age of Ruby $= (16y + y) = 17y$

And present age of Juthika $= \left(\frac{16y}{4}+y\right) = 5y$

Therefore, ratio of present ages of Juthika and Ruby-

$5y : 17y = 5 : 17$

192. The ratio of the present ages of father and son is 2:1. The product of their ages is 200, what will be the ratio of their ages after 5 years?

(a) 9 : 5 (b) 10 : 7

(c) 9 : 2 (d) 5 : 3

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (d) Let the present age of father = 2x years

Present age of son = x years

According to the question,

$2x \times x = 200$

$2x^2 = 200$

$x^2 = 100$

$x = 10$

Ratio of their ages after 5 years−

$$\frac{2x+5}{x+5}=\frac{2\times10+5}{10+5}=\frac{25}{15}=5:3$$

193. Before 10 years, father's age was three times more than his daughter's age. After 10 years, the father's age will be two times more than that of his daughter's age. What is the ratio of their present age?

(a) 3 : 1 (b) 7 : 3

(c) 5 : 2 (d) 4 : 7

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) :

	Age of daughter	Age of father
Before 10 years	x years (let)	3x years
At present →	(x+ 10)years	(3x + 10) years

According to the question,

$2 (x + 20) = (3x + 20)$

$2x + 40 = 3x + 20$

$x = 20$

Present age of daughter $= 20 + 10 = 30$ years

Present age of father $= 3 \times 20 + 10 = 70$ years

$\therefore$ Required ratio $= 70 : 30 = 7 : 3$

194. 10 years ago mother's age was three times her son's age. After 10 years the mother's age will be twice the age of his son. What is the ratio of their present age?

(a) 7 : 3 (b) 12 : 5

(c) 4 : 2 (d) 6 : 1

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (a) Let the present age of son is y years and present age of mother is x years.

According to the question,

$(x - 10) = 3(y - 10)$
$x - 10 = 3y - 30$
$x - 3y = -30 + 10$
$x - 3y = -20$ --------(i)

After 10 years-
$(x + 10) = 2(y + 10)$
$x + 10 = 2y + 20$
$x - 2y = 20 - 10$
$x - 2y = 10$ --------- (ii)

By solving equation (i) and (ii),
$x = 70$
$y = 30$

Required ratio $= \frac{x}{y} = \frac{70}{30} = 7 : 3$

195. Before 10 years Murali's age was three times of the age of his son Satish. Ten years later, Murali's age will be two times that of Satish's age. What is the ratio of their present age?
(a) 9 : 2 (b) 13: 4
(c) 5 : 2 (d) 7: 3

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (d) Let the present age of Murali is x years and present age of his son Satish is y years.
According to the question,
Before 10 years–
$(x-10) = 3(y-10)$
$x - 10 = 3y - 30$
$x - 3y = -20$ ----- (i)
After 10 years, $x + 10 = 2(y + 10)$
$x - 2y = 10$ ----(ii)
On solving both equation-
$x = 70$ and $y = 30$
Ratio of present age of Murali and Satish
$= \frac{x}{y} = \frac{70}{30} = \frac{7}{3} = 7 : 3$

196. The age ratio of Jay and Jog is 5:2. The sum of their age is 63. What will be the ratio of their ages after 9 years?
(a) 5:2 (b) 2:1
(c) 3:2 (d) 4:3

RRB NTPC 03.04.2016 Shift : 1

Ans : (b) Let the present age of Jay and Jog is 5x and 2x years respectively.
According to the question,
$5x + 2x = 63$
$7x = 63$
$x = 9$
$\therefore$ Ratio of their ages after 9 years $= (5\times9+9) : (2\times9+9)$
$= 54 : 27$
$= 2 : 1$

197. The ratio of the present ages of Seema and Reema is 2:3. Seema is 6 years younger than Reema. After 6 years the age ratio of the ages of Seema and Reema will be:
(a) 2:3 (b) 2:7
(c) 3:4 (d) 7:8

RRB NTPC 22.04.2016 Shift : 1

Ans : (c)
Let the present age of Seema and Reema is 2x and 3x years respectively.
According to the question,
$3x - 2x = 6$
$x = 6$ years
Therefore, present age of Seema and Reema $= 2\times6, 6\times3$
$= 12$ years, 18 years
Ratio of the ages of Seema and Reema after 6 years–
$= (12+6) : (18 + 6)$
$= 18 : 24 = 3 : 4$

Type - 5

198. 10 years ago, the ratio of the ages of A and B was 5 : 9. 15 years from now, the ratio of their ages will be 15 : 17. What will be A,s age 15 years from now ?
(a) 30 years (b) 38 years
(c) 35 years (d) 26 years

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : Let the present age of A be x years and the present age of B be y years.
According to the first condition -
$\frac{x-10}{y-10} = \frac{5}{9}$
$9x - 5y = 40$ ..... (i)
According to the second condition -
$\frac{x+15}{y+15} = \frac{15}{17}$
$17x + 255 = 15y + 225$
$17x - 15y = -30$ ..... (ii)
On solving equation (i) and (ii)
$x = 15, y = 19$
Hence the age of A, 15 years from now = 15 + 15 = 30 years.

199. The present ages of Shanti and Kirti are in the ratio of 7 : 3. After 5 years, Shanti's age will be 40. How old will Keerthi be after 5 years?
(a) 10 years (b) 30 years
(c) 20 years (d) 15 years

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (c) : Let the persent age of Shanti and Kirti be 7x and 3x years respectively.
After 5 years, the age of Shanti = 7x + 5
Hence $7x + 5 = 40$
$7x = 40 - 5$
$x = \frac{35}{7} = 5$
Hence the present age of Kirti = $3x = 3 \times 5 = 15$ years
After 5 years the age of Kirti = 15 + 5 = 20 years

200. The ratio of the present ages of P and Q is 5 : 8. After 5 years, Q's age will be 45 years. Six years ago, the age of P was :
(a) 34 years (b) 19 years
(c) 29 years (d) 24 years

RRB Group-D 08/09/2022 (Shift-II)

Ans. (b) : According to the question,

$$\frac{P}{Q}=\frac{5}{8}.....(i)$$

Let the present age of Q be x years
then after 5 years the age of Q = (x + 5) years
Given that
x + 5 = 45 years
x = 40 years
from equation (i)

$$\frac{P}{40}=\frac{5}{8}$$

$$P=\frac{5\times 40}{8}=25\text{years}$$

∴ Six years ago the age of P = 25 – 6 = 19 years.

201. A Father said to his son, "I was as old as you are now when you were born." If the present age of the Father is 40 years, then what was the age of the son 5 years ago ?
(a) 14 years (b) 16 years
(c) 18 years (d) 15 years

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : Let the present age of son = x years
According to the question
The present age of the Father and the age of the Son at the time of his birth are equal -
Hence 2x = 40
x = 20
Hence the age of Son 5 years ago = 20 – 5
= 15 वर्ष

202. The sum of the present ages of a father and his daughter is 80 years ago, the father's age was seven times the age of his daughter. Eight years from now, what will be the daughter's age?
(a) 18 years (b) 20 years
(c) 22 years (d) 24 years

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : The sum of the present ages of Father and daughter = 80 years
The sum of the ages of Father and Daughter 8 years ago = 64 years
Ratio of the ages of Father and Daughter 8 years ago = 7x : x
According to the question,
7x + x = 64
8x = 64
x = 8
Eight years from now, the daughter's age
= 16 + 8 years
= 24 years

203. If the average age of A, B and C is 22 years and the average age of B and C is 25 years, then find A's age after 9 years.
(a) 50 years (b) 35 years
(c) 45 years (d) 25 years

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : Sum of age of A, B and C = 22 × 3 = 66 years
Sum of age of B and C = 25 × 2 = 50 years
Age of A = 66 – 50 = 16 years
Age of A after 9 years = 16 + 9 = 25 years

204. The sum of the present age of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be:
(a) 20 years (b) 21 years
(c) 15 years (d) 19 years

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (a) Let the age of son = x years
Then age of father = (60 – x) years
According to the question,
5(x – 6) = (60 – x – 6)
5x – 30 = 54 – x
6x = 84,
x = 14
Hence, age of son after 6 years = 14 + 6 = 20 years

205. One year ago, Akash's father age was 9 times of Akash's age. After 3 years his father's age will be 5 times of his age. What will be the age of Akash next year?
(a) 6 years (b) 8 years
(c) 5 years (d) 4 years

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (a) Let the present age of Akash's father is x years and age of Akash is y years.
According to the question,
(x–1) = 9 (y–1)
x – 1= 9y – 9
x – 9y = –8 ..... (i)
Again after 3 years,
(x+3) = 5 (y + 3)
x + 3 = 5y + 15
x – 5y = 12 .....(ii)
On solving both equation (i) and (ii),
4y = 20
y = 5
Therefore, the age of Akash next years = 5 +1 = 6 years

206. Before 5 years Sindhu's age was three times that of Kaveri age. 10 years later from now, Kaveri's age will be half of Sindhu's age. After 5 years from now, what will be Kaveri's age.
(a) 15 (b) 20
(c) 55 (d) 25

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (d) : Let the present age of Kaveri = x years
And present age of Sindhu = y years
According to the question,
From first condition−
y – 5 = 3 (x – 5)
y – 5 = 3x – 15
3x – y = 15 – 5
3x – y = 10 .....(i)
From second condition−

$$\frac{(y+10)}{2}=(x+10)$$

$y + 10 = 2x + 20$
$2x - y = 10 - 20$
$2x - y = -10$ .....(ii)
On subtracting equation (ii) from equation (i)
$3x - y = 10$
$2x - y = -10$
$- \quad + \quad +$
$3x - 2x = 20$
$x = 20$
Present age of Kaveri = 20 years
Age of Kaveri after 5 years = 20 + 5 = 25 years

207. The present age of Raghu and Sita are 17 years and 41 years respectively. Before 5 years Raghu's age was _____of Sita age.
(a) 3/4 (b) 1/3
(c) 1/2 (d) 2/3

RRB Group-D – 24/10/2018 (Shift-III)

Ans. (b) : Present age of Raghu = 17 years
Present age of Sita = 41 years
Age ratio of both before 5 years $= \frac{17-5}{41-5} = \frac{12}{36}$
$= 1 : 3$
Therefore, Raghu's age was 1/3 of Sita's age.

208. The sum of the ages of father and son is 50. Before 6 years the age of father was 6 more than thrice of the age of son. What will be the fathers age after 6 years.
(a) 40 years (b) 48 years
(c) 42 years (d) 50 years

RRB JE - 28/05/2019 (Shift-I)

Ans : (c) Let the age of father = x years
And age of son = y years
$x + y = 50$ ---- (i)
According to the question,
$(x-6) = (y-6) \times 3 + 6$
$x - 6 = 3y - 18 + 6$
$x - 3y = -6$ ----(ii)
From equation (i) and (ii)-
$x + y = 50$
$x - 3y = -6$
$- \quad + \quad +$
$4y = 56$
$y = 14$
On putting the value of y in equation (i),
$x = 36$
So, age of father after 6 years = 36 + 6 = 42 years.

209. The age of father is 5 years more than the mother's age. Mother's present age is thrice of the daughter's age. The Present age of daughter is 12 years. What was the age of father at the time of daughter's birth?
(a) 29 years (b) 25 years
(c) 31 years (d) 32 years

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (a) ∵ Present age of daughter = 12 years
So, present age of mother = 3 × 12 = 36 years
Present age of father = 36 + 5 = 41 years
Therefore, the age of father at the birth of daughter
= 41–12 = 29 years

210. A father says to his son "that at the time of your birth my age was as your present age. If the father's present age is 40 years, then what was the son's age before 5 years?
(a) 15 years (b) 13 years
(c) 17 years (d) 23 years

RRB Group-D – 31/10/2018 (Shift-II)

Ans. (a) Let the age of father at the birth of son = x years
So present age of son = x years
Given, present age of father = 40 years
$\Rightarrow (40 - x) = x$
$40 = 2x$
$x = 20$ years
∴ Age of son before 5 years = 20 - 5 = 15 years
So, before 5 years son's age was 15 years.

211. At the time of marriage, the age of a person was 6 years more than the age of his wife but after 12 years of marriage. His age is 1.2 times of his wife's age. What was their age at the time of marriage?
(a) 27 years, 18 years (b) 24 years, 18 years
(c) 21 years, 18 years (d) 23 years, 19 years

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) Let the age of the man's wife at the time of marriage = x years
And age of Man = (x + 6) years
∴ Age of man after 12 years = x+6+12 = (x+18) years
According to the question,
$x + 18 = (x + 12) \times 1.2$
$x + 18 = 1.2x + 14.4$
$0.2x = 3.6$
$x = 18$
So, the age of the man's wife = x = 18 years
And age of man = (x + 6) = (18 + 6) = 24 years

212. The present age of Z is half of A's age. After 5 years the ratio of ages of A and Z will be 11:6. After 3 years what will be the age of Z?
(a) 25 (b) 30
(c) 28 (d) 22

RRB NTPC 31.03.2016 Shift : 1

Ans : (c) If the present age of Z and A is x and 2x years.
According to the question,
$\frac{2x+5}{x+5} = \frac{11}{6}$
$12x + 30 = 11x + 55$
$x = 25$
Age of Z after 3 years = x + 3 = 28 years

213. Rathin is now 16 years old while his cousin is 7 years old. After how many years will Rathin's age be 1.5 times that of his cousin?
(a) 12 (b) 11
(c) 9 (d) 10

RRB ALP & Tec. (13-08-18 Shift-I)

Ans. (b) Let after x years, Rathin's age will be 1.5 times that of his cousin's age.
Age of Rathin after x years = (x + 16) years
Age of cousin = (x+7) years
∴ $(x+16) = (x+7) \times 1.5$
$x+16 = 1.5x+10.5$

5.5=0.5x

$x = \frac{5.5}{0.5}$

x = 11 years

Type - 6

214. Ram is 55 years old and Sam is 25 years old. How many years ago Ram three times as old as Som?

(a) 7 years (b) 15 years

(c) 5 years (d) 10 years

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (d) : Let x years ago Ram is three times as old as Som.

According to the question,

55 – x = 3 × (25–x)

55–x = 75 –3x

2x= 75–55

$x = \frac{20}{2} = 10$

Hence 10 years ago Ram is three times as old as Som.

215. The present ages of two persons are 46 years and 60 years, respectively. If after 'n' years, the ratio of their ages is 4 : 6, then the value of 'n' is :

(a) 13 (b) 11

(c) 12 (d) 10

RRB Group-D 09/09/2022 (Shift-I)

Ans. (d) : According to the question,

$\frac{46+n}{60+n} = \frac{4}{5}$

230 + 5n = 240 + 4n

5n – 4n = 240 – 230

n = 10

216. The sum of ages of P and Q is 15 years more than the sum of ages of Q and R. How many years younger is R as compared to P?

(a) 19 (b) 15

(c) 13 (d) 12

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : According to the question,

P + Q – 15 = Q + R

P + Q – Q – R = 15

P – R = 15

$\boxed{R = P - 15}$

Hence R is 15 years younger than P.

217. In a school 5/8 of the number of students are girls and the rest are boys, 2/5 of the number of girls are below 12 years of age and 4/9 of the boys are 12 years of age or above. If the total number of students is 288, how many students are below 12 years of age?

(a) 132 (b) 124

(c) 144 (d) 140

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given,

Total number of students = 288

Number of girls $= 288 \times \frac{5}{8} = 180$

Number of girls below 12 years $= 180 \times \frac{2}{5} = 72$

Number of boys = 288 – 180 = 108

Number of boys below 12 years $= 108 \times \left(1 - \frac{4}{9}\right)$

$= 108 \times \frac{5}{9}$

= 60

Hence, Number of students below 12 years = 72 + 60

= 132

218. The sum of the ages of five children born at the intervals of three years each is 60 years. What is the age of the youngest child?

(a) 6 years (b) 4 years

(c) 5 years (d) 7 years

RRB Group-D 26/08/2022 (Shift-III)

Ans. (a) : According to the question,

x + x +3 + x+ 6 + x+ 9 + x + 12 = 60

$\Rightarrow$ 5x + 30 = 60

$\Rightarrow$ 5x = 60 – 30

$\Rightarrow$ x = 6

Hence the age of the youngest child is 6 years.

219. The Sum of the age of 6 children born at an interval of 2 years each is 42 years what is the age of the eldest child ?

(a) 19 years (b) 15 years

(c) 12 years (d) 16 years

RRB Group-D 06/09/2022 (Shift-I)

Ans. (c) : Let the ages of 6 children born at an interval of 2 years each be x, x + 2, x + 4, x + 6, x + 8 and x + 10

According to the question,

x + x + 2+ x + 4 + x + 6 + x + 8 + x + 10 = 42

6x + 30 = 42

$x = \frac{12}{6}$

x = 2

Hence the age of the eldest child = (x + 10)

= 2 + 10 = 12 वर्ष

220. At present Bratin is 18 years old, while his cousin is 7 years old. In how many years Bratin's age will be 1.5 times that of his cousin's age?

(a) 13 (b) 14

(c) 16 (d) 15

RRB Group-D – 01/10/2018 (Shift-III)

Ans : (d) Let after x years, Bratin's age will be 1.5 times that of cousin's age.

(x+18) =1.5(x+7)

x+18 = 1.5x+10.5

0.5x = 7.5

x = 15

221. After 2 years from today a man's age will be four times that of his son and after 6 years that the man's age will be 3 times of his son's age. After how many years will the father's age be twice of his son?

(a) 15 years (b) 16 years
(c) 17 years (d) 18 years

RRB NTPC 10.04.2016 Shift : 3

Ans : (d) Let the age of man = x years
And age of son = y years
From question,
$(x + 2) = (y + 2) \times 4$
$x + 2 = 4y + 8$
$x = 4y + 6$ …….(i)
Again
$(x+6) = (y + 6) \times 3$
$x + 6 = 3y + 18$
$x = 3y + 12$ ……..(ii)
From equation (i) and (ii)
$4y + 6 = 3y + 12$
$y = 6$ years
On putting the value of y in equation (i),
$x = 4\times6+6$
$x = 30$ years
Now, let after A years, father's age will be 2 times that of his son.
$\therefore (30 + A) = (6 + A) \times 2$
$30 + A = 12 + 2A$
$A = 18$ years

222. At the time of birth of Priya her father's age was 38 years. At the time of birth of her 4 years younger brother her mother's age was 36 years. How old is his mother younger than his father?

(a) 4 (b) 5
(c) 8 (d) 6

RRB JE - 23/05/2019 (Shift-II)

Ans : (d) According to the question,
Age of father = 38 years
$\because$ Mother's age at the birth of 4 years younger brother = 36 years
$\therefore$ Mother's age at the birth of Priya = 36 – 4 = 32 years
$\therefore$ Age of father – Age of mother = 38 – 32 = 6 years

223. The average age of three children born in a interval of 2 years is 8 years. What is the age of the eldest child?

(a) 12 years (b) 7 years
(c) 10 years (d) 8 years

RRB JE - 24/05/2019 (Shift-II)

Ans : (c) Let the three children are A, B and C and their ages be– A = x, B = x + 2, C = x + 4
According to the question,

$$\frac{x + x + 2 + x + 4}{3} = 8$$

$x + x + 2 + x + 4 = 24$
$3x = 18$
$x = 6$
So, the age of eldest children = x + 4 = 6 + 4 = 10 years

224. The sum of the ages of 5 children born at an interval of 4 years is 80. What is the age of the eldest child?

(a) 18 (b) 24
(c) 16 (d) 28

RRB JE - 26/05/2019 (Shift-I)

Ans : (b) Let the five children are A, B, C, D and E and their ages be–
$\because$ A = x year
B = x + 4
C = x + 8
D = x + 12
E = x + 16
According to the question,
$x+ x+ 4+x+8+x+12+x+16 = 80$
$5x + 40 = 80$
$5x = 40$
$x = 8$
$\therefore$ Age of eldest child = x + 16 = 8 + 16
= 24 years

225. In a group of students, 1/5 is below 8 years of age. Of the remaining students, 2/5 are more then 8 years old. what part of the students are exactly 8 years old?

(a) 4/25 (b) 12/25
(c) 2/5 (d) 3/5

RRB JE - 26/05/2019 (Shift-II)

Ans. (b)
Let the total number of students in the group = x
Number of students below 8 years of age $= \frac{x}{5}$
Number of students more than 8 years old

$$= \left(x - \frac{x}{5}\right) \times \frac{2}{5} = \frac{8}{25}x$$

Number of students of 8 years =

$$x - \left(\frac{x}{5} + \frac{8x}{25}\right) = x - \frac{13x}{25} = \frac{12x}{25}$$

Part of exactly 8 years old students in the group $= \frac{12}{25}$

226. I have a brother who is 3 years elder than me when my brother was born then my sister was 6 years old. Our average age is 14. Now what is the age of my sister?

(a) 20 years (b) 19 years
(c) 17 years (d) 18 years

RRB RPF Constable – 19/01/2019 (Shift-III)

Ans : (b) Let the present age of man = x years
Present age of man's brother = (x + 3) years
Present age of man's sister · (x + 3 + 6) = (x + 9) years
According to the question,
$x + x + 3 + x + 9 = 3 \times 14$
$3x + 12 = 3 \times 14$
$x + 4 = 14$
$x = 10$ years
$\therefore$ Age of sister = 10 + 9 = 19 years

227. The age ratio of two brothers is 7:15. The LCM of their age is 210. What is the age of elder brother?

(a) 45 (b) 42
(c) 15 (d) 30

RRB JE - 30/05/2019 (Shift-III)

Ans : (d) Let the age of younger brother is 7x years and age of elder brother is 15x years.
According to the question,
L.C.M. of number 7x and 15x = 105x
$\therefore$ 105 x = 210
x = 2
Age of elder borther = 15x = 15 × 2 = 30 years

228. If 4 is subtracted from the age of a person and divided by 5, then the result represents the age of his grand son. There is a sister of grand son whose age is 5 years, 6 years less than the grandson. What is the age of grand father?

(a) 58 (b) 57
(c) 60 (d) 59

RRB JE - 31/05/2019 (Shift-III)

Ans. (d) Let the age of grandfather = x years
According to the question,
$\because$ Age of daughter = 5 years
$\therefore$ Age of son = 11 years

$$\frac{x-4}{5}=11$$

x – 4 = 55
x = 59 years

229. The ratio of the ages of grand father and his grand daughter is 9:2. The sum of their ages is a perfect square number. If the difference of their age be multiple of 11, then find their age?

(a) 90, 20 (b) 95, 25
(c) 72, 16 (d) 99, 22

RRB JE - 02/06/2019 (Shift-II)

Ans. (d) According to the question,
Age of grand father = 9x years
Age of grand daughter = 2x years
$9x + 2x = x^2$
$11x = x^2$
x = 11
Age of grand father = 9x = 9 × 11 = 99 years
Age of grand daughter = 2x = 2×11 = 22 years

230. The age of a father is twice of the age of his son. The HCF of their age is 22. What is the age of the son?

(a) 18 years (b) 24 years
(c) 22 years (d) 20 years

RRB JE - 02/06/2019 (Shift-I)

Ans : (c) Let the age of son = x years
Then, age of father = 2x years
HCF of x and 2x = x = x × 1
$2x = x \times 2 \times 1$
So, HCF = x = 22
Therefore, age of son = x years = 22 years

231. The total age of A and B is 12 years more than the total age of B and C. Who among A and C is the younger and By how many years?

(a) A, 6 years (b) A, 12 years
(c) C, 12 years (d) C, 6 years

RRB JE - 28/06/2019 (Shift-III)

Ans. (c) According to the question,
A + B = B + C + 12
A = C + 12
Therefore, it is clear that C is 12 years younger than A.

232. The age of grand father is 5 times more than the age of grandson. Which of the following numbers not support the approximate of the total age of the grand father and his grandson?

(a) 50 (b) 54
(c) 72 (d) 66

RRB RPF SI – 10/01/2019 (Shift-III)

Ans : (a) Let the age of grandson = x years
Age of grandfather = 5x years
Total age = 6x years
Since divisible numbers from 6 are 54, 72 and 66.
Therefore, option (a) does not support the approximate of the total age.

233. The ages of P and Q is 50 and 40 respectively. Before how many years the ratio of their age was 3:2?

(a) 20 years (b) 10 years
(c) 15 years (d) 5 years

RRB JE - 02/06/2019 (Shift-I)

Ans : (a) Let ratio of their ages before x years was 3 : 2
According to the question,

$$\frac{50-x}{40-x}=\frac{3}{2}$$

100 – 2x = 120 – 3x
x = 20 years

234. Sum of the ages of two sisters is 81. The ratio of their ages ratio is 4:5. One sister is how many years younger than other?

(a) 9 (b) 27
(c) 18 (d) 12

RRB JE - 27/06/2019 (Shift-I)

Ans : (a) Let the age of both sisters is 4x, 5x
According to the question,
4x + 5x = 81
9x = 81
x = 9
Age of first sister = 4x = 4 × 9 = 36 years
Age of second sister = 5x = 5 × 9 = 45 years
So, first sister is 9 years younger than second.

235. The age of Sita is twice the average age of Ram, Mohan and Sita. The age of Ram is half of the average age of Ram, Mohan and Sita. If Mohan's age is 5 years then what is the average age of Ram, Mohan and Sita?

(a) 10 years (b) 8 years
(c) 7 years (d) 15 years

RRB Group D 07/12/2018 (Shift-I)

Ans : (a) From question,

$$\text{Age of Sita} = \frac{\text{Ram}+\text{Mohan}+\text{Sita}}{3}\times 2$$

Mohan = 5 years (Given)
3 × Sita = (Ram + 5 + Sita) × 2
3 × Sita = 2 × Ram + 10 + 2 × Sita
Sita = 2 × Ram + 10 -------(1)

Age of Ram $= \frac{\text{Ram} + \text{Mohan} + \text{Sita}}{3} \times \frac{1}{2}$

$6 \times \text{Ram} = \text{Ram} + 5 + \text{Sita}$

$5 \times \text{Ram} = 5 + \text{Sita}$

$\text{Sita} = 5 \times \text{Ram} - 5$ -------(2)

By subtracting equation (1) from equation (2),

Age of Ram = 5, Age of Sita = 20, Age of Mohan = 5

So, average Age $= \frac{\text{Ram} + \text{Sita} + \text{Mohan}}{3}$

$= \frac{5 + 20 + 5}{3} = 10$ years

236. If 2/3 children are in the age group of 1-12, 1/2 children are in the age group of 1-8. Then find the part of children in the age group of 9-12?

(a) 1/3 (b) 1/4

(c) 1/6 (d) 1/2

RRB NTPC 28.03.2016 Shift : 1

Ans : (c) The part of students of 9-12 age group = Part of student of (1-12) years – Part of student of (1-8) years.

$= \frac{2}{3} - \frac{1}{2} = \frac{4-3}{6} = \frac{1}{6}$

237. The sum of the ages of 4 children born at an intervals of 4 years is 48. Find the age of the youngest child.

(a) 4 years (b) 5 years

(c) 6 years (d) 7 years

RRB NTPC 05.04.2016 Shift : 3

Ans : (c) Let all four children are x_1, x_2, x_3 and x_4 and their ages is x, x + 4, x + 8 and x + 12 respectively.

$\therefore$ x + x + 4 + x + 8 + x + 12 = 48 years

4x + 24 = 48 years

$4x = 24 \Rightarrow x = 6$ years

$\therefore$ Age of the youngest boy = 6 years

238. The product of the age of Swati and Aparna is 120. If thrice the age of Aparna is 2 years more than Swati's age, then find the age of Swati?

(a) 18 (b) 20

(c) 24 (d) 16

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) Let the age of Swati is x years and age of Aparna is y years.

According to first condition–

$xy = 120$ ……..(i)

According to second condition–

$3y = x + 2$

$y = \left(\frac{x+2}{3}\right)$

On putting the value of y in equation (i)–

$x \times \left(\frac{x+2}{3}\right) = 120$

$x^2 + 2x - 360 = 0$

$x^2 + 20x - 18x - 360 = 0$

$x(x + 20) - 18(x + 20) = 0$

$(x + 20)(x - 18) = 0$

$x + 20 = 0$ or $x - 18 = 0$

$x = -20$ (Invalid) or $x = 18$

Therefore, age of Swati = 18 years

239. 15 years ago Cynthia was thrice as old as Brittany. The sum of their present ages is 94 years. How old is Brittany now?

(a) 33 years (b) 32 years

(c) 30 years (d) 31 years

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (d) If present age of Cynthia is x years and present age of Brittany is y years. Then,

x + y = 94 years .....(i)

Their age before 15 years was (x-15) years and (y-15) years respectively,

According to the question,

$(x - 15) = 3(y - 15)$

$x - 15 = 3y - 45$

$x - 3y = -30$ .....(ii)

By multiplying 3 in equation (i) and adding equation (ii)–

$3x + 3y = 282$

$x - 3y = -30$

$4x = 252$

$x = 63$ years

Present age of Brittany $\Rightarrow 63 + y = 94$

or $y = 94 - 63 = 31$ years

240. The present age of Kavita, Rajita and Harita are in the ratio of 4 : 7: 9. Eight years ago, the sum of their age was 56. Find their present age (in years) :

(a) 16, 36, 28 (b) 16, 28, 36

(c) 20, 35, 45 (d) 12, 21, 27

RRB ALP & Tec. (20-08-18 Shift-III)

Ans : (b) Let the age of Kavita, Rajita and Harita is 4x, 7x, 9x years respectively.

According to the question,

$(4x - 8) + (7x - 8) + (9x - 8) = 56$

$20x - 24 = 56$

$x = 4$

So, present age of Kavita = $4x = 4 \times 4 = 16$ years

Present age of Rajita = $7x = 7 \times 4 = 28$ years

Present age of Harita = $9x = 9 \times 4 = 36$ years

241. What is the age of the eldest sister if the sum of age of 5 sisters born at the intervals of 3 years each is 50 years?

(a) 16 years (b) 4 years

(c) 14 years (d) 18 years

RRB ALP & Tec. (13-08-18 Shift-III)

Ans. (a) Let the age of eldest sister is x years then, age of other 4 sisters born at 3 years gap is (x-3), (x-6), (x-9) and (x-12) years respectively–

According to the question,

$x + x - 3 + x - 6 + x - 9 + x - 12 = 50$

$5x = 50 + 30$

$5x = 80$

$x = 16$ years

17.

Average

Type - 1

1. Consider a sequence of seven consecutive numbers. If the average of the first five numbers is 'z', then find the average of the last three numbers.

(a) $z + 3$ (b) $z + 5$

(c) $z + 1$ (d) $z + 7$

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (a) : Seven consecutive numbers 1, 2, 3, 4, 5, 6, 7

According to the question,

$$\text{Average of the first five numbers} = \frac{1+2+3+4+5}{5}$$

$$Z = \frac{15}{5} = 3$$

Then, $z = 3$

$$\text{Hence, Average of the last three numbers} = \frac{5+6+7}{3}$$

$$= \frac{18}{3} = 6 \text{ or } z + 3$$

2. The average of the first twelve multiples of 11 is:

(a) 69.5 (b) 68.5

(c) 71.5 (d) 70.5

RRB Group-D 22/08/2022 (Shift-II)

Ans. (c) :

First twelve Multiples of 11 = 11, 22, 33 132

$n = 12$

$$S_n = \frac{n}{2}\left[2a + (n-1)d\right]$$

$$= \frac{12}{2}\left[2\times 11 + (12-1)11\right]$$

$= 858$

$$\text{Required Average} = \frac{858}{12} = 71.5$$

3. If the average of 5 consecutive even numbers is 10, then find the number at the centre when these five numbers are arranged in ascending order.

(a) 20 (b) 14

(c) 12 (d) 10

RRB Group-D 23-08-2022 (Shift-II)

Ans. (d) : As, an average of 5 consecutive even numbers is 10 then sum of the consecutive even numbers = $10 \times 5 = 50$

Let the numbers be, a, (a + 2), (a + 4), (a + 6) (a + 8)

$\Rightarrow a + a + 2 + a + 4 + a + 6 + a + 8 = 50$

$5a + 20 = 50$

$5a = 30$

$$a = \frac{30}{5} = 6$$

The number will be

6, 8, 10, 12, 14

4. The average of 7 numbers was given as 53. Later it was found that one number was misread as 16 instead of 58. What is the correct average of the given 7 numbers?

(a) 55 (b) 56

(c) 59 (d) 52

RRB GROUP-D – 29/09/2022 (Shift-III)

Ans. (c) : Sum of 7 members = $7 \times 53 = 371$

According to the question,

Sum = 371 + 58 – 16

$$\text{Correct Average} = \frac{413}{7} = 59$$

5. The average of 3 consecutive natural numbers (which are in increasing order) is K. If two more consecutive numbers, just next to the first set of numbers, are added then the new average will become.

(a) $\frac{2K+1}{2}$ (b) K+1

(c) K+2 (d) 2K–1

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (b) : Let,

First natural number = x

Second natural number = x+1

Third natural number = x+2

$$\text{Average} = \frac{x+(x+1)+(x+2)}{3} = \frac{3x+3}{3} = \frac{3(x+1)}{3} = x+1$$

Average of the first 3 consecutive natural numbers

$\boxed{x+1=K}$ .....(i)

Average of 5 consecutive natural numbers

$$\frac{x+(x+1)+(x+2)+(x+3)+(x+4)}{5} = \frac{5x+10}{5} = \frac{5(x+2)}{5}$$

$= x + 2 = x+1+1$

From equation (i)

$x + 1 + 1 = K + 1$ ($\because x + 1 = K$)

6. The mean of the squares of the first ten natural numbers is:

(a) 385 (b) 231

(c) $\frac{11}{2}$ (d) $\frac{77}{2}$

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (d) : The sum of the squares of the first 'n' natural numbers = $\frac{n(n+1)(2n+1)}{6}$

Here, n = 10

$$\text{Sum} = \frac{10(10+1)(2\times10+1)}{6} = \frac{10\times11\times21}{6}$$

$$\text{Mean} = \frac{10\times11\times21}{10\times6} = \frac{11\times7}{2} = \frac{77}{2}$$

7. The mean of the first ten odd natural numbers is:

(a) 11 (b) 10

(c) 8 (d) 9

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : First ten odd natural numbers-

$\Rightarrow$ 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

$$\text{Mean} = \frac{1+3+5+7+9+11+13+15+17+19}{10}$$

$$= \frac{100}{10} = 10$$

8. The difference between the mean of the first eight composite natural numbers and the mean of the first eight prime numbers, is:

(a) $\frac{3}{20}$ (b) $\frac{1}{5}$

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (d) : First eight composite natural numbers = 4, 6, 8, 9,10,12,14,15

$$\text{Mean} = \frac{4+6+8+9+10+12+14+15}{8} = \frac{78}{8}$$

First eight prime numbers = 2, 3, 5, 7, 11, 13, 17, 19

$$\text{Mean} = \frac{2+3+5+7+11+13+17+19}{8} = \frac{77}{8}$$

$$\text{Required difference} = \frac{78}{8} - \frac{77}{8} = \frac{1}{8}$$

9. If the mean of five observations x, x – 1, x – 2, x –3 and x – 4 is 20, then the mean of the first two observations is :

(a) 20.5 (b) 23.5

(c) 22.5 (d) 21.5

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (d) : $\text{Arithematic mean} = \frac{\text{Sum of all observations}}{\text{Total no. of observations}}$

According to the question,

$$\frac{x+x-1+x-2+x-3+x-4}{5} = 20$$

$$5x-10=100$$

$$\Rightarrow 5x=110$$

$$x = 22$$

Then, Mean of the first two observations = $\frac{2x-1}{2}$

$$= x - 0.5$$

$$= 22 - 0.5 = 21.5$$

10. If the average of a_1, a_2, a_3 and a_4 is 19.5, a_1 = 21 and the average of a_1, a_2 and a_3 is equal to the average of a_2, a_3 and a_4, then what will be the value of a_4?

(a) 18 (b) 20

(c) 21 (d) 25

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

Average of a_1, a_2 and a_3 = Average of a_2, a_3 and a_4

$$\frac{a_1+a_2+a_3}{3} = \frac{a_2+a_3+a_4}{3}$$

$\Rightarrow 3a_1 + 3a_2 + 3a_3 = 3a_2 + 3a_3 + 3a_4$

$\therefore a_1 = a_4$

and $a_1 = 21$ (Given in the question)

So, $a_4 = 21$

11. The difference between the mean of the first 5 composite numbers and the mean of the first five prime numbers is:

(a) 2.4 (b) 2.6

(c) 1.6 (d) 1.8

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (d) :

Mean of the first five composite numbers

$$= \frac{4+6+8+9+10}{5}$$

$$= \frac{37}{5} = 7.4$$

Mean of the first five prime numbers

$$= \frac{2+3+5+7+11}{5} = \frac{28}{5}$$

$$= 5.6$$

Required difference = 7.4 – 5.6 = 1.8

12. The mean of the first eight odd natural numbers is :

(a) 10 (b) 9

(c) 11 (d) 8

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (d) : First eight odd natural numbers are-

1, 3, 5, 7, 9, 11, 13, 15

$$\text{Arithematic Mean} = \frac{\text{Sum of all observations}}{\text{Total number of observations}}$$

$$\text{Mean} = \frac{1+3+5+7+9+11+13+15}{8} = \frac{64}{8}$$

Mean = 8

13. The average of 5 consecutive even numbers is 40. Find the smallest number among these numbers.

(a) 35 (b) 36
(c) 44 (d) 48

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans : (b) Let the five consecutive even numbers are x, x +2, x + 4, x + 6 and x + 8

According to the question,

$$\frac{x + x + 2 + x + 4 + x + 6 + x + 8}{5} = 40$$

$5x + 20 = 200$

$5x = 180, \quad \boxed{x = 36}$

Therefore, the smallest number is x = 36.

14. Find the average of first 20 multiples of 7

(a) 66.5 (b) 67.5
(c) 73.5 (d) 74.5

RRB NTPC 03.04.2016 Shift : 3

Ans : (c) Sum of the first n multiples of K

$$= \frac{K\left[n(n+1)\right]}{2}$$

$$\text{Sum of the first 20 multiples of } 7 = \frac{7 \times \left[20(20+1)\right]}{2}$$

$$= \frac{7 \times 20 \times 21}{2}$$

$$= 1470$$

$$\text{Average} = \frac{\text{Sum of all observation}}{\text{Total number of observation}}$$

$$\text{Average} = \frac{1470}{20}$$

Average = 73.5

15. Find the average of first 20 multiples of 8–

(a) 78 (b) 80
(c) 84 (d) 82

RRB NTPC 02.04.2016 Shift : 1

Ans : (c) 8, 16, 24 …… 160

$$\text{Sum of terms} = \frac{n}{2}(a + \ell)$$

$$= \frac{20}{2}(8 + 160) = 10 \times 168 = 1680$$

$$\therefore \text{Average} = \frac{1680}{20} = 84$$

16. What is the average of first 30 multiples of 9?

(a) 142 (b) 138.5
(c) 139.5 (d) 143.5

RRB NTPC 16.04.2016 Shift : 1

Ans : (c) Sum of the first n multiples of K $= \frac{K\left[n(n+1)\right]}{2}$

$$\therefore \text{Sum of the first 30 multiples of } 9 = \frac{9\left[30(30+1)\right]}{2}$$

$$= \frac{9 \times 30 \times 31}{2}$$

$$= 4185$$

$$\text{Average} = \frac{4185}{30} = 139.5$$

17. The average of 5 consecutive numbers is 50. What is the difference between the product of the largest and smallest number to the product of the fourth and second number?

(a) 3 (b) –3
(c) 0 (d) 10

RRB NTPC 27.04.2016 Shift : 1

Ans : (b) Let the five consecutive numbers are x, x + 1, x + 2, x + 3 and x + 4

$$\therefore \quad \frac{x + (x+1) + (x+2) + (x+3) + (x+4)}{5} = 50$$

$5x + 10 = 250$

$5x = 240$

$x = 48$

∴ From question,

$x(x + 4) - (x + 1)(x + 3)$

$= x^2 + 4x - (x^2 + 4x + 3) = -3$

18. The average of 5 consecutive numbers is 10 then what will be the middle number?

(a) 10 (b) 11
(c) 8 (d) 9

RRB NTPC 29.04.2016 Shift : 3

Ans. (a) : Let the five consecutive numbers are x, x + 1, x + 2, x + 3 and x + 4

Total sum –

$x + (x + 1) + (x + 2) + (x + 3) + (x + 4) = 10 \times 5$

$5x + 10 = 50$

$5x = 40$

$x = 8$

∴ Hence, the middle number = $(x + 2) = 8 + 2 = 10$

19. The average of 5 consecutive numbers is 100, find the first number.

(a) 98 (b) 99
(c) 100 (d) 101

RRB NTPC 30.04.2016 Shift : 1

Ans : (a) Let the five consecutive numbers are

$x, x+1, x+2, x+3$ and $x+4$

$$\therefore \quad \frac{x + x + 1 + x + 2 + x + 3 + x + 4}{5} = 100$$

$5x + 10 = 500$

$5x = 490$

$x = 98$

Therefore, the first number is 98.

20. The average of 5 consecutive numbers is 100, then the difference of the squares of the largest and the smallest number will be:

(a) 800 (b) 990 (c) 900 (d) 1000

RRB NTPC 30.04.2016 Shift : 2

Ans : (a) Let the five consecutive numbers are: x, x +1, x + 2, x + 3 and x + 4 respectively

According to the question,

$$\frac{x + x + 1 + x + 2 + x + 3 + x + 4}{5} = 100$$

$$\frac{5x + 10}{5} = 100$$

$5x + 10 = 500$

$5x = 490$

$\boxed{x = 98}$

Largest number = x + 4 = 98 + 4 = 102
Smallest number = x = 98
Therefore, difference between square of the largest and the smallest numbers
$= (102)^2 - (98)^2 = (102+98)(102-98) = 200 \times 4 = 800$

Type - 2

21. The mean score of class A of 40 students in the mathematics test of 30 marks is 23. The mean score of class B of 45 students in the same test is 22. What is the ratio of the mean score of both the classes to that of class A?
(a) 380 : 391 (b) 390 : 382
(c) 382 : 391 (d) 391 : 382
RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (c) : The ratio of the mean score of both the classes to that of class A.
$\text{Ratio} = \frac{40\times23+45\times22}{40+45} : 23$
$= \frac{5(8\times23+9\times22)}{85} : 23$
$= \frac{(184+198)}{17} : 23$
$= 382 : 23 \times 17 = 382 : 391$

22. The average of five students in a class test is 39.20 and the average of three of them is 41. What is the average of the remaining two students?
(a) 37.5 (b) 36.5
(c) 39.5 (d) 38.5
RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (b) : Average of marks obtained by 5 students = 39.2 (Sum = Average × No. of students)
∴ Sum of marks obtained by 5 students = 39.2×5 = 196
Sum of marks obtained by 3 students = 41 × 3 = 123
Average of the remaining two students = $\frac{196-123}{2} = 36.5$

23. In a class of 100 students, the mean marks obtained in a certain subject is 25 and in another class of 50 students, the mean marks obtained in the same subject is 70. The mean marks obtained by the students of both the classes taken together.
(a) 25 (b) 60
(c) 30 (d) 40
RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Total marks obtained by the class of 100 students
= 100×25 =2500
Total marks obtained by the class of 50 students = 50 ×70 =3500
Hence, joint average of obtained marks of students of both classes = $\frac{\text{Total marks obtained}}{\text{Total number of students}}$
$= \frac{2500+3500}{100+50} = \frac{6000}{150} = 40$

24. The average marks obtained by a group of 25 students was 36. One student left the group, as a result of which the average of the remaining students grow to 37.5. Soon after another joined the same group, as a result of which the average marks dropped to 37.2. Find the average marks of the student who left and the student who joined the group.
(a) 37.5 (b) 22.5
(c) 30 (d) 15
RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) :
Total marks obtained by 25 students = 25 × 36
= 900
Total marks obtained by 24 students = 24 × 37.5
= 900
So marks obtained by the student who left the group
= 900 – 900 = 0
Marks obtained by 24 students + 1 new joined student
= 25 × 37.2 = 930
Marks obtained by the new student who joined the group = 930 – 900 = 30 marks
Hence, average of obtained marks of students who left and joined the group = $\frac{0+30}{2}$ = 15 marks

25. The mean of the marks scored by 40 students is 68. Later on, it was found that a score of 25 was misread as 45. Find the correct mean :
(a) 68.5 (b) 28
(c) 15 (d) 67.5
RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (d) : Increased marks by mistake = 25 □ 45 = 20
Increased Average = $\frac{20}{40} = 0.5$
Correct mean = 68–0.5 = 67.5

26. The average marks of 3 students of a class in an examination is 18 out of 25. Two new students appeared in the exam. What is the minimum marks which can be obtained by a new student and it is less than other students and the total average of all the five students increases to 20?
(a) 23 (b) 20
(c) 21 (d) 22
RRB RPF SI – 06/01/2019 (Shift-II)

Ans : (c) Maximum marks of three students
= 25 × 3 = 75 marks
And sum of their marks = 18 × 3 = 54 marks
Total marks of 5 students = 20 × 5 = 100 marks
Marks obtained by two students = 100 – 54 = 46
(because maximum marks is 25) 46 → 25 (Maximum marks), 21 (minimum marks)
Therefore minimum 21 marks can be obtained by a student.

27. The number of students of three groups of a college G_1, G_2 and G_3 is 20, 40 and 60 respectively. The average marks obtained by group G_1, G_2 and G_3 is 50%, 60% and 70% respectively. What is the average marks of all the students of the college?

(a) 62% (b) 61%
(c) 60% (d) 63%

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (d) According to the question-
Total obtained marks of group G_1 = 20 × 50 = 1000 marks
Total obtained marks of group G_2 = 40 × 60 = 2400 marks
Total obtained marks of group G_3 = 60 × 70 = 4200 marks
Total obtained marks of group G_1, G_2 and G_3
= 1000 + 2400 + 4200 = 7600 marks
Total number of students = 20 + 40 + 60 = 120
Average of obtained marks of all students $= \frac{7600}{120}$
$= 63.3\% \approx 63\%$

28. The average marks obtained by Reena in 16 exams is 26. The average marks obtained by shreya till now is 24, but she has taken only 12 tests till now. What is the average marks that Shreya has to be obtained in the remaining 4 exams to perform as well as Reena.

(a) 28 (b) 32
(c) 30 (d) 26

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (b) : Average marks obtained by Reena in 16 examinations = 26
∴ Total obtained marks = 26 × 16 = 416 marks
Average marks obtained by Shreya in 12 examinations = 24 marks
∴ Total marks = 24 × 12 = 288 marks
Total difference of Reena's marks and Shreya's marks = 416 – 288 = 128
Difference between their examinations = 16 – 12 = 4
Average marks of Shreya in 4 examinations = $\frac{128}{4}$ = 32 marks
Therefore, In order to perform like Reena, Shreya has to score 32 marks in 4 examinations.

29. In a class there were 9 boys and some girls. In a test, the mean score obtained by the boys was 13 while that obtained by the girls was 15. If the overall average was 14.28, what was the total number of students in the class?

(a) 24 (b) 25
(c) 26 (d) 27

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (b) : Let the number of girls = x
According to the question -
$9 \times 13 + 15 \times x = 14.28 (x+9)$
$117 + 15x = 14.28x + 128.52$
$0.72x = 11.52$
$x = \frac{1152}{72}$
$x = 16$
Therefore number of girls = 16
Total number of students = x + 9 = 16 + 9 = 25

30. The average of the marks of three students in an examination of 25 marks is 16. Two new students appeared in the examination. In order to make the average marks of all the five students is 19, what is the minimum marks that the who got less marks than the second new student must get?

(a) 22 (b) 21
(c) 20 (d) 23

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (a) Let the three students are x, y and z
According to the question,
Sum of marks obtained by 3 students
$x + y + z = 48$ ----- (i)
Let the two newly included students be A and B
Then sum of the marks obtained by 5 students =
$x + y + z + A + B = 95$ -----(ii)
From equation (i) and (ii),
$A + B = 95 – 48$
$A + B = 47$ -----(iii)
Maximum marks for A and B = 25 + 25 = 50 marks
If we give the highest marks to A, then the minimum marks obtained by B is 47 – 25 = 22 marks.

31. The average marks obtained in a test of 18 boys in a class is 16, while the average of the total 30 students in the class is 18.1. What is the average of marks obtained by the girls?

(a) 21.25 (b) 20.5
(c) 20.75 (d) 21

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (a) Average of marks obtained by 18 boys in the test = 16
Total marks = 16 × 18 = 288
Average of all 30 students = 18.1
Total marks = 18.1 × 30 = 543
Total obtained marks by 12 girls = 543 – 288
= 255
Average of all 12 girls $= \frac{255}{12} = 21.25$

32. The average of the marks of three students in an examination to total 45 marks is 38. New two students appeared in the examination. What is the lowest marks that can be obtained by the new student who has scored less than the second new student, so that the total average of the marks of five students becomes 40?

(a) 41 (b) 42
(c) 40 (d) 43

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) Sum of marks of all 5 students = 40 × 5 = 200
Sum of marks of first three students = 38 × 3 = 114
Sum of mark of remaining two new students = 200–114 = 86
Maximum marks in examination = 45

Hence, one of two new students can score a maximum 45 marks.
and second student can get minimum (86 – 45) = 41 marks

33. The average marks of obtained by Raghuveer in 12 tests is 25. Rumela's average so far is 23 marks, but he has appeared in only 8 tests. What is the average score that Rumela has to earn in the remaining 4 tests to be equal to Raghuveer's average?

(a) 27 (b) 29
(c) 26 (d) 28

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (b) Total marks obtained in 12 tests by Raghuveer = 12 × 25 = 300
Total marks obtained in 8 tests by Rumela=8×23 = 184
Required marks of 4 tests to reach at the level of Raghuveer = 300 – 184 = 116

Required Average $= \frac{116}{4} = 29$

34. A group of five students took an examination. Another student joined the group after taking the examination later by including his marks, the average marks of the group increased by 2 marks. This student has scored ----- marks more than the average marks without including him.

(a) 18 (b) 14
(c) 12 (d) 15

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (c)
Let the five students are A, B, C, D and E and their average be x
According to the question,
$\Rightarrow A + B + C + D + E = 5x$ _____(i)
Let the newly included student be F
$\Rightarrow A+ B+ C + D + E + F = 6\ (x+2) = 6x + 12$ ___ (ii)
From equation (i) and (ii)
$\Rightarrow 6x + 12 – 5x = F$
$\Rightarrow F = x + 12$
Hence, the marks of the newly included student is 12 more than the average marks.

35. There were 28 boys and some girls in a class. In an exam the average marks obtained by boys was 12.5. While the average marks obtained by girls was 14.5. If the total average was 13.1 then what was the total no. of students in the class?

(a) 42 (b) 40
(c) 44 (d) 38

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (b) Let the number of girls = x
According to the question,

$$13.1 = \frac{28\times12.5 + x\times14.5}{28 + x}$$

366.8 + 13.1x = 350 + 14.5 x
1.4 x = 16.8
x= 12
Number of boys in class = 28
Number of girls in class = 12
Total number of students = 28 + 12 = 40

36. In a class of 40 students the ratio of boys and girls is 7:3. Average marks of boys is 65 and the average marks of the girls is 72. What is the average marks of the whole class?

(a) 67.1 (b) 68.4
(c) 68.3 (d) 68.2

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (a) Ratio of Boys and Girls = 7 : 3
Total marks of boys = 65×7 = 455
Total marks of girls = 72× 3 = 216
Total marks = 671
Number = 10

Therefore, average marks of whole class $= \frac{671}{10} = \boxed{67.1}$

37. In a class of 45 students. The ratio of boys and girls is 4:5. The average marks of boys is 75 and that of girls is 82. What is the approximate average marks of the whole class?

(a) 78.6 (b) 78.5
(c) 78.9 (d) 79.0

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (c) : Let the number of boys and girls in a class of 45 students are 4x and 5x respectively.
$\therefore$ 4x + 5x = 45
9x = 45
x = 5
Number of boys = 4×5 = 20
Number of girls = 5×5 = 25
Total marks of boys = 75×20 = 1500
Total marks of girls = 25×82= 2050
Total marks of girls and boys = 1500+2050 = 3550

Average marks of the whole class $= \frac{3550}{45} = 78.88$
$= 78.9$

38. The average test score of 18 boys in a class was 15, while the over all average of all the 25 students of the class was 16.12. What was the average score of the girls?

(a) 18.5 (b) 19.5
(c) 19 (d) 18.8

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (c) Number of girls = 25 – 18 = 7
Hence the average test score of a girls

$$= \frac{25\times16.12 - 18\times15}{7}$$

$$= \frac{403 - 270}{7} = \frac{133}{7} = 19$$

39. The average marks obtained by a student in 5 subjects is 75. Average of his first two subjects is 65 and the average of his last two subjects is 85. How much he scored in the third subject?

(a) 80 marks (b) 65 marks
(c) 75 marks (d) 70 marks

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (c) Total marks obtained by a student in 5 subjects
= 75 × 5 = 375
$\because$ Average of his first 2 subjects = 65
Sum of his first 2 subjects = 65 × 2 = 130

$\because$ Average of his last 2 subjects $= 85$

Sum of last two subjects $= 85 \times 2 = 170$

Obtained marks in third subject $=$ sum of all five subjects $-$ (sum of first two subjects+ sum of last two subjects)

$= 375 - (130 + 170) = 375 - 300 = 75$

Hence obtained marks by the student in third subject = 75

40. In a class of 50 students, the ratio of boys and girls is 2:3. The average marks of the boys is 60 and the average marks of the girls is 70. What is the average marks of the whole class?

(a) 65 (b) 66

(c) 67 (d) 64

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (b) Given–

Ratio of girls and boys is 2 : 3

$$\text{Number of boys} = \frac{50\times 2}{5} = 20$$

$$\text{Number of girls} = \frac{50\times 3}{5} = 30$$

$$\text{Average marks of whole class} = \frac{60\times 20 + 30\times 70}{50}$$

$$= \frac{1200+2100}{50} = \frac{3300}{50} = 66$$

41. A group of 19 students took an examination, another student joined the group after baking the examination. By including his marks, the average marks of the group increased by 1.5 marks. This student has scored ----- marks more than the average marks without including him.

(a) 25 (b) 30

(c) 24 (d) 28.5

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (b) Let the average marks of 19 students = x

$$\text{Now, } \frac{\text{student}_1 + \text{student}_2 + ----+\text{student}_{19}}{19} = x$$

$\Rightarrow \text{student}_1 + \text{student}_2 + \text{-----+student}_{19} = 19x$ ---- (i)

After including new student–

$$\frac{\text{student}_1 + \text{student}_2 + ----+\text{student}_{20}}{20} = x + 1.5$$

$\text{student}_1 + \text{student}_2 + \text{-----+student}_{20} = 20x + 30$ --- (ii)

By subtracting equation (i) from equation (ii),

$\text{student}_{20} = 20x + 30 - 19x = x + 30$

It is clear that the student included in the group has scored 30 marks more than the average marks.

42. The average marks obtained by Suveer in 15 exams is 29. Ruchira has maintained the average of 27 but till now she has taken only 11 exams. What is the average score that Ruchira has to score in the remaining four exams to match Suveer's performance?

(a) 35 (b) 34.5

(c) 36 (d) 35.5

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (b) Given-

Average marks of Suveer in 15 examinations $= 29$

Total marks of Suveer $= 29 \times 15 = 435$

Average marks of Ruchira in 11 examinations $= 27$

Total marks of Ruchira $= 27 \times 11 = 297$

Total required marks of Ruchira in remaining 4 examinations $= 435-297 = 138$

Hence, Required average marks of Ruchira $= \frac{138}{4} = 34.5$

43. A group of seven students took an exam. After exam one more students joined the group. After including the new student the average marks is raised by 2. In comparison with the average marks of initial seven students, how much more marks did the new student obtain?

(a) 16 (b) 18

(c) 14 (d) 20

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (a) : Let average marks of 7 students = x

$\therefore$ Total obtained marks by 7 students $= 7x$

Again, let the marks of new student $= y$

According to the question,

$$\frac{7x+y}{8} = (x+2)$$

$7x + y = 8x + 16$

$y = x + 16$

Hence, student scored 16 marks more than the average marks of initial seven students.

44. In a class the average marks obtained by 35 students is 63. If two more students whose average is 85.5 is add, to these then the new average of the class is?

(a) 64.20 (b) 67.90

(c) 63.62 (d) 65.35

RRB NTPC 04.04.2016 Shift : 2

Ans : (a) Total sum of marks of 35 students

$= 35\times 63 = 2205$

From question-

$$\text{New Average of class} = \frac{2205 + 2\times 85.5}{35+2}$$

$$= \frac{2205+171}{37} = \frac{2376}{37} = 64.21 \approx 64.20$$

45. The average marks obtained by James in Maths, Science and History is 89. If the marks of Language is also added then the averages decreases to 88.25. Find out the marks obtained by him in the Language.

(a) 90 (b) 82

(c) 86 (d) 83

RRB NTPC 28.03.2016 Shift : 3

Ans : (c) Marks obtained by him in the language

$= 4 \times 88.25 - 3 \times 89$

$= 353 - 267 = 86$

Type - 3

46. The average weight of 14 students of a class is 20 kg. If a student leaves the class the average weight of the class drops by 2 kg. Find the weight of the student (in kg) who left the class.

(a) 43 (b) 49
(c) 45 (d) 46

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : Let total weight of 14 students of a class
$= 14 \times 20 = 280$ kg
According to the question,

$$\Rightarrow \frac{280 - x}{13} = 18$$

$\Rightarrow 280 - x = 234$
$\Rightarrow x = 280 - 234$
$\Rightarrow x = 46$
Hence, weight of student who left the class = 46 kg

47. The average age of 35 students of a class is 15 years, When the teacher's age is also included, then the average age increases by one year. Find the age of teacher.

(a) 45 years (b) 51 years
(c) 41 years (d) 35 years

RRB Group-D 30-08-2022 (Shift-II)

Ans. (b) : Given,
Average age of 35 students $\rightarrow$ 15 years
Total sum of ages = $35 \times 15 = 525$
According to the question-
Average age of (35 student + Teacher) = (15 + 1) years
Sum of their ages = $16 \times 36 \Rightarrow 576$
Hence, Teacher's age = $576 - 525 \Rightarrow 51$ years

48. There are two sections, A and B of a class, consisting of 40 and 50 students, respectively. If the average weight of students in section A is 36 kg and that of those section B is 45 kg, then the average weight of the whole class is :

(a) 39 kg (b) 43 kg
(c) 42 kg (d) 41 kg

RRB Group-D 30-08-2022 (Shift-II)

Ans. (d) : According to the question,
Total weight of section A = $40 \times 36 = 1440$ kg
Total weight of section B = $50 \times 45 = 2250$ kg
$\therefore$ Average weight of whole class

$$= \frac{\text{Total weight of class}}{\text{Total number of students}}$$

$$= \frac{1440 + 2250}{(40 + 50)} = \frac{3690}{90} = 41$$

49. Six years ago, the average age of L and M was 39 years and the average of the present ages of L, M and N is 54 years. What will be the age of N 5 years from now ?

(a) 97 years (b) 72 years
(c) 92 years (d) 77 years

RRB Group-D 08/09/2022 (Shift-I)

Ans. (d) : Present age of (L + M) = $39 \times 2 + 6 \times 2$
= 90 years
Present age of (L + M + N) = $54 \times 3 = 162$
Present age of N = $162 - 90 = 72$ years
After 5 years age of N = $72 + 5 = 77$ years

50. Geetha, Latha and Madhuri's ages are in the ratio 5 : 6 : 3, If their average age is 42 years, then find Latha's age.

(a) 54 years (b) 27 years
(c) 45 years (d) 35 years

RRB Group-D 30-08-2022 (Shift-III)

Ans. (a) : Let the ages of Geetha, Latha and Madhuri be 5x, 6x and 3x respectively,
$\because$ Their average age = 42 years
$\therefore$ Sum of their ages = $42 \times 3 \rightarrow 126$ year
According to the question,
$5x + 6x + 3x = 126$ year
$14x = 126$
$x = 9$ year
Hence, Latha's age = $6x = 6 \times 9$
= 54 years

51. The average weight of all children in a group is 45 kg. If 10 children of average weight 42 kg leave the group and 2 children of average weight 55 kg join the group, then the average weight of the children in the group increases by $1\frac{1}{4}$ kg. The number of children in the group initially was :

(a) 38 (b) 48
(c) 42 (d) 52

RRB Group-D 09/09/2022 (Shift-II)

Ans. (b) : Let the number of children in the group initially = x
According to the question,

$$x \times 45 - 42 \times 10 + 55 \times 2 = (x - 8)\left(45 + \frac{5}{4}\right)$$

$$45x - 420 + 110 = (x - 8)\frac{185}{4}$$

$180x - 1240 = 185x - 1480$
$-5x = -240$
$x = 48$
Hence the number of children in the group initially = 48

52. The average of the numbers 15, 17, 20, 25, 32 and 35 is:

(a) 24 (b) 28
(c) 18 (d) 14

RRB GROUP-D – 16/09/2022 (Shift-I)

Ans. (a) : Average $= \frac{\text{Sum of terms}}{\text{Number of terms}}$

$= \frac{15+17+20+25+32+35}{6} = \frac{144}{6}$

$= 24$

53. The average weight of P, Q and R is 58 kg. If the average weight of P and Q is 54 kg and that of Q and R is 48 kg, then the weight of Q is:

(a) 26 kg (b) 32 kg

(c) 30 kg (d) 28 kg

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (c) :

Average weight of P, Q and R = 58 kg

Total weight of P, Q and R = 58×3=174 kg

P + Q + R = 174 kg ...(i)

Average weight of P and Q = 54 kg

Total weight of P and Q = 54×2 = 108kg

P + Q = 108 kg ...(ii)

Average weight of Q and R = 48 kg

Total weight of Q and R= 48 × 2 = 96kg

Q + R = 96 kg ...(iii)

From equation (ii) and (iii),

P + 2Q + R = 204kg ...(iv)

On subtracting equation (i) from equation (iv),

Hence, Q = 30 kg

54. The average weight of an apple in a sample of 10 apples was calculated as 104 g. Later on, it was found that the weighing had shown the weight of each apple 20 g less. The correct average weight of an apple in that sample is:

(a) 84 g (b) 124 g

(c) 200 g (d) 1240 g

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : From above question,

Total average weight of 10 apples = 10× 104g = 1040g

Loss in total average weight of 10 apples = 10 × 20

= 200g

Correct average weight $= \frac{1040+200}{10} = \frac{1240}{10} = 124\text{g}$

55. The average weight of A, B, C, and D is 56 kg. If the average weight of A, B and C is 52 kg and that the average weight of C and D is 48 kg, then the weight of C is–

(a) 28 kg (b) 36 kg

(c) 34 kg (d) 30 kg

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (a) : A + B + C + D = 56 × 4 = 224 kg

A + B + C = 52 × 3 = 156 kg

C + D = 48 × 2 = 96 kg

Weight of C = (156 + 96) – 224 kg

= (252 – 224) kg

= 28 kg

56. As of this year, the average age of a family of 8 members is 39 years. Assuming that after six years the family adopts a new-born baby, what will be the average age of the family 10 years from now?

(a) 46 years 8 months (b) 49 years 6 months

(c) 49 years (d) 44 years

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : At present, total age of the family = 39×8 = 312 years

Adopted child after 6 years from now–

Child's age = 4 years

Ten years from now,

Total age of the whole family = 312+ 4 + 8 ×10

= 396 years

Average age of the whole family = $\frac{396}{9}$ = 44 years

57. The mean of ages of 9 children in a joint family is 14 years. The ages of their grandfather and grandmother are 71 years and 67 years respectively. Find the mean of the ages of children and grandparents.

(a) 25 years (b) 51 years

(c) 24 years (d) 16 years

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : Total sum of age of 9 children = 9 × 14 =126 years

Total sum of children, grandfather and grandmother ages

=126 + 71 + 67 = 264 years

Mean of ages of all = $\frac{264}{11}$ = 24 years

58. At present the average age of 20 students of class ten is 15.5 years. The present age of the class teacher is 47 years. What will be the average age of the students and the class teacher after 5 years?

(a) 22.5 years (b) 22 years

(c) 21.8 years (d) 21.5 years

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) : Total average age of the students and the class teacher

= 20 × 15.5 + 47

= 310 + 47 = 357 years

Total age of the students and the class teacher after 5 years = 357 + 20 × 5 + 5 = 462 years

∴ Hence, the average age after 5 years = $\frac{462}{21}$ = 22 years

59. The captain of a cricket team of 11 members is 35 years old and the wicket keeper is 5 years older than the captain. If the ages of these two are excluded, the average of the remaining players is three years less than the average of the whole team. What is the average age of the whole team.

(a) 26 years (b) 24 years

(c) 28 years (d) 25 years

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (b) Let the average age of whole team is x years –
According to the question,

$$\frac{11x-35-40}{9}=x-3$$

$$11x-75=9x-27$$

$$2x=75-27$$

$$2x=48$$

$$x=24 \text{ years}$$

60. The mean of the ages of three friends is 22. If the mean of the ages of four friends is 24, then find the age of the fourth friend.

(a) 31 (b) 30
(c) 22 (d) 24

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (b) : The mean of the ages of three friends = 22
Total age of three friends = 22×3 = 66
The mean of the ages of four friends = 24
Total age of four friends = 24× 4 = 96
Age of fourth friend = Total age of four friends − Total age of three friends = 96 – 66 = 30

61. A person who received 4 packets in January with an average weight of 300g and in February received 8 packets with an average weight of 400g. What will be the average weight (in gram) of all the packets received by the person in both the months?

(a) 350g (b) 366.67g
(c) 412.67g (d) 376.67g

RRB RPF SI – 10/01/2019 (Shift-I)

Ans : (b)
In January, total weight of 4 packets = 4×300 = 1200 g
In February, total weight of 8 packets = 8×400 =3200g
Average weight of total packets

$$=\frac{\text{Sum of total weight}}{\text{Number of total packets}}$$

$$=\frac{1200+3200}{12}=\frac{4400}{12}=\frac{1100}{3}$$

$$=366.67 \text{ g}$$

62. The average weight of 25 items is 50 kg. If the weight of some other item is included in this, then average weight is increased by 500 g. What is the weight of item X ?

(a) 28 kg (b) 36 kg
(c) 82 kg (d) 63 kg

RRB Group-D – 25/09/2018 (Shift-II)

Ans : (d) Total weight of 25 items = 25 × 50
= 1250 kg
Total average weight after including the weight of the new item X
= (50 + .5) kg = 50.5 kg
Hence, total weight of 26 items after in cluding the weight of the new item X = 50.5 × 26
= 1313 kg
Weight of item X = 1313 – 1250 = 63 kg

63. The mean weight of six kids is 17.5 kg. If the individual weights of 5 of those kids are 14, 19, 23, 21 and 13 kg, respectively, find the weight of the sixth kid.

(a) 17 kg (b) 15 kg
(c) 16 kg (d) 18 kg

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Let the weight of 6th child is x kg.

$$\therefore\ 17.5=\frac{14+19+23+21+13+x}{6}$$

$$105.0=90+x$$

$$x=15$$

Hence weight of 6th child = 15 kg

64. The average weight of 42 boys of a class is 41 kg. A boy of 39 kg weight joins the class. A boy already present in the class, whose weight was counted as 34 kg in place of 43 kg. What will be the new average?

(a) 39.81 (b) 40.74
(c) 41.16 (d) 40.92

RRB NTPC 26.04.2016 Shift : 1

Ans : (c) Total weight of 42 boys = 42 × 41 = 1722 kg
On inclusion of 39 kg boy
New weight = 1722 + 39 = 1761 kg
According to the question,

$$\text{New Average}=\frac{1761+43-34}{43}=\frac{1770}{43}=41.16$$

65. In a class of 10 students, the average age was 16 years. When two students dropped the class then the average age of the remaining students was 16.25 years. What was the total age of the dropout students?

(a) 32 years (b) 30 years
(c) 34 years (d) 28 years

RRB RPF Constable – 20/01/2019 (Shift-III)

Ans : (b) Total average age of 10 students
= 16 × 10 = 160 years
Total average age of remaining 8 students = 8 × 16.25
= 130.00 years
Total age of dropout students = 160–130 = 30 years

66. In a group of 5 people the ratio of the average age of first three and the last two is 9:7. If the difference of the average of their ages is 12, then what will be the average age of all the five people?

(a) 46.8 years (b) 49.2 years
(c) 48.4 years (d) 64.8 years

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (b) Let the average age of the group of 3 people = 9 x years
Average age of group of 2 people = 7x years
According to the question,
$\therefore$ 9x – 7x = 12
2x = 12
$\boxed{x=6}$

Average age of 3 people = $9 \times 6 = 54$ years
Average age of 2 people = $7 \times 6 = 42$ years
Total age of 3 people = $3 \times 54 = 162$ years
Total age of 2 people = $2 \times 42 = 84$ years
Total age of 5 people = $(162+84) = 246$ years
Average age of all 5 people $= \frac{246}{5} = 49.2$ years

67. The average age of 40 students is 30 years, average age of 25 students is 36 years. Find the average age of the remaining of the students?
(a) 20 (b) 15
(c) 25 (d) 18

RRB NTPC 05.04.2016 Shift : 2

Ans : (a) Average age of remaining students

$$= \frac{40 \times 30 - 25 \times 36}{40 - 25}$$
$$= \frac{1200 - 900}{15}$$
$$= \frac{300}{15} = 20 \text{ years}$$

68. If the average age of 40 students of class Ist is 10 years and the average age of 30 students in class IInd is 12 years. Find the average age of all students (in years).
(a) 11 (b) 10.54
(c) 10.58 (d) 10.85

RRB NTPC 29.04.2016 Shift : 2

Ans : (d) Total age of 40 students = $10 \times 40 = 400$ years
Total age of 30 students = $12 \times 30 = 360$ years
Average age of all students $= \frac{400+360}{70}$
$= \frac{760}{70} = 10.85$ years

Type - 4

69. The average of 6 numbers is 16. If one of the number is excluded the average become 17. Find the excluded number.
(a) 13 (b) 12
(c) 10 (d) 11

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) :
Total sum of 6 numbers = $16 \times 6 = 96$
Total sum of 5 numbers = $17 \times 5 = 85$
Hence, Excluded number = $96 - 85 = 11$

70. A family spends ₹4600, ₹5600, ₹4800, ₹3800, and ₹6000, on groceries in the first 5 months of a year. How much should the family spend in the 6th month to make the 6 months average spending of family on groceries to ₹4500?
(a) ₹3500 (b) ₹3650
(c) ₹4500 (d) ₹2200

RRB NTPC (Stage-2) 12/06/2022 (Shift-I)

Ans. (d) : Total expenditure of 6 months of family
$= 6 \times 4500 =$ ₹ 27000
First 5 month expenditure of family.
$4600+5600+4800+3800+6000 =$ ₹ 24800
$\therefore$ Total expenditure of 6th month = 27000 – 24800
= ₹ 2200

71. The mean weight of 18 jackfruits is 7.2 kg. If the weighs of 2 more jackfruits whose weighs are equal are added, the mean weight decreases by 20 g. What is the weight of each jackfruit added later?
(a) 7.18 kg (b) 7.12 kg
(c) 7.40 kg (d) 7.00 kg

RRB GROUP-D – 22/09/2022 (Shift-III)

Ans. (d) : Total weight of 18 jackfruits = 18×7.2
= 129.6 kg
when 2 jackfruits are added, the weight is decreased by 20 gm.
then total weight of 20 jackfruits
$= 20 \times \left(7.2\text{kg} - \frac{20}{1000}\text{kg}\right)$
$= 20 \times (7.2 - 0.02)$kg
= 143.6 kg
weight of two jackfruits added later = 143.6 – 129.6
= 14
Hence the weight of each jackfruit added later
$= \frac{14}{2} = 7$kg

72. The average weight of 6 persons increases by 2 kg when one of them whose weight is 72 kg is replaced by a new man. The weight of the new man is:
(a) 84 kg (b) 104 kg
(c) 94 kg (d) 74 kg

RRB GROUP-D – 16/09/2022 (Shift-I)

Ans. (a) : Let the average = x
and the weight of new man = a
According to the question,
$6x + a - 72 = 6(x + 2)$
$6x + a - 72 = 6x + 12$
$a = 84$ kg.

73. The mean of 21 observations is 42. If out of 21 given observations, the mean of the first 11 observations is 50 and the mean of the last 11 observations is 35, then the 11th observation will be:
(a) 50 (b) 53
(c) 35 (d) 40

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,
Sum of total observations = $21 \times 42 = 882$
Sum of first 11 observations = $11 \times 50 = 550$
Sum of last 11 observations = $11 \times 35 = 385$
11th observation = $(550+385) - 882$
$= 935 - 882 = 53$

74. What is the third number in a group of three numbers with a combined average of 29, when the average of the other two numbers is 13?

(a) 61 (b) 28
(c) 34 (d) 30

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (a) : Average of a group of three numbers = 29
Sum of the set of all three numbers = 3×29 = 87
Average of two of them = 13
Sum of both the numbers = 2×13 = 26
Third number = sum of three numbers – sum of two numbers.
Third number = 87 – 26 = 61

75. The mean of 11 numbers is 44. If the mean of the first 6 numbers is 39 and that of the last 6 numbers is 48, then what is the 6th number?

(a) 34 (b) 36
(c) 38 (d) 32

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (c) : Mean $= \frac{\text{Sum of observations}}{\text{Number of observations}}$

$44 = \frac{\text{Sum of 11 numbers}}{11}$

Sum of 11 numbers = 484
And, sum of last 6 numbers = 6×48 = 288
Sum of first 6 numbers = 6×39 = 234
Therefore, 6th number = (Sum of first 6 numbers + Sum of last 6 numbers) – Sum of 11 numbers
= 288 + 234 – 484
= 38

76. If the mean of the following data is 11, find the value of 'k'
11, 19, 5, 10, k, 13, 12, 8, 15, 14

(a) 13 (b) 12
(c) 3 (d) 11

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : Mean of the data $= \frac{\text{Sum of all terms}}{\text{Number of all terms}}$

$$11 = \frac{11+19+5+10+k+13+12+8+15+14}{10}$$

$107 + k = 110$
$k = 3$

77. The average score of a group of 12 members was 8, while the average score of another group of n members was 10. If the combined average was 9.2, then find the value of n.

(a) 18 (b) 24
(c) 16 (d) 30

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (a) : Sum of group of 12 members = 12×8= 96
Sum of the group of n members = 10×n = 10n
∴ According to the question-

$$9.2 = \frac{96+10n}{(12+n)}$$

$$(12+n) = \frac{960+100n}{92}$$

$$1104 + 92n = 960 + 100n$$

$$144 = 8n$$

$$n = \frac{144}{8} = 18$$

$\therefore n = 18$

78. The average of runs scored by a batsman in 5 matches is 125, the average of the runs scored by him in first two match is 150. The average of runs scored in the last two matches is 110. How many runs that batsman scored in the third match?

(a) 115 run (b) 125 run
(c) 105 run (d) 95 run

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (c) : Total runs scored by batsman in 5 matches = 125×5= 625
Total runs scored by bats man in first 2 matches = 150 × 2 = 300
Total runs scored by bats man in last 2 matches = 110 × 2 = 220
∴ Total runs scored in the third match
= 625–(300+220)
= 625 – 520
= 105 run

79. After 12 innings, the average score per innings of a batsman was 55. After 14 innings his average score increased to 60. If the batsman had scored 20 runs more in the 14th innings than the previous innings, then how many runs did he score in the 13th innings?

(a) 90 (b) 85
(c) 80 (d) 75

RRB Paramedical Exam – 21/07/2018 (Shift-I)

Ans : (c) Average score of 12 innings = 55
∴ Total score = 55×12 = 660
Average score of 14 innings = 60
∴ Total score = 14×60 = 840
Total score of 13th and 14th innings = 840 – 660 = 180
Let the score of 13th innings is x then score of 14th inning = x + 20
According to the question-
∴ x + 20 + x =180
2x = 160 ⇒ x = 80

80. After 10 innings the average score per innings of a batsman was 52. After 12 innings the average score increased to 54. If the batsman had scored 16 more runs in the 12th innings than in the previous one, then how many runs did he score in the 11th innings?

(a) 55 (b) 56
(c) 54 (d) 53

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (b) Total score of 10 innings $= 10 \times 52 = 520$
Total score of 12 innings $= 12 \times 54 = 648$
Let, batsman scored x run in 11th innings
According to the question,
$x + x + 16 = 648 - 520$
$2x = 128 - 16$
$2x = 112$
$x = 56$ run
Hence the batsman has scored 56 runs in 11th innings.

81. After 11 innings the average score per innings of a batsman is 52. After 13th innings the average increases to 54. If the batsman scored 16 more runs in the 13th innings than the previous innings, then how many runs did he score in the 12th innings?
(a) 54 (b) 57
(c) 56 (d) 55

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (b) : Total score after 11 innings $= 52 \times 11 = 572$
Total score after 13 innings $= 54 \times 13 = 702$
Run in 12th innings = Score of 13th innings – Score of 11 innings $= 702 - 572 = 130$
Let the Run in 12th innings $= x$
Run in 13th innings $= x+16$
then, $x + (x+16) = 130$
$2x = 130 - 16$
$2x = 114$
$\boxed{x = 57}$

82. Average of 81 results is 54. If the average of first 59 results is 52 and last 21 results is 60, then calculate the 60th result?
(a) 52 (b) 60
(c) 46 (d) 62

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (c) : Grand Total of 81 results $= 81 \times 54 = 4374$
Grand Total of first 59 results $= 59 \times 52 = 3068$
Grand Total of last 21 results $= 21 \times 60 = 1260$
60th result $= 4374 - (3068 + 1260) = 46$

83. Average of 11 results is 50. The average of first 6 results is 49 and last 6 results average is 52. Then what will be the value of the 6th result?
(a) 48 (b) 51
(c) 56 (d) 49

RRB NTPC 02.04.2016 Shift : 3

Ans : (c) 6th result = grand total of first 6 results + grand total of last 6 results - grand total of 11 results.
$= 6 \times 49 + 6 \times 52 - 11 \times 50$
$= 294 + 312 - 550$
$= 606 - 550 = 56$

84. The average of 45 results is 23. The average of first 22 is 18 and last 22 is 21. What is the value of 23rd result?
(a) 172 (b) 190
(c) 177 (d) 187

RRB NTPC 18.04.2016 Shift : 3

Ans : (c) Sum of 45 results $= 45 \times 23 = 1035$
Sum of first 22 results $= 22 \times 18 = 396$
Sum of last 22 results $= 22 \times 21 = 462$
value of 23rd results $= 1035 - (396+462)$
$= 1035 - 858 = 177$

Type - 5

85. The following table shows the weight (in kg) of workers in a factory:

Weight (in kg)	65	55	70	50	60

What is the average weight of the workers?
(a) 55 (b) 70
(c) 65 (d) 60

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,
The average weight of workers $= \frac{65+55+70+50+60}{5}$
$= \frac{300}{5} = 60$

86. The given table shows the number of passengers on an aircraft and their corresponding weight (in kg), for a total of 40 passengers. Answer the question given below based on the table.

No.of passengers	4	15	6	5	3	7
Weight (in kg)	90	60	75	78	72	45

What is the average weight of all the 40 passengers?
(a) 65.77 kg (b) 80.57 kg
(c) 75.77 kg (d) 72.57 kg

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,
The average weight
$= \frac{90 \times 4 + 60 \times 15 + 75 \times 6 + 78 \times 5 + 72 \times 3 + 45 \times 7}{40}$
$= \frac{360 + 900 + 450 + 390 + 216 + 315}{40}$
$= \frac{2631}{40}$
$= 65.77$ kg

87. The sales quantity in a shop is recorded for four different quarters. Following is the data is-

Quarter	Selling Amount
Quarter 1	200
Quarter 2	100
Quarter 3	350
Quarter 4	550

What is average sales per quarter?
(a) 300 (b) 500
(c) 250 (d) 350

RRB RPF SI – 12/01/2019 (Shift-III)

Ans : (a) Average sales per quarter

$$= \frac{(200+100+350+550)}{4}$$

$$= \frac{1200}{4} = 300$$

88. Based on the following table, what is the average number of screws manufactured in the unit in given 6 months?

Months	No. of screws manufactured (In thousands)
January	200
February	300
March	250
April	250
May	250
June	250

(a) 300 (b) 200
(c) 250 (d) 150

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (c) : Average = $\frac{\text{sum of terms}}{\text{number of terms}}$

Average of the screw in given 6 months-

$$= \frac{200+300+250+250+250+250}{6}$$

$$= \frac{1500}{6} = 250$$

89. A private swimming pool provides different time slots for its users, and the following table shows the number of pool visitors of the week?

Days	No. of users of swimming pool
Monday	**8**
Tuesday	**4**
Wednesday	**15**
Thursday	**15**
Friday	**20**
Saturday	**25**
Sunday	**25**

An average of how many visitors visited on one day of that week?

(a) 12 (b) 16
(c) 14 (d) 15

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (b) Number of visitors in the whole week =
8 + 4 + 15 + 15 +20 +25 + 25 = 112

Average = $\frac{112}{7} = 16$

Hence, an average of 16 visitors visited throughout the week.

90. Two football teams, Team A and Team B played in a tournament and following are the goals scored in six matches.

Game	Goal by Team A	Goal by Team B
Kesue 1	2	3
Kesue 2	1	0
Kesue 3	0	1
Kesue 4	4	5
Kesue 5	3	2
Kesue 6	2	1

What can we conclude on the basis of average goals.

(a) The average score of Team A and B is same.
(b) The average score of Team A is higher than that of B.
(c) Team A is similar to B.
(d) The average score of team B is higher than that of team A.

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (a) Average score of Team A

$$= \frac{2+1+0+4+3+2}{6} = \frac{12}{6} = 2$$

Average score of Team B

$$= \frac{3+0+1+5+2+1}{6} = \frac{12}{6} = 2$$

Hence, the average score of team A and B is same.

91. What is the difference in average price per kg (in ₹) for vegetables, three months between two years, according to the data given in the following table?

Months	Per Kg Price-year 1	Per Kg Price-year 2
January	**40**	**35**
February	**40**	**50**
March	**40**	**35**

(a) There is no difference in the average price.
(b) We can't compare values.
(c) The average price of vegetables in year 1 is less than year 2.
(d) The average price of vegetables in year 2 is less than year 1.

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (a)

Average price of first years $= \frac{40+40+40}{3} = 40$

Average price of second year $= \frac{35+50+35}{3} = 40$

Difference = 40 − 40 = 0

Hence, there is no difference in the average price.

92. The number of people going through the way of shop is recorded for four different quarters. The following data is given for this. What is the average number of people going through the shop way in all the quarters?

Quarters	No. of People
Quarter1	**2,000**
Quarter2	**1,000**
Quarter3	**3,500**
Quarter4	**5,500**

(a) 12,000 (b) 4,000
(c) 10,000 (d) 3,000

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (d)

$$\text{Average number} = \frac{2000+1000+3500+5500}{4}$$

$$= \frac{12000}{4} = 3000$$

Direction (71 to 73)

93. The given table represents the marks obtained by four students W, X, Y and Z in four subjects P, C, B and M with the maximum marks in each subject being 100.

The average marks of all the four students in subject C is.

Students/ Subject	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

(a) 67.5 (b) 67

(c) 67.75 (d) 67.25

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (a) Average marks of all four students in subject C

$$= \frac{90+80+20+80}{4} = \frac{270}{4} = 67.5$$

94. What is the average mark of all four students in M?

(a) 62 (b) 62.25

(c) 62.75 (d) 62.5

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (d) Average marks of all four students in M

$$= \frac{85+60+40+65}{4}$$

$$= \frac{250}{4} = 62.5$$

95. What is the average mark of the all four students in P?

(a) 68.5 (b) 68

(c) 68.75 (d) 68.25

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (c) Average marks of all four students in P

$$= \frac{70+55+60+90}{4} = \frac{275}{4} = 68.75$$

Type - 6

96. The average spending of a family per week during a four-week period on essentials items was ₹1475. During the first three weeks the family spent ₹1200, ₹1500 and ₹1875 on such items. How much did the family spend on these items in the final week to ensure that the weekly average is maintained?

(a) ₹1275 (b) ₹1375

(c) ₹1325 (d) ₹1225

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Let Rs. x spend in the last week

$$\text{Average} = \frac{\text{Expenditure of weeks}}{\text{Total number of weeks}}$$

$$1475 = \frac{1200+1500+1875+x}{4}$$

$$5900 - 4575 = x$$

$$x = ₹1325$$

97. The average of ten numbers is 8, If each number is divided by 2, then find the average of the new set of numbers.

(a) 10 (b) 4

(c) 8 (d) 6

RRB Group-D 30-08-2022 (Shift-III)

Ans. (b) : Given :

Average of 10 numbers = 8

If each number is divided by x, then average of new set of number be also divided by x,

$\therefore$ Average of new set = $\frac{8}{2} = 4$

98. 10 is the mean of a set of 7 observations and 5 is the mean of another set of 3 observations. The mean of the combined set is:

(a) 10 (b) 7.5

(c) 15 (d) 8.5

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (d) :

$$\text{Mean} = \frac{\text{Sum of observations}}{\text{Number of observations}}$$

Sum of 7 observations $= 7 \times 10 = 70$

Sum of 3 observations $= 3 \times 5 = 15$

$$= \frac{70+15}{3+7}$$

$$= \frac{85}{10}$$

$$= 8.5$$

99. The mean of 20 observations is 50. It was later found that two observations 13 and 24 were incorrectly recorded as 31 and 42. The correct mean is :

(a) 47.25 (b) 48.20

(c) 50 (d) 51.85

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) : Mean of 20 observations = 50

Total sum of 20 obervations = 20×50 = 1000

Sum of two correct observations = 13+24 = 37

Sum of two incorrect observations = 31+42 = 73

$$\text{Correct mean} = \frac{1000+(37-73)}{20}$$
$$= \frac{1000-36}{20} = \frac{964}{20}$$
$$= 48.20$$

100. The mean of x and y is 400, and the ratio of x to y is 3 : 7. What is the value of y –x?

(a) 230 (b) 800
(c) 320 (d) 130

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

$$\frac{x+y}{2} = 400$$
$$x + y = 800$$
$$x = \frac{3\times 800}{10}$$
$$= 240$$
$$y = \frac{7\times 800}{10}$$
$$= 560$$

Hence, $y - x = 560 - 240$
$= 320$

101. The mean of m + 3, m + 5, m + 6, m + 9 and m + 12 is?

(a) m + 7 (b) m + 9
(c) m + 3 (d) m + 6

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (a) : $\text{Mean} = \frac{\text{Sum of observations}}{\text{Number of observations}}$

$$\text{Mean} = \frac{(m+3)+(m+5)+(m+6)+(m+9)+(m+12)}{5}$$
$$\text{Mean} = \frac{(5m+35)}{5}$$
$$\text{Mean} = \frac{5(m+7)}{5}$$
$$\text{Mean} = (m+7)$$

102. The average score of a group of cricketers was 42. A new player joins and score 250% of the average of the group. Members as a result the overall average is increased by 30% what was the number of cricketers in the group before, the new player joined?

(a) 3 (b) 5
(c) 6 (d) 4

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (d) Let the number of cricketers in the group =x, and average = 42
the, total score = 42x
Number of cricketers after including new player in the group = x + 1

$$\text{New average} = \frac{42\times 130}{100}$$
$$= 54.6$$

$$\text{Score of new player} = \frac{42\times 250}{100} = 105$$

Now total score = (105 + 42x)
Hence sum = average × number
105 + 42x = 54.6 (x + 1)
105 – 54.6 = 54.6x – 42x
50.4 = 12.6x

$$x = \frac{50.4}{12.6} = 4$$

Therefore required number of cricketers in first group (x) = 4

103. In a football tournament Real Madrid scored 33 goals and 22 goals were scored against it. Find the average number of goals done by scored player of the Real Madrid?

(a) 1 (b) 2
(c) 3 (d) 0

RRB NTPC 30.04.2016 Shift : 2

Ans : (c) Real Madrid average number of goals scored by each player

$$= \frac{\text{Number of goals of Real Madrid}}{\text{number of players of football}} = \frac{33}{11} = 3$$

104. Find the average of 3/4, 5/8, 7/12, 15/16

(a) 139/192 (b) 135/64
(c) 11/32 (d) 21/64

RRB RPF SI – 05/01/2019 (Shift-II)

Ans : (a)

$$\text{Average} = \frac{\text{sum of terms}}{\text{number of terms}}$$
$$\text{Average} = \frac{\frac{3}{4}+\frac{5}{8}+\frac{7}{12}+\frac{15}{16}}{4}$$
$$\text{Average} = \frac{\frac{36+30+28+45}{48}}{4}$$
$$= \frac{139}{48\times 4} = \frac{139}{192}$$
$$\text{Average} = \frac{139}{192}$$

105. The average of 4 numbers a, b, c, d is 26. If the average of 'a' and 'b' is 19.5 then average of c and 'd' will be.

(a) 33 (b) 35.5
(c) 31.5 (d) 32.5

RRB RPF Constable – 18/01/2019 (Shift-I)

Ans : (d) According to the first condition,

$$\frac{a+b+c+d}{4} = 26$$
$\therefore a + b + c + d = 104$ ....(i)

According to the second condition,
Average of a and b = 19.5
a + b = 39 ....(ii)

On putting the value of (a+b) from equation (ii) in equation (i),
$\because$ a + b + c + d = 104
39 + c + d = 104
c + d = 104 – 39
c + d = 65

Therefore Average of c and d $= \frac{c+d}{2}$

$= \frac{65}{2} = 32.5$

106. Four numbers W, X, Y and Z are arranged in ascending order. The average of the smallest 3 numbers is 22 while the average of the largest 3 numbers is 28. Find the range of data?

(a) 19 (b) 18
(c) 17 (d) 16

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (b) Let the numbers are w, x, y and z respectively.

$w + x + y = 22 \times 3$ ____ (i)

$x + y + z = 28 \times 3$ _____ (ii)

Range = Greatest number− Smallest number

On subtracting equation (i) from equation (ii),

$\Rightarrow z - w = 84 - 66 = 18$

107. The average of three numbers is 7. The average of first two is 5, while the average of last two is 8. Which are three consecutive numbers?

(a) 3, 7 and 9 (b) 2, 8 and 8
(c) 5, 5 and 11 (d) 4, 6 and 10

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (c) Let the numbers are x, y and z respectively.

According to the question–

$\Rightarrow \frac{x+y+z}{3} = 7$ -----(i)

$\Rightarrow \frac{x+y}{2} = 5$ -----(ii)

$\Rightarrow \frac{y+z}{2} = 8$ -----(iii)

From equation (i) and (ii)

$\Rightarrow z = 21\text{-}10 = 11, z = 11$

putting the value of z in equation (iii)

$\Rightarrow y = 16\text{-}11 = 5, y = 5$

putting the value of y in equation (ii)

$\Rightarrow x = 10\text{-}5 = 5, x = 5$

Therefore, the consecutive numbers are 5,5 and 11

108. When four digits are arranged in ascending order, their order is w, x, y and z. The average of the smallest three digits is 25.5. While the average of the largest three digits average is 29.5. Find the range of data.

(a) 13 (b) 12
(c) 10 (d) 11

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (b) According to the question,

$\frac{w+x+y}{3} = 25.5$

$w + x + y = 76.5$ .....(1)

$\frac{x+y+z}{3} = 29.5$

$x + y + z = 88.5$ .....(2)

On subtracting equation (i) from equation (ii),

$\boxed{z - w = 12}$

Therefore, range = greatest digit – smallest digit

$z - w = 12$

109. The average of three numbers is 8. The average of first two numbers is 6 and the average of last two numbers is 9. Find the three numbers.

(a) 4, 9, 9 (b) 4, 8, 12
(c) 5, 7, 12 (d) 6, 6, 12

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (d) Let the three numbers are a, b and c respectively.

According to the question,

$\frac{a+b+c}{3} = 8$

$a + b + c = 24$ ------(i)

$\frac{a+b}{2} = 6$

$a + b = 12$ ------(ii)

and, $\frac{b+c}{2} = 9$

$b + c = 18$ ------(iii)

From equation (i) , (ii) and (iii)

a = 6, b = 6 and c = 12

Therefore, three numbers are 6, 6 and 12 respectively.

110. The average of three numbers is 28. If 2 is added to the smallest number and 5 is subtracted from the largest number, then the middle number becomes the arithmetic mean, while the range of this new set of data becomes 36. What is the largest number among these three numbers of the original set.

(a) 50 (b) 48
(c) 47 (d) 45

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (a) Let all the three numbers are x, y, z and $x < y < z$

$x + y + z = 28 \times 3$

$x + y + z = 84$ --------(i)

According to the condition-

$\frac{(x+2)+y+(z-5)}{3} = y$

$x + y + z = 3y + 3$

$x - 2y + z = 3$ --------(ii)

With the same condition range is

$z - 5 - (x + 2) = 36$

$z - x = 43$ --------(iii)

On subtracting equation (ii) from equation (i)

$y = 27$

From equation (i)

$x + y + z = 84$

$x + z = 84 - 27$

$x + z = 57$ ..... (iv)

On adding equation (iii) & (iv),

$z = 50$

Hence, the largest number of original set = 50

111. The average of three numbers is 28. If 7 is added to the smallest number and 10 is subtracted from the largest number, then the number at the middle becomes arithmetic mean and the range of new set of data becomes 20. What is the largest number of the original set of three numbers?

(a) 47 (b) 40
(c) 45 (d) 50

RRB Group-D – 24/10/2018 (Shift-III)

Ans. (a) : Let the first, second and third number is x, y and z respectively
and, $x < y < z$
According to the question,
sum of all three numbers $= 28 \times 3$
$x + y + z = 84$ ....(i)
According to the second condition,
$\because \frac{z-10+y+x+7}{3} = y$
$x + y + z - 3 = 3y$
$x + z - 2y = 3$ .....(ii)
Again, according to the question,
$z - 10 - x - 7 = 20$
$z - x = 37$ .....(iii)
from equation (i), (ii) and (iii)
$x + y + z = 84$
$z - 37 + \frac{2z-40}{2} + z = 84$
$2z - 74 + 2z - 40 + 2z = 168$
$6z = 168 + 114$
$6z = 282$
$z = 47$

112. Four numbers a, b, c and d are such that their total average is 39. The average of a and b is 29.5. The average of c and d will be –
(a) 48.5 (b) 48
(c) 49.5 (d) 47.5

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (a) : Sum of the number $= a+b+c+d = 39 \times 4$
$= 156$
Sum of number a and b $= 29.5 \times 2 = 59$
Sum of the number c and d $= [(a+b+c+d) - (a+b)]$
$= [156 - 59] = 97$
$\therefore$ Average of number c and d $= \frac{97}{2} = 48.5$

113. The sum of 7 numbers is 1050. The average of first 3 numbers is 120 and, fourth number is 126, then find the average of last 3 numbers.
(a) 200 (b) 165
(c) 188 (d) 173

RRB NTPC 05.04.2016 Shift : 2

Ans : (c) Sum of the first three numbers $= 120 \times 3 = 360$
Sum of the last three numbers $= 1050 - (360+126)$
$= 1050 - 486$
$= 564$
Hence, the average of the last three numbers are $= \frac{564}{3} = 188$

114. Find the averge of 1, 9, 7, 3, 5, 5, 6, 4, 2, 8
(a) 3 (b) 4
(c) 5 (d) 6

RRB NTPC 05.04.2016 Shift : 3

Ans :(c) Average $= \frac{1+9+7+3+5+5+6+4+2+8}{10}$
$= \frac{50}{10} = 5$

115. Three numbers are given in which the second number is thrice the first, and twice the third number. If the average of three numbers is 66. Then find the first number?
(a) 36 (b) 54
(c) 108 (d) 72

RRB NTPC 12.04.2016 Shift : 3

Ans : (a) Let the second number = x
$\therefore$ First number $= \frac{x}{3}$
Third number $= \frac{x}{2}$
$\therefore$ From question,
$\frac{\frac{x}{3} + x + \frac{x}{2}}{3} = 66$
$\Rightarrow \frac{2x + 6x + 3x}{6 \times 3} = 66$
$\Rightarrow \frac{11x}{18} = 66$
$\Rightarrow x = 6 \times 18 = 108$
$\therefore$ First number $= \left(\frac{x}{3}\right) = \frac{108}{3} = 36$

116. Expenditure of a person has increased by ₹50000 in the months of February and March. If his expenditure in January was ₹50000, then find his average expenditure (in ₹) from January to March.
(a) 100000 (b) 150000
(c) 75000 (d) 50000

RRB NTPC 27.04.2016 Shift : 3

Ans : (a) Expenditure in January = ₹ 50000
$\therefore$ Expenditure in the month of February
= 50000 + 50000
= ₹ 100000
Expenditure in the month of March = 100000 + 50000
= ₹ 150000
Hence, Average expenditure from January to March
$= \frac{50000 + 100000 + 150000}{3}$
$= \frac{300000}{3} =$ ₹ 100000

18.

Speed, Time & Distance

Type - 1

1. In covering a distance of 60 km. Arjun takes 2 hours more than Rohit. If Arjun doubles his speed, then he would take 1 hour less than Rohit. Arjun's original speed is :

(a) 15 km/h (b) 25 km/h
(c) 5 km/h (d) 10 km/h

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (d) : Let, Speed of Arjun and Rohit is x and y km/h respectively.

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\frac{60}{x} - \frac{60}{y} = 2 \text{ ——(1)}$$

$$\frac{60}{y} - \frac{60}{2x} = 1 \text{ ——(2)}$$

From equation (i) and (ii),

$$\frac{60}{2x} = 3$$

$$x = 10 \text{km/h}$$

2. The ratio of the speeds of a bus and a car is 7:11. If the car covers a distance of 396 km in 6 hours, what is the speed of the bus in km/h?

(a) 42 (b) 45.5
(c) 38.5 (d) 35

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (a) : $\frac{\text{Speed of bus}}{\text{Speed of car}} = \frac{7}{11}$

$$\frac{\text{Speed of bus}}{396/6} = \frac{7}{11}$$

$$\frac{\text{Speed of bus}}{66} = \frac{7}{11}$$

$\therefore$ Speed of bus = 6 × 7 = 42 km/h

3. A train covers a distance of 57.6 km in 48 minutes. What is its speed in m/s?

(a) 24 (b) 18
(c) 21 (d) 20

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : Speed = Distance / Time

$$\text{Speed} = \frac{57.6\,\text{km}}{48\,\text{m}}$$

$$= \frac{57600}{48 \times 60} = 20\text{m/sec}$$

4. A man covers a certain distance in 8 hours at the speed of 75 km/h. To cover the same distance in 6 hours, what should be his speed ?

(a) 150 km/h (b) 100 km/h
(c) 300 km/h (d) 200 km/h

RRB Group-D 06/09/2022 (Shift-I)

Ans. (b) : When distance is equal.

$s_1 \times t_1 = s_2 \times t_2$

$75 \times 8 = 6 \times s_2$

$$s_2 = \frac{75 \times 8}{6}$$

s_2 = 100 km/h

5. Rashmika had to travel 612 km in a car travelling at a certain speed. If she reached her destination in 9 hours, find the speed of the car.

(a) 68 km/h (b) 70 km/h
(c) 65 km/h (d) 60 km/h

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (a) : According to the question,

Speed of Car = Distance / Time

$$= \frac{612}{9}$$

= 68 km/h

6. A student reaches school on his bicycle in 3/2 hours at a speed of 8 km/h. On the return journey he rests for half an hour and takes a route which is 1 km shorter. What should be the percentage increase in the speed of the bicycle so that he reaches home in the same time?

(a) 37% (b) 37.5%
(c) 30.5% (d) 35%

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : Initial speed of student = 8 km/h

$$\text{Time} = \frac{3}{2} \text{ hours}$$

Distance = Speed × Time

$$= 8 \times \frac{3}{2} = 12\,\text{km}$$

According to the question-

Let, the speed has increased by x km/h.

$$12 - 1 = (x + 8) \times \left(\frac{3}{2} - \frac{1}{2}\right)$$

$$11 = (x + 8) \times \frac{2}{2}$$

x = 3 km/h

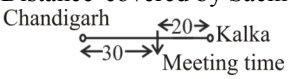
$$\text{Percentage increase in speed} = \frac{3}{8} \times 100 = 37.5\%$$

7. Sachin and Anil started walking at the same time towards Kalka which is 50 km away from Chandigarh. The speed of Sachin is 6 km/h less than that of Anil. Anil reaches Kalka and immediately starts walking back to Chandigarh. On the way he meets Sachin at a distance of 20 km from Kalka. Find the speed of sachin :

(a) 4.5 km/h (b) 5.1 km/h
(c) 4.9 km/h (d) 5.0 km/h

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let speed of Sachin = V km/h
So speed of Anil = V + 6 km/h
And distance covered by Anil = 70 km
Distance covered by Sachin = 30 km



$\therefore$ Time is same for both in the whole journey.

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} \Rightarrow \frac{D_1}{V_1} = \frac{D_2}{V_2}$$

$$\Rightarrow \frac{30}{V} = \frac{70}{V+6}$$
$$\Rightarrow 3V + 18 = 7V$$
$$\Rightarrow 4V = 18$$
$$\Rightarrow V = \frac{18}{4} = \frac{9}{2}$$
$$\Rightarrow \boxed{V = 4.5\ \text{km/h}}$$

8. Ramu can reach a certain distance to 30 hours. If he reduce his speed by $\frac{1}{15}^{th}$, he goes 10 km less in that time. Find his speed.

(a) 4 km/h (b) 5 km/h
(c) $5\frac{1}{2}$ km (d) 6 km/h

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) : Let distance = x km
Speed of Ramu = y km/h

$$\text{From, Speed} = \frac{\text{Distance}}{\text{Time}}$$

In first condition-

$$y = \frac{x}{30} \text{.....(i)}$$

In second condition-

$$\frac{14y}{15} = \frac{(x-10)}{30}$$
$$420y = 15x - 150 \text{ .....(ii)}$$

On putting the value of $y = \frac{x}{30}$ from equation (1) in equation (ii)-

$$420 \times \frac{x}{30} = 15x - 150$$
$$\frac{42x}{3} = 15x - 150$$
$$14x - 15x = -150$$

Distance (x) = 150 km
Now from equation (i)-

$$\text{Speed (y)} = \frac{150}{30}$$

Speed (y) = 5 km/h.

9. A and B start driving simultaneously from point X and go towards point Y. X and Y are 60 km apart. A's speed is 4 km/h less than that of B. B, after reaching Y, returns and meets A at a point 12 km away from Y. Find the speed of A.

(a) 16 km/h (b) 12 km/h
(c) 8 km/h (d) 20 km/h

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the speed of A = x km/h
Then speed of B = (x + 4) km/h
Total distance covered by B = 60 + 12
= 72 km
Total distance covered by A = 60 – 12
= 48 km
According to the question,

$$\frac{72}{x+4} = \frac{48}{x}$$
$$72x = 48x + 192$$
$$24x = 192$$
$$x = 8 \text{ km/h}$$

Hence, speed of A = 8 km/h

10. Two boys Rishi and Vamsi start at the same time to ride from Lucknow to Kanpur that is 95 km away. Rishi travels 5 km/h slower than Vamsi. Vamsi reaches Kanpur and immediately start to travel back. On his return journey he meets Rishi who is 25 km away from Kanpur. Find Rishi's speed.

(a) 8 km/h (b) 5 km/h
(c) 7 km/h (d) 6 km/h

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (c) : Distance travelled by Vamsi from Lucknow to Kanpur and back to meet Rishi = 95 + 25 = 120 km.
and distance travelled by Rishi = 95 – 25 = 70 km.
It took t time for Rishi and Vamsi to cover this distance
Assume that speed of Vamsi = v km/hour
speed of Rishi = v – 5 km/hour
So, according to the question-

$$\frac{120}{v} = \frac{70}{v-5}$$
$$120\ (v-5) = 70v$$
$$120\ v - 600 = 70v$$
$$120\ v - 70\ v = 600$$
$$50\ v = 600$$
$$v = \frac{600}{50} = 12 \text{km/hour}$$

Hence speed of Rishi = v – 5 = 12 – 5 = 7 km/hour

11. A salesman has to cover 6 km in 3/4 h. If he covers 1/2 of the distance in 2/3 of the total time, then what must be his speed (in km/h) to cover the remaining distance in the remaining time?

(a) 8 (b) 15
(c) 12 (d) 6

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c) : Distance covered by the salesman in $\frac{2}{3}$ of the total time = Total distance $\times \frac{1}{2} = 6 \times \frac{1}{2} = 3\,\text{km}$

Remaining distance = 6 – 3 = 3 km.

Remaining time = $\frac{3}{4}\text{h} \times \left(1 - \frac{2}{3}\right) = \frac{1}{4}\text{h}$

So the speed of the salesman to cover the remaining distance $= \frac{\text{Distance}}{\text{Time}} = \frac{3}{1/4} = 12\,\text{km/h}$

12. Two buses from a house run at a speed of 25 km/h at an interval of 15 minutes. How much more speed (km/h) does a woman coming from the opposite side of the house have to walk so that the buses meet at an interval of 10 minutes.

(a) 12 (b) 12.25
(c) 12.5 (d) 12.75

RRB RPF SI – 06/01/2019 (Shift-III)

Ans : (c) Speed of bus = 25 km./hr.

Let the speed of woman = x km/h

Distance = D, Time = 15 minutes $= \frac{15}{60} = \frac{1}{4}$ hours

then new time interval = 10 minutes $= \frac{10}{60} = \frac{1}{6}$ hours

Then relative speed $(S) = \frac{D}{T}$

$\Rightarrow \quad D = S \times T$

$D = 25 \times \frac{1}{4}$

$\because \quad D = \frac{25}{4}$ .....(i)

$D = \frac{25 + x}{6}$ .....(ii)

From equation (i) and equation (ii)

$\frac{25 + x}{6} = \frac{25}{4}$

$25 + x = \frac{150}{4}$

$x = \frac{150}{4} - 25$

$x = \frac{150 - 100}{4}$

$x = \frac{50}{4}$

Speed of woman (x) = 12.5 Km./hr.

13. Prithi is going to Delhi from Rajdhani Express which is running 6 minutes late. Driver increases, its speed by 4 km/hr. By doing this, the train arrives on time at the next station which is at the distance of 36 km. Find the actual speed of the train.

(a) 20 Km./hr. (b) 26 Km./hr.
(c) 36 Km./hr. (d) 30 Km./hr.

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans. (c) : Let the speed of train = x Km./hr.

Distance between both stations = 36 Km.

According to the question,

$\frac{36}{x+4} = \frac{36}{x} - \frac{6}{60}$

(time = distance/speed)

$\Rightarrow \; 36\left(\frac{1}{x} - \frac{1}{x+4}\right) = \frac{1}{10}$

$\Rightarrow 36\left(\frac{x+4-x}{x(4+x)}\right) = \frac{1}{10}$

$\Rightarrow 36 \times 4 \times 10 = x^2 + 4x$

$\Rightarrow x^2 + 4x - 1440 = 0$

$\Rightarrow x^2 + 40x - 36x - 1440 = 0$

$\Rightarrow x(x+40) - 36(x+40) = 0$

$\Rightarrow (x+40)(x-36) = 0$

Actual speed of train, $x = 36\text{Km/h}$

14. Kishan cycled 96 km at a certain speed. If he cycled 4 km/h slower, then he would have taken an additional time of two hours to reach the destination. What is the speed, at which kishan actually cycled in km/h?

(a) 12 (b) 18
(c) 16 (d) 15

RRB Group-D–11/10/2018 (Shift-II)

Ans : (c) Let actual speed = x Km./hr.

Distance = 96 km

New speed = (x–4) Km./hr.

According to the question,

$\frac{96}{x-4} - \frac{96}{x} = 2$

$\frac{48}{x-4} - \frac{48}{x} = 1$

$48\left(\frac{1}{x-4} - \frac{1}{x}\right) = 1 \Rightarrow \; 48\left(\frac{x - x + 4}{x(x-4)}\right) = 1$

$48 \times 4 = x\,(x-4)$

$x^2 - 4x - 192 = 0$

$x^2 - 16x + 12x - 192 = 0$

$x(x-16) + 12\,(x-16) = 0$

$(x+12)\;(x-16) = 0$

Hence $x - 16 = 0$

$x = 16 \qquad x \neq -12$

Actual speed = 16 Km./hr.

15. A person has to cover a distance of 40 km. He covers a distance of 16 km and the remaining distance is covered by a tanga. If he covers a distance of 16 km from a tanga and the remaining distance at a speed of 4 km/hr. So he takes more than 1 hour. Find the speed of the tanga.

(a) 12 Km./hr. (b) 8 Km./hr.
(c) 16 Km./hr. (d) 10 Km./hr.

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (b) Let the speed of tanga = x Km./hr.
Distance = 40 km
According to the question,

$$\left(\frac{16}{x}+6\right)-\left(\frac{24}{x}+4\right)=1$$

$$\Rightarrow \frac{16}{x}+6-\frac{24}{x}-4=1$$

$$\Rightarrow \frac{16}{x}-\frac{24}{x}=1-2$$

$$\Rightarrow \frac{16-24}{x}=-1$$

$$\Rightarrow -8=-x$$

$$x = 8 \text{ Km./hr.}$$

16. In a 200 meters long race the runner A beats runner B by 3 seconds. If the speed difference between A and B is 1.5 m/s. So find the speed of A in meter per second.

(a) 10.778 (b) 10.5
(c) 8.728 (d) 9.728

RRB Group-D – 15/11/2018 (Shift-III)

Ans. : (a) Let the speed of B = x m/s
$\therefore$ Speed of A = (x + 1.5) m/s
According to the question,

$$\frac{200}{x}-\frac{200}{(x+1.5)}=3$$

$$\frac{200x+300-200x}{x^2+1.5x}=3$$

$$x^2 + 1.5x - 100 = 0$$

$$x^2 + 10.778x - 9.278x - 100 = 0$$

$$x (x + 10.778) - 9.278 (x + 10.778) = 0$$

$$(x - 9.278)(x + 10.778) = 0$$

$$x = 9.278 \text{ m/s}$$

Hence, speed of A = (9.278 + 1.5) = 10.778 m/s

17. A train is running in a fog crosses a person, who was walking in the same direction at a speed of 3 km/h. That person could the car up to distance of 100 m for 4 minutes. What was the speed of the car?

(a) 9/2 Km./hr. (b) 7/2 Km./hr.
(c) 5 Km./hr. (d) 5/2 Km./hr.

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (a) : Let the speed of train = x Km./hr.
According to the question,

$$\left\{\text{Relative speed}=\frac{\text{Distance}}{\text{Time}}\right\}$$

$$\because \quad x-3=\frac{\frac{100}{1000}}{\frac{4}{60}} \qquad \left\{\because 100\,\text{m.}=\frac{100}{1000}\,\text{km}\right.$$

$$x-3=\frac{15}{10} \qquad \left.\text{and } 4\,\text{minutes}=\frac{4}{60}\,\text{hr}\right\}$$

$$x=\frac{3}{2}+3$$

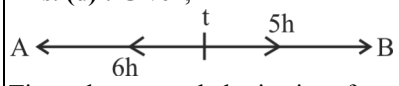
$$x=\frac{9}{2}\,\text{km/hr}$$

18. Two cars A and B starting at the same time meet each other in opposite direction after t hours and after arriving they reach their destination after 5 hours and 6 hours. If the speed of car A is 55 km/hr, what will be the speed of the car B?

(a) $66\sqrt{12}\,\text{km/hr}$ (b) $110\sqrt{3}\,\text{km/hr}$
(c) $\frac{110}{\sqrt{6}}\,\text{km/hr}$ (d) $\frac{55}{6}\sqrt{30}\,\text{km/hr}$

RRB Group-D – 05/11/2018 (Shift-I)

Ans. (d) : Given,



Time taken to reach destination after meeting (A) = 5 hr.
Time taken to reach destination after meeting (B) = 6 hr.
Speed of A = 55 Km./hr.
Let Speed of B = x Km./hr.

$$\therefore \frac{S_B}{S_A}=\sqrt{\frac{t_A}{t_B}}$$

$$\frac{x}{55}=\sqrt{\frac{5}{6}}$$

$$x=55\times\sqrt{\frac{5}{6}}$$

$$x=55\times\sqrt{\frac{5\times6}{6\times6}}$$

$$x=\frac{55}{6}\times\sqrt{30}$$

$$x=\frac{55}{6}\sqrt{30}\,\text{km/hr}$$

19. Parvej belongs to Town A and Gautam belongs to Town B. They start their journey to each other cities by the same route at the same time. They meet where some along the way and continue their journey. Parvej takes 12 hours to reach the destination after meeting Gautam, while Gautam takes another 3 hours to reach the city of parvej. If parvej travels at a speed of 60 km/hr, then find the speed of Gautam in km/hr.

(a) 120 (b) 105
(c) 90 (d) 125

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (a) :

$$\frac{v_1}{v_2}=\sqrt{\frac{t_2}{t_1}}$$

$$\frac{60}{v_2}=\sqrt{\frac{3}{12}} \qquad \{\because v_1 = 60 \text{ Km./hr.}, t_1 = 12, t_2 = 3\}$$

$$\frac{60}{v_2}=\sqrt{\frac{1}{4}}$$

$$v_2 = 120 \text{ Km./hr.}$$

20. Two cars travel from the same houses at a speed of 20 km/h at an interval of 10 minutes. At what speed does a woman come in the opposite direction towards the house. If she gets cars in 8 minutes interval.

(a) 5 (b) 6
(c) 7 (d) 4

RRB NTPC 17.01.2017 Shift-1

Ans : (a) Let the speed of woman is x Km./hr. and the woman's distance from the house is l km and at t time the woman gets the first car.

Then-

$x \times t + 20t = l$ …….. (i)

and $\left(t+\frac{8}{60}\right)x+\left(t+\frac{8-10}{60}\right)\times 20 = l$

$$xt+\frac{8x}{60}+20t-\frac{20\times 2}{60} = xt+20t$$

$$\frac{8x}{60}=\frac{40}{60}$$

$x = 5$ Km./hr.

21. Two bicycles from a house started at a speed of 24 km/h at an interval of 15 minutes. How much more speed does a woman coming from the opposite direction of the house have to walk so that she meet a cycle at an interval of 10 minutes.

(a) 13 (b) 11
(c) 12 (d) 14

RRB NTPC 11.04.2016 Shift : 1

Ans : (c) Distance travelled by cycle in 15 minutes

$$= 24\times\frac{15}{60} = 6 \text{ km.}$$

Hence speed of woman $= \frac{6}{\frac{10}{60}} = \frac{6\times 60}{10} = 36$ Km./hr.

$\therefore$ Intended speed = 36–24 = 12 Km./hr.

22. If Vinay would have run at a high speed of 2 km/h he would have taken 10 minutes less to cover 4 km, then find the speed of Vinay.

(a) 7 Km./hr. (b) 5 Km./hr.
(c) 4 Km./hr. (d) 6 Km./hr.

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (d) Let the speed from starting = S Km./hr.

Increased speed = (S + 2) Km./hr.

Distance = 4 km

from use of formula -

$$\frac{\text{Product of speed}}{\text{Distance}} = \frac{\text{Difference in speed}}{\text{Difference in time}}$$

$$\frac{S(S+2)}{4} = \frac{2}{\frac{10}{60}}$$

$$\frac{S^2+2S}{4} = 12$$

$S^2 + 2S - 48 = 0$

$S^2 + 8S - 6S - 48 = 0$

$S(S+8) - 6(S+8) = 0$

$(S+8)(S-6) = 0$

$S + 8 = 0 \Rightarrow S = -8$

$S - 6 = 0 \Rightarrow S = 6 \text{km/hr}$

Since the speed is always positive therefore speed of Vinay = 6 Km./hr.

23. Two vehicles from a house moved at a speed of 25 km/h. At an interval of 20 minutes. How much more speed a woman coming from the opposite direction of the house will have to walk so that she gets a vehicle at an interval of 18 minutes.

(a) 2 (b) $2\frac{5}{9}$
(c) $2\frac{7}{9}$ (d) $2\frac{8}{9}$

RRB NTPC 26.04.2016 Shift : 2

Ans : (c) Distance covered by vehicle in 20 minutes

Distance = Speed × Time

$$= 25\times\frac{20}{60} \text{ km.}$$

$$= 25\times\frac{1}{3} = \frac{25}{3} \text{ km.}$$

Let the speed of woman = x Km./hr.

$\therefore$ From question,

$$\frac{\frac{25}{3}}{25+x} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{3(25+x)} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{75+3x} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{75+3x} = \frac{3}{10}$$

$$\Rightarrow \quad 250 - 225 = 9x$$

$$\Rightarrow \quad 25 = 9x$$

$$\Rightarrow \quad x = \frac{25}{9}$$

Hence speed of woman $= 2\frac{7}{9}$ Km./hr.

24. Krishna cycled a distance of 90 km at a certain speed. If he cycled 3 km slower every hour, he would have taken 5 more hours to reach his destination. What is the speed in km/hr at which Krishna's actually cycled?

(a) 7.5 (b) 9
(c) 18 (d) 15

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (b) Let the actual speed = x Km./hr.

According to the question,

$$\frac{90}{(x-3)} - \frac{90}{x} = 5$$

$$\Rightarrow \frac{90[x-x+3]}{x^2-3x} = 5$$

$$\Rightarrow \frac{18\times 3}{x^2-3x} = 1$$

$$\Rightarrow 54 = x^2 - 3x$$

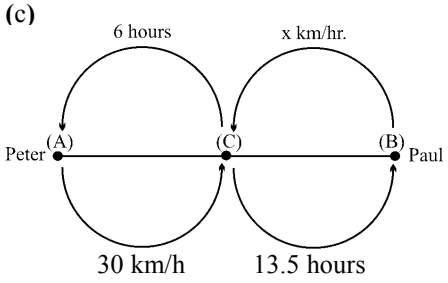
$\Rightarrow x^2 - 3x - 54 = 0$
$\Rightarrow x^2 - 9x + 6x - 54 = 0$
$\Rightarrow x(x-9) + 6(x-9) = 0$
$\Rightarrow (x-9)(x+6) = 0$, $x = -6$ (invalid) $x = 9$ valid
Hence actual speed = 9 Km./hr.

25. Peter belongs to Town A and Paul belongs to Town B. They start their journey towards each other's towns following the same route at the same time. They meet somewhere on the way and continue with their journey. After meeting Paul, Peter takes another 13.5 hours to reach his destination while Paul takes another 6 hours to reach Peter's town. If Peter travelled at the speed of 30 Km./hr., what was Paul's speed in Km./hr.?

(a) 42.5 (b) 40
(c) 45 (d) 47.5

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (c)



Let
Speed of Paul is x Km./hr. then,
It is clear from the above diagram that

$$\frac{405}{x} = \frac{6x}{30}$$

$\Rightarrow 6x^2 = 405 \times 30$
$\Rightarrow x^2 = 2025$ Km./hr. or x = 45 Km./hr.

26. Geeta travels 120 km by steamer, 450 km by train and 60 km by scooter from Hyderabad to IIT Roorkee. The total journey takes 13 hours and 30 minutes and the speed of the train is 3 times the transit of the scooter and 1½ times that of the same steamer. What is the speed of the train?

(a) 60 Km./hr. (b) 70 Km./hr.
(c) 65 Km./hr. (d) 54 Km./hr.

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (a) According to the question,
Let the speed of train = x Km./hr.
Speed of train = 3 × Speed of scooter
x = 3 × Speed of scooter
Speed of scooter = x/3 Km./hr.
Speed of train = 3/2 × Speed of steamer
Speed of steamer = 2x/3

$$\because \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

From question–

$$\frac{120}{\frac{2x}{3}} + \frac{450}{x} + \frac{60}{\frac{x}{3}} = 13 \text{ hours } 30 \text{ minutes}$$

$$\frac{180}{x} + \frac{450}{x} + \frac{180}{x} = \frac{27}{2}$$

$$\frac{810}{x} = \frac{27}{2}$$

$x = 30 \times 2$
$x = 60$ Km./hr.
Hence speed of train = 60 Km./hr.

Type - 2

27. Chakravarty drives a car at a speed of 52 km/h. How much time will the take to cover a distance of 364 km?

(a) 6 hours (b) 4 hours
(c) 5 hours (d) 7 hours

RRB Group-D 27-09-2022 (Shift-II)

Ans. (d) : Given that
Speed = 52 km/h
Distance = 364 km
Hence the time taken to cover 364 km distance at a speed of 52 km/h $= \frac{364}{52}$
= 7 hours.

28. When the speed of a car is increased by 30%, it takes 24 minutes less to cover the same distance. What is the time taken by it to cover the same distance at its usual speed.

(a) 1 hour 40 minutes (b) 1 hour 55 minutes
(c) 1 hour 50 minutes (d) 1 hour 44 minutes

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (d) : Let the speed of car is 100 km/h and time be t hour.
According to the question,
Distance = Speed × Time
= 100 × t

$$100 \times t = 100 \times \frac{130}{100} \times (t - 24)$$

$100t = 130 \times (t - 24)$
$100t = 130t - 3120$
$130t - 100t = 3120$
$30t = 3120$

$$t = \frac{3120}{30}$$

= 104 minute or 1 hour 44 minute

29. At the same time A and B start moving toward each other from two different places. 240 km apart. The ratio of the speeds of A and B is 5 : 7 and the speed of B is 84 km/h. After how minutes will A and B meet each other?

(a) 90 minutes (b) 100 minutes
(c) 80 minutes (d) 120 minutes

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (b) : Given,
Distance between A and B = 240 km.
Ratio of speed of A and B = 5 : 7
= 5x, 7x (Let)

According to the question,
Speed of B = 7x = 84 km/h
x = 12 km/h
Speed of A = 5x = 5×12 = 60 km/h
Hence, Time taken by A and B to meet each other

$$= \frac{240}{144}\text{h}$$

$$= \frac{240}{144} \times 60 \text{ minutes}$$

= 100 minutes

30. The ratio of the speeds of A and B is 4:5 and hence A takes 20 minutes more than the time taken by B to reach the destination. If A had walked at double his speed, he would have covered the distance in :

(a) 80 min (b) 40 min
(c) 50 min (d) 100 min

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (c) : Let ratio of speed of A and B are 4x and 5x respectively.

$$\because \quad \text{Speed} \propto \frac{1}{\text{Time}}$$

$\therefore$ Ratio of time = 5x : 4x
According to the question,
5x – 4x = 20
x = 20
Time taken by A = 5x
= 5×20
= 100 minutes
Time taken by B = 4x
= 4×20
= 80 minutes
When A's speed is double then time is half.
Hence, A covered distance in 50 minutes.

31. Akshita covers a distance of 300 km at the speed of 50km/h, then 360 km at 30 km/h and another 420km at 60km/h. If her average speed for the whole journey is k km/h, then how much time (in hours) will she take to cover 216 km at k km/h?

(a) 5 hours (b) 7 hours
(c) 6 hours (d) 4 hours

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (a) : Let time taken by Akshita covered distance is t_1, t_2 and t_3.

$$t_1 = \frac{300}{50} = 6 \text{ h}$$

$$t_2 = \frac{360}{30} = 12 \text{ h}$$

$$t_3 = \frac{420}{60} = 7 \text{ h}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total Time}}$$

$$k = \frac{300+360+420}{6+12+7}$$

$$k = \frac{1080}{25}$$

k = 43.2 km/h
According to the question,

$$= \frac{216}{43.2}$$

= 5 Hours.

32. Excluding stoppages, the speed of a bus is 45 kmph and including stoppages, it is 27 kmph. For how many minutes does the bus stop per hour?

(a) 24mins (b) 36 mins
(c) 20 mins (d) 40 mins

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) :

$$\text{Required time} = \frac{\text{Difference between speed}}{\text{speed of bus without stoppages}}$$

$$= \frac{45-27}{45}$$

$$= \frac{18}{45} = \frac{2}{5} \text{ Hour or 24 minute}$$

33. How many seconds will a boy take to run one complete round around a square field of side 38 metres, if he runs at a speed of 6 km/h ?

(a) 91.2 (b) 61.2
(c) 71.2 (d) 50.1

RRB Group-D 18/08/2022 (Shift-II)

Ans. (a) : Speed of boy = 6km/h
Each side of square = 38 m
Perimeter of square = 4 × 38
= 152m
So the time taken by boy to complete one round of square field

$$= \frac{152\text{m}}{6 \times \frac{5}{18}}$$

$$= \frac{152 \times 3}{5}$$

= 91.2 sec

34. A bike running at a speed of 50 km/h reaches its destination 10 minutes late. If it runs at 60 km/h it is late by 5 minutes. How many minutes should the bike take, travelling at usual speed to complete the journey on the same route to reach on time?

(a) 15 minutes (b) 25 minutes
(c) 20 minutes (d) 12 minutes

RRB Group-D 23/08/2022 (Shift-I)

Ans. (c) : From question,
Let the actual time = t min.
Distance = Speed × Time

$50 \times \frac{(t+10)}{60} = 60 \times \frac{(t+5)}{60}$

$50t + 500 = 60t + 300$

$10t = 200$

$t = 20$ min

35 A car can cover 275 km in 5 hours. If its speed is reduced by 5 km/h, then how much time will the car take to cover a distance of 250 km ?

(a) 5 hr (b) 5 hr 30 min

(c) 6 hr (d) 4 hr 30 min

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : Let the speed of car be x km/hr.

$x = \frac{275}{5}$

$x = 55$ km/h

If the speed of car is reduced by 5 km/h.

Then time taken by car to cover a distance of 250 km.

$= \frac{250}{55-5} = \frac{250}{50} = 5$ hours

36. A started a journey at 1:00 p.m. at a speed of 40 km/h. B started from the same spot and in the same direction at 1:40 p.m. at a speed of 50 km/h. How many minutes will be take to catch up with A?

(a) 150 min (b) 120 min

(c) 140 min (d) 160 min

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given that

Speed of A = 40 km/h

Speed of B = 50 km/h

Distance covered by A in 40 minutes = Speed × Time

$= \frac{40}{60} \times 40 = \frac{160}{6}$ km

Now B cover $\frac{160}{6}$ km more distance to catch up with A.

$\frac{\text{Distance}}{\text{Relative speed}} = \frac{\frac{160}{6}}{10} = \frac{160}{60} = \frac{16}{6}$

2 hours 40 minutes = 160 minutes

37. Anupam and Vineet standing together started running in opposite direction on 2 km long circular racing track. They ran at the speeds of 9 km/h and 11 km/h respectively. After how much time will they meet on the track?

(a) 12 min (b) 20 min

(c) 10 min (d) 6 min

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let both meet after t time.

According to the question-

$9t + 11t = 2$

$\Rightarrow 20t = 2$

$\Rightarrow t = \frac{2}{20} = \frac{1}{10}$ hours

$\Rightarrow t = \frac{1 \times 60}{10} = 6$ minutes

38. A bus covers a distance of 5 km in 20 min. If its speed is decreased by 3 km/hr, then find the time taken by the bus to cover the same distance.

(a) 30 min (b) 15 min

(c) 25 min (d) 20 min

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\because$ Speed $= \frac{\text{Distance}}{\text{Time}}$

Speed of bus $= \frac{5}{\frac{20}{60}} = 15$km/h

$\because$ On decreasing the speed of bus by 3 km/h -

New speed $= 15 - 3 = 12$km/h

Required time $= \frac{5}{12} \times 60$

$= 25$ minutes

39. Devesh leaves his home every day at 7 am and reaches office at 8:30 am. One day he left his home at 7 am but travelled a fifth of the distance at 5/6 of the usual speed and the rest of the distance at 6/5 of the usual speed. Approximately at what time did Devesh reach office on that day?

(a) 8 : 40 am (b) 8 : 25 am

(c) 8 : 21 am (d) 9 : 36 am

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let Devesh's usual speed = x km/hr

Total time taken by Devesh to reach office from his home = 8:30 – 7:00 = 1hour 30 minutes

Distance = Speed × Time

$= x \times \frac{3}{2}$ km

According to the question,

Speed to cover $\left(\frac{3x}{2} \times \frac{1}{5}\right)$km distance $= \frac{5x}{6}$km/hr

Remaining distance $= \frac{3x}{2} - \frac{3x}{10} = \frac{12x}{10}$ or $\frac{6x}{5}$km

Speed to cover $\frac{6x}{5}$km $= \frac{6x}{5}$km/hr

Suppose the time taken by Devesh to reach office = t hour.

$\frac{\frac{3x}{10}}{\frac{5x}{6}} + \frac{\frac{6x}{5}}{\frac{6x}{5}} = t$

$\frac{18}{50} + 1 = t$

$t = \frac{34}{25}$ hours

= 1 hour 21 minutes (approximately)

Therefore, that day Devesh reach office approximately Morning 8 : 21 am

40. Raima covered some distance with a speed of 7 km/h on foot and some distance at a speed of 12 km/h on a bicycle. He had covered a distance of 64 km in 7 hours. How many hours did he travel on a bicycle?

(a) 2 (b) 3
(c) 5 (d) 4

RRB RPF SI – 11/01/2019 (Shift-I)

Ans. (b) Let Raima covered x_1 distance in t hour by bicycle.
Hence the distance covered by bicycle $(x_1) = 12 \times t$
and distance covered on foot $(x_2) = 7(7 - t)$
So, $x_1 + x_2 = 64$ km.
$12t + 49 - 7t = 64$
$5t = 64 - 49$
$5t = 15$
$t = 3$ hours

41. How long does it take to cross 132meters long bridge by a 110 meters long train running at a speed of 72 km?
(a) 14.3 seconds (b) 9.8 seconds
(c) 12.1 seconds (d) 12.42 seconds

RRB JE - 23/05/2019 (Shift-II)

Ans : (c)
Length of train (l) = 110 meters
Speed of train = 72 Km./hr. $= 72 \times \frac{5}{18} = 20$ m./sec.
Time = T = ?
$\therefore$ Speed of train $= \frac{\text{Distance}}{\text{Time}} = \frac{\ell + \text{length of bridge}}{T}$
$20 = \frac{110 + 132}{T}$
$T = \frac{242}{20} = \frac{121}{10} = 12.1$ seconds

42. At 3/4 of a usual speed, a person reaches his work-place 15 minutes late. Normally how many minutes does it take to reach the work place?
(a) 42 minute (b) 30 minute
(c) 45 minute (d) 60 minute

RRB JE - 24/05/2019 (Shift-III)

Ans : (c) Let the time taken by a person to cover d distance from v speed is t.
$v \xrightarrow{d} t$
$\frac{3}{4} v \xrightarrow{d} (t + 15)$
$v \times t = \frac{3}{4} v(t + 15)$
$4t = 3t + 45$
$4t - 3t = 45$
$t = 45$ minutes

43. A thief rides a bike at a speed of 100 km/h by running away from the police. The police immediately started chasing at 75 km/h after 1 hour the engine of the police car broke down which took 30 minutes to repair, after this the speed of the car is increased to 120 km/h, how long the thief was caught?
(a) 2 hours 45 minutes
(b) 3 hours 40 minutes
(c) 5 hours 15 minutes
(d) 2 hours 30 minutes

RRB JE - 02/06/2019 (Shift-I)

Ans : (c) Given-
Speed of thief = 100 Km./hr.
Distance covered by thief in 1 hour = 100 km.
Speed of police = 75 km./hr.
Distance covered by police in 1 hour = 75 km.
An hour later the distance between both = 25 km.
The time it took to recover after the car broke down = 30 minutes
Distance covered by thief in 30 min. = 50 km.
Now distance between both= 25+50 = 75 km.
The time taken by police to catch the thief at the speed of 120 Km./hr. $= \frac{75}{20\,(\text{Relative speed})}$
$= 3\frac{15}{20} =$ 3 hours. 45 minutes
Hence the total time taken by police to catch the thief = 3:45 + 1:30 = 5:15 hours

44. Two friends start walking towards the city P to Q and city Q to P respectively at the same time. After meeting at same point between P and Q, they reach their destination in 54 and 24 minutes respectively. In what time did that friend who went from Q to P finish their journey.
(a) 48 minutes (b) 36 minutes
(c) 72 minutes (d) 60 minutes

RRB JE - 26/06/2019 (Shift-III)

Ans : (d) P $\frac{24\,\text{min}}{24y}$ • $\frac{54\,\text{min}}{54x}$ Q
Where x and y is the speed of two friends.
$\sqrt{\frac{t_2}{t_1}} = \frac{x}{y} = \sqrt{\frac{24}{54}}$
$\frac{x}{y} = \frac{2}{3}$
$x = \frac{2y}{3}$
Time $= \frac{24y + 54x}{y} = \frac{24y + 54 \times \frac{2}{3} y}{y}$
$= \frac{60y}{y} = 60$ min.

45. Nidhi takes 3 hours 45 minutes to walk from one place and return to the same place by bicycle, it takes 4 hours 20 minutes to walk. So how long will it take to get on the cycle.
(a) 3 hours 10 minutes
(b) 3 hours 35 minutes
(c) 3 hours 45 minutes
(d) 3 hours 15 minutes

RRB RPF SI – 12/01/2019 (Shift-III)

Ans : (a) Time taken by Nidhi to reach T one side on foot + another side by cycle = 3 hours 45 minutes
$\Rightarrow 3 + \frac{45}{60} = 3 + \frac{3}{4} = \frac{15}{4}$
Time taken by her to reach both sides

$\Rightarrow$ 4 hours 20 minutes $= 4+\frac{20}{60}=\frac{13}{3}$

Time taken to walk one side $=\frac{13}{3}\times\frac{1}{2}=\frac{13}{6}$

time taken to reach another side by cycle $=\frac{15}{4}-\frac{13}{6}$

$=\frac{45-26}{12}=\frac{19}{12}$ hour

time taken to travel both side by cycle $=\frac{19}{12}\times 2=\frac{19}{6}$

3 hours $\frac{1}{6}\times 60 = 3$ hours 10 minutes

46. Hema takes 9 hours 55 minutes to walk a certain distance and return by bicycle. She takes 12 hours and 30 minutes to walk and walk on the same distance, how long does it take to go from both sides by bicycle and return from bicycle.

(a) 7 hour 20 min (b) 7 hour 15 min
(c) 7 hour 35 min (d) 7 hour 45 min

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (a) The time taken by Hema to travel and reach certain distance on foot and by bicycle = 9 hours 55 min.
and total time taken by Hema to walk both sides
= 12 hours 30 minutes
$\therefore$ Time taken by Hema to walk one side = 6 hours 15 minutes
Hence time taken to go and to return by cycle
= (9.55–6.15)× 2 = 7 hours 20 minutes

47. How long will it take for a student to take a round of 25 hectares field at the speed of 10 km/hr.

(a) 8 min (b) 16 min
(c) 10 min (d) 12 min

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (d) :
$\because$ 1 Hectare = 10,000 m^2
$\therefore$ 25 Hectares = 250,000 m^2
= (500 × 500) m^2
Hence the shape of field is square.
$\therefore$ a = 500 meters
Perimeter of field = 4a = 4 × 500 = 2000 meters
Time taken by student to complete one round up = $\frac{\text{Total distance}}{\text{Speed}}$

$=\frac{2000\text{ m.}}{10\text{ km./hr.}}=\frac{2000\text{ m.}}{10\times\frac{1000}{60}\text{ m./minute}}=12$ minutes

48. Kiran has to cover a distance of 300 km in 5 hours. He travels for some time at a speed of 75 km/hr and the remaining time travels at a speed of 55 km/h. How long did Kiran travel at high speed.

(a) 1 hour 10 minutes
(b) 1 hour 25 minutes
(c) 1 hour 15 minutes
(d) 1 hour 35 minutes

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (c) Let time taken by kiran to travel of the speed of 75 km/hr is t hours.
$75 \times t + 55 \times (5 - t) = 300$
$75t + 275 - 55t = 300$
$20t = 25$
$t = \frac{25}{20} = \frac{5}{4}$
t = 1 hour 15 minutes
Hence Kiran travelled 1 hours 5 minutes at maximum speed.

49. Sabrina travelled 8 km/h by foot and 13 km/h on a bicycle. She covered 84 km in 8 hours, for how many hours did she ride a cycle.

(a) 4 (b) 3
(c) 5 (d) 2

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (a) Let Sabrina cycled till t time
According to the question,
$8 (8 - t) + 13t = 84$
$64 - 8t + 13t = 84$
$5t = 20$
$t = 4$
Hence Sabrina cycled till 4 hours.

50. Rahman takes 10 hours to walk to a certain place and return by ride. However, if he had traveled on both sides by ride, he could have saved 5 hours. How long will it take to travel on both sides by walking?

(a) 15 hours (b) 10 hours
(c) 5 hours (d) 20 hours

RRB Group-D – 27/09/2018 (Shift-III)

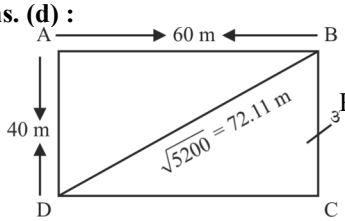
Ans : (a) Let the time taken to walk = tx
Time taken by ride = ty
According to the question,-
$tx + ty = 10$ ____(i)
And, $ty + ty = 5$
$2ty = 5$
$ty = \frac{5}{2}$
From equation (i)
$tx + \frac{5}{2} = 10$
$tx = \frac{15}{2}$
Time taken to walk on foot both sides.
$tx + tx = 2tx = 2 \times \frac{15}{2} = 15$ hours

51. A rectangular lawn is 60 meters long and 40 meters wide, approximately how long will it take for a person to cross its diagonal at a speed of 3 km/h.

(a) 92.8 seconds (b) 81.5 seconds
(c) 84.5 seconds (d) 86.5 seconds

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (d) :



Length of rectangular lawn (AB) = 60 m
breadth (AD) = 40 m
Diagonal (DB) = ?

From Pythagoras theorem,

$BD^2 = AB^2 + AD^2$

$BD^2 = (60)^2 + (40)^2$

$BD^2 = 3600 + 1600$

$BD^2 = 5200$

$BD = \sqrt{5200}$

$BD = 72.11 \approx 72$

Length of diagonal = 72 m

Time = ?

$$\text{Speed} = 3\,\text{km/h} = 3 \times \frac{5}{18} = \frac{5}{6}\,\text{m/sec}$$

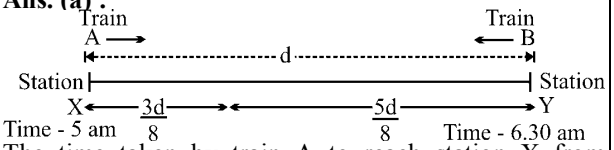
$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{72}{\frac{5}{6}} = \frac{72 \times 6}{5} = 86.4 \approx 86.5 \text{ seconds } (\text{approximately } 86.5)\,\text{sec}$$

52. Train A, 5 am at station X departs and 9 am arrives at station Y. Another train B 6.30 am departs from station Y and arrives station X at 10 am at what time trains meet each other.

(a) 7:40 am (b) 7 am
(c) 8 am (d) 7:30 am

Ans. (a) :



The time taken by train A to reach station X from station Y

= 9 – 5 = 4 hours

The time taken by train B to reach station Y from station X

$$= 10 - 6.30 = \frac{7}{2}\,\text{hours}$$

Let the distance between both stations is d km.

Hence speed of train A $= \frac{d}{4}$ Km./hr.

And speed of train B $= \frac{d}{7/2} = \frac{2d}{7}$ Km./hr.

Distance traveled by train A in 3/2 hours $= \frac{d}{4} \times \frac{3}{2} = \frac{3d}{8}$ km.

Now again the distance between both stations $= d - \frac{3d}{8} = \frac{5d}{8}$ km.

Relative speed of both trains $= \frac{d}{4} + \frac{2d}{7} = \frac{7d + 8d}{28}$

$= \frac{15d}{28}$ Km./hr.

$$\text{Relative Time} = \frac{\text{Distance}}{\text{Relative Speed}} = \frac{5d \times 28}{8 \times 15d}$$

$= \frac{28}{24}$ hours or 1hour 10 minutes

Hence meeting time for both trains

= 6:30 + 1:10 = 7:40 am

53. Pallav cycling at a speed of 12 km/h and walking at a speed of 3.5 km/h, he takes 8 hours to cover a distance of 45 kilometers, how many hours did he ride a cycle.

(a) 5 (b) 2
(c) 4 (d) 3

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (b) Let Pallav ride the cycle x hours

Distance = Speed × Time

Distance travelled by cycle = 12 × x

Time taken to travel distance = 8-x

Hence distance travelled by foot $= 3.5 \times (8 - x)$

According to the question,

$12x + 3.5(8 - x) = 45$

$12x + 28.0 - 3.5x = 45$

$8.5x = 45 - 28$

$8.5x = 17$

or $85x = 170$

$x = \frac{170}{85} = 2$ hours

54. Mrs. Vijaya takes 9 hours and 50 minutes to walk from her starting point to a certain destination and return to her starting point by running again. It takes 12 hours and 20 minutes to walk from both the origin and the destination to the destination and again from the destination to the original place, both by running and in how much times she will complete.

(a) 7 hours 45 minutes
(b) 7 hours 30 minutes
(c) 7 hours 15 minutes
(d) 7 hours 20 minutes

RRB NTPC 19.01.2017 Shift : 3

Ans : (d) Time taken by vijaya to travel and reach cirtain distance on foot and by running = 9 hours 50 minutes

Time taken by vijaya to walk both sides = 12 hours 20 minutes

Time taken by vijaya to walk one side = 6 hours 10 minutes

Time taken by vijaya to cover the distance by running = 9 hours 50 minutes – 6 hours 10 minutes = 3 hours 40 minutes

So, time taken to cover the distance on both sides by running.

= 2 × (3 hours 40 minutes)
= 6 hours 80 minutes
Total time = 7 hours 20 minutes

55. A trip from mumbai to pune takes 4 hours 30 minutes to run at a speed of 60 km/h. How much time will it take us to travel at the speed of 15 m/s.

(a) $3\frac{3}{4}$ hours (b) 5 hours

(c) $4\frac{2}{3}$ hours (d) 4 hours

RRB NTPC 18.01.2017 Shift : 2

Ans : (b) Let the distance = x km

Distance covered in 270 minutes at a speed of 60 Km./hr.

$$\Rightarrow 60 \text{ (speed)} = \frac{x \text{ (distance)}}{\frac{270}{60}\text{(time)}} \Rightarrow 60 = \frac{60x}{270}$$

$$\boxed{x = 270\text{km}}$$

$$15\text{m/s} = 15 \times \frac{18}{5} = 54\text{km/h}$$

Time taken to cover distance of 270 km at a speed of 54 Km./hr.

$$\frac{270}{54} = 5 \text{ hours}$$

56. Bhanu takes a total of 6 hours 50 minutes to walk from one place to another and run back to the starting place. He walks on foot on both sides in 8 hours and 30 minutes. Time taken to run on both sides is?

(a) 5 hours 35 min (b) 5 hours 15 min

(c) 5 hours 10 min (d) 5 hours 45 min

RRB NTPC 17.01.2017 Shift-3

Ans : (c) Let the time taken to cover a distance by running = x

and time taken to cover a distance on foot = y

From question–

$$x + y = 6\frac{5}{6}h = \frac{41}{6} \text{.....(i)}$$

$$2y = 8\frac{1}{2} \Rightarrow y = \frac{17}{4}$$

From equation (i)–

$$x + \frac{17}{4} = \frac{41}{6} \Rightarrow x = \frac{41}{6} - \frac{17}{4}$$

$$x = \frac{82 - 51}{12} = \frac{31}{12}$$

$\therefore$ Time taken to cover a distance both sides by running

$$= 2 \times \frac{31}{12} = \frac{31}{6} = 5 \text{ hours } 10 \text{ minutes}$$

57. The distance between two points A and B was covered at a speed of 50 km/h in 5½ hours. How much time can be saved if the speed is increased by 5 km/h.

(a) 5 minutes (b) 15 minutes

(c) 50 minutes (d) 30 minutes

RRB NTPC 03.04.2016 Shift : 1

Ans : (d) $S_1 = 50\text{km/h}, \quad t_1 = 5\frac{1}{2} = \frac{11}{2}$ hours

$S_2 = (50 + 5) = 55\text{km/h}, \; t_2 = ?$

From formula- $S_1 t_1 = S_2 t_2$

(Distance = Speed×Time)

$$50 \times \frac{11}{2} = 55 \times t_2$$

$$t_2 = \frac{275}{55} = 5 \text{ hours}$$

$$\text{Saved time} = \left(\frac{11}{2} - 5\right) = \frac{1}{2} \text{ hours}$$

$$= 30 \text{ minutes}$$

58. A bus runs at a speed of 80 km/hr. and reaches its destination with a delay of 10 minutes. If it had moved at a speed of 90 km/hr., it would have reached only 8 minutes late. The right time to complete the journey by bus is:

(a) 8 minutes (b) 10 minutes

(c) 12 minutes (d) 15 minutes

RRB NTPC 22.04.2016 Shift : 1

Ans : (a) Given–

$V_1 = 80$ Km./hr. $V_2 = 90$ Km./hr.

$t_1 = 10$ minutes $t_2 = 8$ minutes

Distance covered by bus from origin to destination

$$= \frac{V_1 . V_2}{V_1 \sim V_2} \frac{(t_1 \sim t_2)}{60}$$

$$= \frac{80 \times 90}{80 \sim 90} \times \left(\frac{10 \square 8}{60}\right)$$

$$= \frac{80 \times 90}{10} \times \frac{2}{60} = 24 \text{ km.}$$

Time taken by bus to complete the journey

$$= \frac{24}{80} \times 60 - 10 = 18 - 10 = 8 \text{ minutes}$$

59. A man at 6:30 am starts walking and wants to travel 30 km. His initial speed is 6 km/h and after traveling 3/5 of distance he reduced his speed to 2 km/h. He will finish his journey:

(a) 11.00 am (b) 12.30 pm

(c) 11.30 pm (d) 12.00 pm

RRB NTPC 27.04.2016 Shift : 2

Ans : (b) Total distance = 30 km.

Distance traveled at a speed of 6 Km./hr.

$$= \frac{3}{5} \text{ of total distance}$$

$$= 30 \times \frac{3}{5}$$

$$= 6 \times 3$$

$$= 18 \text{ km}$$

By 2 Km./hr. reduction in speed (6 – 2) = 4 Km./hr.

Hence the last 12 km distance will run at a speed of 4 Km./hr.

Hence time taken to cover the entire distance of 30 km

$$= \frac{18}{6} + \frac{12}{4} = 3 + 3 = 6 \text{ hours}$$

Total time taken by man to finish journey = 6 : 30 + 6 hours

= 12:30 pm

60. A Car can cover 350 km in 4 hours. If its speed is decreased by $12\frac{1}{2}$ Km./hr. how much time does the car take to cover a distance of 450 km.

(a) 7 hours (b) 4 hours

(c) 5 hours (d) 6 hours

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (d) Initial speed of car $= \frac{350}{4} = 87.5$ Km./hr.

Speed of car after decreasing
=87.5–12.5=75 km./hr.

Hence the time taken by car to cover distance of 450 km

$$= \frac{450}{75} = 6 \text{ hours}$$

61. You are driving at a speed of 45 km/h from point A to B. Your friend is driving 53 km/h from point B to A. If the distance between the two points is 1029 km and both of you start at the same time, then how many hours will it take you to cross each other?

(a) 10.5 (b) 9.5
(c) 10 (d) 11

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (a)

A ⟶ 45 km/hour ⟶ B
⟵ 1029 km ⟵
53 km/hour

Time taken to cross each other

$$= \frac{\text{Distance}}{\text{Relative speed (Sum of speed)}}$$

$$= \frac{1029}{98} = 10.5 \text{ hours}$$

62. Mark had to travel 220 km in 4.5 hours. How long did he travel by bus, with a train running at a speed of 60 km/h or a bus traveling at a speed of 40 km/h or a combination of these two?

(a) 1 hour (b) 2 hours
(c) 1 hour 30 minutes (d) 2 hours 30 minutes

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (d) : Time taken by bus to travel = t hours

According to the question,

$$60(4.5 - t) + 40t = 220$$

$$270 - 60t + 40t = 220$$

$$270 - 20t = 220$$

$$20t = 50$$

$$t = \frac{5}{2} = 2 \text{ hours } 30 \text{ minutes}$$

Type - 3

63. A student walks from his house at 2.5 km/hour and reaches his school 6 minutes after school time. Next day he increases his speed by 1 km/hour and reaches his school 6 minutes before school time. How far is the school from his house ?

(a) 2.25 km (b) 2.5 km
(c) 1.75 km (d) 2 km

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (c) : Let distance of the school from the house of the student = d km

According to the question,

$$\frac{d}{2.5} - \frac{6}{60} = \frac{d}{(2.5+1)} + \frac{6}{60}$$

$$\frac{d}{2.5} - \frac{d}{3.5} = \frac{1}{10} + \frac{1}{10}$$

$$\frac{d}{2.5 \times 3.5} = \frac{1}{5}$$

$$d = 0.5 \times 3.5$$

$$\therefore \boxed{d = 1.75 \text{km}}$$

64. Julie can cover a distance of 140 m in 18 second. At that given speed how much distance can Julie cover in 1 hour?

(a) 25.2 km (b) 31.5 km
(c) 28 km (d) 29.4 km

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (c) : Speed = Distance / Time

Time = 18 seconds

Distance = 140 meter

$$\text{then, Speed} = \frac{140}{18} \text{ m/sec}$$

$$= \frac{140}{18} \times \frac{18}{5} \text{ km/hour}$$

$$= 28 \text{ km/h.}$$

The distance covered by Julie in 1 hour = 28 km.

65. Avik runs at a speed of 8 metres per second. How many kilometres will Avik cover in 24 minutes if he continues running at the same speed?

(a) 11.44 (b) 11.56
(c) 11.60 (d) 11.52

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (d) : Distance = Speed × Time

$$= 8 \times 24 \times 60$$

$$= \frac{8 \times 24 \times 60}{1000} \text{ km}$$

$$= 11.52 \text{ km.}$$

66. Ravi has to go from Hyderabad to Delhi. The distance between Hyderabad and Delhi is 1,200 kms. He decides to travel 25% of the distance on foot, 30% of the distance by bus, 15% of the distance by train and the remaining distance by an airplane. What is the distance travelled by Ravi by an Airplane?

(a) 580 km (b) 360 km
(c) 300 km (d) 425 km

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : According to the question,

Onfoot + Bus + Train + Airplane
↓ ↓ ↓ ↓
25% + 30% + 15% + 30% = 100%

$\because$ 100% → 1200 kms.

Distance travelled by Ravi by an Airplane is-

$$\therefore \ 30\% \ \rightarrow \ \frac{1200}{100} \times 30 = 360 \text{km.}$$

67. Suhas travelled by train to cover $\frac{5}{12}$ of the journey, and then travelled by bus to cover $\frac{1}{3}$ of the journey. After that he travelled the remaining 36 km on a bicycle. How much in all did Suhas travel?

(a) 132 km (b) 144 km
(c) 150 km (d) 168 km

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (b) : Distance covered by Suhas by train $= \frac{5}{12}$ part

And distance covered by bus $= \frac{1}{3}$ part

Now remaining distance $= 1 - \left(\frac{5}{12} + \frac{1}{3}\right) = \frac{3}{12}$ part

According to the question,

$\frac{3}{12}$ unit $\longrightarrow$ 36 km

1 unit $\longrightarrow \frac{36 \times 1}{\frac{3}{12}} = \frac{36 \times 12}{3}$

$= 12 \times 12$

$= 144$ km

68. Vaishali covers a certain distance by car at 50 kmph and returns to the original place through the same route on a bicycle at 10 kmph. If the time taken by her for the whole journey was 2 hours 24 minutes, then what was the total distance that she covered?

(a) 40 km (b) 50 km
(c) 48 km (d) 60 km

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) : Let the distance covered by Vaishali in one side be d km.

According to the question,

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\frac{d}{50} + \frac{d}{10} = 2 + \frac{24}{60}$$

$$= \frac{d}{50} + \frac{d}{10} = \frac{12}{5}$$

$$= \frac{d + 5d}{50} = \frac{12}{5}$$

$$= \frac{6d}{50} = \frac{12}{5}$$

$d = 20$ km

$\therefore$ Total distance = distance covered by car + distance covered by cycle on returing the original place

$= 20 + 20$

$= 40$ km

69. If a man takes 36 minutes to cover a certain distance at a speed of 5 km/h, then the distance covered by him is :

(a) 2 km (b) 3.5 km
(c) 3 km (d) 2.5 km

RRB Group-D 30-08-2022 (Shift-II)

Ans. (c) : According to the question

Distance = Speed × Time

Distance $= 5 \times \frac{36}{60}$

Distance = 3 km

70. A person can complete a journey in 14 hours. He covers the first one-third of the distance at the rate of 40 km/h and the remaining distance at the rate of 60 km/h. What is the total distance of his journey ?

(a) 720 km (b) 360 km
(c) 540 km (d) 480 km

RRB Group-D 08/09/2022 (Shift-I)

Ans. (a) : Given that -

Time taken by person to complete a journey = 14 hours

Let total distance = x km

According to the question

Time taken to cover 1/3 of the distance $= \frac{x}{40 \times 3} = \frac{x}{120}$

Time taken to cover remaining 2/3 of the distance $= \frac{2x}{3 \times 60} = \frac{2x}{180}$

Then

$$\text{Total time} = \frac{x}{120} + \frac{2x}{180}$$

$$14 = \frac{7x}{360}$$

$x = 720$

So total distance = 720 km.

71. A car covers certain distance in $2\frac{1}{4}$ hours at 36 miles/h and another distance in $1\frac{3}{4}$ hours at 56 miles/h. Find the total distance (in miles) travelled by the car.

(a) 159 (b) 139
(c) 200 (d) 179

RRB Group-D 01/09/2022 (Shift-III)

Ans. (d) : Total distance covered in $2\frac{1}{4}$ hours at a speed of 36 miles/h $= 36 \times \frac{9}{4} = 81$ miles

Total distance covered in $1\frac{3}{4}$ hours at a speed of 56 miles/h $= 56 \times \frac{7}{4} = 98$ miles

$\therefore$ Total distance travelled by the car = 81 + 98

= 179 miles

72. Two woman walk from a place at the speeds of 6 km/h and 8 km/h respectively. First woman takes 40 min more than the second one to cover the distance. Find the distance.

(a) 14 km (b) 16 km

(c) 12 km (d) 10 km

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (b) : $s_1t_1 = s_2t_2$ (When distance is equal)

$$6\times\left(t+\frac{40}{60}\right)=8\times t$$

$$3\left(t+\frac{2}{3}\right)=4t$$

$3t + 2 = 4t$

$t = 2h$

$\therefore$ Distance $= s_2t_2 = 8 \times 2$

$= 16$ km

73. A man travels 360 km in 4h, partly by air and partly by train. If he had travelled all the way by air, he would have saved $\frac{4}{5}$ of the time he travelled by train, and he would have arrived at his destination 2 h early. Find the distance he travelled by air.

(a) 260 km (b) 290 km

(c) 270 km (d) 280 km

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (c) : 4/5 of the total time taken by train = 2 hours

Total time taken by the train $= \frac{5}{4}\times 2 = \frac{5}{2}$ hours

Total time to cover a certain distance of 360 km in 4 hours

$$4-\frac{5}{2}=\frac{8-5}{2}=\frac{3}{2}\text{ hours}$$

Time taken by air to cover a distance of 360 km = 2 hours

$\therefore$ Distance covered in 3/2 hours $= \frac{360}{2}\times\frac{3}{2}=90\times 3$

$= 270$ km

Hence the total distance travelled by air = 270 km

74. Two cars cover a certain distance by moving at speeds of 45 km/h and 50 km/h respectively. Find the distance travelled when one car takes 32 minutes more than the other to cover the distance?

(a) 240 km (b) $\frac{240}{19}$ km

(c) $\frac{8}{3}$ km (d) $\frac{152}{3}$ km

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (a) : Let distance covered = d km

According to the question,

$$\frac{d}{45}-\frac{d}{50}=\frac{32}{60}$$

$$\frac{d}{9}-\frac{d}{10}=\frac{32}{12}$$

$$\frac{10d-9d}{90}=\frac{32}{12}$$

$$\frac{d}{90}=\frac{32}{12}$$

$$d=\frac{90\times 32}{12}=240\,\text{km}$$

75. A man travelled from a village to a postoffice at a speed of 25 km/h and walked back at a speed of 4 km/h. If the whole journey took 5 hours 48 minutes, then find the distance of the post office from the village.

(a) 20 m (b) 20 km

(c) 40 m (d) 40 km

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let distance of the post office from the village = x km

According to the question,

$$\frac{x}{25}+\frac{x}{4}=5\text{ hours }48\text{ minutes}$$

$$\frac{4x+25x}{100}=5\frac{4}{5}$$

$$\frac{29x}{100}=\frac{29}{5}$$

$x = 20$ km

76. A man travelled a distance of 61 km in 9 h. He travelled partly on foot at the speed of 4 km/h and partly on bicycle at the speed of 9 km/h. What was the distance travelled on Foot?

(a) 12 km (b) 16 km

(c) 18 km (d) 14 km

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let distance travelled x km on foot.

According to the question,

$$9=\frac{x}{4}+\frac{61-x}{9}$$

$$9=\frac{9x+4(61-x)}{36}$$

$9\times 36 = 9x+244-4x$

$324 = 5x + 244$

$5x = 80 \Rightarrow x = 16$ km

77. Driving his car at the speed of 30 km/h Vinod reaches his office 5 min late. If his speed is 40 km/h, he reaches the office 3 min early. Find the distance he travels between his residence and his office.

(a) 20 km (b) 15 km

(c) 18 km (d) 16 km

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (d) : When distance is constant

Distance = Speed × Time

$s_1t_1 = s_2t_2$

$$30\left(t+\frac{5}{60}\right)=40\left(t-\frac{3}{60}\right)$$

$$3t+\frac{15}{60}=4t-\frac{12}{60}$$

$$\frac{15}{60}+\frac{12}{60}=4t-3t$$

$$t=\frac{27}{60}$$

Putting the value of t

$$=30\left(t+\frac{5}{60}\right)$$

$$=30\left(\frac{27}{60}+\frac{5}{60}\right) \quad =30\times\frac{32}{60}=16\,\text{km}$$

78. Two men start walking together to a certain destination, one at the speed of 3 km/h and another at the speed of 3.75 km/h. The latter arrives half an hour before the former. The distance is:

(a) 7.0 km (b) 6.7 m

(c) 0.7 km (d) 7.5 km

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let us consider the distance of distination is d km.

As per the question

$$\frac{d}{3}-\frac{d}{3.75}=\frac{1}{2}$$

$$\frac{.75d}{3\times3.75}=\frac{1}{2}$$

$$d=\frac{15}{2}$$

d = 7.5 km

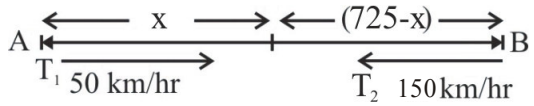
79. A train leaves station A towards station B at the speed of 50 km/hr. After half an hour, another train leaves station B towards station A at 150 km/hr. The distance between the stations is 725 km. The distance of the point from station A where the two trains are to meet is:

(a) 168 km (b) 250 km

(c) 200 km (d) 150 km

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (c) :



Distance of meeting point from 'A' = x km

Distance covered by the first train in 30 min = 25 km

Remaining distance = 725 – 25 = 700 km

Relative speed = (50 + 150) km/h

= 200 km/hr

$$\text{Meeting time}=\frac{700}{200}\,\text{hours}$$

= 3.5 hours

Distance covered by the first train in 3.5 hours

$$=50\times\frac{7}{2}\,\text{km}$$

175 km

Hence, distance from station A where the two trains meet = 175 + 25 = 200 km

80. Ram covers a certain distance on a toy train. Had the train moved 8 km/h faster, it would have taken 20 min less. If it had moved 4 km/h slower, it would have taken 40 min more. Find the distance.

(a) $\frac{16}{3}$ km (b) $\frac{17}{3}$ km

(c) $\frac{20}{3}$ km (d) $\frac{19}{3}$ km

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (a) : Let the distance = n km

If speed of train v km/h and time be t hour.

$(v+8)\quad\left(t-\frac{1}{3}\right)$

$(v-4)\quad(t+2/3)$

When distance is constant

$s_1t_1 = s_2t_2$

$$(v+8)(t-1/3)=(v-4)(t+2/3)$$

$$-v/3+8t-8/3=2v/3-4t-8/3$$

$$v=12t$$

$$t=\frac{v}{12}-----(i)$$

$$\frac{n}{v-4}-\frac{n}{v+8}=1$$

$$12n=v^2+4v-32$$

$$12vt=v^2+4v-32$$

$$v^2=v^2+4v-32$$

v = 8 km

Distance (n) = v×t

$$8\times\frac{8}{12}\ =\frac{16}{3}\,\text{km}$$

81. A thief runs by a car from a city located 400 km away at a speed of 60 km/h. Just 30 minutes later police starts chasing the thief at a speed of 80 km/h. How much distance covered by the police to catch the thief?

(a) 70 km. (b) 85 km.

(c) 90 km. (d) 120 km.

RRB JE - 23/05/2019 (Shift-I)

Ans : (d)

Distance covered by thief in 30 minutes $= 60 \times \frac{1}{2}$

$= 30$ km

Relative speed $= (80 - 60) = 20 \text{km/h}$

Total time taken by the police to catch the thief $= \frac{30}{20}\text{h} = \frac{3}{2}\text{h}$

Distance covered by the police to catch the thief $= \left(80 \times \frac{3}{2}\right)\text{km}$

$= 120$ km

82. Two horses travel the same distance at the speed of 10 km/h and 15 km/h respectively. If the first horse takes 12 minutes longer than the second horse then the distance was travelled.

(a) 8 km (b) 6 km
(c) 4 km (d) 2 km

RRB RPF SI – 16/01/2019 (Shift-III)

Ans. (b) : The speed of both horses is 10 Km./hr. and 15 Km./hr. respectively.

Let distance = x km

Time = Distance / Speed

Time taken by first horse to cover the distance $= \frac{\text{Distance}}{\text{Speed}} = \frac{x}{10}$

Time taken by second horse to cover the distance $= \frac{x}{15}$

According to the question,

$$\frac{x}{10} - \frac{x}{15} = \frac{12}{60}$$
$$\frac{3x - 2x}{30} = \frac{12}{60}$$
$$\frac{x}{30} = \frac{12}{60}$$
$$x = 6 \text{ km}$$

83. Azhar can complete a journey in 10 hours. He covers half of the journey at a speed of 21 km/h and the rest of the journey at the speed of 24 km/h. Find the distance.

(a) 234 (b) 225
(c) 224 (d) 232

RRB RPF SI – 12/01/2019 (Shift-II)

Ans. (c) Let the total distance covered by Azhar = x km.

From the question-

$$\frac{x/2}{21} + \frac{x/2}{24} = 10 \left[\because \text{Time} = \frac{\text{Distance}}{\text{Speed}}\right]$$
$$\Rightarrow \frac{x}{21} + \frac{x}{24} = 20$$
$$\Rightarrow \frac{x}{7} + \frac{x}{8} = 20 \times 3 = 60$$
$$\Rightarrow \frac{8x + 7x}{56} = 60$$
$$\Rightarrow 15x = 60 \times 56$$
$$x = \frac{60 \times 56}{15} = 4 \times 56$$
$$x = 224 \text{ km.}$$

84. The usual average speed of a car at a certain distance is 50 km/h on a particular day. The average speed was 1/10 less than the usual average speed, as a result it took 18 minutes longer to finish the journey, how much is this distance of the road in kilometers?

(a) 135 (b) 120
(c) 125 (d) 140

RRB RPF SI – 10/01/2019 (Shift-II)

Ans : (a) First condition-

Let the distance of road = x km

Usual average speed of car is 50 Km./hr.

Time $= \frac{x}{50}\text{h}$

Second condition–

Average speed of a particular day

$= 50 - 50 \times \frac{1}{10} = 45$ Km./hr.

Time $= \frac{x}{45}$ hours

Now according to the question,

$$\frac{x}{45} - \frac{x}{50} = \frac{18}{60}$$
$$20x - 18x = 18 \times 15$$
$$2x = 18 \times 15$$
$$x = 9 \times 15$$

Therefore distance of road = 135 km

85. Mahima has to travel at a speed of 54 km/h instead of 45 km/h to reach the destination on time due to delay of 12 minutes from her usual time. Find the distance travelled.

(a) 75 km (b) 54 km
(c) 67.5 km (d) 90 km

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (b) : Let the distance travelled by Mahima during the journey is x km.

According to the question,

Time = Distance/Speed

Here the time is same in both cases-

$$\frac{x}{45} = \frac{x}{54} + \frac{12}{60}$$
$$\frac{x}{45} - \frac{x}{54} = \frac{12}{60}$$
$$\frac{54x - 45x}{45 \times 54} = \frac{12}{60}$$
$$\frac{9x}{45 \times 54} = \frac{1}{5}$$
$$\frac{x}{54} = 1$$
$$x = 54 \text{ km.}$$

86. A person travels 480 km in 4 hours, some distance travels by airplane and some train. If he travels the entire journey by airplane then he saves 4/5th time than that of the train and he arrives at destination 2 hours early. Find the distance travelled by the train.

(a) 90 km (b) 120 km
(c) 80 km (d) 110 km

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (b) Total time = 4 hours
Total distance = 480 km.
Let the distance covered by train = x km.
and if the total distance covered by the train then the total time taken = t hours
According to the question,
If the total distance is covered by airplane then the time taken

$$= t - \frac{4t}{5} = \frac{t}{5}$$

$$\frac{t}{5} = (4-2) = 2 \text{ hours}$$

$$\frac{t}{5} = 2$$

t = 10 hours

Hence speed of train $= \frac{480}{10} = 48 \text{km/hr}$

and speed of airplane $= \frac{480}{2} = 240 \text{km/hr}$

Distance covered by train = x km
So distance covered by airplane = (480–x) km.
Hence

$$\frac{x}{48} + \frac{(480-x)}{240} = 4$$

$$\frac{10x + 960 - 2x}{480} = 4$$

$$8x = 1920 - 960$$

$$\boxed{x = 120 \text{ km}}$$

87. A person reaches office driving at a speed of 42 km/hr 2 minutes earlier. While he drives at a speed of 36 km/h, he reaches 5 minutes late. How much distance does he cover (in km)?
(a) 30.8 (b) 29.6
(c) 30.4 (d) 29.4

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (d) : Let the distance covered by the man is x km.
According to the question,

$$\frac{x}{36} - \frac{x}{42} = \frac{7}{60}, \quad \frac{x}{36} - \frac{x}{42} = \frac{7}{60}$$

$$\frac{42x - 36x}{36 \times 42} = \frac{7}{60}, \quad \frac{6x}{36 \times 42} = \frac{7}{60}$$

$$x = \frac{7 \times 42 \times 6}{60}$$

$$x = \frac{7 \times 42}{10}$$

$$x = 29.4 \text{ km}$$

88. A woman reaches the office driving at a speed of 40 km/h 4 minutes earlier while she arrives 5 minutes late if she drives at the speed of 32 km/h, what is the distance covered by him?
(a) 32 (b) 24
(c) 28 (d) 30

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (b) Let the actual time to reach the office = t hr
From {Distance = Speed × Time}-

$$40\left(t - \frac{4}{60}\right) = 32\left(t + \frac{5}{60}\right)$$

$$40\left(t - \frac{1}{15}\right) = 32\left(t + \frac{1}{12}\right)$$

$$40t - \frac{40}{15} = 32t + \frac{32}{12}$$

$$40t - 32t = \frac{32}{12} + \frac{40}{15}$$

$$8t = \frac{8}{3} + \frac{8}{3}$$

$$8t = \frac{16}{3}$$

$$t = \frac{2}{3}$$

Total distance $= 40\left(\frac{2}{3} - \frac{1}{15}\right) \Rightarrow 40 \times \frac{9}{15} = 24 \text{km}$

89. A person reaches his office 1 minute before at a speed of 42 km/h, while that person traveling at a speed of 36 km/h reaches the office with a delay of 3 minutes. How much distance does a person travel (in km)?
(a) 12.9 (b) 16.8
(c) 15.4 (d) 18.2

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (b) Let the time taken by man to reach the office = t hours
According to the question,-

$$42 \times \left(t - \frac{1}{60}\right) = 36 \times \left(t + \frac{3}{60}\right)$$

$$\Rightarrow 42t - \frac{42}{60} = 36t + \frac{108}{60}$$

$$42t - 36t = \frac{108}{60} + \frac{42}{60}$$

$$6t = \frac{15}{6}$$

$$t = \frac{5}{12}$$

Distance = Speed × Time

$$= 36 \times \left(\frac{5}{12} + \frac{3}{60}\right)$$

$$= 36 \times \frac{28}{60} = \frac{6 \times 28}{10} = \frac{168}{10}$$

$$\boxed{\text{Distance} = 16.8 \text{ km}}$$

90. If Raj drives 10 km/h more than his usual speed, then he reaches his village 90 minutes before. If raj drives 10 km/h less than the usual speed then reaches his village 150 minutes late. Find the total distance travelled by him.
(a) 600 km (b) 500 km
(c) 400 km (d) 300 km

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (d) Let the usual speed of Raj = x Km./hr.
Both the given conditions are taken for a certain distance.
Hence from $v_1t_1 = v_2t_2$

$\because \quad (x+10)\times\frac{90}{60}=(x-10)\times\frac{150}{60}$

$(x+10)\times\frac{3}{2}=(x-10)\times\frac{5}{2}$

$3x+30=5x-50$

$2x = 80 \Rightarrow x = 40$ Km./hr.

Again distance is equal then

$v_1t_1 = v_2t_2$

$(40+10)\left(t-\frac{90}{60}\right)=(40-10)\left(t+\frac{150}{60}\right)$

$50\frac{(2t-3)}{2}=30\frac{(2t+5)}{2}$

$100t-150=60t+150$

$40t=300 \Rightarrow t=\frac{15}{2}$ hours

Hence required distance $= 40\times\frac{15}{2}=300$ km.

91. A man travels by train and car to reach his office. If he travels 10 km by car and travels the rest by train then he reaches his office in t hours. If he does the exact opposite of it, he reaches office in (t+0.5) hours. If the speeds of the train and car are 50 km/h and 40 km/h respectively, then how much distance does he cover to reach his office?

(a) 100 km. (b) 80 km.
(c) 120 km. (d) 140 km.

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (c) : Let the man covers D km. distance to reach the office.
According to the question,

$$\frac{10}{40}+\frac{(D-10)}{50}=t \quad \text{.....(i)}$$

and

$$\frac{10}{50}+\frac{(D-10)}{40}=t+0.5 \quad \text{.....(ii)}$$

From equation (ii) - equation (i),

$$\frac{10}{50}+\frac{D-10}{40}-\frac{10}{40}-\frac{D-10}{50}=t+0.5-t$$

or $\frac{1}{5}+\frac{D-10}{40}-\frac{1}{4}-\frac{D-10}{50}=0.5$

$\frac{40+5D-50-50-4D+40}{200}=0.5$

$D-20=100 \quad \boxed{D=120\,Km}$

92. Two men X and Y travel a distance of 21 km between P and Q at the speed of 3 km/h and 4 km/h respectively. Arriving at Q, Y immediately returns and meet X at R. What is the distance between P and R?

(a) 16 km (b) 17.5 km
(c) 17 km (d) 18 km

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : Let the distance between P and R = x km
$\therefore$ Time taken by both will be equal.
Time taken by Y = Time taken by X

$\frac{21+21-x}{4}=\frac{x}{3}$

$(42-x)\times 3 = 4x$

$126-3x = 4x$

$7x = 126$

$x = 18$

Hence, distance between P and R = 18 km.

93. A bus crosses two persons cycling in the same direction of the bus at a speed of 9.6 km/h and 12 km/h respectively, in 4.5 seconds and 9 seconds respectively. What is the length of the bus?

(a) 6 m (b) 8 m
(c) 7 m (d) 4 m

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (a) Let the length of the bus = x meters
According to the question,

$(y-9.6)\times\frac{5}{18}\times 4.5=(y-12)\times\frac{5}{18}\times 9$

$y - 9.6 = 2y - 24$

$y = 14.4$km/h

Hence, the length of bus $= (14.4-12)\times\frac{5}{18}\times 9$

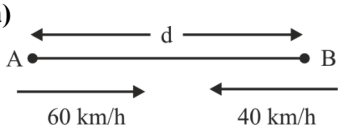
$= 2.4\times\frac{5}{2}=6$m

94. The distance between two points is travelled by the speed of 60 km/h while going and by 40 km/h during the return journey. If it took a total of 5 hours, then the distance between the two points on one side is:

(a) 120 km (b) 135 km
(c) 150 km (d) 180 km

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (a)



$V_1=\frac{d}{t_1} \qquad V_2=\frac{d}{t_2}$

$t_1=\frac{d}{V_1}$ and $t_2=\frac{d}{V_2}$

$\because$ Total time $= t_1 + t_2 = 5$h

$\because \quad 5=\frac{d}{V_1}+\frac{d}{V_2}$

$5=\frac{d}{V_1}+\frac{d}{V_2}$

$5=\frac{d}{60}+\frac{d}{40}$

$5=d\left(\frac{4+6}{240}\right)$

$5=d\times\frac{10}{240}$

$d = 5 \times 24 = 120$ km

$\therefore$ d = 120 km

95. Jatin covers 7.5 km more distance if he walks 9 km/h instead of 4 km/h. What is the total distance covered by him (in km)?

(a) 7 (b) 5
(c) 8 (d) 6

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (d) More distance covered after increasing speed from 4 Km./hr. to 9 Km./hr. = 7.5 km

$\therefore$ 9 Km./hr. – 4 Km./hr. = 7.5 km

5 Km./hr. = 7.5 km

$\therefore$ Time $= \frac{7.5}{5}$hr

$\therefore$ Distance $= \frac{7.5}{5} \times 4$ (Distance = speed × time)

= 6 km

Hence total distance of journey = 6 km

96. A car travels a certain distance in 8 hrs. It travels half of the distance at a speed of 40 km/h and another half distance at a speed of 60 km/h. Find the total distance travelled.

(a) 384 kms (b) 368 kms
(c) 344 kms (d) 388 kms

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (a) Let the certain distance covered by the car in 8 hours = d km

$\because$ Covered distance at the speed of 40 Km./hr. $= \frac{d}{2}$km

$\therefore$ Time taken $= \frac{d}{40 \times 2} = \frac{d}{80}$hr

$\because$ Covered distance at the speed of 60 Km./hr. $= \frac{d}{2}$km

$\therefore$ Time taken $= \frac{d}{60 \times 2} = \frac{d}{120}$hr.

$\because$ Total time = 8 hr.

$\therefore \frac{d}{80} + \frac{d}{120} = 8$

$\therefore \frac{d}{8} + \frac{d}{12} = 80$

$\frac{3d + 2d}{24} = 80 \Rightarrow 5d = 80 \times 24$

$d = \frac{80 \times 24}{5} = 384$ km

97. Travelling at a speed of 57 km/h Manav reached the destination 3 minute earlier. If he travelled at the speed of 51 km/h then he reached 1 minute late. What is the distance travelled by Manav?

(a) 31.5 km (b) 32.3 km
(c) 31.9 km (d) 32.8 km

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (b)

Let the total distance is D km and usual time is t.

Hence $\frac{D}{57} = t - \frac{3}{60}$.....(1)

and $\frac{D}{51} = t + \frac{1}{60}$.....(2)

By subtracting equation (1) from equation (2),

$\frac{D}{51} - \frac{D}{57} = \frac{1}{60} + \frac{3}{60}$

$\frac{6D}{51 \times 57} = \frac{4}{60} = \frac{1}{15}$

$D = \frac{51 \times 57}{6 \times 15} = 32.3$km

98. A woman reaches the office 5 minutes earlier driving at a speed of 45 km/h, while she reaches 7 minutes late driving at a speed of 27 km/h. What distance did she travel?

(a) 18 (b) 16.5
(c) 15 (d) 13.5

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (d) : The distance travelled by the woman in both conditions will be the same {$\because$ t = time taken to arrive at the right time}

$v_1t_1 = v_2t_2$

$45 \times \left(t - \frac{5}{60}\right) = 27 \times \left(t + \frac{7}{60}\right)$

$\frac{5(60t - 5)}{60} = \frac{3(60t + 7)}{60}$

$5(60t - 5) = (60t + 7) \times 3$

$300t – 25 = 180t + 21$

$120\ t = 46$

$t = \frac{46}{120} = \frac{23}{60}$ hours.

Putting the value of t-

$\therefore$ Distance $= 45 \times \left(\frac{23}{60} - \frac{5}{60}\right)$

$= 45 \times \frac{18}{60}$

$= \frac{135}{10} = 13.5$km

99. Travelling at a speed of 66 Km/hr, Piyali reaches a place 5 minutes earlier. If she travels at the speed of 54 km/h, she is delayed by 3 minutes. How much distance did Piyali travel?

(a) 39.2 km (b) 40.2 km
(c) 39.6 km (d) 40.8 km

RRB Group-D – 15/10/2018 (Shift-II)

Ans : (c) Let the time taken by Piyali to cover the distance is t hours.

$\therefore$ Distance from first condition

$= 66 \times \left(t - \frac{5}{60}\right)$ ....(i)

Distance from second condition

$= 54 \times \left(t + \frac{3}{60}\right)$ ....(ii)

By solving equation (i) and (ii)–

$66\left(t - \frac{5}{60}\right) = 54\left(t + \frac{3}{60}\right)$

$11\left(t - \frac{5}{60}\right) = 9\left(t + \frac{3}{60}\right)$

$$11t-\frac{55}{60}=9t+\frac{27}{60}$$
$$11t-9t=\frac{27}{60}+\frac{55}{60}$$
$$2t=\frac{82}{60}$$
$$t=\frac{41}{60}$$

Putting the value of t in equation (i),

Distance covered by Piyali $=66\left(\frac{41}{60}-\frac{5}{60}\right)$

$$=66\times\frac{36}{60}=\frac{11\times18}{5}=39.6\,\text{km}$$

100. Vishnu covers the same distance at a speed of 10 km/h, 30 km/h and 8 km/h and takes a total of 15.5 minutes to complete journey, then find the total distance travelled by him.

(a) 1 (b) 3
(c) 4 (d) 2

RRB NTPC 17.01.2017 Shift-1

Ans : (b) Let total distance covered by Vishnu is x km.

According to the question,

$$\frac{\left(\frac{x}{3}\right)}{10}+\frac{\left(\frac{x}{3}\right)}{30}+\frac{\left(\frac{x}{3}\right)}{8}=\frac{15.5}{60}$$
$$\frac{x}{3}\left(\frac{1}{10}+\frac{1}{30}+\frac{1}{8}\right)=\frac{15.5}{60}$$
$$\frac{x}{3}\left(\frac{24+8+30}{240}\right)=\frac{15.5}{60}$$
$$\frac{x}{3}\left(\frac{62}{240}\right)=\frac{15.5}{60}$$
$$x=\frac{15.5\times240\times3}{60\times62}$$
$$x=\frac{186}{62}$$
$$x=3\ \text{km.}$$

101. If Lalita leaves for her school from her home at a speed of 45 km/h by car then she takes 5 minutes more than driving at 60 km/h. What is the distance between home and school?

(a) 18km (b) 15km
(c) 14km (d) 10km

RRB NTPC 18.01.2017 Shift : 2

Ans : (b) Let the distance of school from home = x km.

then, the time taken by Lalita to cover the distance of x km at the speed of 45 Km./hr. $=\frac{x}{45}$

Time taken by Lalita to cover the distance of x km at the speed of 60 Km./hr. $=\frac{x}{60}$

According to the question,

$$\frac{x}{45}-\frac{x}{60}=\frac{5}{60}$$
$$\frac{4x-3x}{180}=\frac{1}{12}$$
$$x=\frac{180}{12}=15$$
$$\boxed{x=15\text{km}}$$

Distance between school and home = 15 km

102. Ram completes the 4/9th part of the total journey by Bus, the 5/18th part by train and the remaining 10 km by walking. Find the total distance.

(a) 42 km. (b) 90 km.
(c) 36 km. (d) 18 km.

RRB NTPC 19.04.2016 Shift : 2

Ans : (c) Let the total distance is x km.

Distance travelled by bus $=\frac{4x}{9}$

Distance travelled by train $=\frac{5x}{18}$

According to the question,

$$x-\left(\frac{4x}{9}+\frac{5x}{18}\right)=10$$
$$x-\frac{13x}{18}=10$$
$$\frac{5x}{18}=10$$
$$5x=10\times18$$
$$x=\frac{10\times18}{5}=36\text{ km.}$$

103. A runner covers a distance of 60 km in 3 hours and 45 minutes. How much should he increase the average speed to cover this distance 45 minutes before?

(a) 16 Km./hr. (b) 20 Km./hr.
(c) 6 Km./hr. (d) 4 Km./hr.

RRB NTPC 18.04.2016 Shift : 3

Ans : (d) Given–

Distance = 60 km, Time = 3 hours 45 minutes

$$=3\frac{45}{60}\text{ hours}$$
$$=\frac{15}{4}\text{ hours}$$
$$\therefore\ \text{Speed}=\frac{\text{Distance}}{\text{Time}}$$
$$=\frac{60}{(15/4)}=60\times\frac{4}{15}=16\text{ Km./hr.}$$

Let the averge speed be increased by x Km./hr.

Time = 3 hours

Speed = (16+x) Km./hr.

According to the question,

$$(16+x)=\frac{60}{3}$$
$$16+x=20$$
$$x=20-16$$
$$x=4\text{ Km./hr.}$$

104. Mohan covers a certain distance from his car in 12 hours at a uniform speed. When the speed is increased by 5 km/h, then the same distance can be covered in 9 hours. What is the total distance?

(a) 108 km. (b) 90 km.
(c) 190 km. (d) 180 km.

RRB NTPC 18.04.2016 Shift : 3

Ans : (d) Let the total distance is d km and the speed is 'V' km/h-

According to first condition-

$$V = \frac{d}{12} .....(i)$$

According to second condition-

$$(V+5) = \frac{d}{9} .....(ii)$$

From equation (i) and (ii)–

$$\frac{d}{12} + 5 = \frac{d}{9}$$

$$\frac{d+60}{12} = \frac{d}{9}$$

$3d + 180 = 4d$

$d = 180$ km.

105. Chandan covers equal distances at the speed of 3 km/h, 4 km/h and 8 km/h respectively and takes a total time of 42.5 minutes. Find the total distance in km.

(a) 4 (b) 2
(c) 1 (d) 3

RRB NTPC 11.04.2016 Shift : 2

Ans : (d) Time (t) = 42.5 minutes $= \frac{42.5}{60}$ hours.

Let distance = d, $d = d_1 + d_2 + d_3$

and $d_1 = d_2 = d_3 = x$

Average speed = V

$V_1 = 3$ Km./hr. $V_2 = 4$ km/ hr., $V_3 = 8$ Km./hr.

$$\text{Average speed} = (V) = \frac{d_1 + d_2 + d_3}{\frac{d_1}{v_1} + \frac{d_2}{v_2} + \frac{d_3}{v_3}}$$

$$V = \frac{x + x + x}{\frac{x}{3} + \frac{x}{4} + \frac{x}{8}}$$

$$V = \frac{3x}{\frac{8x + 6x + 3x}{24}}$$

$$V = \frac{3x}{\frac{17x}{24}}$$

$$V = \frac{3 \times 24}{17} \text{km/hr.}$$

Then,

Distance = speed × time

$$d = \frac{42.5}{60} \times \frac{3 \times 24}{17}$$

$$d = \frac{425}{600} \times \frac{3 \times 24}{17}$$

$d = 3$ km

106. Monal Kumar travels the same distance at the speed of 3 km/h, 5 km/h and 8 km/h respectively and takes a total time of 395 minutes. Find the total distance in km.

(a) 40 (b) 20
(c) 10 (d) 30

RRB NTPC 22.04.2016 Shift : 2

Ans : (d) Let the total distance is 3d km.

According to the question,

$$\frac{d}{3} + \frac{d}{5} + \frac{d}{8} = \frac{395}{60}$$

$$\frac{40d + 24d + 15d}{120} = \frac{395}{60}$$

$$\frac{79d}{120} = \frac{395}{60}$$

$d = 10$

Hence total distance = $3d = 3 \times 10 = 30$ km.

107. A thief is 400 meters ahead of a policeman. The thief runs away and policeman starts chasing together. Suppose the speed of the thief is 10 km/h and the speed of the police is 15 km/h. Calculate the distance the thief covered before the policeman caught.

(a) 750 meter (b) 800 meter
(c) 850 meter (d) 900 meter

RRB NTPC 29.04.2016 Shift : 2

Ans : (b) Let the thief covered a distance of x m before the policeman caught.

Police Thief

400 m. x m.

According to the question,

$$\frac{x + 400}{15 \times \frac{5}{18}} = \frac{x}{10 \times \frac{5}{18}}$$

$$\frac{6x + 2400}{25} = \frac{9x}{25}$$

$3x = 2400$

$x = 800$m

108. Jai travels from his home to school at a speed of 10 km./hr and reaches late by 5 minutes. If he increases his speed by 3 km./hr, he reaches the school 4 minutes early. What is the distance between his home and the school?

(a) 2 km. (b) 6.5 km.
(c) 4.8 km. (d) 2.5 km.

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (b) Let the distance covered by Jai = d

$\because$ d= vt

According to the question,

$$d = 10 \times \left(t + \frac{5}{60}\right) \quad \text{..... (i)}$$

and $$d = 13 \times \left(t - \frac{4}{60}\right) \quad \text{.....(ii)}$$

From equation (i) and (ii),

$$10 \times \left(t + \frac{5}{60}\right) = 13 \times \left(t - \frac{4}{60}\right)$$

$$10t + \frac{50}{60} = 13t - \frac{52}{60}$$

$$\frac{50}{60} + \frac{52}{60} = 13t - 10t$$

$$\frac{102}{60} = 3t$$

$$t = \frac{34}{60}$$

Putting the value of t in equation (i)

$$d = 10 \times \left(\frac{34}{60} + \frac{5}{60}\right)$$

$$d = 10 \times \frac{39}{60} \Rightarrow d = 6.5 \text{ km.}$$

109. A 150 m long train, travelling at the speed of 54 km./hr, crosses a platform in 42 seconds. What is the length of the platform?

(a) 540 m (b) 630 m
(c) 780 m (d) 480 m

RRB ALP & Tec. (10-08-18 Shift-I)

Ans : (d) Let the length of platform = x meters

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$54 \times \frac{5}{18} = \frac{150 + x}{42}$$

$\Rightarrow$ x+150 = 3×5×42

$\Rightarrow$ x+150 = 630

$\Rightarrow$ x= 630–150

x = 480

Hence the length of platform = 480 m

Type - 4

110. Ravi travels from City A to City B and from City B to City A in 4 hours. If the average speed of the total journey is 68.3 km/h, what is the distance between City A and B ?

(a) 197.06 km (b) 273.2 km
(c) 152.7 km (d) 136.6 km

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (d) :

A ⟶ d ⟵ B

$$\text{Average Speed} = \frac{\text{Total distance}}{\text{Total Time}}$$

$$68.3 = \frac{2d}{4}$$

$$d = \frac{68.3 \times 4}{2}$$

= 136.6 km

111. For a trip of 800 km a truck travels the first 300 km at a speed of 50 km/h. At what speed should it cover the remaining distance, so that the average speed is 60 km/h?

(a) $\frac{600}{13}$ km/h (b) 72 km/h
(c) 52 km/h (d) $\frac{750}{11}$ km/h

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Let the remaining distance is covered at a speed of x km/h.

According to the question,

$$60 = \frac{800}{\frac{300}{50} + \frac{500}{x}}$$

$$\Rightarrow 60 \times \frac{300}{50} + 60 \times \frac{500}{x} = 800$$

$$\Rightarrow \frac{60 \times 500}{x} = 800 - 360$$

$$\Rightarrow x = \frac{60 \times 500}{440}$$

$$\Rightarrow x = \frac{750}{11} \text{km/h}$$

112. A car covers a certain distance at a speed of 45 km/h and returns to the starting point following the same path at a speed of 36 km/h. Find the average speed for the entire journey (in km/h).

(a) 42 (b) 38
(c) 40 (d) 35

RRB NTPC (Stage-II) 15/06/2022 (Shift-II)

Ans. (c) : According to the question,

We know that-

$\because$ Average speed $= \frac{2ab}{a+b}$ Where (a and b = speeds of car)

$$\text{Average speed of car} = \frac{2 \times 45 \times 36}{45 + 36}$$

$$= \frac{2 \times 45 \times 36}{81} = 40 \text{km/h}$$

113. A bus covers four successive 12 km stretches at 20 kmph, 40 kmph, 60 kmph and 120 kmph respectively. Its average speed (in kmph) ever this distance is :

(a) 40 (b) 50
(c) $\frac{200}{9}$ (d) $\frac{100}{9}$

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (a) : Average Speed = $\frac{\text{Total Distance}}{\text{Total Time}}$

$$= \frac{12+12+12+12}{\frac{12}{20}+\frac{12}{40}+\frac{12}{60}+\frac{12}{120}} = \frac{48}{0.6+0.3+0.2+0.1}$$

$$= \frac{48}{1.2} = 40 \text{ km/h}$$

114. A man goes to his office from his house at the speed of 5 km/h and returns to his house using the same route at the speed of 20 km/h. The average speed during the journey is :

(a) 12 km/h (b) 8 km/h
(c) 6 km/h (d) 10 km/h

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) : Average speed $= \frac{2xy}{x+y}$

$= \frac{2\times5\times20}{5+20}$

$= \frac{2\times100}{25}$

$= 2 \times 4 = 8$ km/hr

115. A man covers distances of 300 km, 225 km, and 375 km at the speed of 15 km/h, x km/h and 30 km/h, respectively. If his average speed for the whole journey is 20 km/h, then what is the value of x?

(a) 18 (b) 24

(c) 15 (d) 20

RRB Group-D 01/09/2022 (Shift-III)

Ans. (a) : From, Average speed = Total distance / Total Time

$$20 = \frac{300+225+375}{\frac{300}{15}+\frac{225}{x}+\frac{375}{30}}$$

$$20 = \frac{900}{20+\frac{225}{x}+\frac{75}{6}}$$

$$20+\frac{225}{x}+\frac{75}{6}=\frac{900}{20}$$

$$\frac{225}{x}+\frac{25}{2}=45-20$$

$450 + 25x = 50x$

$$x = \frac{450}{25}$$

$x = 18$ km/h

116. A bus covers 2/5 of a distance at a speed of 50 km/h and the remaining distance at a speed of 60 km/h. Find the average speed of the bus for the whole journey.

(a) $57\frac{2}{9}$km/h (b) $55\frac{8}{9}$km/h

(c) $54\frac{7}{9}$km/h (d) $55\frac{5}{9}$km/h

RRB Group-D 06/09/2022 (Shift-II)

Ans. (d) : Let Total Distance = x

According to the question,

First Part $\rightarrow t_1 = \frac{2x}{5\times50} = \frac{x}{125}$

Second part $\rightarrow t_2 = \frac{3x}{5\times60} = \frac{x}{100}$

Total Time $\rightarrow \frac{x}{125}+\frac{x}{100}$

Average speed = Total distance / Total Time

$$= \frac{x}{\frac{x}{125}+\frac{x}{100}} = \frac{x\times125\times100}{225x}$$

$$\Rightarrow \frac{500}{9}$$

$$\Rightarrow 55\frac{5}{9}\text{km/h}$$

117. A bus covers a distance of 160 km in $3\frac{1}{4}$ hours with one stop of 10 min and another stop of 5 min during the journey. Find the average speed of the bus.

(a) $50\frac{1}{3}$km/h (b) $53\frac{1}{3}$km/h

(c) $52\frac{1}{3}$km/h (d) $51\frac{1}{3}$km/h

RRB Group-D 06/09/2022 (Shift-II)

Ans. (b) : Time $= \frac{13}{4}-\frac{15}{60} \Rightarrow \frac{13}{4}-\frac{1}{4}=\frac{12}{4}=3$ hours

Distance = 160 km

Average speed = Total distance / Total Time

$$= \frac{160}{3}$$

$$= 53\frac{1}{3}\text{km/h}$$

118. A person covers certain distance in 8 hours at a speed of 6 km/h and some more distance in 10 hours at a speed of 4 km/h. Find his average speed for the entire distance covered.

(a) $6\frac{8}{9}$ km/h (b) $4\frac{8}{9}$ km/h

(c) $3\frac{8}{9}$ km/h (d) $5\frac{8}{9}$ km/h

RRB Group-D 09/09/2022 (Shift-II)

Ans. (b) : Average speed = Total distance / Total Time

$$= \frac{6\times8+4\times10}{8+10}$$

$$= \frac{48+40}{18}$$

$$= \frac{88}{18}$$

$$= 4\frac{8}{9}\text{km/h}$$

119. A man travelled at a speed of 20 m/min for 100 min, and at a speed of 70 m/min for 50 min. His average speed is –

(a) 35 m/min (b) 25 m/min

(c) $\frac{110}{3}$ m/min (d) $\frac{70}{3}$ m/min

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (c) : Total distance covered by man in 100 min at a speed of 20m/min = 20 × 100 = 2000m
and distance covered in 50 min at a speed of 70m/min = 70 × 50 = 3500 m
Total travelled distance = 2000 + 3500
= 5500 m
Total time taken = 100 + 50 = 150 min

$$\text{So Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{5500}{150} = \frac{110}{3}\text{ m/min}$$

120. Rohan had to travel from A to B. He covers 75% of the distance at a speed of 60 km/h and the remaining distance at a speed of 40 km/h. What was his average speed for the entire journey?

(a) 55 km/h (b) $53\frac{1}{3}$ km/h

(c) 50 km/h (d) $54\frac{2}{3}$ km/h

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let the total distance be x km.

$$\text{Distance covered at 60 km/h} = \frac{75}{100} \times x = \frac{3}{4}x$$

$$\text{Distance covered at 40 km/h} = \frac{1}{4}x$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total Time}} = \frac{x}{\frac{3}{4}x \times \frac{1}{60} + \frac{1}{4}x \times \frac{1}{40}}$$

$$= \frac{x}{\frac{3x}{160}}$$

$$= \frac{160}{3} = 53\frac{1}{3}\text{ km/h}$$

121. A man travels a distance of 30 km at a speed of 6 km/h and completes the remaining distance 40 km in 5 hours. Find his average speed during the whole journey:

(a) 7 km/hr (b) 8 km/hr

(c) $6\frac{4}{11}$ km/hr (d) 5 km/hr

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Time taken by man to cover a distance of 30 km at a speed of 6 km/h = $\frac{30}{6} = 5$ hours

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{30+40}{5+5}$$

$$= \frac{70}{10}$$

$$= 7\text{ km/hr.}$$

122. A man rides his bicycle for 10 km at an average speed of 12 km/h and further travels 12 km at an average speed of 10 km/h. What is his approximate average speed for the entire trip?

(a) 8 km/h (b) 8.19 km/h

(c) 10.8 km/h (d) 8.10 km/ h

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (c) : Time taken to cover a distance of 10 km with a speed of 12km/h = $\frac{10}{12}$ h

Time taken to cover a distance of 12 km with a speed of 10 km/h

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{10+12}{\frac{10}{12}+\frac{12}{10}}$$

$$= \frac{22}{\frac{100+144}{120}}$$

$$= \frac{22}{244/120}$$

$$= \frac{22}{244} \times 120$$

$$= 10 \cdot 8196$$

$$= 10 \cdot 8\text{ km/h (Approx)}$$

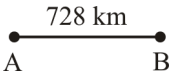
123. Suhas can cover the distance between point A and point B in 7 hours, if he travels at an average speed of 104 km/h. He travelled for the first four hours at an average speed of 118 km/h. What should be his average speed for the rest of the journey, if he wants to reach his destination in a total time of 8 hours from the start of the journey?

(a) 72 km/h (b) 60 km/h

(c) 70 km/h (d) 64 km/h

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (d) :



The total distance between A and B can be covered by Suhas in 7 hours = 104 × 7 = 728 km
Distance covered in first 4 hours = 118 × 4 = 472 km
Remaining distance = 728 – 472 = 256 km

$$\text{Average speed in last 4 hours} = \frac{256}{4} = 64\text{ km/h}$$

124. An aeroplane flies along the sides of an equilateral triangle at the speed of 300 km/h, 200 km/h and 240 km/h, respectively. The average speed of the plane while flying around the triangle is:

(a) 240 km/h (b) 150 km/h

(c) 140 km/h (d) 40 km/h

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the length of the side of equilateral triangle = x km.

$\therefore$ Time taken to cover a distance of x k.m at a speed of 300 km/hr.

$$(t_1) = \frac{x}{300} \text{ hours}$$

Similarly,

$$t_2 = \frac{x}{200}$$

$$t_3 = \frac{x}{240}$$

Hence $$t_1 + t_2 + t_3 = \frac{x}{300} + \frac{x}{200} + \frac{x}{240}$$

$$= \frac{4x + 6x + 5x}{1200} = \frac{15x}{1200}$$

$$\text{Average speed} = \frac{\text{Total Distance}}{\text{Total time}}$$

$$= \frac{3x}{t_1 + t_2 + t_3}$$

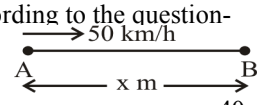
$$= \frac{3x}{x\left(\frac{15}{1200}\right)} = \frac{3600}{15} = 240 \text{ km/h.}$$

125. If a man travels from A to B at a speed of 50 km/h and returns by increasing his speed by 40%, then find his average speed up (to 2 decimal places) for both the trips:

(a) 62.35 km/h (b) 58.33 km/h
(c) 55.34 km/h (d) 47.28 km/h

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question-



Speed for returning trip $= 50 + 50 \times \frac{40}{100} = 70 \text{ km/h}$

$$t_{A \to B} = \frac{x}{50} \text{ h}$$

$$t_{B \to A} = \frac{x}{70} \text{ h}$$

Total time $= \frac{x}{50} + \frac{x}{70} = \frac{7x + 5x}{350} = \frac{12x}{350} = \frac{6x}{175}$

Average speed $= \frac{2x}{6x/175}$

$= \frac{2x}{1} \times \frac{175}{6x} = 58.33 \text{ km/h}$

126. A man walks from P to Q at a speed of 5 km/h and comes back at a speed of 3 km/h from Q to P. What is his average speed during the entire journey?

(a) 8 Km./hr. (b) 3.25 Km./hr.
(c) 3.75 Km./hr. (d) 3.5 Km./hr.

RRB JE - 22/05/2019 (Shift-III)

Ans : (c)

$$\text{Average speed} = \frac{2 \times \text{Product of speed}}{\text{Sum of speed}}$$

$$= \frac{2 \times 5 \times 3}{5 + 3} = \frac{30}{8} = 3.75 \text{ Km./hr.}$$

127. A car covers the first 10 km. with a speed of 4 km/h and the other 10 km covers at a speed of 2 km/h. Find the average speed of that car in km/h.

(a) 2.67 Km./hr. (b) 3.33 Km./hr.
(c) 2 Km./hr. (d) 5.54 Km./hr.

RRB RPF SI – 16/01/2019 (Shift-III)

Ans : (a) When someone travels a certain distance at the speed of x Km./hr.
and travels the same distance at the speed of y Km./hr., then the average speed for the entire journey

$$= \frac{2xy}{(x + y)} \text{km/h} = \frac{2 \times 4 \times 2}{4 + 2} \text{km/h}$$

$$= \frac{8}{3} = 2.67 \text{ km/h}$$

128. An object travels 24 m in 3s and 15 m in 2s. What is the average speed of the object?

(a) $6.67 ms^{-1}$ (b) $7.8 ms^{-1}$
(c) $7.8 ms^{-1}$ (d) $8.0 ms^{-1}$

RRB RPF SI – 11/01/2019 (Shift-I)

Ans. (b) Average speed $= \frac{\text{Total Distance}}{\text{Total Time}}$

$$= \frac{(24 + 15)}{(3 + 2)} = \frac{39}{5} = 7.8 \text{ m/sec} = 7.8 \text{ ms}^{-1}$$

129. A car travels at a speed of 62 km/h for $2\frac{1}{2}$ hours and 68 km/h for $1\frac{1}{4}$ hours. What will be its average speed in total distance travelled?

(a) 65 (b) 64
(c) 63 (d) 61

RRB NTPC 28.04.2016 Shift : 1

Ans : (b) Total distance covered by car

$= 62 \times \frac{5}{2} + 68 \times \frac{5}{4}$ ($\because$ Distance = Speed $\times$ Time)

$= 31 \times 5 + 17 \times 5$

$= 155 + 85 = 240$ km.

$$\text{Average speed of car} = \frac{\text{Total Distance}}{\text{Total Time}}$$

$$= \frac{240}{5/2 + 5/4} \Rightarrow \frac{240 \times 4}{10 + 5}$$

$$= \frac{240 \times 4}{15} \Rightarrow 16 \times 4 = 64 \text{ Km./hr.}$$

130. Rupa goes to her office at half of the speed at which she returns from her office. The average speed during the entire journey is 24 km/h. What was her speed when Rupa was going to her office.

(a) 18 Km./hr. (b) 72 Km./hr.
(c) 9 Km./hr. (d) 24 Km./hr.

RRB NTPC 22.04.2016 Shift : 3

Ans : (a) Let the actual speed of Rupa = S Km./hr.

$$\text{Average speed} = \frac{2V_1V_2}{V_1 + V_2}$$

$$\therefore 24 = \frac{2 \times S \times \frac{S}{2}}{S + \frac{S}{2}}$$

$$\Rightarrow 12 = \frac{S^2}{3S}$$

$\therefore$ S = 36 Km./hr.

Hence speed of Rupa when she was going to her office

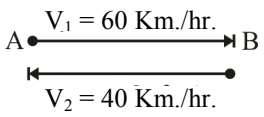
$$= \frac{36}{2} = 18 \text{km/h}$$

131. The speed of a car from A to B is 60 km/h and the speed of return is 40 km/h. Find the average speed of the car (in km/h).

(a) 50 (b) 45
(c) 48 (d) 52

RRB NTPC 12.04.2016 Shift : 1

Ans : (c)



$$\text{Average speed of car} = \frac{2V_1V_2}{V_1 + V_2}$$

$$= \frac{2 \times 60 \times 40}{60 + 40} = \frac{4800}{100} = 48 \text{ Km./hr.}$$

132. A man covers the distance from point A to B at a speed of 40 km/h and returns from B to A at a speed of 60 km/h. What is his average speed during the entire journey?

(a) 48 Km./hr. (b) 55 Km./hr.
(c) 50 Km./hr. (d) 45 Km./hr.

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (a) Speed of man from point A to B = 40 Km./hr.
Speed of man from point B to A = 60 Km./hr.

$$\text{From average speed} = \frac{2xy}{x + y},$$

$$= \frac{2 \times 40 \times 60}{40 + 60}$$

Average speed = 48 Km./hr.

133. Ram swims in a 95 m long pond. He travels 190 m in 1 minute by swimming from one end to the other and coming back the same way. Find his average speed.

(a) 2.05 ms^{-1} (b) 3.17 ms^{-1}
(c) 2.00 ms^{-1} (d) 3.10 ms^{-1}

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (b) $\text{Average speed} = \frac{\text{Total Distance}}{\text{Total Time}} = \frac{190\text{m}}{1\text{min}}$

$$\Rightarrow \frac{190\text{m}}{60\text{Sec}} = \frac{19}{6} = 3.1666$$

$= 3.17 \text{ ms}^{-1}$

134. Ram swims in 80 m long pond. He travels 160 m in 1 minute by swimming from one end to the other and coming back the same way. Find his average speed.

(a) 2.67 ms^{-1} (b) 2.07 ms^{-1}
(c) 3.67 ms^{-1} (d) 2.60 ms^{-1}

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) :

$$\text{Average speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

$$\text{Average speed} = \frac{160}{60} = \frac{8}{3} = 2.67 \text{ m/s} = 2.67 \text{ ms}^{-1}$$

135. An Athlete runs a distance of 500 m in 25s. What is the average speed of an athlete?

(a) 20 ms^{-2} (b) 20 ms^{-1}
(c) 20 ms^{1} (d) 20 ms^{2}

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) Distance = 500 m, Time = 25s

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{500}{25} = 20 \text{ m/sec} = 20 \text{ ms}^{-1}$$

136. A person reaches his office in 2 hours from his home. He travels 1/4th of the total distance at a speed of 15 km/h by cycling, 1/2 of the total distance at a speed of 30 km/h by bus and the rest by walking at a speed of 5 km/h. What is the average speed of this person?

(a) 15 Km./hr. (b) 12 Km./hr.
(c) 10 Km./hr. (d) 14 Km./hr.

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b) Let the total distance = x km
From the question−

$$\frac{x}{4 \times 15} + \frac{x}{2 \times 30} + \frac{x}{4 \times 5} = 2$$

$$\frac{x + x + 3x}{60} = 2$$

$5x = 120$

$x = 24$ km

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{24\text{km}}{2\text{h}} = 12\text{km/h}$$

137. An object covers a distance of 24 meters in the first 6 seconds and a distance of 16 meters in other 4 seconds. What is the average speed of the object?

(a) 4ms^{-1} (b) 6ms^{-1}
(c) 8ms^{-1} (d) 10ms^{-1}

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (a) Let the total distance covered by object

(S) = 24 + 16 = 40 m.

and total time taken

(t) = 6 + 4 = 10 sec.

Average speed (V) of object = ?

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{40}{10} = 4 \text{ m.s.}^{-1}$$

Hence the speed of object is 4 m.s.$^{-1}$

138. The Odometer of a bus shows the reading of 3000 km at the beginning of a journey and 3600 km at the end of the journey. If the journey took a total of 8 hours, then what is the average speed of the bus?

(a) $75kmh^{-2}$ (b) $75kmh^{2}$

(c) $75kmh^{-1}$ (d) $75kmh^{1}$

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (c) Total distance travelled by bus

$= 3600–3000 = 600$ km

$\therefore$ Average speed $= \frac{\text{Total distance}}{\text{Total time}}$

$= \frac{600}{8} = 75$ Km./hr.

139. The total distance between the two stations is 390 km, a train completes 182 km of this distance at a speed of 56 km/h and 108 km at a speed of 72 km/h. The remaining distance is completed by the train in 1¼ hours. Find the average speed of the train during the entire journey.

(a) 65 Km./hr. (b) 75 Km./hr.

(c) 60 Km./hr. (d) 70 Km./hr.

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (a) : Total distance = 390 km

Distance travelled by first train = 182 km

Speed = 56 Km./hr.

Distance travelled by second train = 108 km

Speed = 72 Km./hr.

Remaining Distance = 390 – (182+108) = 100 km

Time $= \frac{5}{4}$ hours

Average speed $= \frac{\text{Total Distance}}{\text{Total Time}}$

$= \frac{390}{\frac{182}{56}+\frac{108}{72}+\frac{5}{4}} = \frac{390}{\frac{13}{4}+\frac{6}{4}+\frac{5}{4}}$

$= \frac{390\times 4}{13+6+5} = \frac{390\times 4}{24}$

$= 65\,\text{km/hr}$

140. P moves at a speed of 50 km/h in the first 1 hour and at a speed of 70 km/h in the next two hours. What is the average speed of P?

(a) 60 km/hr (b) 63.33 km/hr.

(c) 59.33 km/hr. (d) 62 km/hr.

RRB NTPC 02.04.2016 Shift : 1

Ans : (b) Distance covered by P in first hour = 50 km.

Distance covered by P in second hour = 70

Distance covered by P in third hour = 70 km.

$\therefore$ Average speed $= \frac{\text{Total Distance}}{\text{Total Time}}$

$= \frac{50+70+70}{1+1+1} = \frac{190}{3} = 63.33$ Km./hr.

141. A cyclist travels a distance of 8 km at the speed of 15 km/h and a distance of 4 km at a speed of 20 km/h. Then what will be his average speed?

(a) 16.8 (b) 16.36

(c) 15.71 (d) 17.50

RRB NTPC 28.03.2016 Shift : 2

Ans :(b) If a person walks A km distance at a speed of x km./hr. and B km distance at a speed of y km./hr. then

Average speed $= \frac{A+B}{\frac{A}{x}+\frac{B}{y}} = \frac{8+4}{\frac{8}{15}+\frac{4}{20}} = \frac{12}{\frac{8}{15}+\frac{1}{5}}$

$= \frac{12}{\frac{8+3}{15}} = \frac{12\times 15}{11} = 16.36\,\text{km/hr}$

142. A person covers the first 176 km at a speed of 16 km/h and the next 64 km at a speed of 32 km/h. What would be the approximate average speed for the first 240 km of the journey?

(a) 13 km./hr. (b) 27 km./hr.

(c) 18.5 km./hr. (d) 21 km./hr.

RRB NTPC 19.04.2016 Shift : 3

Ans : **(c)** Time taken to travel 176 km. distance = $\frac{176}{16}$ = 11 hours

Time taken to travel 64 km. distance = $\frac{64}{32} = 2$ hrs.

Average speed $= \frac{\text{Total Distance}}{\text{Total Time}}$

$= \frac{176+64}{11+2} = \frac{240}{13}$

= 18.5 Km./hr. (almost)

143. Car P travels a certain distance in 11 hours at a speed of 66 km/h. Car Q travels a distance of 242 km more than car P in the same time. Find the average speed of car Q.

(a) 718 Km./hr. (b) 77 Km./hr.

(c) 88 Km./hr. (d) 83 Km./hr.

RRB NTPC 19.01.2017 Shift : 2

Ans : **(c)** Distance covered by car P = 66×11 = 726 km

Average speed of Q $= \frac{\text{Total distance}}{\text{Total time}}$

Average speed of Q $= \frac{726+242}{11} = \frac{968}{11} = 88$

Average speed of Q = 88 Km./hr.

Type - 5

144. A certain distance (d) is covered by a cyclist at a certain speed. If a jogger covers half the distance in double the time (t), then the ratio of speed of the cyclist to the speed of the jogger is:

(a) 3 : 1 (b) 2 : 1
(c) 4 : 1 (d) 1 : 2

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the speed of the cyclist is v_1 and the speed of the jogger is v_2.

According to the question,

$$v_1 = \frac{d}{t} \text{.....(i)}$$

$$v_2 = \frac{d/2}{2t} = \frac{d}{4t} \text{.....(ii)}$$

From eq^n (i) and (ii)

$$\frac{v_1}{v_2} = \frac{d/t}{d/4t}$$

$$\frac{v_1}{v_2} = \frac{4t \times d}{d \times t}$$

$$\frac{v_1}{v_2} = \frac{4}{1}$$

$$v_1 : v_2 = 4 : 1$$

Required ratio = 4 : 1

145. The ratio of the speeds of two persons while travelling a certain distance is 18:12. Find the ratio of the time taken by them to travel the distance.

(a) 2: 1 (b) 2:5
(c) 2:3 (d) 3:

RRB JE - 23/05/2019 (Shift-III)

Ans : (c) Given-

Ratio of speed = 18 : 12

Ratio of time $= \frac{1}{18} : \frac{1}{12} = \frac{2}{36} : \frac{3}{36} = 2 : 3$

146. A motorcycle driver covers a distance of 192 km at a speed of 32 km/h. A car starts running from the same place after 2.5 hours the motorcyclist moves,but travels that distance 0.5 hours before. What is the ratio of the speed of the car and the motorcycle?

(a) 3:1 (b) 4:3
(c) 2:1 (d) 1:2

RRB JE - 28/05/2019 (Shift-I)

Ans : (c)

Time taken to cover the distance of 192 km by motorcycle $= \frac{192}{32} = 6\,h$

and time taken by car = 6 – (2.5 + .5) = 3 h

Hence speed of car $= \frac{192}{3} = 64\,km/hr$

Hence speed of car : Speed of motorcycle

= 64 : 32 = 2 : 1

147. Two motorists traveling in the opposite direction meet at some point in the middle. After this they take 9 and 16 hours respectively to reach their destination. What is the ratio of their speed?

(a) 4:7 (b) 4:3
(c) 5:3 (d) 5:4

RRB JE - 28/05/2019 (Shift-I)

Ans : (b) Let the speed is x and y

Ratio of speed $= \sqrt{\frac{t_2}{t_1}} = \frac{x}{y}$

$$\frac{x}{y} = \sqrt{\frac{16}{9}}$$

$$\frac{x}{y} = \frac{4}{3}$$

x : y = 4 : 3

148. Car I travels a certain distance in a certain time. Car II travels half of the distance in double the time. Find the ratio of their relative speeds.

(a) 1 : 2 (b) 1 : 4
(c) 2 : 1 (d) 4 : 1

RRB NTPC 17.01.2017 Shift-2

Ans : (d) Let the distance is d and time is t.

According to the question,

Speed for car I $(S_1) = \frac{d}{t}$

Speed for car II $(S_2) = \frac{d/2}{2t} = \frac{d}{4t}$

$$\therefore S_1 : S_2 = \frac{d}{t} : \frac{d}{4t} = 1 : \frac{1}{4} = 4 : 1$$

149. Two stations Mumbai and Pune which have a distance of 300 km. Two buses run opposite directions from Mumbai and Pune respectively and cross each other at a distance of 220 km from a station. What is the ratio of their speed?

(a) 13:9 (b) 10:3
(c) 11:4 (d) 14:5

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) Total distance = 300 km

Distance from first station = 220 km

Distance from second station = 300 – 220 = 80 km

Ratio of speed = 220 : 80 = 11 : 4

19.

Train

Type - 1

1. A 725 m long train passes through a 235 m long tunnel in 48 sec. Find the speed of the train.

(a) 82 km/h (b) 72 km/h
(c) 54/h (d) 66/h

RRB Group-D 30-08-2022 (Shift-I)

Ans. (b) : Given :
Length of train = 725 m
Length of tunnel = 235 m
time = 48 sec.
According to the question -

$\therefore$ Speed $= \dfrac{\text{Distance}}{\text{Time}}$

Speed of train $= \dfrac{725+235}{48} \Rightarrow \dfrac{960}{48} = 20 \text{ n/s}$

Speed of train in km/h $= 20 \times \dfrac{18}{5} = \boxed{72 \text{ km/h}}$

2. A train travels 20 km in 24 minutes. If its speed is increased by 5 km/h, the time taken by it to cover the same distance will be _____ minutes.

(a) $26\dfrac{9}{11}$ (b) $21\dfrac{9}{11}$
(c) $29\dfrac{9}{11}$ (d) $27\dfrac{9}{11}$

RRB Group-D 13/09/2022 (Shift-II)

Ans. (b) : Speed$= \dfrac{\text{Distance}}{\text{Time}}$

Speed of train $= \dfrac{20}{\frac{24}{60}} = \dfrac{20 \times 60}{24} = 50 \text{km/h}$

Speed of train after increase = 50 + 5 = 55 km/h

Time $= \dfrac{20}{55} = \dfrac{20}{55} \times 60 \text{ min}$

$= \dfrac{240}{11} = 21\dfrac{9}{11} \text{ min}$

3. A train is moving with the speed of 90 km/h. How many meters will it cover in 15 min?

(a) 23500 (b) 24500
(c) 21500 (d) 22500

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : Speed of train = 90 km/h

$= 90 \times \dfrac{5}{18} = 25 \text{ m/sec}$

Time = 15 min = $15 \times 60 = 900$ sec
Distance = 25×900
= 22500 meters

4. A train is travelling at a speed of 45 km/hr. Calculate the distance that will be covered by the train in 64 seconds.

(a) 0.8 km (b) 4 km
(c) 2.94 km (d) 8 km

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : Speed of the train = 45 km/hr

Time $= \dfrac{64}{3600} \text{hr}$

$= \dfrac{4}{225} \text{hr}$

Distance = Speed × Time

$= 45 \times \dfrac{4}{225}$

$= \dfrac{3 \times 4}{15} = 0.8 \text{km}$

5. A train covers a distance of 35 km in 60 min. How long will it take to cover 105 km?

(a) 180 min (b) 120 min
(c) 140 min (d) 90 min

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (a) :
$\because$ The train covers a distance of 35 km in 60 minutes.
$\therefore$ The train will cover a distance of 1 km $= \dfrac{60}{35}$ minutes
$\therefore$ Time taken by train to cover a distance of 105 km

$= \dfrac{60}{35} \times 105 = 180 \text{ minutes}$

6. A train is moving at a speed of 180 km/h. Its speed expressed in m/s is:

(a) 50 m/s (b) 40 m/s
(c) 30 m/s (d) 5 m/s

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (a) : Speed of 180 km/h $= 180 \times \dfrac{5}{18}$ m/sec.

= 50 m/sec.

7. The ratio between the speeds of two trains is 7:5. If the second train runs 400 km in 4 h, then the speed of the first train is:

(a) 142 km/h (b) 145 km/h
(c) 148 km/h (d) 140 km/h

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (d) : Speed of second train = $\frac{400}{4}$ = 100 km/h

$\because$ Ratio of speed of both trains = 7:5

So, 5 unit = 100

$\therefore$ 1 unit = $\frac{100}{5} = 20$

$\therefore$ Speed of first train = 7 unit = 7×20 =140 km/h

8. A train is travelling at a uniform speed of 75 km/h. How far will it travel in 20 minutes?

(a) 20 km (b) 40 km

(c) 4 km (d) 25 km

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

Speed = 75 km/h

Time = 20 min.

$= \frac{20}{60}$ hr

Distance = Speed × Time

$= 75 \times \frac{20}{60}$

$\therefore$ Distance = 25 km.

9. A train is moving at a uniform speed of 75 km/h. Find the time required by the train to cover a distance of 250 km.

(a) 2 h (b) 3 h 5 min

(c) 3 h (d) 3 h 20 min

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given, Speed = 75 km/h, Distance = 250 km

$\because$ $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

$75 = \frac{250}{T}$

$T = \frac{250}{75}$

$T = \frac{10}{3}$ h.

Hence Time = 3 h 20 min.

10. A train covers 400 km at a uniform speed. If the speed had been 10 km/h more, it would have taken 2 h less for the same journey. find the speed of the train

(a) 45 km/h (b) 40 km/h

(c) 55 km/h (d) 50 km/h

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let Speed of train is x km/h

According to the question,

$\frac{400}{x} - \frac{400}{x+10} = 2$

$\frac{x+10-x}{x(x+10)} = \frac{1}{200}$

$x^2 + 10x = 2000$

$x^2 + 10x - 2000 = 0$

$x^2 + 50x - 40x - 2000 = 0$

$x(x + 50) - 40(x + 50) = 0$

$(x + 50)(x - 40) = 0$

$x - 40 = 0$

$x = 40$

Hence speed of train = 40 km/h

11. On increasing the speed 5 km/hr of a train. It takes 2 hour less in covering a distance of 300 km find its general speed?

(a) 30 km/hr (b) 25 km/hr

(c) 20 km/hr (d) 35 km/hr

RRB JE - 01/06/2019 (Shift-III)

Ans. (b) Let the normal speed of train = x km/hr.

According to the question,

$\frac{300}{x} - \frac{300}{x+5} = 2$

$\frac{300(x+5) - 300x}{x(x+5)} = 2$

$300x + 1500 - 300x = 2x^2 + 10x$

$2x^2 + 10x - 1500 = 0$

$x^2 + 5x - 750 = 0$

$x^2 + 30x - 25x - 750 = 0$

$x(x+30) - 25(x+30) = 0$

$(x+30)(x-25) = 0$

$x - 25 = 0$

$x = 25$

Hence the normal speed of train is 25 km/hr.

12. A train runs at 72 km/hr. Total distance covered by it in 15 seconds?

(a) 150 metre (b) 300 metre

(c) 200 metre (d) 100 metre

RRB RPF SI – 05/01/2019 (Shift-I)

Ans : (b) Speed of train = 72 km./hr.

$= 72 \times \frac{5}{18}$ m./sec. = 20 m./sec.

$\therefore$ Distance covered in 15 seconds = 20×15 = 300 m.

13. A bullet without stopping completes its journey in 12 hours. If it runs 30 km/hr faster then it can complete its journey in 10 hrs 40 minutes. What was the speed when it completed the journey in 12 hours?

(a) 320 km/hr (b) 180 km/hr

(c) 320 km/hr (d) 240 km/hr

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d) Let the speed of train is x km/hr.

According to the question,

$(x+30) \times 10 + \frac{40}{60} = x \times 12$

$(x+30) \times \frac{32}{3} = 12x$

$32x + 960 = 36x$

$\Rightarrow 4x = 960$

$x = \frac{960}{4} = 240$ km./hr.

14. A train on running at a speed of 48 km/hr completes its journey in 10 hours. If the same distance is to be covered in 8 hours then what should be the speed of train?

(a) 50 km/hr (b) 55 km/hr

(c) 45 km/hr (d) 60 km/hr

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (d) Speed of train = 48 km/hr
Time taken = 10hr
then, Distance = Speed × Time
= 48 × 10 = 480 km
The speed required to cover a distance of 480 km in 8 hours.
$= \frac{480}{8}$ = 60 km/hr

15. A train runs at a normal speed of 70 km/hr. How much distance will it cover in 24 minutes (in km)?
(a) 40 (b) 28
(c) 35 (d) 32
RRB Group-D – 26/10/2018 (Shift-III)

Ans : (b) According to the question,
Speed of train = 70 km/hr
∵ Distance covered by train in 60 minutes = 70 km.
∴ In 1 minute $= \frac{70}{60}$
∴ In 24 minutes $= \frac{70 \times 24}{60}$
Distance = 28 km.
Hence, distance covered in 24 minutes = 28 km

16. The distance between two points was covered by a train at 80 km/hr while going and 40 km/hr while returning. If in this journey total 6 hours were taken then what is the distance between the two points from oneside?
(a) 180 km (b) 140 km
(c) 160 km (d) 150 km
RRB Group-D – 15/11/2018 (Shift-II)

Ans : (c) Let the total distance is x km.
$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$
According to the question,
$\frac{x}{80} + \frac{x}{40} = 6 \Rightarrow \frac{x + 2x}{80} = 6$
$3x = 6 \times 80$
$x = 160$ km.

17. If a train covers 152 km in 8/9 hours, then find the speed of the train?
(a) 170 km/h (b) 171 m/s
(c) 171 km/h (d) 170 m/s
RRB Group-D – 09/10/2018 (Shift-II)

Ans. (c) : Time $= \frac{8}{9}$ hours.
Distance = 152 km. $\left[\because \text{Speed} = \frac{\text{Distance}}{\text{Time}}\right]$
∴ Speed of train $= \frac{152}{\left(\frac{8}{9}\right)} = 152 \times \frac{9}{8}$
= 19 × 9 = 171 km./hr.

18. An express train moves with a speed of 144 km/hr. Calculate the distance covered by train in 15 minutes.
(a) 33 km (b) 32 km
(c) 36 km (d) 35 km
RRB Group-D – 23/09/2018 (Shift-II)

Ans : (c) Given in question,
Speed = 144 km/hour
Time = 15 minutes $= \frac{15}{60}$ hours.
Distance = ?
Let the distance covered by train is D km.
$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$
$144 = \frac{D}{\frac{15}{60}}$
$D = \frac{144 \times 15}{60}$
D = 36 km
Distance covered by train in 15 minutes = 36 km

19. A bullet train covers a certain distance in 5 hours at a speed of 240 km/hr. To cover the same distance in 2 hours what should be its speed (km/hr)?
(a) 420 (b) 540
(c) 480 (d) 600
RRB NTPC 30.04.2016 Shift : 1

Ans : (d) Distance = Speed × Time
= 240 × 5 = 1200 km.
$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{1200}{2} = 600$ km/hr.

20. A train moving with a uniform speed covers 338 m in 50 s. What is its speed?
(a) 6.76 m/s (b) 7.76 m/s
(c) 5.76 m/s (d) 4.76 m/s
RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (a) According to the question,
Distance = 338 m.
Time = 50 seconds
$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{338}{50}$ =6.76 m./sec.

Type - 2

21. A train travelling at 72 km/h crosses a post in 12 seconds. What is the length of the train?
(a) 180 m (b) 225 m
(c) 200 m (d) 240 m
RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (d) : According to the question,
Length of the train = $72 \times \frac{5}{18} \times 12$
= 240 m

22. A train running at the speed of 95 km/h crosses a pole in 18 seconds. What is the length of the train in metres?
(a) 475 m (b) 480 m
(c) 465 m (d) 455 m
RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : Given,

Speed of Train = 95 km/h

Time = 18 seconds

Length (m.) = ?

Then,

Speed = Distance / Time

$$95\times\frac{5}{18}=\frac{\text{Distance}}{18}$$

Distance = 95 × 5

= 475m

23. A train crosses a pole in 80 seconds. If the speed of the train is 36 km/hr, then find the length of the train.

(a) 1200 m (b) 600 m

(c) 1000 m (d) 800 m

RRB Group-D 06/09/2022 (Shift-I)

Ans. (d) : Let the length of the train is x metre.

Then,

$$\text{Speed}=\frac{\text{Distance}}{\text{Time}}$$

$$36\times\frac{5}{18}=\frac{x}{80}$$

x = 2 × 5 × 80

x = 800 m

24. At a speed of 60 km/h a train crosses a pole in 33 s. Find the length of the train.

(a) 550 m (b) 490 m

(c) 400 m (d) 495 m

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) : Speed of Train = 60 km/h

$$=\frac{60\times1000}{60\times60}=\frac{50}{3}\text{m/s}$$

∵ Distance covered by train in 1 second $=\frac{50}{3}$ m.

∵ Distance covered by train in 33 seconds

$$=\frac{50}{3}\times33=550\,\text{m}.$$

Hence, length of train = 550 m.

25. A 300 m long train crosses an electric pole in 5 s. Find the speed of the train.

(a) 200 km/h (b) 220 km/h

(c) 216 km/h (d) 218 km/h

RRB NTPC 28.01.2021 (Shift-I) Stage I

Ans. (c) : Length of train (d) 300 m = 0.3 km

Time (T) = 5 sec $=\frac{5}{60\times60}$ h.

$$\therefore\ \text{Speed}=\frac{\text{Distance}}{\text{Time}}=\frac{(0.3)}{\left(\frac{5}{60\times60}\right)}=\frac{3\times60\times60}{10\times5}$$

= 3 × 12 × 6

= 216 km/h

26. A 180 m long train is running at a speed of 90 km/h. How long will it take to pass a post?

(a) 5.5 s (b) 7.8 s

(c) 7 s (d) 7.2 s

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) : The time taken by the train to cross the post –

$$=\frac{180}{90\times\frac{5}{18}}$$

$$=\frac{180}{25}=7.2\ \text{seconds}$$

27. A train having a speed of 60 km/h crosses a pole in 1.5 min. Find the length of the train (in m).

(a) 1500 (b) 600

(c) 1200 (d) 800

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) : Let the length of train = ℓ m.

According to the question,

$$\frac{\ell}{60}=\frac{1.5}{60}$$

ℓ = 1.5 km

$\boxed{\ell = 1500\ \text{m.}}$

28. A train is running with a speed of 160 km/hr and its length is 180 metre. Find the time taken by the train to cross a pole?

(a) 4.05 seconds (b) 5 seconds

(c) 8.2 seconds (d) 10 seconds

RRB RPF Constable – 19/01/2019 (Shift-I)

Ans : (a) Speed of train = 160 km/h $=160\times\frac{5}{18}$ m./sec.

Required Time $=\frac{\text{Length of train}}{\text{Speed of train}}$

$$=\frac{180}{160\times\frac{5}{18}}=\frac{180\times18}{160\times5}=4.05\ \text{sec.}$$

29. A 110 meter long train takes 12 seconds to cross any pole. Find the speed of the train in km/hr.

(a) 33 km/hr (b) 27 km/hr

(c) 30 km/hr (d) 49 km/hr

RRB JE - 25/05/2019 (Shift-I)

Ans : (a)

Speed of train $=\frac{\text{Length of train}}{\text{Time}}=\frac{110}{12}$ m./sec.

or $=\frac{110}{12}\times\frac{18}{5}$ km/hr. = 33 km./hr.

30. A train whose speed is 60 km/hr crosses a pole in 9 second what is the length of the train?

(a) 120 metre (b) 180 metre

(c) 150 metre (d) 324 metre

RRB JE - 25/05/2019 (Shift-II)

Ans : (c) Let the length of train = *l* metre

$$60\times\frac{5}{18}=\frac{l}{9}$$
$30 \times 5 = l$
$l = 150$ metre

31. A train crosses a 100 metre long platform at a speed of 45 km/hr in 60 seconds. Find the time taken by the train to cross the electric pole.
(a) 2 minute (b) 8 seconds
(c) 1 minute (d) 52 seconds

RRB JE - 27/06/2019 (Shift-I)

Ans : (d) Let the length of train = x metre
According to the question,

$$\frac{100+x}{45\times\frac{5}{18}}=60$$
$2(100+x) = 60 \times 25$
$200 + 2x = 1500$
$2x = 1300$
$x = 650$
The time taken to cross the electric pole =

$$\frac{650}{45\times\frac{5}{18}}=\frac{650\times18}{45\times5}=52 \text{ seconds}$$

32. A 110 m long train, whose speed is 36 km/hr takes 53 second to cross a pole to the end of the train. Find the distance of the pole from the front end.
(a) 640 metre (b) 420 metre
(c) 530 metre (d) 1798 metre

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (b) Let the distance of the pole from the front end of the train = x metre
Distance = Speed × Time

$$(110+x)=36\times\frac{5}{18}\times53$$
$110 + x = 530$
$x = 420$ metre

33. A 200 metre long train, whose speed is 60 km/hr, will take how much time to cross a signal post?
(a) 1 minute (b) 30 seconds
(c) 14 seconds (d) 12 seconds

RRB Group-D– 24/09/2018 (Shift-I)

Ans : (d) Length of train = 200 metre
Speed = 60 km/hr.

$$=60\times\frac{5}{18}\text{m/s}=10\times\frac{5}{3}=\frac{50}{3}\text{m/s}$$

$$\text{Speed}=\frac{\text{Distance}}{\text{Time}}$$

Time taken to cross a signal post

$$=\frac{\text{Distance}}{\text{Speed}}=\frac{200}{\frac{50}{3}}$$

$$=200\times\frac{3}{50}=4\times3=12 \text{ seconds}$$

34. A 150 metre long train is moving with a speed of 54 km/hr. Find the time taken by the train to cross a pole?
(a) 8 second (b) 10 second
(c) 12 second (d) 15 second

RRB NTPC 31.03.2016 Shift : 3

Ans : (b) Speed of train = 54km/h

$$=54\times\frac{5}{18}=15 \text{ m./sec.}$$

Time taken by the train to cross the pole

$$=\frac{\text{Length of train}}{\text{Speed of train}}=\frac{150}{15}=10 \text{ sec.}$$

35. A train is running with a speed of 80 km/hr. If the length of the train is 400 metre, then what time will it take to cross an electric pole?
(a) 10 second (b) 6 second
(c) 18 second (d) 15 second

RRB NTPC 28.03.2016 Shift : 2

Ans :(c) Speed of train = 80 km/hr.

$$=80\times\frac{5}{18}=\frac{400}{18}\text{m./sec}$$

Length of train = 400 metre

$$\text{Time taken to cross the pole}=\frac{400}{\frac{400}{18}}=\frac{400}{400}\times\frac{18}{1}=18 \text{ sec.}$$

36. A train moving with a speed of 120 km/hr crosses a pole in 9 seconds. What is the length of the train?
(a) 240 metre (b) 300 metre
(c) 360 metre (d) 600 metre

RRB NTPC 18.01.2017 Shift : 3

Ans : (b) 120 km/h $=120\times\frac{5}{18}\text{m/s}$

Length of train $=120\times\frac{5}{18}\times9$
(Distance = speed×time)
$\Rightarrow 60 \times 5 = 300$ m.
Length of Train = 300 m.

Type - 3

37. A train is moving from north to south direction. It overtakes Raj and Madhur who are walking in the same direction at the rate of 2 km/h and 4 km/h in 9 sec and 10 sec, respectively. If the train is x meters long, find the value of x.
(a) 70 (b) 30
(c) 90 (d) 50

RRB GROUP-D – 25/08/2022 (Shift-II)

Ans. (d) : Let the speed of the train is y km/hr.

$\because$ $\text{Speed}=\frac{\text{Distance}}{\text{Time}}$

According to the question,

$$y-2=\frac{x}{\frac{9}{3600}}\Rightarrow y=400x+2.....(i)$$

$$y-4=\frac{x}{\frac{10}{3600}}\Rightarrow y=360x+4.....(ii)$$

From eq. (i) and eq. (ii)

$400x + 2 = 360x + 4$

$40x = 2$

$x = \frac{1}{20}\text{km} = \frac{1}{20} \times 1000\text{ m}$

$= 50\text{ m}$

38. A 210 m long train crosses a man walking at a speed of 4.5 km/h in the opposite direction in 12 seconds. What is the speed (in km/h) of the train?

(a) 58.5 (b) 59.5

(c) 61.5 (d) 60.5

RRB Group-D 22/08/2022 (Shift-I)

Ans. (a) : Let the speed of train is x km/h

According to the question,

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\frac{12}{3600} = \frac{\frac{210}{1000}}{4.5 + x}$$

$$\Rightarrow \frac{4.5 + x}{300} = \frac{210}{1000}$$

$$\Rightarrow x = \frac{210 \times 300}{1000} - 4.5$$

$\Rightarrow 63 - 4.5$

$\Rightarrow 58.5$ km/h

39. A train overtakes two persons who are walking at 15 m/s and 35 m/s, respectively, in the same direction as that of the train in 20 seconds and 40 seconds, respectively. The length of the train is :

(a) 800 m (b) 1000 m

(c) 700 m (d) 900 m

RRB Group-D 08/09/2022 (Shift-I)

Ans. (c) : Given that -

Speed of first

Person = 15 m/s

Speed of second person = 35 m/s

Let speed of the train = X m/s

and length of the train = Lm.

According to the question,

$(X - 15) = L/20$

$L = 20X - 300$..... (i)

$(X - 35) = L/40$

$L = 40X - 1400$ ..... (ii)

eq. (i) = eq. (ii)

$20X - 300 = 40X - 1400$

$20X = 1100$

$X = 55$ m/s

On putting the value of X in eq. (i)

$L = 20 \times 55 - 300$

$L = 1100 - 300$

$L = 800$ m

40. A train passes two persons who are walking in the opposite direction of the train at the rate of 4 m/s and 10 m/s in 10 seconds and 8 seconds respectively. What is the speed of the train?

(a) 10 m/s (b) 20 m/s

(c) 15 m/s (d) 40 m/s

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (b) : If a train crosses a person either in same or in opposite direction the train covers the same distance which is equal to the length of the train.

According to the question,

Let the speed of the train = x m/sec

then, $(x + 4) \times 10 = (x + 10) \times 8$

$5x + 20 = 4x + 40$

$x = 20$ m/sec

So, the speed of the train is 20m/sec.

41. A train overtakes two boys who are walking in the same direction as the train, at the rate of 5km/hr and 7 km/hr and passes them completely in 6 seconds and 9 seconds respectively. Find the length of the train.

(a) 10 m (b) 5 m

(c) 30 m (d) 20 m

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the speed of train = x m/s

Then speed of train relatively both boys.

then $\left(x - 5 \times \frac{5}{18}\right)$ and $\left(x - 7 \times \frac{5}{18}\right)$ m/s

$\because$ Distance travel by train to cross the boys.

= length of train

$$\therefore \quad \left(x - 5 \times \frac{5}{18}\right) \times 6 = \left(x - 7 \times \frac{5}{18}\right) \times 9$$

$$\left(x - \frac{25}{18}\right) \times 2 = \left(x - \frac{35}{18}\right) \times 3$$

$$\left(2x - \frac{25}{9}\right) = \left(3x - \frac{35}{6}\right)$$

$$3x - 2x = \frac{35}{6} - \frac{25}{9}$$

$$\frac{315 - 150}{54} = \frac{165}{54}$$

$$x = \frac{55}{18}\text{ m/s}$$

Now, length of train

$$= \left(\frac{55}{18} - \frac{25}{18}\right) \times 6$$

$$= \frac{30}{18} \times 6 = 10\text{ meter}$$

42. A carriage driving in a fog passed a man who was walking at the speed of 3 km/h in the same direction. He could see the carriage for 4 min and it was visible to him up to a distance of 100 m. What was the speed of the carriage?

(a) 5 km/h (b) 4.5 km/h

(c) 6 km/h (d) 5.5 km/h

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the speed of carriage driving = x km/h
Distance covered by carriage driving = speed × time

$$(x-3)\times\frac{4}{60}=\frac{100}{1000}$$

$$\frac{(x-3)}{15}=\frac{100}{1000}$$

$x - 3 = 1.5$

$\boxed{x = 4.5\text{km/h}}$

43. A 110 metre long train is running with a speed of 60 km/hr. How much time will it take to cross a man running from opposite direction with a speed of 6 km/hr.

(a) 5 seconds (b) 6 seconds
(c) 10 seconds (d) 7 seconds

RRB RPF SI – 06/01/2019 (Shift-II)

Ans. (b) Relative Speed = (60 + 6) km./hr.

$$66\times\frac{5}{18}=\frac{55}{3}\text{m/s}$$

$$\text{Time} = \frac{110\,\text{m}}{\frac{55}{3}\text{m/s}}$$

$$\frac{110\times3}{55}=6\text{ seconds}$$

44. A 125 metre long train passes a person, who is going 5 km/hr in the directin of the train and in 10 seconds. How much is the speed of the train?

(a) 50 km/hr (b) 55 km/hr
(c) 54 km/hr (d) 45 km/hr

RRB JE - 01/06/2019 (Shift-I)

Ans : (a) Let the speed of train = x km/hr.
Relative speed of person and train = (x–5) km./hr.

$$=(x-5)\times\frac{5}{18}\text{ m./sec.}$$

$$\therefore\frac{125}{(x-5)\times\frac{5}{18}}=10$$

$$\frac{125\times18}{5x-25}=10$$

$5x = 225 + 25$
$5x = 250$
$x = 50$ km/hr.

45. A train over takes two people who are moving with speed of 2 km/h and 4 km/hr respectively, of the train moving in the same direction and the train passes them in 9 and 10 seconds respectively. Find the length and speed of the train.

(a) 22 km/hr, 50 metre (b) 22 km/hr, 80 metre
(c) 32 km/hr, 50 metre (d) 32 km/hr, 80 metre

RRB Group-D – 31/10/2018 (Shift-II)

Ans : (a) Let the length of train = *x* m.
and speed = y m./sec.

Speed of first person $= 2\times\frac{5}{18}=\frac{5}{9}$ m./sec.

Speed of second person $=4\times\frac{5}{18}=\frac{10}{9}$ m./sec.

Speed of train relative to first person $=\left(y-\frac{5}{9}\right)$ m./sec.

Speed of train relative to second person

$$=\left(y-\frac{10}{9}\right)\text{ m./sec.}$$

$$y-\frac{5}{9}=\frac{x}{9},\qquad y-\frac{10}{9}=\frac{x}{10}$$

$$y=\frac{x+5}{9}\qquad\text{-----(i)}$$

$$y=\frac{x}{10}+\frac{10}{9}=\frac{9x+100}{90}\qquad\text{----- (ii)}$$

$$\frac{x+5}{9}=\frac{9x+100}{90}\qquad\{\text{from equation (i) \& (ii)}\}$$

$10x + 50 = 9x + 100$
$x = 50$ m.

and speed $=\frac{50+5}{9}=\frac{55}{9}$ m./sec.

$$=\frac{55}{9}\times\frac{18}{5}=22\text{ km./hr.}$$

46. A train running at a uniform speed crosses two people moving in the same direction in 6 seconds and 6.4 seconds respectively. First person speed was 4.5 km/hr and the second person speed was 6.3 km/hr. What was the speed of train in km/hr?

(a) 32.6 (b) 33.3
(c) 35.6 (d) 36

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (b) Let the speed of train is V km/hr. and length is d. The speed of the train relative to the velocity of both the people is (V–4.5) and (V–6.3) km/hr respectively.

Now $V=\frac{d}{t}$

Time taken to cross the first person in 6 seconds.

$$=\left(\frac{6}{60\times60}\right)=\frac{6}{3600}\text{ hours}$$

$$V-4.5=\frac{3600d}{6}$$

$6V - 27 = 3600d$ .....(i)

Similarly, time taken to cross the second person in 6.4 sec

$$=\frac{6.4}{60\times60}=\frac{6.4}{3600}\text{hr.}$$

Hence, $V-6.3=\frac{3600d}{6.4}$

$6.4V - 40.32 = 3600d$ .....(ii)

On solving equation (i) & (ii)
$6V - 27 = 6.4V - 40.32$
$6.4V - 6V = 40.32 - 27$
$0.4V = 13.32$

$$V=\frac{13.32}{0.4}$$

$V = 33.3$ km./hr.

Type - 4

47. Train A running at a speed of 63 km/h takes 21 seconds to completely cross train B running at 45 km/h in the opposite direction. The length of train B is 2.5 times the length of train A. Train B crosses a bridge completely in 76 seconds. The length of the bridge (in m) is :

(a) 480 (b) 880
(c) 660 (d) 500

RRB Group-D 08/09/2022 (Shift-II)

Ans. (d) : Let the length of train A = x m.
Length of train B = 2.5x

$$\text{Relative speed} = (63 + 45) \times \frac{5}{18} = 30 \text{ m/sec}$$

Distance = Speed × Time.

$$x + 2.5x = 30 \times 21 \Rightarrow x = \frac{630}{3.5} = 180\text{m}$$

The length of train B = 2.5 × 180 = 450 m
Let the length of the bridge = y m.

$$45 \times \frac{5}{18} = \frac{450 + y}{76}$$

$$450 + y = \frac{45 \times 5}{18} \times 76$$

$$y = 950 - 450$$

$$y = 500\text{m}$$

48. A man walking at a speed of 10 km/h crosses a bridge in $7\frac{1}{2}$ minutes. The length of the bridge is _____ metres.

(a) 1500 (b) 1250
(c) 1560 (d) 1480

RRB Group-D 13/09/2022 (Shift-III)

Ans. (b) : Given,
Speed = 10km/h

$$\text{Time} = 7\frac{1}{2} \text{ minute}$$

Length of Brize = ?
Speed = Distance / Time

$$\text{Distance} = 10 \times \frac{5}{18} \times \frac{15}{2} \times 60$$

= 1250

49. A train crosses a platform of length 200 metres in 40 seconds and a man in 20 seconds. The length of the train is:

(a) 300 metres (b) 400 metres
(c) 200 metres (d) 500 metres

RRB Group-D 05/09/2022 (Shift-I)

Ans. (c) : Let the length of the train = x m.
Speed = Distance / Time
According to the qeustion,

$$\frac{200 + x}{40} = \frac{x}{20}$$

$$2x = 200 + x$$

$$x = 200 \text{ m.}$$

50. A 150m long train passes a canal of 102m in 7 seconds. The speed of the train is

(a) 42 m/s (b) 72 m/s
(c) 36 m/s (d) 21 m/s

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (c) : $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

$$\text{Speed of train} = \frac{150 + 102}{7}$$

$$= \frac{252}{7}$$

$$= 36\text{m/s}$$

51. A train takes 15 s to pass completely through a station platform 50 m long and 10 s through another station platform 20 m long. Find the length of the train.

(a) 40 m (b) 50 m
(c) 60 m (d) 35 m

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (a) : Let, the length of train = x m.

Distance	Time
50 + x m	15 sec
20 + x m	10 sec

With the same speed, the ratio of distances is directly proportional to the ratio of times.

$$\frac{50 + x}{20 + x} = \frac{15}{10} \Rightarrow 2(50 + x) = 3(20 + x)$$

$$\Rightarrow 100 + 2x = 60 + 3x$$

$$\Rightarrow 100 - 60 = 3x - 2x$$

$$\Rightarrow x = 40 \text{ m}$$

52. A train that is 110 m in length is running at a speed of 90 km/h. How much time will the train take to cross a bridge that is 180 m in length?

(a) 10.6 s (b) 11.6 s
(c) 7.6 s (d) 9.6 s

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : Speed of the train = 90 km/h = $90 \times \frac{5}{18}$

= 25 m/sec

Total distance = Length of the train + Length of the bridge

= 110 + 180
= 290 m

$$\text{Required Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{290}{25} = 11.6 \text{ seconds}$$

53. A train 800 m long is travelling at a speed of 120 km/h. How much time will it take to cross a bridge 1200 m long ?

(a) 3 min (b) 1 min
(c) 2 min (d) 4 min

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : Time = Distance / Speed

Distance = (800 + 1200) meter = 2 km.

$$\text{Required time} = \frac{2}{120}\text{h} = \frac{2}{120}\times 60\ \text{min}$$

$$= 1\ \text{min}$$

54. The railway platform at Delhi station is 238 meters long. In how many seconds is it cleared by an express train which is 162 m long and travels at a speed of 120 km/h?

(a) 10 Seconds (b) 14 Seconds

(c) 16 Seconds (d) 12 Seconds

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (d) : Given-

Length of train = 162 m

Length of platform = 238 m

Speed = 120 km/h

$$= 120\times\frac{5}{18} = \frac{100}{3}\ \text{m/s.}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{\text{Length of train} + \text{Length of platform}}{\text{Time}}$$

$$\frac{100}{3} = \frac{162+238}{\text{time}}$$

$$\text{Time} = \frac{400}{\frac{100}{3}} = \frac{1200}{100} = 12\ \text{Seconds}$$

55. Find the time taken by a 450 m long train travelling at the speed of 80 km/h to cross a platform of length 150 m.

(a) 27 s (b) 28 s

(c) 25 s (d) 24 s

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a) : ∵ Speed of train

$$= \frac{\text{Length of train + Length of platform}}{\text{Time taken to cross the platform}}$$

$$80\text{km/h} = \frac{450\text{m}+150\text{m}}{\text{t}}$$

$$80\times\frac{5}{18} = \frac{600}{\text{t}}$$

$$\text{t} = \frac{600\times 18}{400} = 27\ \text{Seconds}$$

56. A train passes two bridges of lengths 600 m and 200 m in 80 s and 40 s respectively. The length of the train is:

(a) 200 m (b) 250 m

(c) 220 m (d) 180 m

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Suppose the length of the train = x m

According to the question,

$$\frac{x+600}{80} = \frac{x+200}{40}$$

$$x + 600 = 2x + 400$$

$$x = 200\ \text{m}$$

57. A train travelling at a speed of 69 km/h passes and electric pole in 8 seconds and a platform in 32 seconds. What is the lenght of the platform?

(a) 460 m (b) 540 m

(c) 500 m (d) 480 m

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (a)

$$\text{Speed of train} = 69\ \text{km/h} = \frac{69\times 5}{18}\ \text{m/s}$$

$$= \frac{115}{6}\ \text{m/s}$$

Distance travelled by train to pass electric pole (length of train) = $\frac{115\times 8}{6} = \frac{460}{3}$ meter

Let the length of platform is L (meter)

According to the question,

$$\frac{460}{3} + \text{L} = \frac{115}{6}\times 32$$

$$\text{L} = \frac{115}{6}\times 32 - \frac{460}{3}$$

$$\text{L} = \frac{1840-460}{3}$$

$$\text{L} = 460\ \text{m}$$

58. A train running with a speed of 84 km/h crosses a pole in 9 seconds and a platform in 30 seconds. Find the length of the platform.

(a) 480 m (b) 500 m

(c) 540 m (d) 490 m

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : Speed of trains = 84km/h = $84\times\frac{5}{18}$ m/s

$$= 14\times\frac{5}{3}\ \text{m/s}$$

$$\text{Length of train} = 14\times\frac{5}{3}\times 9 = 210\ \text{m}$$

Let the length of platform = x m

According to the question,

$$(210 + x) = \frac{70}{3}\times 30$$

$$(210 + x) = 700$$

$$x = 490\ \text{m}$$

59. A 120 metre long train crosses a plateform of 100 metres in 10 seconds. Find its speed?

(a) 79.2 km/hr (b) 80 km/hr

(c) 72 km/hr (d) 100 km/hr

RRB RPF SI – 16/01/2019 (Shift-I)

Ans : (a)

∵ $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$,

$$\text{Speed} = \frac{\text{Length of train} + \text{Length of platform}}{\text{Time}}$$

$$= \frac{120+100}{10}$$

$$= \frac{22\times 18}{5}\ \text{km/hr.}$$

$$= \frac{396}{5} = 79.2\ \text{km./hr.}$$

60. A cargo train runs with a speed of 72 km/hr and crosses a 250 metre long platform in 26 seconds then find the length of the cargo train?
(a) 230 metre (b) 270 metre
(c) 260 metre (d) 240 metre
RRB JE - 29/05/2019 (Shift-I)

Ans : (b) Let the length of cargo train = x metre
According to the question,

$$72 \times \frac{5}{18} = \frac{250 + x}{26}$$

$20 \times 26 = 250 + x$
$520 = 250 + x$
$x = 520 - 250$
$x = 270$ metre
Hence, the length of cargo train is 270 metre.

61. A train running with a speed of 78 km/hr crosses a platform of 455 metre long in 27 seconds. What is the length of the train?
(a) 110 metre (b) 130 metre
(c) 120 metre (d) 100 metre
RRB RPF Constable – 22/01/2019 (Shift-II)

Ans. (b) : Let the length of train is x m.

$$\because \text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\therefore \quad 27 = \frac{455 + x}{78 \times \frac{5}{18}}$$

$585 = 455 + x$
$x = 130$ metre

62. A train moving with a speed of 66 km/hr crosses a 410 metre long platform in 30 second. Find the lengh of the train?
(a) 160 metre (b) 140 metre
(c) 240 metre (d) 180 metre
RRB Group-D – 20/09/2018 (Shift-III)

Ans : (b) Let the length of train is x m.

$$\text{Speed} = 66 \times \frac{5}{18} = \frac{55}{3} \text{m/sec}$$

$$\because \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\Rightarrow \frac{55}{3} = \frac{x + 410}{30}$$

$1650 = 3x + 1230$
$3x = 1650 - 1230$
$3x = 420$
$x = 140$ metre
Hence length of the train will be 140 m.

63. A 162 metre long train moving at a speed of 54 km/hr crosses a platform in 44 seconds. What will be the length of platform?
(a) 660 metre (b) 540 metre
(c) 822 metre (d) 498 metre
RRB Group-D – 25/09/2018 (Shift-II)

Ans : (d) Let the length of platform is x m.

$$\because \text{Speed} = \frac{\text{Length of train} + \text{Length of platform}}{\text{Time}}$$

then, $\dfrac{162 + x}{54 \times \frac{5}{18}} = 44$

$\dfrac{162 + x}{15} = 44$
$162 + x = 44 \times 15$
$x = 660 - 162$
$x = 498$ m

64. A train moving with a speed of 78 km/hr crosses a platform of 450 metre long in 27 seconds. What is the length of the train?
(a) 120 metre (b) 135 metre
(c) 130 metre (d) 125 metre
RRB Group-D – 25/09/2018 (Shift-III)

Ans. (b) : Let the length of train $= \ell$

$$\because \text{Speed} = \frac{\text{Length of train} + \text{Length of platform}}{\text{Time}}$$

$$\therefore 78 \times \frac{5}{18} = \frac{450 + \ell}{27}$$

$$\frac{65}{3} = \frac{450 + \ell}{27}$$

$65 \times 27 = 1350 + 3\ell$
$1755 - 1350 = 3\ell$

$$\ell = \frac{405}{3} = 135 \text{ metre}$$

Hence length of the train = 135 metre

65. A 153 metre long train crosses a 747 metre long bridge in 40.5 seconds. What is the speed of train?
(a) 75 km/hr (b) 85 km/hr
(c) 70 km/hr (d) 80 km/hr
RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) $\because$ $\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}$

$$\text{Speed of train} = \frac{\text{Length of train} + \text{Length of Bridge}}{\text{Total Time taken}}$$

$$= \frac{153 + 747}{40.5} = \frac{900}{40.5} = \frac{9000}{405} \text{ m./sec.}$$

$\because$ On changing the speed of train in km/hr.–

$$= \frac{9000}{405} \times \frac{18}{5}$$

$$= \frac{1800 \times 18}{81 \times 5}$$

$$= \frac{200 \times 18}{9 \times 5} = \frac{200 \times 2}{5} = 80 \text{ km./hr.}$$

66. A train moving with a speed of 66 km/hr crosses a 465 metre long bridge in 33 seconds. What was the length of the train?
(a) 240 metre (b) 180 metre
(c) 140 metre (d) 160 metre
RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c) : $\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}$
length of train + length of bridge = Speed × Time

$$\text{length of train} + 465 = 66 \times \frac{5}{18} \times 33$$

length of train + 465 = 11 × 5 × 11
length of train = 55 × 11 – 465 = 605 – 465 = 140 m

67. A train crosses 130 metre long platform in 14.5 seconds and 245 metre long platform in 20.25 seconds. What is the speed of the train?

(a) 69 km/hr (b) 75 km/hr
(c) 66 km/hr (d) 72 km/hr

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (d) : Let the length of train = x metre

Speed of train in first condition $= \frac{130+x}{14.5}$.....(i)

Speed of train in second condition $= \frac{245+x}{20.25}$.....(ii)

From equation (i) and (ii)

$\therefore \frac{130+x}{14.5} = \frac{245+x}{20.25}$

$20.25 (130 + x) = 14.5 (245 + x)$

$2632.5 + 20.25x = 3552.5 + 14.5x$

$5.75x = 920$

$x = 160$

Hence Speed $= \frac{130+160}{14.5}$

$= \frac{290}{14.5} = 20$ m./sec.

$= 20 \times \frac{18}{5} = 72$ km./hr.

68. A train moving with a speed of 65 km/hr crosses a 815 metre long bridge in 54 seconds. What was the length of the train?

(a) 150 metre (b) 170 metre
(c) 160 metre (d) 155 metre

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (c) Let the length of train is x m.

$\because$ $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$ $\left\{\begin{matrix} 65\text{km/hr} \\ = 65 \times \frac{5}{18}\text{m/s} \end{matrix}\right\}$

Distance = Length of train + Length of bridge

$\therefore$ $54 = \frac{(815+x)}{65 \times \frac{5}{18}}$

$975 = 815 + x$

$x = 975 - 815$

$x = 160$

Hence the length of train is = 160 m.

69. A train moves at an uniform speed and crosses a 350 metre long platform in 15 second and one more station of 430 metre long in 23 seconds. What is the speed of train in km/hr?

(a) 18.70 (b) 23.30
(c) 40 (d) 36

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (d) Let the length of train is x m.

Speed of train =

$$\frac{\text{Length of second station - Length of first station}}{\text{Time difference}}$$

$= \frac{(430-350)}{(23-15)} = \frac{80}{8} = 10$ m/s

$= 10 \times \frac{18}{5} = 36$ km./hr.

70. A train moving with a speed of 78 km/hr crosses a 445 metre long platform in 27 seconds. What is the length of the train?

(a) 120 metre (b) 140 metre
(c) 130 metre (d) 110 metre

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (b) Let the length of train is x m.

Speed = 78 km/h = $78 \times \frac{5}{18}$ m/s $= \frac{65}{3}$ m/s

Distance = length of train + length of platform

Speed = $\frac{\text{Distance}}{\text{Time}}$

$\frac{65}{3} = \frac{445+x}{27}$

$65 \times 9 = 445 + x$

$585 - 445 = x$

$x = 140$ m

Hence the length of train = 140 m.

71. A train crosses 520 metre long platform in 36 seconds. Till how many kilometres was the train moving with 70 km/hr?

(a) 150 metre (b) 140 metre
(c) 180 metre (d) 160 metre

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (c) : Time = 36 seconds

Let the length of train = x m.

The total distance covered by the train = (520 + x) m.

Speed $= 70 \times \frac{5}{18}$ m./sec.

$\left[\because \text{Speed} = \frac{\text{Distance}}{\text{Time}}\right]$

$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$

$36 = \frac{(520+x) \times 18}{70 \times 5}$

$\frac{36}{18} = \frac{520+x}{350}$

$700 = 520 + x$

$x = 700 - 520 = 180$ metre.

72. A 165 metre long train crosses a 755 metre bridge in 46 seconds. What is the speed of train?

(a) 80 km/h (b) 78 km/h
(c) 75 km/h (d) 72 km/h

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (d) :

Total distance = length of train + length of bridge

= 165 + 755

= 920 m

Hence Speed = $\frac{\text{Distance}}{\text{Time}}$

$= \frac{920}{46} = 20 \text{ m/s} = 20 \times \frac{18}{5} = 72 \text{ km/h}$

73. A train moving with a speed of 48 km/hr crosses a 200 metere long platform in 27 second. What is the length of the train?

(a) 180 metre (b) 160 metre
(c) 240 metre (d) 140 metre

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (b) Let the length of train = L metre
Distance = length of train + length of platform

$\because$ $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$,

$$27 = \frac{L+200}{48\times\frac{5}{18}} \qquad [\because \text{km./hr.}\times\frac{5}{18} = \text{m/s.}]$$

$$27\times\frac{40}{3} = L + 200$$

$360 = L + 200$

$L = 360 - 200 = 160$ metre

74. A train of 152.5 metre long. Which is moving with a speed of 57 km/hr crosses a platform in 39 seconds. What is the length of the platform?

(a) 617.5 metre (b) 480 metre
(c) 590 metre (d) 465 metre

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (d) : Let the length of platform = x m.

$$\text{Speed} = 57\times\frac{5}{18}\text{m/sec}$$

Total distance $= 152.5 + x$ m., time = 39 seconds

$$\because \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\frac{57\times5}{18} = \frac{152.5+x}{39}$$

$$\frac{285\times39}{18} = 152.5 + x$$

$x = 617.5 - 152.5$

$\boxed{x = 465\,m}$

75. A train crossed a 110 m long platform in 13.5 seconds and a 205 m long platform in 18.25 seconds. What was the speed of the train?

(a) 75 km/h (b) 72 km/h
(c) 69 km/h (d) 66 km/h

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (b) : Let the length of train = x m.
According to the question-

$$\frac{(110+x)10}{135} = \frac{(205+x)\times100}{1825}$$

$$\frac{(110+x)}{135} = \frac{(205+x)\times2}{365}$$

$$\frac{(110+x)}{27} = \frac{(205+x)\times2}{73}$$

$8030 + 73x = 11070 + 54x$

$73x - 54x = 11070 - 8030$

$19x = 3040$

$\boxed{x = 160}$

$$\text{Speed of train} = \frac{(110+160)\times10}{135} = \frac{270\times10}{135}$$

$$= 20\text{ m/s} = \frac{20\times18}{5} = 72\text{ km./hr.}$$

76. A train having a length of 500 m passes through a tunnel of 1000 m in 1 minute. What is the speed of the train in km./hr

(a) 75 km/hr. (b) 90 km/hr.
(c) 87 km/hr. (d) 96 km/hr.

RRB NTPC 03.04.2016 Shift : 2

Ans : (b) Let the speed of train = x km./hr.
According to the question,

Distance = (500+1000)m = 1.5 km

Time = 1 minute = 1/60 hour

$$\frac{1.5\text{ km}}{x} = \frac{1}{60}\text{h}$$

$x = 90$ km./hr.

77. A 250 metre long train crosses an electric pole in 8 second. If it takes 20 second to cross a platform then what is the length of platform?

(a) 375 metre (b) 625 metre
(c) 500 metre (d) 675 metre

RRB NTPC 29.03.2016 Shift : 2

Ans : (a) Let the length of platform = x m.
and speed of train = y m/s.
According to the question,

$$\frac{250}{8} = y\text{.....(i)}$$

Again from question-

$$\frac{250+x}{20} = y\text{.....(ii)}$$

From equation (i) and (ii)-

$$\frac{250}{8} = \frac{250+x}{20}$$

$5000 = 2000 + 8x$

$8x = 3000 \Rightarrow x = 375$ m.

Hence length of platform = 375 m.

78. A 145 m long train crosses a 655 m long bridge in 36 seconds. What is the speed of the train?

(a) 60 km/hr. (b) 70 km/hr.
(c) 80 km/hr. (d) 75 km/hr.

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (c) Let the speed of train is x m/sec.
According to the question,

$$\frac{145+655}{x} = 36$$

$$x = \frac{800}{36}\text{ m./sec.}$$

$$x = \frac{800}{36}\times\frac{18}{5}\text{ km./hr.}$$

$x = 80$ km/hr.

79. A train crosses a 550m long platform in 36 seconds. How long was the train if it was travelling at the speed of 70 km/h?

(a) 525 metre (b) 160 metre
(c) 140 metre (d) 150 metre

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (d) : Let the length of train = x m.

Speed = 70 km/h $= 70\times\frac{5}{18}$ m/sec

Total distance = length of platform + length of train

Then, $70\times\frac{5}{18} = \frac{550+x}{36}$

$70 \times 5 \times 2 = 550 + x$

$700 = 550 + x$

$x = 150$ m.

Hence length of train = 150 m.

80. A train moving with a speed of 66 km/hr crosses a 300 metre long platform in 24 seconds. How long was the train?

(a) 140 metre (b) 160 metre
(c) 180 metre (d) 240 metre

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (a) Let the length of train = x m.
Total distance covered = (x + 300) m.
Time = 24 seconds

$$\text{Speed} = 66 \text{ km/h} = 66 \times \frac{5}{18} \text{m/sec}$$

Now $66 \times \frac{5}{18} = \frac{x+300}{24}$

$\frac{11 \times 5}{3} = \frac{x+300}{24}$

$11 \times 5 \times 8 = x + 300$

$x = 440 - 300, \quad x = 140$ m.

81. A train crossed a 140 m long platform in 15 seconds and a 180 m long platform in 17 seconds. The speed of the train was :

(a) 75 km/hr (b) 72 km/hr
(c) 66 km/hr (d) 69 km/hr

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (b) Distance difference = 180 –140 = 40 m.
Time difference = 17–15 = 2 second

$$\text{Speed of train} = \frac{\text{Distance}}{\text{Time}} = \frac{40}{2} = 20 \text{ m./sec.}$$

$$20 \times \frac{18}{5} = 72 \text{ km./hr.}$$

82. A train travelling at 76 km/h crosses a 450 m long platform in 27 seconds. What is the length of the train?

(a) 110 metre (b) 120 metre
(c) 130 metre (d) 100 metre

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (b) Let the length of train = x m.
Speed of train = 76 km/h

$$= 76 \times \frac{5}{18} \text{ m/s}$$

According to the question,

$$\frac{x+450}{76 \times \frac{5}{18}} = 27 \qquad \left[\text{Time} = \frac{\text{Distance}}{\text{Speed}}\right]$$

$$x + 450 = 27 \times 76 \times \frac{5}{18} = 570$$

$x = 570 - 450$

$\boxed{x = 120 \text{ m}}$

Type - 5

83. A train crosses a platform 90 metres long in 60 seconds at a speed of 54 km/h. Find the time the train will take to cross an electric pole.

(a) 58 seconds (b) 54 seconds
(c) 48 seconds (d) 60 seconds

RRB Group-D 29/08/2022 (Shift-III)

Ans. (b) : Let the length of train=x meter

$$\text{Speed of train} = 54 \times \frac{5}{18} = 15 \text{m/s}$$

According to the question,

(x+90)=15×60 ($\therefore$ Distance = Speed × time)

x+90=900

x = 810 meter.

$\therefore$ Time taken by train to cross an electric pole

$$= \frac{\text{Distance of train}}{\text{Speed}}$$

$$\frac{810}{15} = 54 \text{ seconds}$$

84. A train crosses a telegraph post and a bridge of length 300 metres in 10 seconds and 20 seconds, respectively. Find the speed of the train.

(a) 108 km/h (b) 75 km/h
(c) 89 km/h (d) 69.5 km/h

RRB Group-D 05/09/2022 (Shift-III)

Ans. (a) : Speed = Distance / Time
Let length of train = x m.
According to the qeustion,

$$\frac{x}{10} = \frac{x+300}{20}$$

$2x = x + 300$

$x = 300$

$$\text{Hence, Speed} = \frac{300}{10} = 30 \text{ m/s}$$

$$= 30 \times \frac{18}{5} \text{km/h}$$

$= 108$ km/h

85. A train crosses a man on a platform in 10s and crosses the platform of 260 m in length in 20s. What is the length of the train?

(a) 280 m (b) 260 m
(c) 220 m (d) 240 m

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the length of the train is = x meters
According to the question –

$$\frac{260+x}{20} = \frac{x}{10}$$

$2x = x + 260$

$x = 260$ meters

86. A 300 metre long train crosses a platform in 39 seconds while crosses a pole in 18 seconds. What is the length of the platform?

(a) 680 metre (b) 350 metre
(c) 320 metre (d) 650 metre

RRB JE - 27/05/2019 (Shift-III)

Ans : (b) Let the length of platform = x m.
According to the question,

$$\frac{300}{18} = \frac{300+x}{39}$$

$\frac{300}{6}=\frac{300+x}{13}$
3900 = 1800 + 6x
2100 = 6x
x = 350 m.
Hence length of platform is 350 m.

87. A train moving with a speed of 54 km/hr crosses a platform and a man standing at the platform in 36 seconds and 20 seconds respectively. Find the lengths of the platform?
(a) 240 metre (b) 180 metre
(c) 270 metre (d) 300 metre

RRB JE - 26/05/2019 (Shift-II)

Ans : (a) Let the length of platform = x m.
Length of train= l $\because$ [distance/ speed = t]
Total distance = x + l

$x+l=54\times\frac{5}{18}\times36$

x + l = 540 ..... (i)
According to the question,
Again Distance = Speed × Time

$l=54\times\frac{5}{18}\times20$

l = 300 ..... (ii)
By subtracting equation (ii) from equation (i)
x + l – l = 540 – 300
Length of Platform $\boxed{x = 240m}$

88. A man is standing on a 70 metre long platform a train croses the platform in 5.5 seconds but it crosses that man in 2 seconds. What is the length of the train?
(a) 80 metre (b) 45 metre
(c) 60 metre (d) 40 metre

RRB JE - 27/05/2019 (Shift-I)

Ans : (d) Let the length of train = x m.
According to the question,

$\frac{x}{2}=\frac{x+70}{5.5}$

$\Rightarrow$ 2x + 140 = 5.5x
$\Rightarrow$ 3.5x = 140
$\Rightarrow$ $x=\frac{1400}{35}=40$
Hence the length of the train = 40 m.

89. A train moving with a speed of 36 km/hr crosses a platform in 80 seconds. The same train takes 24 seconds to cross a man moving in the opposite direction with a speed of 18 km/hr. Find the length of the platform.
(a) 120 metre (b) 440 metre
(c) 300 metre (d) 240 metre

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (b) Let the length of the train = x m
Length of platform = y m
According to the question,

$\frac{36\times5}{18}=\frac{x+y}{80}$

x + y = 800m .... (i)
Relative speed = 36 + 18 = 54 km./hr.

II[nd] condition-

$\frac{54\times5}{18}=\frac{x}{24}$

$15\times24=x$
x = 360 m
length of platform (y) = 800 – x
= 800 – 360 = 440 m.

90. A 200 metre long train crosses a 300 metre long bridge in 30 seconds what time will it take to cross a man standing in the middle of 150 metre long platform? In both the cases the speed is same.
(a) 9 second (b) 11 second
(c) 12 second (d) 10 second

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (c) According to the question,

Speed = $\frac{200+300}{30}=\frac{500}{30}=\frac{50}{3}$ m/s

Time taken to cross a person = $\frac{\text{Distance}}{\text{Speed}}$

$=\frac{200}{\frac{50}{3}}=12$ seconds

91. A train passes by a stationary man standing on a platform in 5 seconds and passes by the platform completely in 25 seconds. If the length of the platform is 300 metres, what is the length of the train.
(a) 150 metre (b) 75 metre
(c) 110 metre (d) 115 metre

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Let the length of train is x m.
According to the question,

$\frac{x}{5}=\frac{x+300}{25}$

5x = x +300
4x = 300
x = 75 m
Hence the length of the train is 75 m.

92. A train crosses a pole in 15 seconds and a 100 metre long platform in 25 seconds. Find the length of the train in metres.
(a) 149 metre (b) 145 metre
(c) 150 metre (d) 155 metre

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (c) : Let the length of the train = x m.
Speed of train while crossing the pole = $\frac{x}{15}$ m./sec.
Again, speed of train while crossing 100 metre long platform = $\frac{100+x}{25}$ m./sec.
According to the question,

$\frac{x}{15}=\frac{100+x}{25}$

$\Rightarrow$ 25x = 1500 + 15x
$\Rightarrow$ 10x = 1500 $\Rightarrow$ x = 150m
Hence the length of train = 150 m

93. What is the time taken by a 180 m long train running at 54 km/h to cross a man standing on a platform?

(a) 10 seconds (b) 12 seconds
(c) 11 seconds (d) 13 seconds

RRB ALP & Tec. (14-08-18 Shift-I)

Ans. (b) Given,

$$54 \text{ km./hr.} = 54 \times \frac{5}{18} \text{ m./sec.} = 15 \text{ m./sec.}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Time} = \frac{180}{15} = 12 \text{ seconds}$$

Hence the train will cross the man in 12 seconds.

Type - 6

94. Two trains having lengths of 200 m and 300 m are running at speeds of 100 km/h and 120 km/h, respectively, in the same direction. The time taken (in minutes) by the faster train, coming from behind, to completely cross the other train is:

(a) 0.5 (b) 2
(c) 1 (d) 1.5

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (d) : Given:–
Total length of both trains = 200 m + 300 m = 500 m
Relative speed = 120 – 100 = 20 km/h

$$\Rightarrow 20 \times \frac{5}{18} \text{ m/s}$$

According to the question,
Time taken by faster train to cross

$$\text{Slower train} = \frac{500}{20 \times \frac{5}{18}}$$

$$= \frac{500 \times 18}{100} = 90 \text{ seconds}$$

Hence, 90 seconds = 1.5 minute.

95. A train P going at the speed of 70 km/h completely passes train Q of length 170m, going in the same directions on parallel tracks, at 56 km/h, in $1\frac{1}{2}$ minutes. How much time (in seconds) will P take to cross completely train R of length 220m, going at 74 km/h in the opposite direction?

(a) 15 (b) 12
(c) 10 (d) 14

RRB Group-D 01/09/2022 (Shift-II)

Ans. (c) : Speed of P = 70 km/h Let length of P = xm
Speed of Q = 56 km/h Length of Q = 170 m

Relative speed of P & Q = (70 – 56) × $\frac{5}{18}$

$$= 14 \times \frac{5}{18} = \frac{70}{18} \text{ m/sec}$$

Crossing time = $1\frac{1}{2}$ min. = 90 sec

$$\text{Time} = \frac{\text{distance}}{\text{speed}}$$

$$90 = \frac{170 + x}{\frac{70}{18}}$$

170 + x = 350
x = 180 m
Time taken by P to crass R

$$= \frac{220 + 180}{(70 + 74) \times \frac{5}{18}}$$

$$= \frac{400 \times 18}{144 \times 5} = 10 \text{sec}$$

96. The Sampark Kranti Express left Delhi for Chennai at 14 : 30 at a speed of 75 km/hr, while the Rajdhani Express left Delhi for Chennai at 16 : 30 on the same route at 90 km/hr at same day. At what distance from Delhi will both the trains meet each-other ?

(a) 860 km (b) 950 km
(c) 820 km (d) 900 km

RRB Group-D 06/09/2022 (Shift-I)

Ans. (d) : Let time taken by train = t sec.
According to the question,

$s_1t_1 = s_2t_2$
$75(t + 2) = 90t$
$75t + 150 = 90t$

$$t = \frac{150}{15}$$

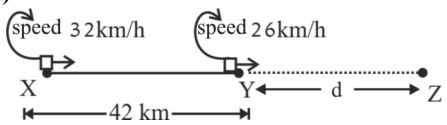
t = 10 sec.
∴ Required distance = 90 × 10 = 900 km

97. Two trains are running in the same direction with the speeds of 32 km/h and 26 km/h respectively from X and Y. If X is 42 km away from Y and if they meet at a point Z beyond Y, then the distance from Y to Z will be:

(a) 148 km (b) 165 km
(c) 182 km (d) 236 km

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c)



Let the distance from Y to Z is d km then both the trains will take the same time to reach point Z.

$$\frac{42 + d}{32} = \frac{d}{26}$$

$1092 + 26d = 32d$

$1092 = 6d$

$d = \frac{1092}{6} = 182\,km$

So the distance from Y to Z = 182 km

98. 200 metre long train and 150 metre long train whose speed is 40 km/hr and 45 km/hr respectively are moving on a parallel track. If they are moving in the same direction, then in what time they will cross each other?

(a) 72 seconds (b) 132 seconds
(c) 192 seconds (d) 252 seconds

RRB RPF SI – 12/01/2019 (Shift-I)

Ans : (d) Relative speed = 45 – 40 = 5 km./hr.

$= 5 \times \frac{5}{18}$ m./sec.

Required time $= \frac{200+150}{5\times\frac{5}{18}} = \frac{350\times18}{25}$

$= 14 \times 18 = 252$ seconds

99. A train runs from a station at a speed of 40 km/hr. After two hours another trains leaves from the same station at a certain speed in the same direction. If the second train catches the first train in 4 hours, then what is the speed of second train?

(a) 60 km/hr (b) 65 km/hr
(c) 50 km/hr (d) 55 km/hr

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (a) Speed of first train = 40 km/hr.
Speed of second train = ?
The second train runs 2 hours after the first train and gets caught after 4 hours of running.
i.e the first train will run for (4 + 2) = 6 hours.
Hence distance travelled by first train = 40 × 6 = 240 km
Hence Total distance travelled = 240 km
The second train will also run 240 km in 4 hours

Hence speed of second train $= \frac{240}{4} = 60$ km/hr

100. A train departs from a station at a speed. Form the same station, in the same direction of the first train a second train whose speed is 70 km/hr departs after two hours and after 5 hours it comes equal to the first train. Tell the speed of first train in km/hr.

(a) 50 km/hr (b) 40 km/hr
(c) 55 km/hr (d) 45 km/hr

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (a) Let the speed of first train = x km/hr.
Speed of second train = 70 km./hr.
Distance travelled by second train in 5 hours
= 70 × 5 = 350 km.
The first train started running 2 hours before the second train
∴ Distance travelled by first train in 7 hours = 350 km.

Hence speed of first train $= \frac{350}{7} = 50$ km./hr.

101. A 250 metre long cargo trains speed is 33 km/hr. A 200 metre long mail train is moving on a parallel track in the same direction with a speed of 60 km/hr which chases the cargo train and leaves back the cargo train after some time. In how much time, minute the mail train left back the cargo train completely?

(a) 1 minute (b) 1.5 minute
(c) 3 minute (d) 2 minute

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (a) Speed of cargo train = 33 km/h
Speed of mail train = 60 km/h
Relative speed = 60–33 = 27 km/h

$\therefore \quad (60-33)\times\frac{5}{18} = \frac{250+200}{T}$

$27\times\frac{5}{18} = \frac{450}{T}$

$\frac{9\times5}{6} = \frac{450}{T}$

$\frac{45}{6} = \frac{450}{T}$

T = 60 seconds
= 1 minute

102. Two trains of speed 110 km/hr and 90 km/hr respectively are moving in the same direction. The fast moving train crosses a man of slow moving train in 18 seconds. Tell the length of fast moving train?

(a) 200 metre (b) 250 metre
(c) 100 metre (d) 150 metre

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (c) Relative speed of train
= (110–90) km/hr = 20 km/hr

$= 20\times\frac{5}{18}$ m/sec.

Time = 18 seconds
Distance = Speed × Time

$= 20\times\frac{5}{18}\times18 = 100\,m.$

103. A bus moving at the speed of 45 km/h overtakes a truck 150 m ahead, going in the same direction in 30 sec. The speed of the truck is:

(a) 24 km/h (b) 25 km/h
(c) 20 km/h (d) 27 km/h

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let the speed of truck = x km/h
Their relative speed in same direction = (45 – x) km/h
According to the question,

$\text{Time} = \frac{\text{Total distance}}{\text{Speed}}$

$30 = \frac{150}{(45-x)\times\frac{5}{18}}$

$30 = \frac{150\times18}{(45-x)\times5}$

$150 \times (45 - x) = 150 \times 18$

$45 - x = 18$

$x = 27$ km/h

Type - 7

104. Two mini trains of length 80 m and 120m, respectively, are moving on parallel tracks in opposite directions at 30 m/s and 20 m/s respectively. The time taken (in seconds) by both the mini trains to cross each other is :

(a) 8 (b) 4

(c) 10 (d) 6

RRB Group-D 08/09/2022 (Shift-II)

Ans. (b) : From the question

length of two train = 80 + 120 = 200m

speed = 30 + 20 = 50m/s

Time = Distance / Speed

$\text{Relative} = \frac{200}{50} = 4\,\text{second}$

105. Two trains are running in opposite directions on parallel tracks. If their speeds are 50 km/h and 58 km/h, fond their relative speed.

(a) 20 m/s (b) 40 m/s

(c) 30 m/s (d) 50 m/s

RRB Group-D 27-09-2022 (Shift-II)

Ans. (c) : We know that when two bodies are moving in the opposite direction, the relative speed is calculated by adding the speed of both the bodies.

$\therefore$ The relative speed of the two trains

$= (50 + 58)\,\text{km/h}$

$= 180$ km/h

$= 108 \times \frac{5}{18}\,\text{m/sec}$

$= 30\,\text{m/sec}$

106. Two trains start at the same time from two stations and proceed towards each other at 30 km/h and 35 km/h respectively. When they meet, it is found that one train has covered 30 km more than the other. Find the distance between the two stations.

(a) 400 km (b) 380 km

(c) 390 km (d) 410 km

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (c) : Given that $V_1 : V_2 = 30 : 35$

$= 6 : 7$

we know that

Distance $\propto$ speed

$D_1 : D_2 = 6 : 7$

Difference of distance = 30

1 unit = 30 km

13 unit = 30 × 13

= 39 km

107. A 250-metre long train running at a speed of 100 km/h crosses another train coming from the opposite direction at a speed of 62 km/h in 10 seconds. What is the length of the second train?

(a) 230 m (b) 270 m

(c) 200 m (d) 240 m

RRB GROUP-D – 25/08/2022 (Shift-II)

Ans. (c) : According to the question,

Relative speed = 100 + 62 = 162 × 5/18

= 45 m/s.

Let the length of the another train is x m.

$\because$ Distance = Speed × Time

$250 + x = 45 \times 10$

$x = 200$ m

108. Two trains of equal speed are running in opposite directions. If their lengths are 120 metres and 140 metres and they cross each other in 10 sec, then find the speed of each train.

(a) 13 m/s (b) 10 m/s

(c) 16 m/s (d) 14 m/s

RRB Group-D 22/08/2022 (Shift-I)

Ans. (a) : Let the speed of the train x m/s.

According to the question,

$2x = \frac{120 + 140}{10}$

$x = \frac{260}{20}$

$x = 13$ m/sec

109. Two trains P and Q, having lengths of 300 m and 340 m respectively, are running towards each other. If P and Q are running at speeds of 35 m/s and 45 m/s, respectively, then how long will they take to cross each other?

(a) 8.5 sec (b) 8 sec

(c) 9 sec (d) 7 sec

RRB Group-D 29/08/2022 (Shift-III)

Ans. (b) : Given

Length of train P and Q = 300m & 340m

Speed of train P and Q = 35 m/s and 45 m/s

According to the question,

$\text{Time to cross each other} = \frac{\text{Total distance}}{\text{Total speed}}$

$= \frac{300 + 340}{35 + 45} = \frac{640}{80}$

$= 8\,\text{seconds}$

110. Two trains from P and Q, respectively, at the same time and run towards each other at a speed of 40 km/h and 30 km/h, respectively, By the time they meet, the first train has covered 80 km more the other train. Find the distance between P and Q.

(a) 660 km (b) 240 km

(c) 560 km (d) 630 km

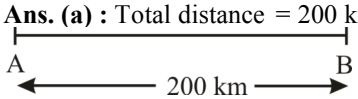
RRB Group-D 30-08-2022 (Shift-III)

Ans. (c) : We know that,
distance ∝ speed
so,
$V_1 : V_2 = 40 : 30 = 4 : 3$
$D_1 : D_2 = 4 : 3$ ($\because D \propto S$)
Difference of distance = 80 km
1 unit = 80 km
total distance = 7 unit = 7 × 80 = 560 km

111. Two trains starts at the same time from A and B proceed towards each other at speeds of 85 km per hour and 105 km per hour, respectively. When they meet, it is found that train form B has travelled 200 km more than the train from A. The distance between A and B.
(a) 1950 km (b) 2000 km
(c) 1800 km (d) 1900 km
RRB Group-D 19-09-2022 (Shift-III)

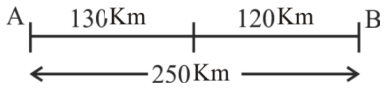
Ans. (d) : Let the distance travelled by train A = n
Given,
Train A = 85 km/h Train B = 105 km/h
When both train starts at the same time then–
$\frac{n}{85} = \frac{n+200}{105}$
105n = 85n + 200 × 85
20n = 17000
n = 850 km
So total distance travel by both trains = n + n + 200
= 850 + 850 + 200
= 1900 km

112. Two trains starting at the same time in opposite directions from two stations 200 km apart meet each other at a distance of 110 km from one of the stations. What is the ratio of their speed?
(a) 11 : 9 (b) 10 : 9
(c) 12 : 8 (d) 13 : 7
RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Total distance = 200 km


Trains running towards each other from different stations at the same time meet each other at a distance of 110 km from one of them.
So, remaining distance = 200 – 110 = 90 km
When the time is equal, the ratio of the speeds to the distance is equal.
$\frac{S_1}{S_2} = \frac{D_1}{D_2} = \frac{110}{90} = 11:9$

113. Two trains going in opposite directions, start at the same time from two stations that are 250 km apart. The trains meet each other at a distance of 130 km from one of the stations. Find the ratio of their speeds.
(a) 15 : 14 (b) 9 : 8
(c) 13 : 12 (d) 12 : 11
RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) :


If train A will run 130 km. then train B will run 120 km.
$\frac{S_1}{S_2} = \frac{d_1}{d_2} = \frac{130}{120}$
(Ratio of both the trains run at the same time)
$S_1 : S_2 = 13 : 12$

114. Two trains 131 m and 89 m long are moving in opposite direction one at the speed of 42 km/h, the other at a speed of 30 km/h. In what time will they be completely clear of each other from the moment they meet?
(a) 10 s (b) 11 s
(c) 20 s (d) 18 s
RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (b)
Speed of the first train = 42 km/h = $42 \times \frac{5}{18} = \frac{35}{3}$ m/s
Speed of the second train =30 km/h = $30 \times \frac{5}{18} = \frac{25}{3}$ m/s
Relative speed = $\frac{35}{3} + \frac{25}{3} = \frac{60}{3} = 20$ m/s
Distance = 131 + 89 = 220 m
Required time = $\frac{220}{20} = 11$ s

115. Two trains 136 m and 185 m in length respectively are running in opposite directions, one at a speed of 70 km/h and the other at a speed of 65 km/h. In what time will they be completely passed of each other from the moment they meet?
(a) 8.56 s (b) 4.78 s
(c) 9.67 s (d) 7.43 s
RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) : Total relative speed of the train = (70+65) km/h = 135 km/h
$= 135 \times \frac{5}{18}$ m/s
Sum of length of the trains = 136+185 = 321 m.
Let the time taken by both the trains to cross each other = t
$135 \times \frac{5}{18} = \frac{321}{t}$
t = 8.56 seconds

116. Train A, running at the speed of 80 km/hr crosses train B, running at the speed of 70 km/hr in the opposite direction. Both trains cross each other in 30 seconds. If the length of train A is 300 m. then the length of train B is:
(a) 950 m (b) 750 m
(c) 850 m (d) 855 m
RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (a) : Relative speed of trains when they running in opposite direction = (80 + 70) km/h = 150 km/h.
$150 \times \frac{5}{18} = \frac{125}{3}$ m/sec
Let the length of train B = x m.
And length of train A = 300 m (given)

$\because$ Time = $\frac{\text{Distance}}{\text{Speed}}$

$30 = \frac{x+300}{125/3}$

$10 \times 125 = x + 300$

$1250 = x + 300$

$x = 1250 - 300$

$x = 950$ m.

Hence, the length of train B = x m = 950 m.

117. Two trains start at the same time from two stations and proceed towards each other at the speeds of 20 km/h and 25 km/h respectively. When they meet, it is found that one train has travelled 80 km more than the other. Find the distance between the two stations.

(a) 700 km (b) 710 km

(c) 730 km (d) 720 km

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let the time taken by train is 't'

According to the question,

$25t - 20t = 80$

$5t = 80$

$t = 16$

Total distance = $25t + 20t = 45$ t

Total distance = $45 \times 16 = 720$ km

118. Two trains of same length takes 10 second and 15 seconds respectively to cross a telegraph post. If each trains length is 120 metre then what time will be taken by them to cross each other moving in opposite direction?

(a) 12 seconds (b) 15 seconds

(c) 10 seconds (d) 20 seconds

RRB JE - 27/05/2019 (Shift-II)

Ans : (a) According to the question,

Speed of first train = $\frac{120}{10}$ = 12 m./sec.

Speed of second train = $\frac{120}{15}$ = 8 m./sec.

$\therefore$ Relative speed of both trains (x+y) m/s. = $\frac{\text{Distance}}{\text{Time}}$

Time taken to cross both trains in opposite direction

$= \frac{\text{Length of first train + Length of second train}}{\text{Speed of first train + Speed of second train}}$

$\Rightarrow \frac{120+120}{12+8} = \frac{240}{20} = 12$ seconds

119. 100 metre and 120 metre long trains of speed 18 metre/second and 15 metre/second respectively are moving towards each other. In how much time will they pass each other?

(a) 6.7 seconds (b) 10 seconds

(c) 7.2 seconds (d) 8 seconds

RRB JE - 30/05/2019 (Shift-I)

Ans : (a)

Speed = $\frac{\text{Distance}}{\text{Time}}$

Time = $\frac{\text{Length of first train + Length of second train}}{\text{Speed of first train + Speed of second train}}$

$= \frac{100+120}{18+15} = \frac{220}{33} = 6.7$ seconds

120. Two train of same speed are moving in opposite direction. If each trains length is 120 metre and they crosses each other in 12 seconds. Then find the speed of each train?

(a) 72km/hr (b) 10 km/hr

(c) 18 km/hr (d) 36 km/hr

RRB JE - 28/06/2019 (Shift-III)

Ans. (d) Let the length of train is l_1 and l_2

$\because$ $l_1 = l_2 =$ 120 metre

According to the question it is given that–

$V_1 = V_2 = V$

$\therefore$ $V_1 + V_2 = \frac{l_1 + l_2}{T}$

$V + V = \frac{120+120}{12} = \frac{240}{12} = 20$

$2V = 20$

$V = 10$m/s

$V = 10 \times \frac{18}{5} = 36$ km/h

121. Two trains whose length is 220 metre and 270 metre, starts moving towards each other with a speed of 135 km/hr and 117 km/hr respectively. They cross each other at a point. In what time will they cross each other?

(a) 5 seconds (b) 7 seconds

(c) 11 seconds (d) 24 seconds

RRB RPF SI – 10/01/2019 (Shift-III)

Ans : (b) Relative speed of train = (135+117) km./hr.

$= 252 \times \frac{5}{18}$ m/sec

$= 14 \times 5 = 70$m/sec

Time taken by train to cross each other-

$= \frac{220+270}{70} = \frac{490}{70} = 7$sec

122. Two trains at the same time starts at 80 km/hr and 95 km/hr respectively for the first station P to Q and the second station Q to P. If they meet after 12 hours, find the difference of the distance travelled by them?

(a) 200 km (b) 15 km

(c) 2100 km (d) 180 km

RRB JE - 28/06/2019 (Shift-III)

Ans. (d) Let the speed of first train is V_1 and second train is V_2.

$V_1 = \frac{D_1}{T} \Rightarrow D_1 = 80 \times 12 = 960$km

$V_2 = \frac{D_2}{T} \Rightarrow D_2 = 95 \times 12 = 1140$km

According to the question,

$D_2 - D_1 = 1140 - 960 = 180$ km

123. 120 metre long train A is running with speed of 20 m/second and 130 metre long train B is running with a speed of 30 m/s in opposite direction. The time taken by train B to cross train A is?

(a) 5 seconds (b) 25 seconds

(c) 10 seconds (d) 50 seconds

RRB RPF Constable – 19/01/2019 (Shift-III)

Ans : (a) Speed of train A = 20 m/s
Length of train A = 120 m
Speed of train B = 30 m/s
Length of train B = 130 m

$$\text{Relative Speed} = \frac{\text{Length of train A} + \text{Length of train B}}{\text{Time}}$$

$$20 + 30 = \frac{120 + 130}{\text{time}}$$

$$50 = \frac{250}{\text{time}}$$

$$\text{Time} = \frac{250}{50} = 5 \text{ seconds}$$

Hence time taken by train B to cross train A = 5 second.

124. Two trains of lengths 152.5 metre and 157.5 metre are coming from opposite directions respectively cross each other in 9.3 seconds, then combined speed of both train per hour will be.

(a) 120 km/hr (b) 125 km/hr
(c) 130 km/hr (d) 115 km/hr

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (a) Length of both train = 152.5+157.5 = 310 m.
time = 9.3 sec

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{310}{9.3} = \frac{100}{3} \text{m/sec}$$

$$\text{On changing in km per hour} = \frac{100}{3} \times \frac{18}{5} = 120 \text{ km./h.}$$

125. Two trains of 132 metre long and 108 metre long are moving with speed of 32 km/hr and 40 km/hr respectively in opposite direction. After meeting what time will be taken by them to cross each other?

(a) 12 seconds (b) 20 seconds
(c) 15 seconds (d) 32 seconds

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a) Total distance covered by train = length of train A + length of train B
= 132 +108 = 240 m

$$\text{Relative speed of train} = 32 + 40 = 72 \times \frac{5}{18} = 20 \text{ m/s}$$

$$\text{Hence Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = \frac{240}{20} = 12 \text{ sec}$$

126. When two trains of speed of 40 km/hr and 32 km/hr respectively are moving in opposite directions, then the fast moving train crosses a person sitting in the slow moving train in 15 seconds. What is the length of fast moving train?

(a) 200 m (b) 300 m
(c) 120 m (d) 100 m

Ans : (b) Speed of first train = 40 km./hr.
Speed of second train = 32 km./hr.
The speed of the train of a person sitting on a slow train = 32 km/hr.
On the opposite direction,
Relative Speed = 40 + 32 = 72 km/hr.

$$= 72 \times \frac{5}{18} = 20 \text{ m/s}$$

Hence the length of train = 20 × 15 = 300 m.

127. Two train, one 153 metre long and second 127 metre long coming from the opposite directions crossed each other in 7.2 seconds. What will be the combined speed of both the trains in km/hr?

(a) 70 km/hr (b) 140 km/hr
(c) 105 km/hr (d) 280 km/hr

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (b) Total distance travelled = 153 + 127 = 280 m
Time taken by trains to cross each other = 7.2 seconds

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{280}{7.2} = \frac{2800}{72} \text{ m./sec.}$$

On changing m/sec to km/h

$$= \frac{2800}{72} \times \frac{18}{5} = 140 \text{ km/hr.}$$

128. The distance between two stations is 380 km from these stations two trains run together on the parallel track to cross each other. In these one train speed is 7 km/hr is more than the other. If the distance between the train is 126 km after 2 hours from starting then what is the speed of each train?

(a) 75 km/hr, 82 km/hr
(b) 55 km/hr, 62 km/hr
(c) 58 km/hr, 65 km/hr
(d) 67 km/hr, 60 km/hr

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (d) Let the speed of first train is x km/hr.
∴ Speed of second train = (x + 7) km./hr.
Distance travelled by both trains in 2 hours
= 380 – 126 = 254

$\Rightarrow$ 2x + 2 (x + 7) = 254
$\Rightarrow$ 2x + 2x + 14 = 254
$\Rightarrow$ 4x = 240
$\Rightarrow$ x = 60 km./hr.

Hence speed of first train = x = 60 km/hr.
Speed of second train = (x + 7) km/hr.
= (60 + 7) = 67 km/hr.

129. Two trains, one whose length is 210 metre and second whose lengths is 250 metre are moving with speed of 130 km/hr and 110 km/hr on the parallel tracks respectively. If they are moving in opposite direction, then how much time will be taken by them to cross each other completely?

(a) 6.9 seconds (b) 6.3 seconds
(c) 6.6 seconds (d) 6.1 seconds

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (a)
Sum of length of both trains = 210 + 250 = 460 m
If both trains move in opposite direction, then the sum of their speed = 130 + 110 = 240 km/hr

$$\text{or } 240 \times \frac{5}{18} \text{m/s} = \frac{200}{3} \text{m/s}$$

Time taken to cross each other $= \frac{\text{Distance}}{\text{Speed}}$

$= \frac{460}{200} \times 3$

$= 2.3 \times 3 = 6.9$ sec

130. Two trains one of 144.5 metre long and other of 165.5 metre long coming from opposite direction takes 9.3 seconds to cross each other. Per hour the combined speed of the trains will be.

(a) 120 km (b) 130 km

(c) 115 km (d) 125 km

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (a)

Distance = length of first train + length of second train

= 144.5 + 165.5 = 310.0 m.

Time = 9.3 seconds

Required Speed $= \frac{\text{Distance}}{\text{Time}}$

$= \frac{310}{9.3} = \frac{100}{3}$ m./sec.

On converting to km/hr $= \frac{100}{3} \times \frac{18}{5} = 120$ km/h

131. A 350 metre long train is moving with speed of 54 km/hr. How much time will be taken to cross a man running from the opposite direction of the train with a speed of 9 km/hr.

(a) 20 seconds (b) 6 seconds

(c) 12 seconds (d) 15.6 seconds

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (a) : Note– 1. When train and person move in the same direction, the speed of the train relative to the person.

= speed of train − speed of person

2. When train and person move in the opposite direction, the speed of the train relative to the person = speed of train + speed of person

According to the question,

Speed in opposite direction = (54 + 9) km/hr.

$= \left[63 \times \frac{5}{18}\right] = \frac{35}{2}$ m./sec.

Time taken to cover 350 meter distance at the speed of $\frac{35}{2}$ m./sec.

$= \frac{350}{\frac{35}{2}} = \frac{350 \times 2}{35} = 20$ seconds.

132. A train departs at 5 am from Patna and arrives Bhopal at 9 am second train departs at 6:30 am from Bhopal and arrives at 10:00 am at Patna. Both train meet at what time?

(a) 7:55 pm. (b) 7:55 am.

(c) 7:40 am. (d) 7:40 pm.

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (c) Let the total distance = x km.

Speed of train running from Patna $= \frac{x}{4}$ km/h

Distance travelled in 1:30 hours $= \frac{x}{4} \times \frac{3}{2} = \frac{3x}{8}$ km

Remaining Distance $= x - \frac{3x}{8} = \frac{5x}{8}$ km

To cover the remaining distance–

Relative speed $= \frac{2x}{7} + \frac{x}{4} = \frac{15x}{28}$ km/hr

Time to meet $= \frac{\frac{5x}{8}}{\frac{15x}{28}} = \frac{5 \times 28}{15 \times 8} = \frac{7}{6}$ hours

Hence time to meet = 6:30 + 1: 10 = 7: 40 am

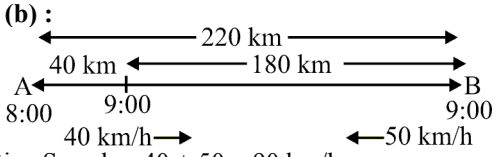
133. At 8 am, a train starts its journey from station A to B at a speed of 40 km/hr 1 hour later another train starts from station B towards station A at a speed of 50 km/hr. If both stations are at a distance of 220 km, then at what time will they cross each other?

(a) 10:30 am (b) 11:00 am

(c) 10:00 am (d) 11:30 am

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) :



Relative Speed = 40 + 50 = 90 km/hr

The time taken by both trains to meet $= \frac{180}{90} = 2$ hours

∴ Both train will cross each other = (9:00+2:00) am

= 11:00 am

134. Two trains, one 150 m long and the other 130 m long, coming from opposite directions crossed each other in 7.2 seconds. The sum of speed of the two trains per hour would then be:

(a) 105 km/h (b) 70 km/h

(c) 280 km/h (d) 140 km/h

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (d) Let the sum of speed of both trains = x km/hr.

According to the question,

Sum of speed of both trains

$= \frac{\text{Sum of length of both trains}}{\text{taken time to cross}}$

$x \times \frac{5}{18} = \frac{150+130}{7.2}$

$5x = \frac{2800}{4}$

$x = \frac{2800}{20}$

x = 140 km/hr

Type - 8

135. A train goes from A to B at a speed of 20 km/h and returns from B to A by the same route at 30 km/h. The average speed (in km/h) of the train during the two-way journey is:

(a) 24 (b) 23

(c) 25 (d) 22

RRB GROUP-D–14/09/2022 (Shift-II)

Ans. (a) : Average Speed $= \frac{2xy}{x+y}$

$= \frac{2\times20\times30}{20+30} = 24\text{km/h}$

136. A train travels at a speed of 30 km/h for 6 hours and at 45 km/h for 4 hours. What is the average speed of the train during these 10 hours?

(a) 35 km/h (b) 36 km/h

(c) 40 km/h (d) $37\frac{1}{2}$ km/h

RRB Group-D 19-09-2022 (Shift-III)

Ans. (b) : Travel distance $(d_1) = 30 \times 6 = 180$ km

Travel distance $(d_2) = 45 \times 4 = 180$ km

Avg. Speed $= \frac{\text{Total distance}}{\text{Total time}} = \frac{180+180}{6+4}$

$= 36$ km/h

137. An express train travelled at an average speed of 100 km/h stopping for 3 min after every 75 km. How much time it took the express train to travel 600 km?

(a) 370 min (b) 381 min

(c) 384 min (d) 308 min

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (b) : $\frac{600}{75} = 8$ times

Then train will stop $= (8-1) = 7$ times

Total time = Distance/speed

$= 600/100 = 6$ hours

$= (6\times60+7\times3)\text{min}$

$= 360+21 = 381\text{minutes}$

138. If a train runs at an average speed of 42 km/h, then it covers a certain distance in 45 min. What is the speed at which the train must run to reduce the time of the same journey to 35 min?

(a) 52.5 km/h (b) 49 km/h

(c) 52 km/h (d) 54 km/h

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (d) : The average speed of train $= 42$km/h

Time $= \frac{45}{60} = \frac{3}{4}$ h

Distance = Speed × Time

$= 42\times\frac{3}{4} = \frac{21\times3}{2}$

To cover the same distance in 35 minutes,

Speed of Train $= \frac{63\times60}{2\times35}$

$= 9\times6$

$= 54$ km/h

139. The uninterrupted average speed of a train is 45 km/hr and the interrupted average speed is 36 km/hr. Find the average speed of the train of its stoppages?

(a) 9 (b) 15

(c) 12 (d) 10

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (c) According to the question,

Average time to stop the train $= \frac{45-36}{45}\times60$

$= \frac{9}{45}\times60 = 12$ minute

140. The distance between two stations is 100 km. A train covers the distance at 80 km/hr going and while returning it covers the distance at 3/4 speed of previous speed. What is the average speed of the train?

(a) 68.5 km/h (b) 68.6 km/h

(c) 70.3 km/h (d) 70.4 km/h

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (b) From average speed of train $= \frac{2ab}{a+b}$,

$a = 80\text{km/hr}$ $b = 80\times\frac{3}{4} = 60\text{km/hr}$ (given)

Average speed of train $= \frac{2\times80\times60}{80+60}$

$= \frac{2\times80\times60}{140} = \frac{9600}{140}$

$= 68.6\text{ km/hr}$

141. A train crosses a 155 metre long platform in 16 seconds and a 195 metre long platform in 18 seconds. What is the average speed of train?

(a) 66 km/h (b) 72 km/h

(c) 75 km/h (d) 69 km/h

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (b)

Let the length of train is *l* metre and speed of train = x m./sec.

$l + 155 = x \times 16$ ..... (i)

$l + 195 = x \times 18$ ..... (ii)

From equation (i) ÷ equation (ii)

$\frac{l+155}{l+195} = \frac{16x}{18x}$

$\frac{l+155}{l+195} = \frac{8}{9}$

$9l + 1395 = 8l + 1560$

$l = 165$ metre

from equation (i),

$x = \frac{l+155}{16} = \frac{165+155}{16} = 20$ metre/ second

$= 20\times\frac{18}{5} = 72$ km/hr.

142. A train moves 1 km an uniform speed of 240 km/hr and next 1 km at 80 km/hr. What is the average speed of train?

(a) 160 km/hr (b) 180 km/hr
(c) 120 km/hr (d) 200 km/hr

RRB NTPC 03.04.2016 Shift : 3

Ans : (c) Average speed of train $= \frac{2ab}{a+b}$

$= \frac{2\times240\times80}{240+80} = \frac{2\times240\times80}{320}$

= 120 km./hr.

143. A train covers first 40 km of distance at 80 km/hr and second 30 km of distance in 60 km/hr. Then find its average speed?

(a) 62 km/hr (b) 64 km/hr
(c) 65 km/hr (d) 70 km/hr

RRB NTPC 27.04.2016 Shift : 2

Ans : (d)

$\left[\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total Time}}\right]$

Average speed = $\frac{40+30}{\frac{40}{80}+\frac{30}{60}} = \frac{70}{\frac{1}{2}+\frac{1}{2}} = \frac{70}{1}$

Average Speed = 70 km/hr.

Type - 9

144. A train covered a certain distance at a uniform speed. If the train had been 12 km/h faster, it would have taken 8 hours less than the scheduled time. If the train were slower by 12 km/h, the train would have taken 12 hours more than the scheduled time. Find the length of the journey (in km).

(a) 1480 (b) 2860
(c) 2880 (d) 1440

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Let the speed of the train be x km/h and the time has taken by t hour.

Total distance = xt km

Case- I

Speed increases by 12 km/h and the time taken reduces by 8 hours.

Then distance = (x + 12) (t – 8)

$\Rightarrow$ xt = (x + 12) (t – 8)

$\Rightarrow$ xt = xt – 8x + 12t – 96

$\Rightarrow$ –8x + 12t = 96 ..... (i)

Case- II

Speed deceases by 12 km/h and the time taken increases by 12 hours

Then distance = (x – 12) (t + 12)

$\Rightarrow$ xt = (x – 12) (t + 12)

$\Rightarrow$ xt = xt + 12x – 12t – 144

$\Rightarrow$ 12x – 12t = 144 ..... (ii)

From eq (i) and (ii) -

x = 60

On putting the value of x in equation (i)

Then t =48

Hence, the length of the journey = xt

= 60 × 48

= 2880 km

145. A train completes a journey in 8 hours, the first half of the journey is completed at 45 km/hr and the second half of the journey is completed at 55 km/hr. What was the total distance of the journey?

(a) 395 km (b) 296 km
(c) 396 km (d) 391 km

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (c) From Average Speed $= \frac{2a.b}{a+b}$,

$= \frac{2\times45\times55}{45+55} = 49.5\,\text{km/hr}$

Total taken time = 8 hours

Total Distance = Time × Speed

= 8 × 49.5 = 396 km

146. A man travelling in a train notices that he can count 21 telephone posts in 1 min. If the poles are 50 m apart, then at what speed is the train travelling?

(a) 60 km/h (b) 21 km/h
(c) 50 km/h (d) 65 km/h

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (a) : The distance between 21 telephones poles = 20 × 50 = 1000 m

Time taken to cross the poles = 1 min

= 60 sec

$\therefore$ Speed of train $= \frac{1000}{60}\frac{\text{m}}{\text{s}}$

$= \frac{1000}{60}\times\frac{18}{5}$ km/h

= 60 km/h

147. How many poles will be covered by train in 4 hours if the train is running at a speed if 45 km/hr, given that the poles on the railway track are 50 m apart and the train crosses a pole at the beginning of its journey.

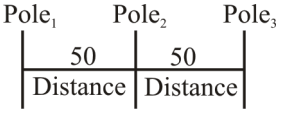
(a) 3606 (b) 3636
(c) 3600 (d) 3601

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (d) : Speed of train = 45km/h, Time = 4h

$\because$ Distance = Time × Speed

= 4 × 45 = 180 km.



$\because$ Distance between two poles = 50 m.

180 km × 1000 m = 180000 m

Poles = $\frac{180000}{50}$ = 3600

At the end one pole is more because train has crossed a pole at the beginning of the journey.

Hence, total number of pole crossed by train.

3600 + 1 = 3601 Poles

148. Excluding stoppage station, the speed of a train is 60 km/h and including stoppage station it travels at a speed of 45 km/h. For how many minutes does the train stop per hour?

(a) 15 mins (b) 30 mins

(c) 10 mins (d) 20 mins

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : Excluding stoppage station, speed of train = 60 km/h

Including stoppage speed of train = 45 km/h

According to the question,

$$\text{Train stop per hour} = \frac{60-45}{60}\times 60$$

$$= \frac{15}{60}\times 60 = 15 \text{ minutes}$$

149. A train covers a certain distance at a speed of 240 km/h in 5 hours. If a flight has to cover the same distance in 45 mins, it must travel at a speed of:

(a) 1250 km/h (b) 1600 km/h

(c) 1440 km/h (d) 1200 km/h

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let the speed of flight is *x* km/h.

According to the question,

$$5 \times 240 = x \times 45 \times \frac{1}{60}$$

$$x = \frac{5\times 240\times 60}{45}$$

$$x = 1600 \text{ km/h}$$

150. Two trains of length 200 m and 400 m run on parallel lines. When they run in the same direction, it take 30 seconds for the train with the higher speed to overtake the other train, and when they travel in the opposite directions, it takes them 6 seconds to cross each other. What are the speeds (in km/h) of the two trains?

(a) 216 and 144 (b) 190 and 260

(c) 280 and 140 (d) 184 and 144

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (a) : Let the velocity of first train v_1 and second train is v_2.

According to the question,

$$30 (v_1 - v_2) = 6 (v_1 + v_2)$$

$$5 v_1 - 5v_2 = v_1 + v_2$$

$$\frac{v_1}{v_2} = \frac{6}{4} = \frac{3}{2}$$

$$v_1 : v_2 = 3 : 2$$

$\therefore$ Let the velocities of two trains be 3a & 2a.

When they are moving in opposite direction.

$$\frac{200+400}{5a} = 6$$

$$a = \frac{600}{30} = 20\times\frac{18}{5} = 72 \text{km/h}$$

Velocity of Ist train = 3 a = 3×72 = 216 km/h

Velocity of IInd train = 2 a = 2 × 72 =144 km/h

151. A train running at 70 km/h passes a person riding parallel to the railway line moving in the opposite direction in 2 seconds. If the rider goes in the same direction, the train takes 5 seconds to pass him. What is the speed of the rider?

(a) 30 km/h (b) 20 km/h

(c) 40 km/h (d) 60 km/h

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let the speed of rider be x km/h

According to the question,

$$2\text{sec} = \frac{\ell}{(70+x)} \text{ ——— (i)}$$

and, $$5\text{sec} = \frac{\ell}{(70-x)} \text{ ——— (ii)}$$

From eq (i) and eq (ii)–

$$2 (70 + x) = 5 (70 - x)$$

$$140 + 2x = 350 - 5x$$

$$7x = 350 - 140$$

$$7x = 210 \Rightarrow x = 30 \text{ km/h}$$

152. The speeds of three trains are in the ratio of 2 : 3 : 5. The amount of time taken by these trains to travel the same distance is in the ratio of :

(a) $\frac{1}{2}:\frac{1}{3}:\frac{1}{5}$ (b) $6:12:18$

(c) $2:3:4$ (d) $2:3:5$

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (a) : We know that,

When the distance is equal, ratio of times is inversely proportional to ratio of speeds.

Ratio of speeds = 2:3:5

$$\text{Ratio of times} = \frac{1}{2}:\frac{1}{3}:\frac{1}{5}$$

153. A train starts at a speed of 40 km/h. Its speed increases every 1 h by 20 km/h. How much time does it take to cover a distance of 470 km?

(a) 4 h 30 min (b) 5 h 30 min

(c) 6 h (d) 6 h 30 min

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

Speed of train = 40 km/h

According to the question,

Speed of train in second hour = 60 km/h

Speed of train in third hour = 80 km/h

Speed of train in fourth hour = 100 km/h

Speed of train in fifth hour = 120 km/h

Speed of train in sixth hour = 140 km/h

Distance travelled in 5 hours = 40+60+80+100+120 = 400km

Remaining Distance = 470 – 400 = 70 km

Hence, Time taken to cover a distance of 70 km at a speed of 140 km/h

$$70\times\frac{60}{140} = 30 \text{ min}$$

Hence total time taken to cover a distance of 470 km = 5 hours 30 minutes.

154. The ratio of the speed of two trains is 3:4. If the second train covers a distance of 300 km in 3 hours then what will be the speed of first train?

(a) 100 km/hr (b) 50 km/hr
(c) 70 km/hr (d) 75 km/hr

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (d) Let the speed of trains is 3x and 4x km/hr respectively.

$\therefore \quad 4x = \frac{300}{3}$

$4x = 100$

$x = 25$

$\therefore$ Speed of first train = $3 \times 25 = 75$ km./hr.

155. Prithvi is going to Delhi by Rajdhani express, which is running late by six minutes. The driver increased its speed by 4 km/hr. The train reaches the next station which is 36 km far at the correct time. What is the original speed of the train?

(a) 20 km/hr (b) 36 km/hr
(c) 30 km/hr (d) 26 km/hr

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (b) According to the question,
Let the real speed of train is x km/hr.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\frac{36}{x} - \frac{36}{x+4} = \frac{6}{60}$$

$$36\left(\frac{x+4-x}{x^2+4x}\right) = \frac{1}{10}$$

$x^2 + 4x - 1440 = 0$

$x^2 + 40x - 36x - 1440 = 0$

$x(x + 40) - 36(x + 40) = 0$

$(x + 40)(x - 36) = 0$

$x - 36 = 0 \Rightarrow x = 36$ km/h

156. After an accident a train moves with 4/5 of its speed due to which it reaches 30 minute late. Find the original time after the accident region?

(a) 120 minute (b) 90 minute
(c) 150 minute (d) 60 minute

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (a) Let the speed of train is x km/hr.
and the correct time taken by him is t hour
According to the question,

$$xt = \frac{4x}{5}\left(t + \frac{30}{60}\right)$$

$$t = \frac{4t}{5} + \frac{2}{5}$$

$$\frac{t}{5} = \frac{2}{5}$$

$t = 2$ hours or 120 minute

157. Ratio of the speeds of two trains is 4:5. If the second train covers 800 km in 8 hours then what is the speed of the first train?

(a) 95 km/hr (b) 85 km/hr
(c) 75 km/hr (d) 80 km/hr

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) Let the speed of first and second train is 4x, 5x km/h respectively.

$\because \quad \text{Speed} = \frac{\text{Distance}}{\text{Time}}$

$5x = \frac{800}{8}$

$5x = 100$

$x = 20$

Hence speed of first train = $4x = 4 \times 20 = 80$ km/h

158. Train P and Q are moving on a parallel track in the same direction. Train P crosses train Q completely in 60 seconds and a passenger present in train P crosses train Q in 40 seconds. If the speed of the train is in the 2:1 ratio, then calculate the ratio of their lengths?

(a) 3:4 (b) 1:2
(c) 3:1 (d) 3:2

RRB JE - 23/05/2019 (Shift-III)

Ans : (b) Let the speed of trains is 2x and x.
and the length of trains is l_1 and l_2

same direction
P ⟶ ⟶ Q
(2x–x) Relative speed

same direction
P ⟶ ⟶ Q
(2x–x) Relative speed

From first condition-

$$60 = \frac{l_1 + l_2}{2x - x}$$

$60x = l_1 + l_2$ ...(i)

From second condition-

$$40 = \frac{l_2}{2x - x}$$

$40x = l_2$ ....(ii)

$l_1 = 60x - l_2$

$= 60x - 40x$

$= 20x$

$l_1 : l_2 = 20x : 40x$

$l_1 : l_2 = 1 : 2$

159. A train crosses a pole in 20 seconds and it crosses a cycling man whose speed is 5 km/hr coming from the opposite direction in 18 seconds. Find the speed of the train?

(a) 40 km/hr (b) 62 km/hr
(c) 45 km/hr (d) 65 km/hr

RRB JE - 31/05/2019 (Shift-II)

Ans : (c) Let the speed of train = x km./hr.
Distance covered to cross the pole in 20 seconds

$$= \frac{x \times 20}{3600}\text{ km} = \frac{x}{180}\text{ km}$$

Speed of cycle = 5 km./hr.

Speed of cycle + Speed of train = (x + 5) km./hr.

Distance covered to cross the cycle = $\frac{(x+5)\times 18}{3600}$ km.

$$\frac{(x+5)\times 18}{3600} = \frac{x}{180}$$

$18x + 90 = 20x$

$2x = 90$

$x = 45$ km/hr.

20.

Boat & Stream

Type - 1

1. A driver rowing at the speed of 3 km/h still water takes double the time going 50 km upstream compared to going 50 km downstream. The speed of the stream is:

(a) $\frac{4}{3}$km/h (b) 3km/h

(c) $\frac{7}{3}$km/h (d) 1km/h

RRB GROUP-D – 16/09/2022 (Shift-I)

Ans. (d) : Let the speed of stream = x km/h

Formula- Time = Distance /Speed

According to the question,

$$\frac{50}{3-x}=\frac{50}{3+x}\times 2$$

$6 - 2x = 3 + x$

$3x = 3$

$\boxed{x = 1\text{km/h}}$

2. The speed of a boat in still water is 14 km/h. It goes 28 km downstream in 1 h 45 min. Find the speed of the stream.

(a) 2 km/h (b) 7 km/h

(c) 12km/h (d) 16km/h

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let the speed of the stream be x km/h.

$$1\text{h } 45\text{min}=1+\frac{45}{60}=1+\frac{3}{4}=\frac{7}{4}\text{h}$$

According to the question –

$$14+x=\frac{28}{7/4}$$

$14 + x = 16$

$x = 2\text{km/h}$

Hence, Speed of the stream is 2 km/h.

3. A motor boat, whose speed is 11 km/h in still water, goes 28 km downstream in 2 h 20 min. Find the speed of the stream.

(a) 12 km/h (b) 10 km/h

(c) 1 km/h (d) 11 km/h

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given–

Speed of boat = 11 km/h in still water

Distance = 28 km

Time = 2 h 20 min = $\frac{7}{3}$h

Let the speed of the stream = x km/h

According to the question –

$$\frac{28}{11+x}=\frac{7}{3}$$

$11 + x = 12$

$\boxed{x = 1\text{ km/h}}$

Hence, the speed of the stream is 1km/h.

4. In still water the speed of a boat is 11 km/hr. If the boat covers 19 km in 2 hours in upstream. Find the speed of the stream.

(a) 20.5 km/hr. (b) 11.5 km/hr.

(c) 1.5 km/hr. (d) 3 km/hr.

RRB NTPC 29.04.2016 Shift : 1

Ans : (c) Speed of boat in still water = 11 km./hr.

Distance travelled by boat in the 2 hours in upstream = 19 km.

Speed of boat in the upstream = $\frac{19}{2}$ km/hr.

$$\text{Speed of stream } = 11-\frac{19}{2}=\frac{22-19}{2}$$

$$=\frac{3}{2}=1.5\text{ km/hr.}$$

5. Suresh covers a distance of 34 km in the direction of a river in 4 hours 15 minutes by a luxury boat and 19 kilometers in the opposite direction of a river in 3 hours 10 minutes. As present what is the speed of the flow of river?

(a) 3 km./hr. (b) 2 km./hr.

(c) 1 km./hr. (d) 5 km./hr.

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (c) Let the speed of luxury boat is x km/hr. and speed of stream is y km/hr.

$$x+y=\frac{34}{4\frac{15}{60}}=\frac{34\times 4}{17}$$

$\Rightarrow$ $x + y = 8$ .....(i)

$$x-y=\frac{19}{3\frac{10}{60}}=\frac{19\times 6}{19}$$

$\Rightarrow$ $x - y = 6$ .....(ii)

From equation (i) & equation (ii)

$2y = 2 \Rightarrow y = 1$

Hence, the speed of the flow of river is 1 km/h

6. The speed of a man in still water is 28/3 km/h. He takes three times the time taken in the upstream, as in downstream. What is the velocity of the current or the stream.

(a) 16/3 km./hr. (b) 20/3 km./hr.
(c) 6 km./hr. (d) 14/3 km./hr.

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (d) Let the velocity of stream = R km/h
Man's movement in still water = (28/3) km/h
According to the question,
Time taken in the upstream
= 3× time taken in the downstream

$$\frac{d}{\frac{28}{3}-R}=3\times\frac{d}{\frac{28}{3}+R} \qquad \left\{t=\frac{d}{v}\right\}$$

$$\frac{28}{3}+R=3\times\left(\frac{28}{3}-R\right)$$

$$\frac{28}{3}+R=28-3R$$

$$4R=28-\frac{28}{3}$$

$$4R=\frac{56}{3}$$

$$R=\frac{14}{3}\text{km/h}$$

7. A sailor travels a distance of 24 km in the upstream and 36 km in the downstream and takes 6 hours each time. Find the speed of the stream.

(a) 2 km./hr. (b) 4 km./hr.
(c) 1 km./hr. (d) 3 km./hr.

RRB JE - 26/05/2019 (Shift-II)

Ans : (c) According to the question,
Speed of boat = B km/hr
Speed of stream = W km/hr
Speed of boat in the downstream = (B+W) km/hr
Speed of boat in the upstream = (B–W) km/hr

Speed of boat in downstream (B+W) $=\frac{36}{6}$

B + W = 6 km/h ..... (i)
Speed of boat in upstream

$$B-W=\frac{24}{6}$$

B – W = 4 km/h ..... (ii)
On adding equation (i) and (ii)
B + W = 6
B – W = 4
2B = 10
Speed of boat B = 5 km/h
B + W = 6
5 + W = 6
Speed of stream W = 1 km/h

8. A boat takes 2 hours to travel 16 km in the downstream and 4 hours to cover the same distance in the upstream. Find the speed of the current.

(a) 12 km./hr. (b) 2 km./hr.
(c) 4 km./hr. (d) 6 km./hr.

RRB JE - 29/05/2019 (Shift-II)

Ans : (b) Let speed of stream = R km/hr
Speed of Boat = B km/hr
Speed of boat in downstream–

$$B+R=\frac{16}{2}=8\text{km/hr} \qquad \text{.....(i)}$$

Speed of boat in upstream–

$$B-R=\frac{16}{4}=4\text{km/hr} \qquad \text{.....(ii)}$$

On adding equation (i) and (ii)–
B + R + B – R = 8 + 4
2B = 12
B = 6 km/h
On putting value of B in eq^{n} (i)
$6+R=8$
∴ R = 2 km/hr
Hence, speed of current (R) = 2 km/h

9. A boat, whose speed in still water is 15 km/hr. goes 30 km in the downstream in 4.5 hours and returns in the upstream. Find the speed of the stream.

(a) 4 km./hr. (b) 5 km./hr.
(c) 10 km./hr. (d) 6 km./hr.

RRB RPF SI – 10/01/2019 (Shift-I)

Ans : (b) Let the speed of stream = x km/hr.
Speed of boat in the downstream = (15+x) km/hr.
Speed of boat in the upstream = (15 –x) km/hr.
According to the question,

$$\frac{30}{(15+x)}+\frac{30}{(15-x)}=4.5$$

$$\frac{450-30x+30x+450}{(15+x)(15-x)}=4.5$$

$$\frac{900}{225-x^2}=4.5$$

$$\frac{200}{225-x^2}=1$$

$200 = 225 - x^2$
$x^2 = 25$
x = 5 km/hr.
Hence, the speed of stream 5km/h.

10. A boat's speed in still water is 20 km/hr. If the boat covers a distance of 20 km in the upstream in 4 hours, find the speed of the current.

(a) 20 km/hr (b) 15 km/hr
(c) 25 km/hr (d) 30 km/hr

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (b) Speed of boat in still water (a) = 20 km/hr

Speed of boat in the upstream $=\frac{20}{4}=5$ km/hr

Let the speed of stream is b km/hr.
According to the question,
Speed of boat in the upstream = (a–b) km/hr
∴ 5 = 20 – b
b = 20 – 5
b = 15
Hence speed of stream = 15 km/hr

11. The speed of a boat is 12 km/hr. in still water. If the boat covers a distance of 38 km in the opposite direction of the stream of water in 4 hours, then the speed of the stream is in km/hr.

(a) 3 (b) 2.5
(c) 3.17 (d) 6.5

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (b) Let the speed of stream = x km/hr,
Speed of boat in still water = 12 km/hr
Then speed in upstream = (12–x) km/hr

$$\text{Speed in upstream} = \frac{38}{4} = 9.5 \text{ km/hr}$$

$\therefore \quad 9.5 = 12 - x$
$x = 12 - 9.5$
$x = 2.5$
Hence speed of stream = 2.5 km/hr

12. 15 hours is taken by a boat to reach its destination in still water and return to its starting point from there. The same journey requires 16 hours if the river flows. The difference between the speed of boat and the river is 15 km/hr. Find the speed of the flow of river.

(a) 10 km./hr. (b) 6 km./hr.
(c) 4 km./hr. (d) 5 km./hr.

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (d) : Let the distance between both places = D km
And speed of stream = x km/hr
$\therefore$ Speed of boat = (15 + x) km/hr
According to the question,
The time it took to come and go from the boat in still water = 15 hours

$$\frac{2D}{x+15} = 15 \qquad \text{.....(i)}$$

and the time it took to come and go when the water flowed = 16 hours

$$\frac{D}{x+15+x} + \frac{D}{x+15-x} = 16$$

$$\frac{D}{15+2x} + \frac{D}{15} = 16 \qquad \text{.....(ii)}$$

On solving equation (i) and (ii)
D = 150 km
and x = 5 km/h

13. A rower takes 16 hours to rowed 100 km upstream, while it takes only 10 hours to travel the same distance with the flow of the stream. What is the speed of the stream.

(a) 6.625 km/h (b) 1.875 km/h
(c) 6.25 km/h (d) 8.125 km/h

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (b) Let the speed of boat = x km/h
And speed of stream = y km/h
According to the question,

$$x - y = \frac{100}{16} = \frac{25}{4} \qquad \text{.....(i)}$$

$$x + y = \frac{100}{10} = 10 \qquad \text{.....(ii)}$$

By solving equation (i) and (ii)
x = 8.125
y = 1.875
Hence speed of stream = 1.875 km/h

14. In stagnant water the speed of a boat is 20 km/hr. The boat travels 364 kilometers down the stream and then travels in the opposite direction to its begining point. Time taken by the journey is 40 hours. What is the speed of the current?

(a) 10 km/hr (b) 8 km/hr
(c) 4 km/hr (d) 6 km/hr

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (d) Let the speed of stream = x km/hr
Speed in the downstream = (20 + x) km/hr
Speed in the upstream = (20 – x) km/hr
According to the question,

$$\frac{364}{20+x} + \frac{364}{20-x} = 40$$

$$\frac{20-x+20+x}{(20-x)(20+x)} = \frac{40}{364}$$

$(20 - x)(20 + x) = 364$
$400 - x^2 = 364$
$36 - x^2 = 0$
$x^2 = 36$
$x = \pm 6$
Hence, the speed of stream = 6 km/h

15. Every 5 hours a person swims 4 km upstream and 16 km in the downstream. Find the speed of stream.

(a) 2.2 km/h (b) 3.2 km/h
(c) 1.2 km/h (d) 1.5 km/h

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (c) According to the question,

$$\text{Speed in the downstream (a)} = \frac{16}{5} \text{ km/h}$$

$$\text{Speed in the upstream (b)} = \frac{4}{5} \text{ km/h}$$

$$\text{Speed of stream} = \frac{a-b}{2} = \frac{\frac{16}{5} - \frac{4}{5}}{2}$$

$$= \frac{\frac{12}{5}}{2} = \frac{12}{10} = 1.2 \text{ km/h}$$

16. A swimmer swimming in stagnant water at a speed of 9 km/hour and given that the time taken by him to cover a certain distance in the direction of the flow is half the time taken to cover the same distance in the direction opposite the flow of water. Find the speed of water.

(a) 10 km/hr (b) 3 km/hr
(c) 5 km/hr (d) 8 km/hr

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (b) Let the speed of water is x km/hr and the distance travelled by swimmer is D km.
And the time taken to cover the distance D km in the direction against the stream = t hr.
According to the question,

$D = (9 - x) \times t$ .....(i)

$$D = (9+x) \times \frac{t}{2} \qquad \text{.....(ii)}$$

From equation (i) and (ii)

$\Rightarrow (9-x)t = (9+x)\frac{t}{2}$

$18 - 2x = 9 + x$

$3x = 9,\ x = 3$ km/hr

17. It takes 12 hours for a sailor to cover a distance of 75 km in upstream while it takes only 7.5 hours to cover that distance in the downstream. What is the speed of the stream?

(a) 6.625 km./hr. (b) 6.25 km./hr.
(c) 8.125 km./hr. (d) 1.875 km./hr.

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (d) : Let the speed of boat = x km/hr
Speed of stream = y km/hr
Total distance = 75 km
Speed in the upstream,

$$\frac{75}{x-y} = 12$$

$$x - y = \frac{75}{12} = 6.25 \quad \text{.....(i)}$$

Speed in the downstream,

$$\frac{75}{x+y} = 7.5$$

$$x + y = 10 \quad \text{.....(ii)}$$

On adding equation (i) & equation (ii)

$$2x = 16.25$$

$$x = 8.125$$

Hence from equation (i)

$$x - y = 6.25$$

$$8.125 - y = 6.25$$

$$y = 8.125 - 6.25$$

$$y = 1.875\,\text{km/hr}$$

18. Ramu can ride a boat at 9 km/hr, speed in still water. It take twice the time to go in the opposite direction of the stream than going in the direction of the stream. Find the speed of the stream.

(a) 16 km./hr. (b) 8 km./hr.
(c) 3 km./hr. (d) 9 km./hr.

RRB NTPC 16.04.2016 Shift : 1

Ans : (c) Speed of boat in still water = 9 km/hr.
Speed of stream = x km/hr.
And distance = d km.
Speed of boat in the downstream = (9+x) km/hr.
Speed of boat in the upstream = (9 – x) km/hr.

From $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$

$$\Rightarrow \frac{d}{9+x} \times 2 = \frac{d}{9-x}$$

$$\Rightarrow 18 - 2x = 9 + x$$

$$= 3x = 9$$

$$x = 3$$

Hence speed of stream = 3 km/hr.

19. A man can ride a boat at a speed of 4 km/hr. He founds that the time taken to travel in the opposite direction of the stream is double the time it takes to travel in the direction of the flow of the stream. Find the speed of the stream.

(a) 1.5 (b) 1.3
(c) 2 (d) 1

RRB NTPC 27.04.2016 Shift : 1

Ans : (b) Let the speed of stream = x km/hr.
Speed of boat in the downstream = (4+x) km/hr.
Speed of boat in the upstream = (4-x) km/hr.

$\because$ $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$

$$\frac{d}{4-x} = \frac{2d}{4+x}$$

$$4 + x = 8 - 2x$$

$$3x = 4$$

$$x = 1.3\,\text{km/hr.}$$

20. A person travels a distance of 16 km in two hours in the downstream. If he travels half the distance in the upstream in the same time, then find the speed of the stream.

(a) 4 km./hr. (b) 2 km./hr.
(c) 3 km./hr. (d) 1 km./hr.

RRB NTPC 27.04.2016 Shift : 3

Ans : (b) Let the speed of stream is x km/hr. and speed of man is y km/hr.
Speed of man in the downstream = (x+y) km/h
Speed in the upstream = (y–x) km/h
According to the question,

$$x + y = \frac{16}{2} \quad \Rightarrow x + y = 8\text{.....(i)}$$

$$y - x = \frac{8}{2} \quad \Rightarrow y - x = 4\text{.....(ii)}$$

On subtracting equation (ii) from equation (i)

$2x = 4 \Rightarrow x = 2$ km/h

Type - 2

21. Raju travels 150 km in 7.5 hours moving downstream. The speed of the stream is 5 km h. Find the speed with which Raju should row the boat to reach back in the same time.

(a) 10 km/h (b) 18 km/h
(c) 25 km/h (d) 7.5 km/h

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) :
Let Raju increases his upstream speed by x km/h to return in the same time

$$\text{Speed of Raju in downstream} = \frac{150}{7.5} = 20\,\text{km/h}$$

$\therefore$ Speed of stream = 5 km/h.

$\therefore$ Speed of Raju in still water = 20 – 5 = 15 km/h

Speed of Raju in upstream = 15 – 5 = 10 km/h

According to the question,

$$\therefore (10 + x) = \frac{150}{7.5}$$

$x = 20 - 10$

$x = 10$ km/h.

Hence speed of Raju = (15 + 10) km/h
= 25 km/h.

22. The speed of a stream is 4 km/h. A boat can go 40 km downstream and 12 km upstream in 4 hours. What is the speed (in km/h) of the boat in still water?

(a) 16 (b) 12
(c) 10 (d) 14

RRB Group-D 05/09/2022 (Shift-II)

Ans. (b) : Let the speed of the boat in still water = x km/h

Time = Distance /Speed

According to the question,

$$\frac{40}{x+4}+\frac{12}{x-4}=4$$

or, $$\frac{10}{x+4}+\frac{3}{x-4}=1$$

$$\frac{10x-40+3x+12}{x^2-16}=1$$

$$x^2 - 13x + 12 = 0$$

$$(x - 12)(x - 1) = 0$$

$$(x - 12) = 0 \Rightarrow x = 12 \text{ km/h}$$

23. A boat starting from point P goes downstream to point Q in 3 hours and return back from point Q to the point P in 4 hours. If the speed of the water is 3 km/h, find the speed of the boat in still water.

(a) 20 km/h (b) 32 km/h
(c) 12 km/h (d) 21 km/h

RRB Group-D 22/08/2022 (Shift-III)

Ans. (d) :

Let the speed of the boat in still water = x km/h

Formula- Time = Distance /Speed

According to the question,

$$(x + 3) \times 3 = (x - 3) \times 4$$

$$3x + 9 = 4x - 12$$

$$\boxed{x = 21 \text{ km/h}}$$

24. The speed of a boat in the opposite direction of the flow is 40 km/hr, and in stagnant water 55 km/hr. What will be the speed of boat in the flow direction of the stream.

(a) 75 km./hr. (b) 70 km./hr.
(c) 60 km./hr. (d) 65 km./hr.

RRB NTPC 02.04.2016 Shift : 2

Ans : (b) Let the speed of boat in the downstream = x km/hr

Speed of boat in still water $=\frac{1}{2}$ (speed in the downstream + speed in the upstrem)

$$55=\frac{1}{2}\left(x+40\right)$$

$$110 = x + 40$$

$$x = 110 - 40$$

$$x = 70$$

Hence speed of boat in the downstream = 70 km/hr.

25. A boat covers a distance of 35 km in the direction of the stream in 5 hours and returns in 7 hours. Find the speed of the boat in still water.

(a) 6 km/hr (b) 5.5 km/hr
(c) 10.5 km/hr (d) 7.5 km/hr

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (a) According to the question,

Speed of boat in the downstream = $\frac{35}{5}$ = 7 km/hr

Speed of boat in upstream = $\frac{35}{7}$ = 5 km/hr

Hence speed of boat in still water = $\frac{7+5}{2}$ = 6 km/hr

26. A man's speed in the downstream in 15 km/hr. and the speed of the stream is 2.5 km/hr. Find his speed upstream.

(a) 10 km./hr. (b) 9 km./hr.
(c) 12.5 km./hr. (d) 8.5 km./hr.

RRB JE - 26/06/2019 (Shift-I)

Ans : (a) Let the speed of Man is x km/hr and speed of stream is y km/hr.

Speed of Man in the downstream = (x + y) = 15 km/h

Speed of stream (y) = 2.5 km/h

$$x + y = 15$$

$$x + 2.5 = 15$$

$$x = 12.5 \text{ km/h}$$

Speed of man in the upstream=x–y=12.5–2.5 = 10 km/h

27. A man takes time t_1 and t_2 respectively to travel a certain distance in the upstream and in the downstream. If the speed of the stream is 'y' km/h. Find the speed in still water.

(a) $\left[\frac{(t_1+t_2)2y}{(t_1-t_2)}\right]$ km./hr.

(b) $\left[\left(\frac{t_1-t_2}{t_1+t_2}\right)y\right]$ km./hr.

(c) $\left(\frac{t_1^2-t_2^2}{2y}\right)$ km./hr.

(d) $\left[\frac{(t_1+t_2)}{(t_1-t_2)}y\right]$ km./hr.

RRB JE - 31/05/2019 (Shift-I)

Ans : (d) Let Speed in still water = x km/hr & covered distance = d

Speed of stream = y km/hr

Distance = d km/hr

$$\frac{d}{t_1} = (x - y) \Rightarrow (x - y)t_1 \quad \text{.....(i)}$$

$$\frac{d}{t_2} = (x + y) \Rightarrow (x + y)t_2 \quad \text{.....(ii)}$$

From equation (i) and (ii)-

$$(x - y)\, t_1 = (x + y)\, t_2$$

$$t_1x - t_1y = t_2x + t_2y$$

$$x\,(t_1 - t_2) = y\,(t_1 + t_2)$$

$$x = \frac{y(t_1 + t_2)}{(t_1 - t_2)} \text{ km/hr}$$

28. It takes 8 hours for a rower to cover a distance of 60 km upstream of a river while it takes 5 hours to cover the same distance downstream. What will be the speed of the rower in stagnant water.

(a) 9.25 km/h (b) 9.80 km/h
(c) 9.75 km/h (d) 9.5 km/h

RRB RPF SI – 05/01/2019 (Shift-III)

Ans.(c) Speed of rower in upstream $= \frac{60}{8} = 7.5$ km/hr

Speed of rower in downstream $= \frac{60}{5} = 12$ km/hr

Speed of rower in still water $= \frac{12+7.5}{2} = 9.75$ km/hr

29. Arjun takes 5 hours to swim 40 km in the downstream, where as he only takes 2 hours to swim 24 km in the upstream. Tell his speed of swimming in still water.

(a) 12 km/hr (b) 10 km/hr
(c) 9 km/hr (d) 15 km/hr

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (b) Speed of Arjun in the downstream $= \frac{40}{5} = 8$ km/hr

Speed of arjun in the upstream

$$= \frac{24}{2} = 12 \text{ km/hr}$$

$\therefore$ Speed of Arjun in still water

$$= \frac{12+8}{2} = 10 \text{ km/hr}$$

30. A sailor covers 2 km in the upstream in 1 hour and a distance of 1 km in the downstream in 10 minutes. Find the speed in still water.

(a) 4 km./hr. (b) 2.5 km./hr.
(c) 3 km./hr. (d) 4.5 km./hr.

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (a) Speed of boat = B km/hr

Speed of stream = R km/hr

$\therefore$ The speed of boat in the upstream = (B–R) km/hr

Speed of boat in the downstream = (B+R) km/hr

According to the question,

$$B - R = \frac{2}{1} \quad \text{.....(i)}$$

$$B + R = \frac{1}{\frac{10}{60}} = 6 \quad \text{.....(ii)}$$

On adding equation (i) and equation (ii)

2 B = 8

B = 4

Hence, the speed of boat in still water is 4 km/hr.

Type - 3

31. The speed of a sailor in still water is x km/hr. and the speed of stream is y km/hr. If a person moves a certain distance opposite the stream, and then returns the same distance in the direction of the stream, find his average speed during the journey.

(a) $\frac{x^2+y^2}{xy}$ km./hr. (b) $\frac{x^2-y^2}{2xy}$ km./hr.

(c) $\frac{x^2+y^2}{x}$ km./hr. (d) $\frac{x^2-y^2}{x}$ km./hr.

RRB JE - 29/05/2019 (Shift-II)

Ans : (d) Speed of Sailor = x km/hr.

Speed of stream = y km/hr.

Speed of boat in the downstream (V_1) = (x+y) km/hr.

Speed of boat in the upstream (V_2) = (x-y) km/hr.

$\therefore$ Average Speed $= \frac{2v_1v_2}{v_1+v_2}$,

$$= \frac{2(x+y)(x-y)}{x+y+x-y} = \frac{2\left(x^2-y^2\right)}{2x}$$

$$= \frac{x^2-y^2}{x} \text{ km/hr.}$$

32. A boat covers a distance of 12 km. The distance of first 4 km in the downstream is covered in 15 minutes. The next 8 km is travelled in upstream. The speed of the boat in the downstream is twice the speed of the boat in the upstream. Find the average speed of journey.

(a) 11.6 km./hr. (b) 9.6 km./hr.
(c) 10 km./hr. (d) 10.4 km./hr.

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Time taken to travel the distance of 4 km = 15 minutes.

$\therefore$ Speed $= \frac{4}{\frac{15}{60}} = 16 \text{ km/hr}$

According to the question,

Speed of boat in the upstream

$$= \frac{16}{2} = 8 \text{ km/hr}$$

Remaining distance = 12 – 4 = 8 km

Time taken to travel the distance of 8 km at the speed of 8 km/hr $= \frac{8}{8} = 1$ hr.

$\because$ Average Speed $= \frac{\text{Total distance}}{\text{Total time}}$

Average Speed $= \frac{12}{\frac{15}{60}+1} = \frac{12\times 60}{75}$

$$= \frac{48}{5} = 9.6 \text{ km/hr}$$

33. A boat moves in the upstream from city P to city Q and then it returns in the downstream from city Q to city P. If the speed of the boat in the stagnant water is 35 km/hr and the stream speed is 5 km/hr. then in total journey what is the Average speed of boat?

(a) 36.28 km./hr. (b) 34.28 km./hr.
(c) 35 km./hr. (d) 33.33 km./hr.

RRB NTPC 03.04.2016 Shift : 3

Ans : (b) Speed in the upstream
$= 35 - 5 = 30$ km./hr.
Speed in the downstream = 35+5 = 40 km./hr.
Average speed of boat $= \frac{2ab}{a+b}$
$= \frac{2\times40\times30}{40+30} = \frac{2\times40\times30}{70} = 34.28$ km/hr.

34. A boat moves from the city x to city 'y' in the upstream and then returns from city 'y' to city 'x' in the downstream. If in still water the speed is 40 km/hr. and the speed of stream is 10 km/hr. then what is the average speed of the total journey?

(a) 36.5 km./hr. (b) 34.5 km./hr.
(c) 37.5 km./hr. (d) 33.33 km./hr.

RRB NTPC 02.04.2016 Shift : 1

Ans : (c) Speed of boat in the downstream
$= B + R = 40 + 10 = 50$ km/hr.
Speed of boat in the upstream
$= B - R = 40 - 10 = 30$ km/hr.
$\therefore$ Average speed of boat over the entire journey
$= \frac{2ab}{a+b} = \frac{2\times50\times30}{50+30} = \frac{2\times1500}{80} = 37.5$ km/hr.

Type - 4

35. A boat moving in the upstream takes 8 hours 48 minutes to cover a distance, while it takes 4 hours to return to the starting point in the downstream. Find the ratio of the speed of the boat to the stream in still water.

(a) 3 : 2 (b) 8 : 3
(c) 4 : 3 (d) 2 : 1

RRB JE - 24/05/2019 (Shift-II)

Ans : (b) Let the speed of stream = R km/h
And Speed of boat = B km/h
$\therefore$ Speed of boat in the upstream
$= (B - R)$ km/hr
And speed of boat in the downstream
$= (B + R)$ km/hr
According to the question,
{$\because$ Distance = speed×time}

$(B-R)\times 8\frac{48}{60} = (B+R)4$

$(B-R)\times\frac{44}{5} = (B+R)4$

$44B - 44R = 20B + 20R$
$24B = 64R$
$\frac{B}{R} = \frac{64}{24} = \frac{8}{3}$
$B : R = 8 : 3$

36. The ratio for the time taken by the boat in the upstream and the time taken in the downstream to cover a certain distance is 4:1. Find the ratio of the speed of the boat in the downstream and in the upstream.

(a) 4 : 1 (b) 3 : 5
(c) 1 : 4 (d) 5 : 3

RRB JE - 25/05/2019 (Shift-I)

Ans : (a) Let the certain distance = d
Speed of boat in the upstream
$= V_A = \frac{d}{4t}$
Speed of boat in the downstream
$= V_B = \frac{d}{t}$
According to the question–

$\frac{V_B}{V_A} = \frac{\frac{d}{t}}{\frac{d}{4t}} = \frac{4}{1}$

$\therefore \quad V_B : V_A = 4 : 1$

37. If the time taken in the upstream is equal to 'n' time taken in the downstream and the speed in the still water is 'x' and the speed of stream is 'y' then find the value of x : y.

(a) n/2 (b) (n + 1)/(n - 1)
(c) (n - 1)/(n + 1) (d) n/(n - 1)

RRB RPF SI – 11/01/2019 (Shift-II)

Ans : (b) Let the speed of boat and stream is x km/hr and y km/hr respectively.
According to the question,

$\frac{D}{(x-y)} = n\times\frac{D}{(x+y)}$

$\frac{x+y}{x-y} = n$
$x + y = n(x-y)$
$x + y = nx - ny$
$y(n+1) = x(n-1)$
$\frac{x}{y} = \frac{n+1}{n-1}$

38. A boat covers a certain distance in the downstream in 4 hours, but takes 6 hours to return to the starting point. What is the ratio of the speed of the stream and the speed of the boat in still water?

(a) 1:5 (b) 1:4
(c) 5:1 (d) 4:3

RRB JE - 27/05/2019 (Shift-III)

Ans : (a) Let the speed of stream = R km/hr
Speed of boat = B km/hr
According to the question–
$(B+R)\,4 = (B - R)6$
$4B + 4R = 6B - 6R$
$10R = 2B$
$\frac{R}{B} = \frac{2}{10}$
$R : B = 1 : 5$

39. A man take twice the time to ride the boat in upstream as compared to ride the boat in the downstream. Find the ratio of the boat to the stream in current water.

(a) 3 : 2 (b) 4 : 1
(c) 2 : 1 (d) 3 : 1

RRB JE - 28/05/2019 (Shift-II)

Ans : (d) Speed of boat in the downstream
= (x+y) km/h
Then speed of boat in the upstream
= (x – y) km/h
From Distance = Speed × Time
(x+y) t = (x – y) 2t
x + y = 2x – 2y
x = 3y

Required Ratio = $\frac{x}{y}:\frac{3}{1}=3:1$

Type - 5

40. A boat takes 7 hours to move 63 km downstream and 30 km upstream. The boat takes 6 hours to move 28 km downstream and 48 km upstream. How much time will it take to move 35 km downstream and 27 km upstream?

(a) 5hours 20 minutes (b) 5 hours
(c) 4 hours 50 minutes (d) 4 hours 45 minutes

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : Let speed of boat in downstream = x km/h.
And, speed of boat in upstream = y km/h.

According to 1st condition, $\frac{63}{x}+\frac{30}{y}=7$ ——— (i)

According to the 2nd condition, $\frac{28}{x}+\frac{48}{y}=6$

On multipying by $\frac{9}{4}$ in both sides,

$$\Rightarrow \frac{63}{x}+\frac{108}{y}=\frac{6\times 9}{4}$$

$$\Rightarrow \frac{63}{x}+\frac{108}{y}=\frac{27}{2} \quad \text{——— (ii)}$$

From equation (ii) and (i)–

$$\frac{78}{y}=\frac{13}{2}\Rightarrow y=12 \text{ km/h.}$$

On putting y = 12 in equation (i),

$$\frac{63}{x}=7-\frac{5}{2}$$

$$\Rightarrow \quad x = 14 \text{ km/h.}$$

Hence, Time taken by boat to travel a distance of 35 km in downstream and 27 km in upstream $=\frac{35}{x}+\frac{27}{y}$

$$=\frac{35}{14}+\frac{27}{12}$$

$$=\frac{5}{2}+\frac{9}{4}$$

$$=\frac{19}{4} \text{ hours}$$

= 4 hours 45 minute

41. The speed of a stream is 3 km/h and the speed of a man in still water is 5 km/h. The time taken by the man to swim 26 km downstream is:

(a) $3\frac{1}{4}$ hours (b) $4\frac{1}{3}$ hours
(c) $1\frac{3}{4}$ hours (d) $4\frac{3}{4}$ hours

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the time taken by man is T hours.
Speed of stream = 3 km/h
Speed of man = 5 km/h
According to the question,

Speed of downstream = $\frac{\text{Distance}}{\text{Time}}$

$$\Rightarrow 5+3=\frac{26}{T}$$

$$T=\frac{26}{8}=3\frac{1}{4} \text{ hours}$$

42. The speed of a stream is 3 km/h and the speed of a man in still water is 6 km/h. The time taken by the man to swim 37 km downstream is:

(a) $4\frac{1}{3}$h (b) $4\frac{1}{9}$h
(c) $4\frac{3}{4}$h (d) $1\frac{3}{4}$h

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (b) : Speed of man in the downstream
= Speed of man + Speed of current
= 6 + 3 = 9 km/h

∴ Required time = $\frac{37}{9}=4\frac{1}{9}$ hr.

43. Ram goes from place A to B cycling at a uniform speed of 12 km/hr. and then comes back to place A while cycling. His friend Gopi travels by boat from places A to B and comes back to location A. Where his speed in still water is 10 km/hr and speed of stream is 4 km/hr. Who will return to position A first?

(a) Gopi
(b) Ram
(c) Both reach which at the same time
(d) Can not be determined

RRB JE - 29/05/2019 (Shift-III)

Ans : (b) Let distance AB = 84 km (L.C.M. of 12, 14)
The time taken by Ram to go from A to B at a speed of 12 km/h = The time taken by Ram to return to A again at a speed of 12 km/hour $= \frac{84}{12} = 7h$
Total time taken by Ram to travel = 7 + 7 = 14 h
The time taken by Gopi to go from A to B at a speed of (10+4) km/h. $= \frac{84}{14} = 6h$
The time taken by Gopi to return to A again at a speed of (10-4) km/h $= \frac{84}{6} = 14$ h
Total time take by Gopi to travel = 14 + 6 = 20 h
Hence, It is clear that Ram takes less time in traveling so Ram will come back to place A first.

44. It takes 12 hours for a boat to travel a certain distance in the downstream and it takes 24 hours to return. How long will it take for the boat to cover the same distance in still water?
(a) 15 Hours (b) 10 Hours
(c) 18 Hours (d) 16 Hours

RRB JE - 02/06/2019 (Shift-III)

Ans : (d) Let the total distance = x km
Time taken to cover the same distance in still water = t hour

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Speed of boat in still water = $\frac{1}{2}$ (Speed of boat in the downstream + Speed of boat in the upstream)

$$\frac{x}{t} = \frac{1}{2}\left[\frac{x}{12} + \frac{x}{24}\right]$$

$$\frac{x}{t} = \frac{1}{2}\left[\frac{2x + x}{24}\right]$$

$$\frac{x}{t} = \frac{1}{2} \times \frac{3x}{24}$$

$$\frac{1}{t} = \frac{1}{16}$$

t = 16 hours

45. The speed of a boat is x km/hr in still water and a speed of stream is 'y' km/hr. If the time taken to cover a distance upstream is t hour more than the time taken to cover the same distance in the downstream, find the distance covered.
(a) $\left[\frac{(x^2 - y^2)t}{2xy}\right]$ km. (b) $\left[\frac{(x^2 - y^2)t}{2y}\right]$ km.
(c) $\left[\left(\frac{x+y}{x-y}\right)t\right]$ km. (d) $\left[\frac{(x+y)t}{2}\right]$ km.

RRB JE - 30/05/2019 (Shift-III)

Ans : (b) Let the travelled distance = z km
Speed of boat in downstream = x + y km/hr.
Speed of boat in the upstream = x – y km/hr.
According to the question,

$$\frac{z}{x-y} - \frac{z}{x+y} = t$$

$$z\left[\frac{x+y-x+y}{(x-y)(x+y)}\right] = t$$

$$z\left[\frac{2y}{x^2 - y^2}\right] = t \Rightarrow z = \frac{(x^2 - y^2)t}{2y} \text{ km.}$$

46. The speed of a boat in still water is 12 km/hr. and the speed of stream is 3 km/hr. A person goes 135 km in the upstream by boat and returns to the starting point by walking in the downstream. Find the time taken to cover the total journey in hours.
(a) 24 (b) 48
(c) 36 (d) 30

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) Let the total time taken is t hour.

$$t = \frac{d}{B+R} + \frac{d}{B-R}$$

(B = Speed of boat
R = Speed of stream)

$$t = \frac{135}{12+3} + \frac{135}{12-3}$$

$$t = \frac{135}{15} + \frac{135}{9}$$

t = 9 + 15
t = 24 hours

47. If in still water, the speed of the boat is x km/hr. and speed of stream is 'y' km/hr. and the time taken to reach a place and to return from there is 't' hour, find the distance travelled in one direction.
(a) $\left[\left(\frac{x^2 + y^2}{2xy}\right)t\right]$ km. (b) $\left[\frac{t(x^2 - y^2)}{2x}\right]$ km.
(c) $\left[\frac{t(x^2 + y^2}{2x}\right]$ km. (d) $\left[\frac{t(x^2 - y^2)}{xy}\right]$ km.

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (b) Let the total distance = d km
Speed in the downstream = (x + y) km/h
Speed in the upstream = (x –y) km/h
According to the question,

$$\frac{d}{(x+y)} + \frac{d}{(x-y)} = t$$

$$d\left[\frac{1}{(x+y)} + \frac{1}{(x-y)}\right] = t$$

$$d\left[\frac{x-y+x+y}{x^2 - y^2}\right] = t$$

$$d \times \left(\frac{2x}{x^2 - y^2}\right) = t$$

$$d = \frac{(x^2 - y^2)}{2x} \times t$$

Total distance (d) $= \left[\frac{t(x^2 - y^2)}{2x}\right]$ km.

21.

Mensuration

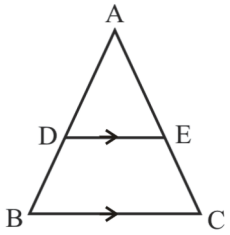
Type - 1

1. In ΔABC, DE || BC which intersects AB to D and AC to E. AD : BD = 2 : 3 and the area of trapezium BDEC is 63 cm^2. What is the area of ΔADE ?

(a) 14 cm^2 (b) 28 cm^2
(c) 42 cm^2 (d) 12 cm^2

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (d) :



Given,
AD : BD = 2:3
Area of trapezium BDEC = 63cm^2
Let area of Δ ADE = Pcm^2
According to the question,

$$\frac{AD^2}{AB^2 - AD^2} = \frac{P}{63}$$

$$\frac{2^2}{(2+3)^2 - (2)^2} = \frac{P}{63}$$

$$\frac{4}{25-4} = \frac{P}{63}$$

$$\frac{4}{21} = \frac{P}{63}$$

$$P = 4 \times 3$$

$\therefore$ $\boxed{P = 12cm^2}$

2. The altitude of an equilateral triangle is 12 cm. What is the perimeter of the triangle?

(a) $18\sqrt{3}$ cm (b) 42 cm
(c) $24\sqrt{3}$ cm (d) $30\sqrt{3}$ cm

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (c) : Given,
Length of altitude of an equilateral triangle = 12 cm

$$\frac{\sqrt{3}}{2} \times \text{Side} = 12$$

$$\text{Side} = 8\sqrt{3} \text{ cm}$$

$\therefore$ Perimeter of the triangle = 3 × side

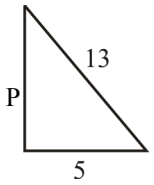
$$= 3 \times 8\sqrt{3} = 24\sqrt{3} \text{ cm}$$

3. The length of the hypotenuse of a right-angled triangle is 13 cm and the length of one of the other two sides is 5 cm. What is the area (in cm^2) of the triangle?

(a) 28 (b) 29.5
(c) 30 (d) 32.5

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (c) :



From Pythagoras Theorem-

$$\text{Perpendicular (P)} = \sqrt{(\text{Hypotenuse})^2 - (\text{Base})^2}$$

$$= \sqrt{(13)^2 - (5)^2}$$

$$= \sqrt{169 - 25}$$

$$= \sqrt{144}$$

$$= 12 \text{ cm}$$

$$\text{Area of right - angled triangle} = \frac{1}{2} \times \text{Perpendicular} \times \text{Base}$$

$$= \frac{1}{2} \times 12 \times 5$$

$$= 30cm^2$$

4. The length of the three sides of a triangle are 12 cm, 15 cm and 21 cm, respectively, Find the area (in cm^2) of the triangle.

(a) $36\sqrt{6}$ (b) $30\sqrt{6}$
(c) $72\sqrt{6}$ (d) $48\sqrt{6}$

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (a) : Given,
Length of the three sides of a triangle
a = 12 cm, b = 15 cm, c = 21 cm

$$\text{Semi-perimeter(s)} = \frac{a+b+c}{2}$$

$$= \frac{12+15+21}{2}$$

$$= 24 \text{ cm}$$

$$\text{Area of triangle } (\Delta) = \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{24(24-12)(24-15)(24-21)}$$

$$= \sqrt{24 \times 12 \times 9 \times 3}$$

$$= 36\sqrt{6} \text{ cm}^2$$

5. A triangle has sides of length 5 cm, 7 cm and 10 cm. Find the area of the triangle (in cm^2).

(a) 25 (b) $2\sqrt{66}$

(c) $7\sqrt{10}$ (d) 350

RRB Group-D 22/08/2022 (Shift-I)

Ans. (b) : According to the question,

$s = \frac{5+7+10}{2} = \frac{22}{2} = 11$

Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{11(11-5)(11-7)(11-10)}$

$= \sqrt{11\times6\times4\times1} = 2\sqrt{66}\ cm^2$

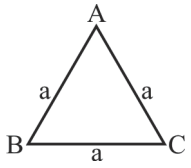
6. If the area of an equilateral triangle is $25\sqrt{3}$ cm^2, then the length of each side of the triangle is:

(a) 12 cm (b) 5 cm

(c) 8 cm (d) 10 cm

RRB Group-D 23-08-2022 (Shift-II)

Ans. (d) : Given,



The area of An equilateral triangle is $25\sqrt{3}\ cm^2$

So, $\frac{\sqrt{3}}{4}a^2 = 25\sqrt{3}$

$a^2 = 100$

$a = 10$

Hence, the length of each side of the triangle is 10 cm

7. The sides of a triangle are 15 cm, 28 cm, and 41 cm. What is the length of its altitude corresponding to the side with a length of 28 cm?

(a) 14 cm (b) 10 cm

(c) 12 cm (d) 9 cm

RRB Group-D 01/09/2022 (Shift-III)

Ans. (d) : Sides of triengle = 15 cm, 28 cm and 41 cm

$S = \frac{a+b+c}{2}$

$S = \frac{15+28+41}{2} = \frac{84}{2} = 42\ cm$

Area of triangle $= \sqrt{42(42-15)(42-28)(42-41)}$

$= \sqrt{42\times27\times14\times1} = 126\ cm^2$

length of altitude will be 28 cm then

$\text{Area} = \frac{1}{2}\times\text{Base}\times\text{Height}$

$126 = \frac{1}{2}\times28\times\text{altitude}$

Thus, altitude = 9 cm

8. The ratio of the lengths of two corresponding sides of two similar triangles is 2 : 1. The ratio of the areas of these two triangles, in the order mentioned, is:

(a) 3 : 1 (b) $2\sqrt{2}:1$

(c) 4 : 1 (d) 2 : 1

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (c) : Given: Ratio of length of two corresponding sides of two similar triangle is 2 : 1.

$\because$ We know that

Ratio of Area of similar triangle = (Ratio of corresponding side)

$\therefore$ Ratio of areas = $2^2 : 1^2$

= 4 : 1

9. In any triangle ABC, a + b + c = 2s with usual notation, then the value of $\sin\left(\frac{A}{2}\right)$ is

(a) $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$ (b) $\sqrt{\frac{(s-c)(s-a)}{ac}}$

(c) $\sqrt{\frac{(s-b)(s-c)}{bc}}$ (d) $\sqrt{\frac{s(s-a)}{bc}}$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given-

$a + b + c = 2s$ ...(i)

Area of triangle $= \frac{1}{2}bc\sin A$

By formula:-

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$\frac{1}{2}bc\sin A = \sqrt{s(s-a)(s-b)(s-c)}$

$\sin A = \frac{2\times\sqrt{s(s-a)(s-b)(s-c)}}{bc}$ $\left\{\begin{matrix}\text{formula}-\\ \sin x = 2\sin\frac{x}{2}\cos\frac{x}{2}\end{matrix}\right\}$

$\sin\frac{A}{2}\cos\frac{A}{2} = \frac{\sqrt{s(s-a)(s-b)(s-c)}}{bc}$ ... (ii)

We know that-

$\cos A = \frac{b^2+c^2-a^2}{2bc}$

$2\cos^2\frac{A}{2} - 1 = \frac{b^2+c^2-a^2}{2bc}$ $\left(\begin{matrix}\text{Formula - } \cos2A = 2\cos^2A - 1\\ \cos A = 2\cos^2\frac{A}{2} - 1\end{matrix}\right)$

$2\cos^2\frac{A}{2} = \frac{b^2+c^2-a^2+2bc}{2bc}$

$\cos^2\frac{A}{2} = \frac{(b+c-a)(b+c+a)}{4bc}$

$\cos^2\frac{A}{2} = \frac{(2s-a-a)2s}{4bc}$ [From equ^n(i)]

$\cos^2\frac{A}{2} = \frac{(2s-2a)2s}{4bc}$

$$\cos^2\frac{A}{2}=\frac{s(s-a)}{bc}$$

$$\cos\frac{A}{2}=\sqrt{\frac{s(s-a)}{bc}}$$

Putting the value of $\cos\frac{A}{2}$ in equation (ii)-

$$\sin\frac{A}{2}\sqrt{\frac{s(s-a)}{bc}}=\frac{\sqrt{s(s-a)(s-b)(s-c)}}{bc}$$

$$\boxed{\sin\frac{A}{2}=\sqrt{\frac{(s-b)(s-c)}{bc}}}$$

10. The ratio of the area of an equilateral triangle of side x to the area of a square of side x is:

(a) $\sqrt{3}:4$ (b) $\sqrt{3}:8$

(c) $\sqrt{3}:2$ (d) $\sqrt{3}:1$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (a) : Area of equilateral triangle : Area of square

$$=\frac{\sqrt{3}}{4}x^2:\ x^2=\sqrt{3}\ :\ 4$$

11. The base of a right-angled triangle is 12 cm and the difference between the other two sides is 6 cm. What will be the perimeter of the triangle?

(a) 30 cm (b) 54 cm

(c) 36 cm (d) 18 cm

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

$b = 12$ cm

$c - a = 6$ cm

$c = a + 6$

$\because\ a^2 + b^2 = c^2$

$b^2 = c^2 - a^2 = (c + a)(c - a)$

$144 = (c + a) \times 6$

$144 = 6c + 6a$

$144 = 6(6 + a) + 6a$

$144 = 36 + 12a$

$a = 9$ cm

$c - a = 6$

$c - 9 = 6$

$c = 15$ cm

Hence the perimeter of the triangle $= a + b + c$

$= 9 + 12 + 15$

$= 36$ cm

12. If the hypotenuse of a right angled isosceles is 8 cm, then the area of the triangle is:

(a) $16\ cm^2$ (b) $2\sqrt{32}cm^2$

(c) $\sqrt{32}cm^2$ (d) $8cm^2$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (a) :

$\because$ Area of right angled isosceles triangle

$$=\frac{(\text{Hypotenuse})^2}{4}=\frac{8\times8}{4}$$

$= 16\ cm^2$

13. The lengths of the two shorter sides of a right triangle 24 cm & 7 cm. Find the radius of circumcircle of the triangle.

(a) 12.5 cm (b) 12 cm

(c) 16 cm (d) 15.5 cm

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (a) : Given-

The lengths of the two shorter sides of a right angle triangle are 7 cm and 24 cm respectively.

$\because$ The hypotenuse is the longest side of a right angled triangle.

$$\therefore\ \text{Hypotenuse}=\sqrt{(24)^2+(7)^2}=\sqrt{576+49}=\sqrt{625}$$

Hypotenuse = 25 cm

$\because$ Radius of the circumcircle of right angled triangle

$$=\frac{\text{Hypotenuse}}{2}=\frac{25}{2}=12.5\text{ cm}$$

14. Area of an equilateral triangle is $49\sqrt{3}cm^2$. Find the side of the triangle.

(a) 18 cm (b) 14 cm

(c) 12 cm (d) 16 cm

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (b) : $\because$ Area of equilateral triangle $=\frac{\sqrt{3}}{4}(a)^2$

(Where a = side of triangle)

$$\therefore\frac{\sqrt{3}}{4}(a)^2=49\sqrt{3}$$

$$a^2=49\times4=7^2\times2^2$$

$$\therefore a=14\text{cm}$$

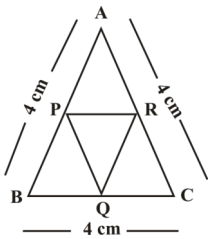
15. ABC is an equilateral triangle. P, Q and R are the midpoints of sides AB, BC and AC respectively. The length of the side of the triangle is 4 cm. The area of triangle PQR is:

(a) $\frac{1}{4}\sqrt{3}cm^2$ (b) $\frac{\sqrt{3}}{2}cm^2$

(c) $\sqrt{3}\,cm^2$ (d) $\frac{\sqrt{3}}{9}cm^2$

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c)



Area of $\Delta PQR = \frac{1}{4}\times$ Area of equilateral triangle ABC

$$=\frac{1}{4}\times\frac{\sqrt{3}}{4}\times4^2=\sqrt{3}\,cm^2$$

16. Find the area of a triangle whose sides are 5 cm, 7cm and 11 cm.

(a) 12.97 cm^2 (b) 12.27 cm^2

(c) 12.30 cm^2 (d) 12.50 cm^2

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (a) : $s = \frac{a+b+c}{2} = \frac{5+7+11}{2} = 11.5$

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{11.5(11.5-5)(11.5-7)(11.5-11)}$

$= \sqrt{11.5 \times 6.5 \times 4.5 \times 0.5}$

$= \sqrt{168.18}$

$= 12.97\ cm^2$

17. If the area of a triangle with base 12 cm is equal to the area of a square with side 12cm, then the altitude of the triangle will be:

(a) 12 cm (b) 18 cm

(c) 36 cm (d) 24 cm

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : Area of triangle = Area of square

$\frac{1}{2} \times$ Base $\times$ Height $= (12)^2$

$\frac{1}{2} \times 12 \times$ Height $= 144$

Height $= 24$ cm

18. Two sides of triangle are of lengths 4 cm and 10 cm. If the length of the third side is a cm then

(a) $6 < a < 14$ (b) $a > 5$

(c) $a < 6$ (d) $6 < a < 12$

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (a) : We know that the measure of any side of any triangle is less than the sum of the other two sides and greater than the difference.

$\therefore$ $(10-4) < a < (10+4)$

$6 < a < 14$

19. The area of an isosceles right angle triangle is 81 cm^2. Find the length of its hypotenuse.

(a) 18 cm (b) 22 cm

(c) 16 cm (d) 14 cm

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (a) : Let the length of sides of an isosceles right angle triangle is x cm.

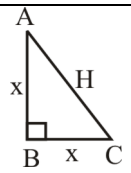
According to the question–

Area of triangle $= \frac{1}{2} \times$ Base $\times$ Height

$81 = \frac{1}{2} \times x \times x$

$x^2 = 81 \times 2$

$x = 9\sqrt{2}$



Then, $H = x\sqrt{2}$

$= 9\sqrt{2} \times \sqrt{2} = 18$ cm.

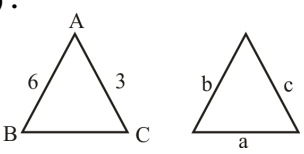
20. The sides of triangle are positive integers if the measures of two sides are 6 cm and 3 cm, then find the possible number of such distinct triangles:

(a) 3 (b) 9

(c) 7 (d) 5

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) :



In any triangle $\rightarrow |b-c| < a < |b+c|$

So in Δ ABC, $|AB - AC| < BC < |AB + AC|$

$|6-3| < BC < |6+3|$

$3 < BC < 9$

$\therefore$ BC is a positive integer, so all possible value of BC = 4, 5, 6, 7, 8

Hence, total number of triangles will be 5.

21. The area of triangle ABC is 39 cm^2. D and E are two points on BC such that BD = DE = EC, then what is the area of triangle ADC?

(a) 26 cm^2 (b) $\frac{9}{4} cm^2$

(c) 13 cm^2 (d) 52 cm^2

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (a) :



$\because$ Area of $\Delta ABC = 3$ unit

$\therefore 3$ unit $\rightarrow 39 cm^2$

1 unit $\rightarrow 13 cm^2$

$\therefore$ Area of $\Delta ADC = 2$ unit

$\therefore$ 2 unit $\rightarrow 13 \times 2 = 26 cm^2$

22. If the inradius of a triangle with perimeter 64 cm is 8 cm, then find the area of the triangle.

(a) 265 cm^2 (b) 120 cm^2

(c) 256 cm^2 (d) 146 cm^2

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (c) : Inradius $(r) = \frac{\text{Area}\ (\Delta)}{\text{Semi perimeter}\ (s)}$

$\Delta = r \times s = 8 \times 32 = 256 cm^2$

23. The ratio of bases of two triangles is 4 : 5 and that of their areas is 8 : 15. What is the ratio of their corresponding altitudes?

(a) 2 : 3 (b) 1 : 2
(c) 3 : 2 (d) 1 : 3

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Suppose base of triangle is 4x and 5x and height is h_1 and h_2 then–

According to the question,

Ratio of area of triangles = 8 : 15

$$\frac{4x \times h_1}{5x \times h_2} = \frac{8}{15}$$

$$\frac{h_1}{h_2} = \frac{8}{15} \times \frac{5}{4}$$

$$\frac{h_1}{h_2} = \frac{40}{60}$$

$$\frac{h_1}{h_2} = \frac{2}{3}$$

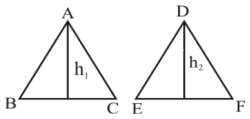
$$h_1 : h_2 = 2 : 3$$

24. The corresponding altitudes of two similar triangles are 8 cm and 11 cm. Find the ratio of their areas:

(a) 64 : 121 (b) 11 : 8
(c) 8 : 11 (d) 121 : 64

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question



$h_1 = 8$ cm, $h_2 = 11$ cm

$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \frac{(h_1)^2}{(h_2)^2}$$

$$\frac{(8)^2}{(11)^2} = \frac{64}{121}$$

25. Given that $\Delta ABC \sim \Delta DEF$, if BC = 12.5 cm and EF = 10 cm, then the areas of ΔABC and ΔDEF are in the ratio of:

(a) 3 : 4 (b) 1 : 2
(c) 16 : 25 (d) 25 : 16

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \left(\frac{BC}{EF}\right)^2$ (By theorem)

$$= \frac{(12.5)^2}{(10)^2}$$

$$= \frac{12.5 \times 12.5}{10 \times 10}$$

$$= \frac{25}{16}$$

Required ratio = 25 : 16

26. When the side of an equilateral triangle is made three times the original side, the area of the new equilateral triangle will become:

(a) 12 times of the original area
(b) 6 times of the original area
(c) 3 times of the original area
(d) 9 times of the original area

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (d) : Suppose, the side of original triangle is 'a' and area is A_1 and the new area of triangle is A_2

$\because$ Area of equilateral triangle $(A_1) = \frac{\sqrt{3}}{4} \times a^2$

According to the question,

On increasing side by 3 times –

New area of equilateral triangle $(A_2) = \frac{\sqrt{3}}{4}(3a)^2$

$$= \frac{\sqrt{3}}{4} \times 9a^2$$

$$= 9 \times \frac{\sqrt{3}}{4} a^2$$

$$A_2 = 9A_1$$

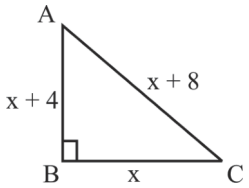
Hence, area of new equilateral triangle will become 9 times of the original area.

27. In a right angled triangle, the perpendicular is 4 cm larger than the base and the hypotenuse is 4 cm larger than the perpendicular. Calculate the length of the hypotenuse.

(a) 12 cm (b) 10 cm
(c) 20 cm (d) 8 cm

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans : (c)



From Pythagoras theorem

Hypotenuse^2 = Perpendicular^2 + Base^2

$(x + 8)^2 = (x + 4)^2 + x^2$

$x^2 + 64 + 16x = x^2 + 16 + 8x + x^2$

$x^2 - 8x - 48 = 0$

$x^2 - 12x + 4x - 48 = 0$

$x(x - 12) + 4(x - 12) = 0$

$(x - 12)(x + 4) = 0$

So $x = 12$, $x = -4$ not possible

$\therefore$ Hypotenuse $= 12 + 8 = 20$ cm

28. The perimeter of an isosceles triangle is 32 cm. Its base is $\frac{6}{5}$ times of equal sides. Find the area of triangle.

(a) 39 cm^2 (b) 64 cm^2
(c) 48 cm^2 (d) 57 cm^2

RRB JE - 22/05/2019 (Shift-III)

Ans : (c) Let the side of isosceles triangle is x.

According to the question-

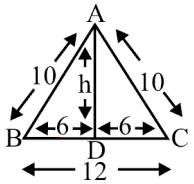
$$x + x + \frac{6x}{5} = 32$$

$\Rightarrow \quad 2x + \frac{6x}{5} = 32$

$\Rightarrow \quad 10x + 6x = 32 \times 5$

$\Rightarrow \quad x = \frac{32 \times 5}{16}$

$x = 10$



Sides of isosceles triangles are 10, 10 and 12 cm respectively.

$AD^2 = AB^2 - BD^2$

$= 10^2 - 6^2$

$AD = \sqrt{64} = 8$ cm.

Hence, height = 8 cm.

Area of isosceles triangle $= \frac{1}{2} \times$ base $\times$ height

$= \frac{1}{2} \times 12 \times 8 = 6 \times 8 = 48 \text{ cm}^2$

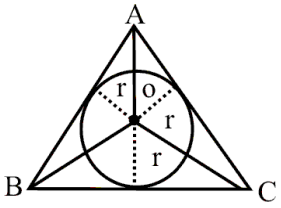
29. If the perimeter of a triangle is 28 cm. Its internal radius is 3.5 cm. Find the area of triangle.

(a) 49 cm^2 (b) 28 cm^2

(c) 35 cm^2 (d) 42 cm^2

RRB JE - 22/05/2019 (Shift-III)

Ans : (a)



Area of ΔABC = Area of ΔOBC + Area of ΔOAC + Area of ΔOAB

$= \frac{1}{2} \times r \times BC + \frac{1}{2} \times r \times AC + \frac{1}{2} \times r \times AB$

$= \frac{1}{2} \times r \times (BC + AC + AB)$

$= \frac{1}{2} \times 3.5 \times 28 = 49 \text{ cm}^2$

30. The ratio of their corresponding sides of two similar triangles is 1:3 and the area of the larger triangle is 72 cm^2. Find the area of smaller triangle.

(a) 18 cm^2

(b) 8 cm^2

(c) 14 cm^2

(d) 9 cm^2

RRB JE - 29/05/2019 (Shift-I)

Ans : (b) According to rule of similar triangle -

$\frac{(\text{Area})_1}{(\text{Area})_2} = \frac{(\text{Side})_1^2}{(\text{Side})_2^2}$

$\frac{(\text{Area})_1}{72} = \frac{1}{9}$

$(\text{Area})_1 = 8 \text{ cm}^2$

So area of smaller Δ will be 8 cm^2.

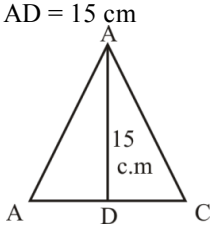
31. The altitude of an equilateral triangle is 15 cm. Find the area of this triangle.

(a) 60 cm^2 (b) $75\sqrt{3}$ cm^2

(c) 90 cm^2 (d) $60\sqrt{3}$ cm^2

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (b) Let the equilateral triangle is ABC whose altitude AD = 15 cm



$\because$ Height of equilateral triangle $(h) = \frac{\sqrt{3}}{2}a$

[Where AD = h = 15 cm]

$15 = \frac{\sqrt{3}}{2}a$

$a = \frac{30}{\sqrt{3}}$

$\therefore$ Area of triangle $= \frac{\sqrt{3}}{4}a^2$

$\left[\text{Where } a = \frac{30}{\sqrt{3}}, \quad a^2 = 300\right]$

$= \frac{\sqrt{3}}{4} \times 300 = 75\sqrt{3} \text{ cm}^2$

32. The ratio of their corresponding sides of two similar triangles is 2:3 then find the ratio of their corresponding heights.

(a) 2 : 3 (b) 3 : 2

(c) 4 : 9 (d) 16 : 81

RRB RPF SI – 06/01/2019 (Shift-II)

Ans : (a) Let the height of similar triangle is h_1 and h_2.

Formula – $\frac{(\text{Side})_1}{(\text{Side})_2} = \frac{h_1}{h_2}$

$\frac{2}{3} = \frac{h_1}{h_2}$

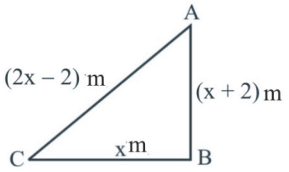
$h_1 : h_2 = 2 : 3$

33. In a right angle triangle, the length of the hypotenuse is 2 meter less than twice the length of the shortest side. If the third side is 2 meters larger than the shortest side, what is the length of the hypotenuse of the triangle?

(a) 10 m (b) 13 m
(c) 12 m (d) 7 m

RRB RPF SI – 05/01/2019 (Shift-I)

Ans :(a) Let the smallest side of right angled triangle = x m



According to Pythagoras theorem

$$AC^2 = AB^2 + BC^2$$

$$\Rightarrow (2x-2)^2 = (x+2)^2 + x^2$$

$$\Rightarrow 4x^2 + 4 - 8x = x^2 + 4 + 4x + x^2$$

$$\Rightarrow 2x^2 - 12x = 4 - 4 \quad \Rightarrow 2x(x-6) = 0$$

If $x - 6 = 0 \Rightarrow x = 6$

Length of hypotenuse $= 2x - 2 = 2 \times 6 - 2 = 10$ m.

34. An equilateral triangle is formed by folding a rectangle whose dimensions are 4 cm and 5 cm. What will be the area of equilateral triangle so formed?

(a) $9\sqrt{3}$ cm^2 (b) $3\sqrt{3}$ cm^2

(c) $6\sqrt{3}$ cm^2 (d) $\frac{9}{4}\sqrt{3}$ cm^2

RRB RPF Constable – 18/01/2019 (Shift-I)

Ans : (a) Perimeter of rectangle = 2(length + breadth)

Perimeter of rectangle

$= 2(5 + 4) = 18$cm

And perimeter of equilateral triangle=3×side = 3a cm

According to the question

Perimeter of rectangle = Perimeter of equilateral triangle

$18 = 3 \times$ side $= 3a$

$\therefore a = 6$

So area of equilateral triangle $= \frac{\sqrt{3}}{4} \times 6 \times 6 = 9\sqrt{3}$ cm^2

35. An equilateral triangle is formed by folding a rectangle whose dimensions are 4 cm and 2 cm. What will be the area of equilateral triangle so formed?

(a) $4\sqrt{3}$ cm^2 (b) $6\sqrt{3}$ cm^2

(c) $\frac{9}{4}\sqrt{3}$ cm^2 (d) $2\sqrt{3}$ cm^2

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (a) Let the length of rectangle = 4 cm and breadth = 2 cm

Perimeter of rectangle = 2(4 + 2) = 12 cm

$\because$ Perimeter of equilateral triangle = 3 × Side

$\because$ Perimeter of equilateral triangle = Perimeter of rectangle

$\therefore$ Perimeter of equilateral triangle = 12 cm

$\therefore$ Side of equilateral triangle = 4 cm

Area of equilateral triangle $= \frac{\sqrt{3}}{4}$ (Side)^2

$$= \frac{\sqrt{3}}{4} \times (4)^2 = \frac{\sqrt{3}}{4} \times 16 = 4\sqrt{3} \text{ cm}^2$$

36. Three sides of a triangle are 5 cm, 12 cm and 13 cm. A smaller triangle is formed by joining the midpoints of these three sides of this triangle. What is the area of the smaller triangle?

(a) 15 (b) 30

(c) 7.5 (d) 32.5

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (c) : Biggest side of triangle = 13 cm.

Other sides are − 5 cm and 12 cm

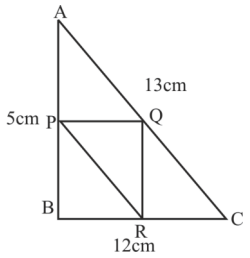
$\because (13)^2 = (12)^2 + (5)^2$

$169 = 169$

So it will be a right angled triangle

Area of ΔPQR joining the midpoint of three sides of triangle

$$= \frac{\text{Area of } \Delta ABC}{4}$$



Area of $\Delta PQR = \frac{\frac{1}{2} \times 5 \times 12}{4} = \frac{30}{4} = 7.5$ cm^2

37. What is the cost of leveling a triangular region of land at the rate of 20 paise per square meter whose sides are 72 m, 30 m and 78 m respectively?

(a) Rs. 200 (b) Rs. 210

(c) Rs. 216 (d) Rs. 220

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (c) Formula-

$$s = \frac{a+b+c}{2}$$

(Where a=72, b=30, c=78)

$$= \frac{72+30+78}{2} = 90 \text{ m}$$

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{90(90-72)(90-30)(90-78)}$$

$$= \sqrt{90 \times 18 \times 60 \times 12}$$

$$= \sqrt{1166400} = 1080$$

20 Paise $= \text{Rs.}\frac{20}{100} = \text{Rs.}\frac{1}{5}$

$\therefore$ Cost price of leveling triangular land

$$= 1080 \times \frac{1}{5} = \text{Rs. } 216$$

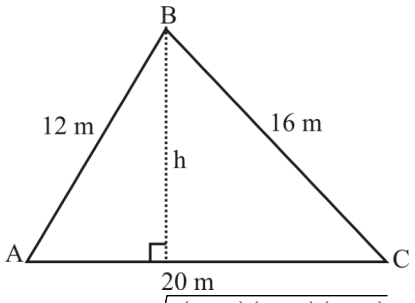
38. The sides of a triangle are 16 m, 12 m and 20 m. Find altitude of the triangle.

(a) 9.2 m (b) 9.6 m

(c) 9.4 m (d) 9.8 m

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (b)



Area of the triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

Where $s = \dfrac{a+b+c}{2}$

$s = \dfrac{16+12+20}{2} = 24$

$\therefore$ Area $= \sqrt{24(24-16)(24-12)(24-20)}$

$= \sqrt{24\times 8\times 12\times 4}$

$= 96\,m^2$

$\therefore$ The altitude $(h) = \dfrac{2\times \text{area}}{\text{base}}$

$= \dfrac{2\times 96}{20}$

$= \dfrac{96}{10} = 9.6\,m$

39. Find the area of a triangle if its two dimensions and circumference are 9 cm, 11 cm and 34 cm respectively.

(a) $17\sqrt{12}$ sq.cm (b) $12\sqrt{15}$ sq.cm

(c) $12\sqrt{17}$ sq.cm (d) $15\sqrt{17}$ sq.cm

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans : (c) Let the side of triangle are a, b, c

Then, a = 9 cm, b = 11 cm, a + b + c = 34 cm

9 + 11 + c = 34, c = 14 cm, $s = \dfrac{a+b+c}{2} = \dfrac{34}{2} = 17$

$\Delta = \sqrt{s(s-a)(s-b)(s-c)}$

$\Delta = \sqrt{17(17-9)(17-11)(17-14)}$

$\Delta = \sqrt{17\times 8\times 6\times 3} = \sqrt{17\times 144}$

$= 12\sqrt{17}\,cm^2$

So area of triangle $= 12\sqrt{17}\,cm^2$

40. Find the area of a triangle whose sides are 7.8 cm, 5 cm and 11.2 cm.

(a) 18 cm^2 (b) 16.8 cm^2

(c) 17.4 cm^2 (d) 12 cm^2

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (b) Semi perimeter $(s) = \dfrac{7.8+5+11.2}{2} = \dfrac{24}{2} = 12$

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{12(12-7.8)(12-5)(12-11.2)}$

$= \sqrt{12\times 4.2\times 7\times .8}$

$= \sqrt{282.24}$

$= 16.8\ cm^2$

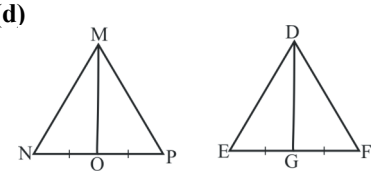
41. ΔMNP is similar to ΔDEF. Area of ΔMNP is 1024 cm^2 and area of ΔDEF is 144 cm^2. If the longest side of ΔMNP is 64 cm then what is the longest side of ΔDEF?

(a) 32 cm (b) 28 cm

(c) 20 cm (d) 24 cm

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (d)



Δ MNP $\sim \Delta$ DEF

By the law of similarity

$\dfrac{\text{Area of } \Delta MNP}{\text{Area of } \Delta DEF} = \dfrac{(\text{longest side of } \Delta MNP)^2}{(\text{longest side of } \Delta DEF)^2}$

$\Rightarrow \sqrt{\dfrac{1024}{144}} = \left(\dfrac{64}{\text{longest side of } \Delta DEF}\right)$

$\Rightarrow \dfrac{32}{12} = \dfrac{64}{\text{longest side of } \Delta DEF}$

$\Rightarrow$ Longest side of $\Delta DEF = \dfrac{64\times 12}{32}$

$= 2\times 12 = 24$ cm

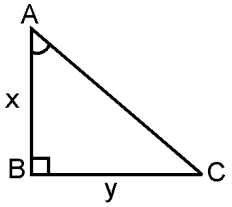
42. Difference between the height and the base of a right angled triangle is 7 cm and the area of that triangle is 30 sq. cm. The perimeter of the triangle is:

(a) 13 cm (b) 12 cm

(c) 30 cm (d) 25 cm

RRB Group-D – 05/11/2018 (Shift-II)

Ans : (c) Given



Difference between height and base of triangle = 7

$x - y = 7$ ..... (i)

Area of triangle = 30 cm^2

So, area of right angled triangle

$= \dfrac{1}{2}\times$ base $\times$ height

$30 = \dfrac{1}{2}xy \Rightarrow xy = 60$ ..... (ii)

$x + y = \sqrt{(x-y)^2 + 4xy}$

$= \sqrt{49 + 240}$

$= \sqrt{289}$

$x + y = 17$ ..... (iii)

From the equation (i) and (iii)

x = 12 cm.

y = 5 cm.

According to Pythagoras theorem in triangle ABC

$AC^2 = AB^2 + BC^2$

$AC^2 = (12)^2 + (5)^2$
$AC^2 = 144 + 25$
$AC^2 = 169$
$AC = 13$ cm.
So, perimeter of triangle $= 13 + 12 + 5 = 30$ cm.

43. The numerical value of the area of an equilateral triangle is two times the numerical value of its perimeter. Find the area of the above triangle.

(a) $48\ cm^2$ (b) $24\sqrt{3}\ cm^2$
(c) $48\sqrt{3}\ cm^2$ (d) $36\sqrt{3}\ cm^2$

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (c) Let the side of equilateral triangle is a cm.
According to the question,
Area of equilateral Δ = 2 × perimeter of equilateral Δ

$$\frac{\sqrt{3}a^2}{4} = (3a)\times 2$$

$$\frac{\sqrt{3}a}{4} = 6$$

$$a = \frac{24\sqrt{3}}{3}$$

$$a = 8\sqrt{3}\ cm$$

$\because$ Area of equilateral $\Delta = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4}\times 8\sqrt{3}\times 8\sqrt{3}$

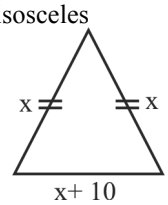
$= 2 \times 3 \times 8\sqrt{3} = 48\sqrt{3}\ cm^2$

44. The perimeter of a triangle is 100 cm. If its two sides are equal and the third side is 10 cm more than the equal sides. What is the length of the third side?

(a) 30 (b) 25
(c) 40 (d) 36

RRB NTPC 03.04.2016 Shift : 3

Ans : (c) $\because$ Two sides of a triangle are equal
$\therefore$ Triangle will be isosceles



Perimeter of Triangle = 100 cm
x + x + x + 10 = 100
3x + 10 = 100
3x = 90
$\boxed{x = 30}$
So length of the third side = x + 10 = 30 + 10 = 40 cm.

45. If side of an equilateral triangle is 4 unit, then area of that triangle is :

(a) $16/\sqrt{3}$ square unit (b) $4\sqrt{3}$ square unit
(c) $2/\sqrt{3}$ square unit (d) $\sqrt{3}$ square unit

RRB NTPC 30.03.2016 Shift : 2

Ans : (b)

Area of equilateral triangle $= \frac{\sqrt{3}}{4}\times(side)^2$

$= \frac{\sqrt{3}}{4}\times 16 = 4\sqrt{3}$ square unit

46. The area of a triangle is 456 cm^2 and its height is 24 cm. Then the length of its base is:

(a) 32 (b) 36
(c) 34 (d) 38

RRB NTPC 06.04.2016 Shift : 2

Ans : (d) Area of triangle = 456 cm^2
Height = 24 cm
Base=?

Area of triangle $= \frac{1}{2}\times$ base $\times$ height

$$456 = \frac{1}{2}\times 24 \times \text{base}$$

$$\text{Base} = \frac{456}{12},\ \text{base} = 38\ cm.$$

47. The area of two similar triangles are 121 m^2 and 64 m^2. If the median of the first triangle is 12.1 m then the median of the second triangle is:

(a) 6.4 m (b) 8.4 m
(c) 8.8 m (d) 9.2 m

RRB NTPC 19.01.2017 Shift : 2

Ans : (c)

$$\frac{M_1}{M_2} = \sqrt{\frac{A_1}{A_2}} \qquad \frac{12.1}{M_2} = \sqrt{\frac{(121)}{(64)}}$$

$$\frac{12.1}{M_2} = \frac{11}{8},\ \boxed{M_2 = 8.8\ m.}$$

48. Find the area of the triangle whose sides are 11 cm, 7 cm and 14 cm.

(a) $7\sqrt{22}$ (b) $11\sqrt{8}$
(c) $12\sqrt{10}$ (d) $13\sqrt{3}$

RRB NTPC 29.04.2016 Shift : 1

Ans : (c) a = 11 cm., b = 7 cm., c = 14 cm.

Semi perimeter $(s) = \frac{a+b+c}{2} = \frac{11+7+14}{2} = \frac{32}{2}$

s = 16

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{16(16-11)(16-7)(16-14)}$

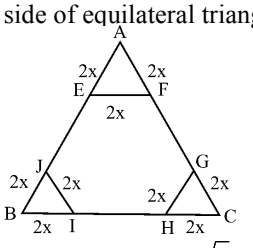
$= \sqrt{16(5)(9)(2)} = 12\sqrt{10}\ cm^2$

49. Three triangles are marked out of a large triangle at the three vertices such that each side of each of the small triangles is one-fourth as long as each corresponding side of the large triangle. The ratio of the area of the three small triangles taken together to that of the rest of the large triangle is:

(a) 3 : 13 (b) 1 : 5
(c) 3 : 16 (d) 4 : 15

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (a) Let the side of equilateral triangle = 8x unit



Area of large equilateral triangle $= \frac{\sqrt{3}}{4} \times (8x)^2$

$= \frac{\sqrt{3}}{4} \times 64x^2 = 16\sqrt{3}x^2$

Area of three small equilateral triangle

$= 3 \times \frac{\sqrt{3}}{4} \times (2x)^2 = 3\sqrt{3}x^2$

$\therefore$ Area of remaining equilateral triangle

$= 16\sqrt{3}x^2 - 3\sqrt{3}x^2 = 13\sqrt{3}x^2$

$\therefore$ Required ratio $= 3\sqrt{3}x^2 : 13\sqrt{3}x^2 = 3 : 13$

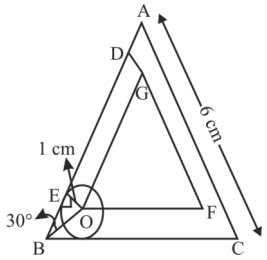
50. ABC is an equilateral triangle of side 6cm. If a circle of radius 1 cm is formed inside and along the sides of the triangle, the locus of the centre of the circle is an equilateral triangle of side is :

(a) 4 cm (b) $\left(6 - 2\sqrt{3}\right)$ cm

(c) 5 cm (d) $\left(3 + \sqrt{3}\right)$ cm

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b)



From ΔOEB

$\tan 30° = \frac{OE}{EB}$

$\frac{1}{\sqrt{3}} = \frac{1}{EB}$

$EB = \sqrt{3}$ cm

So, side of equilateral triangle formed from the locus center of circle

$= AB - (EB + DA) = AB - 2\,EB = \left(6 - 2\sqrt{3}\right)$ cm

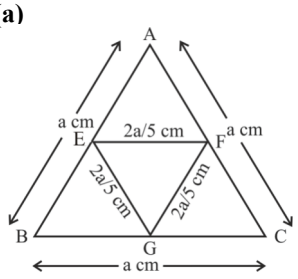
51. Three small triangles are so formed from the three corners of a large triangle in such a way that each side of the small triangle is equal to $\frac{2}{5}$ times of the corresponding side of the large triangle. What is the ratio between the total areas of the three small triangles and the remaining area of the large triangle?

(a) 12 : 13 (b) 1 : 5

(c) 12 : 25 (d) 4 : 25

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (a)



Area of equilateral triangle ABC $= \frac{\sqrt{3}}{4} a^2$ cm

Area of small equilateral $\Delta AEF, \Delta BEG$ and ΔCFG

$= \frac{\sqrt{3}}{4}\left\{\left(\frac{2a}{5}\right)^2 + \left(\frac{2a}{5}\right)^2 + \left(\frac{2a}{5}\right)^2\right\}$

$= \frac{3\sqrt{3}}{4} \times \frac{4a^2}{25} = \frac{3\sqrt{3}}{25} a^2$ cm

$\frac{\text{Area of } \Delta ABC}{\text{Area of three small triangles}} = \frac{\sqrt{3}/4\,a^2}{3\sqrt{3}/25\,a^2}$

$\frac{\text{Area of } \Delta ABC}{\text{Area of three small triangles}} - 1 = \frac{25}{12} - 1$

$\frac{\text{Area of } \Delta ABC - \text{Area of three small triangles}}{\text{Area of three small triangles}} = \frac{25 - 12}{12}$

$= \frac{\text{Area of remaining triangle}}{\text{Area of three small triangles}} = \frac{13}{12}$

$= \frac{\text{Area of three small triangles}}{\text{Area of remaining triangle}} = \frac{12}{13}$

Type - 2

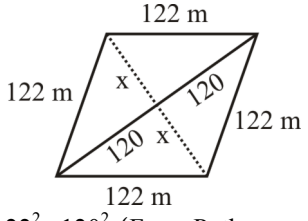
52. A field is in the shape of a rhombus whose side is 122 m. The length of one of its diagonal's is 240 m. What is the area (in m^2) of the field?

(a) 1320 (b) 3080

(c) 5280 (d) 1760

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (c) : According to the question,



$x^2 = 122^2 - 120^2$ (From Pythagoras theorem)

$= 14884 - 14400$

$= 484$

$x = 22$ meter

Second diagonal $(d_2) = 2x$

$= 2 \times 22$

$= 44$ meter

Area of rhombus = $\frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 240 \times 44 = 5280 \text{ m}^2$

53. Find the area of a rhombus whose diagonals are 48m and 64m long.

(a) 1636 sq.m (b) 1536 sq.m

(c) 1436 sq.m (d) 1736 sq.m

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : Area of rhombus = $\frac{1}{2} \times$ product of diagonal

$= \frac{1}{2} \times 48 \times 64$

= 1536 square meter.

54. The area of a trapezium is 1792 cm^2 and the perpendicular distance between its parallel sides is 28 cm. If the length of one of the parallel sides is 72 cm, then find the length of the other side.

(a) 64 cm (b) 56 cm

(c) 84 cm (d) 48 cm

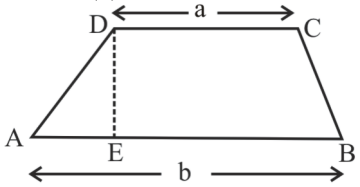
RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (b) : Given,

Area of trapezium = 1792 cm^2

Distance between its parallel sides. (h) = 28 cm

Length of one side (b) = ?



Now,

Area of trapezium = $\frac{1}{2}(a+b) \times h$

$1792 = \frac{1}{2}(72+b) \times 28$

$256 = (72 + b) \times 2$

$128 = 72 + b$

$b = 128 - 72$

Length of second side (b) = 56 cm

55. The area of a rhombus is 440 cm^2. If the length of one of its diagonals is 20 cm, then what is the length of its other diagonal?

(a) 22 cm (b) 11 cm

(c) 44 cm (d) 88 cm

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (c) : Area of rhombus = $\frac{1}{2} \times d_1 \times d_2$

$\frac{1}{2} \times 20 \times d_2 = 440 \text{ cm}^2$

$d_2 = 44$ cm

56. Find the area a trapezium (in sq. with parallel sides of length 3 unit and 5 unit and the shortest distance between its parallel sides is 6 units.

(a) 24 (b) 15

(c) 48 (d) 12

RRB Group-D 01/09/2022 (Shift-III)

Ans. (a) : Are of trapezium = $\frac{1}{2}$ ×(Sum of parallal sides) × minimum distance between them = $\frac{1}{2}(3+5) \times 6$

= 24 square unit

57. The parallel sides of a trapezium and its height are in an arithmetic progression with a common difference of 4. If the height is the highest term and the area of the trapezium is 160 sq. units, find the ratio of length of greatest parallel side to that of the smallest parallel side.

(a) 5 : 1 (b) 2 : 3

(c) 3 : 2 (d) 1 : 5

RRB Group-D 18/08/2022 (Shift-III)

Ans. (c) : Smallest side of parallogram = x

other sides of arthmetic progression = x + 4 and x + 8

and longest side converted in height

According to the question,

Area of trapezium = $\frac{1}{2}$× (Sum of parallel sides) × height

$160 = \frac{1}{2}(x + x + 4)(x + 8)$

$320 = (2x + 4)(x + 8)$

$320 = 2x^2 + 20x + 32$

$x^2 + 10x + 16 = 160$

$x^2 + 10x - 144 = 0$

$x^2 + 18x - 8x - 144 = 0$

$x(x + 18) - 8(x + 18) = 0$

अतः $(x + 18)(x - 8) = 0$

$x = 8$

The ratio of length of longest side of parallel side and smalles sides of parallel sides = 12 : 8

= 3 : 2

58. In a parallelogram, the altitude is twice the corresponding base, and the area of the parallelogram is 288 m^2. The altitude of the parallelogram is:

(a) 12 m (b) 18 m

(c) 36 m (d) 24 m

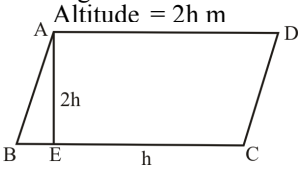
RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (d) : Given:–

Area of Parallelogram = 288 m^2

Let length of base = h m

Altitude = 2h m



$$\text{Altitude of parallelogram} = \frac{\text{Area}}{\text{Base}}$$

$$2h = \frac{288}{h}\text{ m}$$

$$h^2 = 144\text{ m}$$

$$h = 12\text{ m}$$

$$\text{Altitude} = 2h = 2 \times 12 = 24\text{ m}$$

59. If a triangle and a parallelogram are on the same base and between the same parallel lines, then the area of the triangle is equal to :

(a) One- third of the area of the parallelogram

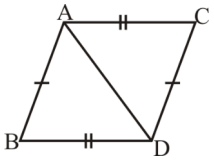
(b) Half of the area of the parallelogram

(c) Three-fourth of the area of the parallelogram

(d) The area of the parallelogram

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b)



From figure,

$$\text{Area of } \Delta ABD = \frac{1}{2} \times \text{area of parallelogram ABCD}$$

Hence, it is clear from the above that a parallelogram and a triangle are created on same base and same parallel lines. Hence the area of triangle will be half of the area of the parallelogram.

60. Find the area of a rhombus whose perimeter is 164 cm and one diagonal is of length 80 cm.

(a) 700 cm^2 (b) 720 cm^2

(c) 705 cm^2 (d) 710 cm^2

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

Diagonal of rhombus (AB) (d_1) = 80 cm

Perimeter of rhombus = 164 cm

$$\therefore \text{ Side of rhombus} = \frac{164}{4} = 41\text{cm}$$

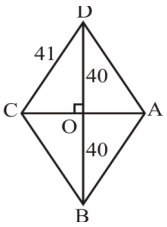
From Pythagoras theorem,

$OC^2 = (41)^2 - (40)^2$

$(OC)^2 = 1681 - 1600 = 81$

$OC = \sqrt{81}$

$OC = 9$ cm



$\therefore d_2 = 2 \times OC = 2 \times 9 = 18$ cm

$$\text{Hence, area of rhombus} = \frac{1}{2} d_1 \times d_2 = \frac{1}{2} \times 80 \times 18$$

$$= 80 \times 9 = 720\text{ cm}^2$$

61. What will be the area of a parallelogram with base 44 cm and height 22 cm?

(a) 978 cm^2 (b) 958 cm^2

(c) 988 cm^2 (d) 968 cm^2

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Base = 44 cm.

Height = 22 cm

Area of parallelogram = Base × Height

$= 44 \times 22$

$= 968\text{ cm}^2$

62. A rectangle of sides 34 cm and 18 cm is reconstructed to form a rhombus whose perimeter is equal to that of the rectangle and one of its angle is 120º. Find the area of the rhombus in cm^2.

(a) $\frac{169\sqrt{3}}{3}$ (b) $169\sqrt{3}$

(c) $338\sqrt{3}$ (d) $\frac{338\sqrt{3}}{3}$

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

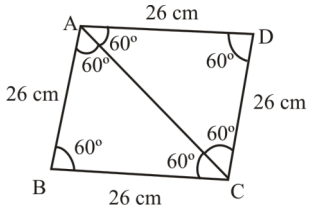
Ans. (c) : Let the side of rhombus be a cm.

According to the question,

Perimeter of rhombus = Perimeter of rectangle

$4a = 2(34 + 18)$

$a = 26$



Area of rhombus ABCD = 2 × Area of equilateral triangle ABC

$$\text{Area} = 2 \times \frac{\sqrt{3}}{4} \times \text{side}^2$$

$$= 2 \times \frac{\sqrt{3}}{4} \times 26 \times 26\,\text{cm}^2$$

$$= 26 \times 13 \times \sqrt{3}\text{ cm}^2$$

and diagonal AC = 14 cm

$$= 338\sqrt{3}\text{ cm}^2$$

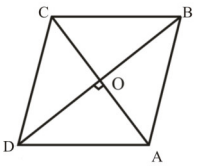
63. What is the area of a rhombus, whose sides are 25 cm and one of the diagonals is 14 cm?

(a) 336 cm^2 (b) 310 cm^2

(c) 330 cm^2 (d) 300 cm^2

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) :



ABCD is a rhombus in which,

AB = BC = CD = DA = 25 cm

∵ Diagonals of a rhombus bisect each other at right angle.

$\therefore$ AB = 25 cm, OA = $\frac{14}{2}$ =7 cm

In Δ AOB,

$\angle AOB = 90°$

Now, $OB^2 = (AB^2 - OA^2)$

$= (25^2 - 7^2) = (625 - 49)$

$OB^2 = 576$

$\Rightarrow OB = \sqrt{576}$

OB = 24 cm

BD = (2×OB)

BD = 2×24 = 48 cm

$\therefore$ Area of rhombus = $\frac{1}{2} \times AC \times BD$

$= \frac{1}{2} \times 14 \times 48$

$= 7 \times 48$

$= 336\ cm^2$

64. Find the area of a rhombus whose side is 10 cm and the longest diagonal is 16 cm.

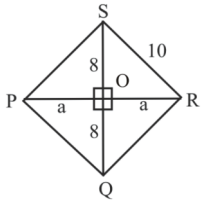
(a) 86 cm^2 (b) 88 cm^2

(c) 96 cm^2 (d) 94 cm^2

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (c) : In rhombus PQRS diagonal (SQ) = 16 cm

Suppose second diagonal (RP) = 2a cm



In ΔSOR ,

$a^2 + (8)^2 = (10)^2$

$a^2 + 64 = 100$

$a = \sqrt{100 - 64} = \sqrt{36}$

a = 6 cm

Second diagonal = 2a = 2×6 = 12

Area of rhombus $= \frac{1}{2} d_1 d_2 = \frac{1}{2} \times 16 \times 12 = 96\ cm^2$

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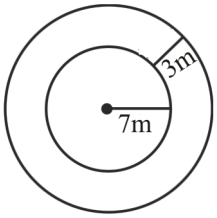
65. What is the area (in m^2) of a circular path having a uniform width of 3m surrounding a circular field of diameter 150m?

(a) 453π (b) 447π

(c) 456π (d) 459π

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (d) : According to the question,



Area of circle = πr^2

Area of circular field

= (Area of field with circular path) – (Area of the field)

$= \pi(75 + 3)^2 - \pi(75)^2$

$= \pi 78 \times 78 - \pi \times 75 \times 75$

$= 459\pi\ m^2$

66. If diameter of a circle is 16m, then what is the area of the circle?

(a) 256π m^2 (b) 96π m^2

(c) 64π m^2 (d) 128π m^2

RRB NTPC (Stage-II) 15/06/2022 (Shift-II)

Ans. (c) : 2R = 16 m

R = 8 m $\left[\text{Radius}(R) = \frac{\text{Diameter}(D)}{2}\right]$

Area of the circle = πR^2

$= \pi \times 8^2$

$= 64\pi\ m^2$

67. What will be the perimeter of a quarter circle having a radius of 10 cm? [Use π = 3.14]

(a) 15.7 cm (b) 35.7 cm

(c) 25.7 cm (d) 51.4 cm

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (b) : Perimeter of quarter circle

$= \frac{2\pi r}{4} + 2r$

$= 2 \times \frac{22}{7} \times \frac{1}{4} \times 10 + 2 \times 10$

$= \frac{110}{7} + 20$

= 15.7+20 = 35.7 cm

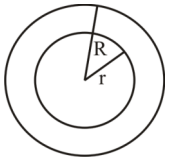
68. A circular racing track has been developed in a field. If the difference between the outer circumference and the inner circumference of the racing track is 33 m, then find the width of the track (in m) (Use $\pi = \frac{22}{7}$)

(a) $5\frac{1}{5}$ (b) $4\frac{3}{4}$

(c) $5\frac{3}{4}$ (d) $5\frac{1}{4}$

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (d) : According to the question,



Let the radius of the outer circle be R and the inner circle be r

Now,

$$2\pi\ (R - r) = 33$$

$$(R - r) = \frac{33 \times 7}{2 \times 22}$$

$$(R - r) = \frac{21}{4} = 5\frac{1}{4}$$

Hence, width of racing track (in m) = $5\frac{1}{4}$

69. An equilateral triangle of side 12 cm is inscribed in a circle. What is the area (in cm^2) of the circle?

(a) 24π (b) 36π

(c) 18π (d) 48π

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : Side of a equilateral triangle inscribed in circle = 12 cm



then, Radius of circumscribed circle $= \frac{a}{\sqrt{3}}$

$$= \frac{12 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}}$$

$$= 4\sqrt{3}$$

Area of circle $= \pi r^2$

$$= \pi \times 4\sqrt{3} \times 4\sqrt{3}$$

$$= 48\pi$$

70. If the perimeter of a circle is $\frac{88}{7}$cm, then find the perimeter (in cm) of the square the length of each of whose sides is equal to the radius of the given circle. $\left(\text{Use } \pi = \frac{22}{7}\right)$

(a) 7 (b) 8

(c) 6 (d) 9

RRB Group-D 23-08-2022 (Shift-II)

Ans. (b) : Given,

The perimeter of a circle $= \frac{88}{7}$cm

$$\Rightarrow 2\pi r = \frac{88}{7}$$

$$2 \times \frac{22}{7} \times r = \frac{88}{7}$$

$$r = 2 \text{ cm}$$

The perimeter of the square = 4a

$= 4 \times 2 = 8 \text{ cm}^2$

71. A man walks around a circular pond exactly once. If his step is 44 cm long and he takes 700 steps to complete one round of the pond, find the area of the pond.

(a) 7546 m^2 (b) 6546 m^2

(c) 7456 m^2 (d) 6574 m^2

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (a) : According to the question-

$$700 \times 44 = 2\pi r$$

$$r = \frac{700 \times 7 \times 44}{22 \times 2}$$

$$r = 4900\text{cm}$$

$$\boxed{r = 49\text{m}}$$

Hence, area of the pond $= \pi r^2$

$$= \frac{22}{7} \times 49 \times 49$$

$$= 7546\text{m}^2$$

72. The area of a circular park is 1386 m^2. If a path of the width 7 m is laid around and inside the park. Then the area of the path is:

(a) 760 m^2 (b) 780 m^2

(c) 770 m^2 (d) 790 m^2

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (c) : Area of circular park = 1386 m^2

$$\pi r^2 = 1386$$

$$\frac{22}{7} \times r^2 = 1386$$

$$r^2 = \frac{1386 \times 7}{22}$$

$$r = 21 \text{ m}$$

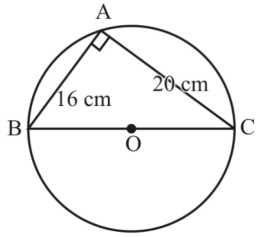
$\therefore$ Area of path = Area of larger circular park – Area of smaller circular park

$$= 1386 - \pi(r - 7)^2$$

$$= 1386 - \frac{22}{7}(21 - 7)^2 = 1386 - \frac{22}{7} \times 14 \times 14$$

$$= 1386 - 616 = 770 \text{ m}^2$$

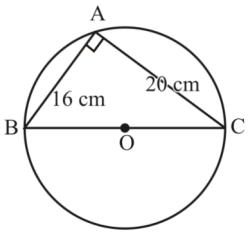
73. Find the area of ΔABC



(a) 32 cm^2 (b) 160 cm^2
(c) 320 cm^2 (d) 240 cm^2

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : Given that,



In ΔABC

$\angle BAC = 90°$ {Angle subtended by a diameter on any point of circumference of circle is 90º}

Area of $\Delta ABC = \frac{1}{2} AB.AC.\sin A$

$= \frac{1}{2} \times 16 \times 20 \times 1 \quad [\sin 90° = 1]$

$= 160\ cm^2$

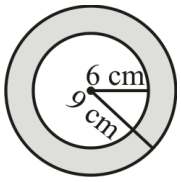
74. Two concentric circles drawn with the radius of inner circle 6 cm and outer circle radius 50% more than inner circle. What is the area of the annulus formed between two circles ?

(a) $\frac{990}{7}\ cm^2$ (b) $\frac{890}{7}\ cm^2$
(c) $\frac{900}{7}\ cm^2$ (d) 990 cm^2

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (a) Radius of inner circle $(r_2) = 6$ cm

: Radius of outer circle $(r_1) = 6 \times \frac{150}{100} = 9$ cm



Area of annulus $= \pi r_1^2 - \pi r_2^2$

$= \pi\left(r_1^2 - r_2^2\right)$

$= \frac{22}{7}(81 - 36)$

$= \frac{22}{7} \times 45$

$= \frac{990}{7}\ cm^2$

75. If in a circle of radius *r* = 36 cm a sector of arc length *l*, satisfies 4*l* = 3*r*, then the area of the sector is:

(a) 486 cm^2 (b) 461 cm^2
(c) 496 cm^2 (d) 476 cm^2

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given
Radius of circle $(r) = 36$
$4l = 3r$
$4l = 3 \times 36$ cm
Length of arc $(l) = 27$ cm

Area of sector $= \frac{1}{2} \times$ Length of arc $\times$ Radius

$= \frac{1}{2} \times 27 \times 36$
$= 27 \times 18$
$= 486\ cm^2$

76. If the area of a circle is 154 cm^2, then the circumference of the circle is:

(a) 11 cm (b) 44 cm
(c) 36 cm (d) 22 cm

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

$\pi r^2 = 154$

$r^2 = \frac{154 \times 7}{22} = 49$

$r = 7$ cm.

Then the circumference of circle $= 2\pi r$

$= 2 \times \frac{22}{7} \times 7 = 44$ cm.

77. If Circumference and area of a circle are numerically equal then radius of the circle is–

(a) 4 units (b) 2 units
(c) 1 units (d) 16 units

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : $\because$ The circumference of circle $= 2\pi r$
and area $= \pi r^2$
According to the question,

$2\pi r = \pi r^2$

Radius (r) = 2 units

78. The diameter of a wheel is 88 cm. Find the number of revolutions in which it will cover a distance of 8712m.

$\left(\textbf{Use}\ \pi = \frac{22}{7}\right)$

(a) 3450 (b) 3250
(c) 3350 (d) 3150

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the number of revolutions = N
Distance = Circumference of wheel $\times$ Number of revolutions

$\Rightarrow 100 \times 8712\ cm = 2 \times \frac{22}{7} \times 44 \times N$

{Circumference of circle $= 2\pi r$}

$N = \frac{7 \times 8712 \times 100}{44 \times 44} = 3150$

$\boxed{N = 3150}$

79. What is the area of the region swept by the minute hand 6 cm long, of a wall clock, in an interval of 5 minutes?

(a) 9.43 cm^2 (b) 9.6 cm^2

(c) 9.8 cm^2 (d) 9.63 cm^2

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : The area covered by the minute hand of the wall clock in 60 minutes = πr^2

Where r = lengh of minute hand

$$\therefore \text{Area covered in 5 minutes} = \frac{5}{60}\pi r^2$$

$$= \frac{5}{60}\times\frac{22}{7}\times 6\times 6$$

$$= \frac{1}{12}\times\frac{22}{7}\times 36$$

Hence covered area = 9.43 cm^2

80. If the outer and inner radii of a circular path are 2a and b, then its area is _____ sq. units.

(a) $(-4a^2+b^2)$ (b) $\pi\ (-4a^2+b^2)$

(c) $(4a^2-b^2)$ (d) $\pi\ (4a^2-b^2)$

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : Area of path = Area of outer part – Area of inner part.

$$= \pi r_1^2 - \pi r_2^2$$

$$= \pi\left[(2a)^2 - (b)^2\right]$$

$$= \pi\left(4a^2 - b^2\right) \qquad \{\because r_1 = 2a\ ,\ r_2 = b\}$$

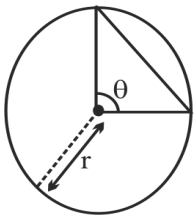
81. A sector is cut off from a circle of radius 21 cm. The angle of the sector is 40 degree. find the area of the sector in square cm?

(a) 145 (b) 154

(c) 156 (d) 144

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given, r = 21 cm, $\theta = 40^\circ$



The area of sector $= \frac{\pi r^2\theta}{360^\circ}$

$$= \frac{22\times 21\times 21\times 40^\circ}{7\times 360^\circ}$$

$$= 154\ cm^2$$

82. The diameter of circle whose perimeter is 8.8 cm is _____. $\left(\pi = \frac{22}{7}\right)$

(a) 1.4 cm (b) 5.6 cm.

(c) 2.8 cm (d) 0.28 cm.

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (c) : The perimeter of circle = $2\pi r$

$$2\times\frac{22}{7}r = 8.8$$

$$2r = \frac{8.8\times 7}{22}$$

$$2r = 2.8\ cm$$

Hence the diameter of circle = 2.8 cm

83. The area of a circle is 616 sq.m. Find its diameter. ($\pi = 22/7$)

(a) 7 m (b) 14 m

(c) 28 m (d) 56 m

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (c) $\because$ Area of circle = 616 sq.m.

$$\pi r^2 = 616$$

$$r^2 = \frac{616\times 7}{22},\ r^2 = 196$$

r = 14m

Diameter = 2×14

Diameter = 28m.

84. Find the area of the circular path, which is formed around a circle of circumference 440 m and whose width is 7 m.

(a) 3856 sq.m. (b) 3234 sq.m.

(c) 3900 sq.m. (d) 3204 sq.m.

RRB JE - 27/05/2019 (Shift-II)

Ans : (b) Circumference of a circle = $2\pi r$

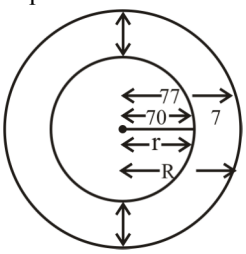
$2\pi r = 440$

$$2\times\frac{22}{7}\times r = 440$$

$$r = \frac{440\times 7}{2\times 22}$$

r = 70 m

Let r be the radius of the circle and the radius of the circle with circular path is R.



Area of circular track $= \pi\left(R^2 - r^2\right)$

$$= \pi\left[(77)^2 - (70)^2\right]$$

$$= \pi[5929 - 4900]$$

$$= \pi\times 1029$$

$$= \frac{22}{7}\times 1029$$

= 3234 square meter

85. What is the circumference of a semicircle diameter is 28 cm?

(a) 36 cm. (b) 144 cm.

(c) 72 cm. (d) 44 cm.

RRB RPF Constable – 24/01/2019 (Shift-I)

Ans : (c) Diameter $= 28$ cm,

Radius $= \dfrac{\text{diameter}}{2} = \dfrac{28}{2} = 14$ cm

Circumference of a semicircle $= \pi r + 2r = r(2+\pi)$

$$= 14\left(2+\frac{22}{7}\right) = 14\times\frac{36}{7} = 72 \text{ cm.}$$

86. The radius of a circle is increased by 5%. Find the percentage increase in its area.

(a) 10.25% (b) 21.5%

(c) 10.5% (d) 25%

RRB JE - 28/05/2019 (Shift-I)

Ans : (a) Let the radius of circle $= x$

Increase % in area of the circle

$$= \left(2x + \frac{x^2}{100}\right)\%$$

$$= \left(2\times 5 + \frac{(5)^2}{100}\right)\%$$

$$= (10 + 0.25)\%$$

$$= 10.25\%$$

87. What will be the radius of inner circle of triangle whose sides are 7 cm, 24 cm and 25 cm?

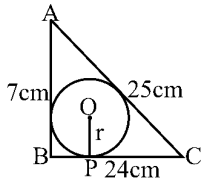
(a) 4 cm (b) 2.5 cm

(c) 3.5 cm (d) 3 cm

RRB RPF SI – 12/01/2019 (Shift-I)

Ans : (d) The sides of the given triangle form a right angled triangle.

Then,



Area of triangle $(\Delta) = \dfrac{1}{2}\times 24\times 7 = 84 \text{ cm}^2$

Semi perimeter $(s) = \dfrac{1}{2}[24+25+7] = 28$

Hence radius of inner circle $(r) = \dfrac{\Delta}{s} = \dfrac{84}{28} = 3\text{cm}$

88. The cost of installing a paved floor in a circular room is ₹ 1540 at the rate of ₹10 per square meter. What is the cost of fencing at the rate of ₹ 6 per meter?

(a) ₹ 260 (b) ₹ 264

(c) ₹ 250 (d) ₹ 265

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (b) Area of the circle $= \pi r^2$

$\because$ ₹ 10 per square meter cost = ₹ 1540

$\therefore$ Area of circle $= \dfrac{1540}{10} = 154$

$$\pi r^2 = 154$$

$$r^2 = \frac{154\times 7}{22}$$

$$r^2 = 49$$

$$r = 7 \text{ m}$$

Perimeter of circle $= 2\pi r = 2\times\dfrac{22}{7}\times 7 = 44$ m

Cost of fencing at the rate of ₹ 6 per meter

$= 6\times 44 =$ ₹ 264

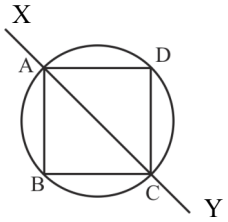
89. ABCD is a quadrilateral inscribed in a circle of radius r. The bisectors of ∠DAB and ∠BCD intersect the circle at X and Y respectively. What is the length of the straight line X Y?

(a) 2r (b) (r +2)

(c) $\dfrac{\pi r^2}{2}$ (d) πr^2

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (a)



In a cyclic quadrilateral, the bisector of the opposite angle will pass through the center.

XY = AC

and AC is the diameter of the circle

$\boxed{XY = 2r}$

90. The circumference of a circle is 15 cm more than its diameter. Find the radius of the circle.

(a) 7 cm (b) 3.5 cm

(c) 4 cm (d) 8 cm

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (b) According to the question-

$$2\pi r - 2r = 15$$

$$2r(\pi - 1) = 15$$

$$2r\left(\frac{22}{7} - 1\right) = 15$$

$$2r\left(\frac{15}{7}\right) = 15$$

$$2r = 7$$

$$\boxed{r = 3.5 \text{ cm.}}$$

91. The inner and outer circumference of the circular ring is 22 cm and 44 cm respectively. Find the thickness of the ring.

(a) 5.5 cm (b) 1.5 cm

(c) 3.5 cm (d) 2.5 cm

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (c) Let internal radius of ring $= r_1$

and outer radius of ring $= r_2$

As per the question –

$$2\pi r_1 = 22, \qquad 2\pi r_2 = 44$$

$$2\times\frac{22}{7}\times r_1 = 22, \qquad 2\times\frac{22}{7}\times r_2 = 44$$

$$r_1 = \frac{7}{2}\text{cm}, \qquad r_2 = 7\text{cm}$$

Thickness of ring $= r_2 - r_1$

$$= 7 - \frac{7}{2} = \frac{7}{2}\text{cm} = 3.5 \text{ cm}$$

92. An outer circular path is built around a circular garden. If the outer and the inner perimeter of the path are 220 m and 44 m respectively, Find the area of the path.

(a) 3960 m^2 (b) 3696 m^2
(c) 3069 m^2 (d) 3096 m^2

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) Let the outer radius $= r_1$

Internal radius $= r_2$

Given,

Circumference of circle $\Rightarrow 2\pi r_1 = 220, \quad 2\pi r_2 = 44$

$r_1 = 35m, \quad r_2 = 7m$

Area of the garden with the path $= \pi r_1^2$

$$= \frac{22}{7} \times 35 \times 35 = 3850 \text{ m}^2$$

Area of garden $= \pi r_2^2 = \frac{22}{7} \times 7 \times 7 = 154 \text{ m}^2$

Area of path $= 3850 - 154 = 3696 \text{ m}^2$

93. The area of an equilateral triangle inscribed in a circle is $9\sqrt{3}$ cm^2. What is the area of the circle?

(a) 16π (b) $12\sqrt{3}\ \pi$
(c) $15\sqrt{3}\ \pi$ (d) $12\ \pi$

RRB Group-D – 05/12/2018 (Shift-I)

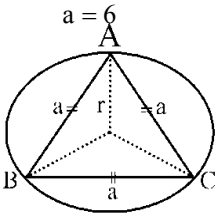
Ans : (d)

Area of equilateral $\Delta = \frac{\sqrt{3}}{4}a^2$ Where a = side of Δ

$$\frac{\sqrt{3}}{4} \times a^2 = 9\sqrt{3}$$

$$a^2 = 36$$

$$a = 6$$



Note- The radius of the circumcircle of an equilateral triangle of side 'a' $= \frac{a}{\sqrt{3}} = \frac{6}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$= 2\sqrt{3}$

Area of circle $= \pi r^2$

$= \pi \times 2\sqrt{3} \times 2\sqrt{3}$

Hence area of circle $= 12\pi$

94. A race ground is in the form of a ring. Its inner and outer circumference are 88 m and 154 m respectively. What is the width of the race ground?

(a) 12m (b) 15m
(c) 16.5 m (d) 10.5 m

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (d) Let the outer radius of the field = R

Internal radius of the field = r

Outer circumference of the field $= 2\pi R$

$2\pi R = 154$

$\pi R = 77$

$R = 49/2$

Internal circumference of the field $= 2\pi r$

$2\pi r = 88$

$\pi r = 44$

$r = 14$

Width of the field $= R - r = \frac{49}{2} - 14$

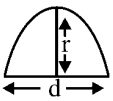
$$= \frac{49-28}{2} = \frac{21}{2} = 10.5\text{m}$$

95. If the diameter of a semicircle is 14 m. What will be the perimeter of the semicircle?

(a) 44 m (b) 22 m
(c) 36 m (d) 58 m

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (c) :



$\because$ Diameter of semicircle $=$ 14 m

$2r = 14$

$r = 7$ m

Perimeter of semicircle $= \pi r + 2r$

$$= \frac{22}{7} \times 7 + 14$$

$= 22 + 14 = 36$ m

96. If the diameter of the wheel of a car is 56 cm, then how many times will the wheel of the car rotate during the journey of 88 km?

(a) 500 (b) 50,000
(c) 5,000 (d) 5,00,000

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) : Diameter of wheel = 56 cm.

$d = 56$ cm

$\therefore \quad r = \frac{d}{2}$

$r = \frac{56}{2} = 28\,\text{cm}$

Let the wheel will rotate n times to cover the distance of 88 km

$n \times 2\pi r = 88\,\text{km}$ [1 km = 100000 cm]

$$n = \frac{88 \times 100000}{2 \times \frac{22}{7} \times 28}$$

$$n = \frac{88 \times 100000}{2 \times 88}$$

$n = 50000$

97. A circular land of radius 7 m has 3.5 m wide path around it. Find the area of the path. $\left(\pi = \frac{22}{7}\right)$

(a) 202 sq. m. (b) 154 sq. m.
(c) 192.5 sq. m. (d) 346.5 sq. m.

RRB NTPC 17.01.2017 Shift-2

Ans : (c) Area of path = Area of land with path – Area of land.

$= \pi(7+3.5)^2 - \pi(7)^2$

$= \frac{22}{7}\left[(10.5-7)(10.5+7)\right]$

$= \frac{22}{7} \times 17.5 \times 3.5 = 192.5 \text{ m}^2$

98. If the circumference of a circle is 18π cm, then the area of the circle is:

(a) 18π sq. cm. (b) $18\pi^2$ sq. cm.

(c) 81π sq. cm. (d) 9π sq. cm.

RRB NTPC 05.04.2016 Shift-1

Ans : (c) Given- Circumference of a circle $= 18\pi$

$2\pi r = 18\pi$

$r = \frac{18}{2}$

$r = 9$ cm

$\therefore$ Area of circle $= \pi r^2$

$= \pi \times (9)^2 = 81\pi$ square cm

99. If the diameter of a circle is 7 cm then find its area.

(a) 49 cm^2 (b) 38.5 cm^2

(c) 154 cm^2 (d) 98 cm^2

RRB NTPC 04.04.2016 Shift : 2

Ans : (b) Radius of the circle (r) $= \frac{\text{diameter}}{2}$

$= \frac{7}{2}\text{cm}$

Area of circle $= \pi r^2$

$= \frac{22}{7} \times \left(\frac{7}{2}\right)^2 = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = \frac{77}{2} = 38.5 \text{ cm}^2$

100. If the circumference of a circle is 22 cm, find the area of the semicircle.

(a) 38.5 sq.cm. (b) 19.25 sq.cm.

(c) 44 sq.cm. (d) 77 sq.cm.

RRB NTPC 03.04.2016 Shift : 2

Ans :(b) Circumference of the circle $= 22$ cm

$2\pi r = 22$

$r = \frac{22}{2\pi} = \frac{22 \times 7}{2 \times 22}$ $\quad r = \frac{7}{2}$ cm

Area of semicircle $= \frac{\pi r^2}{2} = \frac{22 \times 7 \times 7}{2 \times 7 \times 2 \times 2}$

$= \frac{11 \times 7}{4} = \frac{77}{4} = 19.25$ square cm.

101. When a square is made by bending a wire then the area of the square is 484 cm^2. If the same wire is bent as a circle then its area will be:

(a) 264 sq. cm. (b) 616 sq. cm.

(c) 488 sq. cm. (d) 492 sq. cm.

RRB NTPC 02.04.2016 Shift : 3

Ans : (b) Area of square $= 484$ square cm.

$(\text{Side})^2 = 484 = (22)^2$

Side $= 22$ cm

Perimeter of square $= 4 \times$ side $= 4 \times 22$

$= 88$cm

Perimeter of circle $=$ Perimeter of square

$= 88$cm

$\therefore 2\pi r = 88 \Rightarrow 2 \times \frac{22}{7} \times r = 88$

$\Rightarrow r = \frac{4 \times 7}{2} = 14$ cm

Area of circle $= \pi r^2$

$= \frac{22}{7} \times (14)^2 = \frac{22}{7} \times 14 \times 14$

$= 22 \times 2 \times 14 = 616 \text{ cm}^2$

102. The largest chord of a circle measures 10 cm and the shortest chord measures 4 cm. Find the radius of the circle.

(a) 20 cm. (b) 5 cm.

(c) 8 cm. (d) 2 cm.

RRB NTPC 29.03.2016 Shift : 2

Ans : (b) Diameter of circle $=$ length of the largest chord of the circle = 10 cm

$\therefore$ Radius of circle $= \frac{10}{2} = 5$cm

103. Find the area of a circular region whose circumference is 22 cm.

(a) 22 sq. cm. (b) 11 sq. cm.

(c) 44 sq. cm. (d) 38.5 sq. cm.

RRB NTPC 29.03.2016 Shift : 2

Ans : (d) Circumference of a circle $= 2\pi r$

From the question–

$2\pi r = 22$

$r = \frac{22}{2 \times \pi}$

$r = \frac{22 \times 7}{2 \times 22} \Rightarrow \boxed{r = \frac{7}{2}}$

$\therefore$ Area of circle $= \pi r^2$

$= \frac{22}{7} \times \left(\frac{7}{2}\right)^2$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2}$

$= \frac{77}{2} = 38.5$ square cm.

104. Find the increase in the circumference of the circle of radius 14 cm, if the radius is increased by 7cm. $\left(\pi = \frac{22}{7}\right)$

(a) 44 cm (b) 22 cm

(c) 66 cm (d) 88 cm

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) Circumference of a circle whose radius is 14 cm $= 2\pi r$

$= 2 \times \frac{22}{7} \times 14 = 88$ cm

When radius is increased by 7 cm

Then radius $= 14 + 7 = 21$

Perimeter $= 2 \times \frac{22}{7} \times 21 = 132$ cm.

Required increase $= 132 - 88 = 44$ cm

105. A piece of wire is folded and shaped into a square with a side of 44cm. Again the square is shaped into a circle. What is the radius of this circle?

(a) 108 cm. (b) 56 cm.
(c) 14 cm. (d) 28 cm.

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) From the question,
Side of square = 44 cm
Perimeter = 4 × side = 4 × 44 $\Rightarrow$ 176 cm
Perimeter of square = Circumference of a circle = 176 cm

$\because 2\pi r = 176\text{cm} \quad \left(\because \pi = \frac{22}{7}\right)$

Radius (r) = $\frac{176\times 7}{22\times 2} = 28$ cm

106. What is the cost of the levelling a circular ground of 28 meters diameter at the rate of ₹ 125 per square meter? $(\pi = 22/7)$

(a) ₹ 76,000 (b) ₹ 76,400
(c) ₹ 76,800 (d) ₹ 77,000

RRB NTPC 06.04.2016 Shift : 1

Ans : (d) Radius of circular field $(r) = \frac{28}{2} = 14\,\text{m}.$

Area of circular ground = πr^2

$= \frac{22}{7}\times 14\times 14 = 616\,\text{m}^2$

Cost of 1 m^2 = ₹125
Cost of 616 m^2 = 125×616 = ₹ 77,000

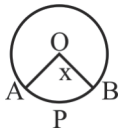
107. If the radius (r) of a circle is increased by x units, how many units will increase in its circumference?

(a) π (b) 2π
(c) $2\pi r$ (d) $2\pi x$

RRB NTPC 27.04.2016 Shift : 2

Ans : (d) Radius of circle = r
Increases radius of circle = r + x
Increase in circumference of circle
$= 2\pi(r + x) - 2\pi r$
Increase in circumference of circle
$= 2\pi(r + x - r) = 2\pi x$

108. In figure 'O' is the centre of a circle. The area of sector OAPB is $\frac{5}{18}$ of the area of the circle. Find x.



(a) 120 degrees (b) 100 degrees
(c) 125 degrees (d) 115 degrees

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (b) According to the question $\frac{\pi r^2 x}{360^o} = \pi r^2 \times \frac{5}{18}$

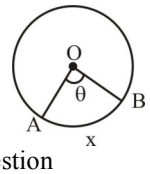
$\frac{x}{20^o} = 5$
$x = 100^o$

109. The length of the arc is $\frac{2}{9}$ times of the circumference of the circle. What is the measure of the angle (in degrees) subtended by the arc at the centre of the circle :

(a) 50 (b) 80
(c) 60 (d) 30

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (b) Let the arc in the circle = AB
or Arc $(AB) = \frac{2\pi r\theta}{360^0}$



According to the question

$\frac{2\pi r\theta}{360^0} = 2\pi r \times \frac{2}{9}$

($\because 2\pi r$ = Circumference of circle)

$\frac{\theta}{360^0} = \frac{2}{9} \qquad \theta = 80^0$

At the centre of circle the angle made by arc
$(\theta) = \angle AOB = 80^0$

110. A copper wire when bent in the form of a square encloses an area of 121 cm^2. If the same wire is bent into the form of a circle, find the area of the circle: (Use $\pi = \frac{22}{7}$)

(a) 154 cm^2 (b) 153 cm^2
(c) 155 cm^2 (d) 150 cm^2

RRB ALP & Tec. (09-08-18 Shift-III)

Ans : (a) Area of square = a^2

According to the question,

a^2 = 121 cm^2

$\therefore$ a = 11 cm

$\because$ Perimeter of square = 4a = length of wire

$\therefore$ Length of wire = 11 × 4 = 44 cm

Circumference of circle = $2\pi r$
Circumference of circle = Perimeter of square
$\therefore 2\pi r = 44$
$\therefore$ r = 7 cm

$\therefore$ Area of circle = $\pi r^2 = \frac{22}{7}\times(7)^2$ = 154 cm^2

111. Find the perimeter (in cm) of a square having an area equal to the area of a rhombus of whose diagonals are 8 cm and 16 cm

(a) 32 (b) 34
(c) 36 (d) 35

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (a) : Area of rhombus $= \frac{1}{2} \times d_1 \times d_2$

(where d = diagonal)

$= \frac{1}{2} \times 8 \times 16$

$= 64 \text{ cm}^2$

According to the question,

Area of square = Area of rhombus

Side of square $= \sqrt{\text{Area of square}}$

$= \sqrt{64}$

$= 8\text{cm}$

Perimeter of square = side of square ×4

$= 8 \times 4$

$= 32 \text{ cm}$

112. The perimeter of a square is equal to the perimeter of a rectangle of length 56 cm and breadth 42 cm. Find the perimeter of a semicircle (in cm) whose diameter is equal to the side of the square (Use $\pi = \frac{22}{7}$)

(a) 182 (b) 224
(c) 198 (d) 126

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (d) : Perimeter of square = Perimeter of rectangle

$4 \times \text{side} = 2(l+b)$

$4 \times \text{side} = 2(56+42)$

$4 \times \text{side} = 2 \times 98$

$4 \times \text{side} = 196$

$4 \times \text{side} = 196$

$\text{side} = 49$

radius of semicircle $= \frac{49}{2}$

Perimeter of semicircle $= \pi r + 2r$

$= \frac{22}{7} \times \frac{49}{2} + 49$

$= 77 + 49 = 126 \text{ cm}$

113. The length of a diagonal of a square is 18 cm. What is the perimeter of the square?

(a) 72 cm (b) $72\sqrt{2}$ cm
(c) 36 cm (d) $36\sqrt{2}$ cm

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (d) : Given,

Diagonal of square = 18 cm

Perimeter of square = ?

Square of Diagonal = $a\sqrt{2} = 18$

$a = \frac{18 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}}$

Side (a) = $9\sqrt{2}$ cm

Then, Perimeter of square = 4a

$= 4 \times 9\sqrt{2}$

$= 36\sqrt{2}$ cm

114. The sides of two squares are in the ratio 4:3 and the sum of their areas is 225 cm^2. Find the perimeter of the smaller square (in cm).

(a) 36 (b) 48
(c) 30 (d) 44

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : Let the sides of two squares are 4x and 3x respectively

Sum of areas = 225 cm^2

$(4x)^2 + (3x)^2 = 225$

$16x^2 + 9x^2 = 225$

$25x^2 = 225$

$x^2 = 9$

$x = 3$

Hence, the perimeter of the smaller square $= 3x \times 4$

$= 3 \times 3 \times 4$

$= 36 \text{ cm}$

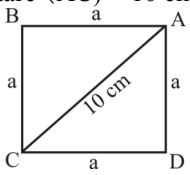
115. The length of each side of a square whose diagonals are 10 cm each is:

(a) $10\sqrt{2}$ cm (b) 5 cm
(c) 7 cm (d) $5\sqrt{2}$ cm

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let each side of square = a cm

and diagonal of square (AC) = 10 cm (Given)



In ΔADC

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

$(10)^2 = a^2 + a^2$

$100 = 2a^2$

$a^2 = 50$

$a = \sqrt{50}$

$a = \sqrt{25 \times 2}$

$\boxed{a = 5\sqrt{2}}$

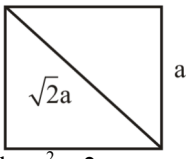
$\therefore$ Each side of square = $5\sqrt{2}$ cm

116. A fence is constructed along the diagonal of a square field. What is the length of the fence (in km) if the area of the square field is 2 km^2?

(a) 2 (b) 5
(c) 4 (d) 3

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (a) : Let the length of sides of square field = a



Area of square field = $a^2 = 2$

$a = \sqrt{2}$

Length of diagonals of field = $\sqrt{2}a$

$= \sqrt{2} \times \sqrt{2}$

$= 2$

117. The area of two squares are in the ratio 16:9. Find the ratio of their respective perimeters.

(a) 4 : 3 (b) 4 : 5
(c) 5 : 4 (d) 3 : 4

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (a) : Let the area of squares be A_1 and A_2 respectively and sides be a_1 and a_2 respectively.

According to the question-

$\because A_1 : A_2 = 16 : 9$

$a_1^2 : a_2^2 = (4)^2 : (3)^2$

$a_1 : a_2 = 4 : 3$

Perimeter of square = 4a

$\therefore$ Ratio of their perimeters $= 4a_1 : 4a_2 = 4 : 3$

118. If the side of a square is tripled, then the ratio of the area of the resulting square to that of original square is:

(a) 3 : 1 (b) 9 : 1
(c) 9 : 2 (d) 3 : 2

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (b) : From question,

Side of the original square = a

Side of the resulting square = 3a

$$\frac{\text{Area of square}}{\text{Area of resulting square}} = \frac{a^2}{9a^2}$$

The Ratio of the area of the resultant and the original square = 9 : 1

119. A square shaped ground has an area of 10,000 m^2. Find the perimeter of a square which sides are as long as the length of diagonals of initial ground.

(a) $400\sqrt{2}$ m (b) 40,000 m
(c) 20,000 m (d) 10,000 m

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (a) : Area of the square shaped ground = 10,000 m^2

Side $= \sqrt{10,000} = 100$m

Diagonal of the square = side $\sqrt{2}$

$= 100\sqrt{2}$ m

Perimeter of a square whose side is equal to the diagonal of initial ground = 4 × side

$= 4 \times 100\sqrt{2}$

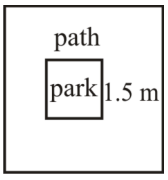
$= 400\sqrt{2}$ m

120. A square park is surrounded by a path of uniform width 1.5 m all around it. The area of the path is 225 m^2. Find the perimeter of the park.

(a) 144 m (b) 142 m
(c) 143 m (d) 144.5 m

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (a) :



Area of the path = Area of the square park including the path – Area of the square park.

$[a + 2(1.5)]^2 - a^2 = 225$

$a^2 + 9 + 6a - a^2 = 225$

$6a = 216$

$a = 36$ m

Perimeter of the square park = 4×side = 4a

= 4×36 = 144 m

121. The perimeters of five squares are 24 cm, 32 cm, 40 cm, 76 cm and 80 cm respectively. The perimeter of another square whose area is equal to the sum of the areas of these squares will be :

(a) 128 cm (b) 100 cm
(c) 124 cm (d) 120 cm

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : The perimeters of five squares are 24 cm, 32 cm, 40 cm, 76 cm and 80 cm respectively.

Perimeter = 4 × side

$a_1 = 6, a_2 = 8, a_3 = 10, a_4 = 19, a_5 = 20$

Area = $(Side)^2$

Sum of area of all squares

$= (6)^2 + (8)^2 + (10)^2 + (19)^2 + (20)^2$

$= 36 + 64 + 100 + 361 + 400$

Area = 961 cm^2

$(Side)^2$ = Area

Side $= \sqrt{961} = 31$

Perimeter = 4 × side = 4 × 31 = 124 cm

122. If the side of a square is $\frac{1}{10}$m, then how many such squares will get accommodated in a large square of side 4 m?

(a) 1500 (b) 1600
(c) 1200 (d) 1650

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Side of small square (a) $= \frac{1}{10}$ m

Side of a large square (a) $= 4$m

Number of squares in a large square

$$= \frac{(\text{Large side})^2}{(\text{One side of small square})^2}$$

$$= \frac{(4)^2}{(1/10)^2} = \frac{16}{1/100}$$

$= 1600$

123. The area of a square is 289 cm^2. Find the length of its diagonal.

(a) $13\sqrt{2}$ cm (b) $15\sqrt{2}$ cm

(c) $17\sqrt{2}$ cm (d) $19\sqrt{2}$ cm

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let side of square = a cm.

According to the question,

Area of square $= (\text{side})^2$

$a^2 = 289$

$a = 17$ cm.

Hence the diagonal of square = $a\sqrt{2} = 17\sqrt{2}$ cm.

124. There is square park of size 18m in length. A road of width 3m is constructed outside the square around it. Find the area of the road.

(a) 352 m^2 (b) 350 m^2

(c) 252 m^2 (d) 250 m^2

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c)

Length of park including road = 18 + 3 + 3 = 24 m

Length of park excluding road = 18 m

Area of road = Area of park including road – Area of park

$= (24)^2 - (18)^2$

$= (24 + 18) \times (24 - 18)$

$= 42 \times 6 = 252$ m^2

125. The area of a square field is 7200 m^2. How long will a cycle take to cross the field diagonally at a constant rate of 4 km/h?

(a) 25 minutes (b) 30 minutes

(c) 5 minutes (d) $\frac{9}{5}$ minutes

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let the length of one side of the square field = a meter

$a^2 = 7200$

$a = 60\sqrt{2}$ m

Then,

Diagonal of the square $= a\sqrt{2}$

$= 60\sqrt{2} \times \sqrt{2} = 120$ m

or $\frac{120}{1000}$ km.

Time taken to walk diagonally $= \frac{\frac{120}{1000}}{4}$

$= \frac{3}{100}$ hour

or $\frac{3}{100} \times 60 = \frac{9}{5}$ minutes.

126. The floor of a room is 3 m long and 1 m 50 cm broad. Find the number of the largest possible square slabs which can be used to pave the floor.

(a) 2 (b) 4

(c) 5 (d) 6

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Length of room = 3m = 300 cm

and, breadth 1m, 50 cm = 100 + 50 = 150 cm

Hence, H.C.F of 300 and 150 = 150

The area of the largest square slab that can be placed in the room = 150 × 150 cm^2

$$\text{Number of slabs} = \frac{\text{Area of room slab}}{\text{Area of one slab}}$$

$$= \frac{300 \times 150}{150 \times 150} = 2$$

127. If the length of the diagonal of a square is 20 cm, then what is its perimeter?

(a) $40\sqrt{2}$ cm (b) $40\sqrt{2}$ m

(c) 0 cm (d) $\sqrt{2}$ cm

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (a) : Diagonal of square = side $\times\sqrt{2}$

$20 = \text{side} \times\sqrt{2}$

$$\text{Side} = \frac{20 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}}$$

$\text{Side} = 10\sqrt{2}$

Perimeter of square = 4 × side

$= 4 \times 10\sqrt{2} = 40\sqrt{2}$ cm

128. Manish fixed 48 poles in order to fence a square. If the distance between 2 poles is 5 m, then what will be the area of the square, formed?

(a) 4000 m^2 (b) 3600 m^2

(c) 3200 m^2 (d) 3500 m^2

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the each side of square be x m.

Perimeter of square = (48×5) m

$4x = 48 \times 5$

$$x = \frac{48 \times 5}{4}$$

$\boxed{x = 60\text{m}}$

Hence the area of square field = $(\text{Side})^2$

$= 60^2 = 3600$ m^2

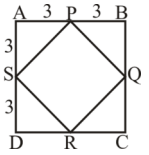
129. The area of a square is 36 cm^2. Find the area of the square formed by joining the mid-points of its sides:

(a) 20 cm^2 (b) 28 cm^2

(c) 25 cm^2 (d) 18 cm^2

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

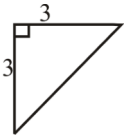
Ans. (d)



Area of square $= a^2$

$a^2 = 36$

$a = 6$



$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Height})^2$

$(\text{Hypotenuse})^2 = (3)^2 + (3)^2$

$\text{Hypotenuse} = 3\sqrt{2}$

$\text{Area of PQRS} = \left(3\sqrt{2}\right)^2$

$= 9 \times 2$

$= 18\ cm^2$

130. 784 square tiles, each of side 50 cm are required to tiles a floor of a square room. Find the length of the sides of the room.

(a) 15 m (b) 12 m

(c) 14 m (d) 13 m

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question-

Area of the tiles $= 50 \times 50 = 2500\ cm^2$ or

$= 0.25\ m^2$

Area of square shaped room $= 784 \times 0.25$

$(\text{side})^2 = 196$

side = 14 m

Hence the length of the side of the room is 14 m.

131. The sum of the lengths of the edges of a cube is equal to four times the perimeter of a square. If one-fourth of the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then the length of the side of the square is:

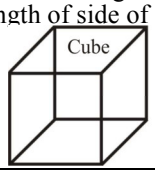
(a) 27 unit (b) 10.5 unit

(c) $\frac{9}{4}$ unit (d) $\frac{27}{16}$ unit

RRB RPF Constable – 17/01/2019 (Shift-III)

Ans : (d) Let the length of the edge of cube = y unit

Let the length of side of square = x unit





The first condition –

Sum of length of the edge of cube

$= 4$ (Perimeter of square)

$12y = 4(4x)$ $\left[\because \text{Edge of cube} = 12,\ \text{Perimeter of square} = 4x\right]$

$12y = 16x$

$3y = 4x$

$\boxed{y = \frac{4}{3}x}$ ..... (1)

Second condition –

$\frac{\text{Numerical value of volume of cube}}{4} = \text{Area of square}$

$\frac{y^3}{4} = x^2$

$y^3 = 4x^2$ ..... (2)

Putting the value of y from equation (1) in equation (2)

$\left(\frac{4}{3}x\right)^3 = 4x^2$

$\frac{64}{27}x^3 = 4x^2$

$\frac{16}{27}x = 1$

$\boxed{x = \frac{27}{16}}$

Hence side of square $= \frac{27}{16}$ unit

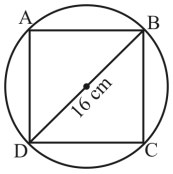
132. Find the area of a square made by touching its circumference inside a circle of radius 8cm.

(a) 144 cm^2 (b) 128 cm^2

(c) 64 cm^2 (d) 136 cm^2

RRB JE - 23/05/2019 (Shift-I)

Ans : (b)



Radius of circle = 8 cm, (given)

Diameter of circle = diagonal of square (According to the question)

$8 \times 2 = \text{side}\left(\sqrt{2}\right)$

$\text{Side} = 8\sqrt{2}$

$\text{Area of square} = (\text{side})^2$

$\text{Area of square} = \left(8\sqrt{2}\right)^2 = 128\ cm^2$

133. Find the embodied area between a circle and a square with side 'a' inscribed in it.

(a) $(a^2/2)(\pi - 2)$ sq. unit

(b) $2a^2(\pi - 2)$ sq. unit

(c) $a^2(2 - \pi)$ sq. unit

(d) $a^2(2\pi - 1)$ sq. unit

RRB JE - 26/05/2019 (Shift-I)

Ans : (a) Area of circle $= \pi R^2$

$$= \pi \times \left(\frac{a\sqrt{2}}{2}\right)^2$$

$$= \pi \times \frac{a^2 \times 2}{4} = \frac{2\pi a^2}{4} = \frac{\pi a^2}{2}$$

Area of square $=$ (side)$^2 = (a^2) = a^2$

$\therefore$ Required area $= \frac{\pi a^2}{2} - a^2 = \frac{a^2}{2}(\pi - 2)$

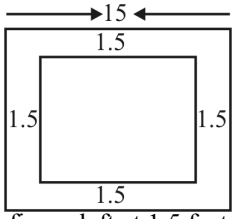
134. A room is 15 feet long and 12 feet wide. A mat is to be laid on the floor of the room leaving a space of 1.5 feet from the walls. What is the cost of the mat at the rate of Rs. 3.50 per square feet?

(a) Rs. 630 (b) Rs. 378

(c) Rs. 472.50 (d) Rs. 496

RRB JE - 30/05/2019 (Shift-II)

Ans : (b)



According to the figure left at 1.5 feet

length $= 15 - (2 \times 1.5) = 12$ feet

breadth $= 12 - (2 \times 1.5) = 9$ feet

$\therefore$ Area of mat $= 12 \times 9$

$= 108$ Square feet

$\because$ Cost of 1 square feet $=$ Rs. 3.50

$\therefore$ Cost of 108 square feet $= 3.50 \times 108$

$=$ Rs. 378

135. The area of a square field is 24200 m^2. How long time will it take for a person walking at a speed of 4.4 km/hr to cross it diagonally?

(a) 3 minutes (b) 4 minutes

(c) 2.5 minutes (d) 2 minutes

RRB JE - 01/06/2019 (Shift-I)

Ans : (a) As per the question,

Area of square $= 24200$ m^2

$a^2 = 24200$ m^2

$a = 110\sqrt{2}$ m

Distance travelled diagonally by person

$= a\sqrt{2} = 110\sqrt{2} \times \sqrt{2} = 220$ m

$\because$ Speed $= 4.4$ km/hour $= \frac{4.4 \times 1000}{60}$ m/minute

$= \frac{220}{3}$ m/minute

So time $= \frac{\text{Distance}}{\text{Speed}} = \frac{220}{220/3} = 3$ minutes

136. The difference between the areas of the two squares is 32cm^2. If the difference of their sides is 4cm. Find the value of the sides of both squares.

(a) 6 cm., 2 cm. (b) 12 cm., 8 cm.

(c) 4 cm., 4 cm. (d) 4 cm., 2 cm.

RRB JE - 01/06/2019 (Shift-III)

Ans. (a) Let sides of squares is x, y.

Area of first square $= x^2$

Area of second square $= y^2$

$x^2 - y^2 = 32$ ..... (i)

$x - y = 4$ ..... (ii)

From equation (i)–

$(x-y)(x+y) = 32$

$4(x+y) = 32$

$x + y = 8$ ..... (iii)

From equation (ii) and (iii)–

$x + y = 8$

$x - y = 4$

$2x = 12$

$x = 6$

Putting the value of x in equation (ii)

$x - y = 4$

$6 - y = 4$

$y = 2$

So, sides of square are 6 cm and 2cm.

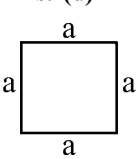
137. The perimeter of a square is 32m and the other is 24m. Find the diagonal of the square whose area is equal to the area of these two squares.

(a) $2\sqrt{10}$m (b) 20m

(c) $10\sqrt{4}$m (d) $10\sqrt{2}$m

RRB RPF SI – 16/01/2019 (Shift-I)

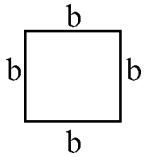
Ans. (d)



$4a = 32$ m

$a = 8$ m

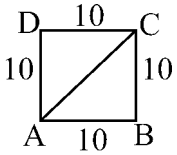
$a^2 = 64$,



$4b = 24$

$b = 6$ m

$b^2 = 36$,



Area of ABCD

square $= 64 + 36$

$AB \times AB = 100$ m^2

$AB = \sqrt{100}$

$AB = 10$ m

Length of diagonal (AC) $= \sqrt{2}$ AB

$= \sqrt{2} \times 10 = 10\sqrt{2}$ m

138. The sum of the lengths of the cores of the cube is the $\frac{3}{5}$th of the perimeter of the square. If the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then find the perimeter of the square.

(a) 500 unit (b) 360 unit

(c) 480 unit (d) 300 unit

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) : If length of each core of cube $=$ a unit

$\therefore$ Sum of length of core of cube $= 12$ a unit

If each side of square $=$ b, then perimeter $= 4b$ unit

In first condition,

$$12a = \frac{3}{5} \times 4b$$

or $a = \frac{b}{5}$

Then according to second condition, $a^3 = b^2$

or $\left(\frac{b}{5}\right)^3 = b^2$

or $\frac{b^3}{125} = b^2$

or, $\boxed{b = 125}$

Now perimeter of square $= 4b = 4 \times 125 = 500$ unit

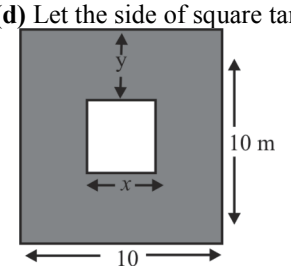
139. The middle area of a square room of 10 m sides is covered with square tank carpet and the remaining floor is covered with oil cloth. The carpet and the oil cloth are priced at Rs. 15 and Rs. 6.5 respectively, and their total price is Rs. 1338.50. What will be the width of the oil cloth border?

(a) 2 m (b) 5 m

(c) 1 m (d) $\frac{1}{2}$ m

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (d) Let the side of square tank $= x$ m.



$\therefore$ Area of square shape tank (which cover with carpet) $= x^2$

Area of oil cloth's $= 10 \times 10 - x^2$

$= 100 - x^2$

$\therefore \quad 15x^2 + 6.50\,(100 - x^2) = 1338.50$

$15x^2 + 650 - 6.5\,x^2 = 1338.50$

$8.5\,x^2 = 688.50$

$x^2 = \frac{688.5}{8.5}$

$x^2 = 81$

$x = 9$

$\therefore$ Breadth of oil cloth's border $= \frac{10 - x}{2}$

$= \frac{10 - 9}{2} = \frac{1}{2}$ m

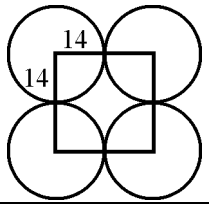
140. Four equal circles are formed on the four vertices of a square in such a way that each circle touches two other circles. What will be the area outside the perimeter of the circles towards the middle of the square. If the length of each side of the square is 28 cm?

(a) 168 cm^2 (b) 40 cm^2

(c) 42 cm^2 (d) 32 cm^2

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a)



Area of square $= 28^2 = 784$ cm^2

So area of four sectors

$= 4 \times \frac{\theta}{360} \pi r^2$

$= 4 \times \frac{90}{360} \times \frac{22}{7} \times 14 \times 14$

$= 616$

Required area = Area of square – Area of four sectors

$= 784 - 616 = 168$ cm^2

141. The area of the square field is 31684 m^2 on which the wire has to be tied at 1, 2, 3 and 4 m above the ground. If the length required for each wire is 5% more than the circumference of the field, then what length of the wire is required?

(a) 2090 m (b) 2099 m

(c) 2909 m (d) 2990.4 m

RRB Group-D – 22/09/2018 (Shift-III)

Ans. (d) : Let the side of square $= a$ m

Area of square $(a^2) = 31684$ m^2

$a = 178$ m

Circumference of square $= 4a$

$= 4 \times 178 = 712$ m

As per the question-

Length of 1 wire $= 712 \times \frac{105}{100} = 747.60$

Total length of four wire $= 747.60 \times 4$

$= 2990.40$ m

142. A 0.5 cm line segment was cut from each corner of a square with an edge of 3 cm, the cut section has a vertex. What is the area of the octagon so formed?

(a) $10\sqrt{2}$cm and 8 cm^2

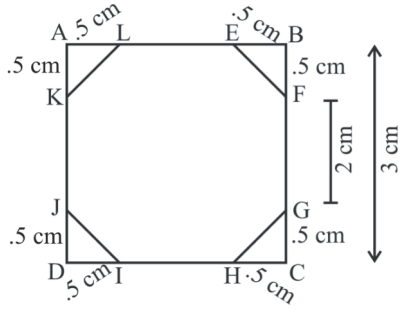
(b) 8 cm and 8 cm^2

(c) $8\sqrt{2}$cm and 8 cm^2

(d) $\left(8 + 2\sqrt{2}\right)$cm and 8.5 cm^2

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (d)



EF = GH = IJ = KL $= \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2}$

$= \frac{1}{\sqrt{2}}$

Perimeter of octagon= LE+EF+FG+GH+HI+IJ+JK+KL

$= 2 + \frac{1}{\sqrt{2}} + 2 + \frac{1}{\sqrt{2}} + 2 + \frac{1}{\sqrt{2}} + 2 + \frac{1}{\sqrt{2}}$

$= 8 + \frac{4}{\sqrt{2}}$

$= \left(8 + 2\sqrt{2}\right)$cm

Area of octagon = Area of square – 4×Area of triangular part

$= (3)^2 - 4 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$

$= 8.5 \text{ cm}^2$

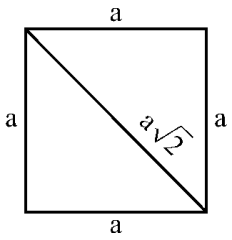
143. The numerical value of the area of a square is equal to half of the numerical value of each of its diagonals. What is the numerical value of diagonal?

(a) 1 (b) $\sqrt{2}$

(c) 2 (d) $\frac{\sqrt{2}}{2}$

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (a)



As per the question,

Area of square = half of the diagonal of square

$a^2 = a\sqrt{2} \times \frac{1}{2}$

$a = \frac{1}{\sqrt{2}}$

Diagonal of square $= a\sqrt{2}$

$= \frac{1}{\sqrt{2}} \times \sqrt{2} = 1$

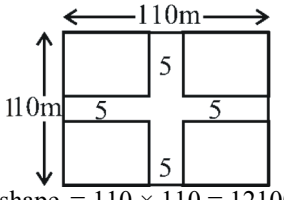
144. The side of a square field is 110 m. Two routes 5 m wide pass through the middle of the square field parallel to the sides, intersects each other. Find the area of the routes.

(a) 1000 m^2 (b) 1100 m^2

(c) 1075 m^2 (d) 975 m^2

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (c)



Area of square shape = 110 × 110 = 12100 m^2

Remaining area = 105 × 105 = 11025 m^2

So area of road = 12100 – 11025 = 1075 m^2

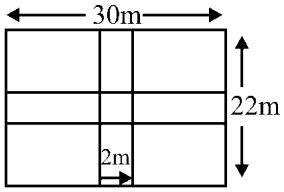
145. A rectangular park measuring 30 m × 22 m has two footpath 2m wide. One from north to south and the other from east to west and they both intersect each other in the middle of the park. If the cost of construction of the road is Rs. 15 per square meter, then calculate the total cost of construction to the road.

(a) Rs. 1545 (b) Rs. 1560

(c) Rs. 1490 (d) Rs. 1500

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (d)



Area of path = 30 × 2 + 22 × 2 – 2 × 2 = 100 square meter

Total cost of 1 square meter = Rs. 15

Total cost of 100 square meter = 15 × 100 = Rs. 1500

146. The sum of the length of the cores of a cube is equal to twice the perimeter of a square. If the numerical value of the volume of the cube is equal to the numerical value of the area of the square then what is the area of the square?

(a) 10.5 unit (b) 27 unit

(c) 13.5 unit (d) 12.5 unit

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (c) Let the length of core of cube = a unit

and length of side of square = b unit

$\because$ Number of cores of cube = 12

As per the question,

$12a = (4b) \times 2$

$12a = 8b$

$a = \frac{2}{3}b$ unit

Volume of cube = area of square

$a^3 = b^2$

$\left(\frac{2}{3} \times b\right)^3 = b^2$

$\therefore b = \frac{27}{8}$ unit

So perimeter of square = 4× side = 4 × b

$= 4 \times \frac{27}{8} = 13.5$ unit

147. The order of a rotational symmetry of a square is:

(a) 2 (b) 6

(c) 4 (d) 8

RRB NTPC 07.04.2016 Shift : 3

Ans : (c) The four sides of the square are equal and each angle is 90°. Hence, it's rational symmetry will be 4 in order.

148. Find the area of a square whose diagonal is half of 12 cm.

(a) 18 sq.cm. (b) 64 sq.cm.

(c) 36 sq.cm. (d) 72 sq.cm.

RRB NTPC 19.01.2017 Shift : 2

Ans : (a) Diagonal of square $= a\sqrt{2}$ (Where a = side)
As per the question −

$$\frac{12}{2} = a\sqrt{2}$$

$$a = \frac{6}{\sqrt{2}}$$

$$a = \frac{6\sqrt{2}}{2} \quad \boxed{a = 3\sqrt{2}}$$

Area of square $= a^2$

$$= \left(3\sqrt{2}\right)^2 = 18 \text{ square cm}$$

149. The area of a square field is 313600 m^2. How long will it take for a woman to cross the field diagonally at the rate of $4\sqrt{2}$ m/s.?

(a) 3 minutes (b) 2 minutes 20 sec.
(c) 2 minutes 40 sec. (d) 3 minutes 10 sec.

RRB NTPC 28.04.2016 Shift : 3

Ans : (b) Given−
Area of square field = 313600 square meter
$(\text{side})^2 = 313600$
$\text{Side} = \sqrt{313600} = 560$ meter
$\therefore$ Diagonal $= \text{side} \times \sqrt{2} = 560\sqrt{2}$ meter (distance)
Speed $= 4\sqrt{2}$ meter/second
Hence time taken to cross the field diagonally = distance/speed

$$= \frac{560\sqrt{2}}{4\sqrt{2}} = 140 \text{ seconds} = 2 \text{ minutes } 20 \text{ seconds}$$

150. The sum of the lengths of the core of a cube is equal to half the perimeter of a square. If the numerical value of the volume of the cube is equal to one-sixth of the numerical value of the area of the square, then the length of one side of the square is :

(a) 18 units (b) 36 units
(c) 31.5 units (d) 27 units

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (b) : Let length of the core of cube = y
and length of side of square = x
As per the question-

$$12y = \frac{4x}{2}$$

$$y = \frac{1}{6}x \quad \text{.....(i)}$$

As per second condition-

$$y^3 = \frac{1}{6}x^2$$

$$\left(\frac{1}{6}x\right)^3 = \frac{1}{6}x^2 \text{ From equation (i)}$$

$$\frac{1}{216}x^3 = \frac{1}{6}x^2$$

$$x = \frac{216}{6}$$

$$x = 36$$

Side of square (x) = 36 units

151. The sum of the lengths of the core of a cube is equal to half the perimeter of a square. If the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then the length of one side of the square is:

(a) 108 units (b) 36 units
(c) 216 units (d) 288 units

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (c) If the length of each core of cube = a_1
and length of each side of square = a_2
Then,

$$\text{Sum of length of core of cube} = \frac{\text{Perimeter of square}}{2}$$

$$12a_1 = \frac{4a_2}{2}$$

$$\text{or } 12a_1 = 2a_2$$

$$\boxed{a_1 = \frac{a_2}{6}}$$

$$\text{Now volume of a cube} = (a_1)^3 = \left(\frac{a_2}{6}\right)^3 = \frac{a_2^3}{216}$$

Hence As per the question,, $\frac{a_2^3}{216} = a_2^2$

or, $\boxed{a_2 = 216 \text{ unit}}$

Hence length of Required side = 216 unit

152. The area of the square field is 196 m^2. Its each side is:

(a) 16 m (b) 17 m
(c) 14 m (d) 13 m

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (c)
Area of the square field $= (\text{side})^2$

$$196 = (\text{side})^2$$

$$\text{Side} = \sqrt{196} = \sqrt{14 \times 14}$$

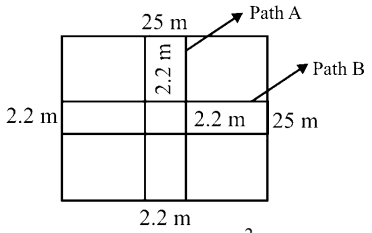
$$\text{Side} = 14 \text{ m}$$

153. Each side of a square park is 25m and there are two paths of width 2.2m passing through its centre. What is the total cost of laying gravel of the roads at a cost of ₹1/m^2?

(a) ₹ 11,000 (b) ₹ 110
(c) ₹ 105.16 (d) ₹ 10,516

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (d) :



Area of path A $= 25 \times 2.2 = 55 \text{ m}^2$
Area of path B $= 25 \times 2.2 = 55 \text{ m}^2$
Total area of street $= 25 \times 2.2 + 25 \times 2.2 - 2.2 \times 2.2$
$= 55 + 55 - 4.84 = 105.16 \text{ m}^2$
Total cost $= 105.16 \times 100 =$ ₹ 10516

154. What is the area of a square whose diagonal is 4 cm?

(a) 10 cm^2 (b) 8 cm^2

(c) 4 cm^2 (d) 6 cm^2

RRB ALP CBT-2 Electrician 22-01-2019 (Shift-I)

Ans. (b) : Length of the diagonal = 4 cm

Side of square = $\frac{\text{diagonal}}{\sqrt{2}} = \frac{4}{\sqrt{2}} = 2\sqrt{2}$ c.m

Area of square = $(\text{side})^2 = \left(2\sqrt{2}\right)^2 = 8\ cm^2$

Type - 5

155. The area of a rectangle is 225 cm^2. The length (x) of the rectangle is 4 more than 4 times the breadth (y). The area in terms of a quadratic form (in x) is:

(a) $x^2 \div 4x \div 900 = 0$ (b) $x^2 - 4x - 900 = 0$

(c) $x^2 - 4x \div 900 = 0$ (d) $x^2 \div 4x - 900 = 0$

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (b) : Let Length = x

And breadth = y

According to the question,

$x = 4y + 4$

$y = \frac{x-4}{4}$

$\because x \times y = 225$

$x \times \frac{x-4}{4} = 225$

$x^2 - 4x = 900$

$x^2 - 4x - 900 = 0$

156. The diagonal and one side of a rectangular plot are 65 m and 63 m, respectively. What is the perimeter of the rectangular plot?

(a) 225 m (b) 256 m

(c) 196 m (d) 158 m

RRB Group-D 18/08/2022 (Shift-II)

Ans. (d) : Given,

Diagonal of rectangular plot = 65m

Side of a rectangular = 63m

From pythagoras theorem, second side of rectangular plot = 16m

Perimeter of the Rectangular = 2(l + b)

= 2(63 + 16)

= 2 × 79

= 158m

157. The length of a rectangle is 5 cm more than its width. If the area of the rectangle is 215 cm^3, then the equation to find the width (w) of the rectangle is:

(a) $w^2 - 5w - 215 = 0$ (b) $w^2 + 5w + 215 = 0$

(c) $2w^2 + 5w - 215 = 0$ (d) $w^2 + 5w - 215 = 0$

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (d) :

Let breadth of rectangular be w and length (w + 5)

According to the question,

$(w+5) \times w = 215$

$w^2 + 5w = 215$

$w^2 + 5w - 215 = 0$

158. The length and the breadth of a rectangular park are in the ratio 7 : 3. The perimeter of the park is 21000 m. What is the difference between the length and the breadth of the park?

(a) 4200 m (b) 3400 m

(c) 3675 m (d) 3150 m

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (a) : Let the length = 7x, Breadth = 3x

According to the question,

The perimeter of the park = 2100 m

$2(7x+3x) = 21000$

$20x = 21000$

$x = 1050$

Difference between length and breadth

= 7x – 3x = 4x = 4×1050 = 4200 m

159. The area of a rectangular field, whose sides are in the ratio 13 : 5 is 260 m^2. What is the perimeter of the rectangular field?

(a) 68 m (b) 70 m

(c) 72 m (d) 66 m

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,

Let the sides of rectangular field

= 13x and 5x

Area of rectangular field = 260 m^2

$13x \times 5x = 260$

$x^2 = 4$

x = 2m.

Perimeter of rectangular field = 2 (13x + 5x)

= 2 × 18x

= 2 × 18 ×2

= 72 m.

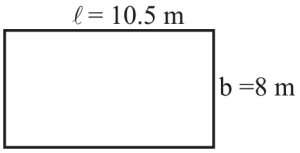
160. The length and the width of a rectangular plot of land are 10.5 m and 8 m, respectively. Find the cost of laying grass in the entire plot at ₹ 15.25 per square metre.

(a) ₹ 1,293 (b) ₹ 1,275

(c) ₹ 1,281 (d) ₹ 1,302

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (c) :



Area of rectangular plot = $\ell \times b$

= 10.5 × 8

= 84 m^2

The cost of laying grass in the entire plot = 84 × 15.25

= ₹ 1281

161. The area of a rectangle whose length and width are in the ratio 9:5 is given as 180 cm^2. Find the perimeter of the rectangle.

(a) 70 cm (b) 56 cm
(c) 42 cm (d) 54 cm

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (b) : Let the sides of rectangle be 9x and 5x
According to the question,

$9x \times 5x = 180$
$45x^2 = 180$
$x^2 = 4$
$x = 2$

Sides of rectangle = 9x and 5x
$= 9 \times 2 = 5 \times 2$
= 18cm and = 10 cm

Then,
Perimeter of rectangle = 2 (length + breadth)
= 2 (18+10)
= 56 cm

162. The diagonal of a rectangular plot is 37m and its-area is 420 m^2. What is the cost of fencing the plot at ₹ 37.50 per meter?

(a) ₹3,525 (b) ₹3,750
(c) ₹3,675 (d) ₹3,600

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) : Diagonal of a rectangular plot = 37

$\sqrt{\ell^2 + b^2} = 37$
$\ell^2 + b^2 = 1369$ ——— (1)
$\ell b = 420$ ——————(2)

$(\ell + b)^2 = \ell^2 + b^2 + 2\ell b$
$= 1369 + 840 = 2209$
$\ell + b = \sqrt{2209} = 47$

Cost of fencing the plot $= 2(\ell + b) \times 37.5$

$= 94 \times \frac{75}{2} = ₹3525$

163. If length of rectangle increase 4m and breadth decrease 2m, then increase his area $2m^2$. If length decrease 3m and breadth increase 5m then are increase $23m^2$, find the perimeter of original rectangle.

(a) 52 (b) 44
(c) 48 (d) 42

RRB Group-D 06/09/2022 (Shift-II)

Ans. (b) : According to question,
Condition- I

$(x + 4)(y - 2) = xy + 2$
$xy - 2x + 4y - 8 = xy + 2$
$x - 2y = -5$ ..... (i)

Condition - II

$(x - 3)(y + 5) = xy + 23$
$xy + 5x - 3y - 15 = xy + 23$
$5x - 3y = 38$ ..... (ii)

From eq. (i) and eq. (ii)

$x = 13$ and $y = 9$

Perimeter of original rectangle = $2(x + y)$
$= 2(13 + 9)$
$= 2 \times 22$
$= 44$ m

164. The length of a rectangular plot is 60% more than its breadth. If the difference between the length and the breadth of that rectangle is 30 cm, what is the perimeter of that rectangle ?

(a) 300 cm (b) 260 cm
(c) 330 cm (d) 270 cm

RRB Group-D 27-09-2022 (Shift-II)

Ans. (b) : Let the breadth of rectangle = x cm

then the length of rectangle = $x \times \frac{160}{100} = 1.6x$ cm

According to the question,
length breadth = 30
$1.6x - x = 30$
$0.6x = 30$
$\boxed{x = 50cm}$
Breadth = 50cm

Length $= 50 \times \frac{160}{100} = 80cm$

Hence the perimeter of the rectangle
$= 2(\text{length} + \text{breadth})$
$= 2(80 + 50)$
$= 2 \times 130$
$= 260cm$

165. The two unequal sides of a rectangle are in the ratio of 3 : 4. If the perimeter is 42 cm, then the length of diagonal will be :

(a) 35 cm (b) 15 cm
(c) 25 cm (d) 30 cm

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the length of unequal sides of rectangle = 3x and 4x.
According to the question,

Perimeter of rectangle = 42 cm
$2(3x+4x) = 42$
$14x = 42$
$x = 3$

Length of unequal sides = 9 cm and 12 cm

Diagonal of rectangle $= \sqrt{9^2 + 12^2}$
$= \sqrt{81 + 144}$
$= \sqrt{225}$
$= 15$ cm

166. A rectangular field is 16 meters long and 12 meters wide. A barbed fence has to be drawn on three sides of the field leaving one side open along the width. What is the cost of fencing at the rate of 25 paise per cm?

(a) ₹4,400 (b) ₹1,100
(c) ₹1,900 (d) ₹1,600

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : Length of rectangular field = 16 m
Width of rectangular field = 12 m
According to the question,
Perimeter of barbed fence = 16 + 12 + 16 = 44 m
The cost of fencing at the rate of 25 paise per cm

$$= 44 \times 100 \times \frac{25}{100}$$
$$= ₹1100$$

167. The ratio of the length to the breadth of a rectangular field is 6 : 5. If the breadth is 25 m less than the length, then perimeter of the field is:

(a) 550 m (b) 530 m
(c) 540 m (d) 560 m

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the length of the rectangular field = 6x
Width of the rectangular field = 5x
According to the question,
6x – 5x = 25
x = 25
Perimeter of rectangle = 2 (6x + 5x)
= 22x =22 × 25 = 550m

168. If the length and the perimeter of a rectangle are in the ratio of 3 : 20, then its length and breadth will be in the ratio of :

(a) 3 : 7 (b) 3 : 6
(c) 3 : 5 (d) 3 : 4

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (a) : We know that
Perimeter of rectangle is 2 (l + b).
Where,
l = length of rectangle
b = breadth of rectangle
As per question,

Therefore, $\frac{l}{2(l+b)} = \frac{3}{20}$

$$\Rightarrow \frac{l}{l+b} = \frac{3}{10}$$
$$\Rightarrow 3l + 3b = 10l$$
$$\Rightarrow 7l = 3b$$
$$\Rightarrow \frac{l}{b} = \frac{3}{7}$$

Hence the ratio of the length and breadth of the rectangle will be 3 : 7

169. Find the cost of carpeting a 15-m-long and 11-m-wide room with a 75cm-wide carpet, if the price of the carpet is ₹13 per meter (Not considering the cost of labour)

(a) ₹2,960 (b) ₹2,660
(c) ₹2,860 (d) ₹2,760

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (c) : Area of the room = 15 × 11
= 165 m^2
Width of the carpet = 75 cm

$$= \frac{75}{100}$$
$$= \frac{3}{4}m$$

Area of the carpet = Area of the room

$$\text{Length} \times \frac{3}{4} = 165$$
$$\text{Length} = \frac{165}{3} \times 4 = 220m$$

Hence, cost of laying a carpet 220 m long at the rate of ₹13 per meter = 220 × 13 = ₹ 2860

170. Find the perimeter of the rectangle whose length is 5 m more than its breadth, and the value of the perimeter is one thrice of its area.

(a) 60 m (b) 50 m
(c) 40 m (d) 45 m

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (b) : Let-+98aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#aw#

Width of the rectangle = x m
Length = (x + 5) m
Perimeter of rectangle = 2(l+b)
= 2 (x + x +5)
=2 (2x + 5)
= 4x +10
According to the question,

Perimeter of the rectangle $= \frac{1}{3} \times$ Area of the rectangle

Hence, $4x + 10 = \frac{1}{3} \times (l \times b)$
$(4x + 10) \times 3 = x \times (x + 5)$
$12x + 30 = x^2 + 5x$
$x^2 - 7x - 30 = 0$
$x^2 - 10x + 3x - 30 = 0$
$x(x - 10) + 3(x - 10) = 0$
$(x - 10)(x + 3) = 0$
$x - 10 = 0$
$\boxed{x = 10}$

Perimeter of the rectangle = 2 (10+15)
= 50 m

171. If p is the length of a rectangle and its width is one-third of its length, then the area of the rectangle will be:

(a) p^2 (b) $\frac{p^2}{3}$
(c) $\frac{p^2}{4}$ (d) $\frac{p^2}{5}$

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (b) : Length of rectangle = p

Width of rectangle = $\frac{p}{3}$

Area of rectangle = $l \times b$

$= p \times \frac{p}{3}$

$= \frac{p^2}{3}$

172. The area of a rectangle is 396 cm^2, and its length and breadth are in the ratio of 11:9. Find its perimerter:

(a) 80 cm (b) 50 cm

(c) 60 cm (d) 70 cm

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (a**) :** Let,

Lengh of rectangle = 11x cm

Breadth of rectangle = 9x cm

Area of rectangle = Length×Breadth

$396 = 11x \times 9x$

$396 = 99 \times x^2$

$4 = x^2$

$x = 2$

Length = $11x = 11 \times 2 = 22$ cm

Breadth = $9x = 9 \times 2 = 18$ cm

Perimerter of rectangle = 2(L+B)

= 2(22+18)

= 2×40

= 80 cm.

173. A rectangle has 15 cm as its length and 150 cm^2 as its area. If the area is increased to $1\frac{1}{3}$ times the original area by increasing its length only, then the new perimeter is:

(a) 60 cm (b) 70 cm

(c) 80 cm (d) 50 cm

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (a) : Area of rectangle = Length × Breadth

150 = 15 × Breadth

Breadth = 10 cm

Now, if length is increased by x cm.

Again, $(15 + x) \times 10 = 150 \times \frac{4}{3}$

$(15+x) \times 10 = 200$

$15 + x = 20$

$x = 5$

Now, new perimeter of rectangle = 2 (20+10) = 60 cm

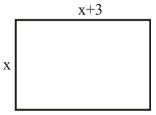
174. A rectangle has a length 3m more than its width and a perimeter numerically equal in value to its area. The integer part of the value of its diagonal is:

(a) 7 (b) 9

(c) 8 (d) 6

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d**) :**



Let, Breadth = x m

Length = x+3 m

According to the question,

Perimeter of rectangle = Area of rectangle

$2(x+x+3) = x(x+3)$

$2(2x+3) = x^2+3x$

$4x+6 = x^2+3x$

$\Rightarrow \quad x^2-x-6 = 0$

$\Rightarrow \quad x^2-3x+2x-6 = 0$

$x(x-3)+2(x-3) = 0$

$(x-3)(x+2) = 0$

$x = 3, -2$

$\therefore$ Length = 3+ 3

= 6 m

Breadth = 3m

Diagonal = $\sqrt{\text{Length}^2 + \text{Breadth}^2}$

$= \sqrt{36+9}$

$= \sqrt{45} = 6.7 = 6$ (Integer part).

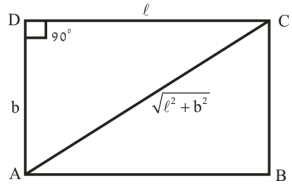
175. The area of a rectangle is 60 sq. units and its perimeter is 34 units then find its diagonal :

(a) 12 units (b) 17 units

(c) 13 units (d) 14 units

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,



Given,

Perimeter of rectangle = $2(\ell + b) = 34$

$l + b = 17$

Area of rectangle = $lb = 60$

Diagonal (AC) = $\sqrt{\ell^2 + b^2}$

$AC = \sqrt{(\ell+b)^2 - 2\ell b}$

$AC = \sqrt{(17)^2 - 2 \times 60}$

$AC = \sqrt{289-120}$

$AC = \sqrt{169}$

AC = 13 units

176. The breadth of a rectangular plot of land is one-third of its length. If the perimeter of the plot is 240 m, then what is the length of the plot?

(a) 95 m (b) 70 m

(c) 90 m (d) 60 m

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the length of the rectangular plot = ℓ meters
And breadth = b meters
According to the question,

$$b = \frac{\ell}{3}$$

Perimeter of rectangular plot $= 2(\ell + b)$

$$240 = 2\left(\ell + \frac{\ell}{3}\right)$$

$$240 = 2\left(\frac{4\ell}{3}\right)$$

$$\ell = \frac{240 \times 3}{2 \times 4}$$

$$\boxed{\ell = 90\,m}$$

Hence the length of the plot = 90 m

177. If the length of a rectangular solar panel having an area of 110 m^2 is 10% more than its breadth, then what will be the breadth?

(a) $20\sqrt{3}$ m (b) 10 m
(c) $10\sqrt{3}$ m (d) 110 m

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let breadth (b) = x m.
According to the question,

$$\text{Length } (l) = = \frac{110x}{100}$$

$$= \frac{11}{10}x$$

Area of rectangular solar panel = lb

$$l\text{b} = 110$$

$$\frac{11}{10}x^2 = 110$$

$$x^2 = 100$$

$$x = 10$$

Therefore breadth of solar panel = 10 m.

178. The length of a rectangle is 3/5 of the radius of a circle. The radius of a circle is equal to the side of a square whose area is 4900 m^2. what is the area of the rectangle if its breadth is 20m.

(a) 840 m^2 (b) 880 m^2
(c) 480 m^2 (d) 860 m^2

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let the side of square be 'a' meter and the radius of circle be 'r' meter
According to the question

$$\text{Area of square } (a^2) = 4900\ m^2$$

$$a = 70\ m$$

$\therefore$ Radius of circle (r) = 70 m

$$\text{Length of Rectangle} = \text{Radius of circle} \times \frac{3}{5}$$

$$= 70 \times \frac{3}{5} \qquad (\because r = a)$$

$$= 42\ m$$

Area of Rectangle = Length × Breadth

$$= 42 \times 20$$

$$= 840\ m^2$$

179. In a rectangle, the length is twice the breadth and the perimeter of the rectangle is 48 cm. The area of the rectangle is:

(a) 288 cm^2 (b) 512 cm^2
(c) 128 cm^2 (d) 144 cm^2

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (c) : Let the breadth of rectangle = x cm
$\therefore$ Length = $2x$ cm
Perimeter of rectangle = 2 (length + breadth)
48 = 2 (x + 2x)
48 = 2 × 3x
Breadth (x) = 8 cm
Length (2x) = 16 cm
Area of rectangle = Length × Breadth
= 16 × 8 = 128 cm^2

180. The ratio of the perimeter to the length of a rectangle is 5 : 1. If the area of the rectangle is 216 cm^2, then the length of the rectangle (in cm) is:

(a) 12 cm (b) 18 cm
(c) 14 cm (d) 16 cm

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) :
Let the length of rectangle is x cm and perimeter is 5x cm.

$$2 \times \text{Width} = \text{Perimeter} - 2\ell$$

$$= 5x - 2x$$

$$\text{Width} = \frac{3x}{2}$$

$$\text{Area} = \text{Length} \times \text{Width} = 216\ cm^2$$

$$x \times \frac{3x}{2} = 216$$

$$3x^2 = 216 \times 2$$

$$x^2 = 72 \times 2$$

$$x = 12\ cm$$

Hence, length of rectangle (x) = 12 cm.

181. The length of a rectangular plot is 5 m more than its width. If the circumference of the plot is 142 m, find the dimensions of the plot.

(a) Length 38 m and width 33 m
(b) Length 39 m and width 34 m
(c) Length 34 m and width 39 m
(d) Length 33 m and width 38 m

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans. (a) :
Suppose the length of rectangular plot is l meter and breadth b meters.
$\because$ Circumference of rectangular plot $= 2(\ell + b)$
According to the question,
$\because$ $\ell = b + 5$

$\therefore \quad 2(\ell + b) = 142$

$\Rightarrow \quad 2(b + 5 + b) = 142$

$\Rightarrow \quad (2b + 5) = 71$

$\Rightarrow \quad 2b = 71 - 5$

$\Rightarrow \quad 2b = 66$

$\Rightarrow \quad b = 33\text{m}$

$\ell = 33 + 5 = 38\text{m}$

So length will be 38 meters and breadth will be 33 meters.

182. In a rectangle length : width = 4:3. Find the value of length : diagonal.

(a) 4 : 7 (b) 2 : 3

(c) 4 : 5 (d) 1 : 5

RRB JE - 24/05/2019 (Shift-I)

Ans : (c) Let the length of rectangle = 4x

and breadth of rectangle = 3x

$\therefore$ Diagonal of rectangle $= \sqrt{(4x)^2 + (3x)^2} = 5x$

$\therefore$ Length : Diagonal = 4x : 5x = 4 : 5

183. The length of a rectangular plot is 20 m more than its width. If the cost of planting the fence at ₹26.50 per meter on the plot is ₹ 5300, find the length of the plot in meters.

(a) 50 m (b) 40 m

(c) 120 m (d) 60 m

RRB JE - 29/05/2019 (Shift-I)

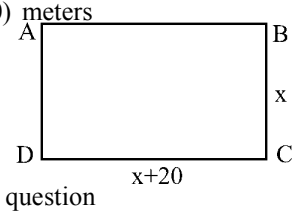
Ans : (d) Let width of rectangular plot = x m

Length of plot = (x + 20) m

Perimeter = 2 (length + width)

= 2 (x + x + 20) meters

= (4x + 40) meters



According to the question

(4x + 40) × 26.50 = 5300

4x + 40 = 200

4x = 160

x = 40

Length of plot = (x + 20) meters = (40 + 20) meters

= 60 meters

184. The ratio of length and width of a rectangle is 3:1. If its perimeter is 96 m, then what is the length of rectangle?

(a) 48 m (b) 24 m

(c) 36 m (d) 12 m

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (c) Let the length of rectangle is 3x m and breadth is x m

Perimeter of rectangle (P) = 2 [l + b]

$\begin{bmatrix} l = \text{length} \\ b = \text{breadth} \end{bmatrix}$

96 = 2 [3x + x]

96 = 6x + 2x

96 = 8x

$x = \frac{96}{8}$

$\boxed{x = 12}$

Length of rectangle = 3 × 12

= 36 meters

185. The dimensions of the rectangular plot of land are given in the nearest integer, 37 m and 23m. What is the upper limit of the circumference of the rectangle?

(a) 122 m (b) 61 m

(c) 60 m (d) 120 m

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (a) : Given-

Length of rectangle = 37 m

Breadth of rectangle = 23 m

Circumference of rectangle

= 2 (length + breadth)

= 2 (37 + 23)

= 120 meter

So this answer will be 122 m because the nearest integer is given here and asked about the upper limit.

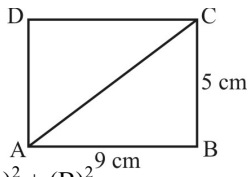
186. Find the length of the diagonal (in cm) of a rectangle whose length and breadth are 9 cm and 5 cm respectively.

(a) $\sqrt{106}$ (b) $\pm\sqrt{106}$

(c) $2\sqrt{14}$ (d) $\pm 2\sqrt{14}$

RRB RPF SI – 10/01/2019 (Shift-II)

Ans : (a)



$(\text{Diagonal})^2 = (L)^2 + (B)^2$

$(AC)^2 = 9^2 + 5^2$

$(AC)^2 = 81 + 25$

$(AC)^2 = 106 \qquad AC = \pm\sqrt{106}$ cm

But diagonal is distance and distance cannot be negative-

So

$AC = \sqrt{106}$

187. The difference between the length and breadth of a rectangle is 6 m. If its perimeter is 64 m, then its area is:

(a) 256 sq. m. (b) 247 sq. m.

(c) 264 sq. m. (d) 238 sq. m.

RRB RPF Constable – 19/01/2019 (Shift-III)

Ans : (b) Let the length of rectangle = x m

Breadth = (x –6) m

$\because$ Perimeter = 64 m

2(x + x – 6) = 64

2x – 6 = 32

2x = 38

x = 19

$\therefore$ Area of rectangle = x × (x -6)

= 19 × (19 – 6)

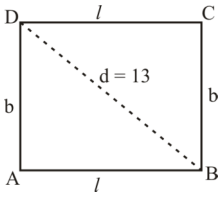
= 19 ×13 = 247 square meter

188. Suresh took 15 seconds to cross a rectangular ground diagonally at a speed of 52 m/min. and Rajesh took the same time to cross the same ground by its sides at a speed of 68 m/min. Find the area of the ground.

(a) 30 m^2 (b) 40 m^2
(c) 50 m^2 (d) 60 m^2

RRB JE - 26/05/2019 (Shift-II)

Ans : (d)



Distance $= 52 \times \frac{15}{60}$

$\boxed{d = 13}$

As per the question,,

$\ell + b = 68 \times \frac{15}{60}$

$\boxed{\ell + b = 17}$.....(i)

Diagonal of a rectangle $(d) = \sqrt{\ell^2 + b^2}$

$13 = \sqrt{\ell^2 + b^2}$

On squaring both sides

$169 = \ell^2 + b^2$

From equation (i)

$(l+b)^2 = (17)^2$

$l^2 + b^2 + 2lb = 289 \quad \because [l^2 + b^2 = 169]$

$169 + 2lb = 289$

$2lb = 289 - 169$

$2lb = 120$

Area of field $\boxed{\ell b = 60 \text{ square meter}}$

189. The perimeter of a rectangle is two times the perimeter of a square whose side is 18 units. If the breadth of the rectangle is 45 m then find its area.

(a) 1360 square units
(b) 1050 square units
(c) 1215 square units
(d) 1152 square units

RRB JE - 23/05/2019 (Shift-I)

Ans : (c) Given—

Side of square = 18 units

Breadth of rectangle = 45 m

Perimeter of rectangle = 2 × Perimeter of square

2 (Length + Breadth) = 2 × 18 × 4

2 (Length + 45) = 2 × 72

L = 72 – 45 = 27

Area = Length × Breadth = 27 × 45

Area = 1215 square units

190. The diagonal of the floor of a rectangular room is 7.5 feet. The smaller side of the room is 4.5 feet. Find the area (in sq. feet) of the room.

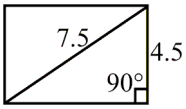
(a) 27 $foot^2$ (b) 13.5 $foot^2$
(c) 37 $foot^2$ (d) 5.25 $foot^2$

RRB RPF SI – 05/01/2019 (Shift-II)

Ans : (a) Diagonal floor of rectangular room= 7.5 foot

Small side of rectangular room (breadth)

= 4.5 foot



∴ Largest side of the rectangular room (length)

$= \sqrt{(7.5)^2 - (4.5)^2}$

$= \sqrt{36} = 6$ foot

∴ Area of the room = $\ell \times b = 6 \times 4.5 = 27$ $foot^2$

191. The length of a rectangular plot is three times of its width. If the area of rectangular plot is 867 m^2, then what is the length of rectangular plot?

(a) 34 m (b) 17 m
(c) 51 m (d) 68 m

RRB JE - 25/05/2019 (Shift-II)

Ans : (c) Let the breadth of rectangular plot (b) = x meters

Length of rectangular plot (l) = 3x meters

Area of rectangular plot = l.b

$867 = 3x \times x$

$867 = 3x^2$

$289 = x^2$

$\boxed{x = 17}$

Length of rectangular plot (l) = 3x = 3 × 17 = 51 m

192. The area of a rectangular carpet is 120 m^2 and its perimeter is 46 m. Find the length of its diagonal.

(a) 15 m (b) 16 m
(c) 20 m (d) 17 m

RRB JE - 29/05/2019 (Shift-III)

Ans : (d) Area of rectangle = $\ell \times b$

$\ell \times b = 120$ ..... (i)

Perimeter of rectangle = 2 (ℓ + b)

$(\ell + b) = 23$ ..... (ii)

Diagonal of rectangle $= \sqrt{l^2 + b^2}$

From equation (i) and (ii)–

$(\ell + b)^2 = \ell^2 + b^2 + 2\ell \times b$

$(23)^2 = \ell^2 + b^2 + 2 \times 120$

$529 - 240 = \ell^2 + b^2$

$289 = \ell^2 + b^2$

$\ell^2 + b^2 = 289$

Diagonal = 17 m

193. A circular wire of radius 7 cm is folded to form a rectangle whose sides are in the ratio of 4:7. Find the area of the rectangle so formed.

(a) 56 cm^2 (b) 60 cm^2
(c) 112 cm^2 (d) 84 cm^2

RRB JE - 31/05/2019 (Shift-I)

Ans : (c) $2\pi r = 2 (l + b)$

$2 \times \frac{22}{7} \times 7 = 2\ (7x + 4x)$

$22 = 11x$

$x = 2$

Area of rectangle $= 7x \times 4x$

Area of rectangle $= 28x^2 = 28 \times 4 = 112\ cm^2$

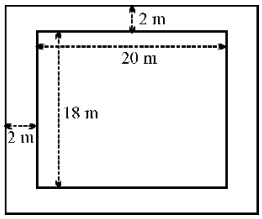
194. Find the area of the jogging track which has a width of 2m and is built around a rectangle with dimension 20m × 18m.

(a) 200 m^2 (b) 140 m^2

(c) 136 m^2 (d) 168 m^2

RRB JE - 31/05/2019 (Shift-III)

Ans. (d)



Area of rectangle $= 20 \times 18 = 360$ square meters

Area of rectangle with jogging track $= 24 \times 22 = 528\ m^2$

Area of jogging track $= 528 - 360 = 168\ m^2$

195. Find the length (in cm) of the diagonal of a rectangle whose length and breadth are 5 cm and 6 cm respectively.

(a) $\sqrt{61}$ (b) $\pm\sqrt{61}$

(c) $\sqrt{11}$ (d) $\pm\sqrt{11}$

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (a) Diagonal of rectangle $= \sqrt{l^2 + b^2}$

$= \sqrt{5^2 + 6^2} = \sqrt{25 + 36} = \sqrt{61}$

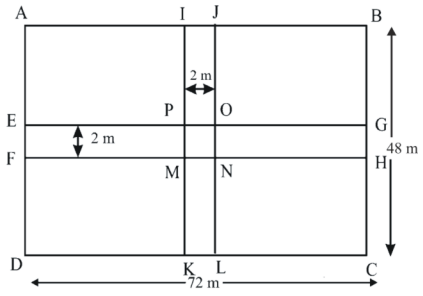
196. In a rectangular park of 72 m × 48 m, 2m wide paths Nehru Road and Zoo Park Road intersect each other at right angles in the centre of the park. Each path is parallel to one of the dimensions of the park. What will be the cost of constructing the road at the rate of Rs. 150 per square meter?

(a) Rs. 35,300 (b) Rs. 35,350

(c) Rs. 35,395 (d) Rs. 35,400

RRB RPF SI – 12/01/2019 (Shift-I)

Ans. (d)



Area of path

= Area of EFHG + Area of IJKL - Area of MNOP

$= 72 \times 2 + 2 \times 48 - 2 \times 2$

$= 2\ (72 + 48) - 4 = 2 \times 120 - 4 = 236$

Hence, cost of path $= 236 \times 150$

$= ₹\ 35,400$

197. Shrinesh wants to upgrade his office floor, which is made of 2800 marble tiles. Each tile is 3 cm long and 5 cm wide. Calculate the total cost of polishing the floor at the rate of Rs. 25 per square meter.

(a) Rs. 100 (b) Rs. 115

(c) Rs. 125 (d) Rs. 105

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (d) : Length of each tile = 3 cm.

And breadth = 5 cm.

So tile is a rectangle.

Area of tiles $= 3 \times 5 = 15\ cm^2$

$15 cm^2 = \frac{15}{100 \times 100} m^2$

Area of floor $= \frac{15}{100 \times 100} \times 2800 m^2$

$= 4.2 m^2$

Cost of polishing the floor at the rate of Rs. 25 per square meter. $= 4.2 \times 25 = Rs.105$

198. The sides of a rectangular plot of a land are given 35 m and 25 m in the nearest integer. What is the maximum value of the perimeter of a rectangular plot?

(a) 60 m (b) 122 m

(c) 120 m (d) 61 m

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (b) Taking maximum integer of side of rectangular plot-

Length = 35.5 m, b = 25.5 m

Maximum value of perimeter of plot

$= 2$ (length + breadth)

$= 2(35.5 + 25.5)$

$= 2 \times 61$

$= 122$ m

199. The area of a rectangle is 12.46 m^2. If the length of the rectangle is 3.5 m then find the breadth (in m) of the rectangle.

(a) 3.56 (b) 3.58

(c) 3.62 (d) 3.54

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (a) Given-

Area of rectangle $= 12.46\ m^2$

Length $(l) = 3.5$ m

Breadth $= \frac{12.46}{3.5\,m} = 3.56\,m$

$\boxed{b = 3.56\,m}$

200. The dimensions of a rectangular plot is given to 28 m and 22 m to the nearest integer. What is the minimum possible perimeter of a rectangular plot?

(a) 49 m (b) 100 m

(c) 50 m (d) 98 m

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (d) Perimeter of rectangular plot = 2 (l + b)

Let the length and breadth of rectangular plot is minimum 28 m and 22 m respectivily.

Then perimeter $= 2\ (28 + 22)$

$= 2 \times 50 = 100$ m

Minimum perimeter will be 98 m of rectangular plot which is predecessor of 100 m.

201. The ratio of length and breadth of a rectangular field is 4:3. If the area of the field is 1452 m^2, then find the cost of making the boundary of the field at the rate of Rs. 12 per meter.

(a) Rs. 1,858 (b) Rs. 1,848
(c) Rs. 1,845 (d) Rs. 1,868

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) Given-
Let the length and breadth of rectangular field be 4x m and 3x m respectively.
As per the question-
$4x \times 3x = 1452$
$\Rightarrow 12x^2 = 1452$
$\Rightarrow x^2 = 121$
$\Rightarrow x = 11$ m
So, length $= 4x$
$= 4 \times 11 = 44$ m
Breadth $= 3x = 3 \times 11 = 33$ m
Perimeter of rectangular field $= 2(\ell + b)$
$= 2(44 + 33)$
$= 2 \times (77)$
$= 154$ m
Hence, cost of making the boundary of rectangular field
$= 154 \times 12$
$=$ Rs. 1848

202. A farmer has a rectangular field 250 m long and 380.5 m wide. He expects to sow different types of rice which will yield 30 quintals per hectare and he will sell it in the market at Rs. 620 per quintal. Calculate his expected income.

(a) Rs. 716932.5 (b) Rs. 179632.5
(c) Rs. 176923.5 (d) Rs. 176932.5

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (d) 1 hectare $=$ 10000 square meter
Expected income = area of field × 30 quintal × 620 ₹/quintal
$= \frac{250 \times 380.5 \times 30 \times 620}{10,000}$
$=$ ₹ 176932.5

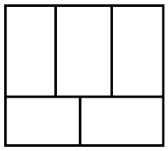
203. The side of a square flower garden is 1 m 80 cm long. It is extended by digging a 20 cm wide border from all side. Find the area of extended flower garden.

(a) 4.81 m^2 (b) 4.82 m^2
(c) 4.84 m^2 (d) 4.8 m^2

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (c) It is extended by digging 20cm wide from each side
Then $20 + 20 = 40$ cm
Total increased part $=$ (180 + 40) cm = 220 cm
Area of square $=$ $(\text{side})^2$
$= (220)^2$
$= 48400$ cm^2
$= 4.84$ m^2

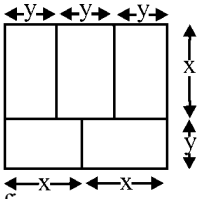
204. In the following figure, five congruent rectangles are given, each of which has a largest side x m. If the total area of the figure is 6000 sq.m, then find the value of x.



(a) $30\sqrt{2}$ (b) $40\sqrt{3}$
(c) 40 (d) $\frac{40\sqrt{2}}{3}$

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (a)



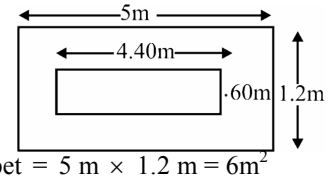
It is clear from the figure
$2x = 3y$
As per the question,
Total area = 6000
$xy+xy+xy+xy+xy = 6000$
$5xy = 6000$
$5x \times \frac{2x}{3} = 6000$
$x^2 = 1800 = 30\sqrt{2}$

205. A carpet is 5 m long and 1.2 m wide. It has a 30 cm wide printed border on all flour sides. What will be the cost of printing the border at the rate of Rs. 225 per square meter?

(a) Rs. 854 (b) Rs. 1,027
(c) Rs. 756 (d) Rs. 902

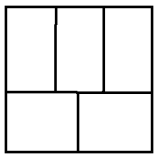
RRB Group-D – 05/12/2018 (Shift-III)

Ans : (c)



Area of carpet $=$ 5 m $\times$ 1.2 m $= 6m^2$
Area of remain carpet left of border = 4.40 m×0.60 m
$= 2.64$ m^2
Area of border $= 6 - 2.64 = 3.36$
Cost of printing the border $= 3.36 \times 225 =$ Rs. 756

206.

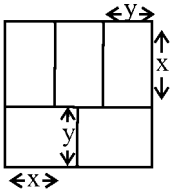


The above rectangle has five congruent rectangles. Each of which has a largest side x m. If the total area of the figure is 7500 m^2, then find the value of x.

(a) $15\sqrt{10}$ (b) $10\sqrt{10}$
(c) $10\sqrt{15}$ (d) $\frac{10\sqrt{15}}{3}$

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (a) : Let the small side = y m
Area of large rectangle = Area of five congruent rectangle



$2x \times (x + y) = 5xy$
$2x + 2y = 5y$
$2x = 3y$
$\therefore y = \frac{2}{3}x$
But
$5xy = 7500$
$5x \times \frac{2}{3}x = 7500$
$x^2 = 2250$
$x = 15\sqrt{10}$ m

207. The area of a rectangle is $2x^2 + 3x + 1$ and its length is 2x +1. Find its breadth.
(a) 2x +2 (b) x +1
(c) x – 2 (d) x – 1

Ans. (b) : Area of rectangle = Length × Breadth
$2x^2 + 3x + 1 = (2x+1) \times b$
$\Rightarrow (2x^2 + 3x + 1) = (2x + 1) \times b$
$\Rightarrow (2x^2 + 2x + x + 1) = (2x + 1) \times b$
$\Rightarrow 2x (x + 1) + 1 (x + 1) = (2x + 1) \times b$
$\Rightarrow (2x + 1) \times b = (x + 1) (2x + 1)$
$b = (x + 1)$

208. 150 cm wide carpet is to be laid on the floor of a rectangular hall. If the hall is 20 m long and 18 m wide, what will be the required cost of carpet at the rate of ₹ 12 per meter?
(a) ₹ 3,280 (b) ₹ 2,280
(c) ₹ 2,880 (d) ₹ 2,480
RRB Group-D – 05/10/2018 (Shift-III)

Ans. (c) As per the question,
Length of hall = 20 m
Breadth of hall = 18 m
Area of hall = 20 × 18 [150cm = 1.5m]
= 360 m^2
Breadth of carpert = 1.5 m
Cost = ₹ 12 per meter
Cost of carpet = $\frac{360}{1.50} \times 12$
= ₹ 2880

209. The breath of a rectangular field is 60% of its length. If the perimeter of the field is 800 m, then find the area of the field.
(a) 18750 m^2 (b) 37500 m^2
(c) 40000 m^2 (d) 48000 m^2
RRB Paramedical Exam – 20/07/2018 (Shift-II)

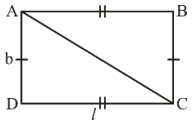
Ans. (b) Let the length of rectangular field = x
Breadth of rectangular field $= x \times \frac{60}{100} = \frac{3x}{5}$
Perimeter of field = 800
$2\left(x + \frac{3x}{5}\right) = 800$
$2\left(\frac{5x + 3x}{5}\right) = 800$
$8x = 400 \times 5$
$x = 250$ m
Length of field (x) = 250
Breadth of field $= \frac{3x}{5} = \frac{3 \times 250}{5} = 150$ m
Area of field = 250 × 150 = 37500 m^2

210. A square of the side 2 m inside a rectangle of length 5 m and breadth 2 m is shaded. What is the ratio of the area of the shaded square and the area of the unshaded region of the rectangle?
(a) 3 : 2 (b) 2 : 3
(c) 5 : 2 (d) 2 : 5
RRB NTPC 17.01.2017 Shift-2

Ans : (b) Area of rectangle = 5 × 2 = 10m^2
Area of shaded square = 2 × 2 = 4m^2
Area of unshaded region of the rectangle = 10 – 4 = 6m^2
Required ratio = Area of shaded square : Area of unshaded region of the rectangle
Required ratio = 4 : 6 = 2 : 3

211. The length of the diagonal of a rectangle and its semi-perimeter are 11 cm and 13 cm respectively. Find the area of the rectangle.
(a) 12 square cm. (b) 48 square cm.
(c) 36 square cm. (d) 24 square cm.
RRB NTPC 05.04.2016 Shift-1

Ans : (d)



Given—
Semi perimeter $(l + b) = 13$ cm. ..... (i)
Diagonal of rectangle $\left(\sqrt{l^2 + b^2}\right) = 11$cm
$\Rightarrow l^2 + b^2 = 121$ cm $l =$ length, b = breadth
$\Rightarrow (l + b)^2 - 2lb = 121$ From equation (i)
$\Rightarrow (13)^2 - 2lb = 121$
$\Rightarrow 2lb = 169 - 121 = 48$
$\Rightarrow l.b = 48/2$
$\Rightarrow l.b = 24$ square cm.
Area of rectangle = 24 square cm.

212. The perimeter of a rectangle is 28 cm. If its one side is 4 cm then find other side of the rectangle.
(a) 24 cm (b) 7 cm
(c) 10 cm (d) 8 cm
RRB NTPC 04.04.2016 Shift : 1

Ans : (c) Let the length of the other side be = x cm
∵ Perimeter of rectangle = 28
2 × (x + 4) = 28
x + 4 = 14
x = 10 cm.

213. The area of a rectangle is 42 cm^2 and its length is 7 cm. Find its perimeter.
(a) 14 cm. (b) 21 cm.
(c) 26 cm. (d) 24 cm.
RRB NTPC 03.04.2016 Shift : 2

Ans : (c) Area of rectangle = $\ell \times b = 42$
$7 \times b = 42$
$b = 6$ cm.
Perimeter of rectangle = $2(\ell + b)$
$= 2(7 + 6) = 2 \times 13 = 26$ cm.

214. The length of a rectangle is 6 times its breadth. If the perimeter of a rectangle is 56 cm then find the area of the rectangle.
(a) 48 square cm. (b) 96 square cm.
(c) 144 square cm. (d) 64 square cm.
RRB NTPC 03.04.2016 Shift : 3

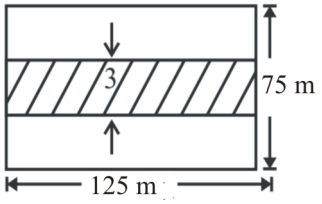
Ans : (b) Let the width of the rectangle be = x cm
Then length of rectangle = 6x cm
$\because$ Perimeter of rectangle = $2(\ell + b)$
$56 = 2(x + 6x)$ $28 = 7x$
$\boxed{x = 4}$
So area of rectangle = $\ell \times b = 6x \times x$
$= 6x^2 = 6(4)^2 = 6 \times 16 = 96$ square cm

215. The perimeter of a rectangle and its diagonal are 34 cm and 13 cm respectively. Find its area
(a) 987 square cm. (b) 240 square cm.
(c) 120 square cm. (d) 60 square cm.
RRB NTPC 31.03.2016 Shift : 1

Ans : (d) If the length and breadth of a rectangle will be ℓ cm and b cm respectively.
Diagonal of rectangle = 13 cm
$\sqrt{\ell^2 + b^2} = 13$
$l^2 + b^2 = 169$ ……. (1)
$\because$ Perimeter of rectangle = 34 cm
$2(l+b) = 34$
$l + b = 17$……. (2)
$\because$ $(l+b)^2 = l^2 + b^2 + 2lb$
$(17)^2 = 169 + 2lb$
$289 - 169 = 2lb$
$2lb = 120$
$\therefore$ Area of rectangle = 60cm.

216. The length of a rectangular field is 125 m and breadth is 75 m. There is a 3 m wide footpath in the middle of the field. What is the area of the field without the footpath?
(a) 9375 square m. (b) 9000 square m.
(c) 9750 square m. (d) 8625 square m.
RRB NTPC 31.03.2016 Shift : 2

Ans : (b)



Area of field without footpath
$= 125 \times 75 - 125 \times 3$
$= 125 \times (75 - 3)$
$= 125 \times 72$
$= 9000$ square m.

217. What is the length of diagonal, if area of a rectangle is 168cm^2 and breadth is 7cm?
(a) 24 cm (b) 15 cm
(c) 17 cm (d) 25cm
RRB NTPC 30.03.2016 Shift : 1

Ans : (d) $\because$ Area of rectangle = 168 square cm
$\therefore$ Length $\times$ Breadth = 168
As per the question
$7 \times$ Length = 168
Length $= \frac{168}{7} = 24$ cm
$\therefore$ Length of diagonal $= \sqrt{l^2 + b^2}$
$= \sqrt{(24)^2 + (7)^2}$
$= \sqrt{576 + 49} = \sqrt{625} = 25$ cm.

218. The perimeter of a rectangle is 28 cm. If the length is $\frac{5}{2}$ times of the breadth, then find the length and breadth of the rectangle.
(a) 90 and 5 (b) 10 and 4
(c) 6 and 7 (d) 11 and 3
RRB NTPC 29.03.2016 Shift : 1

Ans : (b) As per the question,
length of rectangle $= \frac{5}{2} \times$ Breadth
Perimeter of rectangle = 28
$2(L + B) = 28$
$(\frac{5}{2}B + B) = \frac{28}{2} = 14$
$\frac{7}{2}B = 14 \implies B = 4$ cm
$\therefore L = \frac{5}{2} \times 4 = 10$ cm
So length and breadth of rectangle is 10 cm and 4 cm.

219. Ankita stands at the corner of a rectangular field of 40 m length and 30 m breadth. If Ankita runs only along the diagonal and returns to the starting point, then what is the total distance covered by Ankita?
(a) 100 m (b) 80 m
(c) 140 m (d) 120 m
RRB NTPC 28.03.2016 Shift : 3

Ans : (a) Length of diagonal of rectangle
$= \sqrt{(40)^2 + (30)^2}$
$= \sqrt{1600 + 900} = \sqrt{2500} = 50$ m
$\therefore$ Total distance covered by Ankita
$= 2 \times 50 = 100$ m

220. The length of a rectangular board is 4 times its breadth, if the area of the board is 256 sq. m, then find its length?
(a) 8 m (b) 16 m
(c) 24 m (d) 32 m
RRB NTPC 18.01.2017 Shift : 1

Ans : (d) Let be breadth = b
$\ell = 4b$, Area = 256
$\therefore 4b \times b = 256$
$b^2 = 64$, $b = 8$
$\therefore \ell = 4b = 4 \times 8 = 32$m

221. The order of the rotational symmetry of a rectangle is:

(a) 1 (b) 4

(c) 2 (d) 0

RRB NTPC 11.04.2016 Shift : 1

Ans : (c) The order of the rotational symmetry of the rectangle is 2.

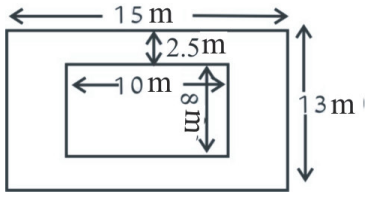
222. A footpath of 2.5 m breadth is built around a rectangular garden having a length of 10 m and breadth of 8 m. Find the area of the garden which includes the footpath.

(a) 130.25 square m. (b) 131.25 square m.

(c) 195.00 square m. (d) 162.50 square m.

RRB NTPC 06.04.2016 Shift : 1

Ans : (c)



Area of the garden which includes the footpath $=15\times13$ $=195$ square meter

223. The one side of a rectangle is 12 m and its diagonal is 13 m, then find its area.

(a) 60 m^2 (b) 55 m^2

(c) 50 m^2 (d) 45 m^2

RRB NTPC 06.04.2016 Shift : 2

Ans : (a) In triangle ABC

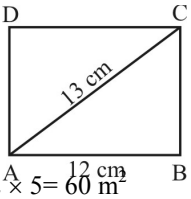
$AC^2 = AB^2 + BC^2$

$(13)^2 = (12)^2 + BC^2$

$BC^2 = 169 - 144$

$BC = \sqrt{25}$

$BC = 5$ m.



Area of rectangle $= AB\times BC = 12\times 5 = 60\ m^2$

224. Find the length of the diagonal of a rectangle whose length and breadth are 6 cm and 6 cm respectively.

(a) $6\sqrt{2}$ (b) $\pm6\sqrt{2}$

(c) 0 (d) $\sqrt{2}$

RRB NTPC 26.04.2016 Shift : 3

Ans : (a)

$$\text{Diagonal of rectangle} = \sqrt{(\text{length})^2 + (\text{breadth})^2}$$

$$= \sqrt{(6)^2 + (6)^2} = \sqrt{36+36} = \sqrt{6\times6\times2} = 6\sqrt{2}$$

225. The area of a rectangle is 448 sq. m. If its length is 12% more than its breadth, then find its breadth.

(a) 14m (b) 16m

(c) 18m (d) 20m

RRB NTPC 27.04.2016 Shift : 2

Ans : (d)

Let the breadth $= x$

$$\text{Length} = \frac{x\times112}{100} = \frac{112x}{100}$$

$$\text{Area of rectangle} = \text{length} \times \text{breadth}$$

$$448 = \frac{x\times112x}{100}$$

$$\Rightarrow \quad x^2 = \frac{448\times100}{112}$$

$$x^2 = 400$$

$$x = 20$$

So breadth $= 20$ m

226. Find the maximum area of a rectangular field which is surrounded by a rope of 400 m

(a) 5000 m^2 (b) 6250m^2

(c) 4000m^2 (d) 10000m^2

RRB NTPC 27.04.2016 Shift : 3

Ans : (d) We know that the area of a rectangle will be maximum when the length of the rectangle is equal to its width

$\therefore$ For maximum area

$2(L + B) = 400$ $(\because L = B)$

$$\text{Length} = \frac{400}{4} = 100\text{ m}$$

Area = length × breadth

$= 100 \times 100 = 10{,}000\ m^2$

227. Find the maximum area of a rectangular field enclosed by a 40 m long rope?

(a) 160 m^2 (b) 180 m^2

(c) 200 m^2 (d) 100 m^2

RRB NTPC 30.04.2016 Shift : 2

Ans : (d) Let the length $= a$

breadth $= b$

According to the question,

$2(a + b) = 40$

$a + b = 20$

$\because$ ab = maximum

$\therefore a = 10, b = 10$

So maximum area of field $= ab = 10\times10= 100\ m^2$

Type - 6

228. The length of each edge of a cube is 2.6 cm. What is the total surface area (in cm^2) of the cube ?

(a) 40.76 (b) 40.56

(c) 39.96 (d) 40.36

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : Total surface area of a Cube $= 6a^2$

$= 6\times(2.6)^2$

$= 6\times6.76 = 40.56\ cm^2$

229. The cost of painting a cube on all the external surfaces at the rate of ₹2/cm^2 is ₹588. Find the volume of the cube (in cm^3).

(a) 343 (b) 512

(c) 216 (d) 274.625

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (a) : Surface area of a cube $= \frac{\text{cost of paintings}}{2}$

$$6a^2 = \frac{588}{2}$$

$$6a^2 = 294$$

$$a^2 = \frac{294}{6}$$

$$a^2 = 49$$

$$a = 7$$

Volume of the cube $= a^3$

$= (7)^3$

$= 343\ cm^3$

230. Find the volume of a cube whose edge is 8 cm.

(a) $264\ cm^3$

(b) $256\ cm^3$

(c) $521\ cm^3$

(d) $512\ cm^3$

RRB Group-D 05/09/2022 (Shift-III)

Ans. (d) : The volume of a cube $= (side)^3$

$= 8^3$

$= 512 cm^3$

231. Six equal cubes, each of side 7 cm, are placed adjacent to each other. The volume of the new solid formed will be:

(a) $2312\ cm^3$ (b) $2058\ cm^3$

(c) $2206\ cm^3$ (d) $2124\ cm^3$

RRB Group-D 27-09-2022 (Shift-II)

Ans. (b) : Volume of new solid

= Volume of 6 equal Cubes

$= 6 \times (a)^3$

$= 6 \times (7)^3$

$= 6 \times 343$

$= 2058\ cm^3$

232. If the perimeter of one face of a cube is 24 cm, then its volume is :

(a) $180\ cm^3$ (b) $154\ cm^3$

(c) $200\ cm^3$ (d) $216\ cm^3$

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (d) : Given Perimeter of one face of cube = 24 cm

$\therefore$ Side of this cube $= \frac{24}{4} = 6$ cm

$\therefore$ Volume of cube $= (Side)^3$

$= 6^3 = 216\ cm^3$

233. The space diagonal of a cube measures $8\sqrt{3}$ cm. What is the volume of the cube?

(a) $1536\ cm^3$ (b) $512\sqrt{3}\ cm^3$

(c) $512\ cm^3$ (d) $1536\sqrt{3}\ cm^3$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

Length of diagonal of a cube $= a\sqrt{3}$

$$8\sqrt{3} = a\sqrt{3}$$

$$a = 8\ cm$$

$\therefore$ Volume of cube $= a^3$

$= 8^3$

$= 512\ cm^3$

234. The total surface area of a cube of side measuring 2 m is:

(a) $30\ m^2$ (b) $25\ m^2$

(c) $20\ m^2$ (d) $24\ m^2$

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) : Side of cube (a) = 2m

Total surface area of cube $= 6a^2$

$= 6 \times (2)^2$

$= 24\ m^2$

235. If the diagonal of a cube is $10\sqrt{3}$ cm long, then what is its volume?

(a) $1000\ cm^3$ (b) $800\ cm^3$

(c) $500\ cm^3$ (d) $9000\ cm^3$

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

$a\sqrt{3} = 10\sqrt{3} \Rightarrow a = 10$ cm.

So, volume of cube $= (a^3) = (10)^3 = 1000\ cm^3$

236. If the side of a cube is $9\sqrt{3}$ cm, then its diagonal will be :

(a) 28 cm (b) 26 cm

(c) 27 cm (d) 29 cm

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Diagonal of cube = side $\times \sqrt{3}$

$\because$ Side $= 9\sqrt{3}$ [Given that]

$\therefore$ Diagonal of cube $= 9\sqrt{3} \times \sqrt{3}$

$= 9 \times 3$

$= 27$ cm

237. A larger cube is formed by melting of three smaller cubes of sides 3 cm, 4 cm and 5 cm each. The ratio of the surface area of the three smaller cubes to the larger cube is.

(a) 9 : 4 (b) 18 : 25

(c) 25 : 18 (d) 27 : 64

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

$$(3)^3 + (4)^3 + (5)^3 = A^3$$

$$27 + 64 + 125 = A^3$$

$$216 = A^3$$

$$A = 6\ cm$$

Surface area of larger cube $= 6A^2$

$= 6 \times (6)^2$

$= 216\ cm^2$

Sum of the surface area of three smaller cubes $= 6\ (3^2 + 4^2 + 5^2)$

$= 6\ (9 + 16 + 25)$

$= 300\ cm^2$

Hence Required ratio $= \frac{300}{216} = 25 : 18$

238. The ratio of the volumes of two cubes is 64 : 1331. What is the ratio of their total surface areas?

(a) 16 : 121 (b) 121 : 16
(c) 16 : 4 (d) 4 : 121

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : Let sides of both cubes are a and b respectively.

According to the question,

$$\frac{a^3}{b^3}=\frac{64}{1331}=\frac{(4)^3}{(11)^3} \Rightarrow \frac{a}{b}=\frac{4}{11}$$

The ratio of their total surface area,

$$=\frac{6a^2}{6b^2}=\frac{a^2}{b^2}$$

$$=\left(\frac{a}{b}\right)^2=\left(\frac{4}{11}\right)^2$$

$$=\frac{16}{121}\Rightarrow 16:121$$

239. If length of each side of a cube is doubled, then its volume ..... the original volume

(a) Is doubled (b) Becomes 9 times
(c) Becomes 8 times (d) Becomes 6 times

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let the side of the initial cube = a

Volume of the initial cube = a^3

Length of each side of the cube = 2a

Volume = $(2a)^3 = 8a^3$

Volume = 8×Initial cube/volume of the original cube.

So, if the length of each side of the cube is doubled. Then its volume will become 8 times of the original volume.

240. Each edge of a cube is increased by 50%. Find the percentages increase in its surface area

(a) 130% (b) 100%
(c) 125% (d) 120%

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : Increase in surface area $= (a + b + \frac{ab}{100})\%$

$= 50 + 50 + \frac{50\times 50}{100}$

$= 100 + 25$

$= 125\%$

or

Let side of cube = a cm.

and surface area = $6a^2$ cm^2

$\because$ side of new cube $= a\times\frac{150}{100}$

$$=\frac{3a}{2}\text{ cm.}$$

Surface area $= 6\times\left(\frac{3a}{2}\right)^2$

$$=6\times\frac{9a^2}{4}=\frac{27a^2}{2}\ cm^2$$

$\because$ Increase % in surface area $=\frac{\frac{27a^2}{2}-6a^2}{6a^2}\times 100$

$$=\frac{15}{12}\times 100=125\%$$

241. If the surface area of a cube is 3750 cm^2, then find its volume?

(a) 14255 cm^3 (b) 16625 cm^3
(c) 12225 cm^3 (d) 15625 cm^3

RRB JE - 23/05/2019 (Shift-III)

Ans : (d) Surface area of the cube $= 6a^2$

As per the question,

$6a^2 = 3750$

$a^2 = 625$

$a = 25$

Volume of cube $= (side)^3$

$= 25 \times 25 \times 25$

$= 15625\ cm^3$

242. The sum of all the sides of a cube is 48 cm. Find its volume?

(a) 27 cm^3 (b) 216 cm^3
(c) 64 cm^3 (d) 36 cm^3

RRB JE - 23/05/2019 (Shift-III)

Ans : (c) Let each side of cube = a cm

As per the question,

$12\ a = 48$

$a = 4$

Volume of cube $= (a)^3 = (4)^2 = 64cm^3$

243. If the length of each side of a cube is increased by 3 times, then how much of its volume will be the actual volume?

(a) 9 times (b) 2 times
(c) 3 times (d) 27 times

RRB RPF SI – 11/01/2019 (Shift-I)

Ans. (d) Let side of cube = a

Volume of cube = a^3

Side of new cube = 3a

Volume of new cube = $(3a)^3 = 27\ a^3$

The volume of new cube will be 27 times the volume of the cube.

244. The length of the edge of a cube is 80 cm. A circle is painted yellow on each surface of that cube. If the area covered by the circle is as large as possible, then what will be the total area of the surface of the cube which is not painted?

(a) 8,200.14 cm^2 (b) 8,528.57 cm^2
(c) 8,228.57 cm^2 (d) 8,127.14 cm^2

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (c) Given

$r = \frac{80}{2} = 40cm,\ a = 80$ cm

Area of not painted layer = $6a^2 - \{6 \times (\pi r^2)\}$

$= 6 \times (80)^2 - \{6 \times \frac{22}{7} \times (40)^2\}$

$= 38400 - \{6 \times 5028.57\}$

$= 38400 - 30171.42$

$= 8228.58\ cm^2 \approx 8228.57\ cm^2$

245. The length, breadth and height of a right angled parallel hexagon are 3.6 m, 2.5 m and 1.8 m respectively, how many cubes are made by melting this metal, if measurement of each side is 0.3 m of each cube.

(a) 60 (b) 6000
(c) 600 (d) 60,000

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (c) Let the number of new cubes is n

$$n = \frac{\text{Volume of right angled parallel hexagon metal volume}}{\text{Volume of melting cube}}$$

$$= \frac{3.6 \times 2.5 \times 1.8}{0.3 \times 0.3 \times 0.3}$$

$$= 12 \times 50 = 600$$

246. How many times the volume of a cube is reduced by halving its sides?

(a) $\frac{1}{4}$ (b) $\frac{1}{8}$
(c) $\frac{1}{3}$ (d) $\frac{1}{2}$

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (b) Volume of cube with sides 'a' = a × a × a = a^3

Volume of cube with sides $\frac{a}{2} = \left(\frac{a}{2}\right)^3 = a^3 \times \frac{1}{8}$

So by halving the sides of the cube, Its volume will be reduced by $\frac{1}{8}$ times.

247. If one side of a cube is extended by 1 cm, the volume will increase by 169 cm^3. Find the each side of the cube?

(a) 8cm (b) 7cm
(c) 6cm (d) 9cm

RRB Group-D – 05/10/2018 (Shift-III)

Ans. (b) Let edge of cube = a cm
So, volume of cube = a^3
As per the question,

$(a + 1)^3 - a^3 = 169$
$a^3 + 1 + 3a(a + 1) - a^3 = 169$
$3a^2 + 3a - 168 = 0$
$a^2 + a - 56 = 0$
$a^2 + 8a - 7a - 56 = 0$
$a(a + 8) - 7(a + 8) = 0$
$(a + 8)(a - 7) = 0$

$\therefore$ a = 7 cm a = –8 (invalid)

248. The sum of the lengths of the edges of a cube is equal to the perimeter of a square. If the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then the length of one side of the square is:

(a) 30 units (b) 9 units
(c) 27 units (d) 12 units

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (c) Let side of cube = y unit and side of square = x unit
As per the question,

$12y = 4x$, $y = \frac{x}{3}$ .....(i)

and $y^3 = x^2$

From equation (i)

$$\left(\frac{x}{3}\right)^3 = x^2$$

$x = 27$

Side of square (x) = 27 units

249. If the edge of a cube is increased by 3 cm, the volume will increases by 657 cm^3. Then what is the original length of each edge of the cube?

(a) 7 cm (b) 8 cm
(c) 6 cm (d) 9 cm

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (a) Let length of the edge of cube = a
So volume = a^3
As per the question,
Length increased by 3 cm
So length of new edge of cube = a + 3
So new volume = $(a+3)^3$
As per the question,

$(a+3)^3 - a^3 = 657$
$a^3 + 27 + 9a(a+3) - a^3 = 657$
$27 + 9a^2 + 27a = 657$
$9a^2 + 27a = 657 - 27$
$9a^2 + 27a = 630$
$a^2 + 3a = \frac{630}{9}$
$a^2 + 3a - 70 = 0$
$a^2 + 10a - 7a - 70 = 0$
$a(a + 10) - 7(a + 10) = 0$
$(a + 10)(a - 7) = 0$

So required length of edge of the cube = 7 cm

Type - 7

250. Rajesh needs to buy some cardboard to build a box that is 12 inches long, 8 inches wide and 10 inches high. How much cardboard is needed to build the box?

(a) 350 sq inches (b) 960 sq inches
(c) 400 sq inches (d) 592 sq inches

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (d) : Cardboard required to make a box,
= 2(*l*b+bh+*l*h)
= 2(12×8+8×10+10×12)
= 2(96+80+120)
= 2×296
= 592 square inches

251. Rohan had a cuboidal box having dimensions of 36 cm × 25 cm × 20 cm. He packed into it as many cubes as possible. Each of which has edges 4 cm long. How much space will be still left in the box?

(a) 820 cm^3 (b) 720 cm^3
(c) 780 cm^3 (d) 680 cm^3

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (b) : Volume of cuboid = $36 \times 25 \times 20$
$= 18000\ cm^3$
Total possible number of small cubes = $(36\times25\times20)cm^3$
$\therefore$ (24 cm because that is the max dimension of the cube of 4 cm that can cover for space of 25 cm)
$= \frac{36}{4}\times\frac{24}{4}\times\frac{20}{4}$
$= 9 \times 6 \times 5$
$= 270$
Total volume of small cubes $= 270 \times (4)^3$
$= 270 \times 64$
$= 17280\ cm^3$
Remaining part = $18000 - 17280$
$= 720\ cm^3$

252. The ratio of the length, breadth and height of a cuboid is 4 : 3 : 5 and the sum of the lengths of all its edges is 144 cm. Find the total surface area of the cuboid.
(a) $756\ cm^2$ (b) $846\ cm^2$
(c) $1026\ cm^2$ (d) $1620\ cm^2$
RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (b) : Let Length of Cuboid = 4x
Breadth = 3x
Height = 5x
According to the question,
$4(4x+3x+5x) = 144$
$4\times12x = 144, \quad x = 3$
Then surface area of cuboid = $2(lb + bh + hl)$
$= 2(12+15+20)x^2$
$= 2\times47x^2$
$= 94\times9$
$= 846\ cm^2$

253. If the length and the height of a cuboid are 18 m and 12 m respectively and its volume is 3024 m^2, then find its breadth:
(a) 16 (b) 14
(c) 13 (d) 15
RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (b) : Length of Cuboid (l) = 18 m
Height (h) = 12 m
Volume = $3024\ m^3$
Breadth (b) = ?
Volume = $l \times b \times h$
$3924 = 18 \times b \times 12$
$b = \frac{3024}{18\times12}$
$b = 14$ m

254. If the breadth and height of a closed cuboid are, respectively, 25% and 50% of its length of 12 cm, then find the total surface area of this cuboid.
(a) $126\ cm^2$ (b) $522\ cm^2$
(c) $63\ cm^2$ (d) $252\ cm^2$
RRB Group-D 26/08/2022 (Shift-III)

Ans. (d) : Given,
Length of the cuboid = 12 cm
Breadth of the cuboid = $12 \times \frac{25}{100} = 3$ cm
Height of the cuboid = $12 \times \frac{50}{100} = 6$ cm
Total surface area of the cuboid = $2(lb + bh + hl)$
$= 2(12 \times 3 + 3 \times 6 + 6 \times 12)$
$= 2(36 + 18 + 72)$
$= 2 \times 126$
$= 252\ cm^2$

255. The edges of a cuboid are in the ratio 1:2:3 and its volume is 1296 cm^3. The surface area of the cuboid is:
(a) $824\ cm^2$ (b) $792\ cm^2$
(c) $684\ cm^2$ (d) $748\ cm^2$
RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (b) : Let the sides of cuboid respectively = x, 2x and 3x
length (l) = x
breadth (b) = 2x
height (h) = 3x
Volume of cuboid = lbh
$\Rightarrow x \times 2x \times 3x = 1296$
$6x^3 = 1296$
$x^3 = 216$
$x = 6$ cm
length (l) = 6, breadth (b) = 12, height (h) = 18
Surface are of cuboid = $2(lb + bh + hl)$
$= 2(6 \times 12 + 12 \times 18 + 18 \times 6)$
$= 2(72 + 216 + 108)$
$= 2(396)$
$= 792\ cm^2$

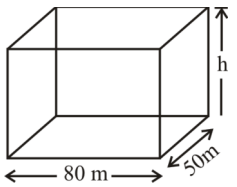
256. A cuboid of dimensions 18.5cm × 12.5 cm × 10 cm needs to be painted all over. Find the area to be painted.
(a) $1157.5\ cm^2$ (b) $1198\ cm^2$
(c) $1082.5\ cm^2$ (d) $984.56\ cm^2$
RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (c) :
The total surface area of cuboid = $2(lb + bh + lh)$
$= 2(18.5 \times 12.5 + 12.5 \times 10 + 18.5 \times 10)$
$= 2(231.25 + 125 + 185)$
$= 2 \times 541.25$
$= 1082.5 cm^2$

257. 500 persons are taking a dip in a cuboidal pond, which is 80 m long and 50 m broad. What is the rise in the water level in the pond, if the average displacement of the water by one person is 0.04 m^3?
(a) 2.5 cm (b) 1 cm
(c) 1.5 cm (d) 0.5 cm
RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (d) :

If the height of the pond is h m.



Volume of pond
$= l \times b \times h$
$= 80 \times 50 \times h$
$= 4000\ h\ m^3$

Volume of water removed by 500 persons
$= 500 \times 0.04 = 20.00\ m^3 = 20\ m^3$

Therefore, the rise in the water level of the pond

$\because (1m = 100cm)$

$4000\ h = 20$

$h = \frac{20}{4000} = 0.005\ m = 0.5\ cm$

258. How many cubes of side 3 cm can be formed by melting a cuboid of length 9 cm, breadth 6 cm and height 6 cm?

(a) 14 (b) 12
(c) 13 (d) 11

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (b) : Required number of cubes

$$= \frac{\text{Volume of cuboid}}{\text{Volume of cube}} = \frac{lbh}{a^3} = \frac{9\times6\times6}{3\times3\times3} = 12$$

259. A tank 4 m long, 2 m wide and 1.5 m deep is dug in a field 22 m long and 14 m wide. If the earth dug out is evenly spread out over the remaining field, then the level of the field will rise by:

(a) 4.75 m (b) 5 cm
(c) 3.5 cm (d) 4 cm

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d**) :** Let the level of the field be increased by h m.

Volume of dug soil = Area of remaining field × height.

$4\times2\times1.5 = (22\times14 - 4\times2)\times h$

$12 = 4(75)\times h$

$h = \frac{12}{300}\text{m}$

$h = \frac{12}{300}\times100$

$h = 4\text{cm}$

260. If the volume of a cube is equal to the volume of a cuboid of dimensions 54 cm, 18 cm and 6 cm, then find the length of the side of the cube?

(a) 18 cm (b) 24 cm
(c) 12 cm (d) 16 cm

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Volume of Cuboid = $\ell\times b\times h$
$= 54 \times 18 \times 6\ cm^3$

$\because$ Volume of Cube = Volume of Cuboid

$(side)^3 = 18\times3\times18\times6$
$= 18\times18\times18$

Hence the length of the side of the cube = 18 cm

261. A cuboid having the surface area of 3 adjacent faces as a, b, c has the volume:

(a) $(abc)^{\frac{1}{2}}$ (b) $a^3b^3c^3$
(c) abc (d) $(abc)^{\frac{1}{3}}$

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (a) : Given,

Length × Breadth = a _____(i)

Breadth × Height = b _____ (ii)

Height × Length = c _____ (iii)

On multiplying equation (i), (ii) and (iii),

$(L \times B \times H)^2 = a \times b \times c$

Hence, Volume = Length × Breadth × Height= $(abc)^{\frac{1}{2}}$

262. The sides of a cuboid are in the ratio of 1:2:3. If its surface area is 88 cm^2, find its volume.

(a) 48 cm^3 (b) 120 cm^3
(c) 64 cm^3 (d) 24 cm^3

RRB JE - 25/05/2019 (Shift-II)

Ans : (a**)** Let the length (l), breadth (b) and height (h) be x, 2x and 3x respectively.

Surface area of cuboid = 88 cm^2

$2\ (l.b + b.h + h.l) = 88\ cm^2$

$2\ (x.\ 2x + 2x.\ 3x + 3x.\ x) = 88 cm^2$

$2\ (2x^2 + 6x^2 + 3x^2) = 88$

$22x^2 = 88$

$x^2 = 4$

$\boxed{x = 2}$

Length of cuboid (l) = x = 2cm

Breadth of cuboid (b) = 2x = 2 × 2 = 4cm

Height of cuboid (h) = 3x = 3 × 2 = 6 cm

Volume of cuboid $= \ell.b.h$
$= 2 \times 4 \times 6$
$= \boxed{48cm^3}$

263. Cuboid of dimensions *l* × b × h is cut into the form of the frames of dimensions *l* × 0.5 b × 0.4 h. Find the number of frames.

(a) 4 (b) 5
(c) 20 (d) 10

RRB JE - 27/05/2019 (Shift-II)

Ans : (b)

$$\text{Number of frames} = \frac{\text{Volume of large cuboid}}{\text{Volume of small cuboide}}$$

$= \frac{\ell\times b\times h}{\ell\times0.5b\times0.4h}$

$= \frac{1}{0.5\times0.4}$

$= \frac{1}{0.20} = \frac{100}{20} = 5$

264. A wooden box measures 20 cm × 12 cm × 10 cm. The thickness of the wood is 1 cm. Find the volume of the wood used to make the box.

(a) 1120 cm^3 (b) 2400 cm^3
(c) 519 cm^3 (d) 960 cm^3

RRB JE - 29/05/2019 (Shift-II)

Ans : (d)
Wooden box measurement $=20\text{ cm} \times 12\text{ cm} \times 10\text{ cm}$
$= 2400\text{ cm}^3$
$\because$ Wood thickness is 1 cm
$\therefore$ Internal measurement of wooden box
$= (20 - 1 \times 2) \times (12 - 1 \times 2) \times (10 - 1 \times 2)$
$= 18 \times 10 \times 8 = 1440\text{ cm}^3$
$\therefore$ Volume of wood used for making box
$= 2400 - 1440 = 960\text{ cm}^3$

265. The length, breadth and height of the box of each rectangular panel are 12 cm, 8 cm and 10 cm respectively. Find the total surface area of the box :
(a) 592 square cm. (b) 376 square cm.
(c) 524 square cm. (d) 482 square cm.

RRB JE - 30/05/2019 (Shift-III)

Ans : (a) Given
$l = 12$ cm
b = 8 cm
h = 10 cm
Total surface area of rectangular panel
$= 2(lb + bh + hl)$
$= 2(12 \times 8 + 8 \times 10 + 12 \times 10)$
$= 2(96 + 80 + 120)$
$= 2 \times 296$
$= 592$ square cm.

266. The surface area of a cuboid is 1372 cm^2. Its dimensions are in the ratio of 4:2:1. Find the length?
(a) 24 cm (b) 7 cm
(c) 28 cm (d) 12 cm

RRB JE - 30/05/2019 (Shift-III)

Ans : (c) Let cuboid dimensions be 4x, 2x, x cm respectively.
Surface area of cuboid $= 2[lb + bh + hl)$
$1372 = 2[4x \times 2x + 2x \times x + 4x \times x]$
$1372 = 2[8x^2 + 2x^2 + 4x^2]$
$1372 = 2[14x^2]$
$x^2 = \frac{1372}{28}$
$x^2 = 49$
$x = 7$
Length of cuboid $= 4x$
$= 4 \times 7 = 28$ cm.

267. The ratio of the length, breadth and height of a room is 3:3:4. If the length is two times, width is two-third and the height is halved then by what percentage will the cost of painting the four walls of the room be reduced?
(a) $30\frac{3}{4}$ (b) $33\frac{1}{3}$
(c) 32 (d) $28\frac{1}{4}$

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (b) : Let length of room $= 3x$
breadth $= 3x$
height $= 4x$
Area of room $= 2(L + B) \times h$
$= 2(3x + 3x) \times 4x$
$= 48x^2$
When the length is doubled, breadth is two-third and height is halved, then the new area obtained
$= 2\left(3x \times 2 + 3x \times \frac{2}{3}\right) \times \frac{4x}{2}$
$= 2(6x + 2x) \times 2x$
$= 16x \times 2x = 32x^2$
Decrease $= 48x^2 - 32x^2 = 16x^2$
Decrease % $= \frac{16x^2}{48x^2} \times 100 = \frac{100}{3} = 33\frac{1}{3}\%$

268. The measurement of a rectangular box is in the ratio of 2:3:5. If the total surface area is 6200 cm^2, find the dimensions of the cuboid.
(a) 20cm × 40cm × 50cm
(b) 20cm × 30cm × 40cm
(c) 30cm × 40 cm × 50cm
(d) 20cm × 30cm × 50cm

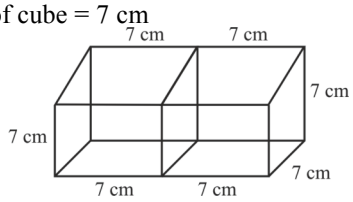
RRB Group-D – 03/10/2018 (Shift-III)

Ans : (d) Let sides be 2x cm, 3x cm. and 5x cm then
Total surface area of cuboid
$= 2(lb + bh + hl)$
$2(lb + bh + hl) = 6200$
$2(2x \times 3x + 5x \times 3x + 5x \times 2x) = 6200$
$2(6x^2 + 15x^2 + 10x^2) = 6200$
$31x^2 = 3100$
$x^2 = 100 \Rightarrow \boxed{x = 10\text{ cm}}$
So dimensions or sides of cuboid—
$2x = 2 \times 10 = 20$cm
$3x = 3 \times 10 = 30$ cm
$5x = 5 \times 10 = 50$ cm

269. Two cubes of 343 cm^3 volume are added at their edges. The total floor area of the cuboid so formed is?
(a) 436 square cm (b) 466 square cm
(c) 346 square cm (d) 490 square cm

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (d) Area of cube $= 343\text{ cm}^3$
Then side of cube = 7 cm



Area of cuboid $= 2(lb + bh + hl)$
As per the question,
l= 7+7=14, b= 7,h=7
$\therefore$ Area of cuboid
$= 2(14 \times 7 + 7 \times 7 + 7 \times 14) = 490$ square cm

270. The area of the three faces of a cube including the top is 25 m^2, 32 m^2 and 32 m^2. What is the volume of the cuboid?
(a) 184 m^3 (b) $\sqrt{3024}\text{m}^3$
(c) 92 m^3 (d) 160m^3

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (d) Area of first face of cuboid $(lb) = l \times b$
$= 25\text{ m}^2$
Area of second face of cuboid $(bh) = b \times h = 32\text{ m}^2$
Area of third face of cuboid $(hl) = h \times l = 32\text{ m}^2$
Now,
Volume of cuboid $= \sqrt{lb \times bh \times lh}$

$= \sqrt{25\times32\times32}$

$= \sqrt{5\times5\times16\times2\times16\times2}$

$= 5 \times 4 \times 4 \times 2 = 160$

Hence volume of cuboid $= 160\ m^3$

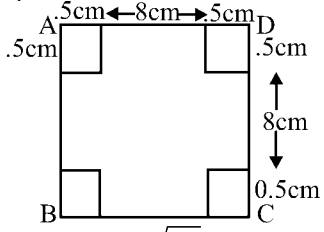
271. The pieces of 0.25 cm^2 square have been cut from a square plate of each side of 4 cm and the remaining plate is joined with cut edges from an open cuboid. What will be the volume of this open cuboid?

(a) 34 (b) 30

(c) 36 (d) 32

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (d)



Side of cut square $= \sqrt{.25} = .5$cm

$\therefore$ Volume of open top cuboid $= 8 \times 8 \times 0.5 = 32\ cm^3$

272. Two cubes each volume 216 cm^2 are joined end to end. The total surface area of the resulting cuboids is?

(a) 360 cm^2 (b) 380 cm^2

(c) 330 cm^2 (d) 340 cm^2

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (a) Let side of cube = a cm

Volume of cube = $(side)^3$

$216 = a^3$

$a = \sqrt[3]{216}$

a = 6 cm

According to the question,

l = 12, b = 6, h = 6

Total surface area of cuboid $= 2(lb + bh + hl)$

$= 2\ (12\times6 + 6\times6 + 6\times12)$

$= 2\ (72 + 36 + 72)$

$= 2\ (180) = 360\ cm^2$

273. The ratio of the length, breadth and height of a room is 3:2:1. If its volume is 3072 m^3, then find its width?

(a) 18 m (b) 16 m

(c) 24 m (d) 12 m

RRB NTPC 09.04.2016 Shift : 3

Ans : (b) Ratio = 3 : 2 : 1

Let length, breadth and height of room be 3x, 2x and x m respectively.

Volume of cuboid $= l \times b \times h = 3072$

$3x \times 2x \times x = 3072$

$6x^3 = 3072 \quad \Rightarrow \quad x^3 = 512$

$x = \sqrt[3]{512}$

$x = 8$

Hence, $b = 2x = 2\times8 = 16$ m

274. The surface areas of three faces of a cuboid sharing a vertex are 20 m^2, 32 m^2 and 40 m^2. What is the volume of the cuboid?

(a) 92 m^3 (b) $\sqrt{3024}\ m^3$

(c) 160 m^3 (d) 184 m^3

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (c) Let length, breadth and height of cuboid is ℓ, b and h.

$\ell b \times bh \times \ell h = 40 \times 20 \times 32$

$(\ell bh)^2 = 25600$

$\ell bh = 160\ m^3$

Hence, the volume of the cuboid (ℓbh) will be 160 m^3.

Type - 8

275. The circumference of the base of a right circular cylinder is 176 cm and its height is 12 cm. Find the total surface area (in cm^2) of the cylinder. (Use $\pi = \frac{22}{7}$)

(a) 7064 (b) 7640

(c) 7040 (d) 7460

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (c) : Circumference of base of cylinder = 176 cm

$2\pi r = 176$

$2\times\frac{22}{7}\times r = 176$

r = 28 cm

h = 12 cm

Totoal surface area of cylinder $= 2\pi r\ (r+h)$

$= 176\times(28+12)$

$= 176 \times 40 = 7040\ cm^2$

276. Find the cost of painting all surfaces of a 10 m long hollow steel pipe whose internal and external diameters measure 15 cm and 17 cm respectively, if the cost of painting 1cm^2 of the surface is ₹0.15. [Use $\pi = \frac{22}{7}$]

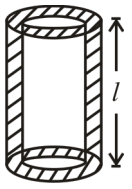
(a) ₹15,160.80 (b) ₹15,100.80

(c) ₹15,200.80 (d) ₹15,000.80

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : Given,

$R = \frac{17}{2}$cm, $r = \frac{15}{2}$cm, l=1000cm



Total surface area of Hollow cyclinder.

$= 2\pi(R+r)l + 2\pi(R^2-r^2)$

$= 2\pi(R+r)(l+R-r)$

$= 2\times\frac{22}{7}\times16\times(1000+1)$

$= 2\times22\times16\times143\ cm^2$

Cost of painting $= 2\times22\times16\times143\times0.15 = 15100.8\ cm^2$

277. The sum of the radius of the base and the height of a solid right circular cylinder is 39 cm. Its total surface area is 1716cm^2. What is the Volume (in cm^3) of the cylinder? (Take $\pi = \frac{22}{7}$)

(a) 4620 (b) 5082
(c) 4774 (d) 4928

RRB NTPC (Stage-II) 15/06/2022 (Shift-II)

Ans. (d) : Let the radius and height of the cylinder is R and H respectively.

According to the question,

Total surface area of cylinder = 1716

$2\pi R(H+R) = 1716 \quad (\because H+R = 39cm)$

$2\times\frac{22}{7}\times R\times 39 = 1716$

$R = \frac{1716\times 7}{39\times 2\times 22}$

R = 7 cm

Volume of cylinder = $\pi R^2 H$

$= \frac{22}{7}\times 7\times 7\times 32 \quad [H = 39 - 7 = 32]$

$= 4928\,cm^3$

278. Two cylinders have the same volume, but the radius of the base of the second cylinder is 20% less than the radius of the base of the first. How much greater should the height of the second cylinder be in comparison to the height of the first?

(a) 55.25% (b) 56.25%
(c) 55.75% (d) 56.75%

RRB NTPC (Stage-II) 15/06/2022 (Shift-I)

Ans. (b) : Let radius of first cylinder (R) = 100

Radius of second cylinder (r) = $100\times\frac{80}{100} = 80$

According to the question,

$\pi R^2 H = \pi r^2 h$

$\Rightarrow \quad (100)^2\times H = (80)^2\times h$

$\Rightarrow \quad \frac{H}{h} = \frac{6400}{10,000}$

Required increase % = $\frac{(10000-6400)\times 100}{6400}$

$= \frac{3600\times 100}{6400}$

$= \frac{225}{4}$

$\boxed{= 56.25\%}$

279. The volume of a cylinder having height 21 cm and radius 10 cm is : $\left(\text{Use } \pi = \frac{22}{7}\right)$

(a) 9900 cm^3 (b) 6600 cm^3
(c) 8800 cm^3 (d) 7700 cm^3

RRB Group-D 08/09/2022 (Shift-II)

Ans. (b) : Volume of a cylinder = $\pi r^2 h$

Given,

h = 21cm

r = 10cm

$\therefore$ Volume of a cylinder $= \frac{22}{7}\times 21\times 10\times 10$

$= 6600cm^3$

280. Find the volume of a cylinder whose radius of base is 5 cm and height is 7 cm.

(a) 157 π cm^3
(b) 715 π cm^3
(c) 517 π cm^3
(d) 157 π cm^3

RRB Group-D 30-08-2022 (Shift-II)

Ans. (d) : Given,

Radius of cylinder (r) = 5 cm

Height of cylinder (h) = 7 cm

$\because$ Volume of cylinder (V) = $\pi r^2 h$

$= \pi 5^2 \times 7$

$\Rightarrow 175\ \pi\ cm^3$

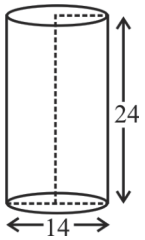
281. Find the curved surface area of a cylinder whose diameter of base is 14 m and height is 24 m.

$\left(\text{Use } \pi = \frac{22}{7}\right)$

(a) 1065 cm^2 (b) 1056 cm^2
(c) 1560 cm^2 (d) 1506 cm^2

RRB Group-D 23-08-2022 (Shift-II)

Ans. (b) : Curved surface are a of a cylinder $\Rightarrow 2\pi rh$



$\Rightarrow 2\times\frac{22}{7}\times 7\times 24$

$\Rightarrow 2\times 22\times 24$

$\Rightarrow 1056$

282. If the volume of a cylinder is 256π cm^3 and the radius of its base is 8 cm, then find the height of the cylinder.

(a) 5 cm (b) 4 cm
(c) 6 cm (d) 3 cm

RRB Group-D 30-08-2022 (Shift-III)

Ans. (b) : Given, Volume of cylinder = 256 × cm^3
Radius = 8 cm
Height = ?
$\because$ Volume of cylinder = $\pi r^2 h$
$256\pi = \pi (8)^2 h$
$h = \frac{256}{64} \Rightarrow 4$ cm
Hence, height of cylinder = 4 cm.

283. The volume of a cylinder having diameter 14 cm and height 5 cm is:

$\left(\textbf{Use}\ \pi = \frac{22}{7}\right)$

(a) 880 cm^3 (b) 660 cm^3
(c) 770 cm^3 (d) 990 cm^3

RRB Group-D 05/09/2022 (Shift-III)

Ans. (c) : D = 14, and h = 5cm
r = 7
Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times (7)^2 \times 5$
$= 770 cm^3$

284. The ratio of radius of cylinder and height is 3 : 4. If volume is 38808 cm^3. Then using $\pi = \frac{22}{7}$ find the radius of cylinder ?

(a) 35 cm (b) 14 cm
(c) 21 cm (d) 28 cm

RRB Group-D 06/09/2022 (Shift-II)

Ans. (c) : Radius of cylinder (r) = 3x
Height = 4x
Volume of cylinder (v) = $\pi r^2 h$
$\frac{22}{7} \times 9x^2 \times 4x = 38808$
$x^3 = 343$
x = 7
Radius of cylinder (r) = 3 × 7
= 21 cm

285. The total surface area of a cylinder of diameter 10 cm is 330 square centimeters. Find the height of the cylinder?

(a) 5.5 cm (b) 6.5 cm
(c) 10.5 cm (d) 2.5 cm

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) :
Total surface area of a cylinder of diameter = $2\pi rh + 2\pi r^2$
$330 = 2\pi r\ (h + r)$
$330 = 2 \times \frac{22}{7} \times 5\ (h + 5)$
$42 = 4h + 20$
$4h = 22$
$h = \frac{22}{4}$
h = 5.5 cm

286. The volume (in cm^3) of a solid right circular cylinder whose diameter of base is 7cm and height is 20 cm is _____(Use $\pi = \frac{22}{7}$)

(a) 980 (b) 1440
(c) 3080 (d) 770

RRB Group-D 13/09/2022 (Shift-III)

Ans. (d) : Given,
Diameter (d) = 7 cm
radius (r) $= \frac{7}{2}$ cm
Height (h) = 20 cm
Volume of solid right circular cylinder = $\pi r^2 h$
$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 20$
= 770 cm

287. If are of base of a cylinder is 346.50 cm^2 and height 21 cm. Then find his total surface area (using $\pi = \frac{22}{7}$)

(a) 2352 cm^2 (b) 2231 cm^2
(c) 2145 cm^2 (d) 2079 cm^2

RRB GROUP - D – 29/09/2022 (Shift–II)

Ans. (d) : According to the question,
Area of base of cylinder = 346.50 cm.
$\pi r^2 = 346.50$
$r^2 = \frac{34650 \times 7}{22 \times 100}$
$r = \frac{21}{2}$
total surface area of cylinder $= 2\pi r(h + r)$
$= 2 \times \frac{22}{7} \times \frac{21}{2}\left(21 + \frac{21}{2}\right)$
$= 2 \times \frac{22}{7} \times \frac{21}{2} \times 21\left(1 + \frac{1}{2}\right)$
$= 2 \times \frac{22}{7} \times \frac{21}{2} \times 21 \times \frac{3}{2}$
$= 2079\ (cm)^2$

288. If the volume of a solid right circular cylinder is 198 m^3 and the radius of its base is 3 m, then its height (in m) is _____. Take $\pi = \frac{22}{7}$

(a) 7 (b) 9
(c) 27 (d) 6

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (a) : Given :– Volume of cylinder = 198 m^3
Radius of base (r) = 3m
Height (h) = ?
$\because$ Volume of cylinder = $\pi r^2 h$
$\therefore\ 198 = \pi \times 3^2 \times h \qquad \because \left(\pi = \frac{22}{7}\right)$
$h \Rightarrow \frac{198 \times 7}{22 \times 9}$
h = 7 m

289. Find the amount of water contained in a cylindrical tank of radius 7 m and height 20 m. It is known that the tank is completely filled.

(a) 4250 m^3 (b) 3125 m^3
(c) 5110 m^3 (d) 3080 m^3

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (d) : According to the question

$r = 7$ m

$h = 20$ m

Now $\boxed{\text{Volume cylinder} = \pi r^2 \times h}$

$$= \frac{22}{7} \times (7)^2 \times 20$$

$$= 3080 \text{ m}^3$$

290. If the radius and height of a cylinder are 25 cm and 42 cm respectively, then its lateral surface area is:

(a) 660 cm^2 (b) 1960 cm^2
(c) 6000 cm^2 (d) 6600 cm^2

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) : Given–

Radius of cylinder (r) = 25 cm

Height (h) = 42 cm

Lateral surface area of cylinder = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 25 \times 42 = 44 \times 150 = 6600 \text{cm}^2$$

291. If the radius of two cylinders are in ratio 2:3 and their respective heights are in ratio 5:3 then what is the ratio of their volumes?

(a) 10 : 17 (b) 20 : 27
(c) 20 : 37 (d) 17 : 27

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : Ratio of volumes $= \frac{r^2h}{R^2H} = \left(\frac{r}{R}\right)^2 \times \frac{h}{H}$

$$= \left(\frac{2}{3}\right)^2 \times \frac{5}{3} = 20 : 27$$

292. In a right circular cylinder, the ratio of curved surface area to total surface area is 3:7. Find the ratio of height to radius of the cylinder.

(a) 4 : 5 (b) 5 : 3
(c) 4 : 3 (d) 3 : 4

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : Curved surface area of cylinder = $2\pi rh$

Total surface area of cylinder = $2\pi r(h+r)$

According to the question,

$$\frac{2\pi rh}{2\pi r(h+r)} = \frac{3}{7}$$

$7h = 3h + 3r$

$4h = 3r$

$$\frac{h}{r} = \frac{3}{4}$$

$h : r = 3 : 4$

293. A cylinder has 14 cm height and 660 cm^2 curved surface area. The volume of the cylinder is:

$\left(\text{Take } \pi = \frac{22}{7}\right)$

(a) 2425 cm^3 (b) 2275 cm^3
(c) 2475 cm^3 (d) 2225 cm^3

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$h = 14$ cm

Curved surface area of cylinder $= 2\pi rh$

$$660 = 2 \times \frac{22}{7} \times r \times 14$$

$$r = \frac{660}{88}$$

$$= \frac{60}{8}$$

$$= 7.5\text{cm}$$

Volume of the cylinder $= \pi r^2 h$

$$= \frac{22}{7} \times 7.5 \times 7.5 \times 14$$

$$= 2475\text{cm}^3$$

294. If the radius of a cylinder is 5 cm, its vertical height is 172 cm, what will be the volume?

(a) 1500π cm^3 (b) 4300π cm^3
(c) 1000π cm^3 (d) 4100π cm^3

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (b) : As per the question,

Radius of cylinder (r) = 5cm

Height of cylinder (h) = 172cm

$\therefore$ Volume of cylinder = $\pi r^2 h$

$$= \pi \times 5^2 \times 172$$

$$= 4300\pi \text{ cm}^3$$

295. The capacity of a cylindrical tank is 6160 m^3. If the diameter of base of the tank is 28m, then find the depth (in m) of the tank.

(a) 12 (b) 10
(c) 14 (d) 8

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (b) $\because$ Volume of cylinder $= \pi r^2 h$

$$\text{Radius (r)} = \frac{\text{Diameter}}{2}$$

$$= \frac{28}{2}$$

$\boxed{r = 14 \text{ m}}$

According to the question –

$$\pi r^2 h = 6160 \text{ m}^3$$

$$\frac{22}{7} \times 14 \times 14 \times h = 6160$$

$$h = \frac{6160 \times 7}{14 \times 14 \times 22}$$

$\boxed{h = 10 \text{ m}}$

296. In a right circular cylinder, the ratio of the curved surface area to the total surface area is 5:9. Find the ratio of the height of the cylinder to the radius of the cylinder.

(a) 3 : 5 (b) 5 : 3
(c) 4 : 5 (d) 5 : 4

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : Curved surface area of the cylinder $= 2\pi rh$

The total surface area of the cylinder $= 2\pi r(h + r)$

$$\frac{\text{Curved surface area of cylinder}}{\text{Total surface area of cylinder}} = \frac{5}{9}$$

$$\frac{2\pi rh}{2\pi r(h+r)} = \frac{5}{9}$$

$$\Rightarrow \quad \frac{h}{h+r} = \frac{5}{9}$$

$$\Rightarrow \quad 9h = 5h + 5r$$

$$9h - 5h = 5r$$

$$\frac{h}{r} = \frac{5}{4}$$

297. A cylinder has a height of 14 cm and the curved surface area is 528 cm^2. The volume of the cylinder is :

(a) 1244 cm^3 (b) 1584 cm^3
(c) 2538 cm^3 (d) 792 cm^3

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Height of cylinder (h) = 14 cm

Curved surface area of cylinder $(2\pi rh) = 528\ cm^2$

$$\Rightarrow 2\times\frac{22}{7}\times r\times 14 = 528$$

$$\Rightarrow r = \frac{528}{2\times 2\times 22}$$

r = 6 cm

Volume of cylinder $(\pi r^2 h) = \frac{22}{7}\times 6\times 6\times 14$

$= 22\times 36\times 2$

$= 1584\ cm^3$

298. Find the ratio of the volume of a sphere whose radius r and cylinder whose radius r and height 2r?

(a) 2:3 (b) 3:2
(c) 5:4 (d) 3:5

RRB JE - 22/05/2019 (Shift-I)

Ans : (a) Radius of sphere = r

Radius of cylinder = r

Height of cylinder = 2r

$$\text{So} \quad \frac{\text{Volume of sphere}}{\text{Volume of cylinder}} = \frac{\frac{4}{3}\pi r^3}{\pi r^2 h}$$

$$= \frac{\frac{4}{3}\pi r^3}{\pi r^2\times 2r} = \frac{2}{3}$$

$\therefore$ Volume of sphere : Volume of cylinder = 2 : 3

299. What will be the total surface area of that solid cylinder? Whose radius is half of the radius of the circle having an area of 154 square meters and the height is equal to its radius?

(a) 231 m^2 (b) 123 m^2
(c) 312 m^2 (d) 132 m^2

RRB JE - 25/05/2019 (Shift-I)

Ans : (a) Area of circle = 154 m^2

$\pi r^2 = 154$

$$r^2 = 154\times\frac{7}{22} = 7\times 7$$

r = 7

As per the question,,

Height of cylinder = 7 m

Radius of cylinder = $\frac{7}{2}$ m

Total surface area of cylinder = $2\pi r\,(h + r)$

$$= 2\times\frac{22}{7}\times\frac{7}{2}\left(7+\frac{7}{2}\right)$$

$$= 22\times\frac{21}{2} = 231 m^2$$

300. A wire made by melting a metal sphere with radius of 6 cm, the length of the wire whose radius of the transverse section is 8 cm?

(a) 4 cm (b) 3.5 cm
(c) 5 cm (d) 4.5 cm

RRB JE - 26/05/2019 (Shift-III)

Ans : (d) Let the length of wire is l cm

As per the question-

$\therefore$ Volume of sphere = Volume (cylinder) of wire

$$\frac{4}{3}\pi\times 6\times 6\times 6 = \pi\times 8\times 8\times \ell$$

$$\ell = \frac{4\times 6\times 6\times 6}{3\times 8\times 8} = 4.5\ \text{cm.}$$

301. Find the total surface area of hemisphere melted on a cylinder while both have the same radius, and the height of the cylinder is twice its radius?

(a) $8\pi r^2$ (b) $4\ \pi r^2$
(c) $7\pi r^2$ (d) $(2\pi rh + 2\ \pi r^{2)}$

RRB JE - 29/05/2019 (Shift-II)

Ans : (c) Radius of hemisphere = Radius of cylinder

Height of cylinder (h) = 2r

$\therefore$ Total surface area = Curved surface area of cylinder + Curved surface area of hemisphere + Area of base of cylinder = $2\pi rh + 2\pi r^2 + \pi r^2$

$= 2\pi r\times 2r + 3\pi r^2$

$= 4\pi r^2 + 3\pi r^2 = 7\pi r^2$

302. Find the radius of the cylinder whose volume is 3850 cm and height is 25 cm:

(a) 7 cm (b) 14 cm
(c) 3.5 cm (d) 10.5 cm

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (a) Volume of cylinder (V) = 3850 cm^3

h = 25 cm

r = ?

$V = \pi r^2 h$

$3850 = \frac{22}{7} \times r^2 \times 25$

$r^2 = \frac{3850 \times 7}{22 \times 25} = 49$

r = 7 cm

303. The capacity of a cylindrical tank is 3080 cubic meters. The radius of its base is 7 meters. So find the depth of the tank?

(a) 10 m (b) 25 m

(c) 15 m (d) 20 m

RRB JE - 02/06/2019 (Shift-III)

Ans : (d) Base radius (r) = 7 m

Capacity or volume of cylinderical tank =3080 cubic m.

$\pi r^2 h = 3080$

$\frac{22}{7} \times 7^2 \times h = 3080$

$7h = \frac{3080}{22}$

$h = \frac{140}{7} = 20$ m

304. If the height 'h' of a cylinder is equal to the circumference of its base. Find the area of its curved surface in terms of h:

(a) h^3 (b) 2h/3

(c) $3h^2$ (d) h^2

RRB JE - 02/06/2019 (Shift-I)

Ans : (d) Circumference $(2\pi r) = h$

Curved surface of cylinder = $2\pi rh$ $[2\pi r = h]$

$= h \times h = h^2$

305. The total surface area of a solid cylinder is 462 cm^2. Its curve surface is one third of the entire surface area. Find its volume:

(a) 964 cm^3 (b) 810 cm^3

(c) 539 cm^3 (d) 1024 cm^3

RRB JE - 27/06/2019 (Shift-III)

Ans : (c) Given

Total surface area of cylinder = 462 cm^2

$2\pi r (h+r) = 462$ ----(i)

Curved surface area of cylinder $= 462 \times \frac{1}{3}$

$2\pi rh = 154$ cm ----(ii)

From equation (i) and (ii)-

$\frac{2\pi r(h+r)}{2\pi rh} = \frac{462}{154}$

$\frac{(h+r)}{h} = 3$

h + r = 3h

r = 2h ----(iii)

From equation (ii)–

$2\pi rh = 154$

$2 \times \frac{22}{7} \times 2h \times h = 154$

$4 \times \frac{22}{7} \times h^2 = 154$

$h^2 = \frac{49}{4}$

$h = \frac{7}{2}$

From equation (iii)–

r = 2h

$r = 2 \times \frac{7}{2} = 7$ cm

Volume of cylinder $(\pi r^2 h)$ =

$\frac{22}{7} \times 7 \times 7 \times \frac{7}{2} = 11 \times 49 = 539$ cm^3

306. Find the volume of a cylinder whose radius is one-third of the radius of a circle with an area of 1386 cm^2 and the height is twice its radius?

(a) 3246 cm^3 (b) 3562 cm^3

(c) 2156 cm^3 (d) 2584 cm^3

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans. (c) Area of circle = πR^2

$\therefore \pi R^2 = 1386$

$\frac{22}{7} \times R^2 = 1386$

$R^2 = \frac{1386 \times 7}{22} = 63 \times 7$

$R = \sqrt{63 \times 7} = 3 \times 7$

R = 21 cm

As per the question,

Radius of cylinder = $21 \times \frac{1}{3} = 7$ cm

Height of cylinder = 7 × 2 = 14 cm

Volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 14 = 2156$ cm^3

307. A solid cylindrical metal with a diameter of 14 cm and a height of 15 cm is melted to form a solid wire whose length is 60 meters. Find the diameter of the wire.

(a) 7 mm (b) 14 mm

(c) 3.5 mm (d) 35 mm

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans. (a) Diameter of cylindrical metal (d_1) = 14cm

$2r_1 = 14$cm

$r_1 = 7$cm

The length of the wire = 60m

Cylinder is melted to form of a wire, so the length of the wire.

$h_2 = 60m = 6000cm$

Volume of solid cylinder = Volume of wire

$\pi r_1^2 h_1 = \pi r_2^2 h_2$

$7 \times 7 \times 15 = r_2^2 \times 6000$

$r_2 = \sqrt{\frac{7 \times 7}{400}} = \frac{7}{20}$cm

$r_2 = \frac{7}{20} \times 10$mm (1cm = 10mm)

$r_2 = 7/2$

So, diameter = $2r_2 = \frac{7}{2} \times 2 = 7$mm

308. 42 cm diameter solid metal sphere is melted and made then a wire which has a diameter 7mm find the length of the wire.

(a) 1008 m (b) 1008 cm
(c) 2016 cm (d) 2016 m

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (a) Diameter of sphere = 42 cm

$$\text{Radius (R)} = \frac{42}{2} = 21\text{cm} = 21 \times 10^{-2}\text{ m}$$

Diameter of wire (cylinder) = 7 m

$$\text{Radius (r)} = \frac{7}{2}\text{mm} = \frac{7}{2}\times 10^{-3}$$

Volume of sphere = Volume of cylinder (wire)

$$\frac{4}{3}\pi R^3 = \pi r^2 h$$

$$\frac{4}{3}\times(21\times10^{-2})^3 = \left(\frac{7}{2}\times10^{-3}\right)^2 \times h$$

$$\frac{4}{3}\times 21\times 21\times 21\times 10^{-6} = \frac{7}{2}\times\frac{7}{2}\times 10^{-6}\times h$$

$$h = \frac{4}{3}\times\frac{21\times21\times21\times4}{7\times7}$$

$$h = 16\times3\times21$$

$$h = 1008\text{ m.}$$

So, length of wire (h) = 1008 m

309. The length of a hollow cylinder is 84 cm and its outer diameter is 32 cm and the inner diameter is 24 cm. If the of substance is 10 grams/cm^3, what will be the weight of the hollow cylinder?

(a) 295680 kg (b) 329680 kg
(c) 295.68 kg (d) 329.68 kg

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans : (c) Height of a hollow cylinder = 84 cm
External diameter = 32 cm
External radius (R) = 16 cm
Internal diameter = 24 cm
Internal radius (r) = 12 cm

Density of substance of cylinder = 10 gr/cm^3

$$\text{Density of substance of cylinder} = \frac{10}{1000} = \frac{1}{100}\text{ kg/cm}^3$$

Volume of hollow cylinder = $\pi h (R^2 - r^2)$

$$= \frac{22}{7}\times 84\left\{(16)^2 - (12)^2\right\}$$

$$= 22\times12\times28\times4$$

$$= 88\times12\times28$$

$$= 29568\text{ cm}^3$$

Hence, weight of substance of hollow cylinder = volume × Density $= \frac{29568}{100} = 295.68\text{ kg.}$

310. The outer and inner diameters of a hollow sphere are 12 cm and 8 cm respectively. It is melted to give the shape of a cylinder whose base diameter is 16 cm. What will be the height of the cylinder?

(a) 3.33 cm (b) 4.33 cm
(c) 3.17 cm (d) 4.17 cm

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (c) Given-

∵ External and internal diameter of hollow sphere are 12cm and 8cm.

∴ External radius of hollow circle (R) = 6 cm

And internal radius (r_1) = 4 cm

Diameter of cylinder (2r) = 16 cm

$$r_2 = \frac{16}{2} = 8\text{ cm}$$

As per the question,-

Volume of hollow sphere = volume of cylinder

$$\frac{4}{3}\pi\left(R^3 - r_1^3\right) = \pi r_2^2 h$$

$$\frac{4}{3}\pi\left[(6)^3 - (4)^3\right] = \pi(8)^2\times h$$

$$\frac{4}{3}\pi[216-64] = 64\pi h$$

$$\frac{1}{3}[152] = 16h$$

$$\Rightarrow 50.667 = 16h \quad \Rightarrow h = 3.17\text{ cm}$$

311. The capacitance of a cylindrical tank is 20790 m^3. If its radius is 10.5 m, find its depth.

(a) 60 m (b) 120 m
(c) 30 m (d) 75 m

RRB Group-D – 03/12/2018 (Shift-III)

Ans. (a) : Capacitance of cylindrical tank = 20790 m^3

So, $\pi r^2 h = 20790$

$$\frac{22}{7}\times(10.5)^2\times h = 20790$$

$$\frac{22}{7}\times10.5\times10.5\times h = 20790$$

$$\frac{22}{7}\times\frac{105}{10}\times\frac{105}{10}\times h = 20790$$

$$\frac{22\times21\times21}{7\times2\times2}\times h = 20790$$

$$\frac{11\times63}{2}\times h = 20790$$

$$h = \frac{20790\times2}{11\times63}$$

$$h = 60\text{ m}$$

So depth = 60 m

312. The radius of a sphere is three times the radius of the base of a cylinder. The height of a cylinder is 9 times the radius of its base. It the total surface area of the cylinder and the numerical value of the volume of the sphere are equal, so what is the height of the cylinder.

(a) 3 unit (b) 4.5 unit
(c) 5 unit (d) 2.25 unit

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) : Let radius of cylinder = r

Then radius of sphere $(r_2) = 3r$

Height of cylinder (h) = 9r

As per the question,

Volume of sphere = Surface area of cylinder

$$\frac{4}{3}\pi(r_2)^3 = 2\pi r(h+r)$$

$$\Rightarrow \frac{4}{3}\pi(3r)^3 = 2\pi r(9r+r) \Rightarrow \frac{4}{3}\pi 27r^3 = 20\pi r^2$$

$$r = \frac{5}{9}\text{ unit}$$

$$h = 9r = 9\times\frac{5}{9}$$

$$h = 5$$

So height of cylinder = 5 unit

313. A rectangular Aluminium sheet with dimensions 22m × 10m is rolled into a cylinder so that the smaller side becomes the height of the cylinder. What is the volume of the cylinder formed?

(a) 385 m^3 (b) 370 m^3

(c) 380 m^3 (d) 375 m^3

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (a) When the rectangular aluminium sheet is folded into a cylindrical form, the width (smaller side) will change as the height of the cylinder and the length will become the base of the cylinder.

∴ Height of cylinder (h) = 10 m

Circumference of the base of cylinder = 2πr = 22m.

$$\Rightarrow \quad 2\times\frac{22}{7}\times r = 22$$

$$r = \frac{7}{2}\text{m}$$

Volume of cylinder (V) = $\pi r^2 h$

$$V = \frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\times 10$$

$$V = 11\times 7\times 5 = 385\ m^3$$

314 . What will be the volume of an perpendicular cylinder if its radius is 2.5 cm and height is 2 cm.

(a) 275 cm^3 (b) 275/21 cm^3

(c) 275/2 cm^3 (d) 275/7 cm^3

RRB NTPC 19.01.2017 Shift : 1

Ans : (d) Volume of cylinder = $\pi r^2 h$

$$= \frac{22}{7}\times(2.5)^2\times 2$$

$$= \frac{275}{7}\text{cm}^3$$

315. What is the volume of a perpendicular cylinder whose radius is 2 cm and height is 2 cm. $\left(\pi = \frac{22}{7}\right)$

(a) 175/7 cm^3 (b) 176/21 cm^3

(c) 176/7 cm^3 (d) 176 cm^3

RRB NTPC 19.01.2017 Shift : 3

Ans : (c) Volume of cylinder $= \pi r^2 h = \frac{22}{7}\times 2\times 2\times 2$

$$= \frac{22}{7}\times 8 = \boxed{\frac{176}{7}\text{cm}^3}$$

Type - 9

316. Find the total surface area (in m^2) of a right circular cone whose radius of base is 70 cm and perpendicular height is 240 cm. $\left[\text{Use}\,\pi = \frac{22}{7}\right]$

(a) 704 (b) 0.704

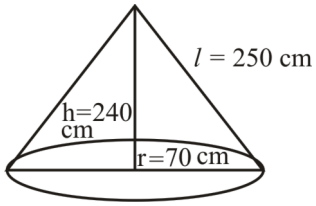
(c) 7.04 (d) 70400

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (d) : Given,

radius (r) = 70 cm

height (h) = 240 cm



Then, $l^2 = h^2 + r^2$

$= (240)^2 + (70)^2$

$l = \sqrt{62500}$

$l = 250$ cm

Total surface area of cone = $\pi r(l + r)$

$$= \frac{22}{7}\times 70(250+70)$$

$$= \frac{22}{7}\times 70\times 320$$

$$= 70400\ \text{cm}^2$$

317. The slant height of a right circular cone is 13 cm and the area of the base is $144\pi\ cm^2$. Find the volume (in cm^3) of the cone.

(a) 245 π (b) 260 π

(c) 240 π (d) 225 π

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (c) : Given,

Slant height of cone $(\ell) = 13$cm

Area of base = 144 πcm^2

$\pi r^2 = 144\ \pi cm^2$

$r^2 = 144$

Radius (r) = 12 cm

Height (h) = $\sqrt{\ell^2 - r^2}$

$= \sqrt{13^2 - 12^2}$

$= \sqrt{25}$

∴ h = 5 cm

Volume of cone = $\frac{\pi r^2 h}{3}$

$$= \frac{\pi\times(12)^2\times 5}{3}$$

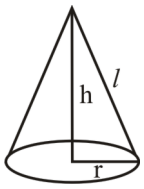
$$= \pi\times 12\times 4\times 5 = 240\pi$$

318. The area of the base of a conical tomb is 616 m^2 and its height is 48 m. What is the cost of plastering in curved surface area at ₹ 150 per m^2? (Take $\pi = \frac{22}{7}$)

(a) ₹ 3,60,000 (b) ₹ 3,15,000
(c) ₹ 3,00,000 (d) ₹ 3,30,000

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (d) :



Area of base of cone $= 616\ m^2$

$\pi r^2 = 616$

$\frac{22}{7} \times r^2 = 616$

$r^2 = 7 \times 7 \times 4$

$r = 14\ m$

$l = \sqrt{h^2 + r^2}$

$= \sqrt{48^2 + 14^2}$

$= \sqrt{2500}$

$= 50\ m$

Required cost $= \pi r l \times 150 = \frac{22}{7} \times 14 \times 50 \times 150$

$= ₹\ 330{,}000$

319. The radius of the base of a solid right circular cone is 5 cm and its height is 12 cm . What is its total surface area (in cm^2)?

(a) 34π (b) 90π
(c) 84π (d) 70π

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (b) : Given,

Radius (r) = 5 cm

Height (h) = 12 cm

Slant-Height (l) $= \sqrt{5^2 + 12^2}$

$= \sqrt{169}$

$= 13$ cm

Total surface area of cone $= \pi r (l + r)$

$= \pi \times 5 \times 18$

$= 90\pi$

320. The diameter of base of a right circular cone is 20 cm and its slant height is 10.5 cm. What is the curved surface area (in cm^2) of the right circular cone? $\left[\text{Use } \pi = \frac{22}{7}\right]$

(a) 165 cm^2 (b) 660 cm^2
(c) 495 cm^2 (d) 330 cm^2

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : Given,

Diameter of cone = 20 cm

Radius (r) $= \frac{20}{2} = 10$ cm

Slant height (l) = 10.5 cm

Curved surface area of cone = $\pi r l$

$= \frac{22}{7} \times 10 \times 10.5$

$= 330\ cm^2$

321. A solid metallic cylinder of base radius 3 cm and height 5 cm is melted to form cones each of height 1 cm and base radius 1 mm. How many cones were formed?

(a) 13,500 cones (b) 12,500 cones
(c) 19,500 cones (d) 10,500 cones

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Let,

Number of formed cones = n

According to the question-

Volume of cylinder = n × Volume of cone

$\pi r^2 h = n \times \frac{1}{3} \pi r^2 h$

$\pi \times (3)^2 \times 5 = n \times \frac{1}{3} \pi \times \left(\frac{1}{10}\right)^2 \times 1$

$n = 9 \times 5 \times 3 \times 100$

$\boxed{n = 13500 \text{ cones}}$

322. The height of the solid frustum of a cone is 8cm. If the radii of its lower and upper ends are 3 cm and 9 cm respectively, then its slant height is:

(a) 10 cm (b) 12 cm
(c) 15 cm (d) 9 cm

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (a) : Given that–

Height of frustum (h) = 8 cm

Radius of upper end (R) = 9 cm

Radius of lower end (r) = 3 cm

Slant height (l) $= \sqrt{h^2 + (R - r)^2}$

$= \sqrt{8^2 + (9-3)^2}$

$= \sqrt{64 + 36}$

$= \sqrt{100}$

$= 10$cm

323. Calculate the total surface area of a cone if its radius is $\frac{r}{4}$ and slant height is $4l$.

(a) $\pi r(l+r)$ (b) $2\pi r(l+r)$
(c) $\pi r\left(l + \left(\frac{r}{16}\right)\right)$ (d) $2\pi r l$

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

radius (r) $= \frac{r}{4}$

Slant height $l = 4l$

Total surface area of cone $= (\pi rl + \pi r^2)$

$= \pi\frac{r}{4} \times 4l + \pi\left(\frac{r}{4}\right)^2$

$= \pi rl + \pi\frac{r^2}{16}$

$= \boxed{\pi r\left(l + \frac{r}{16}\right)}$

324. Find the total surface area of a cone, if its radius and slant height are 2r and 1/2 respectively.

(a) $\pi r\,(2r + 1)$ (b) $\frac{4r^2 + 1}{2}$

(c) $\pi r\,(4r + 1)$ (d) $\pi\,(4r^2 + 1)$

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c) : Total surface area of cone $= \pi rl + \pi r^2$

Where, r = Radius

l = Slant height

So, total surface area of a cone whose radius 2r and slant height $\frac{1}{2} = \pi \times 2r \times \frac{1}{2} + \pi(2r)^2$

$= \pi r + \pi 4r^2$

$= \pi r\,(1+4r)$

$= \pi r\,(4r+1)$

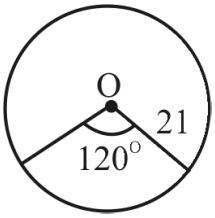
325. A circle sector with radius 21 cm and center is turned into a cone by turning 120°. Find the radius of the cone thus formed.

(a) 42 cm (b) 21 cm

(c) 7 cm (d) 7.5 cm

RRB JE - 29/05/2019 (Shift-I)

Ans : (c) Let radius of cone = R cm



Radius of sector = 21cm

Angle = 120^0

From, Angle $= \frac{\text{Arc}}{\text{radius}}$, $\left[\because \text{where angle will be in radian}\right]$

$120° \times \frac{\pi}{180°} = \frac{\text{Arc}}{21}$

$\frac{2\pi}{3} \times 21 = \text{arc}$

Circumference of circle formed by base of the cone = length of arc.

$2\pi R = \frac{2\pi}{3} \times 21$

$\boxed{R = 7\text{ cm}}$

326. A solid hemisphere of metal is melted and is formed into the same radius of 'R' as a cone if the height of the cone is 'H' then.

(a) H = R (b) H = R/2

(c) H = 2R (d) H = R/3

RRB JE - 27/05/2019 (Shift-I)

Ans : (c) We know that

Volume of hemisphere $= \frac{2}{3}\pi r^3$

Volume of cone $= \frac{1}{3}\pi r^2 h$

As per the question,,

$\frac{2}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$ (r = R) (h=H)

$\frac{2}{3}\pi R^3 = \frac{1}{3}\pi R^2 H$

$\boxed{H = 2R}$

327. There are two cones that have a ratio of volume 1 : 10 and a ratio of height 2 : 5. Find the ratio of their base radius.

(a) 2:1 (b) 5:2

(c) 7:25 (d) 1:2

RRB JE - 28/05/2019 (Shift-I)

Ans : (d)

$V_1 : V_2 = 1 : 10$

$h_1 : h_2 = 2 : 5$

$\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2}$

$\frac{1}{10} = \frac{r_1^2 \times 2}{r_2^2 \times 5}$

$\frac{1}{2} = \frac{r_1^2 \times 2}{r_2^2 \times 1}$

$\boxed{r_1 : r_2 = 1 : 2}$

328. The size of a solid is like a hemisphere with the same radius melted on a cone of radius 2 cm and the height of the cone is equal to its radius. Find the volume of this solid.

(a) $2\pi\ cm^3$ (b) $6\pi\ cm^3$

(c) $8\pi\ cm^3$ (d) $4\pi\ cm^3$

RRB JE - 30/05/2019 (Shift-I)

Ans : (c)

$\because$ Height of cone is equal to radius of cone

$\therefore$ Total volume = Volume of hemisphere + Volume of cone

$= \frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$ [h = r]

$= \frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^3 = \frac{3\pi r^3}{3}$

$= \pi \times (2)^3$ [r = 2 cm]

$= 8\pi\ cm^3$

329. Numerical values of the volume and surface area of a cone are equal. If 'h' and 'r' represent the height and base radius of the cone, find the value of $(1/h^2) + (1/r^2)$

(a) 2/9 (b) 1/9
(c) 1/3 (d) 3

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Volume of cone = Surface area of cone

$\frac{1}{3}\pi r^2 h = \pi r l$, Where, l = Slant height of cone

$\frac{1}{3}rh = l$ r – Radius, h – Height

$\frac{r}{3l} = \frac{1}{h}$

On squaring both sides,

$\frac{1}{h^2} = \frac{r^2}{9l^2}$ .....(i)

And $\frac{1}{r^2} = \frac{h^2}{9l^2}$ .....(ii)

On adding equation (i + ii)

$\frac{1}{h^2} + \frac{1}{r^2} = \frac{r^2}{9l^2} + \frac{h^2}{9l^2}$

$\frac{1}{h^2} + \frac{1}{r^2} = \frac{h^2 + r^2}{9l^2}$

$\frac{1}{h^2} + \frac{1}{r^2} = \frac{l^2}{9l^2}$ $\left(\because l^2 = h^2 + r^2\right)$

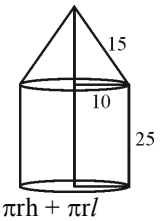
$\frac{1}{h^2} + \frac{1}{r^2} = \frac{1}{9}$

330. A tent is in the shape of a cylinder and a cone has been established above it, the radius and height of the cylindrical part are 10 meters and 25 meters respectively. The radius is 10 meters of conical portion and the slant height is 15 meters. Calculate the amount of canvas required for the construction of this tent, taking an additional canvas of 20 percent for sealing, etc.

(a) 3783.26 m^2 (b) 4714.43 m^2
(c) 3772.14 m^2 (d) 2451.40 m^2

RRB JE - 26/06/2019 (Shift-III)

Ans : (d)



Area of tent = $2\pi rh + \pi rl$

area of tent = $2\times\pi\times10\times25 + \pi\times10\times15 = 500\pi + 150\pi$

= 650π m^2

Required area = $650\times\frac{120}{100}\times\frac{22}{7}$

= $\frac{780\times22}{7} = \frac{17160}{7} = 2451.40$ m^2

331. Some circular cone shaped chocolates were made from a circular solid chocolates of radius 6 cm. Both the radius and height of this cone are 2 cm. The chocolate is kept in a 12 × 9 configuration in a square box. The height of the box is 2 cm. The box were filled with honey to keep the chocolate edible for a long time. The volume of honey in the box is what percentage of the total volume.

(a) 73.81 (b) 75.46
(c) 70.45 (d) 71.23

RRB RPF SI – 13/01/2019 (Shift-III)

Ans. (a) Given—

Length of box = 4 × 12 = 48 cm

Breadth of box = 4 × 9 = 36 cm

Number of cone = 12 × 9 = 108

Volume of honey = Volume of box − Number of cone × Volume of one cone

$= 48\times36\times2 - 108\times\frac{1}{3}\times\frac{22}{7}\times2^2\times2$

= 3456 – 905.14

= 2550.87

Honey's percentage = $\frac{2550.857}{3456}\times100$

= 73.809%

= 73.81%

332. The height and slant height of a perpendicular circular cone are 24 cm and 25 cm respectively. Find the curved surface area of the cone, assuming the value of π is 22/7.

(a) 572 cm^2 (b) 528 cm^2
(c) 539 cm^2 (d) 550 cm^2

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (d) According to the question, the height of the perpendicular cone is 24 cm and the slant height is 25cm.

Formula- $l^2 = h^2 + r^2$ $\begin{cases} h = 24\,cm \\ l = 25\,cm \end{cases}$

$(25)^2 = (24)^2 + r^2$

$625 = 576 + r^2$

$49 = r^2$

$\therefore$ $\boxed{r = 7\ cm}$

Curve surface area of cone = πrl

$= \frac{22}{7}\times7\times25$

$= 22\times25$

$= 550\ cm^2$

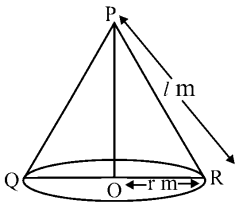
333. The diameter and slant height of a conical tent are 16 meters and 5.6 meters respectively. If the width is to be maintained at 4 meters, how much cloth will be required for the construction of the tent?

(a) 35m (b) 32m
(c) 32.5 m (d) 35.2 m

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (d) Given- diameter of tent(d) = 16 m

Breadth = 4 m



$\therefore$ Radius (OR = OQ) = 8 m $\left(\because r = \frac{d}{2}\right)$

Slant height of cone (l) = 5.6 m

Curved surface area of cone = π rl

$= \frac{22}{7} \times 8 \times 5.6 = 0.8 \times 8 \times 22 = 140.8\ m^2$

So required length of cloths for making tent

$= \frac{\text{Curved surface area of the cone}}{\text{breadth}} = \frac{140.8}{4} = 35.2$ m

334. Curved surface of cone X is 5 times that of curved surface of cone Y. Slant height of cone Y is 5 times slant height of cone X. What will be the ratio of the area of the base of the cone X and the cone Y.

(a) 5 : 1 (b) 125 : 1

(c) 625 : 1 (d) 25 : 1

RRB Group-D – 05/12/2018 (Shift-III)

Ans : (c) Curve surface area of cone = πrl

Curved surface of X cone=Curve surface of Y cone $\times 5$

$\pi r_1 l_1 = \pi r_2 l_2 \times 5$

$r_1 l_1 = r_2 l_2 \times 5$.....(1)

$5\times$ Slant height of cone X = Slant height of cone Y

$\boxed{5l_1 = l_2}$

On putting the value of l_2 in equation (1)

$r_1 l_1 = r_2 \times 5 l_1 \times 5$

$\frac{r_1}{r_2} = \frac{25}{1}$

Ratio of base area of cone X and cone Y =

$\frac{\pi r_1^2}{\pi r_2^2} = \frac{(25)^2}{(1)^2} = 625 : 1$

335. A solid round metal ball of 36 cm diameter is melted and small solid cones of 12 cm in diameter and 12 cm height are made from it. Describe the number of cones made using this molten metal.

(a) 52 cone (b) 60 cone

(c) 48 cone (d) 54 cone

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (d) Diameter of solid sphere ball = 36 cm

Radius of solid sphere ball (R) = 18 cm

Diameter of cone = 12 cm

Radius of cone (r) = 6 cm

Height of cone (h) = 12cm

Suppose the number of cones formed by melting the solid sphere ball is n, then

$n = \frac{\text{Volume of the solid sphere ball}}{\text{Volume of cone}}$

$n = \frac{\frac{4}{3}\pi R^3}{\frac{1}{3}\pi r^2 h}$

$n = \frac{4 \times 18 \times 18 \times 18}{6 \times 6 \times 12}$

n= 54 cone

So, the number of cone's of melted metal = 54 cone

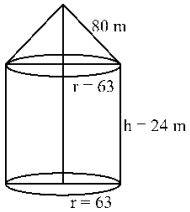
336. A tent as such that its lower part is like a cylinder of 24 m height having 126 m diameter. Its apex is cone shaped with a base of the same diameter of 126 m and is 80 m slant height. Its canvas is 8 m wide. Calculate the length of canvas required to construct the tent.

(a) 3296 m (b) 3020 m

(c) 3168 m (d) 3190 m

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) We know that, $r = \frac{D}{2} = \frac{126}{2} = 63$m.



Curved surface of tent = $2\pi rh + \pi rl$

$= \pi r(2h + l)$

$= \frac{22}{7} \times 63(2 \times 24 + 80)$

$= 198\ (48 + 80)$

$= 198\ (128)$

$= 25344\ m^2$

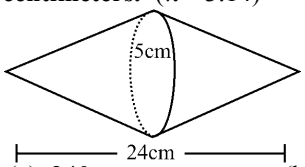
Area of canvas = ($l \times$ b) = 25344

$l \times 8 = 25344$

$\therefore\ l = \frac{25344}{8}$

Length of required canvas = 3168 m

337. The following structure is formed by connecting two perpendicular cones with their bases. The radius of each base is 5 cm. And the total length of this structure is 24 cm the total volume of this structure will be in cubic centimeters. ($\pi = 3.14$)



(a) 240 (b) 628

(c) 314 (d) 376.8

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (b) : Volume of cone = $\frac{1}{3}\pi r^2 h$

Radius = 5 cm

Height = 12 cm

Volume of given figure = 2 × Volume of one perpendicular cone

Volume of figure = $\left(\frac{1}{3} \times 3.14 \times 5 \times 5 \times 12\right) \times 2$

[where $\pi = 3.14$]

$= \frac{1884}{3} = 628\ cm^3$

Type - 10

338. The surface area of a sphere is 38.5 cm^2. Find the radius of the sphere. [Use $\pi = \frac{22}{7}$]

(a) 1.8 cm (b) 1.4 cm
(c) 1.5 cm (d) 1.75 cm

RRB NTPC (Stage-II) 15/06/2022 (Shift-II)

Ans. (d) : Surface area of sphere = 38.5

$$4\pi R^2 = 38.5$$

$$R^2 = \frac{38.5}{4\times\frac{22}{7}} \quad \left[\text{Surface area of sphere} = 4\pi R^2\right]$$

$$R^2 = \frac{38.5\times 7}{4\times 22} = \frac{7\times 7}{4\times 4}$$

$$R = \frac{7}{4} = 1.75\,\text{cm}$$

339. A hemispherical bowl of internal radius 24 cm is full of liquid. This liquid is to be filled in cylindrical bottles, each of internal radius 6 cm and height 8 cm. How many bottles are required to empty the bowl?

(a) 32 (b) 36
(c) 35 (d) 30

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (a) : Number of bottles required to completely empty the hemispherical bowl

$$= \frac{\text{Volume of the hemispherical bowl}}{\text{Volume of cylindrical bottle}}$$

$$= \frac{\frac{2}{3}\pi r^3}{\pi r^2 h}$$

$$= \frac{\frac{2}{3}\times 24\times 24\times 24}{6\times 6\times 8}$$

$= 2\times 4\times 4$

$= 32$

Hence, 32 bottles will be required to completely empty the hemispherical bowl.

340. The total surface area of a solid hemisphere is 1848 cm^2. What is the length of the diameter of the flat surface of the hemisphere. [Use $\pi = \frac{22}{7}$]

(a) 35 cm (b) 21 cm
(c) 14 cm (d) 28 cm

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (d) : According to the question,

Total surface area of solid Hemisphere = $3\pi r^2$

$$3\pi r^2 = 1848\ cm^2$$

$$\Rightarrow r^2 = \frac{1848}{3\pi}$$

$$\Rightarrow r^2 = \frac{1848\times 7}{3\times 22}$$

$$\Rightarrow r^2 = 196$$

$$\Rightarrow r^2 = (14)^2$$

$\therefore$ Radius (r) = 14

Diameter = 2r

$= 2\times 14$

$= 28$ cm

341. A solid metallic sphere of radius 3 cm is melted and drawn into a wire of thickness 4 mm What is the length of the wire (in m)?

(a) 7.5 (b) 8
(c) 9 (d) 9.25

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (c) : Volume of wire = Volume of sphere

$$4\text{mm} = \frac{4}{10}\text{cm}.$$

$$\text{Radius of wire} = \frac{1}{2}\times\frac{4}{10} = 0.2\,\text{cm}.$$

Volume of wire = $\pi r^2 l$

Where, l = length of wire

$$\therefore \pi(0.2)^2 l = \frac{4}{3}\pi(3)^3$$

$$0.04\times l = \frac{4}{3}\times 27$$

$$0.04\times l = 36$$

$$l = \frac{36}{0.04}$$

$$l = \frac{36\times 100}{4}$$

$l = 9\times 100$ cm

$l = 9$ m.

342. If three solid gold spherical beads of radii 6 cm. 8 cm. and 10 cm. respectively are melted into one spherical bead, then what is the radius (in cm) of the larger bead?

(a) 15 cm (b) 12 cm
(c) 13 cm (d) 16 cm

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (b) : Radius of larger spherical bead = Sum of volumes of smaller spherical beads

$$\frac{4}{3}\pi R^3 = \frac{4}{3}\pi r_1^3 + \frac{4}{3}\pi r_2^3 + \frac{4}{3}\pi r_3^3$$

$$R^3 = (6)^3 + (8)^3 + (10)^2$$

$$= 216 + 512 + 1000$$

$$= \sqrt{1728}$$

$R = 12$ cm.

343. The total surface area of a hemisphere is 108π cm^2. What is the volume of the hemisphere?

(a) $216\pi\ cm^3$ (b) $108\sqrt{6}\pi\,cm^3$
(c) $144\pi\ cm^3$ (d) $54\sqrt{3}\pi\,cm^3$

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Total surface area of hemisphere $= 108\pi cm^2$

$3\pi r^2 = 108\pi$

$r^2 = 36$

$r = 6$ cm

Now the volume of hemisphere $= \frac{2}{3}\pi r^3$

$= \frac{2}{3} \times \pi \times 6 \times 6 \times 6$

$= 144\pi \text{ cm}^3$

344. Find the surface area of sphere which diamefer is $\frac{1}{2}$cm :

(a) $2\pi^2$ cm^2 (b) π^2 cm^2

(c) $\frac{\pi}{4}$cm^2 (d) $\frac{\pi}{2}$cm^2

RRB Group-D 26/08/2022 (Shift-III)

Ans. (c) : Given -

$d = \frac{1}{2}$cm $\left(\text{where } r = \frac{d}{2}\right)$ $r = \frac{1}{2 \times 2}$

surface area of sphere $= 4\pi r^2$

$= 4\pi \times \left(\frac{1}{2 \times 2}\right)^2$

$= 4\pi \times \frac{1}{16}$

$= \frac{\pi}{4}$cm^2

345. The volumes of two spheres are in the ratio 216 : 125. The ratio of their surface areas is :

(a) 25 : 9 (b) 36 : 25

(c) 9 : 4 (d) 16 : 9

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) :

$\frac{\text{Volume of first sphere}}{\text{Volume of second sphere}} = \frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3}$

$\frac{r_1^3}{r_2^3} = \frac{216}{125}$

$\frac{r_1}{r_2} = \frac{6}{5}$

$\frac{\text{Surface area of first sphere}}{\text{Suface are of second sphere}} = \frac{4\pi r_1^2}{4\pi r_2^2} = \left(\frac{r_1}{r_2}\right)^2$

$= \left(\frac{6}{5}\right)^2$

$= \frac{36}{25}$

Thus, the ratio both surface area = 36 : 25

346. A hollow spherical sheel is made of a metal of density 6 g/cm^3. its internal and external radii are 8 cm and 9 cm, respectively. What is the weight (in kg) of the shell (take $\pi = \frac{22}{7}$) ?

(a) 5.456 (b) 6.462

(c) 6.642 (d) 4.546

RRB Group-D 08/09/2022 (Shift-I)

Ans. (a) : Given,

Density of metal = 6 gm/cm^3

External radius (R) = 9 cm. internal radius (r) = 8 cm.

According to the question

volume of hollow sphere $= \frac{4}{3}\pi(9)^3 - (8)^3$

$= \frac{4}{3} \times \frac{22}{7} \times (729 - 512)$

$= \frac{4}{3} \times \frac{22}{7} \times 217$

$= 909.33 \text{ cm}^3$.

mass of hollow sphere = volume × density

$= 909.33 \times 6 = 5456$ gm

Weight of hollow sphere = 5.456 kg.

347. Find the volume of a sphere whose diameter is 42m.

(a) 13, 416 m^3

(b) 23, 437 m^3

(c) 38,808 m^3

(d) 42,137 m^3

RRB Group-D 30-08-2022 (Shift-III)

Ans. (c) : Given : Diameter of sphere = 42 m

Radius (r) of sphere = $\frac{42}{2} = 21$m

Volume of sphere = $\frac{4}{3}\pi r^3$

$\Rightarrow \frac{4}{3} \times \frac{22}{7} \times 21 \times 21 \times 21$

$\Rightarrow 38808 \text{ m}^3$

348. On melting a solid sphere of radius 12 cm made 27 equal sphere. Find the ratio of surface area of original sphere and the surface area of this kind of made 6 sphere.

(a) 3 : 2

(b) 9 : 4

(c) 9 : 8

(d) 3 : 1

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : Volume of solid metalic sphere = volume of 349 equal sphere

$\frac{4}{3}\pi R^3 = 27\frac{4}{3}\pi r^3$

$\frac{12 \times 12 \times 12}{27} = r^3$

$\boxed{r = 4}$

According to question,

$4\pi R^2 : 6 \times 4\pi r^2$

$\Rightarrow 4 \times 12 \times 12 : 6 \times 4 \times 4 \times 4$

$\Rightarrow 3 : 2$

350. How many spherical solid marbles, each having a radius of 0.3 cm, can be made from a solid sphere having a radius of 6 cm?

(a) 7500 (b) 9000

(c) 8000 (d) 8500

RRB Group-D 18/08/2022 (Shift-III)

Ans. (c) : According to the question,

$$\frac{\text{Volume of solid sphere}}{\text{Volume of sphierical solid marble}}$$

$$= \frac{\frac{4}{3}\pi \times 6 \times 6 \times 6}{\frac{4}{3}\pi \times 0.3 \times 0.3 \times 0.3}$$

$= 2 \times 2 \times 2 \times 1000$

$= 8000$

13. Find the surface area of a sphere of radius 3.5 cm.

(a) 154 cm^2 (b) 210 cm^2

(c) 142 cm^2 (d) 120 cm^2

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : $\because$ Surface area of a sphere= $4\pi r^2$

$$= 4 \times \frac{22}{7} \times (3.5)^2$$

$= 154\ cm^2$

26. The total surface area of a solid hemisphere is 42 cm^2. Its radius (in cm) is : Take $\pi = \frac{22}{7}$

(a) $\frac{7\sqrt{2}}{\sqrt{11}}$ (b) $\frac{7\sqrt{3}}{\sqrt{22}}$

(c) $\frac{7}{\sqrt{11}}$ (d) $\frac{7\sqrt{2}}{\sqrt{22}}$

RRB Group-D 13/09/2022 (Shift-III)

Ans. (c) : Given,

Total surface area of hemisphere

$3\pi r^2 = 42$

$3 \times \frac{22}{7} \times r^2 = 42$

$r^2 = \frac{49}{11}$

$r = \frac{7}{\sqrt{11}}\text{cm}$

44. If the volume of a sphere is 4851 cm^3, then find the radius of the sphere. $\left[\text{Use}\,\pi = \frac{22}{7}\right]$

(a) 12.5 cm (b) 10.5 cm

(c) 11.5 cm (d) 13.5 cm

RRB Group-D 29-09-2022 (Shift-II)

Ans. (b) : $\because$ Volume of sphere $= \frac{4}{3}\pi r^3 = 4851$

$\frac{4}{3} \times \frac{22}{7} \times r^3 = 4851$

$\frac{4}{3} \times \frac{2}{7} \times r^3 = 441$

$r^3 = \frac{21 \times 21 \times 21}{8}$

$r = \frac{21}{2} = 10.5\text{cm}$

47. 3 solid hemispheres of radius 2 unit each are melted and recast into a single sphere. Find the radius (in given units) of the newly cast single sphere.

(a) $\sqrt[3]{12}$ (b) 3

(c) $\sqrt[3]{10}$ (d) $\sqrt[3]{15}$

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (a) : Volume of hemisphere $= \frac{2}{3}\pi r^3$

Volume of sphere $= \frac{4}{3}\pi R^3$

$3 \times \frac{2}{3}\pi(2)^3 = \frac{4}{3}\pi R^3$

$16 = \frac{4}{3}R^3$

$R^3 = 12$

$R = \sqrt[3]{12}\ \text{cm}$

87. If the volume of a sphere is divided by its surface area, the result is 9 cm. The radius (in cm) of the sphere is _____.

(a) 18 (b) 4.5

(c) 27 (d) 81

RRB GROUP-D – 18/09/2022 (Shift-II)

Ans. (c) : According to the question,

$$\frac{\text{Volume of sphere}}{\text{Surface area of sphere}} = 9$$

$\frac{\frac{4}{3}\pi r^3}{4\pi r^2} = 9$

$r = 9 \times 3$

$r = 27$ cm.

56. The volumes of two spheres are in the ratio of 27 : 8. The ratio of the surface areas of these spheres, in the order in which they are mentioned here, is _____.

(a) 4 : 9 (b) 9 : 4

(c) 3 : 2 (d) 2 : 3

Ans. (b) : Let the radius of bigger and smaller sphere be R_1 and R_2 respectively.
According to the question,
Volume of the sphere = $\frac{4}{3}\pi r^3$

$$\frac{\frac{4}{3}\pi(R_1)^3}{\frac{4}{3}\pi(R_2)^3} = \frac{27}{8}$$

$$\frac{(R_1)^3}{(R_2)^3} = \frac{27}{8}$$

$R_1 : R_2 = 3 : 2$

$\therefore$ Ratio of surface area of both spheres $\Rightarrow$

$$\frac{4\pi(R_1)^2}{4\pi(R_2)^2} \Rightarrow \frac{(3)^2}{(2)^2} \Rightarrow 9:4$$

52. If the volume of a sphere is 36π cm^3, then the diameter of the sphere is :
(a) 3 cm (b) 9 cm
(c) 27 cm (d) 6 cm

Ans. (d) : Given,
Volume of a sphere = 36π cm^3

$$\boxed{\text{Volume of sphere} = \frac{4}{3}\pi r^3}$$

$$\frac{4}{3}\pi r^3 = 36\pi$$

$\Rightarrow r^3 = 9 \times 3$

$\Rightarrow r = 3$

$\therefore$ Diameter = $2r = 2 \times 3 = 6$ cm

272. What is the ratio of the surface areas of two spheres, if their volumes are in the ratio 8 : 27?
(a) 8 : 27 (b) 2 : 3
(c) 4 : 3 (d) 4 : 9

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : As per the question,
Ratio of volumes of spheres = $\frac{8}{27}$

$$\frac{\frac{4}{3}\pi R_1^3}{\frac{4}{3}\pi R_2^3} = \frac{8}{27}$$

$$\frac{R_1}{R_2} = \frac{2}{3}$$

Hence, ratio of surface areas = $\frac{4\pi R_1^2}{4\pi R_2^2} = \frac{R_1^2}{R_2^2} = \frac{4}{9}$
$= 4 : 9$

273. What is the ratio of volumes of two spheres where the curved surface areas are in the ratio of 1 : 4?
(a) 8 :13 (b) 1:4
(c) 1:8 (d) 8:1

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (c) : Curved surface area of sphere = $4\pi r^2$
Let, radius of small sphere = r_1
Radius of large sphere = r_2
According to the question,
Then,

$$\frac{\text{Curved surface area of small sphere}}{\text{Curved surface area of large sphere}} = \frac{1}{4}$$

$$\frac{4\pi r_1^2}{4\pi r_2^2} = \frac{1}{4}$$

$$\frac{r_1}{r_2} = \frac{1}{2}$$

$$\frac{\text{Volume of small sphere}}{\text{Volume of large sphere}} = \frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3} = \frac{1}{(2)^3} = \frac{1}{8}$$

Hence, Required ratio = 1 : 8

274. If the volume of sphere is given as 4851 cm^3, then find its diameter?

$$\left[\text{Use } \pi = \frac{22}{7}\right]$$

(a) 42 cm (b) 21 cm
(c) 28 cm (d) 10.5 cm

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : $\because$ Volume of sphere = $\frac{4}{3}\pi r^3$

$$\frac{4}{3} \times \frac{22}{7} \times r^3 = 4851$$

$$r^3 = \frac{441 \times 21}{4 \times 2}$$

$$r^3 = \frac{21 \times 21 \times 21}{2 \times 2 \times 2}$$

$$r = \frac{21}{2}$$

Diameter $(2r) = \frac{21}{2} \times 2 = 21$ cm

275. A solid sphere of surface area S, is cut into four equal pieces by two radial planes. The total surface area of all the pieces?
(a) Becomes S (b) Becomes 4S
(c) Becomes 2S (d) Becomes 3S

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : On cutting the solid sphere vertically and horizontally, the surface area equal to four circles will increase and the radius of those circles will also be equal to the radius of solid sphere.
Hence, the surface area of the solid sphere = $4\pi r^2$

$$S = 4\pi r^2$$

The total surface area of the four pieces after making the vertical and horizontal cuts = $4\pi r^2 + 4\pi r^2$

$= 8\pi r^2 = 2 \times 4\pi r^2 = 2\ S$

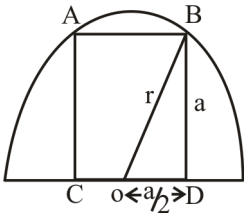
276. What is the area of the largest square that is inscribed in a semicircle of radius 10 cm?

(a) 10 cm^2 (b) 70 cm^2

(c) 80 cm^2 (d) 90 cm^2

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let- each side of the square be 'a' cm.



In ΔODB

$$r^2 = a^2 + \frac{a^2}{4}$$

$$r^2 = \frac{5a^2}{4}$$

$$a^2 = \frac{4r^2}{5} = \frac{4\times(10)^2}{5} = 80\,cm^2$$

Hence, the area of the largest square (a) = 80 cm^2

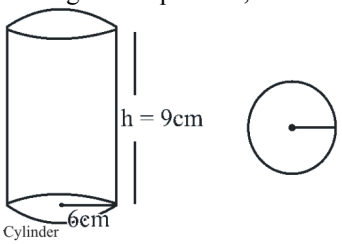
277. What will the radius of a sphere which is formed, by melting a cylinder whose radius is 6 cm and height is 9 cm?

(a) $3\sqrt[3]{9}$ (b) $4\sqrt[3]{3}$

(c) $3\sqrt[3]{3}$ (d) 27

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans. (a) According to the question,



Volume of solid cylinder = Volume of sphere

$$\pi r^2 h = \frac{4}{3}\pi R^3$$

$$(6)^2 \times 9 = \frac{4}{3}R^3$$

$$\frac{36\times9\times3}{4} = R^3$$

$$R = \sqrt[3]{9\times9\times3}$$

$$R = \sqrt[3]{3\times3\times3\times3\times3}$$

Radius of sphere $(R) = 3\sqrt[3]{9}$

278. Two perpendicular cones of height 16.4 cm and 17.2 cm respectively whose base radius is 8.4 cm. Both these cones are melted and formed into a sphere. Find the diameter of the sphere.

(a) 8.6 cm (b) 8.2 cm

(c) 8.4 cm (d) 16.8 cm

RRB JE - 22/05/2019 (Shift-III)

Ans : (d) Given radius of both cones $r_1 = r_2 = 8.4$ cm

Height of first cone $(h_1) = 16.4$ cm

Height of second cone $(h_2) = 17.2$ cm

Suppose radius of sphere = R

Volume of both cones = Volume of sphere

$$\frac{1}{3}\pi r_1^2 h_1 + \frac{1}{3}\pi r_2^2 h_2 = \frac{4}{3}\pi R^3$$

$$\frac{1}{3}\pi\left[r_1^2 h_1 + r_2^2 h_2\right] = \frac{4}{3}\pi R^3$$

$$\left[(8.4)^2 \times 16.4 + (8.4)^2 \times 17.2\right] = 4R^3$$

$$(8.4)^2\left[16.4 + 17.2\right] = 4R^3$$

$$\frac{8.4\times8.4\times33.6}{4} = R^3$$

$R^3 = 8.4 \times 8.4 \times 8.4$

$R = 8.4$

Diameter of sphere (d) = 2R

$= 2 \times 8.4$

$= 16.8$ cm

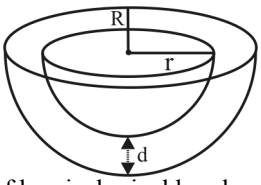
279. Find the surface area of a hemispherical bowl of thickness 'd' and internal radius 'r'.

(a) $\pi(4r^2 + 6rd + 3d^2)$ (b) $4\pi r^2 + 4\pi rd + 3d^2$

(c) $\pi(4r^2 + 3rd + d^2)$ (d) $4\pi r^2 + 6\pi rd + 3d^2$

RRB JE - 25/05/2019 (Shift-II)

Ans : (a)



Internal radius of hemispherical bowl = r

Thickness (d) = R – r

External radius of hemispherical bowl = R = d + r

Surface area of hemispherical bowl

$= 2\pi R^2 + 2\pi r^2 + \pi(R^2 - r^2)$

$= 2\pi\{(d+r)^2\} + 2\pi r^2 + \pi\{(d+r)^2 - r^2\}$

$= 2\pi\{d^2 + r^2 + 2dr\} + 2\pi r^2 + \pi\{d^2 + r^2 + 2rd - r^2\}$

$= 2\pi d^2 + 2\pi r^2 + 4\pi rd + 2\pi r^2 + \pi d^2 + 2\pi rd$

$= 3\pi d^2 + 4\pi r^2 + 6\pi rd$

$= \pi(4r^2 + 6rd + 3d^2)$

280. A hemisphere with maximum volume is cut out from a cube of side 6 cm. Find the remaining volume.

(a) $36 - (3\pi/3)$ (b) $[27 - (2\pi/3) \times 6]$

(c) $216 - 12\pi$ (d) $216 - 18\pi$

RRB JE - 29/05/2019 (Shift-III)

Ans : (d) Volume of cube = $(6)^3 = 216\ cm^3$

Volume of hemisphere $= \frac{2}{3}\pi r^3 = \frac{2}{3}\pi(3)^3 = \frac{2}{3}\times27\times\pi$

Required difference $= 216 - \frac{2}{3}\times27\times\pi$

$= 216 - 18\pi$

281. Find the volume of the sphere whose surface area is 1386 m^2.

(a) 3850 m^3 (b) 4851 m^3

(c) 4651 m^3 (d) 5711 m^3

RRB JE - 01/06/2019 (Shift-I)

Ans : (b) Given,

Surface area of sphere = 1386 m^2

$4\pi r^2 = 1386$

$4 \times \frac{22}{7} \times r^2 = 1386$

$4 \times r^2 = 63 \times 7$

$4 \times r^2 = 7 \times 3 \times 3 \times 7$

$r = \sqrt{\frac{7 \times 7 \times 3 \times 3}{4}}$

$r = \frac{7 \times 3}{2}$

$r = \frac{21}{2}$ m

Volume of sphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$

$= 21 \times 21 \times 11$

$= 4851\ m^3$

282. A solid cylinder made of glass is 1 m high and the diameter of its base is 1.5 m wide. It is melted and turned into a solid sphere. The diameter of the sphere is.

(a) 1.5 m (b) 1 m

(c) 0.5 m (d) 2.5 m

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (a) Volume of cylinder $= \pi r^2 h$

$= \pi\left(\frac{1.5}{2}\right)^2 \times 1 = \frac{2.25\pi}{4}$ cubic meter

Volume of cylinder = Volume of sphere

$\frac{2.25\pi}{4} = \frac{4}{3}\pi R^3$

$R^3 = \frac{2.25 \times 3}{16}$

$= \frac{3 \times 3 \times 3 \times 0.5 \times 0.5}{2 \times 2 \times 2 \times 2} = \frac{3^3}{2^3 \times 2^3}$

$R = \frac{3}{4}$ m

So diameter of sphere = 2R

$= 2 \times \frac{3}{4} = \frac{3}{2}$ m $= 1.5$ m

283. How many balls of 1 cm radius can be made from a steel sphere with a radius of 6 cm.

(a) 64 (b) 216

(c) 27 (d) 126

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (b) Volume of steel sphere of 6 cm radius

$= \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times (6)^3$

$= \frac{4}{3} \times \pi \times 216$

Volume of steel sphere of 1 cm radius $= \frac{4}{3} \times \pi r^3$

$= \frac{4}{3}\pi \times (1)^3$

$= \frac{4}{3}\pi \times 1$

Required number of balls $= \frac{\text{Volume of large sphere}}{\text{Volume of small sphere}}$

$= \frac{\frac{4}{3}\pi \times 216}{\frac{4}{3}\pi \times 1} = 216$

= 216 (balls can be made)

284. What would be the surface area of a solid sphere its radius is 1.5 cm.? ($\pi = \frac{22}{7}$)

(a) 190/21 (b) 190/7

(c) 198/7 (d) 198/21

RRB NTPC 19.01.2017 Shift : 1

Ans : (c) Surface area of solid sphere $= 4\pi r^2$

r = 1.5cm., $\pi = \frac{22}{7}$

$= 4 \times \frac{22}{7} \times (1.5)^2 = \frac{198}{7}$ square cm.

285. Find the area of a solid sphere whose radius is 2 cm. (Given $\pi = \frac{22}{7}$)

(a) 352/7 (b) 350/21

(c) 352/21 (d) 350/7

RRB NTPC 19.01.2017 Shift : 3

Ans : (a) Area of sphere $= 4\pi r^2 = 4 \times \frac{22}{7} \times (2)^2$

$= \frac{16 \times 22}{7} = \boxed{\frac{352}{7} cm^2}$

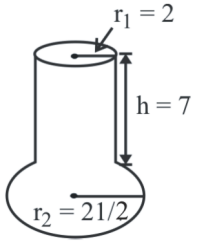
286. A spherical glass vessel has a cylindrical upper part 7 cm long and 4 cm in diameter. The diameter of the spherical part is 21cm. Find the quantity of water it can hold in cm^3.

(a) 4932 cm^3 (b) 4939 cm^3

(c) 4930 cm^3 (d) 4929 cm^3

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (b)



Required quantity of water

= Volume of cylinder + Volume of sphere

$= \pi r_1^2 h + \frac{4}{3}\pi r_2^3 = \pi\left[r_1^2 h + \frac{4}{3} r_2^3\right]$

$$= \frac{22}{7}\left[2^2 \times 7 + \frac{4}{3} \times \left(\frac{21}{2}\right)^3\right]$$

= 4939 cubic cm.

287. The area of the base of a cone is 64π cm^2 while its slant height is 17 cm. This cone is remoulded to obtain a solid sphere. The radius of this sphere will be

(a) $2\sqrt[3]{30}$ cm (b) $2\sqrt[3]{40}$ cm

(c) $8\sqrt[3]{30}$ cm (d) 6.5 cm

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (a) Given—

Base area of cone $=64\pi$ square cm.

$\Rightarrow$ $\pi r^2 = 64\pi$

$\Rightarrow$ $r = 8$ cm

$\because$ Slant height of cone $(l) = 17$ cm

$\therefore$ Height of cone $(h) = \sqrt{\ell^2 - r^2}$

$= \sqrt{(17)^2 - (8)^2}$

$= \sqrt{289 - 64} = \sqrt{225}$

= 15 cm.

According to the question

Volume of cone = Volume of sphere

$\Rightarrow$ $\frac{1}{3}\pi r^2 h = \frac{4}{3}\pi R^3$

$\Rightarrow$ $64 \times 15 = 4R^3$

$\Rightarrow$ $240 = R^3$

$\Rightarrow$ $R = \sqrt[3]{240}$

$= \sqrt[3]{8 \times 30} = 2\sqrt[3]{30}$ cm.

Type - 11

288. The base of a right pyramid is a square with a 16 unit diagonal. Its one slant edge is 17 units. Find its vertical height.

(a) 30 (b) 12

(c) 25 (d) 15

RRB JE - 24/05/2019 (Shift-III)

Ans : (d)

$h = \sqrt{(17)^2 - (8)^2}$

$h = \sqrt{289 - 64}$

$h = \sqrt{225}$

h = 15 unit

289. The base of a triangular prism is a triangle with 8, 15, 17 unit sides and its height is 20 units. Find its total surface area.

(a) 920 (b) 1020

(c) 960 (d) 940

RRB JE - 02/06/2019 (Shift-I)

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (a) Given,

Sides of triangular prism is 8, 15, 17 (units)

height (h) = 20 unit

Total surface area = Perimeter of base × Height + 2 × Area of base

$= (8 + 15 + 17) \times 20 + 2 \times \frac{1}{2} \times 8 \times 15$

$= 40 \times 20 + 120 = 920$ square units

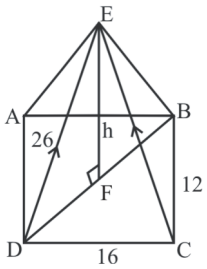
290. The base of the pyramid is a rectangle whose length and width are 16 cm and 12 cm respectively. If all the lateral edges passing through the top of the right rectangular pyramid are 26 cm in length, find the volume of the pyramid in cubic centimeters.

(a) 1536 (b) 1024

(c) 718 (d) 2072

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (a)



Diagonal of rectangle

$= \sqrt{(16)^2 + (12)^2} \Rightarrow \sqrt{400} = 20$ cm

We draw the perpendicular from the vertex E at the base of the pyramid which is at point F, the height of the pyramid is h and the hypotenuse is 26 cm.

Height $(h) = \sqrt{(26)^2 - (10)^2} = \sqrt{576} = 24$ cm

Volume of pyramid $= \frac{1}{3} \times$ Area of base $\times$ height

$= \frac{1}{3} \times 16 \times 12 \times 24$

= 1536 cm^3

291. Ratio of the sides of the base of a symmetrical triangular prism is 8 : 15 : 17. If the height of the prism is 21 cm and the sum of the area of the lateral surfaces is 840 cm^2, Find the volume of the prism in cubic centimeters.

(a) 1200 (b) 1260

(c) 1280 (d) 1240

RRB Group-D – 12/10/2018 (Shift-II)

RRB Group-D – 01/10/2018 (Shift-II)

Ans : (b) Suppose bases of prism are 8x, 15x and 17x.

Total area of lateral surfaces = 840 cm^2

Lateral surface area = Perimeter of base (right triangular prism) × h

$840 = (8x + 15x + 17x) \times 21$

$840 = 40x \times 21$

$x = \frac{840}{40 \times 21} = 1$

So sides of triangular prism are 8cm, 15 cm, 17 cm

Triangle (base of prism) is right angled triangle

$\therefore (17)^2 = (8)^2 + (15)^2$

$289 = 289$

Volume of prism = Area of base × Height

$= \frac{1}{2} \times 8 \times 15 \times 21 = 60 \times 21 = 1260 \text{ cm}^3$

Type - 12

85. A lawn in the shape of a rectangle has an area of 7260 m^2 and its sides are in the ratio 5 : 3, Its perimeter is equal to the perimeter of a circular garden. What is the area of the circular garden? $\left(\text{Take } \pi = \frac{22}{7}\right)$

(a) 7260 m^2 (b) 9878 m^2

(c) 9856 m^2 (d) 8712 m^2

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,

Let, the sides of rectangular lawn,

$= 5x, 3x$

Area of rectangular lawn = 7260

$\Rightarrow 5x \times 3x = 7260$

$\Rightarrow x^2 = 484$

$\Rightarrow x = 22$ m.

Perimeter of rectangular lawn = Circumference of circular garden

$\Rightarrow 2(5x + 3x) = 2\pi r$

$\Rightarrow 2 \times 8 \times 22 = 2 \times \frac{22}{7} \times r$

$\Rightarrow r = 56$ m.

$\therefore$ Area of circular garden $= \pi r^2$

$= \frac{22}{7} \times 56 \times 56$

$= 9856 \text{ m}^2$

67. The length of each side of a regular hexagon is $2\sqrt{3}$ cm. What is the area of the given hexagon?

(a) 54 cm^2 (b) $18\sqrt{3}$ cm^2

(c) 18 cm^2 (d) $24\sqrt{3}$ cm^2

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : Given,

The length of each side of a regular hexagon = $2\sqrt{3}$cm.

According to the question,

Area of hexagon = $\frac{3\sqrt{3}a^2}{2}$

$= \frac{3\sqrt{3} \times \left(2\sqrt{3}\right)^2}{2} = \frac{3\sqrt{3} \times 12}{2}$

$= \boxed{18\sqrt{3} \text{ cm}^2}$

42. ABCDEF is a regular hexagon and m ($\overline{BE}$) = 14 cm. What is the perimeter of the hexagon?

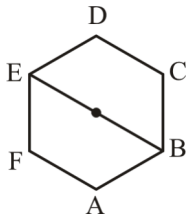
(a) 42 cm (b) 30 cm

(c) 48 cm (d) 36 cm

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) : Given, hexagon– A B C D E F

m ($\overline{BE}$) = 14 cm



then side $= \frac{14}{2}$

$= 7$ cm

Hence, Perimeter of hexagon = 6 × side

$= 6 \times 7$

$= 42$ cm

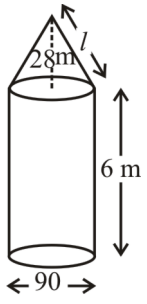
23. A tent is cylindrical upto a height of 6 m and conical above it. The diameter of the base is 90 m and the height of the conical part is 28 m. What is the area (in m^2) of canvas used in making it?

(a) 2925π (b) 2905π

(c) 2895π (d) 2940π

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (a) :



Diameter (D) = 90 m

Radius (r) = $\frac{90}{2} = 45$ m

Slant height of cone $(l)^2 = h^2 + r^2$

$= (45)^2 + (28)^2$

$= \sqrt{2025 + 784}$

$= \sqrt{2809}$

$= 53$

Area of canvas used = curved surface area of cylinder + curved surface area of cone

$2\pi rh + \pi rl$

$= \pi r(2h + l)$

$= \pi \times 45\ (12 + 53)$
$= \pi \times 45 \times 65$
$= 2925\ \pi\ m^2$

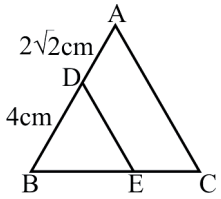
78. In Δ ABC, DE || AC, where D and E are the points on side AB and BC, respectively. If BD = 4 cm and AD = $2\sqrt{2}$ cm, then what is the ratio of the area of Δ BDE to the trapezuim ADEC?

(a) $2:\left(1+\sqrt{2}\right)$ (b) $2:\left(1+3\sqrt{2}\right)$

(c) $2:\left(1+2\sqrt{2}\right)$ (d) $1:\left(1+2\sqrt{2}\right)$

RRB Group-D 01/09/2022 (Shift-III)

Ans. (c) :



$$\frac{\text{area of } \Delta BDE}{\text{area of } \square ADEC} = \frac{BD^2}{(AB)^2 - (BD)^2}$$

$$= \frac{(4)^2}{(4+2\sqrt{2})^2 - (4)^2}$$

$$= \frac{16}{24+16\sqrt{2}-16}$$

$$= \frac{16}{8+16\sqrt{2}}$$

$$= 2:\left(1+2\sqrt{2}\right)$$

29. A length of sides of a rectangular field are 77m and 50m. This area is equal area of a circular field. Find the perimeter of circular field (In m) ($\pi = \frac{22}{7}$)

(a) 110 (b) 220

(c) 165 (d) 330

RRB Group-D 06/09/2022 (Shift-I)

Ans. (b) : According to the question,

Area of rectangular field = Area of circular field

$$77 \times 50 = \pi r^2$$

$$r^2 = \frac{77 \times 50 \times 7}{22}$$

r = 35 मी.

perimeter, of circular field = $2\pi r$

$$= 2 \times \frac{22}{7} \times 35$$

$$= 220 \text{ m}$$

91. If the perimeter of a square is 44 cm, then find the perimeter of a circle whose radius is equal to the length of a side of the given square.

(a) 22π (b) 11π

(c) 12π (d) 21π

RRB Group-D 27-09-2022 (Shift-II)

Ans. (a) : Given that

Perimeter of a square = 44cm

Side of a square $= \frac{44}{4} = 11\text{cm}$

According to the question,

Radius of the Circle = length of a side of square

r = 11cm

Hence the Perimeter of a circle $= 2\pi r$

$= 2\pi 11$

$= 22\pi$

84. The surface area of a 12 cm × 6 cm × 4 cm brick is:

(a) $27\sqrt{R}\ cm^2$ (b) $26\sqrt{3}\ cm^2$

(c) $24\sqrt{3}\ cm^2$ (d) $25\sqrt{3}\ cm^2$

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (c) : Area of hexag on $= 6 \times \frac{\sqrt{3}}{4} a^2$

Given, a = 4 cm

$$= 6 \times \frac{\sqrt{3}}{4} \times 4 \times 4$$

$$= 24\sqrt{3}\ cm^2$$

292. Two regular polygons have the same number of sides. Their lengths are in the ratio 7 : 5 and the area of the larger polygon is 1127 cm^2. Find the area of the smaller polygon.

(a) 565 cm^2 (b) 585 cm^2

(c) 575 cm^2 (d) 550 cm^2

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (c) :

$$\therefore \frac{\text{Area of larger polygon } (A_1)}{\text{Area of smaller polygon } (A_2)} = \frac{(a_1)^2}{(a_2)^2}$$

$$\frac{1127}{A_2} = \frac{(7)^2}{(5)^2}$$

$$A_2 = \frac{1127 \times 5 \times 5}{49}$$

$A_2 = 23 \times 5 \times 5$

$A_2 = 575\ cm^2$

Hence, Area of smaller polygon = 575 cm^2

293. If the base of a cylinder is the same as that of a cone, and the height of the cylinder is also the same as that of the cone, then find the ratio of the volumes of the cylinder and the cone.

(a) 1 : 3 (b) 2 : 3

(c) 3 : 2 (d) 3 : 1

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

Let, the base of the cylinder and the cone = d

Then, radius = d/2 = r (Let)
And, height = h (Let)
So,

$$\frac{\text{Volume of cylinder}}{\text{Volume of cone}} = \frac{\pi r^2 h}{\frac{1}{3}\pi r^2 h}$$

Hence, required ratio = 3:1

294. A cuboid of 6 cm long, 4 cm width and 4 cm height melted. How many cubes of each 2 cm side can be made?

(a) 14 (b) 16
(c) 12 (d) 18

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (c) : Volume of Cuboid = $l \times b \times h$
$= 6 \times 4 \times 4 = 96$
Volume of a cube = $a^3 = 2^3 = 8$

$$\text{Then, the number of cubes} = \frac{\text{Volume of cuboid}}{\text{Volume of a cube}}$$

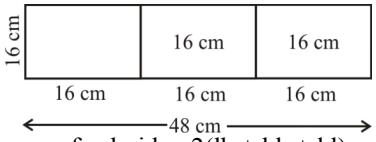
$$= \frac{96}{8} = 12 \text{ cubes}$$

295. 3 cubes each with side 16 cm are joined side by side in a line. Find the surface area of the cuboid so formed.

(a) 3584 cm^2 (b) 3588 cm^2
(c) 3600 cm^2 (d) 3564 cm^2

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a)



∴ Surface area of cuboid = 2(lb + bh + hl)
= 2(48 × 16 + 16 × 16 + 16 × 48)
=2 (48 × 16 + 48 × 16 + 256)
=2(1536 + 256)
=2 × 1792
=3584 cm^2

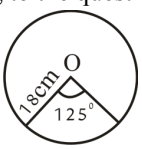
296. A sector of a circle has a radius of 18 cm and a central angle of 125º. What will be its approximate perimeter?

$\left(\textbf{Use } \pi = \frac{22}{7}\right)$

(a) 75.3 cm (b) 73.85 cm
(c) 74 cm (d) 73 cm

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,



Given that,
r = 18cm

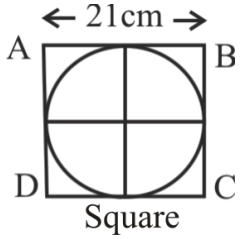
$$\text{Perimeter of sector of a circle} = \frac{\theta}{360^\circ} \times 2\pi r + 2r$$
$$= \frac{125^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 18 + 2 \times 18$$
$$= \frac{275}{7} + 36$$
$$= \frac{527}{7} = 75.28$$
$$\approx 75.3\text{cm}$$

297. The area of the greatest circle that can be inscribed inside a square of side 21 cm is:

(a) 351.5 cm^2 (b) 350.5 cm^2
(c) 346.5 cm^2 (d) 347 cm^2

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,



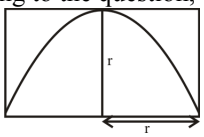
$$\because \text{ Radius} = \frac{\text{Diameter}}{2} = \frac{\text{Side of square}}{2}$$
$$= \frac{21}{2} = 10.5 \text{ cm}$$
$$\therefore \text{ Area of circle} = \pi r^2$$
$$= \frac{22}{7} \times 10.5 \times 10.5$$
$$= 346.5 \text{ cm}^2$$

298. The area of semicircle is 1250π cm^2 inscribed inside a rectangle. The diameter of the semicircle coincides with the length of the rectangle. The area of the rectangle is:

(a) 4000 cm^2 (b) 3000 cm^2
(c) 2000 cm^2 (d) 5000 cm^2

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question,



Length of rectangle = 2r
Width of rectangle = r
Area of rectangle = Length × Width
$= 2r \times r$
$= 2r^2$

Again, According to the question, $\frac{\pi r^2}{2} = 1250\pi$
$r^2 = 2500$
$r = 50$
Area of rectangle = $2r^2 = 2 \times (50)^2 = 5000 \text{ cm}^2$

299. A few lead spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water such that they are fully submerged. If the diameter of the beaker is 9 cm and the water level has risen by 32 cm, find the number of lead spheres dropped into the beaker.

(a) 16 (b) 14
(c) 18 (d) 15

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let number of lead spheres is n.

Radius of beaker $= \frac{\text{Diameter}}{2} = \frac{9}{2}$ cm

Radius of each sphere $= \frac{6}{2} = 3$ cm

According to the question

(Volume of Sphere × n = The volume of risen water in cylindrical breaker).

$\frac{4}{3}\pi r_1^3 \times n = \pi r_2^2 h$

$\frac{4}{3}\pi(3)^3 \times n = \pi(9/2)^2 \times 32$

$n = \frac{81}{4} \times 32 \times \frac{3}{4} \times \frac{1}{27}$

$n = 9 \times 2$

$\boxed{n = 18}$

300. Find the length of the longest pole that can be placed in a room of dimensions 30m × 15m × 10m.

(a) 31 m (b) 35 m
(c) 33 m (d) 18 m

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : Given–

Length of the room (l) = 30 m

Breadth (b) = 15 m

Height (h) = 10 m

Diagonal of room is the length of longest pole

$\Rightarrow$ Diagonal $= \sqrt{l^2 + b^2 + h^2}$

$= \sqrt{30^2 + 15^2 + 10^2}$

$= \sqrt{900 + 225 + 100}$

$= \sqrt{1225}$

= 35 m

301. The radius of a sphere 'r', is equal to the radius of the base of a right circular cylinder. The total volume of these two solids = $\frac{7}{3}\pi r^3$. If 'h' is the height of the cylinder. Find $\frac{h}{r}$.

(a) 1 (b) 1.5
(c) 3 (d) 2

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (a) : Volume of sphere $= \frac{4}{3}\pi r^3$

Volume of cylinder $= \pi r^2 h$

Total volume of both solid $= \frac{7}{3}\pi r^3$

or $\frac{4}{3}\pi r^3 + \pi r^2 h = \frac{7}{3}\pi r^3$

$\frac{7}{3}\pi r^3 - \frac{4}{3}\pi r^3 = \pi r^2 h$

$\frac{3}{3}\pi r^3 = \pi r^2 h$

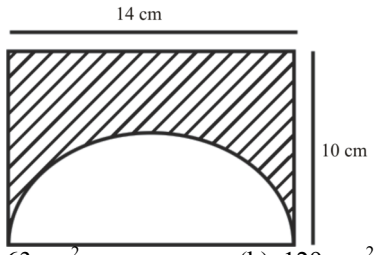
$\pi r^3 = \pi r^2 h$

$r = h$

$\frac{h}{r} = 1$

or h : r = 1 : 1

302. A semi circle is drawn on the side of the length of a rectangle. Find the area of the shaded part in the figure



(a) 63 cm^2 (b) 129 cm^2
(c) 77 cm^2 (d) 14 cm^2

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (a) : Area of rectangle = Length × Breadth

$= 14 \times 10$

$= 140$ cm^2

Area of semicircle $= \frac{\pi r^2}{2}$

$= \frac{22}{7} \times \frac{1}{2} \times 7^2$

$= 77$ cm^2

Area of shaded portion = Area of rectangle – Area of semi-circle

$= 140 - 77$

$= 63$ cm^2

303. The circumradius of a triangle is 9 cm while the inradius of it is 4 cm. What is the distance between the circumcentre and the incentre of the triangle?

(a) 3 cm (b) 2 cm
(c) 4 cm (d) 5 cm

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (a) Circumradius of triangle (R) = 9 cm

Inradius of triangle (r) = 4 cm

Distance between circumradius and inradius of triangle

$= \sqrt{R^2 - 2rR}$

$= \sqrt{(9)^2 - 2\times4\times9} = \sqrt{81-72} = \sqrt{9}$

D = 3 cm

304. The circumference of a circle is equal to the perimeter of an equilateral triangle. If the radius of the circle is 21 cm, what is the length of the side of the equilateral triangle?

(a) 44 cm (b) 22 cm

(c) 33 cm (d) 55 cm

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : Perimeter of equilateral triangle = Circumference of a circle of radius 21 cm

So, perimeter of equilateral $\Delta = 2\times\frac{22}{7}\times21$

One side of equilateral $\Delta\times3 = 6\times22$

$\text{Side} = \frac{6\times22}{3} = 44\,\text{cm}$

Hence, the side of the given equilateral triangle is = 44 cm

305. Find the volume of the largest sphere that can be out of a cube of side 21 cm.

(a) 4851 cm^3 (b) 5841 cm^3

(c) 8551 cm^3 (d) 4158 cm^3

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

Radius of sphere $= \frac{\text{Side of cube}}{2}$

$r = \frac{21}{2}$ cm

$\because$ Volume of sphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3}\times\frac{22}{7}\times\frac{21}{2}\times\frac{21}{2}\times\frac{21}{2}$

$= 11\times21\times21$

$= 11\times441$

$= 4851\ cm^3$

306. The dimensions of a metallic cuboid are 50 cm × 40 cm × 32 cm. This cuboid is melted and recast into a cube. Find the surface area of the cube.

(a) 8,350 cm^2 (b) 7,150 cm^2

(c) 8,700 cm^2 (d) 9,600 cm^2

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (d) : Volume of cuboid $= 50\times40\times32$

$= 64000\ cm^3$

According to the question,

Volume of cube = Volume of cuboid

$(\text{side})^3 = a^3 = 64000\ cm^3$

$a = 40$ cm

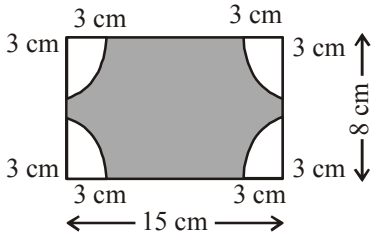
$\because$ Surface area of cube $= 6a^2$

$= 6\times(40)^2$

$= 6\times1600$

$= 9600\ cm^2$

307. Find the area of shaded region



(a) $\frac{588}{7}cm^2$ (b) $\frac{642}{7}cm^2$

(c) $\frac{78}{7}cm^2$ (d) $\frac{12}{7}cm^2$

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (b) :

Area of shaded portion = Area of rectangle $-\ \frac{1}{4}\times4$ Area of sectors

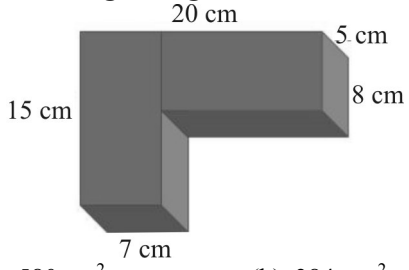
$= 15\times8 - \pi r^2$

$= 120 - \frac{22}{7}\times3\times3$ ($\because$ r = 3 cm)

$= \frac{840-198}{7}$

$= \frac{642}{7}\ cm^2$

308. What is the total surface area of the visible faces in the given figure?

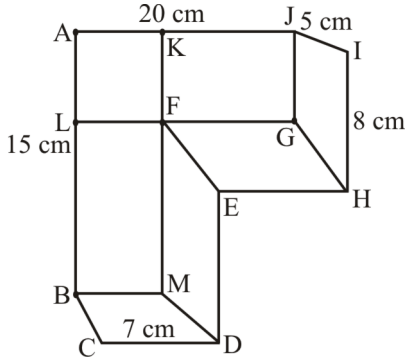


(a) 580 cm^2 (b) 384 cm^2

(c) 905 cm^2 (d) 1325 cm^2

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (b)



Area of ALGJ = 20 × 8 = 160

Area of LBMF = 7 × 7 = 49

Area of BCDM = 7 × 5 = 35

Area of MDEF = 7 × 5 = 35

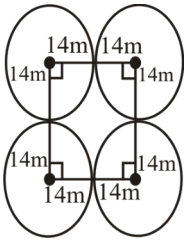
Area of GHIJ = $8 \times 5 = 40$
Area of EFGH = $13 \times 5 = 65$
$\underline{384}$
Total area = 384 cm^2

309. Four cows are tethered to the four corners of a square field of length 28 m so that each cow can just touch the two cows in the adjacent corners. If the grass in the area inside the squre field that was accessible to the cows was enough to feed them for 22 days, for how many days would the grass that is beyond the reach of these cows be able to feed them if someone cuts it and leaves it inside the grazable parts? [Use π=22/7]

(a) 7 (b) 6
(c) 5 (d) 4

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : Accoding to the question –



Area of remaining part = Area of square field – Area of 4 sectors

$$= (28)^2 - 4 \times \pi \times (14)^2 \times \frac{90^\circ}{360^\circ}$$

$$= 784 - 4 \times \frac{22}{7} \times 14 \times 14 \times \frac{1}{4}$$

$$= 784 - 616$$

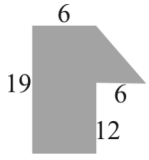
$$= 168 m^2$$

Area of the part that is accessible to the cow is $616 m^2$ which is enough to feed for 22 days.

22 = 616
1 = 28
1×6 = 28×6
6 = 168

Hence, it is enough to feed for 6 days.

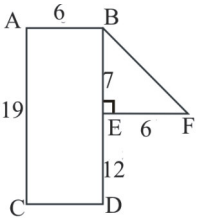
310. What is the area of the compound shape?



(a) 114 units (b) 21 units
(c) 135 square units (d) 114 square units

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) :



From above diagram,
Area of the given figure = Area of rectangle ABCD + Area of triangle BEF

$$= 19 \times 6 + \frac{1}{2} \times 6 \times 7 = 114 + 21 = 135 \text{ square units}$$

311. 30 ml paint is required to paint a circular plate of 20 cm radius. How much paint is required to paint a similar plate of radius 80 cm?

(a) 450 ml (b) 300 ml
(c) 480 ml (d) 360 ml

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

Area of circular plate $= \pi r^2$

$$= \pi \times 20^2$$

$$= 400\pi$$

The area of circular plate will be painted with full colours.

So, the paint applied to the area of 400 cm^2 = 30ml

$\because$ Paint required in 1 cm^2 area $= \frac{30ml}{400\pi}$

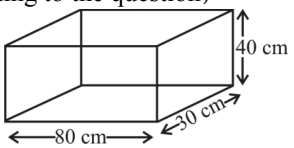
$\therefore$ Required paint $= 80 \times 80 \times \pi \times \frac{30ml}{400\pi} = 480ml$

312. An aquarium is in the form of a cuboid whose external measure are 80 cm×30 cm×40 cm. The base, side faces and back face are to be covered with a paper. Find the area of the paper needed?

(a) 6000 cm^2 (b) 8080 cm^2
(c) 8000 cm^2 (d) 8050 cm^2

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,



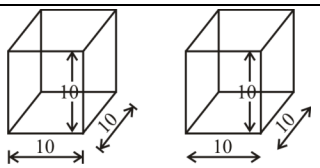
Required area of paper = Area of base + Area of 2 faces + Area of back face
= (80×30) + 2(30×40) + (80×40)
= 2400 + 2400 + 3200 = 8000 cm^2

313. If two cubes, each with a side of 10 cm, are joined end to end, then find the surface area of the resulting cuboid.

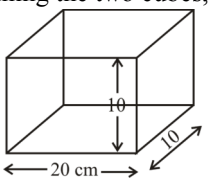
(a) 300 cm^2 (b) 500 cm^2
(c) 1000 cm^2 (d) 100 cm^2

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) :



After joining the two cubes,



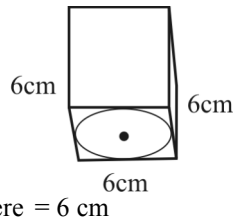
Surface area of cuboid = 2(L×W+W×H+H×L)
= 2(20 × 10 + 10 × 10 + 10 × 20)
= 2 (500) = 1000 cm^2

314. The largest sphere is cut off from a solid cube of side 6 cm. The volume of the sphere will be:

(a) $108\pi\ cm^3$ (b) $27\ \pi\ cm^3$
(c) $36\ \pi\ cm^3$ (d) $12\ \pi\ cm^3$

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (c) :



Diameter of sphere = 6 cm
2 R = 6 cm
Radius (R) = 3 cm

$$\text{Volume of sphere} = \frac{4}{3}\pi R^3$$

$$= \frac{4}{3}\times\pi\times3\times3\times3$$

$$= 36\ \pi\ cm^3$$

315. A rectangle with dimensions of 24 cm and 28 cm was reconstructed to make a rhombus with the same perimeter as that of the rectangle and 120° as one of its angles. The area of the rhombus was:

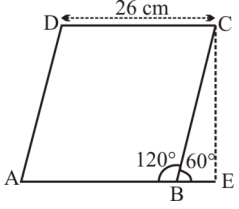
(a) $\frac{169\sqrt{3}}{3}cm^2$ (b) $169\sqrt{3}cm^2$

(c) $338\sqrt{3}cm^2$ (d) $\frac{338\sqrt{3}}{3}cm^2$

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question,

$$\text{Side of Rhombus} = \frac{2(24+28)}{4} = 26\ cm$$



In triangle BCE,

$$\sin 60° = \frac{CE}{BC}$$

$$\frac{\sqrt{3}}{2} = \frac{CE}{26}$$

$$CE = 13\sqrt{3}\ cm$$

Area of Rhombus = b × h = $26\times13\sqrt{3} = 338\sqrt{3}\ cm^2$

316. There is a regular hexagon of side 5 cm. Find its area.

(a) $36\sqrt{3}cm^2$ (b) $\frac{75\sqrt{3}}{2}cm^2$

(c) $25\sqrt{3}cm^2$ (d) $\frac{50\sqrt{3}}{3}cm^2$

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : Area of regular hexagon $(A) = \frac{3\sqrt{3}\times a^2}{2}$

Given: Side (a) = 5cm

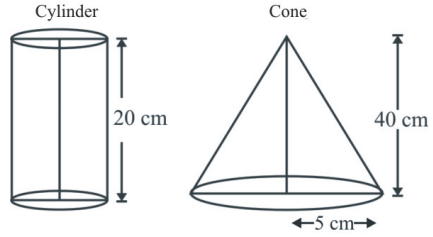
$$\text{Area} = \frac{3\sqrt{3}\times5\times5}{2} = \frac{75\sqrt{3}}{2}cm^2$$

317. Find the percentage of material wasted in converting a cylinder of base diameter 10 cm and height 20 cm into same base but double the height of a cone.

(a) 25% (b) 20%
(c) 35% (d) 33.3%

RRB JE - 23/05/2019 (Shift-I)

Ans : (d)



Volume of cylinder $= \pi r^2 h = \pi\times25\times20$
$= 500\pi\ cm^3$

Volume of formed cone $= \frac{1}{3}\pi R^2 H$

$\left\{\begin{matrix} H = 2h \\ r = R \end{matrix}\right\}$ given

$$= \frac{1}{3}\pi\times25\times40$$

$$= \frac{1000\pi}{3}$$

$$\text{Quantity of waste material} = 500\pi - \frac{1000\pi}{3} = \frac{500\pi}{3}$$

$$\text{Percentage of waste material } (\%) = \frac{\frac{500\pi}{3}}{500\pi}\times100$$

$$= 33.3\%$$

318. The ratio of the radii of the bases of a cylinder and cone is $\sqrt{3}:\sqrt{2}$ and the ratio of their

heights is $\sqrt{2}:\sqrt{6}$, then find the ratio of their volume.

(a) $\sqrt{3}:\sqrt{3}$ (b) $3\sqrt{3}:2$

(c) $\sqrt{3}:\sqrt{2}$ (d) $3\sqrt{3}:\sqrt{2}$

RRB JE - 23/05/2019 (Shift-II)

Ans : (b)

$$\frac{\text{Volume of cylinder}}{\text{Volume of cone}}=\frac{\pi R_1^2 h_1}{\frac{1}{3}\pi R_2^2 h_2}=3\left(\frac{R_1}{R_2}\right)^2\left(\frac{h_1}{h_2}\right)=\frac{V_1}{V_2}$$

$$\frac{V_1}{V_2}=3\left(\frac{\sqrt{3}}{\sqrt{2}}\right)^2\times\left(\frac{\sqrt{2}}{\sqrt{6}}\right)=3\times\frac{3}{2}\times\frac{1}{\sqrt{3}}$$

$$\frac{V_1}{V_2}=\frac{3\sqrt{3}}{2}$$

$$\therefore V_1:V_2=3\sqrt{3}:2$$

319. Find the area of the hexagon of side 6 cm.

(a) $72\sqrt{3}$ cm^2 (b) $64\sqrt{3}$ cm^2

(c) $108\sqrt{3}$ cm^2 (d) $54\sqrt{3}$ cm^2

RRB JE - 24/05/2019 (Shift-III)

Ans : (d) Formula : Area of regular hexagon

$$=6\times\frac{\sqrt{3}}{4}\times(\text{side})^2$$

$$=6\times\frac{\sqrt{3}}{4}\times6\times6$$

$$=54\sqrt{3}\text{ cm}^2$$

320. How much material is wasted when a solid cylinder of 6 cm radius and 6 cm height is made from a cone of 24 cm height and 8 cm radius?

(a) 57.8% (b) 37.5%

(c) 52% (d) 64%

RRB RPF SI – 16/01/2019 (Shift-II)

Ans : (a) Volume of cylinder $=\pi r^2h$

$$=\pi\times6\times6\times6$$

$$=216\pi$$

Volume of cone $=\frac{1}{3}\pi r^2h$

$$=\frac{1}{3}\pi\times8\times8\times24$$

$$=512\pi$$

$$\text{Wasted material \%}=\frac{(512\pi-216\pi)\times100}{512\pi}$$

$$=\frac{296\pi}{512\pi}\times100=\boxed{57.81\%}$$

321. A square sheet of paper is fold into a cylinder by turning its side. Find the ratio of the side of the square and the radius of the base of the cylinder.

(a) $2\pi:1$ (b) $1:4\pi$

(c) $1:\pi$ (d) $1:2\pi$

RRB JE - 29/05/2019 (Shift-III)

Ans : (a) Suppose side of square = x

Radius of cylinder = r

From question−

Circumference of the base of cylinder = Side of square

$$2\pi r=x$$

$$\frac{x}{r}=\frac{2\pi}{1}$$

$$x:r=2\pi:1$$

322. What is the ratio between the volume of a cube and the volume of a sphere that will fit perfectly in the cube?

(a) $3:\pi$ (b) $6:\pi$

(c) $3:4$ (d) $\pi:1$

RRB JE - 30/05/2019 (Shift-III)

Ans : (b) Diameter of sphere = Side of cube

$2r=a$

$$r=\frac{a}{2}$$

$$\frac{\text{Volume of cube}}{\text{Volume of sphere}}=\frac{a^3}{\frac{4}{3}\pi\left(\frac{a}{2}\right)^3}=\frac{a^3}{\frac{4}{3}\pi\frac{a^3}{8}}$$

$$=\frac{1}{\frac{\pi}{6}}=6:\pi$$

323. The height of a cube and a sphere is the same. Find the ratio of their volume.

(a) $6:\pi$ (b) $4:\pi$

(c) $2:\pi$ (d) $3:\pi$

RRB JE - 28/05/2019 (Shift-II)

Ans : (a) Height of sphere = Height of cube

$$2r=a$$

$$r=\frac{a}{2}$$

$$\Rightarrow\ \frac{\text{Volume of cube}}{\text{Volume of sphere}}=\frac{a^3}{\frac{4}{3}\pi r^3}$$

$$=\frac{a^3}{\frac{4}{3}\pi\times\left(\frac{a}{2}\right)^3}=\frac{a^3}{\frac{4}{3}\pi\times\frac{a^3}{8}}$$

$$=a^3\times\frac{6}{\pi a^3}=6:\pi$$

324. The area of a rectangle is 9/20 times the area of a square. If the length and breadth of the rectangle are in the ratio 5 : 4, find the ratio of the perimeter of the rectangle and the square.

(a) 25:48 (b) 27:20

(c) 27:40 (d) 25:45

RRB JE - 31/05/2019 (Shift-III)

Ans. (c) Let the length of rectangle is 5x and breadth is 4x

Area of rectangle = $5x\times4x=20x^2$

According to the question

$$\text{Area of square}\times\frac{9}{20}=\text{Area of rectangle}$$

$$\text{Area of square}\times\frac{9}{20}=20x^2$$

$$\text{Area of square}=\frac{400x^2}{9}$$

Side of square $= \frac{20x}{3}$

$\frac{\text{Perimeter of rectangle}}{\text{Perimeter of square}} = \frac{2\times(5x+4x)}{4\times\frac{20x}{3}}$

$= \frac{18x\times3}{80x} = \frac{27}{40}$

Required ratio $= 27 : 40$

325. How many carpets of 6 m × 4 m will be required to lay on the floor of a room measuring 40 m × 24 m?

(a) 40 (b) 12

(c) 18 (d) 15

RRB JE - 02/06/2019 (Shift-III)

Ans : (a) $\frac{\text{Area of room's floor}}{\text{Area of 1 carpet}} = \text{Number of carpet}$

$\frac{40\times24}{6\times4} = \text{Number of carpets}$

Number of carpets $= 40$

326. The length of a room is 5.5 meters and the breadth is 3.75 meters. Find the cost of laying slab at the rate of ₹800 per m^2 on the floor.

(a) Rs. 15550 (b) Rs. 15600

(c) Rs. 16500 (d) Rs. 15000

RRB Paramedical Exam – 21/07/2018 (Shift-I)

Ans : (c) Given−

Length of room $= 5.5$ m

Breadth of room $= 3.75$ m

Area of room = area of floor $= 5.5\times3.75 = 20.625\ m^2$

Cost of laying slab on the floor $= 20.625 \times 800$

$= ₹16500.00$

327. The capacity to fill water in a drum is 0.6. When 38 liters of water is taken out, then it is 0.125 full. What will be the capacity of the drum in liters?

(a) 40 (b) 120 (c) 80 (d) 160

RRB RPF Constable – 19/01/2019 (Shift-III)

Ans : (c) Let capacity of drum is x litres

then, According to the question,

$0.6x - 38 = 0.125x$

$0.6x - 0.125x = 38$

$0.475x = 38$

$x = \frac{38}{0.475} = \frac{38\times1000}{475}$ $x = 80$ litres

328. If only diagonal measurements are given, which of the following quadrilateral can be constructed.

1. Square 2. Rectangle 3. Rhombus

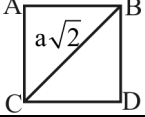
(a) 1 and 3 (b) 1 and 2

(c) only 1 (d) only 3

RRB JE - 01/06/2019 (Shift-I)

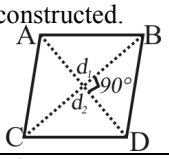
Ans : (a) Square and rhombus are geometric figures which have the same four sides.

We know, diagonal of square $= a\sqrt{2}$



With this, the side of the square can be known and the square can be constructed.

The diagonals of the rhombus intersect each other at 90°. Hence side of the rhombus will be known, so the rhombus can be constructed.



329. The ratio of length, breadth and height of room is 5 : 3 : 2. If the length is 2 times, the breadth is one third and the height is halved, then the percentage of expenditure incurred in painting the four walls of the room will be reduced by what percentage?

(a) 32 (b) 28.75

(c) 31.25 (d) 30.75

RRB RPF SI – 13/01/2019 (Shift-III)

Ans. (c) Let length $= 5x$

Breadth $= 3x$

Height $= 2x$

Area of room $= 2\ (l + b) \times h$

$= 2(5x + 3x) \times 2x$

$= 32x^2$

The length is doubled, breadth is one third and height is halved, then the new area obtained

$= 2(10x + x) \times x = 22x^2$

Percentage reduction in expenditure

$= \frac{\left(32x^2 - 22x^2\right)}{32x^2}\times100$

$= \frac{10x^2\times100}{32x^2} = \frac{500}{16} = 31.25\%$

330. The volume of right circular cone whose base radius is equal to 5/9 of its height and equal to the volume of the sphere then what is the ratio of the radius of the cone and the sphere?

(a) $\sqrt[3]{4} : \sqrt[3]{3}$ (b) $\sqrt[3]{4} : \sqrt[3]{2}$

(c) 1:1 (d) $\sqrt[3]{60} : 3$

RRB RPF SI – 12/01/2019 (Shift-II)

Ans. (d) Let height of cone =h, radius = r_1

$\therefore$ Radius $(r_1) = \frac{5}{9}h$

$\therefore \quad h = \frac{9}{5}r_1$

Let radius of sphere = r_2

$\because$ Volume of cone = Volume of sphere

$\frac{1}{3}\pi r_1^2 h = \frac{4}{3}\pi r_2^3$

$r_1^2 \times \frac{9}{5}r_1 = 4r_2^3$

$\left(\frac{r_1}{r_2}\right)^3 = \frac{20}{9}$

$\frac{r_1}{r_2} = \sqrt[3]{\frac{20\times3}{9\times3}} = \frac{\sqrt[3]{60}}{3}$

$\therefore \quad r_1 : r_2 = \sqrt[3]{60} : 3$

331. If the perimeter of a circular plot is equal to the perimeter of a square plot, what will be the ratio of their area?

(a) 6 : 11 (b) 14 : 11
(c) 12 : 11 (d) 7 : 11

RRB Group-D – 22/09/2018 (Shift-I)
RRB Group-D – 29/10/2018 (Shift-III)

Ans : (b) Given-
Circumference of a circle = Perimeter of square

$$2\pi r = 4a$$

$$a = \frac{\pi r}{2}$$

Ratio of areas $= \frac{\pi r^2}{a^2} = \frac{\pi r^2}{\frac{\pi^2 r^2}{4}} = \frac{4 \times 7}{22} = \frac{14}{11}$

332. The volume of a right circular cone whose base radius is one third of its height is equal to the volume of a hemisphere. Then what is the ratio of the radii of the cone and hemisphere?

(a) 2 : 3 (b) $\sqrt[3]{2} : \sqrt[3]{3}$
(c) $\sqrt[3]{3} : \sqrt[3]{2}$ (d) $\sqrt[3]{2} : 1$

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (b) : Let radius of cone is R and height H
Given,

$$R = \frac{H}{3} \qquad \text{.....(i)}$$

Let radius of hemisphere is r.
As per the question,
Volume of cone = Volume of hemisphere

$$\frac{1}{3}\pi R^2 H = \frac{2}{3} r^3 \pi$$

From equation (i), $R = \frac{H}{3}$

$$\frac{1}{3} \times 3R^3 = \frac{2}{3} r^3$$

$$\frac{R^3}{r^3} = \frac{2}{3}$$

$$\left(\frac{R}{r}\right)^3 = \frac{2}{3}$$

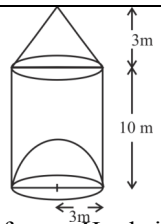
$$\frac{R}{r} = \sqrt[3]{\frac{2}{3}}$$

333. The top of the rocket is shaped like an elliptical cone with a height of 3m while its lower part is cylindrical with a radius of 3m and height 10m. To make room for the engine, the base of the rocket is cut in a hemispherical shape from inside, whose radius is also 3m. Find the total volume of the rocket in cubic meters.

(a) 72π (b) 90π
(c) 100π (d) 81π

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (d)



(Where, h = height of cone, H = height of cylinder)
Volume of rocket = Volume of cone + Volume of cylinder – Volume of hemispherical part

$$= \frac{1}{3}\pi r^2 h + \pi r^2 H - \frac{2}{3}\pi r^3 = \frac{1}{3}\pi r^2 (h + 3H - 2r)$$

$$= \frac{1}{3}\pi \times 3 \times 3(3 + 3 \times 10 - 2 \times 3)$$

$$= 3\pi(33 - 6)$$

$$= 3\pi \times 27 = 81\pi \text{ cubic meter}$$

334. A sphere was divided in the ratio 2 : 3. The larger part is inserted as a cone whose height is equal to the radius of its base, while the smaller part is inserted as a cylinder, whose height is equal to the radius of its base. What will be the ratio of the radii of the base of the cone to the height of the cylinder?

(a) 3:1 (b) $\sqrt[3]{9} : \sqrt[3]{2}$
(c) $\sqrt[3]{9} : 1$ (d) $1 : \sqrt[2]{3}$

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (b) Large part of sphere $= \frac{3}{5}$

Small part of sphere $= \frac{2}{5}$

In large cone, radius (r_c) = h

Volume of cone $= \frac{1}{3}\pi r_c^2 h = \frac{3}{5} \times \frac{4}{3}\pi r^3$

$$r_c^3 = \frac{12}{5} r^3 \text{.....(i)}$$

Volume r_c small part of cylinder of sphere r_c = h

$$\pi r_c^2 h = \frac{2}{5} \times \frac{4}{5}\pi r^3 \Rightarrow h^3 = \frac{8}{25} r^3 \text{.....(ii)}$$

On dividing equation (i) into equation (ii)

$$\frac{r_c^3}{h^3} = \frac{12}{5} \times \frac{15}{8}$$

$$\frac{r_c^3}{h^3} = \frac{9}{2}$$

$$\frac{r_c}{h} = \sqrt[3]{\frac{9}{2}}$$

$$\boxed{r_c : h = \sqrt[3]{9} : \sqrt[3]{2}}$$

option (b) will be correct answer

335. What will be the ratio of the area of a hexagon with the same perimeter and the area of 1 square?

(a) 2 : 3 (b) $1 : \sqrt{3}$
(c) $4 : 3\sqrt{3}$ (d) $\sqrt{3} : 2$

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (d)
Let side of right hexagon is x and side of square is y

Then perimeter = 6x = 4y

$$\frac{x}{y}=\frac{4}{6}$$

$$\frac{x}{y}=\frac{2}{3}$$

Ratio of area of hexagen to area of square $=\dfrac{\frac{3\sqrt{3}}{2}\times(x)^2}{(y)^2}$

$$=\frac{\frac{3\sqrt{3}}{2}\times(2)^2}{(3)^2}=\frac{6\sqrt{3}}{9}=\frac{2\sqrt{3}}{3}=\frac{2\sqrt{3}}{\sqrt{3}\times\sqrt{3}}=\frac{2}{\sqrt{3}}$$

Required ratio = $2:\sqrt{3}$ or $\sqrt{3}:2$

336. A company plans to pack spherical thin hollow balls in long circular cylinder shape cartons. Where there is no lid on either side of the box. If the ball and box are made of the same material, calculate the ratio of the shell and the material used in the box.

(a) $\frac{\pi}{2}$ (b) 1

(c) π (d) 2π

RRB Group-D – 07/12/2018 (Shift-III)

Ans : (b) Let sphere's radius is r

Area of sphere = $4\pi r^2$ .....(i)

Area of cylindrical boxes for keeping spherical ball = Curve page of boxes

$2\pi rh = 2\pi r\times 2r$

$= 4\pi r^2$ ....(ii)

From equation (i) and (ii)

$$\frac{\text{Area of sphere}}{\text{Area of boxes}}=\frac{4\pi r^2}{4\pi r^2}=1$$

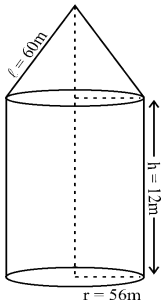
337. A tent is such that its lower part is like a cylinder of 12 meters height with a diameter of 112 meters. Its top is like a cone with a base of the same diameter of 112 meters and is 60 meters slant height. And its canvas is 4 meters wide. Calculate the required length of the canvas to make the tent.

(a) 3276 m (b) 3696 m

(c) 4686 m (d) 4096 m

RRB Group-D – 04/12/2018 (Shift-III)

Ans. (b)



Total area of tent

= curved surface area of cylinder + curved surface area of cone

$= 2\pi rh + \pi r\ell$

$=\frac{22}{7}\times 56(2\times 12+60)$

$= 22 \times 8 \times 84 = 14784\ m^2$

Let length of canvas = l m

So area of canvas = area of tent

$4 \times$ length = 14784

$\therefore$ length = 3696 m

338. A solid sphere of 5 cm radius is melted to from a solid marigold with a maximum possible number of 1 cm radius. If the balls are placed optimally in a cubic box, what percentage of the space will be used in the box?

(a) 52.38% (b) 55.76%

(c) 72.53% (d) 47.62%

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (d) Side of cube = 10 cm (diameter of sphere)

Radius of sphere = 5 cm

As per the question,

Empty place in box = Volume of cube – Volume of sphere

$$=10\times10\times10-\frac{4}{3}\pi\times5^3$$

$$=1000-523.80$$

$$=476.19\text{cm}^3$$

Percentage of empty place in boxes $=\dfrac{476.19\times100}{1000}$

$$=47.619\cong47.62\%$$

339. The area of the cross section of a pipe is 10.4 cm^2 and water flowed through it at a rate of 54 km/h. If the pipe is always filled with 60% flow, then in 5 minutes find the volume of water passing through the pipe.

(a) 2808 (b) 2008

(c) 2010 (d) 2101

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) Volume of taking water by any pipe = Cross section area × Velocity of water

$$=10.4\text{cm}^2\times54\text{km/h}\times5\text{min}\times\frac{60}{100}$$

$$=10.4\times10^{-4}\text{m}^2\times54\times\frac{5}{18}\text{m/sec}\times5\times60\text{sec}\times\frac{60}{100}$$

$= 10.4 \times 10^{-4}m^2 \times 15 \times 5 \times 36$

$= 28080 \times 10^{-4}m^3$

$= 28080 \times 10^{-4} \times 1000\ \ell$ ($\because$ $1m^3 = 1000\ \ell$)

$= 28080 \times 10^{-4} \times 10^3\ \ell = 2808\ \ell$

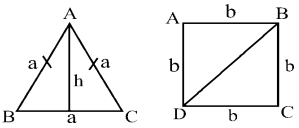
340. The height of an equilateral triangle is equal to one third of the diagonal of a square. What is the ratio between the area of the triangle and the square?

(a) $\sqrt{3}:\sqrt{2}$ (b) $2:9\sqrt{3}$

(c) $3:4\sqrt{3}$ (d) $\sqrt{3}:6$

RRB Group-D – 26/11/2018 (Shift-III)

Ans : (b)



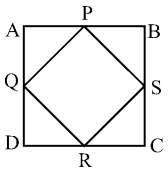
Height of equilateral triangle=Diagonal of square $\times \frac{1}{3}$

$$\frac{\sqrt{3}}{2}a = \sqrt{2}b \times \frac{1}{3} \Rightarrow \frac{a}{b} = \frac{2\sqrt{2}}{3\sqrt{3}}$$

$$\frac{\text{Area of equilateral triangle}}{\text{Area of square}} = \frac{\frac{\sqrt{3}}{4}a^2}{b^2} = \frac{\frac{\sqrt{3}}{4} \times 2\sqrt{2} \times 2\sqrt{2}}{3\sqrt{3} \times 3\sqrt{3}}$$

$$= 2 : 9\sqrt{3}$$

341.



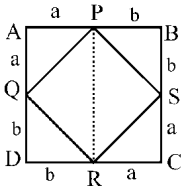
Rectangle PQRS is formed by cutting two pairs of equilateral triangles from the square ABCD in the given figure. The total area of the served part is 288 meters^2. What will be the length of PR in meters?

(a) 24 (b) $\sqrt{288}$

(c) $\sqrt{512}$ (d) 48

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (a) :



Let in ABCD square,

AP = AQ = CS = CR = a m

PB = BS = DQ = DR = b m

According to the question

Total area of part side = 288 m^2

$$\frac{1}{2} \times a \times a + \frac{1}{2} \times a \times a + \frac{1}{2} \times b \times b + \frac{1}{2} \times b \times b = a^2 + b^2 = 288$$

So in PQRS rectangle

$$\text{Diagonal (PR)} = \sqrt{PQ^2 + RQ^2} = \sqrt{2 \times a^2 + 2 \times b^2}$$

$$= \sqrt{2(a^2 + b^2)} = \sqrt{2 \times 288} = \sqrt{576} = 24 \text{ m}$$

342. A wall 4.84 meters long and 3.1 meters high is covered with 22 cm × 10cm tiles. If the cost of each tile is Rs. 1.50, Find the total cost of the tiles.

(a) Rs. 1,025 (b) Rs. 1,023

(c) Rs. 1,022 (d) Rs. 1,020

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Length of wall = 4.84 m = 484 cm

Height of wall = 3.1 m = 310 cm

Number of tiles = $\frac{484 \times 310}{22 \times 10} = 682$

Cost of a tile = Rs. 1.50

Total cost of tiles = 682 × 1.50

= Rs. 1023

343. A cylindrical container with no lid is to be made from a rectangular seat of metal measuring 2.2 m × 2.1 m. The diameter and height of the container to be made is the same. The cost of manufacturing a container is Rs. 50. If the diameter of the container is to be made 14 cm, Find the total cost price to make the full container.

(a) 3,000 (b) 5,000

(c) 3,750 (d) 2,500

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (a) Area of rectangular sheet = $\ell \times b$

= 2.2 × 100 × 2.1 × 100

= 220 × 210

= 46200 square cm.

According to the question,

Diameter of container is equal to their height,

So height is 14 cm. and diameter 14 cm. then radius = 7cm.

Area of container = Surface area of container + Area of base of container.

$$2\pi rh + \pi r^2 = 2 \times \frac{22}{7} \times 7 \times 14 + \frac{22}{7} \times 7 \times 7$$

$$= 616 + 154 = 770 \text{ square cm}$$

Then number of required containers

$$= \frac{46200}{770} = 60$$

$\therefore$ Total cost of making 60 containers = 60×50 = 3000

344. The circumference of an equilateral hexagon is 72 cm. what is its area in cm.?

(a) $144\sqrt{3}$ (b) $216\sqrt{3}$

(c) $108\sqrt{3}$ (d) $36\sqrt{3}$

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (b) Perimeter of right hexagon = 72cm

6a = 72 cm

a = 12 cm

Area of right hexagon = $6 \times \frac{\sqrt{3}}{4}a^2$

$$= 6 \times \frac{\sqrt{3}}{4} \times (12)^2 = 6 \times \frac{\sqrt{3}}{4} \times 144$$

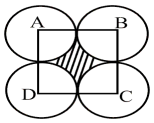
$$= 6 \times 36\sqrt{3} \quad = 216\sqrt{3} \text{ cm}^2$$

345. 4 cows are tied on four corners of square of 35 m side so that he can reach each other which part of the area is left from the graze?

(a) 252.5 sq m (b) 162.5 sq m
(c) 262.5 sq m (d) 260.5 sq m

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (c)



AB = BC = CD = AD = 35 m

Side of square = 35 m

Radius of sectors $= \frac{35}{2}$

So 4 × Area of sectors $= 4 \times \frac{\pi r^2 \theta}{360^0}$ $(\because \theta = 90^0)$

Area of four sectors $= 4 \times \frac{22}{7} \times \left(\frac{35}{2}\right)^2 \times \frac{90^0}{360^0}$

$= 4 \times \frac{22}{7} \times \frac{35}{2} \times \frac{35}{2} \times \frac{1}{4}$

$= \frac{55 \times 35}{2}$

$= 55 \times 17.5$

$= 962.5 \text{ m}^2$

Area of square = side^2 = $(35)^2$= 1225 m^2

Required area

= Area of square – Area of four sectors

= 1225.0 – 962.5

= 262.5 m^2

346. A closed wooden rectangular box is made of one cm thick wood whose outer dimensions are as follows length 22cm, breadth 17cm and height 12cm. It is completely filled with cement what will be the amount of cement in the box?

(a) 1488 cube cm (b) 3000 cube cm
(c) 4488 cube cm (d) 2880 cube cm

RRB NTPC 02.04.2016 Shift : 2

Ans : (b) Length of the wood = 22 cm

Breadth = 17 cm

Height = 12 cm

Rectangular wood is 1 cm thick

So, length of cement = 22 – 2 = 20 cm

Breadth = 17–2 = 15 cm

Height = 12–2 = 10 cm

Quantity of cement = 20 × 15 × 10 = 3000 cubic cm

347. How many time will it take for Ramesh to walk around a 50 meters square park if he runs at the rate of 18 km/h?

(a) 40 sec (b) 20 sec
(c) 80 sec (d) 160 sec

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) Given-

Side of square shape park = 50 m

Perimeter of square shape park = 4 × 50

= 200 m

Speed of Ramesh = 18 Km/h

$= 18 \times \frac{5}{18}$ meter/second

= 5 meter/second

Time taken by Ramesh to run around a park one time $= \frac{200}{5} =$ 40 seconds

348. The base of a triangle is one-third of the base of a parallelogram having the same area as that of the triangle. The ratio of the corresponding heights of the triangle to the parallelogram will be:

(a) 3 : 2 (b) 4 : 1
(c) 3 : 1 (d) 6 : 1

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (d) Let base of parallelogram is a and height h_1

Again let height of triangle is h_2.

As per the question,

Area of triangle = Area of Parallelogram

$\frac{1}{2} \times \frac{a}{3} \times h_2 = a \times h_1$

$\Rightarrow \quad \frac{h_1}{h_2} = \frac{1}{6}$

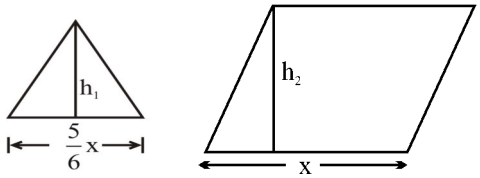
So, Height of triangle : Height of parallelogram = 6 : 1

349. The base of a triangle is five-sixth of the base of a parallelogram having the same area as that of the triangle. The ratio of the corresponding heights of the triangle to the parallelogram will be:

(a) 12 : 5 (b) 5 : 12
(c) 5 : 3 (d) 6 : 5

RRB ALP & Tec. (29-08-18 Shift-III)

Ans : (a)



Let base of parallelogram = x

then base of Δ triangle $= \frac{5}{6}x$

According to the question,

$\frac{1}{2} \times \frac{5}{6} x \times h_1 = x \times h_2$

$\frac{5}{12} h_1 = h_2 \qquad h_1 : h_2 = 12 : 5$

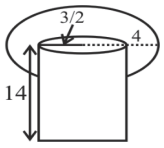
350. A well of diameter 3m and depth 14 m is dug. The earth, taken out of it, has been evenly spread all around it in the shape of a circular ring of breadth 4m to form an embankment. Find the height of embankment.

(a) $\frac{1}{8}$ m (b) $\frac{9}{8}$ m

(c) $\frac{7}{8}$ m (d) $\frac{3}{8}$ m

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (b)



$h = 14, r = \frac{3}{2}, R = 4 + \frac{3}{2} = \frac{11}{2}$

According to the question,

Height of the embankment $(H) = \frac{\pi r^2 h}{\pi(R)^2 - \pi r_1^2}$

$= \frac{\pi r^2 h}{\pi(R^2 - r_1^2)} = \frac{(3/2)^2 \times 14}{(11/2)^2 - (3/2)^2}$

$H = \frac{9/4 \times 14}{\frac{121}{4} - \frac{9}{4}} = \frac{9 \times 14}{112}, \quad H = \frac{9}{8}$m.

351. From a solid cube of side 7cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the volume of remaining solid?

(a) 270 cm^3 (b) 277 cm^3

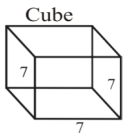
(c) 300 cm^3 (d) 272 cm^3

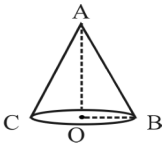
RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (b) Volume of cube $= (side)^3$

Volume of cone $= \frac{1}{3}\pi r^2 h$

Volume of left solid = Volume of cube – Volume of cone





OA = h = 7 cm

OB = OC = r = 3

$= (7)^3 - \frac{1}{3}\pi(3)^2 \times 7 = 343 - \frac{1}{3} \times \frac{22}{7} \times 3 \times 3 \times 7$

$= 343 - 66 = 277\,cm^3$

Volume of left solid $= 277\ cm^3$

352. The volume of a right circular cone, whose radius of the base is half of its altitude, and the volume of a hemisphere are equal. The ratio of the radius of the cone to the radius of the hemisphere is:

(a) $\sqrt{2}:1$ (b) $\sqrt[3]{2}:1$

(c) 1 : 1 (d) 2 : 1

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (c) Let height of right circular cone $= h$

According to the question,

Base radius $(r) = \frac{1}{2} \times h$

$2r = h$

Volume of cone = Volume of hemisphere

$\frac{1}{3}\pi r^2 h = \frac{2}{3}\pi r_1^3$

$\left(\frac{h}{2}\right)^2 \times h = 2r_1^3, \left(\frac{2r}{2}\right)^2 \times 2r = 2r_1^3$

$r^3 = r_1^3 \Rightarrow \frac{r^3}{r_1^3} = \frac{1}{1}, \quad \boxed{r : r_1 = 1:1}$

353. The volume of a right circular cone, whose radius of the base is same as its altitude, and the volume of a sphere are equal. The ratio of the radius of the cone to the radius of the sphere is :

(a) 1 : 1 (b) $\sqrt[3]{4}:1$

(c) $\sqrt{2}:1$ (d) $\sqrt[3]{3}:\sqrt[3]{2}$

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b) Let radius and height of right circular cone $= r_1$ and radius of sphere $= r_2$

$\therefore$ Volume of cone = Volume of sphere

$\frac{1}{3}\pi r_1^2 \times r_1 = \frac{4}{3}\pi r_2^3, \therefore \frac{r_1^3}{r_2^3} = \frac{4}{1}, \therefore \frac{r_1}{r_2} = \frac{\sqrt[3]{4}}{1} = \sqrt[3]{4}:1$

354. The volume of a right circular cone, whose radius of the base is same as one-third of its altitude, and the volume of a sphere are equal. The ratio of the radius of the cone to the radius of the sphere is :

(a) 1 : 1 (b) $\sqrt[3]{3}:\sqrt[3]{2}$

(c) $\sqrt[3]{4}:1$ (d) $\sqrt[3]{4}:\sqrt[3]{3}$

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (d) Let radius of cone $= r_1$ then height of cone $= 3r_1$

Let radius of sphere $= r_2$

Volume of cone = Volume of sphere

$\frac{1}{3}\pi r_1^2 h = \frac{4}{3}\pi r_2^3$

$\Rightarrow \frac{r_1^3}{r_2^3} = \frac{4}{3}$

$\Rightarrow \left(\frac{r_1}{r_2}\right)^3 = \frac{4}{3}$

$\Rightarrow r_1 : r_2 = \sqrt[3]{4}:\sqrt[3]{3}$

22.

Algebra

Type - 1

1. What is the sum of the first 25 odd numbers?

(a) 150 (b) 625
(c) 250 (d) 144

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (b) : The first 25 odd numbers will be 1,3,5,7,9.....49 respectively which are in the arithmetic progression.

Where first term (a) = 1

and common difference (d) = 3 – 1 = 2

And number of terms (n) = 25

So, sum of n numbers of term in arithmetic progression

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$= \frac{25}{2}[2\times 1 + (25-1)\times 2]$$

$$= \frac{25}{2}\left[2 + (24)\times 2\right]$$

$$= \frac{25}{2}[2 + 48]$$

$$= \frac{25\times 50}{2}$$

$$= 25 \times 25 = 625$$

Hence, sum of the first 25 odd number = 625

2. How many numbers are there between 1000 and 3000 that are completely divisible by 7 ?

(a) 281 (b) 284
(c) 286 (d) 283

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) :

Numbers divisible by 7 between 1000 and 3000

1001, 1008 ..... 2996.

$\because$ $l = a + (n-1)\,d$

Where, l = Last term

a = First term

d = Common difference

n = Number of terms

$\therefore$ $2996 = 1001 + (n-1)\times d$

$1995 = (n-1)\times 7$

$(n-1) = 285$

$n = 286$

3. $\left(1-\frac{1}{n}\right)+\left(1-\frac{2}{n}\right)+\left(1-\frac{3}{n}\right)+$ .....up to n terms will result as:

(a) $\frac{1}{2n}$ (b) $\frac{1}{2n-1}$
(c) $\frac{1}{n^2}$ (d) $\frac{n-1}{2}$

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\left(1-\frac{1}{n}\right)+\left(1-\frac{2}{n}\right)+\left(1-\frac{3}{n}\right)+$ .....up to n terms

$$= (1+1+1....\text{n term}) - \left(\frac{1}{n}+\frac{2}{n}+\frac{3}{n}.....\frac{n}{n}\right)$$

$$= n - \left(\frac{1}{n}+\frac{2}{n}+\frac{3}{n}.....\frac{n}{n}\right)$$

Where $\left(\frac{1}{n}+\frac{2}{n}+\frac{3}{n}.....\frac{n}{n}\right)$ is A.P.

So, difference $= \frac{2}{n}-\frac{1}{n} = \frac{1}{n}$

We know that,

Sum of n terms in A.P. $(S_n) = \frac{n}{2}\left[2a + (n-1)d\right]$

$$= n - \left[\frac{n}{2}\left\{2\times\left(\frac{1}{n}\right)+(n-1)\left(\frac{1}{n}\right)\right\}\right]$$

$$= n - \left[\frac{n}{2}\left\{\left(\frac{2}{n}\right)+\left(\frac{n-1}{n}\right)\right\}\right]$$

$$= n - \left\{1+\frac{n}{2}\left(\frac{n-1}{n}\right)\right\}$$

$$= n - \frac{n+1}{2}$$

$$= \frac{n-1}{2}$$

4. Find the number of terms in the sequence 4, 8, 16, 32, ... 512

(a) 10 (b) 8
(c) 9 (d) 7

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) : 4, 8, 16, 32, ..., 512

$l = ar^{n-1}$

Where, l = Last term

a = First term

n = Number of terms

r = Common ratio

$\therefore$ $512 = 4\times(2)^{n-1}$

$128 = 2^{n-1}$

$2^7 = 2^{n-1}$

$n - 1 = 7$

$n = 8$

5. What is the value of k in the following Arithmetic progression?

15+13+11+9+…….+k = –105

(a) 7 (b) –21
(c) –5 (d) –25

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : 15 + 13 + 11 + 9 + --------+ k = –105
We know that sum of n terms

$$S_n = \frac{n}{2}\left[2a + (n-1)d\right]$$

n = No. of terms, a = First number,
d = Common difference

$$-105 = \frac{n}{2}\left[2\times 15 + (n-1)\times -2\right]$$

$$-210 = n\left[30 - 2n + 2\right]$$

$$32n - 2n^2 = -210$$

$$2n^2 - 32n - 210 = 0$$

$$n^2 - 16n - 105 = 0$$

$$n^2 - 21n + 5n - 105 = 0$$

n (n–21) + 5(n–21) = 0
(n + 5) (n–21) = 0
n = –5, n = 21
$\because a_n = a_1 + (n-1)\,d$
On putting, n = 21
k = 15+(21–1)×–2
k = 15–40
k = –25

6. The sum of all odd numbers between 0 and 52 is:
(a) 729 (b) 576
(c) 676 (d) 625

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (c) : Total odd numbers between 0 and 52
= 1, 3, 5, 7, 9, 11, ..., 51
$\therefore$ No. of terms (n) = 26
First term (a) = 1
Last term (ℓ) = 51

$$\therefore \text{Sum of n terms} = \frac{n}{2}(a + \ell)$$

$$\therefore = \frac{26}{2}(51 + 1)$$

$$= 13 \times 52 = 676$$

7. The sum of the first 20 terms of the series $\frac{1}{5\times 6} + \frac{1}{6\times 7} + \frac{1}{7\times 8} + \ldots\ldots$ is :
(a) 0.16 (b) 16
(c) 1.6 (d) 0.016

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (a) : $\text{Number of terms} = \frac{\text{Last term} - \text{First term}}{\text{Difference}}$

$$20 = \frac{\text{Last term} - 5}{1}$$

Last term = 25
First term = 5

$$\text{Sum of 20 terms} = \frac{1}{\text{difference}}\left[\frac{1}{\text{first term}} - \frac{1}{\text{last term}}\right]$$

$$= \frac{1}{1}\left[\frac{1}{5} - \frac{1}{25}\right] = \frac{5-1}{25} = \frac{4}{25}$$

$$= \boxed{0.16}$$

8. What is the 50th term of arithmetic progression 3, 8, 13, 18, 23, ...?
(a) 150 (b) 248
(c) 267 (d) 345

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (b) : 3, 8, 13, 18, 23, ...50th term
a = 3 d = 8 – 3 = 5 n = 50
Formula : $T_n = a + (n-1)d$
= 3 + (50 – 1) ×5
= 3 + 245
= 248

9. Find the ninth term of an arithmetic progression whose first term is 5 and the common difference is 4.
(a) 41 (b) 37
(c) 35 (d) 39

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (b) : Given that-
n = 9
First term (a) = 5
Difference (d) = 4
$T_n = a + (n-1)\,d$
$T_9 = 5 + (9-1) \times 4$
$T_9 = 5 + 8 \times 4$
$T_9 = 37$

10. If the first term of a geometric progression is 2 and the common ratio is 3, then what will be the fifth term of the geometric progression?
(a) 243 (b) 324
(c) 81 (d) 162

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : a = 2, r = 3
$T_n = ar^{n-1}$
$T_5 = 2\times 3^{5-1}$
$T_5 = 2\times 3^4$
= 162

11. Find the sum of the all even natural number less than 85.
(a) 4700 (b) 840
(c) 1806 (d) 1408

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : Even natural numbers smaller than 85 are.
2, 4, 6, 8, 10, ...80, 82, 84

$$n = \frac{l - a}{d} + 1$$

(Where l - Last term, a - First term,
d - Common difference)

$$= \frac{84 - 2}{2} + 1$$

$$\boxed{n = 42}$$

Sum of even natural number = n (n + 1)
= 42 (42 + 1)
= 1806

12. The 10th term, of the Arithmetic Progression 2, 7, 12, ... is:

(a) 27 (b) 37
(c) 47 (d) 57

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given that,
Arithmetic progression 2, 7, 12 ..... n
First term (a) = 2
Number of terms (n) = 10
Common difference (d) = $T_2 - T_1 = 7 - 2 = 5$
By the formula we know,
$T_n = a + (n-1)\,d$
$T_{10} = 2 + (10-1)\,5$
$= 2 + 45$
$= 47$

13. What is the sum of the following two series?
(8 + 27 + 64 + ... +1000) + (2 + 4 + 6 + ... + 20)

(a) 3136 (b) 3134
(c) 3135 (d) 3133

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) :
$(8 + 27 + 64 + ... + 1000) + (2 + 4 + 6 + ... + 20)$
$= [(2)^3+(3)^3+(4)^3+ ..... +(10)^3] + 2(1+2+3+ ..... +10)$
$= [\{(1)^3 + (2)^3 + (3)^3 + (4)^3+.....+ (10)^3\} - (1)^3] +2$
$(1+2+3+ ..... + 10)$
∵ The sum of cubes of the first 'n' natural numbers $= \left[\frac{n(n+1)}{2}\right]^2$

And, sum of the first 'n' natural numbers $= \frac{n(n+1)}{2}$

$= \left[\frac{10(10+1)}{2}\right]^2 - 1 + 10(10+1)$
$= (5 \times 11)^2 - 1 + 10 \times 11$
$= (55)^2 - 1 + 110$
$= 3025 - 1 + 110$
$= 3024 + 110$
$= 3134$

14. If the ratio of the 11th term of an AP to its 18th term is 2 : 3. Find the ratio of the sum of its first five terms to the sum of its first 10 terms.

(a) 1 : 2 (b) 5 : 4
(c) 6 : 17 (d) 17 : 6

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the first term of A.P. is a and common difference is d.

n^{th} term $(a_n) = a + (n-1).\,d$

$\frac{a_{11}}{a_{18}} = \frac{a+10d}{a+17d} = \frac{2}{3}$

$3a + 30d = 2a + 34d$
$a = 4d$

∵ $S_n = \frac{n}{2}\,[2a + (n-1).d]$

$\frac{S_5}{S_{10}} = \frac{\frac{5}{2}[2a+4d]}{\frac{10}{2}[2a+9d]}$

$= \frac{8d+4d}{2[8d+9d]}$ [∵ a = 4d]

$= \frac{6d}{17d} = 6:17$

15. Find the numbers if the arithmetic mean and the geometric mean of the two numbers are 7 and $2\sqrt{10}$ respectively.

(a) 5, 4 (b) 2, 20
(c) 4,10 (d) 8,5

RRB RPF Constable – 17/01/2019 (Shift-III)

Ans : (c) Let two numbers be a and b.
Arithmetic mean of both numbers $= \frac{a+b}{2}$
Geometric mean $= \sqrt{ab}$
According to the question,

$\frac{a+b}{2} = 7$
$a + b = 14$ ....(i)
and $\sqrt{ab} = 2\sqrt{10}$
$ab = 40$ ...(ii)

On solving equation (i) and (ii),

$a + \frac{40}{a} = 14$

$\frac{a^2+40}{a} = 14$

$a^2 + 40 = 14a$
$a^2 - 14a + 40 = 0$
$a^2 - 10a - 4a + 40 = 0$
$a(a-10) - 4(a-10) = 0$
$(a-10)(a-4) = 0$
$a = 10$ or 4
$a = 10$
$b = 4$

Hence the numbers are 4 and 10.

16. Find the three numbers in the arithmetic series whose sum is 15 and the product is 105.

(a) 1, 5, 9 or 9, 5, 1 (b) 3, 5, 7 or 7, 5, 3
(c) 3, 8, 7 or 7, 8, 3 (d) 3, 5, 8 or 8, 5, 3

RRB RPF SI – 05/01/2019 (Shift-III)

Ans : (b) From option (b),
3, 5, 7 or 7, 5, 3
Succession 5-3=2
7-5=2
From the question, 3+5+7 = 15 (total sum)
$3 \times 7 \times 5 = 105$ (multiple)

17. How many three digit numbers are divisible by 9.

(a) 100 (b) 95
(c) 90 (d) 105

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans : (a) The three digits numbers which are divisible by 9 are–

108, 117, ----------999

Clearly, these number are in AP.

first term (a) = 108

last term (l) = 999

common difference (d) = 117-108

= 9

$\because$ $l = a + (n-1)d$

$999 = 108 + (n-1) \times 9$

$999 - 108 = (n-1)9$

$891 = (n-1) \times 9$

$99 = (n-1)$

$n = 100$

Hence there are 100 three digit numbers divisible by 9.

18. 16, 32, 64, 128, .. 11th term of this series will be

(a) 16348 (b) 16384

(c) 16834 (d) 13684

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (b) 16, 32, 64, 128, ….. 11th term

= 16(1, 2, 4, 8 ----)

n^{th} term of geometric progression

$t_n = ar^{n-1}$

$a = 1, n = 11, r = \frac{4}{2} = 2$

$t_{11} = 16(1 \times 2^{11-1}) = 16 \times 1024 = 16384$

19. 10th term of arithmetic series $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, 7\sqrt{2}$ is ____

(a) $11\sqrt{2}$ (b) $10\sqrt{2}$

(c) 12 (d) $19\sqrt{2}$

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (d) Given arithmetic series is-

$\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, 7\sqrt{2}$.....

10th term = T_{10} = ?

First term $(a) = \sqrt{2}$, common difference $(d) = 2\sqrt{2}$

n = 10 (number of terms)

Tenth term $= T_{10} = \sqrt{2} + (10-1)2\sqrt{2}$

$\left[\because T_n = a + (n-1)d\right]$

$T_{10} = \sqrt{2} + 9 \times 2\sqrt{2}$

$T_{10} = \sqrt{2} + 18\sqrt{2}$

$\boxed{T_{10} = 19\sqrt{2}}$

20. The sum of the first 2007 terms of series 1, 2, 3, 4, 1, 2, 3, 4, will be_____

(a) 5016 (b) 5107

(c) 5020 (d) 5013

RRB Group-D – 22/09/2018 (Shift-I)

Ans : (a) 1, 2, 3, 4, 1, 2, 3, 4, _____ 2007 term

Total term to taking number of 1, 2, 3, 4

$= \frac{2007}{4} = 501 \text{ quotient} + 3 \text{ remainder}$

Sum of numbers 1, 2, 3, 4 = 10

Total sum = $501 \times 10 + 1 + 2 + 3$

= 5010 + 6 = 5016

21. 17, 22, 27, 32, ... 20th term in this series will be

(a) 107 (b) 117

(c) 112 (d) 115

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (c) 17, 22, 27, 32, ..., 20th term = ?

$\because$ Above mention series is arithmetic series.

$\therefore$ $\boxed{T_n = a + (n-1)d}$

Where a= first term =17, d = common difference = 5

number of n terms = 20

$T_{20} = 17 + (20-1)\,5$

$= 17 + 19 \times 5$

$= 17 + 95$

$= 112$

22. What will be the 12th term of arithmetic series 142, 148, 154 _____

(a) 210 (b) 200

(c) 208 (d) 300

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (c) $\boxed{T_n = a + (n-1)d}$

142, 148, 154 ----- 12th term

a = 142

d = 148 - 142 = 6

$T_{12} = 142 + (12 - 1)\,6$

= 142 + 66

= 208

23. The ratio of the sum of the first three terms of the geometric progression (G.P.) and the sum of the first six terms is 125 : 152. What is the common ratio of G.P.

(a) $\frac{4}{5}$ (b) $\frac{5}{3}$

(c) $\frac{5}{4}$ (d) $\frac{3}{5}$

RRB Paramedical Exam – 20/07/2018 (Shift-I)

Ans : (d)

$$\frac{\text{Sum of the six terms of geometric progression}}{\text{Sum of the three terms of geometric progression}} = \frac{152}{125}$$

$$\frac{\frac{a(r^6-1)}{r-1}}{\frac{a(r^3-1)}{r-1}} = \frac{152}{125}$$

$$\frac{r^6-1}{r^3-1} = \frac{152}{125}$$

$$\frac{(r^3-1)(r^3+1)}{(r^3-1)} = \frac{152}{162}$$

$$1 + r^3 = \frac{152}{125}$$

$$r^3 = \frac{152}{125} - 1, \qquad r^3 = \frac{152-125}{125}$$

$$r^3 = \frac{27}{125}, \qquad r = \frac{3}{5}$$

24. Find the 5th term in the given geometric progression 3, 6, 12, ……..

(a) 48 (b) 62
(c) 57 (d) 50

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (a) First term (a) = 3, Common ratio (r) $= \frac{6}{3} = 2$

n = 5

Formula- $t_n = ar^{n-1}$

$t_5 = 3\,(2)^{5-1} = 3 \times 2^4$

$t_5 = 3 \times 16$

Hence the 5th term in the series is 48.

25. What is the 23rd term in the given series 5, 11, 17, ...

(a) 137 (b) 140
(c) 135 (d) 139

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (a) : Given,

First term (a) = 5

Common difference (d) = 6

T_{23} =?

$T_{23} = a + (n-1)d$

$T_{23} = 5 + (23-1)6$

$T_{23} = 5 + (22 \times 6)$

$T_{23} = 5 + 132$

$T_{23} = 137$

26. The sum of the arithmetic mean and the geometric mean of two positive numbers is equal to the difference of those numbers. Find the ratio of those numbers.

(a) 9 : 1 (b) 2 : 3
(c) 1 : 4 (d) 1 : 12

RRB Group-D – 15/11/2018 (Shift-II)

Ans : (a) Let the number be a and b

Arithmetic mean of two positive number $= \frac{a+b}{2}$

Geometric mean $= \sqrt{ab}$

$$\frac{a+b}{2} + \sqrt{ab} = b - a$$

$$a + b + 2\sqrt{ab} = 2(b-a)$$

$$\left(\sqrt{a}\right)^2 + \left(\sqrt{b}\right)^2 + 2\sqrt{a.b} = 2\left[\left(\sqrt{b}\right)^2 - \left(\sqrt{a}\right)^2\right]$$

$$\left(\sqrt{a} + \sqrt{b}\right)^2 = 2\left(\sqrt{b} - \sqrt{a}\right)\left(\sqrt{b} + \sqrt{a}\right)$$

$$\sqrt{a} + \sqrt{b} = 2\sqrt{b} - 2\sqrt{a}$$

$$3\sqrt{a} = \sqrt{b}$$

$$\frac{\sqrt{a}}{\sqrt{b}} = \frac{1}{3}$$

Squaring on both sides,

$$\frac{a}{b} = \frac{1}{9}$$

So, ratio of number = 9 : 1

27. How many numbers of three digits are divisible by 8.

(a) 114 (b) 111
(c) 113 (d) 112

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (d) The smallest number of three digits divisible by 8 is 104 and largest number = 992

$l = a + (n-1)\,d$

Where, a = first term = 104

Last term (l) = 992

d = common difference = 8

n = number of terms = ?

$l = 104 + (n-1) \times 8$

$992 = 104 + 8n - 8$

$8n = 992 - 96$

$8n = 896$

$n = 112$

Hence there are 112 three digits numbers which are divisible by 8.

28. Find the geometric mean of the numbers 7, 7^2, 7^3, ... 7^n

(a) $7^{\frac{n+1}{2}}$ (b) $7^{\frac{n-1}{2}}$
(c) $7^{\frac{7}{4}}$ (d) $7^{\frac{4}{7}}$

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (a) Geometric mean of the numbers 7, 7^2, 7^3.....7^n

Formula− Geometric mean $= \sqrt{ab}$

a = 7, r = 7

$\because$ $T_n = ar^{n-1}$

$T_n = 7.7^{n-1}$

$T_n = 7^n$

Geometric mean $= \sqrt{7.7^n}$

$= \sqrt{7^{n+1}} = 7^{\frac{n+1}{2}}$

29. The sum of the arithmetic progression 1+4+7+ ....+ X is 782. What is the value of X.

(a) 70 (b) 61
(c) 64 (d) 67

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (d) Arithmetic progression 1+4+7+.....X

$S_n = 782$

a = 1 (first term)

d= 4-1 = 3 (common difference)

$$S_n = \frac{n}{2}\left[2a + (n-1)d\right]$$

$$782 = \frac{n}{2}\left[2x1 + 3n - 3\right]$$

$1564 = 3n^2 - n$

$3n^2-n-1564=0$

$3n^2-69n+68n-1564=0$

$3n(n-23)+68(n-23)=0$

$(3n+68)\,(n-23)=0$

$n-23=0$

$\boxed{n = 23}$

$T_n = a + (n-1)d = 1 + (23-1)\,3 = 1 + 22 \times 3$

X = 67

30. What is the sum of the first 10 numbers in the sequence –3, –8, –13, –18 .....

(a) –260 (b) –250
(c) –245 (d) –255

RRB Group-D – 04/10/2018 (Shift-I)

Ans. (d) Given numbers are in arithmetic progression
Where,
First term (a) = –3
Common difference (d) = –5
Number of terms (n) = 10

$$\text{Sum } (S_n) = \frac{n}{2}\left[2a + (n-1)d\right]$$

$$S_n = \frac{10}{2}\left[2\times(-3) + (10-1)(-5)\right]$$

$$S_n = 5\left[-6-45\right] = 5\times(-51)$$

$$S_n = -255$$

31. Split 69 into three parts such that they are in A.P. series and the product of their smaller parts is 483. Find the numbers:

(a) 19,23,27 (b) 17,23,29
(c) 15,23,31 (d) 21,23,25

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (d) If three parts are a–d, a and a+d then-
According to the question,

$a - d + a + a + d = 69$
$3a = 69$
$a = 23$

and $(a - d) \times a = 483$
$(23 - d) \times 23 = 483$
$(23 - d) = 21$

or, $d = 2$

Now three part
$(23 - 2)$, 23, and $(23 + 2)$

$\Rightarrow$ it is 21, 23 and 25.

32. Find the 10th number in the series 12, 19, 26, 33 ……..

(a) 89 (b) 75
(c) 82 (d) 68

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (b) The given series 12, 19, 26, 33 …….. belongs to A.P.(Arithmetic Progression)
Where, the first term 'a' = 12, common difference 'd' = 19 – 12 = 7 and the number of terms 'n' = 10
Hence, the nth term of the series,

$$T_n = a + (n-1)d$$

$$T_{10} = 12 + (10-1)\times 7 = 12 + 63 = 75$$

33. How many terms in the series 7, 14, 21, 28, the sum of is 952?

(a) 16 (b) 17
(c) 18 (d) 19

RRB NTPC 28.04.2016 Shift : 1

Ans : (a) The given series- 7, 14, 21, 28, ……
Let the sum of n terms = 952
$7 + 14 + 21 + 28 + \ldots\ldots\ldots = 952$
$\Rightarrow 7(1 + 2 + 3 + 4 + \ldots\ldots\ldots) = 952$
$\Rightarrow 1 + 2 + 3 + 4 + \ldots\ldots\ldots = 136$
$\Rightarrow \frac{n(n+1)}{2} = 136$

$\because$ The sum of n consecutive numbers $= \frac{n(n+1)}{2}$

$\Rightarrow n^2 + n = 272$
$\Rightarrow n^2 + n - 272 = 0$
$\Rightarrow n^2 + 17n - 16n - 272 = 0$
$\Rightarrow (n - 16)(n + 17) = 0$
$n - 16 = 0 \Rightarrow n = 16$
Hence, the sum of 16 terms is 952.

34. Find the value of 6 + 11 + 16 + 21 + …. + 71

(a) 539 (b) 561
(c) 661 (d) 639

RRB NTPC 19.04.2016 Shift : 2

Ans : (a) Given series-
$6 + 11 + 16 + 21 + \ldots\ldots + 71$
$\because$ This is an arithmetic progression in which-
$a = 6, d = 5, l = 71$
$\therefore l = a + (n-1)d$
$\Rightarrow 71 = 6 + (n-1)5$
$\Rightarrow (n-1) = 13$
$\Rightarrow n = 14$

Hence, the required sum of the series $S_n = \frac{n}{2}(a + \ell)$

$$= \frac{14}{2}(6 + 71) = 7 \times 77 = \boxed{539}$$

35. If 11, 17, 23…….. be in an arithmetical progression. Find it's 12th term.

(a) 77 (b) 83
(c) 71 (d) 89

RRB NTPC 29.04.2016 Shift : 3

Ans. (a) : 11, 17, 23, ……..
$a = 11$
$d = 17 - 11 = 6$
$\therefore T_n = a + (n-1).d$
$T_{12} = 11 + (12 - 1)\,6$
$= 11 + 11 \times 6 = 77$

Type - 2

36. Find the HCF of $(x^4 - y^4)$, $(x^8 - y^8)$ and $(x^2 - y^2)$

(a) $(x - y)(x + y)$
(b) $(x - y)(x + y)(x + y)$
(c) $(x - y)(x + y)(x - y)(x + y)$
(d) $(x + y)(x + y)$

RRB Group-D 08/09/2022 (Shift-III)

Ans. (a) : $x^4 - y^4 = (x^2 - y^2)(x^2 + y^2)$
$= (x - y)(x + y)(x^2 + y^2)$
$x^8 - y^8 = (x^4 - y^4)(x^4 + y^4)$
$= (x^2 - y^2)(x^2 + y^2)(x^4 + y^4)$
$= (x - y)(x + y)(x^2 + y^2)(x^4 + y^4)$
$x^2 - y^2 = (x - y)(x + y)$
HCF of $(x^4 - y^4)(x^8 - y^8)$ and $(x^2 - y^2) = (x - y)(x + y)$

37. If $X = 3^2\times2$, $Y = 2^3\times3$ and $Z = 3^2\times2^2$ then the LCM of XY, YZ, ZX is:

(a) 2482 (b) 2582
(c) 2492 (d) 2592

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$X = 3^2\times2,\ Y = 2^3\times3,\ Z = 3^2\times2^2$

According to the question,

$XY = 2^4\times3^3$

$YZ = 2^5\times3^3$

$ZX = 2^3\times3^4$

LCM of XY, YZ, ZX = $2^5\times3^4$

$= 32 \times 81 = 2592$

38. If HCF of $2x^2 + 5x - 12$ and $x^2 + x - 12$ is (x+a), then find the value of a.

(a) –3 (b) –2
(c) 4 (d) 5

RRB NTPC 16.04.2016 Shift : 1

Ans : (c) First term,

$2x^2 + 5x - 12$

$= 2x^2 - 3x + 8x - 12$

$= x(2x-3) + 4(2x-3)$

$= (x+4)(2x-3)$

Second term,

$= x^2 + x - 12$

$= x^2 + 4x - 3x - 12$

$= x(x+4) - 3(x+4)$

$= (x+4)(x-3)$

So, from both terms the HCF = (x + 4)

On comparing $(x+4)$ with $(x+a)$, $\Rightarrow \boxed{a = 4}$

39. Find the LCM of ab^2c^2, a^2bc and $a^3b^3c^2$

(a) $a^2b^2c^2$ (b) abc
(c) $a^3b^3c^2$ (d) $a^3b^3c^3$

RRB JE - 23/05/2019 (Shift-II)

Ans : (c) Finding the LCM by prime factorization method,

$ab^2c^2 = a\times b\times b\times c\times c$

$a^2bc = a\times a\times b\times c$

$a^3b^3c^2 = a\times a\times a\times b\times b\times b\times c\times c$

LCM $= a^3b^3c^2$

40. Find the HCF of $a^3b^3c^3$, $a^2b^2c^2$, abc and a^2bc.

(a) $a^4b^4c^4$ (b) $a^3b^3c^3$
(c) $a^2b^2c^2$ (d) abc

RRB JE - 27/06/2019 (Shift-III)

Ans : (d) On finding the HCF,

$a^3b^3c^3 = a\times a\times a\times b\times b\times b\times c\times c\times c$

$a^2b^2c^2 = a\times a\times b\times b\times c\times c$

$abc = a\times b\times c$

$a^2bc = a\times a\times b\times c$

HCF $= a\times b\times c$

Note- For finding the HCF of any expression, always take the least power of numbers.

41. Find the LCM of 6 (xy – y), $8(x^4y - xy)$.

(a) 24 xy (x^3-1) (b) $24(x^3-1)$
(c) 24 xy (d) $(x^3-1)\,xy$

RRB JE - 26/05/2019 (Shift-III)

Ans : (a) Finding the LCM by prime factorization method,

$6(xy-y) = 6y(x-1) = 2\times3\times y(x-1)$

$8(x^4y - xy) = 8xy(x^3-1)$

$\because (a^3 - b^3) = (a-b)(a^2+ab+b^2)$

$= 2\times2\times2xy(x-1)(x^2+x+1)$

$\therefore$ LCM $= 2\times2\times2\times3xy(x-1)(x^2+x+1)$

$= 24xy(x^3-1)$

42. The LCM of $15x^3y^4$ and $12x^2y^5$ is:

(a) $60x^3y^5$ (b) $25x^3y^5$
(c) $12x^3y^3$ (d) $15x^3y^5$

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (a) Finding the LCM by using prime factorization method,

$15x^3y^4 = 3\times5\times x^3\times y^4$

$12x^2y^5 = 2\times2\times3\times x^2\times y^5$

So, the required LCM

$= 2\times2\times3\times5\times x^3\times y^5 = 60x^3y^5$

43. Find the HCF of $(a^3 + b^3)$, $(a + b)^2$ and $(a^2 - b^2)$.

(a) (a + b) (b) (a – b)
(c) (a + b) (a – b) (d) $(a^3 + b^3)(a^2 - b^2)$

RRB JE - 31/05/2019 (Shift-III)

Ans. (a) $(a^3 + b^3) = (a + b)(a^2 + b^2 - ab)$

$(a + b)^2 = (a + b)(a + b)$

and

$(a^2 - b^2) = (a + b)(a - b)$

So, HCF $=$ (a + b)

44. Find the LCM of $(a^3 - b^3)$, $(a^2 - b^2)$, (a – b).

(a) (a – b) (b) $(a^3 - b^3)(a + b)$
(c) $(a^3 - b^3)$ (d) $(a^3 - b^3)(a^2 - b^2)$

RRB JE - 27/06/2019 (Shift-I)

Ans : (b) LCM of $(a^3 - b^3)$, $(a^2 - b^2)$, (a – b)

$(a^3 - b^3) = (a-b)(a^2+b^2+ab)$

$(a^2 - b^2) = (a-b)(a+b)$

$(a - b) = (a - b)$

LCM $= (a-b)(a+b)(a^2+b^2+ab)$

$= (a^3 - b^3)(a+b)$

45. Find HCF of $6xy^2z$, $8x^2y^3z^2$, $12x^3y^3z^3$

(a) $2xyz$ (b) $4xy^2z$
(c) $3xy^2z$ (d) $2xy^2z$

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (d) $6xy^2z = 2\times3\times x\times y\times z$

$8x^2\times y^3\times z^2 = 2\times2\times2\times x\times x\times y\times y\times y\times z\times z$

$12\times x^3\times y^3\times z^3 = 2\times2\times3\times x\times x\times x\times y\times y\times y\times z\times z\times z$

HCF $= 2xy^2z$

46. Find HCF of $15x^2+8x-12$, $3x^2 + x - 2$, $3x^2 - 2x$, $9x^2 - 12x + 4$

(a) x–4 (b) x–2
(c) 3x–4 (d) 3x–2

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (d) $15x^2 + 8x - 12$
$= (5x + 6)(3x-2)$
$3x^2 + x - 2$
$= (3x-2)(x+1)$
$3x^2 - 2x = x(3x-2)$
$9x^2 - 12x + 4$
$= (3x-2)(3x-2)$
HCF $= (3x-2)$

47. Find LCM of $2x^3-16$, $3(x^2+3x-10)$, x^3+2x^2-8x
(a) $6x(x+2)(x+4)(x+5)(x^2+2x+4)$
(b) $6x(x-2)(x+4)(x+5)(x^2+2x+4)$
(c) $6(x-2)(x+4)(x+5)(x^2+2x+4)$
(d) $6x(x-3)(x+4)(x+5)(x^2+2x+4)$

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b) $2x^3 - 16 = 2(x^3 - 8)$
$= 2(x-2)(x^2 + 4 + 2x)$
$3(x^2 + 3x - 10) = 3(x^2 + 5x - 2x - 10)$
$= 3[x(x+5) - 2(x+5)]$
$= 3(x-2)(x+5)$
$x^3 + 2x^2 - 8x = (x-2)(x^2 + 4x)$
$= x(x-2)(x+4)$
LCM $= 3 \times 2 \times x \times (x-2)(x+4)(x+5)(x^2+4+2x)$
$= 6x(x-2)(x+4)(x+5)(x^2+4+2x)$

Type - 3

48. Subtract, the sum of (2x - 3y +7z) and (4z - 5x) from (12x - Z) :
(a) $3x + 3y - 3z$ (b) $4x + 7y$
(c) $1x + 12y - 12z$ (d) $15x + 3y - 12z$

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : From the question,
$(12x - z) - \{(2x - 3y + 7z) + (4z - 5x)\}$
$= 12x - z + 3x + 3y - 11z$
$= 15x + 3y - 12z$

49. If x + y = 8 product of x and y is, 15 then find the value of $x^4 + y^4$:
(a) 606 (b) 806
(c) 906 (d) 706

RRB Group-D 08/09/2022 (Shift-III)

Ans. (d) : Given,
$x + y = 8$ .....(i)
$xy = 15$ .....(ii)
From the eq. (i)
$(x + y)^2 = 8^2$
$x^2 + y^2 + 2xy = 64$
$x^2 + y^2 + 2 \times 15 = 64 \quad \{\because xy = 15\}$
$(x^2 + y^2) = 34$
$(x^2 + y^2)^2 = (34)^2$
$x^4 + y^4 + 2x^2y^2 = 1156$
$x^4 + y^4 = 1156 - 2 \times (15)^2$
$x^4 + y^4 = 706$

50. If $x = 2 + \sqrt{5}$ and $y = 2 - \sqrt{5}$ then find the value of $x^2 + y^2$.
(a) 18 (b) 20
(c) 16 (d) 22

RRB Group-D 26/08/2022 (Shift-III)

Ans. (a) : Given,
$x = 2 + \sqrt{5}$
$y = 2 - \sqrt{5}$
According to the question,
$x^2 + y^2 = \left(2+\sqrt{5}\right)^2 + \left(2-\sqrt{5}\right)^2$
$= 4 + 5 + 4\sqrt{5} + 4 + 5 - 4\sqrt{5}$
$= 9 + 9$
$= 18$

51. For what value of K such that the equations 2x+3y+11 = 0 and 6x+ky+33 = 0 represent coincident lines.
(a) 6 (b) 9
(c) 12 (d) 5

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (b) : $2x + 3y + 11 = 0$ ..... (i)
$6x + ky + 33 = 0$ ..... (ii)
On multiplying by 3 in equation (i)-
$6x + 9y + 33 = 0$ ..... (iii)
From equation (iii) – equation (ii),
$9y - ky = 0$
$ky = 9y$
$k = 9$

52. If there is no solution of the equation 4x+3y+5 = 0 and 6x–ky–7= 0, then the value of k will be-
(a) – 4. 5 (b) – 8
(c) 8 (d) 4.5

RRB RPF SI – 12/01/2019 (Shift-III)

Ans : (a)
Given equation is $4x+3y+5=0$ and $6x-ky-7=0$
$a_1x+b_1y+c_1= 0$ and $a_2x+b_2y+c_2=0$ if–
$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \Rightarrow \frac{4}{6} = \frac{3}{-k} \neq \frac{5}{-7}$
$\Rightarrow \frac{4}{6} = \frac{3}{-k} \Rightarrow -4k = 6 \times 3$
$\Rightarrow k = \frac{18}{-4}$
$\Rightarrow \boxed{k = -4.5}$

53. Find the value of x and y by solving the following equations: 9x + 3y + 12 = 0; 18x + 6y + 24 = 0
(a) x = 4; y = – 16
(b) x = 2; y = 10
(c) x = 1; y = 7
(d) not unique solution but infinite solution

RRB JE - 25/05/2019 (Shift-II)

Ans : **(d)** $9x + 3y + 12 = 0$

On comparing from equation $a_1x + b_1y + c_1 = 0$

$a_1 = 9, b_1 = 3, c_1 = 12$

$18x + 6y + 24 = 0$

On comparing from equation $a_2x + b_2y + c_2 = 0$

$a_2 = 18, b_2 = 6, c_2 = 24$

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

$$\frac{9}{18} = \frac{3}{6} = \frac{12}{24}$$

$$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$

So no unique solution but infinite solutions.

54. For which value of p, will have only one solution of the following equation.
$2x + 3y = -5$ and $2x + py = 2$

(a) 3 is the only one solution of p
(b) p has many solution
(c) p has other solution except 3
(d) 2 is the only one solution of p

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : **(c)** For unique solution

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

$$\frac{2}{2} \neq \frac{3}{p}$$

$p \neq 3$

Hence p has any solution except 3

55. If there is no solution of the equations $14x + 8y + 5 = 0$ and $21x - ky - 7 = 0$ is possible, then the value of k will be:

(a) -16 (b) 12
(c) 8 (d) -12

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (d) $14x + 8y + 5 = 0$ — (1)

$21x - ky - 7 = 0$ — (2)

No solution of equation (1) and (2) will be possible if–

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

$$\frac{14}{21} = \frac{8}{-k}$$

$$\frac{2}{3} = \frac{8}{-k} \Rightarrow \boxed{k = -12}$$

Hence no solution is possible for the value of $k = -12$.

56. What is the value of k for which the equation $16x - 12y + 9 = 0$ and $12x + ky - 11 = 0$ has no solution

(a) –16 (b) 16
(c) –9 (d) 9

RRB Group-D – 04/12/2018 (Shift-III)

Ans. **(c)** When there is no solution–

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

Equation $16x - 12y + 9 = 0$ ...(i)

$12x + ky - 11 = 0$ ...(ii)

From equation (i) and (ii) when there is no solution on comparison then,

$$\frac{16}{12} = \frac{-12}{k} \neq \frac{9}{-11}$$

$$\frac{16}{12} = \frac{-12}{k}$$

$16k = -144$

$$k = \frac{-144}{16}$$

$k = -9$

57. If there is no solution of $20x + 5y + 11 = 0$ and $50x - ky - 9 = 0$, then find the value of k.

(a) 12.5 (b) -12.5
(c) 18 (d) -18

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (b) :

$20x + 5y + 11 = 0$ .....(i)

$50x - ky - 9 = 0$ .....(ii)

$a_1 = 20$ $b_1 = 5$ $c_1 = 11$

$a_2 = 50$ $b_2 = -k$ $c_2 = -9$

Two linear equation have no solution if

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

So taking $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

$$\frac{20}{50} = \frac{5}{-k}$$

$$k = -\frac{50 \times 5}{20}$$

$k = -12.5$

58. If no solution of the equations $4x + 3y + 5 = 0$ and $10x - ky - 7 = 0$ is possible, then what will be the value of k?

(a) -8 (b) 7.5
(c) 8 (d) -7.5

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (d) : The equation have no solution when their slopes are same.

From formula - $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$$\frac{4}{10} = \frac{3}{-k}$$

$-2k = 15$

$\boxed{k = -7.5}$

59. If the equations $6x - 5y + 11 = 0$ and $15x + ky - 9 = 0$ have no solution, then the value of k is :

(a) – 18 (b) 12.5
(c) – 12.5 (d) 18

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : **(c)** When equation have no solution then,

$a_1x + b_1y + c_1 = 0$

$a_2x + b_2y + c_2 = 0$

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

As per question,

Equation $6x - 5y + 11 = 0$

$15x + ky - 9 = 0$

Then $\frac{6}{15} = \frac{-5}{k} \neq \frac{11}{-9}$

$\frac{2}{5} = \frac{-5}{k}$, $k = \frac{-25}{2}$

$\boxed{k = -12.5}$

60. The pair of linear equations $3x + y = 1$ and $px + 2y = 5$ has no finite solution if :

(a) $0 < p < 6$ (b) $p = 6$

(c) $p = 0$ (d) $P \geq 6$

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (b) Linear equation will not be solution for $3x+y = 1$ and $px+2y = 5$

$\frac{3}{p} = \frac{1}{2} \neq \frac{1}{5} \left\{ \because \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \right\}$

$\Rightarrow p = 6$

61. The number of solutions of the pair of linear equations $x + 2y - 8 = 0$ and $2x + 4y = 16$ is

(a) 0 (b) 1

(c) infinite (d) 2

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (c)

(I) Unique solution will be equation of $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(II) No solution of equation $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(III) Infinite solution must be equation of $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Equation $x + 2y - 8 = 0$, $2x + 4y - 16 = 0$

Then $\frac{1}{2} = \frac{2}{4} = \frac{-8}{-16}$

$\boxed{\frac{1}{2} = \frac{1}{2} = \frac{1}{2}}$ So, the equation will have infinite solutions.

Type - 4

62. Find the value of

$$\frac{(4x^2 - 9y^2)^3 + (9y^2 - 49z^2)^3 + (49z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 7z)^3 + (7z - 2x)^3}$$

(a) (2x–3y)(3y–7z)(7z–2x)

(b) 42xyz(2x+3y)(3y+7z)(7z+2x)

(c) 42xyz(2x–3y)(3y–7z)(7z–2x)

(d) (2x+3y)(3y+7z)(7z+2x)

RRB Group-D 22/08/2022 (Shift-III)

Ans. (d) : From the question,

$$\frac{(4x^2 - 9y^2)^3 + (9y^2 - 49z^2)^3 + (49z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 7z)^3 + (7z - 2x)^3}$$

If $a + b + c = 0$ then $a^3 + b^3 + c^3 = 3abc$

$4x^2 - 9y^2 + 9y^2 - 49z^2 + 49z^2 - 4x^2 = 0$

$2x - 3y + 3y - 7z + 7z - 2x = 0$

Hence,

$$= \frac{3(4x^2 - 9y^2)(9y^2 - 49z^2)(49z^2 - 4x^2)}{3(2x - 3y)(3y - 7z)(7z - 2x)}$$

$$= \frac{(2x + 3y)(2x - 3y)(3y - 7z)(3y + 7z)(7z + 2x)(7z - 2x)}{(2x - 3y)(3y - 7z)(7z - 2x)}$$

$= (2x + 3y)(3y + 7z)(7z + 2x)$

63. Simplyfy $\frac{(5p - q)^2 - (3p - 2q)^2 - (q + 2p)^2}{13pq - 15p^2 - 2q^2}$

(a) 6p-3q (b) -6p+3q

(c) 6p+3q (d) -6p-3q

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (d) : $\frac{(5p - q)^3 + (-3p + 2q)^3 + (-q - 2p)^3}{-(15p^2 - 13pq + 2q^2)}$

$$= \frac{3(5p - q)(-3p + 2q)(-q - 2p)}{-(15p^2 - 10pq - 3pq + 2q^2)}$$

$$= \frac{3(5p - q)(-3p + 2q)(-q - 2p)}{-(3p - 2q)(5p - q)}$$

$$= \frac{-3(5p - q)(3p - 2q)(-q - 2p)}{-(3p - 2q)(5p - q)}$$

$= 3(-q - 2p)$

$= -3q - 6p$

$= -6p - 3q$

64. If $x + \frac{1}{x} = 3$ then find the value of $x^2 + \frac{1}{x^2}$

(a) 7 (b) 8

(c) 9 (d) 6

RRB Group-D 01/09/2022 (Shift-II)

Ans. (a) : $x + \frac{1}{x} = 3$

Squaring both side

$$\left(x + \frac{1}{x}\right)^2 = 9$$

$$x^2 + \frac{1}{x^2} + 2 = 9$$

$$x^2 + \frac{1}{x^2} = 7$$

65. If $p + q + r = 13$ and $pq + qr + rp = 30$, then the value of $p^3 + q^3 + r^3 - 3pqr$ is :

(a) 1125 (b) 1145

(c) 1027 (d) 1216

RRB Group-D 09/09/2022 (Shift-II)

Ans. (c) : $p + q + r = 13$

$pq + qr + rp = 30$

$p^3 + q^3 + r^3 - 3pqr = ?$

pulting $r = 0$ in equation

$p + q + 0 = 13$

$p + q = 13$ ..... (i)

$pq + q \times 0 + 0 \times p = 30 \Rightarrow p = 30$..... (ii)

$p^3 + q^3 + 0^3 - 3pq \times 0 = ?$

$p^3 + q^3 = ?$

from eq. (i) and (ii) $p = 10, q = 3$

$p^3 + q^3 = (10)^3 + 3^3$

$= 1000 + 27$

$= 1027$

Hence,

$p^3 + q^3 + r^3 - 3pqr = 1027$

66. If $x + \frac{1}{x} = 42$ then Find the value of $x^3 + \frac{1}{x^3}$.

(a) 74, 130 (b) 73,962

(c) 72,629 (d) 74,926

RRB Group-D 30/08/2022 (Shift-II)

Ans. (b) : $x + \frac{1}{x} = 42$ .....(i)

Squaring both side

$x^2 + \frac{1}{x^2} + 2 = (42)^2$

$x^2 + \frac{1}{x^2} = 1764 - 2$

$x^2 + \frac{1}{x^2} = 1762$.....(ii)

$x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2} - 1\right)$

From equntion (i) and (ii)-

$= (42)(1762 - 1)$

$= 42 \times 1761$

$= 73962$

67. If $a + b = 56$ and $(a - b)^2 = 496$ then find the product of a and b.

(a) 460 (b) 760

(c) 560 (d) 660

RRB Group-D 18/08/2022 (Shift-II)

Ans. (d) : Given,

$a + b = 56$

$(a - b)^2 = 496$

$\Rightarrow a + b = 56$

Squaring both side

$a^2 + b^2 + 2ab = 3136$

$a^2 + b^2 = 3136 - 2ab$

$\Rightarrow (a - b)^2 = 496$

$a^2 + b^2 - 2ab = 496$

$3136 - 2ab - 2ab = 496$

$3136 - 4ab = 496$

$4ab = 3136 - 496$

$4ab = 2640$

$ab = 660$

68. If $3x - 2y = 10$ and $xy = 11$ then find the value of $27x^3 - 8y^3$

(a) 2569 (b) 3336

(c) 3170 (d) 2980

RRB Group-D 18/08/2022 (Shift-II)

Ans. (d) : Given,

$3x - 2y = 10$

$xy = 11$

According to the question,

$27x^3 - 8y^3 = (3x)^3 - (2y)^3$

$= (3x - 2y)[(3x)^2 + (2y)^2 + 6xy]$

$= (3x - 2y)[(3x)^2 + (2y)^2 + 6xy + 12xy - 12xy]$

$= (3x - 2y)[(3x - 2y)^2 + 18xy]$

$= 10[(10)^2 + 18 \times 11]$

$= 10[100 + 198]$

$= 2980$

69. If $a + b = 48$ and $ab = 56$ then find the value of $a^3 + b^3$.

(a) 1,20,825 (b) 1,02,258

(c) 1,02,528 (d) 1,20,528

RRB Group-D 29/08/2022 (Shift-I)

Ans. (c) : Given

$a + b = 48, ab = 56$

Then

$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$= (a + b)((a + b)^2 - 3ab))$

$= 48 \times ((48)^2 - 3 \times 56)$

$= 48 \times 2136$

$= 102,528$

70. If $(a^2 - b^2) \div (a + b) = 25$ then the value of a-b is-

(a) 15 (b) 18

(c) 25 (d) 30

RRB RPF SI – 13/01/2019 (Shift-II)

Ans : (c) Given- $(a^2 - b^2) \div (a + b) = 25$

$$\frac{(a - b)(a + b)}{(a + b)} = 25$$

$$\boxed{a - b = 25}$$

71. If $x + y = 1$, then $x^3 + y^3 + 3xy - 1 = ?$

(a) 0 (b) 1

(c) 5 (d) 2

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (a) $x + y = 1$

On cubing both sides,

$(x+y)^3 = (1)^3$

$x^3 + y^3 + 3xy(x+y) = 1$ [$\because x + y = 1$]

$x^3 + y^3 + 3xy - 1 = 0$

72. Expand: $(c-3)^3$

(a) $c^3+9c^2+27c+27$ (b) $c^3-9c^2+27c-9$

(c) $c^3-9c^2+27c-27$ (d) $c^3-9c^2-27c-27$

RRB NTPC 30.03.2016 Shift : 2

Ans : (c) $(c-3)^3 = c^3 - 27 - 9c^2 + 27c$

$= c^3 - 9c^2 + 27c - 27$

$[\because (a-b)^3 = a^3 - b^3 - 3a^2b + 3ab^2]$

73. Expand : $(s + 2)^3$

(a) $s^3 + 3s^2 + 12s + 8$ (b) $s^3 + 3s^2 + 6s + 8$

(c) $s^3 + 6s^2 + 12s + 8$ (d) $s^3 + 6s^2 + 6s + 8$

RRB NTPC 29.03.2016 Shift : 3

Ans : (c) $(s + 2)^3 = s^3 + (2)^3 + 3 \times s \times 2 (s + 2)$

$= s^3 + 8 + 6s^2 + 12s$

$= s^3 + 6s^2 + 12s + 8$

74. If $a + b + c = 0$, then $(a^3 + b^3 + c^3)^2$ = ?

(a) $3a^2b^2c^2$ (b) $9a^2b^2c^2$

(c) 9abc (d) 27abc

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (b) According to the formula−

$a^3+b^3+c^3-3abc = (a + b + c)(a^2+b^2+c^2-ab-bc-ca)$

$\because$ Given− $(a + b + c) = 0$

$\therefore$ $a^3 + b^3 + c^3 - 3abc = 0\ (a^2 + b^2 + c^2 - ab - bc - ca)$

$a^3 + b^3 + c^3 - 3abc = 0$

$a^3 + b^3 + c^3 = 3abc$

Squaring on both side−

$(a^3 + b^3 + c^3)^2 = (3abc)^2$

$$\boxed{\left(a^3 + b^3 + c^3\right)^2 = 9a^2b^2c^2}$$

75. If $x^2 + 25y^2 = 10xy$, then x : y = ?

(a) 5 : 1 (b) 2 : 3

(c) 1 : 5 (d) 3 : 5

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

If $x^2 + 25y^2 = 10xy$ then,

$= x^2 + (5y)^2 - 2 \times x \times 5y = 0 \ldots\ldots ((a-b)^2 = a^2 + b^2 - 2ab)$

$(x - 5y)^2 = 0$

$x - 5y = 0$

$x = 5y$

$\frac{x}{y} = \frac{5}{1}$

Hence, x : y = 5 : 1

76. If x = 12 and y = 7, then the value of $\left(\frac{x^2 + y^2 - xy}{x^3 + y^3}\right)$ is-

(a) $\frac{1}{5}$ (b) $\frac{2}{19}$

(c) $\frac{1}{2}$ (d) $\frac{1}{19}$

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : x = 12 , y = 7

$$\frac{x^2 + y^2 - xy}{x^3 + y^3} = \frac{(12)^2 + (7)^2 - 12 \times 7}{(12)^3 + (7)^3}$$

$$= \frac{144 + 49 - 12 \times 7}{1728 + 343}$$

$$= \frac{193 - 84}{2071} = \frac{109}{2071} = \frac{1}{19}$$

77. Find the value of $a^2 + b^2 + c^2 - 2ab + 2ac - 2bc$, if a = x + y, b = x − y and c = 2x −1

(a) $(x - y - 1)^2$ (b) 0

(c) $(2x + 2y - 1)^2$ (d) $(2x - 2y - 1)^2$

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$a^2 + b^2 + c^2 - 2ab + 2ac - 2bc = (a - b + c)^2$

From question,

$(x + y - x + y + 2x - 1)^2$

(On putting the value of a, b and c)

$(2x + 2y - 1)^2$

78. If $x^4 + x^{-4} = 1154$, then the value of $x + x^{-1}$ is:

(a) 12 (b) 6

(c) 8 (d) 5

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (b) : $x^4 + x^{-4} = 1154$

or $x^4 + \frac{1}{x^4} = 1154$

On adding 2 both sides,

$$\left(x^2\right)^2 + \frac{1}{\left(x^2\right)^2} + 2 = 1156$$

$$\left(x^2 + \frac{1}{x^2}\right)^2 = 1156$$

$$x^2 + \frac{1}{x^2} = 34$$

On adding 2 both sides,

$$x^2 + \frac{1}{x^2} + 2 = 36$$

$$\left(x + \frac{1}{x}\right)^2 = 36$$

$$x + \frac{1}{x} = 6$$

or $x + x^{-1} = 6$

79. If $a + \frac{1}{a} = -6$ then find the value of $a^3 + \frac{1}{a^3}$.

(a) -198 (b) -216

(c) 216 (d) 198

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (a) : $a+\frac{1}{a}=-6$

On cubing both sides,

$$\left(a+\frac{1}{a}\right)^3=(-6)^3$$

$$a^3+\frac{1}{a^3}+3\times a\times\frac{1}{a}\left(a+\frac{1}{a}\right)=(-6)^3$$

$$a^3+\frac{1}{a^3}+3\left(a+\frac{1}{a}\right)=-216$$

$$a^3+\frac{1}{a^3}+3\times(-6)=-216$$

$$a^3+\frac{1}{a^3}=-216+18$$

$$a^3+\frac{1}{a^3}=-198$$

80. Select the value which is in the following expression will replace '?' If a+b+c = 0 then $a^3 + b^3 + c^3 = ? \times abc$

(a) 1 (b) 4
(c) 3 (d) 2

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (c) We know that

$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$ ---(i)

Given-

$a + b + c = 0$

$a^3 + b^3 + c^3 = ? \times abc$

$$\frac{a^3+b^3+c^3}{abc}=?$$ ---(ii)

Putting $a + b + c = 0$ in equation (i)

$a^3 + b^3 + c^3 - 3abc = 0$

$a^3 + b^3 + c^3 = 3abc$ ---(iii)

From equation (ii) and (iii)

$$\frac{3abc}{abc}=3$$

81. If a(a+b+c) = 45; b (a + b + c) = 75 and c (a+ b + c) = 105 then find the value of $a^2 + b^2 + c^2$.

(a) 83 (b) 225
(c) 625 (d) 90

RRB JE - 25/05/2019 (Shift-III)

Ans : (a) $a(a+b+c)=45$ .....(i)

$b(a+b+c)=75$ .....(ii)

$c(a+b+c)=105$ ..... (iii)

From equation (i) and (ii),

$$\frac{a}{b}=\frac{3}{5}$$ .....(iv)

From equation (ii) and (iii),

$$\frac{b}{c}=\frac{5}{7}$$ ..... (v)

From equation (iv) and (v),

$a : b : c = 3 : 5 : 7$

From eqation (i),

$3k(3 + 5 + 7)k = 45$

$45k^2 = 45$

$k^2 = 1$

$k = 1$

$\therefore\quad a^2 + b^2 + c^2 = 3^2 + 5^2 + 7^2$

$= 9 + 25 + 49$

$= 83$

82. If $x^{1/3} + y^{1/3} - z^{1/3} = 0$, then find the value of $(x + y - z)^3 + 27xyz$.

(a) $x^3 + y^3 - z^3$ (b) $-z^3$
(c) 1 (d) 0

RRB JE - 28/05/2019 (Shift-II)

Ans : (d) $x^{\frac{1}{3}}+y^{\frac{1}{3}}-z^{\frac{1}{3}}=0$

$$x^{\frac{1}{3}}+y^{\frac{1}{3}}=z^{\frac{1}{3}}\text{.....(i)}$$

Cube of both side

$$\left(x^{\frac{1}{3}}+y^{\frac{1}{3}}\right)^3=\left(z^{\frac{1}{3}}\right)^3$$

$$\left(x^{\frac{1}{3}}\right)^3+\left(y^{\frac{1}{3}}\right)^3+3x^{\frac{1}{3}}y^{\frac{1}{3}}\left(x^{\frac{1}{3}}+y^{\frac{1}{3}}\right)=z$$

From equation (i),

$$x+y+3x^{\frac{1}{3}}y^{\frac{1}{3}}z^{\frac{1}{3}}=z \qquad \left(\because x^{\frac{1}{3}}+y^{\frac{1}{3}}=z^{\frac{1}{3}}\right)$$

$$x+y-z=-3(xyz)^{\frac{1}{3}}$$

Again cube of both side,

$$(x+y-z)^3=\left[-3(xyz)^{\frac{1}{3}}\right]^3$$

$(x + y - z)^3 = -27xyz$

$(x + y - z)^3 + 27xyz = 0$

83. If a + b + c = 0, then find the value of $(b + c)^2/bc + (c + a)^2/ca + (a + b)^2/ab$.

(a) $a^2 + b^2 + c^2$ (b) $2(a + b + c)^2$
(c) 8 abc (d) 3

RRB JE - 31/05/2019 (Shift-III)

Ans : (d) $a + b + c = 0$

$a + b = -c$

$(a + b)^2 = c^2$

$$\frac{(a+b)^2}{ab}=\frac{c^2}{ab}$$ ----(i)

Similarly,

$$\frac{(b+c)^2}{bc}=\frac{a^2}{bc}$$ ----(ii)

$$\frac{(c+a)^2}{ca}=\frac{b^2}{ca}$$ ----(iii)

From equation (i) + equation (ii) + equation (iii)-

$$\frac{(a+b)^2}{ab}+\frac{(b+c)^2}{bc}+\frac{(c+a)^2}{ca}=\frac{c^2}{ab}+\frac{a^2}{bc}+\frac{b^2}{ca}$$

$$=\frac{c^3+a^3+b^3}{abc}$$

$$=\frac{3abc}{abc}$$

$$\frac{(a+b)^2}{ab}+\frac{(b+c)^2}{bc}+\frac{(c+a)^2}{ca}=3$$

84. If $a + b + c = 2s$, then find the value of $(s - a)^3 + (s - b)^3 + 3(s - a)(s - b)c$.

(a) 2s (b) c^2
(c) c^3 (d) ac

RRB JE - 01/06/2019 (Shift-II)

Ans : (c) $a + b + c = 2s$ -----(i)

$(s-a)^3+(s-b)^3+3(s-a)(s-b) = (s-a+s-b)^3$

$= (2s-a-b)^3$

$= (a+b+c-a-b)^3$

$= c^3$

85. $\dfrac{(a-b)^3+(b-c)^3+(c-a)^3}{3(a-b)(b-c)(c-a)} = ?$

What is the value of above expression?

(a) 1 (b) 4
(c) 0 (d) 2

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (a)

$$\frac{(a-b)^3+(b-c)^3+(c-a)^3}{3(a-b)(b-c)(c-a)} = ?$$

Let $a - b = A$

$b - c = B$

$c - a = C$

so $A + B + C = a - b + b - c + c - a$

$= 0$

$\therefore A^3 + B^3 + C^3 = 3ABC$

or

Formula- $(a-b)^3 + (b-c)^3 + (c-a)^3 = 3(a-b)(b-c)(c-a)$

so

$$= \frac{3(a-b)(b-c)(c-a)}{3(a-b)(b-c)(c-a)}$$

$= 1$

86. If $a+b+c = 16$ and $ab+bc+ca = 78$. Find the value of $a^3 + b^3 + c^3 - 3abc$.

(a) 218 (b) 352
(c) 320 (d) 220

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (b) : Given,

$a + b + c = 16$

$ab + bc + ca = 78$

$a^3 + b^3 + c^3 - 3abc = ?$

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

$(16)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

$(16)^2 - 2(ab + bc + ca) = a^2 + b^2 + c^2$

$256 - 2 \times 78 = a^2 + b^2 + c^2$

$256 - 156 = a^2 + b^2 + c^2$

$100 = a^2 + b^2 + c^2$

$a^3 + b^3 + c^3 - 3abc = (a + b + c)\{(a^2 + b^2 + c^2) - (ab + bc + ca)\}$

$16 \times (100 - 78)$

$\Rightarrow 16 \times 22$

$\Rightarrow 352$

87. If $a+b+c = 9$ and $a^2+b^2+c^2 = 29$ then find the value of $a^3 + b^3 + c^3 - 3abc$.

(a) 9 (b) 27
(c) 3 (d) 81

RRB Group-D – 31/10/2018 (Shift-I)

Ans : (b) If $a + b + c = 9$ $a^2 + b^2 + c^2 = 29$

then $a^3 + b^3 + c^3 - 3abc = ?$

Formula $= (a + b+c)^2 = a^2 + b^2 + c^2+2 (ab+bc+ca)$

$(9)^2 = 29 + 2 (ab + bc + ca)$

$81–29 = 2(ab+ bc + ca)$

$26 = (ab + bc + ca)$

Formula- $a^3+b^3+c^3–3abc =$

$(a+b+c)[(a^2+b^2+c^2)–(ab+bc+ca)]$

$= 9 (29–26)$

$= 9 \times 3$

$\boxed{a^3 + b^3 + c^3 - 3abc = 27}$

88. If $2x (x + y + z) = 250$, $2y (x + y + z) = 100$, $2z (x + y + z) = 100$ then find the value of $(3x + 6y + 15z)$.

(a) 110 (b) 95
(c) 85 (d) 69

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) $2x (x + y + z) = 250$ …… (1)

$2y (x +y+z) = 100$ …… (2)

$2z (x+y+z) = 100$ …….. (3)

Adding the equation of (1), (2) and (3)

$(x+y+z) (2x + 2y + 2z) = 450$

$2 (x + y+z)^2 = 450$

$(x+y+z)^2 = 225$

$x + y + z = 15$

$\therefore$ From equation (1), $x = \dfrac{250}{30} = \dfrac{25}{3}$

From equation (2), $y = \dfrac{100}{30} = \dfrac{10}{3}$

From equation (3), $z = \dfrac{100}{30} = \dfrac{10}{3}$

$\therefore 3x + 6y + 15z$

$= 3 \times \dfrac{25}{3} + 6 \times \dfrac{10}{3} + 15 \times \dfrac{10}{3} = 25 + 20 + 50 = 95$

89. If $a = 5$, $b = 4$, $c = 8$ then find the value of $(a^3 + b^3 + c^3 - 3abc)/ (ab + bc + ca - a^2 - b^2 - c^2)$.

(a) 15 (b) 17
(c) –17 (d) –15

RRB NTPC 19.04.2016 Shift : 2

Ans : (c) Given-

$a = 5, b = 4, c = 8$

$$\frac{a^3+b^3+c^3-3abc}{(ab+bc+ca-a^2-b^2-c^2)} = \frac{(a+b+c)(a^2+b^2+c^2-ab-bc-ca)}{-(a^2+b^2+c^2-ab-bc-ca)}$$

$= – (a+b+c) = – (5 + 4 + 8) = –17$

90. If $a^3 + b^3 + c^3 - 3abc = 0$ then find the value of $(a^2/bc + b^2/ac - 3)$.

(a) $–c^2/ab$ (b) $–c^2/bc$
(c) $–c^3/ba$ (d) $–c/a$

RRB NTPC 19.04.2016 Shift : 2

Ans : (a) Given-

$a^3 + b^3 + c^3 - 3abc = 0$ ……(i)

$\therefore \frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab} - 3 = 0$ (Divided by abc in both side)

$\frac{a^2}{bc} + \frac{b^2}{ca} - 3 = -\frac{c^2}{ab}$

$= \boxed{\frac{-c^2}{ab}}$

91. For real a, b and c if $a^2 + b^2 + c^2 = ab + bc + ca$, then find the value of $(a + b + c)^2$.

(a) $9a^2$ (b) $81a^2$

(c) $27a^2$ (d) $243a^2$

RRB NTPC 18.04.2016 Shift : 1

Ans : (a) Given–

$a^2 + b^2 + c^2 = ab + bc + ca$

Similarly $a^2 = ab$

$b^2 = bc$

$c^2 = ca$

So $a = b = c$ ----------(1)

So from the quesiton,

$\therefore (a + b + c)^2 = (a+a+a)^2$

$= 9a^2$

92. If $a^2 + b^2 + c^2 + 3 = 2(a + b + c)$ then the value of $(a + b + c)$.

(a) 2 (b) 5

(c) 4 (d) 3

RRB NTPC 12.04.2016 Shift : 1

Ans : (d) From the question,

$a^2 + b^2 + c^2 + 3 = 2(a + b + c)$

$\Rightarrow a^2 + b^2 + c^2 + 3 - 2(a + b + c) = 0$

$\Rightarrow (a^2 - 2a + 1) + (b^2 - 2b + 1) + (c^2 - 2c + 1) = 0$

$\Rightarrow (a-1)^2 + (b-1)^2 + (c-1)^2 = 0$

$\Rightarrow \therefore a - 1 = 0 \mid b - 1 = 0 \mid c - 1 = 0$

$a = 1 \mid b = 1 \mid c = 1$

$\therefore a + b + c = 1 + 1 + 1$

$= 3$

93. If $x^2 - 4x + 1 = 0$, what is the value of $x^2 + \frac{1}{x^2}$?

(a) 14 (b) 15

(c) 18 (d) 16

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (a) : $x^2 - 4x + 1 = 0$

$x - 4 + \frac{1}{x} = 0$ [On dividing by x in both sides]

$x + \frac{1}{x} = 4$ (On squiring on both sides)

$x^2 + \frac{1}{x^2} = 4^2 - 2$

$x^2 + \frac{1}{x^2} = 14$

94. If $a + b = 10$ and $a^2 + b^2 = 68$, find $a^3 + b^3$.

(a) 620 (b) 560

(c) 520 (d) 540

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (c) : Given,

$a + b = 10$

$a^2 + b^2 = 68$

Formula- $(a+b)^2 = a^2 + b^2 + 2ab$

$10^2 = 68 + 2ab$

$2ab = 100 - 68$

$ab = 16$

Formula- $a^3 + b^3 = (a+b)(a^2 + b^2 - ab)$

$a^3 + b^3 = 10(68 - 16)$

$a^3 + b^3 = 10 \times 52$

$\boxed{a^3 + b^3 = 520}$

95. If $x^4 + \frac{1}{x^4} = 194$, find $x^3 + \frac{1}{x^3}$

(a) 54 (b) 56

(c) 52 (d) 62

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (c) : Given,

$x^4 + \frac{1}{x^4} = 194, \quad x^3 + \frac{1}{x^3} = ?$

Let,

$x^4 + \frac{1}{x^4} = k_1$

$\therefore x^2 + \frac{1}{x^2} = \sqrt{k_1 + 2}$

$x^2 + \frac{1}{x^2} = \sqrt{194 + 2}$

$x^2 + \frac{1}{x^2} = 14 = k_2$

Again-

$x + \frac{1}{x} = \sqrt{k_2 + 2}$

$x + \frac{1}{x} = \sqrt{14 + 2}$

$x + \frac{1}{x} = 4$ ..... (I)

$\because \left(x + \frac{1}{x}\right)^3 = x^3 + \frac{1}{x^3} + 3x \times \frac{1}{x}\left(x + \frac{1}{x}\right)$

From equation (I)–

$4^3 = x^3 + \frac{1}{x^3} + 3 \times 4$

$x^3 + \frac{1}{x^3} = 64 - 12$

$\boxed{x^3 + \frac{1}{x^3} = 52}$

96. If x + y + z =0, then what will be the value of $\frac{x^2}{yz}+\frac{y^2}{zx}+\frac{z^2}{xy}$?

(a) 3 (b) $\frac{x^2y^2z^2}{x}$

(c) $\frac{3x^2+3y^2+3z^2}{x}$ (d) $x^2+y^2+z^2$

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (a) : Given: $x + y + z = 0$

$$\therefore \frac{x^2}{yz}+\frac{y^2}{zx}+\frac{z^2}{xy}=\frac{x^3+y^3+z^3}{xyz}$$

$$=\frac{3xyz}{xyz} \quad [\text{When } a+b+c=0 \text{ then } a^3+b^3+c^3=3abc]$$

$$=3$$

97. If $x = 2-\sqrt{3}$, then $x-\frac{1}{x}$ is

(a) $3\sqrt{3}$ (b) $-2\sqrt{3}$

(c) $5\sqrt{3}$ (d) $12-30\sqrt{3}$

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given,

$x = 2 - \sqrt{3}$

$$\frac{1}{x}=\frac{1}{2-\sqrt{3}}\times\frac{2+\sqrt{3}}{2+\sqrt{3}}=\frac{2+\sqrt{3}}{(2)^2-\left(\sqrt{3}\right)^2}=2+\sqrt{3}$$

$$x-\frac{1}{x}=2-\sqrt{3}-\left(2+\sqrt{3}\right)$$

$$= 2-\sqrt{3}-2-\sqrt{3}$$

$$=-2\sqrt{3}$$

98. The value of x that satisfying the equation $x^2 + a^2 = (b–x)^2$ is ?

(a) $\frac{b^2+a^2}{2b}$ (b) $\frac{a^2-b^2}{2b}$

(c) $\frac{b^2-a^2}{2a}$ (d) $\frac{b^2-a^2}{2b}$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : $x^2 + a^2 = (b - x)^2$

$x^2 + a^2 = b^2 + x^2 - 2bx$

$a^2 - b^2 = -2bx$

$b^2 - a^2 = 2bx$

$$\frac{b^2-a^2}{2b}=x$$

99. If a+b+c = 17, abc = 168, and ab+bc+ca = 94, then $a^3+b^3+c^3$ = ?

(a) 621 (b) 623

(c) 620 (d) 622

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b)

From formula- $(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$

$(17)^2 = a^2 + b^2 + c^2 + 2 \times 94$

$289 = a^2 + b^2 + c^2 + 188$

$289 - 188 = a^2 + b^2 + c^2$

$101 = a^2 + b^2 + c^2$

Again-

$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$a^3 + b^3 + c^3 - 3abc = (a+b+c)\{a^2+b^2+c^2-(ab+bc+ca)\}$

$a^3 + b^3 + c^3 - 3 \times 168 = 17(101-94)$

$a^3 + b^3 + c^3 - 504 = 17 \times 7$

$a^3 + b^3 + c^3 = 119 + 504$

$a^3 + b^3 + c^3 = 623$

100. If x > 1 and $x+\frac{1}{x}=\sqrt{29}$, what is the value of $x-\frac{1}{x}$?

(a) 3 (b) 4

(c) 5 (d) 2

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (c) $x+\frac{1}{x}=\sqrt{29}$

$x^2+\frac{1}{x^2}+2=29$ (On squaring of both sides)

$x^2+\frac{1}{x^2}=27$ _____(i)

$\left(x-\frac{1}{x}\right)^2=x^2+\frac{1}{x^2}-2$

$\left(x-\frac{1}{x}\right)^2=27-2$ (From equation (i))

$x-\frac{1}{x}=\sqrt{25}$

$\boxed{x-\frac{1}{x}=5}$

101. If x – y = 1, then the value of $x^3 – y^3 – 3xy$ will be:

(a) 2 (b) -1

(c) 0 (d) 1

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (d) $x - y = 1$

$x^3 - y^3 - 3xy = ?$

$(x-y)^3 = x^3 - y^3 - 3xy(x-y)$

$\Rightarrow (1)^3 = x^3 - y^3 - 3xy(1)$

$\Rightarrow x^3 - y^3 - 3xy = 1$

102. If $x = \sqrt{3} + \sqrt{2}$, then the value of $x^2 + \frac{1}{x^2}$ is:

(a) $2\sqrt{3}$ (b) 14

(c) 12 (d) 10

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) : $x = \sqrt{3} + \sqrt{2}$

$$\frac{1}{x} = \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} = \frac{\sqrt{3}-\sqrt{2}}{3-2} = \sqrt{3}-\sqrt{2}$$

Then, $\left(x + \frac{1}{x}\right) = \sqrt{3} + \sqrt{2} + \sqrt{3} - \sqrt{2} = 2\sqrt{3}$

$$\therefore \quad x^2 + \frac{1}{x^2} = \left(2\sqrt{3}\right)^2 - 2$$

$= 12 - 2 = 10$

103. Which of the following option is equivalent to?

$$\frac{\left(x^3 - y^3\right)\left(x^2 + 5x + 6\right)\left(x^4 - 16\right)}{\left(x - y\right)\left(x + 3\right)\left(x - 2\right)\left(x^2 + 4\right)}$$

(a) $\left(x^2 + y^2 - xy\right)$

(b) $(x^2 + y^2 + xy)(x + 2)^2$

(c) $(x^2 + y^2 - xy)(x + 2)^2$

(d) $(x + 2)^2$

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) :

$$\frac{\left(x^3 - y^3\right)\left(x^2 + 5x + 6\right)\left(x^4 - 16\right)}{\left(x - y\right)\left(x + 3\right)\left(x - 2\right)\left(x^2 + 4\right)}$$

From Formula- $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

and $a^2 - b^2 = (a + b)(a - b)$

$$\Rightarrow \frac{(x-y)\left(x^2+y^2+xy\right)\left(x^2+3x+2x+6\right)\left(x^2-4\right)\left(x^2+4\right)}{(x-y)(x+3)(x-2)\left(x^2+4\right)}$$

$$\Rightarrow \frac{\left(x^2+y^2+xy\right)(x+3)(x+2)(x-2)(x+2)}{(x+3)(x-2)}$$

$\Rightarrow (x^2 + y^2 + xy)(x + 2)^2$

104. If x satisfies the equation $x^2 - 2x + 1 = 0$, then the value of $x^3 - \frac{1}{x^3}$ is:

(a) 1 (b) –1

(c) 0 (d) $\frac{1}{3}$

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c) : $x^2 - 2x + 1 = 0$

$$x\left(x - 2 + \frac{1}{x}\right) = 0$$

$$x + \frac{1}{x} = 2$$

On putting, x = 1

$$1 + \frac{1}{1} = 2$$

$$x^3 - \frac{1}{x^3} = 1 - 1 = 0$$

105. If $p^2 + q^2 - r^2 = 0$, then the value of $p^6 + q^6 - r^6 \div p^2q^2r^2$, is:

(a) 3 (b) –3

(c) $\frac{1}{3}$ (d) 3pqr

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) $p^2 + q^2 - r^2 = 0$

then, $p^6 + q^6 - r^6 = -3\, p^2q^2r^2$

(If $a + b - c = 0$ then $a^3 + b^3 - c^3 = -3abc$)

$$\frac{p^6 + q^6 - r^6}{p^2q^2r^2} = \frac{-3p^2q^2r^2}{p^2q^2r^2} = -3$$

106. If $x^2y^2 + \frac{1}{x^2y^2} = 83$, then the value of $xy - \frac{1}{xy}$ is:

(a) 10 (b) 81

(c) 85 (d) 9

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : $x^2y^2 + \frac{1}{x^2y^2} = 83$

$$\because \quad \left(xy - \frac{1}{xy}\right)^2 = x^2y^2 + \frac{1}{x^2y^2} - 2$$

$$= 83 - 2 = 81$$

$$\therefore \quad xy - \frac{1}{xy} = 9$$

107. If $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = \sqrt{3}$ and $\frac{a}{x} + \frac{b}{y} + \frac{c}{z} = 0$ then, find the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2}$?

(a) 0 (b) $\sqrt{3}$

(c) 3 (d) 6

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$$\frac{a}{x} + \frac{b}{y} + \frac{c}{z} = 0$$

$$\Rightarrow \frac{1}{\frac{x}{a}} + \frac{1}{\frac{y}{b}} + \frac{1}{\frac{z}{c}} = 0 \qquad \text{Let}\left(\frac{x}{a} = p, \frac{y}{b} = q, \frac{z}{c} = r\right)$$

$$\Rightarrow \frac{1}{p} + \frac{1}{q} + \frac{1}{r} = 0$$

$$\Rightarrow \frac{qr+pr+pq}{pqr}=0$$

$$(qr+pr+pq)=0 \text{.....(i)}$$

$\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=\sqrt{3}$ Given,

On putting the value-

$\Rightarrow p+q+r=\sqrt{3}$

On squaring both sides,

$\Rightarrow p^2+q^2+r^2+2(pq+qr+pr)=(\sqrt{3})^2$

$\Rightarrow p^2+q^2+r^2+2\times 0=3$ ..... From equation (i)

$\Rightarrow p^2+q^2+r^2=3$

$\Rightarrow \frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=3$

108. What is the value of $8x^3 + 18xy + y^3 - 27$ when $2x + y - 3 = 0$.

(a) 27 (b) –27
(c) 0 (d) 1

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$2x + y - 3 = 0$

$(2x + y) = 3$…….. (i)

By cubing both sides,

$(2x + y)^3 = (3)^3$

$8x^3 + y^3 + 3\times 2x \times y(2x + y) = 27$

$8x^3 + y^3 + 3\times 2\times xy \times 3 = 27$

$[\because 2x + y = 3]$

$8x^3 + y^3 + 18xy - 27 = 0$

109. If $3a + 4b = 2$ and $ab = \frac{1}{36}$, then $27a^3 + 64b^3$ is,

(a) 6 (b) 4
(c) 8 (d) 2

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (a) : $3a + 4b = 2$

By cubing both sides,

$(3a+4b)^3 = 2^3$

$27a^3 + 64b^3 + 36ab\,(3a + 4b) = 8$

$27\ a^3 + 64b^3 + 36 \times \frac{1}{36} \times (2) = 8$

$27a^3 + 64b^3 = 6$

110. If $p = 5 - 2\sqrt{6}$, then fined the value of $p^2 + \frac{1}{p^2}$

(a) $\sqrt{6} - \sqrt{5}$ (b) 100
(c) $25 + \sqrt{6}$ (d) 98

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) : $p = 5 - 2\sqrt{6}$

$$\frac{1}{p}=\frac{1}{5-2\sqrt{6}}\times\frac{5+2\sqrt{6}}{5+2\sqrt{6}}=\frac{5+2\sqrt{6}}{25-24}=5+2\sqrt{6}$$

$$p+\frac{1}{p}=10$$

$$p^2+\frac{1}{p^2}=(10)^2-2=98$$

111. Solve the following :

$(x-y)^3+(y-z)^3+(z-x)^3=?$

(a) 3xyz
(b) (x – y) (y – z) (z – x)
(c) 3(x – y) (y – z) (z – x)
(d) (x + y + z) ($x^2 + y^2 + z^2$)

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (c) : $(x - y)^3 + (y - z)^3 + (z - x)^3$

$A^3 + B^3 + C^3 = (A + B + C)\,(A^2 + B^2 + C^2 - AB - BC - CA) + 3ABC$

$= \{(x - y) + (y - z) + (z - x)\}\ \{(x - y)^2 + (y - z)^2 + (z - x)^2 - (x - y)(y - z) - (y - z)(z - x) - (z - x)(x - y)\} + 3(x - y)(y - z)(z - x)$

$= 0\times\{(x - y)^2 + (y - z)^2 + (z - x)^2 - (x - y)(y - z) - (y - z)(z - x) - (z - x)(x - y)\} + 3(x - y)(y - z)(z - x)$

$= 3(x - y)(y - z)(z - x)$

112. If $a^2 + b^2 = 82$ and $ab = 9$, find the value of $a^3 + b^3$

(a) 750 (b) 730
(c) 720 (d) 830

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given-

$a^2 + b^2 = 82$

$ab = 9$

On adding 2ab both sides,

$a^2 + b^2 + 2ab = 82 + 2ab \qquad (\because ab = 9)$

$(a + b)^2 = 82 + 18$

$(a + b)^2 = 100$

$a + b = 10$

By cubing both sides

$(a + b)^3 = (10)^3$

$a^3 + b^3 + 3ab(a + b) = 1000$

$a^3 + b^3 + 3\times 9(10) = 1000$

$a^3 + b^3 = 1000 - 270$

$a^3 + b^3 = 730$

113. If $a^3 - b^3 = 625$, $a^2 - b^2 = 25$ and $a + b = 5$ then the value of $a^2 + ab + b^2$ is:

(a) 150 (b) 125
(c) 5 (d) 25

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : $a^3 - b^3 = 625$

$(a–b)\,(a^2 + b^2 + ab) = 625$ _____(i)

$(a + b) = 5$ _____(ii)

$a^2 - b^2 = 25$

$(a + b)\,(a - b) = 25$ _____(iii)

From equation (ii), $5(a - b) = 25$

$a - b = 5$ .....(iv)

From equation (i) and equation (iv),

$5\,(a^2 + b^2 + ab) = 625$

$a^2 + b^2 + ab = 125$

114. If $(x+1/x) = 3$ then find the value of $(x^3+1/x^3) \div (x^2+1/x^2)$

(a) 18/5 (b) 26/3

(c) 18/7 (d) 54/5

RRB RPF SI – 10/01/2019 (Shift-III)

Ans : (c) $x+\frac{1}{x}=3$

On squaring both sides,

$$\left(x+\frac{1}{x}\right)^2=(3)^2$$

$$x^2+\frac{1}{x^2}+2\times x\times\frac{1}{x}=9$$

$$x^2+\frac{1}{x^2}=7$$

$$x+\frac{1}{x}=3$$

By cubing both sides,

$$\left(x+\frac{1}{x}\right)^3=(3)^3$$

$$x^3+\frac{1}{x^3}+3\times x\times\frac{1}{x}\left(x+\frac{1}{x}\right)=27$$

$$x^3+\frac{1}{x^3}+3\times 3=27$$

$$x^3+\frac{1}{x^3}=27-9$$

$$x^3+\frac{1}{x^3}=18$$

$$\frac{x^3+\frac{1}{x^3}}{x^2+\frac{1}{x^2}}=\frac{18}{7}$$

115. If $x^{2n}+\frac{1}{x^{2n}}=k$, then find the value of $x^n-\frac{1}{x^n}$

(a) $k+2$ (b) $k-2$

(c) $\sqrt{k-2}$ (d) $\sqrt{k+2}$

RRB JE - 24/05/2019 (Shift-I)

Ans : (c)

$\because x^{2n}+\frac{1}{x^{2n}}=k$

$$\left(x^n-\frac{1}{x^n}\right)^2=x^{2n}+\frac{1}{x^{2n}}-2\times x^n\times\frac{1}{x^n}$$

$$\left(x^n-\frac{1}{x^n}\right)^2=k-2$$

$$\therefore\ \left(x^n-\frac{1}{x^n}\right)=\sqrt{k-2}$$

116. If $X-\frac{1}{X}=3$ then find the value of $X^4+\frac{1}{X^4}$

(a) 129 (b) 119

(c) 14 (d) 123

RRB JE - 24/05/2019 (Shift-III)

Ans : (b)

$$X-\frac{1}{X}=3$$

Squaring on both sides,

$$X^2+\frac{1}{X^2}-2=9$$

$$X^2+\frac{1}{X^2}=11$$

Again squaring on both sides,

$$X^4+\frac{1}{X^4}+2=121$$

$$X^4+\frac{1}{X^4}=119$$

117. If $x^3+y^3=9$ and $x+y=3$ then find the value of x^2+y^2

(a) 25 (b) 6

(c) 3 (d) 5

RRB JE - 26/05/2019 (Shift-II)

Ans : (d) Given - $x^3+y^3=9$, $x+y=3$

According to the question,

$(x+y)^3 = x^3+y^3+3xy\,(x+y)$

$(3)^3 = 9+3xy\times 3$

$27-9=9xy$

$9xy=18$

$\boxed{xy=2}$

$(x+y)^2 = x^2+y^2+2xy$

$(3)^2 = x^2+y^2+2\times 2$

$9-4=x^2+y^2$

$\boxed{x^2+y^2=5}$

118. If $a-\frac{1}{a}=7$ then $a^2+\frac{1}{a^2}=?$

(a) 52 (b) 50

(c) 49 (d) 51

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (d) Given–

$$a-\frac{1}{a}=7$$

Squaring on both sides,

$$a^2+\frac{1}{a^2}-2\times a\times\frac{1}{a}=49$$

$$a^2+\frac{1}{a^2}-2=49$$

$$a^2+\frac{1}{a^2}=49+2$$

$$a^2+\frac{1}{a^2}=51$$

119. If a is positive and $a^2 + \frac{1}{a^2} = 7$ then $a^3 + \frac{1}{a^3} = ?$

(a) 18 (b) $3\sqrt{7}$

(c) $7\sqrt{7}$ (d) 21

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (a) $a^2 + \frac{1}{a^2} = 7$ .....(i)

Adding 2 in both sides of equation (i),

$$a^2 + \frac{1}{a^2} + 2 \times a \times \frac{1}{a} = 7 + 2$$

$$\left(a + \frac{1}{a}\right)^2 = (3)^2$$

$$a + \frac{1}{a} = 3 \quad .....(ii)$$

Taking cube on both sides of equation (ii)

$$a^3 + \frac{1}{a^3} + 3a \times \frac{1}{a}\left(a + \frac{1}{a}\right) = 27$$

$$a^3 + \frac{1}{a^3} + 3 \times 3 = 27 \qquad (\because a + \frac{1}{a} = 3)$$

$$a^3 + \frac{1}{a^3} = 27 - 9$$

$$\boxed{a^3 + \frac{1}{a^3} = 18}$$

120. If $a + \frac{1}{a} = 5$ then find the value of $a^3 + \frac{1}{a^3}$?

(a) 140 (b) 110

(c) 120 (d) 130

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (b)

$$a + \frac{1}{a} = 5$$

$$a^3 + \frac{1}{a^3} = ?$$

Now $a + \frac{1}{a} = 5$

By cubing both sides–

$$a^3 + \frac{1}{a^3} + 3a \times \frac{1}{a}\left(a + \frac{1}{a}\right) = 125$$

$$a^3 + \frac{1}{a^3} + 3 \times 5 = 125$$

$$a^3 + \frac{1}{a^3} = 125 - 15$$

$$a^3 + \frac{1}{a^3} = 110$$

121. If $\left(a - \frac{1}{a}\right) = 6$ then $\left(a^4 + \frac{1}{a^4}\right) = ?$

(a) 34 (b) 1444

(c) 38 (d) 1442

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (d) Given that,

$$\left(a - \frac{1}{a}\right) = 6$$

Squaring on both sides,

$$a^2 + \frac{1}{a^2} - 2 = 36, \qquad a^2 + \frac{1}{a^2} = 38$$

Again on squaring both sides,

$$a^4 + \frac{1}{a^4} + 2 = 1444$$

$$a^4 + \frac{1}{a^4} = 1442$$

122. If $x^2 + \frac{2x}{5} + \frac{1}{25} = 0$ then $\left(x - \frac{2}{3}\right)^2 = ?$

(a) $\frac{1}{3}$ (b) $\frac{169}{225}$

(c) $\frac{44}{169}$ (d) $\frac{225}{256}$

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (b) : $x^2 + \frac{2x}{5} + \frac{1}{25} = 0$ then $\left(x - \frac{2}{3}\right)^2 = ?$

$$x^2 + \frac{2x}{5} + \frac{1}{25} = 0$$

$$25x^2 + 10x + 1 = 0$$

$$25x^2 + 5x + 5x + 1 = 0$$

$$5x(5x + 1) + 1(5x + 1) = 0$$

$$(5x + 1)(5x + 1) = 0$$

$$5x + 1 = 0$$

so $x = -\frac{1}{5}$

Hence $\left(x - \frac{2}{3}\right)^2 = \left(-\frac{1}{5} - \frac{2}{3}\right)^2$

$$= \left(-\frac{13}{15}\right)^2 = \frac{169}{225}$$

123. If $a + \frac{1}{a} = 8$, then $a^3 + \frac{1}{a^3} = ?$

(a) 500 (b) 488

(c) 536 (d) 512

RRB Group-D – 05/12/2018 (Shift-III)

Ans : (b) $a + \frac{1}{a} = 8$

On cubing both sides,

$$\left(a + \frac{1}{a}\right)^3 = (8)^3$$

$$a^3 + \frac{1}{a^3} + 3 \times a \times \frac{1}{a}\left(a + \frac{1}{a}\right) = 512$$

$$a^3 + \frac{1}{a^3} + 3 \times 8 = 512$$

$$a^3 + \frac{1}{a^3} = 512 - 24$$

$$a^3 + \frac{1}{a^3} = 488$$

124. If $a + \frac{1}{a} = -3$ then find the value of $a^6 + \frac{1}{a^6}$

(a) 36 (b) 322
(c) 729 (d) 18

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (b)

$$a + \frac{1}{a} = -3$$

Squaring on both sides,

$$\left(a + \frac{1}{a}\right)^2 = (-3)^2$$

$$a^2 + \frac{1}{a^2} + 2 = 9$$

$$a^2 + \frac{1}{a^2} = 7 \text{---------(I)}$$

By cubing both sides,

$$\left(a^2 + \frac{1}{a^2}\right)^3 = (7)^3$$

$$a^6 + \frac{1}{a^6} + 3a^2 \times \frac{1}{a^2}\left(a^2 + \frac{1}{a^2}\right) = 343 \text{ …From equation (I)}$$

$$a^6 + \frac{1}{a^6} = 343 - 21 = 322$$

125. If $x + y = 9, x^2 + y^2 = 41$, then find the value of $x^3 + y^3$

(a) 189 (b) 249
(c) 289 (d) 100

RRB Group-D – 15/11/2018 (Shift-III)

Ans. : (a) Given by-

$x + y = 9$
$x^2 + y^2 = 41$
$x^3 + y^3 = ?$
$(x + y)^2 = (9)^2$
$x^2 + y^2 + 2xy = 81$
$41 + 2xy = 81$
$xy = 20$
$(x + y)^3 = x^3 + y^3 + 3xy(x + y)$
$(9)^3 = x^3 + y^3 + 3 \times 20 \times 9$
$x^3 + y^3 = 729 - 540$
$x^3 + y^3 = 189$

126. If $\frac{x+1}{x} = 2$, then find the value of $x^2 + \frac{1}{x^2}$

(a) 5 (b) 4
(c) 1 (d) 2

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (d) Given -

$$\frac{x+1}{x} = 2$$

$$\therefore \quad 1 + \frac{1}{x} = 2$$

$$\frac{1}{x} = 2 - 1 = 1$$

$$\boxed{1 = x}$$

So $x^2 + \frac{1}{x^2} = (1)^2 + \frac{1}{(1)^2} = 1 + 1 = 2$

127. If $\frac{x-1}{x} = 3$, then what will be the value of $\frac{x^2+1}{x^2}$

(a) 3 (b) 11
(c) 9 (d) 7

RRB Group-D – 12/10/2018 (Shift-II)

Ans : (*) This question cancelled by RRB

$$\frac{x-1}{x} = 3 \Rightarrow 1 - \frac{1}{x} = 3 \Rightarrow x = -\frac{1}{2}$$

So, $$\frac{x^2+1}{x^2} = 1 + \frac{1}{x^2} = 1 + \frac{1}{\left(-\frac{1}{2}\right)^2}$$

It will be 1+4= 5 (which answer is not in options)

128. If $a - \frac{1}{a} = 10$, then what will be the value of $a^2 + \frac{1}{a^2}$

(a) 98 (b) 102
(c) 100 (d) 99

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (b) : Given–

$$a - \frac{1}{a} = 10$$

Squaring on both sides,

$$\left(a - \frac{1}{a}\right)^2 = (10)^2$$

$$\Rightarrow \quad a^2 + \frac{1}{a^2} - 2 = 100$$

$$\Rightarrow \quad a^2 + \frac{1}{a^2} = 100 + 2$$

$$\Rightarrow \quad a^2 + \frac{1}{a^2} = 102$$

129. If (a–1/a) = 3/4 then find the value of (a^3–1/a^3)

(a) 164/31 (b) 171/64
(c) 171/32 (d) 164/37

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) $a - \frac{1}{a} = \frac{3}{4}$

By cubing both sides,

$$\left(a - \frac{1}{a}\right)^3 = \frac{27}{64}$$

$$a^3 - \frac{1}{a^3} - 3\left(a - \frac{1}{a}\right) = \frac{27}{64}$$

$$a^3 - \frac{1}{a^3} - 3 \times \frac{3}{4} = \frac{27}{64}$$

$$a^3 - \frac{1}{a^3} = \frac{27}{64} + \frac{9}{4} = \frac{171}{64}$$

130. If $(x^2 + 1/x^2) = 6$ then find the value of $(10x - 10/x)$

(a) +/–15 (b) +/–20
(c) +/–30 (d) +/–40

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) $x^2 + \frac{1}{x^2} = 6$

On subtracting 2 in both sides,

$x^2 + \frac{1}{x^2} - 2 = 6 - 2$

$\left(x - \frac{1}{x}\right)^2 = 4$

$x - \frac{1}{x} = \pm 2$ (On multiplying the both side by 10)

$10x - \frac{10}{x} = \pm 20$

131. If $(x + 1/x) = 2$, then find the value of $(x^3 + 1/x^3) \div (x^{18} + 1/x^{18})$.

(a) 2/9 (b) 5
(c) 1 (d) 1/9

RRB NTPC 12.04.2016 Shift : 3

Ans : (c) From the question,

$x + \frac{1}{x} = 2$

$x^2 + 1 = 2x$

$x^2 - 2x + 1 = 0$

$(x - 1)^2 = 0$

$x - 1 = 0$

$x = 1$

Now

$$\frac{x^3 + \frac{1}{x^3}}{x^{18} + \frac{1}{x^{18}}} = \frac{1+1}{1+1} = \frac{2}{2} = 1$$

132. If $a^2 + \frac{1}{a^2} = 3$ then $a^3 + \frac{1}{a^3} = ?$

(a) $3\sqrt{5}$ (b) $2\sqrt{5}$
(c) $2\sqrt{3}$ (d) $3\sqrt{3}$

RRB ALP & Tec. (21-08-18 Shift-III)

Ans : (b) $\left(a + \frac{1}{a}\right)^2 = a^2 + \frac{1}{a^2} + 2$

$\left(a + \frac{1}{a}\right)^2 = 3 + 2 \quad \left[\because a^2 + \frac{1}{a^2} = 3\right]$

$a + \frac{1}{a} = \sqrt{3+2} = \sqrt{5}$

$a^3 + \frac{1}{a^3} = \left(a + \frac{1}{a}\right)^3 - 3\left(a + \frac{1}{a}\right)$

$= \left(\sqrt{5}\right)^3 - 3 \times \sqrt{5}$

$= 5\sqrt{5} - 3\sqrt{5} = 2\sqrt{5}$

So $\boxed{a^3 + \frac{1}{a^3} = 2\sqrt{5}}$

Type - 5

133. Simplify: $x(2x–5) + 6(x^2–4) + 18$

(a) $8x^2 – 5x + 6$
(b) $8x^2 + 5x + 6$
(c) $8x^2 – 5x – 6$
(d) $8x^2 + 5x – 6$

RRB Group-D 29/08/2022 (Shift-II)

Ans. (c) : $x(2x – 5) + 6(x^2 – 4) + 18$
$= 2x^2 – 5x + 6x^2 – 24 + 18$
$= 8x^2 – 5x – 6$

134. If polynomials $4x^3 + ax^2 – 3x + 1$ and $x^4 + x^3 – x^2 + 6$ leave the same remainder when each is divided by (x+1), then the value of a is:

(a) 4 (b) –1
(c) 5 (d) 9

RRB NTPC 15.03.2021 (Shift-II) Stage Ist

Ans. (c) : $4x^3+ax^2–3x+1$ _____(i)
$x^4+x^3–x^2+6$ _____(ii)

According to the question-

$4x^3+ ax^2–3x+1 = x^4+x^3–x^2+6$

On putting the value of x = –1

$4 (–1)^3+ a(–1)^2– 3(–1)+1 = (–1)^4+(–1)^3–(–1)^2+6$

$\Rightarrow –4+a+3+1=1–1–1+6$

$\Rightarrow a = 5$

135. If the polynomial $6x^4+8x^3+17x^2+21x+7$ is divided by another polynomial $3x^2+4x+1$, the remainder comes out to be ax + b, find a and b

(a) a = 1; b = 3 (b) a = 3; b = 1
(c) a = 1; b = 1 (d) a = 1; b = 2

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) According to the question,

$$\begin{array}{r} 2x^2+5 \\ 3x^2+4x+1 \overline{)\ 6x^4+8x^3+17x^2+21x+7} \\ \underline{6x^4+8x^3+2x^2} \\ 15x^2+21x+7 \\ \underline{15x^2+20x+5} \\ x+2 \end{array}$$

Remainder = x + 2 ... (1)
Given remainder is = ax + b ...(2)
On comparing equation (1) and equation (2)
a = 1; b = 2

136. What will be the remainder when $27x^3 –9x^2 + 3x – 8$ is divided by 3x + 2

(a) –22 (b) +22
(c) +16 (d) –16

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (a) $27x^3 –9x^2 + 3x – 8$,

$3x + 2 = 0$

$3x = –2$

Then, $x = \frac{–2}{3}$

So $27\left(\frac{-2}{3}\right)^3 - 9\left(\frac{-2}{3}\right)^2 + 3\left(\frac{-2}{3}\right) - 8$

$\Rightarrow 27\left(\frac{-8}{27}\right) - 9\left(\frac{4}{9}\right) + 3\left(\frac{-2}{3}\right) - 8$

$\Rightarrow -8 - 4 - 2 - 8$

$\Rightarrow -22$

137. If $2x^m + x^3 - 3x^2 - 26$ is divided by x–2, the remainder 994 is left, find the value of 'm'

(a) 10 (b) 9

(c) 11 (d) 8

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (b)

On dividing $2x^m + x^3 - 3x^2 - 26$ by x–2, remainder is 994 or (x–2) a factor of equation is given

so $x - 2 = 0$

Putting in equation, $x = 2$

$2 \times 2^m + 8 - 12 - 26 = 994$

$2 \times 2^m = 1024$

$2^m = 512$

$2^m = 2^9$

$\boxed{m = 9}$

138. On dividing $2x^2 + ax + b$ by $x - 3$, then remainder is 31 and on dividing $x^2 + bx + a$ by $x - 3$, the remainder is 24 then the value of a + b will be equal to-

(a) -7 (b) 23

(c) -23 (d) 7

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (d) : $2x^2 + ax + b$ ..... (i)

$x^2 + bx + a$ ..... (ii)

Dividing to both equations from (x–3) left remainder is 31 and 24 respectively.

So a factor of both equation is (x-3)

$\therefore$ Putting x = 3 in both equation

From equation (i)

$2 \times 9 + a \times 3 + b = 31$

$3a + b = 13$ .....(iii)

From equation (ii),

$9 + 3b + a = 24$

$a + 3b = 15$ ..... (iv)

Equation (iv) × 3

$3a + 9b = 45$ ....(v)

Subtracting equation (iii) from equation (v)–

$3a + 9b = 45$

$3a + b = 13$

$- \quad - \quad -$

$8b = 32$

$\boxed{b = 4}$

Putting the value of b in equation (iii)

$3a + 4 = 13$

$3a = 9$

$\therefore \boxed{a = 3}$

So $\boxed{a + b = 7}$

139. On dividing $4x^6 - 5x^3 - 3$ by $x^3 - 2$, the remainder left is-

(a) 3 (b) 0

(c) 1 (d) 2

RRB Group-D – 20/09/2018 (Shift-II)

Ans : (a) Divide $4x^6 - 5x^3 - 3$ to $x^3 - 2$

$x^3 - 2 = 0$

$x = (2)^{\frac{1}{3}}$

Putting the value of x in equation

$= 4 \times \left[(2)^{\frac{1}{3}}\right]^6 - 5\left[(2)^{\frac{1}{3}}\right]^3 - 3$

$= 4 \times 2^2 - 5 \times 2 - 3 = 16 - 10 - 3 = 3$

So, the remainder left is 3.

140. When $x^2 + ax + b$ is divided by $x - 7$ the remainder left is 35 and when $x^2 + bx + a$ is divided by x - 7, the remainder left is 31. Then a + b is equal to-

(a) 3 (b) 4

(c) –3 (d) –4

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (d) Divide $x^2 + ax + b$ from $x - 7$ remainder = 35

Putting, $x = 7$

$(7)^2 + 7a + b = 35$

$7a + b = 35 - 49$

$7a + b = -14$ -------(i)

Again divide $x^2 + bx + a$ from $x - 7$ remainder = 31

Putting, $x = 7$

$(7)^2 + 7b + a = 31$

$a + 7b = 31 - 49$

$a + 7b = -18$ -------(ii)

Adding equation (i) and (ii) –

$7a + b = -14$

$a + 7b = -18$

$8a + 8b = -32$

$8(a + b) = -32$

$\boxed{a + b = -4}$

141. If $2x^2 + ax + b$ is divided by x – 3, leaves a remainder of 35 and when $2x^2 + bx + a$ is divided by x – 3, leaves a remainder of 29, then the value of a + b will be-

(a) -7 (b) -23

(c) 7 (d) 23

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (c) $2x^2 + ax + b = 35$ ____ (i)

$2x^2 + bx + a = 29$ _____ (ii)

On putting x = 3 in equation (i) and (ii)

$\Rightarrow 18 + 3a + b = 35$

$\Rightarrow 3a + b = 17$ _____ (iii)

$\Rightarrow 18 + 3b + a = 29$

$\Rightarrow 3b + a = 11$ _____ (iv)

Adding equation (iii) and (iv)

$4a + 4b = 28$

$a + b = \frac{28}{4} = 7$

$a + b = 7$

142. If the value for k for which $x^2 + 5kx + k^2 + 5$, is completely divisible by x+2 but not divisible by x+3

(a) neither 1 nor 9 (b) both 1 and 9
(c) 1 (d) 9

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (d) : $x^2+5kx+k^2 + 5$, is completely divisible by x + 2

$\therefore$ Putting x = –2 remainder = 0

$(-2)^2 + 5k(-2) + k^2 + 5 = 0$

$4 - 10k + k^2 + 5 = 0$

$k^2 - 10k + 9 = 0$

$(k - 9)(k - 1) = 0$

$\therefore$ k = 9, 1

Putting k = 9

$= x^2 + 45x + 81 + 5$

$= x^2 + 45x + 86$

$= x(x + 43) + 2(x + 43)$

$= (x + 43)(x + 2)$

Putting k = 1

$= x^2 + 5x + 1 + 5$

$= x^2 + 5x + 6$

$= (x + 3)(x + 2)$

But from (x+3) is not divisible

$\therefore$ k = 9

143. If $2x^2+ax+2b$, is when divided by x - 1, leaves remainder 16 and when $x^2+bx+2a$ is divided by x + 1, leaves remainder -1 then a+b is equal to-

(a) -8 (b) -14
(c) 14 (d) 8

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : In these questions which to divide out of that, keep the value of x in equation and write a remainder equal to new equation

$2x^2 + ax + 2b$

Putting x–1 = 0, x = 1

$\therefore \quad 2(+1)^2 + a \times (1) + 2b = 16$

$2 + a + 2b = 16$

$a + 2b = 14$ _____ (i)

$x^2 + bx + 2a$

$x + 1 = 0$

Putting x = (-1)

Again $(-1)^2 + b(-1) + 2a = -1$

$2a - b = -2$ _____(ii)

Equation (i) + equation (ii) × 2

$a + 2b = 14$

$4a - 2b = -4$

$5a = 10$

$\boxed{a = 2}$

Putting the value of a in equation (i)

$2+2b = 14$

$2b = 12$

$\boxed{b = 6}$

$a + b = 2 + 6$

$= 8$

144. If $3x^2 + ax + 4$, is completely divisible by x – 8 then the value of 'a' will be-

(a) –24.5 (b) 25.5
(c) 24.5 (d) –25.5

RRB Group-D – 28/09/2018 (Shift-I)

Ans : (a) $3x^2 + ax + 4 = 0$

$x - 8 = 0, \Rightarrow x = 8$

Putting, x = 8 in given equation,

$\Rightarrow 3 \times 64 + a \times 8 + 4 = 0$

$\Rightarrow 192 + 8a + 4 = 0$

$\Rightarrow 8a = -192 - 4$

$\Rightarrow 8a = -196$

$a = \frac{-196}{8} = -24.5$

$a = -24.5$

145. If $4x^3 - 2x^2 + 5x - 8$ is divided by (x–2) then the remainder will be -

(a) 16 (b) 26
(c) 42 (d) 81

RRB Group-D – 16/10/2018 (Shift-II)

Ans : (b) Divide if $4x^3 - 2x^2 + 5x - 8$ from (x–2)

Putting x = 2 in expression $4x^3 - 2x^2 + 5x - 8$

Remainder-

$= 4 \times (2)^3 - 2 \times (2)^2 + 5 \times 2 - 8$

$= 4 \times 8 - 2 \times 4 + 10 - 8$

$= 32 - 8 + 2$

$= \boxed{26}$

146. Find the value of 'A' when the polynomial is P (x) = $x^3 + 3x^2 - 2Ax + 3$ Where 'A' is the constant which divided by $x^2 + 1$ the remainder is equal to -5x

(a) 3 (b) -2
(c) 2 (d) -3

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (c) Polynomial P (x) = $x^3+3x^2-2Ax+3$

Remainder on divident = -5x

So $x^2 + 1 = 0$

Putting the value of $x^2 = -1$ in polynomial

P (x) = $-x^2x + 3x^2 - 2Ax + 3$

$(-1) \times x + 3 \times (-1) - 2Ax + 3 = -5x$

$-x - 3 - 2Ax + 3 = -5x$

$-2Ax = -4x$

A = 2

147. When $3x^2 + 2ax + 4b$ is divided by x + 3, leaves a remainder of 15 and when $2x^2 + 3bx + 5a$ is divided by x-3, leaves a remainder 65 then the value of a+b is.

(a) 9 (b) 6
(c) 7 (d) 11

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (c) : First expression = $3x^2 + 2ax + 4b$

Second expression = $2x^2 + 3bx + 5a$

Divide first expression from x + 3 left remainder is 15

$x + 3 = 0$

Putting in first expression x = -3

$3 \times (-3)^2 + 2a \times (-3) + 4b = 15$

$27 - 6a + 4b = 15$

$3a - 2b = 6$ .....(i)

Divide second expression from x – 3 left remainder is 65

$x - 3 = 0$

$x = 3$ Putting in second expression

$2(3)^2 + 3b(3) + 5a = 65$

$18 + 9b + 5a = 65$

$5a + 9b = 47$ .....(ii)

equation (i) × 9 + equation (ii) × 2

$27a - 18b = 54$

$10a + 18b = 94$

$37a = 148$

$a = 4$

Putting the value of a in equation (i)

$3a - 2b = 6$

$3 \times 4 - 2b = 6$

$12 - 6 = 2b$

$6 = 2b$

$b = 3$

So b = 3

Then $a + b = 4 + 3 = 7$

148. On dividing $4x^6 - 5x^3 - 3$ by $x^3 - 2$, leaves a remainder.

(a) 3 (b) 2

(c) 0 (d) 1

RRB Group-D – 02/11/2018 (Shift-II)

Ans. (a) According to the question,

$$x^3-2 \overline{)\ 4x^6-5x^3-3\ (\ 4x^3+3}$$

$4x^6 - 8x^3$ (− +)

$3x^3 - 3$

$3x^3 - 6$ (− +)

3

So remainder will be 3

149. If $3x^2 + ax - 12$ is completely divisible by x-8 then the value of 'a' is-

(a) -24.5 (b) 22.5

(c) 24.5 (d) -22.5

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (d) $3x^2 + ax - 12$ .....(i)

Equation (i) is totally divisible by x – 8

∴ Putting, x = 8 in equation (i)

$3 \times (8)^2 + a \times 8 - 12 = 0$

$3 \times 64 + 8a - 12 = 0$

$8a = 12 - 192$

$8a = -180$

$a = -22.5$

150. If $3x^2 + ax + 7$ is completely divisible by x-1 then the value of 'a' is-

(a) –10.6 (b) –10.5

(c) –10 (d) –3

RRB Group-D – 12/11/2018 (Shift-II)

Ans : (c)

Equation $3x^2 + ax + 7$ is divisible by x – 1

Then $x - 1 = 0$

Putting x = 1

$\Rightarrow$ $3(1)^2 + a(1) + 7 = 0$

$\Rightarrow$ $3 + a + 7 = 0$

$\boxed{a = -10}$

151. If $4x^3 - 2x^2 + 5x - 8$ is divided by (x–2) then the remainder is-

(a) 43 (b) 16

(c) 26 (d) 25

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (c) $x - 2 = 0$

$x = 2$

putting the value of x in given expression -

Remainder $= 4(2)^3 - 2(2)^2 + 5 \times 2 - 8$

$= 4 \times 8 - 2 \times 4 + 5 \times 2 - 8$

$= 32 - 8 + 10 - 8 = 42 - 16 = 26$

So remainder = 26

152. If $x^2 + ax + b$, divided by x – 3, then the remaining 22 is obtained and the expression $x^2 + bx + a$, when divided by x – 3 then the remaining 24 is obtained. What is the value of a+b?

(a) 23 (b) – 23

(c) – 7 (d) 7

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (d) Left remainder is 22 if divide x^2+ax+b to x-3

∴ $x^2 + ax + b = 22$ (putting x = 3)

$9 + 3a + b = 22$

$3a + b = 13$ ....(i)

Left remainder is 24 if divide x^2+ax+b to x – 3

$x^2 + bx + a = 24$ (Putting x = 3)

$9 + 3b + a = 24$

$3b + a = 15$ ....(ii)

From equation (i) + (ii)

$4(a + b) = 28$

$a + b = \frac{28}{4}$

$\boxed{a + b = 7}$

153. If $x^2 + ax + b$, when divided by x – 4, left a remainder of 32 and $x^2 + bx + a$, when divided by x–4, left a remainder of 35, then a + b = ?

(a) –7 (b) 23

(c) –23 (d) 7

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (d)

Left remainder is 32 from $x^2 + ax + b \div (x - 4)$

Putting, x = 4

$(4)^2 + 4a + b - 32 = 0$

$\Rightarrow$ $16+4a+b-32 = 0$

$\Rightarrow$ $4a+b = 16$ ..... (i)

And left remainder is 35 from $(x^2+bx+a) \div (x-4)$

Putting, x = 4 in given equation,

$(4)^2 + b \times 4 + a - 35 = 0$

$16 + 4b + a - 35 = 0$

$4b + a - 19 = 0$

$4b+a = 19$ ..... (ii)

Adding equation (i) + (ii)

$5a+5b = 16+19$

$5(a+b) = 35$

$a+b = 7$

154. If $x^2 + ax + b$, divided by x+3 then the remaining – 1 is obtained and the expression $x^2 + bx + a$ when divided by x – 3 then the remaining 39 is obtained. What is the value of a+b?

(a) – 14 (b) – 38
(c) 14 (d) 38

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (c) $x^2 + ax + b = -1$
Putting x = –3
$9 – 3a + b = –1$
$b – 3a = –10$ ..... (1)
$x^2 + bx + a = 39$
Putting x = 3
$9 + 3b + a = 39$
$3b + a = 30$ ..... (2)
Solving equation (1) and (2)
a = 6, b = 8
a + b = 6 + 8 = 14

Type - 6

155. The factorisation of $x^2 + 11xy + 24y^2$ is :

(a) (x - 8y) (x - 3y) (b) (x + 8y) (x - 3y)
(c) (x + 8y) (x + 3y) (d) (x - 8y) (x + 3y)

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c)
$\Rightarrow x^2 + 11xy + 24y^2$
$\Rightarrow x^2 + 8xy + 3xy + 24y^2$
$\Rightarrow x(x + 8y) + 3y(x + 8y)$
$\Rightarrow (x + 8y)(x + 3y)$

156. If (2x-1) is a factor of $2x^4 - 7x^3 + x + k = 0$, then find the value of 'k'.

(a) $\frac{1}{4}$ (b) $-\frac{5}{12}$
(c) 0 (d) $-\frac{1}{4}$

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question-
$2x^4 – 7x^3 + x + k = 0$ **...** (1)
$\because$ Equation (1) is divisible by (2x – 1)
Hence, $2x – 1 = 0 \Rightarrow x = \frac{1}{2}$
On putting the value of x in equation .....(i)

$$2\times\left(\frac{1}{2}\right)^4 – 7\times\left(\frac{1}{2}\right)^3 + \frac{1}{2} + k = 0$$

$$\frac{1}{8} – \frac{7}{8} + \frac{1}{2} + k = 0$$

$$–\frac{2}{8} = –k$$

$$\boxed{k = \frac{1}{4}}$$

157. If $x^2 - 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, then which of the following is a possible relation between the coefficients of powers of x.

(a) b + c + d = a + e (b) a + b + c = d + e
(c) a + b + e = c + d (d) a + c + e = b + d

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : $x^2 – 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e = 0$
On putting the value of x = –1
$a(–1)^4 + b(–1)^3 + c(–1)^2 + d(–1) + e = 0$
$a – b + c – d + e = 0$
$\boxed{a + c + e = b + d}$

158. If (4y – 1) and (y + 4) both are factors of $py^2 + 15y – q$ then:

(a) p = 4q (b) $p = \frac{q}{4}$
(c) p = q (d) p = –q

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : Given-
(4y–1) and (y+4) both the factors of $py^2 + 15y – q$.
$4y – 1 = 0$ $y + 4 = 0$
$4y = 1$ $y = –4$
$y = \frac{1}{4}$

On putting $y = \frac{1}{4}$ in the expression

$$p\times\left(\frac{1}{4}\right)^2 + 15\times\left(\frac{1}{4}\right) – q = 0$$

$$\frac{p}{16} + \frac{15}{4} – q = 0$$

$$\frac{p + 60 – 16q}{16} = 0$$

$16q – p = 60$ ……(i)
On putting y = – 4 in the expression
$p \times (– 4)^2 + 15 \times (–4) – q = 0$
$16p – 60 – q = 0$
$16p – q = 60$ .....(ii)
From equation (i) and (ii)
$16q – p = 16p – q$
$17q = 17p$
q = p
Hence option (c) is true.

159. If (x + 1) and (x + 2) are factors of $ax^3 + 3x^2 + bx$ then the values of a and b are-

(a) a = 2 and b = 3 (b) a = 3 and b = 2
(c) a = 2 and b = 1 (d) a = 1 and b = 2

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (d) : Given Expression
$ax^3 + 3x^2 + bx = 0$ ...(i)
$\because (x + 1)$ is factor of given expression then x + 1 = 0
$\Rightarrow$ Putting x = –1 in equation (i)
$–a + 3 – b = 0 \Rightarrow a + b = 3$...(ii)
And, (x + 2) = 0
{$\because$ (x+2), is factor of expression}
$\Rightarrow$ Putting x = –2 in equation (i),
$–8a + 12 – 2b = 0 \Rightarrow 4a + b = 6$ ...(iii)

From equation (iii) and (ii)
$\Rightarrow a = 1$
Putting the value of a in equation (ii)
$1 + b = 3 \Rightarrow b = 3 - 1$
$\Rightarrow b = 2$

160. Which of the following is a factor of the polynomial $x^2 - x - 20$?
(a) x - 4 (b) x - 5
(c) x + 2 (d) x + 5
RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) Given,
$x^2 - x - 20$
$= x^2 - 5x + 4x - 20$
$= x(x-5) + 4(x-5)$
$= (x-5)(x+4)$
Hence (x–5) is a factor of given polynomial.

161. If $(x^4 - 2x^3 + 3x^2 - x + k)$ is a multiple of $(x - 3)$ then value of k is
(a) 51 (b) –51
(c) 165 (d) –165
RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (b) : $x^4 - 2x^3 + 3x^2 - x + k$,
(x – 3) is a factor of the given expression,
$\therefore$ On putting, x = 3
$\Rightarrow (3)^4 - 2\times(3)^3 + 3(3)^2 - 3 + k = 0$
$\Rightarrow 81 - 54 + 27 - 3 + k = 0$
$\Rightarrow 51 + k = 0$
$\Rightarrow k = -51$

162. Factors of $x^2 + 7x + 10$ are.
(a) (x – 5) (x – 2) (b) (x + 5) (x + 2)
(c) (x – 5) (x + 2) (d) (x – 4) (x + 2)
RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (b) Factor of $x^2 + 7x + 10$
$= x^2 + 5x + 2x + 10$
$= x(x+5) + 2(x+5)$
$= (x+5)(x+2)$

163. $x^3+5x^2-2x-24$ has a zero x=2. Find the other zero.
(a) -3, 5 (b) -2, 3
(c) -3, -4 (d) 3, 4
RRB JE - 24/05/2019 (Shift-III)

Ans : (c) (x-2) is a factor of $x^3 + 5x^2 - 2x - 24$
$x^2(x-2) + 7x^2 - 2x - 24 = 0$
$x^2(x-2) + 7x(x-2) + 12x - 24 = 0$
$x^2(x-2) + 7x(x-2) + 12(x-2) = 0$
$(x^2 + 7x + 12)(x-2) = 0$
$(x+4)(x+3)(x-2) = 0$
$x = -4, -3, 2$

164. If (x – 1) and (x + 3), is factor of $x^2 + ax + b$, then find the value of 'a' and 'b' respectively.
(a) 2, 3 (b) 2, – 3
(c) –2, –3 (d) –2, 3
RRB JE - 25/05/2019 (Shift-I)

Ans. (b) Equation x^2+ax+b has a factor of (x–1) and (x+3)
$(x-1)(x+3) = x^2 + ax + b$
$x^2 + 3x - x - 3 = x^2 + ax + b$
$x^2 + 2x - 3 = x^2 + ax + b$
On comparing of both sides
$a = 2 \quad b = -3$

165. What is the square root of $(x^2+4x+4)(x^2+6x+9)$
(a) (2x + 3) (x + 3) (b) (x + 2) (x+3)
(c) (x + 2) (2x + 3) (d) (x+2) (x+4)
RRB Group-D – 31/10/2018 (Shift-II)

Ans : (b) $(x^2 + 4x + 4)(x^2 + 6x + 9)$
On comparing with $(a^2 + 2ba + b^2)(a^2 + 2.a.b + b^2)$
$(a+b)^2 (a+b)^2$
$\{(x^2 + 2.2x + (2)^2\}\ \{(x^2 + 2.3.x + (3)^2\}$
$(x+2)^2 (x+3)^2$
Square root = $\boxed{(x+2)(x+3)}$

166. Find the factors of $(x^2 + x - 42)$
(a) (x+14) (x–3) (b) (x+6) (x–7)
(c) (x–6) (x+7) (d) (x–14) (x+3)
RRB NTPC 30.03.2016 Shift : 1

Ans : (c) $x^2 + x - 42$
$= x^2 + 7x - 6x - 42$
$= x(x+7) - 6(x+7)$
$= (x-6)(x+7)$

167. Select the correct factor of $f(x) = 2x^2 - 5x + 2$
(a) x – 2 (b) x – 3
(c) x – 4 (d) x –5
RRB RPF Constable – 20/01/2019 (Shift-III)

Ans : (a) $f(x) = 2x^2 - 5x + 2$
$= 2x^2 - 4x - x + 2$
$= 2x(x-2) - 1(x-2)$
$= (2x-1)(x-2)$

168. If the factor of $3x^4 - (a+2)x^3 - x^2 - 4$ is (x-2), then find the value of 'a'
(a) 5 (b) -1
(c) 3 (d) 4
RRB NTPC 22.04.2016 Shift : 1

Ans : (c) Given -
Factor of $3x^4 - (a+2)x^3 - x^2 - 4 = (x-2)$
$\because$ x -2, is a factor
$\therefore \quad x - 2 = 0 \Rightarrow x = 2$
$\Rightarrow 3\times(2)^4 - (a+2)\times(2)^3 - (2)^2 - 4 = 0$
$\Rightarrow 3\times16 - (a+2)\times8 - 4 - 4 = 0$
$\Rightarrow 48 - 8a - 16 - 8 = 0$
$\Rightarrow 24 - 8a = 0$
$\Rightarrow 8a = 24$
$\Rightarrow a = \frac{24}{8}$
$\Rightarrow \boxed{a = 3}$

169. Factors of $x^2 - 8x + 12$
(a) (x – 6) (x – 2) (b) (x – 6) (x + 2)
(c) $(x-4)^2$ (d) (x + 6) (x – 2)
RRB NTPC 27.04.2016 Shift : 1

Ans : (a) $x^2 - 8x + 12$
$= x^2 - 6x - 2x + 12$
$= x(x - 6) - 2(x - 6)$
$= (x - 6)(x - 2)$

170. Factors of $x^2 - 6x + 8$
(a) $(x - 4)(x - 2)$ (b) $(x + 4)(x + 2)$
(c) $(x + 8)(x - 2)$ (d) $(x - 4)(x + 2)$

RRB NTPC 29.04.2016 Shift : 2

Ans : (a) Given expression $x^2 - 6x + 8$
$= x^2 - 4x - 2x + 8$
$= x(x-4) - 2(x-4)$
$= (x-4)(x-2)$

171. Factors of $x^2 + 6x + 8$
(a) $(x + 4)(x + 2)$ (b) $(x - 4)(x + 2)$
(c) $(x -)2$ (d) $(x - 4)(x - 2)$

RRB NTPC 30.04.2016 Shift : 2

Ans : (a) $x^2 + 6x + 8$
$= x^2 + 4x + 2x + 8$
$= x(x + 4) + 2(x + 4)$
$= (x + 4)(x + 2)$

Type - 7

172. Which of the following describes the nature of the roots of the quadratic equation $3x^2 - 4x + 10 = 0$?
(a) No real roots
(b) One real root and one imaginary root
(c) Two equal roots
(d) Two distinct real roots

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (a) : $3x^2 - 4x + 10 = 0$
$D = b^2 - 4ac$
$= (-4)^2 - 4 \times 3 \times 10$
$= 16 - 120$
$D = -104$
Hence, $D < 0$
when $b^2 - 4ac < 0$ then any root will not be real.

173. If r and s are the roots of $x^2 - 3x + 2 = 0$, then the quadratic equation in x whose roots are $r^2 + s^2$ and $(rs)^2$ is:
(a) $x^2 + 9x - 20 = 0$ (b) $x^2 + 9x + 20 = 0$
(c) $x^2 - 9x + 20 = 0$ (d) $x^2 - 9x - 20 = 0$

RRB Group-D 27-09-2022 (Shift-II)

Ans. (c) : The given equation are -
$x^2 - 3x + 2 = 0$
Sum of roots $r + s = \frac{-b}{a} = \frac{3}{1}$ .....(I)
Product of roots $rs = \frac{c}{a} = \frac{2}{1}$ .....(II)
For quadratic equation in x whose roots are $r^2 + s^2$ and $(rs)^2$
sum of roots = $r^2 + s^2 + (rs)^2$
$P = 5 + (2)^2$ (from eq^n (II) & (III))
$\boxed{P = 9}$
And Product of roots $(q) = (r^2 + s^2) \times (rs)^2$
$= 5 \times (2)^2$
$\boxed{q = 20}$
Hence the equation is -
$x^2 - px + q = 0$
$\boxed{x^2 - 9x + 20 = 0}$

174. The roots of the equation $a x^2 + x + b = 0$ are equal if :
(a) $ab = \frac{1}{4}$ (b) $b^2 < 4a$
(c) $b^2 > 4a$ (d) $b^2 = 4a$

RRB GROUP-D – 17/08/2022 (Shift-I)

Ans. (a) : $\therefore$ roots of the equation
$ax^2 + x + b = 0$ are equal
$\therefore B^2 = 4AC$
here B = 1, A = a, C = b
$\therefore 1^2 = 4 \times a \times b$
$\therefore ab = \frac{1}{4}$

175. If 2 is a root of the equation $x^2 - px + 6 = 0$ and the quadratic equation $x^2 + 2px + q = 0$ has equal roots, then the value of q is:
(a) 36 (b) 12
(c) 16 (d) 25

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (d) : $x^2 - px + 6 = 0$
Let roots are α and β
$\alpha = 2$
तो $\alpha + \beta = p$ | $\alpha\beta = 6$
$2 + \beta = P$ | $\beta = 6/2$
$p = 2 + 3 = 5$ | $\beta = 3$
$x^2 + 2px + q = 0$
$D = 0$
$b^2 - 4ac = 0$
$(2p)^2 - 4 \times 1 \times q = 0$
$4p^2 = 4q$
$25 = q$

176. What is the sum of the solutions of the roots of equation $2y^2 - 6y - 7 = 0$?
(a) $-\frac{7}{2}$ (b) -3
(c) 3 (d) 7

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,
Equation
$2y^2 - 6y - 7 = 0$ —— (i)
We know that:−
Quadratic equation $ax^2 + bx + c = 0$ —— (ii)
On comparing equation I and II,
$a = 2, b = -6, c = -7$
Hence, sum of roots $= \frac{-b}{a} = \frac{-(-6)}{2} = \frac{6}{2} = 3$

177. Which of the quadratic equations below will not have real roots?
(a) $x^2 + 4x - 5 = 0$ (b) $x^2 + 4x + 4 = 0$
(c) $x^2 + 4x + 5 = 0$ (d) $x^2 + 4x - 4 = 0$

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (c) :
Note :- (i) if $ax^2 + bx + c = 0$ and $b^2 - 4ac > 0$ then
The roots of the equation will be real and unequal
(ii) $ax^2 + bx + c = 0$ and $b^2 - 4ac = 0$ then, The Roots of the equation will be real and equal.
(iii) if $ax^2 + bx + c = 0$ and $b^2 - 4ac < 0$ then, The Roots of the equation imaginary.
From option (c)
$x^2 + 4x + 5 = 0$
$b^2 - 4ac < 0$
$(4)^2 - 4\times1\times5 < 0$
$16 - 20 < 0$
Hence, the roots of the equation are imaginary, that is the roots are not real.

178. If the roots of the equation $2x^2-3x+a=0$ are in the ratio 1:2 , then find the value of a.
(a) 2 (b) 1
(c) –1 (d) –2

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (b) : Given,
$2x^2-3x+a=0$
The ratio of the roots = 1:2 then a=?
Let roots be K and 2K
According to the question,
$\alpha+\beta = \frac{-b}{a}$
$K + 2K = \frac{-(-3)}{2}$
$3K = \frac{3}{2}$
$\therefore \quad \boxed{K = \frac{1}{2}}$
Again, product of roots $(\alpha.\beta) = \frac{c}{a}$
$K.2K = \frac{a}{2}$
$\frac{1}{2}\times2\times\frac{1}{2} = \frac{a}{2}$ (On putting $K = \frac{1}{2}$)
$a = 1$

179. If $6y^2 - 13y + 6 = 0$, then find the product of the two roots of the equation.
(a) 1 (b) –1
(c) $\frac{13}{6}$ (d) $\frac{-13}{6}$

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (a) : Given, equation
$6y^2 - 13y + 6 = 0$
On comparing this with the standard form of quadratic equation
$ax^2 + bx + c = 0$
Where, $a = 6, b = -13, c = 6$
$\therefore$ The product of the roots $= \frac{c}{a}$
$= \frac{6}{6}$
$= 1$

180. If roots of quadratic equation $x^2 - kx + 169 = 0$ are equal, then find the value of k.
(a) ±14 (b) ±26
(c) ±13 (d) ±17

RRB Group-D 26/08/2022 (Shift-I)

Ans. (b) : equation $x^2 - kx + 169 = 0$
$a = 1\ b = -k\ c = 169$
$\because$ roots are equal, Hence $b^2 - 4ac = 0$
$(-k)^2 - 4 \times 1 \times 169 = 0$
$k^2 = 4 \times 169$
$k = \pm\sqrt{4\times169}$
$k = \pm26$

181. **If $x^2 + 2x + 9 = (x - 2)(x - 3)$, then the resultant equation is:**
(a) a cubic polynomial
(b) not a quadratic equation
(c) a cubic equation
(d) a quadratic equation

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : quadratic equation - $ax^2 + bx + c = 0$
$x^2 + 2x + 9 = (x - 2)(x - 3)$
$\Rightarrow x^2 + 2x + 9 = x^2 - 3x - 2x + 6$
$\Rightarrow 2x + 5x = +6 - 9$
$\Rightarrow 7x = -3$
$\Rightarrow x = \frac{-3}{7}$
Hence, this is not quadratic equation

182. Find the roots of $\frac{6}{x}-\frac{2}{x-1}-\frac{1}{x-2}=0$

(a) $\frac{4}{5}$ and $\frac{3}{2}$ (b) $\frac{4}{3}$ and 3

(c) $\frac{4}{5}$ and 3 (d) $\frac{4}{3}$ and $\frac{3}{2}$

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : $\frac{6}{x}-\frac{2}{x-1}-\frac{1}{x-2}=0$

$\frac{6(x-1)(x-2)-2x(x-2)-1x(x-1)}{x(x-1)(x-2)}=0$

$\frac{6\left(x^2-2x-x+2\right)-2x^2+4x-x^2+x}{x\left(x^2-2x-x+2\right)}=0$

$\frac{6x^2-18x+12-2x^2+4x-x^2+x}{x^3-3x^2+2x}=0$

$3x^2 - 13x + 12 = 0$

$3x^2 - 9x - 4x + 12 = 0$

$3x(x - 3) - 4(x - 3) = 0$

$(3x - 4)(x - 3) = 0$

roots $= \frac{4}{3}, 3$

183. If the roots of quadratic equation $(2 - p)x^2 + 2px - (p + 1) = 0$ are equal, then the value of p is:

(a) 2 (b) 1

(c) –1 (d) –2

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : $(2 - p)x^2 + 2px - (p + 1) = 0$

On Being equal roots

$b^2 - 4ac = 0$

$\Rightarrow (2p)^2 - 4 \times (2 - p) \times -(p + 1) = 0$

$\Rightarrow 4(p^2 + 2p + 2 - p^2 - p) = 0$

$\Rightarrow p + 2 = 0$

$p = -2$

184. Find the sum of roots of quadratic equation $7x^2 + 28x + 1 = 0$:

(a) 28 (b) $-\frac{1}{7}$

(c) – 4 (d) 1

RRB Group-D 29/08/2022 (Shift-I)

Ans. (c) : $7x^2 + 28x + 1 = 0$

Sum of roots $= \frac{-b}{a} = \frac{-28}{7} = -4$

(where b = coefficient of x coefficient of x^2)

185. Find the negative roots of quadratic equation $3x^2 + 12x - 15 = 0$:

(a) x = – 1 (b) x = – 5

(c) x = 5 (d) x = 1

RRB Group-D 29/08/2022 (Shift-I)

Ans. (b) : $3x^2 + 12x - 15 = 0$

On solving

$3x^2 + 15x - 3x - 15 = 0$

$3x(x + 5) - 3(x + 5) = 0$

$(x + 5)(3x - 3) = 0$

$x = -5, 1$

Hence, negative root.

186. What is the nature of the roots of $3x^2 + 6x - 5 = 0$?

(a) The roots are real and distinct

(b) The roots are real and equal

(c) The roots are real and more than 2

(d) There are no real roots

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (a) : The given equation is

$3x^2 + 6x - 5 = 0$

Here, a = 3, b = 6 and c = – 5

Discriminant

$D = b^2 - 4ac$

$= (6)^2 - 4 \times 3 \times (-5)$

$= 36 + 60$

$= 96$

Hence, the roots are real and distinct

187. Determine the values of a and b for which the following system of equations has infinite solutions.

$2x - (a - 4)y = 2b + 1, 4x - (a - 1)y = 5b - 1$

(a) a = 7 and b = 1 (b) a = 7 and b = 3

(c) a = 5 and b = 2 (d) a = 2 and b = 7

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) :

$2x - (a - 4)y = 2b + 1, 4x - (a - 1)y = 5b - 1$

$2x - (a - 4)y - (2b + 1) = 0$

On comparing $a_1x + b_1y + c_1 = 0$

$a_1 = 2, b_1 = -(a - 4), c_1 = -(2b + 1)$

$4x - (a - 1)y - (5b - 1) = 0$

On comparing $a_2x + b_2y + c_2 = 0$

$a_2 = 4, b_2 = -(a - 1), c_2 = -(5b - 1)$

If the equation has infinite solution then

$\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

$\frac{1}{2}=\frac{a-4}{a-1}$

$a = 7$

$\frac{1}{2}=\frac{2b+1}{5b-1}$

$b = 3$

$a = 7$ and $b = 3$

188. If α and β are the zeros of the polynomial $f(x) = kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, then find the positive value of k.

(a) $\frac{3}{4}$ (b) $\frac{1}{3}$

(c) $\frac{4}{3}$ (d) $\frac{2}{3}$

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (d) $f(x) = kx^2 + 4x + 4$

On comparing $f(x) = ax^2 + bx + c$

$a = k, b = 4, c = 4$

Sum of roots $(\alpha + \beta) = \frac{-b}{a} = \frac{-4}{k}$

Product of roots $(\alpha.\beta.) = \frac{c}{a} = \frac{4}{k}$

$\alpha^2 + \beta^2 = 24$ (Given)

$(\alpha+\beta)^2 = \alpha^2 + \beta^2 + 2\alpha.\beta$

$\left(\frac{-4}{k}\right)^2 = 24 + \frac{8}{k}$

$24k^2 + 8k - 16 = 0$

$3k^2 + k - 2 = 0$

$3k^2 + 3k - 2k - 2 = 0$

$(k + 1)(3k - 2) = 0$

$= -1, \frac{2}{3}$

$k = \frac{2}{3}$

189. If $x^3 - 9x^2 + 26x - 24 = 0$, then which of the values of x given in the options will provide an incorrect solution to the given equation?

(a) 1 (b) 3

(c) 4 (d) 2

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (a) : Given equation-

$x^3 - 9x^2 + 26x - 24 = 0$

$x^3 - 4x^2 - 5x^2 + 20x + 6x - 24 = 0$

$x^2(x-4) - 5x(x-4) + 6(x-4) = 0$

$(x^2 - 5x + 6)(x-4) = 0$

$(x-2)(x-3)(x-4) = 0$

$x = 3, 4, 2$

Hence, x = 1, will be wrong solution of the given equation.

190. Which of the following is NOT a quadratic equation ?

(a) $(x+2)^2 = 2x(x+1)$

(b) $(x+1)^2 = 2(x-3)$

(c) $m(2m+3) = m^2 + 1$

(d) $x^2 + 3x + 1 = (x-2)^2$

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) : (a) $(x + 2)^2 = 2x(x + 1)$

$x^2 + 4 + 4x = 2x^2 + 2x \Rightarrow x^2 - 2x - 4 = 0$

(b) $(x + 1)^2 = 2(x - 3)$

$x^2 + 1 + 2x = 2x - 6 \Rightarrow x^2 + 7 = 0$

(c) $m(2m + 3) = m^2 + 1$

$2m^2 + 3m = m^2 + 1 \Rightarrow m^2 + 3m - 1 = 0$

(d) $x^2 + 3x + 1 = (x - 2)^2$

$x^2 + 1 + 3x = x^2 + 4 - 4x \Rightarrow 7x - 3 = 0$ (Simple linear equation)

Hence option (d) is not a quadratic equation.

191. The equation whose roots are –2 and 3 is :

(a) $x^2 - x + 6 = 0$ (b) $x^2 - x - 6 = 0$

(c) $x^2 - 5x + 6 = 0$ (d) $x^2 + 3x - 6 = 0$

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (b) : Given roots $\alpha = -2, \beta = 3$

Equation $x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$x^2 - (-2 + 3)x + (-2)3 = 0$

$x^2 - x - 6 = 0$

192. If the roots of the equation $(4+m)x^2+(m+1)x+1 = 0$ are equal, then find the values of m.

(a) m = 0, 5 (b) m = –1, –3

(c) m = 2, 3 (d) m = 5, –3

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) : $(4 + m)x^2 + (m + 1)x + 1 = 0$

$\because$ If quadratic equation $ax^2 + bx + c = 0$ have equal roots,

then, $D = b^2 - 4ac = 0$

On comparing we have –

$(m + 1)^2 - 4 \times (4 + m) \times 1 = 0$

$m^2 + 1 + 2m - 16 - 4m = 0$

$m^2 - 2m - 15 = 0$

$m^2 - 5m + 3m - 15 = 0$

$m(m - 5) + 3(m - 5) = 0$

$(m - 5)(m + 3) = 0$

$\therefore$ m = 5, – 3

193. The Sum of the zeros of the polynomial $5x^2 + (5p - 1)x - (2p + 5)$ is the same as one fourth of their product. Find the value of p.

(a) – 2 (b) 2

(c) $-\frac{1}{2}$ (d) $\frac{1}{2}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : $5x^2 + (5p - 1)x - (2p + 5) = 0$

Sum of zeros $= \frac{-b}{a} = -\frac{(5p-1)}{5}$

Product of zeros $= \frac{c}{a} = -\frac{(2p+5)}{5}$

According to the question,

$\frac{(5p-1)}{5} = \frac{(2p+5)}{5} \times \frac{1}{4}$

$20p - 4 = 2p + 5$

$18p = 9$

$p = \frac{1}{2}$

194. If –5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and also of the quadratic equation $p(kx^2 + x) = 0$ then what are the values of p and k?

(a) 7, 0.2 (b) 7, –0.2

(c) –7, 0.4 (d) –7,–0.2

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (a) : $2x^2+px-15=0,\ p(kx^2+x)=0$

$\because$ Root $= -5$

$\therefore\ 2\times(-5)^2+p(-5)-15=0$

$p\times5=35$

$p=7$

Again, $p(kx^2+x)=0$

$7\left[k(-5)^2+(-5)\right]=0$

$7\times(k\times25-5)=0$

$175k-35=0$

$k=\dfrac{35}{175}$

$k=\dfrac{5}{25}=0.2$

$k=0.2$

Hence the value of p & k is 7 and 0.2 respectively.

195. If the sum of the square of the root of the polynomial $x^2+8x+15k$ is 34, then the value of k

(a) 1 (b) 2

(c) -1 (d) 3

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (a) : Quadratic equation $ax^2+bx+c=0$

Sum of roots $=\dfrac{-b}{a}$

Product of roots $=\dfrac{c}{a}$

then $a+b=-8$, $ab=15k$

Let a and b are the root of polynomial

According to the question,

$a^2+b^2=34$

$(a+b)^2-2ab=34$

$(-8)^2-30k=34$

$64-30k=34$

$30k=30$

$k=1$

196. Which of the following is not a quadratic equation.

(a) $m(2m+3)=m^2+1$

(b) $(y-2)^2+1=2y-3$

(c) $x(x+1)+8=(x+2)(x-2)$

(d) $(m-2)^3=m^3-4$

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : From option (c),

$x(x+1)+8=(x+2)(x-2)$

$x^2+x+8=x^2-2x+2x-4$

$x^2+x+8-x^2+4=0$

$x+12=0$

Hence option (c) is not a quadratic equation.

197. If the equations $x^2+ax+b=0$ and $x^2+bx+a=0$ have a common root, then find the value of a + b (where a is not equal to b)

(a) 2 (b) –1

(c) 0 (d) 1

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$x^2+ax+b=0$ …(i)

$x^2+bx+a=0$ … (ii)

α is a common root of eq^n (i) and (ii),

From eq^n (i) and (ii)

$\alpha^2+a\alpha+b=0$

$-\alpha^2-b\alpha-a=0$

$\alpha(a-b)+(b-a)=0$

$\alpha(a-b)=a-b$

$\alpha=1$

Putting the value of α in eq^n (i)

$x^2+ax+b=0$

$1+a+b=0$

$a+b=-1$

198. If the sum of the squares of quadratic polynomial $f(x)=x^2-8x+k$ is 40, then find the value of k.

(a) 12 (b) 10

(c) 14 (d) 11

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

$x^2-8x+k=0$ .....(i)

Let the roots of equation are α and β.

and $\alpha^2+\beta^2=40$

From equation (i),

Sum of roots $(\alpha+\beta)=\dfrac{-b}{a}$

$\alpha+\beta=8\Rightarrow(\alpha+\beta)^2=8^2$

Product of roots $(\alpha\cdot\beta)=k$

$\alpha^2+\beta^2+2\alpha\beta=64$

$40+2\times k=64$

$2k=24$

$k=12$

199. If α and β are the zeroes of the polynomial x^2-5x+m such that $\alpha-\beta=1$, then what will be the value of m.

(a) 3 (b) 6

(c) 10 (d) 2

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (b) : $x^2-5x+m=0$

$\alpha+\beta=\dfrac{-b}{a}=\dfrac{5}{1}$

$\alpha-\beta=1$ .....(i)

$\alpha+\beta=5$ .....(ii)

On adding equation (i) and (ii)

$2\alpha=6$

$\alpha=3$

$\therefore\quad\beta=2$

$\Rightarrow\quad\alpha\beta=\dfrac{c}{a}=m$

$\therefore\quad m=3\times2=6$

200. If α and β are the zeroes of the polynomial f(x) = x^2 - 5x + k such that $\alpha - \beta = 1$, then find the value of k.

(a) 3 (b) 5
(c) 6 (d) 4

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given, $f(x) = x^2 - 5x + k$

$\alpha - \beta = 1$ --------- (i)

$\because$ Sum of roots $(\alpha + \beta) = \frac{\text{Coefficient of } (-x)}{\text{Coefficient of } x^2}$

$\alpha + \beta = -(-5)$

$\alpha + \beta = 5$ ----------(iii)

$\because$ Product of roots $(\alpha.\beta) = \frac{\text{constant term}}{\text{coefficient of } x^2}$

$\Rightarrow \alpha . \beta = k$

From equation (i) and (ii), we have –

$$\begin{array}{rcrcl} \alpha & - & \beta & = & 1 \\ \alpha & + & \beta & = & 5 \\ \hline 2\alpha & & & = & 6 \end{array}$$

$\alpha = 3$ and $\beta = 2$

$\Rightarrow \alpha.\beta = k$

$\Rightarrow 3.2 = k$

$\Rightarrow k = 6$

201. The roots of the equation $x^2 - 7x + 12 = 0$ are:

(a) 5, 6 (b) 3, 4
(c) 2, 3 (d) 7, 8

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (b) : $x^2 - 7x + 12 = 0$

$\Rightarrow x^2 - 4x - 3x + 12 = 0$

$\Rightarrow x(x-4) - 3(x-4) = 0$

$\Rightarrow (x-4)(x-3) = 0$

$\Rightarrow x = 4, \quad x = 3$

$\Rightarrow x = 3, 4$

202. If one of the roots of the equation $x^2 - 19x + 88 = 0$ is 8, then what is the other root?

(a) 13 (b) 11
(c) 17 (d) 12

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : Let the equation $x^2 - 19x + 88 = 0$ have two roots α and β.

According to the question-

$\alpha = 8$

Product of roots = 88

$\alpha\beta = 88$

$8\beta = 88$

$\beta = \frac{88}{8} = 11$

So, the second root is 11.

203. The pair of equations $2^{x+y} = 16$ and $64^{x-y} = 2$ has

(a) Unique solution $x = \frac{23}{12}, y = \frac{25}{12}$
(b) No common solution
(c) Infinite solutions
(d) Unique solution $x = \frac{25}{12}, y = \frac{23}{12}$

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : $2^{x+y}=16$ …(Given)

$2^{x+y}=2^4$

Hence $x+y=4$ …(i)

And $64^{x-y}=2$ …(Given)

$2^{6(x-y)}=2^1$

Hence $6(x-y)=1$

$x - y = \frac{1}{6}$ …(ii)

On solving eqn (i) and (ii) ,

$x = \frac{25}{12}$ and

$y = \frac{23}{12}$ $\left(\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \text{.....(Unique solution)}\right)$

204. What is the number of all positive solutions of the equation $|x \times 1| = 0$?

(a) 1 (b) 0
(c) 2 (d) 3

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : $|x \times 1| = 0$

$x \times 1 = 0$ (positive solutions)

$x = 0$

205. Which of the following is valid for $(a + b)^2 = a^2 + b^2$.

(a) May be true for only a finite number of (a, b)
(b) May be true for exactly one pair (a, b)
(c) Cannot be true for any set of (a, b)
(d) May be true for infinite number of (a, b)

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) : $(a+b)^2 = a^2 + b^2$

$\Rightarrow a^2 + b^2 + 2ab = a^2 + b^2$

$2ab = 0$

$ab = 0$

$\Rightarrow a = 0$ or $b = 0$

$\therefore$ (0, b) or (a,0)

Here, the value of 'a' and 'b' can be infinite. Thus it can be true for an infinite number of (a, b).

206. One root of the equation $2x^2 - 8x - m = 0$, is $\frac{5}{2}$. The other root of the equation and the value of m are respectively.

(a) $-\frac{3}{2}$ and $\frac{15}{2}$ (b) $\frac{5}{2}$ and $-\frac{15}{2}$
(c) $\frac{3}{2}$ and $-\frac{15}{2}$ (d) $-\frac{5}{2}$ and $\frac{15}{2}$

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

First root $(\alpha) = \frac{5}{2}$

Let second root is β

$\because$ Sum of roots $(\alpha+\beta) = \frac{\text{Coefficient of } (-x)}{\text{Coefficient of } x^2}$

$$\frac{5}{2}+\beta = \frac{8}{2}$$

$$\beta = \frac{3}{2}$$

$\because$ Product of roots $(\alpha \cdot \beta) = \frac{\text{Constant term}}{\text{Coefficient of } x^2}$

$$\frac{5}{2}\times\beta = \frac{-m}{2}$$

$$\frac{5}{2}\times\frac{3}{2} = \frac{-m}{2}$$

$$m = \frac{-15}{2}$$

207. If there is no solution of $6x^2 + 2kx + k = 0$, then find the value of k:

(a) $0 < k < 6$ (b) $k > -6$

(c) $k > 6$ (d) $k < 6$

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (a) $6x^2 + 2kx + k = 0$ has no solution

Putting, $k = 1$ in equation

$6x^2 + 2x + 1 = 0$

So there is no solution

On putting $k = 1$ to $k = 6$

$6x^2 + 12x + 6 = 0$

$6x^2 + 6x + 6x + 6 = 0$

$6x(x + 1) + 6(x + 1) = 0$

$\boxed{x = -1,}$

Hence the solution of the equation is obtained at $k = 6$.

So it is clear that the equation from $k = 1$ to $k = 5$ will have no solution.

i.e. $\boxed{0 < k < 6}$

208. If $3x^2 + kx + k = 0$ has no solution, then the value of k will satisfy :

(a) $k > 12$ (b) $k < 12$

(c) $k > -12$ (d) $0 < k < 12$

RRB ALP & Tec. (31-08-18 Shift-II)

Ans. (d) : For the equation to have no solution,

$b^2 - 4ac < 0$

$\Rightarrow$ $k^2 - 4 \times 3k < 0$

$\Rightarrow$ $k(k - 12) < 0$

$\Rightarrow$ $k - 12 < 0, k < 0$

$k < 12$

So intended relationship will be $= 0 < k < 12$

209. If $x^2 + kx + k = 0$ has no solution, then the value of k will satisfy:

(a) $k > 4$ (b) $0 < k < 4$

(c) $k < 4$ (d) $k > -4$

RRB ALP & Tec. (17-08-18 Shift-I)

Ans : (b) $\because$ There is no solution of $x^2 + kx + k = 0$

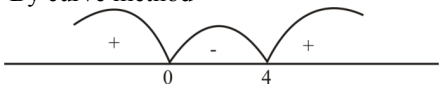
$\therefore$ Discriminant $(D) < 0$

$b^2 - 4ac < 0$

$k^2 - 4k < 0$

$k(k - 4) < 0$

By curve method



So $0 < k < 4$

210. If there is two real solution of $x^2 - 4x + 4b = 0$, then find the value of 'b'.

(a) $b \geq 1$ (b) $b < 1$

(c) $b = +1, -1$ (d) $b = 0$

RRB JE - 22/05/2019 (Shift-I)

Ans : (b) $x^2 - 4x + 4b = 0$

Discriminant's value must be positive for two real solution of quadratic equations

or

$b^2 - 4ac > 0$

$(-4)^2 - 4 \times 1 \times 4b > 0$

$16 - 16b > 0$

$16 > 16b$

$1 > b$

so $b < 1$

211. If the two roots of the quadratic equation is α and β, when $\alpha+\beta=8$ and $\alpha-\beta=2$, then equation is

(a) $x^2 - 8x + 15 = 0$ (b) $x^2 + 8x - 15 = 0$

(c) $x^2 - 8x - 15 = 0$ (d) $x^2 + 8x + 15 = 0$

RRB JE - 23/05/2019 (Shift-II)

Ans: (a) $\because$ α and β quadratic equations have two roots.

$\alpha + \beta = 8$ ..... (i)

$\underline{\alpha - \beta = 2}$ ..... (ii)

$2\alpha = 10$

$\alpha = 5$

From equation (i) –

$5 + \beta = 8$

$\beta = 3$

Quadratic equation

$x^2 - (\alpha + \beta)x + \alpha\beta = 0$

$x^2 - 8x + 15 = 0$

212. Find the root of $2x^2 - 15x + 28$

(a) Both negative

(b) Not real

(c) One positive, one negative

(d) Both positive

RRB JE - 27/05/2019 (Shift-I)

Ans : (d)

$2x^2 - 15x + 28 = 0$

$2x^2 - (8 + 7)x + 28 = 0$

$(2x^2 - 8x) - (7x - 28) = 0$

$2x(x - 4) - 7(x - 4) = 0$

$(2x - 7)(x - 4) = 0$

$2x - 7 = 0$

$x = 7/2$

$x - 4 = 0$

$x = 4$

It is clear that both roots is positive.

213. For which value of 'k' are the roots of the equation kx (x-2) + 6 = 0 is similar.

(a) 6 (b) 0, 6

(c) 3, 2 (d) -2

RRB JE - 27/05/2019 (Shift-III)

Ans : (a) $kx(x-2)+6=0$

$kx^2-2kx+6=0$

Roots of quadratic equations will be equal if value of these discriminant will be zero.

$b^2-4ac=0$

$(-2k)^2-4\times k\times 6=0$

$4k^2-24k=0$

$4k(k-6)=0$

$k=6$

214. If a and b are the roots of equation $3x^2-5x+2=0$ then find the value of (a/b)+(b/a).

(a) 13/9 (b) 13/6

(c) 13/2 (d) 9/13

RRB JE - 28/05/2019 (Shift-II)

Ans : (b) Comparing equation $Ax^2+Bx+C=0$ from equation $3x^2-5x+2=0$

$A=3, B=-5, C=2$

Sum of roots $(a+b)=\frac{-B}{A}=\frac{-(-5)}{3}=\frac{5}{3}$

Multiplication of roots $(ab)=\frac{C}{A}=\frac{2}{3}$

$$\frac{a}{b}+\frac{b}{a}=\frac{a^2+b^2}{ab}$$

$$=\frac{a^2+b^2+2ab-2ab}{ab}$$

$$=\frac{(a+b)^2-2ab}{ab}$$

$$=\frac{\left(\frac{5}{3}\right)^2-2\times\frac{2}{3}}{\frac{2}{3}}$$

$$=\frac{\frac{25}{9}-\frac{4}{3}}{\frac{2}{3}}$$

$$=\frac{\frac{25-12}{9}}{\frac{2}{3}}$$

$$=\frac{13}{9}\times\frac{3}{2}=\frac{13}{6}$$

215. For which value of 'k' in equation $x^2+2kx+4=0$, is a real solution?

(a) 0 (b) 2, 0

(c) –2, 0 (d) 2, – 2

RRB JE - 31/05/2019 (Shift-I)

Ans : (d) For real solution of equation $x^2+2kx+4=0$ for the value of k

$B^2-4AC=0$

$4k^2-16=0$

$k^2=4$

$k=\pm 2$

216. Given $2x^2+19x+45=0$ and $2y^2+11y+12=0$ then which of the following is true for the roots x, y.

(a) $x\geq y$ (b) $x<y$

(c) $x\leq y$ (d) $x>y$

RRB JE - 31/05/2019 (Shift-III)

Ans. (b) $2x^2+19x+45=0$

$2x^2+10x+9x+45=0$

$2x(x+5)+9(x+5)=0$

$(x+5)(2x+9)=0$

$x=-5, -9/2$

$\because$ $2y^2+11y+12=0$

$2y^2+8y+3y+12=0$

$2y(y+4)+3(y+4)=0$

$(y+4)(2y+3)=0$

$y=-4, -3/2$

It is clear that $y>x$

217. Find the equation whose roots are $\left(a+\sqrt{b}\right)$ and $\left(a-\sqrt{b}\right)$.

(a) $x^2+2ax-(a^2-b)=0$

(b) $x^2-2ax+(a^2-b)=0$

(c) $x^2-ax+a^2-b^2=0$

(d) $x^2+ax+a^2-b^2=0$

RRB JE - 02/06/2019 (Shift-III)

Ans : (b) Equation's roots is $\left(a+\sqrt{b}\right), \left(a-\sqrt{b}\right)$

x^2-(sum of roots) $x+$ product of roots $=0$

$x^2-(a+\sqrt{b}+a-\sqrt{b})x+(a+\sqrt{b})(a-\sqrt{b})=0$

$x^2-2ax+(a^2-b)=0$

218. If α and β are the roots of quadratic equation $\left(5+\sqrt{2}\right)x^2-\left(4+\sqrt{5}\right)x+\left(8+2\sqrt{5}\right)=0$ then the value of $\frac{2\alpha\beta}{\alpha+\beta}$ will be.

(a) 4 (b) 2

(c) 8 (d) 7

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (a) $\alpha+\beta=\frac{-b}{a}=\frac{+\left(4+\sqrt{5}\right)}{\left(5+\sqrt{2}\right)}$

$$\alpha\beta=\frac{c}{a}=\frac{8+2\sqrt{5}}{5+\sqrt{2}}$$

$$\frac{2\alpha\beta}{\alpha+\beta}=\frac{2\times\left(\frac{8+2\sqrt{5}}{5+\sqrt{2}}\right)}{\left(\frac{4+\sqrt{5}}{5+\sqrt{2}}\right)}, \quad =4\times\frac{\left(4+\sqrt{5}\right)}{\left(5+\sqrt{2}\right)}\times\frac{\left(5+\sqrt{2}\right)}{\left(4+\sqrt{5}\right)}=4$$

219. A root of $x^2 - 12x + 2k = 0$ is x = 4. The other root will be -

(a) x = 6 (b) x = 8

(c) x = –4 (d) x = –8

RRB RPF SI – 06/01/2019 (Shift-I)

Ans. (b) : $x^2 - 12x + 2k = 0$, putting x = 4

$(4)^2 - 12 \times 4 + 2k = 0$

$16 - 48 + 2k = 0$

$2k = 32$

$\boxed{k = 16}$

New equation

$x^2 - 12x + 32 = 0$

$x^2 - 12x + 32 = 0$

$x^2 - 8x - 4x + 32 = 0$

$x(x-8) - 4(x-8) = 0$

$(x-8)(x-4) = 0$

$x - 8 = 0 \Rightarrow x = 8$

$\therefore$ Other root = 8

220. Solve the following equation to find the value of 'x'. $(x-2)^2 - 36 = 0$; $x \in N$

(a) 4 (b) –8

(c) –4 (d) 8

RRB Group-D – 03/10/2018 (Shift-I)

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d)

$(x-2)^2 - 36 = 0$ $x \in N$

$x^2 + 4 - 4x - 36 = 0$

$x^2 - 4x - 32 = 0$

$x^2 - 8x + 4x - 32 = 0$

$x(x-8) + 4(x-8) = 0$

$(x-8)(x+4)$

x = 8, –4 but according to the question $x \in N$ so value of x will be 8.

221. Two square roots of a quadratic equation is given as $x = \frac{1}{7}$ and $x = \frac{-1}{8}$. The equation can be written as–

(a) (7x + 1) (8x + 1) = 0

(b) (7x – 1) (8x – 1) = 0

(c) (7x + 1) (8x –1) = 0

(d) (7x–1) (8x+1) = 0

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (d)

$x = \frac{1}{7}, \quad x = -\frac{1}{8}$

$\Rightarrow 7x = 1, \quad 8x = -1$

$(7x - 1) = 0, (8x + 1) = 0$

Quadratic equations will be–

$\boxed{(7x-1)(8x+1) = 0}$

222. Solve- $x : x \in N; (x-4)^2 - 36 = 0$

(a) 2 (b) –2

(c) 10 (d) –10

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (c) $(x-4)^2 - 36 = 0$

$x^2 + 16 - 8x - 36 = 0$

$x^2 - 8x - 20 = 0$

$x^2 - 10x + 2x - 20 = 0$

$x(x-10) + 2(x-10) = 0$

$(x+2)(x-10) = 0$

$x - 10 = 0$

$\boxed{x = 10}$

$x + 2 = 0$

$x = -2$

Always it is taken as positive value.

223. One of the roots of equation $x^2 - 24x + k = 0$ is x = 2 other value will be–

(a) x = 12 (b) x = –22

(c) x = 22 (d) x = –12

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (c) : $x^2 - 24x + k = 0$

One root x = 2 then putting the value of x in equation

$(2)^2 - 24 \times 2 + k = 0$

$4 - 48 + k = 0$

$k - 44 = 0$

$k = 44$

Substituting the value of k into the equation-

$x^2 - 24x + 44 = 0$

$x^2 - 22x - 2x + 44 = 0$

$x(x - 22) - 2(x - 22) = 0$

$(x - 2)(x - 22) = 0$

x = 2 and x = 22

(given)

So other root = 22

224. If $x^2+1.5kx+4.5k=0$ contains the recurring root, what will be the satisfactory value of k.

(a) only k = 8 (b) k < 0 or k > 8

(c) k = 8 or k = 0 (d) 0 < k < 8

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (c) Quadratic equations-

On comparing from $ax^2 + bx + c = 0$

$x^2 + 1.5kx + 4.5k = 0$

a = 1, b = 1.5k, c = 4.5k

$b^2 - 4ac = 0$

$(1.5k)^2 - 4 \times 1 \times 4.5k = 0$

$\frac{225k^2}{100} - 18k = 0$

$225k^2 - 1800k = 0$

$225k^2 = 1800k$

$\boxed{k = 8}$ or k = 0

225. If α and β are o (zero) of the polynomial x^2 – 5x + 6. Then find the value of $\frac{\alpha^2 + \beta^2}{\alpha^{-2} + \beta^{-2}}$ =?

(a) 63 (b) 62

(c) 36 (d) 26

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (c)

Quadratic equations $ax^2 + bx + c = 0$ of root (zero) is α and β then $\alpha + \beta = -\frac{b}{a}$

And $\alpha.\beta = \frac{c}{a}$

Given polynomial $x^2 - 5x + 6$

$\therefore \alpha+\beta = 5$

$\alpha.\beta = 6$

$$\therefore \frac{\alpha^2+\beta^2}{\alpha^{-2}+\beta^{-2}} = \frac{\alpha^2+\beta^2}{\alpha^{\frac{1}{2}}+\beta^{\frac{1}{2}}} = \frac{\alpha^2+\beta^2}{\alpha^2+\beta^2}.\alpha^2\beta^2 = \alpha^2\beta^2$$

$$= (\alpha\beta)^2$$

$$= 6^2 = 36$$

226. If $x^2 + 4.5kx + 13.5k = 0$ have recurring roots, then what condition will the value to satisfy.

(a) $0 < k < \frac{8}{3}$ (b) $k < 0$ or $k > \frac{8}{3}$

(c) $k = \frac{8}{3}$ (d) $k = \frac{8}{3}$ or $k = 0$

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (d) $x^2 + 4.5\,kx + 13.5\,k = 0$

$$x^2 + \frac{9}{2}kx + \frac{27}{2}k = 0$$

If root is equal/same then–

$b^2 - 4ac = 0$

$$\left(\frac{9}{2}\right)^2 k^2 - 4 \times \frac{27}{2}k = 0$$

$$\frac{81}{4}k^2 - 54k = 0$$

$$k\left\{\frac{81}{4}k - 54\right\} = 0$$

$k = 0$,

or $81k = 54 \times 4$

$$k = \frac{8}{3}$$

227. Two roots of a quadratic equation are $x = \frac{1}{11}$ and $x = \frac{-1}{9}$. The equation can be written as which of the following.

(a) $(11x + 1)(9x - 1) = 0$

(b) $(11x + 1)(9x + 1) = 0$

(c) $(11x - 1)(9x + 1) = 0$

(d) $(11x - 1)(9x - 1) = 0$

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (c) When two roots given α and β

$$\alpha = \frac{1}{11}, \quad \beta = \frac{-1}{9}$$

Quadratic equation written as-

$$(x - \alpha)(x - \beta) = 0$$

$$\left(x - \frac{1}{11}\right)\left(x + \frac{1}{9}\right) = 0$$

$$\left(\frac{11x - 1}{11}\right)\left(\frac{9x + 1}{9}\right) = 0$$

$\Rightarrow$ $(11x - 1)(9x + 1) = 0$

228. If $3x^2 + 2kx + k = 0$ has no real solution, then what will be correct about the value of k.

(a) $k < 0$ or $k > 3$ (b) $k > 3$

(c) $0 < k < 3$ (d) $k < 0$

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (c) When root is not real

By formula $b^2 - 4ac < 0$

$3x^2 + 2kx + k = 0$

$a = 3, b = 2k, c = k$

$4k^2 - 12k < 0$

$4k(k - 3) < 0$

$0 < k < 3$

229. If $\alpha \neq \beta$ but $\alpha^2 = 5\alpha - 3, \beta^2 = 5\beta - 3$, then find the equation whose roots are $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$.

(a) $3x^2 - 19x - 3 = 0$ (b) $3x^2 - 19x + 3 = 0$

(c) $3x^2 + 19x - 3 = 0$ (d) $3x^2 + 19x + 3 = 0$

RRB Group-D – 05/12/2018 (Shift-I)

Ans : (b) Given-

$\alpha \neq \beta$

$\alpha^2 = 5\alpha - 3$, $\beta^2 = 5\beta - 3$

$\alpha^2 - 5\alpha + 3 = 0$ $\beta^2 - 5\beta + 3 = 0$

$$\alpha = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 1 \times 3}}{2}$$

$$\beta = \frac{\left(+5 \pm \sqrt{(-5)^2 - 4 \times 1 \times 3}\right)}{2}$$

$$\alpha = \frac{+5 + \sqrt{25 - 12}}{2}, \quad \beta = \frac{+5 - \sqrt{25 - 12}}{2}$$

$$\boxed{\alpha = \frac{+5 + \sqrt{13}}{2}} \qquad \boxed{\beta = \frac{+5 - \sqrt{13}}{2}}$$

Formula of quadratic equation -

x^2 – (sum of roots) x + product of roots = 0

$$x^2 - \left(\frac{\alpha}{\beta}+\frac{\beta}{\alpha}\right)x+\frac{\alpha}{\beta}\times\frac{\beta}{\alpha}=0$$

$$x^2-\left(\frac{\alpha^2+\beta^2}{\alpha\beta}\right)x+1=0$$

$$x^2-\left[\frac{\left(\frac{+5+\sqrt{13}}{2}\right)^2+\left(\frac{+5-\sqrt{13}}{2}\right)^2}{\left(\frac{+5+\sqrt{13}}{2}\right)\left(\frac{+5-\sqrt{13}}{2}\right)}\right]x+1=0$$

$$x^2-\frac{76}{25-13}x+1=0$$

$$x^2-\frac{76}{12}x+1=0$$

$$12x^2-76x+12=0$$

$$\Rightarrow \boxed{3x^2-19x+3=0}$$

230. If $2x^2+x-28<0$, then which of the following specifies all the possible values of 'x'.

(a) $x > \frac{7}{2}$ (b) $-4 < x < \frac{7}{2}$

(c) $0 < x < 13$ (d) $x < -4$

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (b) $2x^2 + x - 28 < 0$

$2x^2 + 8x - 7x - 28 < 0$

$2x(x + 4) - 7(x + 4) < 0$

$(x + 4)(2x - 7) < 0$

if $x + 4 < 0$

$x > -4$

if $x - 7 < 0$

$x < \frac{7}{2}$

So All possible value of $-4 < x < \frac{7}{2}$, x is specified.

231. If α and β are the roots of $2x^2 + 7x - 4 = 0$, then what will be the equation whose roots are α^2 and β^2.

(a) $4x^2 - 65x - 16 = 0$ (b) $4x^2 + 65x - 16 = 0$

(c) $4x^2 - 65x + 16 = 0$ (d) $4x^2 + 65x + 16 = 0$

RRB Group-D – 01/12/2018 (Shift-II)

Ans : (c) α, β is root of equation $2x^2 + 7x - 4 = 0$

or $\alpha+\beta = \frac{-b}{a} = \frac{-7}{2}$

$$\alpha.\beta = \frac{c}{a} = \frac{-4}{2} = -2$$

If root of equation is α^2 and β^2 then

$$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = \frac{49}{4} - 2\times(-2) = \frac{65}{4}$$

$\alpha^2\beta^2 = (\alpha\beta)^2 = 4$

Quadratic equations–

x^2 – (sum of root) x + (product of root) = 0

$$= x^2 - \frac{65}{4}x + 4 = 0$$

$4x^2 - 65x + 16 = 0$

232. If $2x^2 - 9x - 18 < 0$, then which of the following specifies all the possible values of 'x'.

(a) $x < -\frac{3}{2}$ x (b) $-\frac{3}{2} < x < 6$

(c) $x < 6$ (d) $0 < x < 12$

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (b)

$2x^2 - 9x - 18 < 0$

$\Rightarrow 2x^2 - (12 - 3)x - 18 < 0$

$\Rightarrow 2x^2 - 12x + 3x - 18 < 0$

$\Rightarrow 2x(x - 6) + 3(x - 6) < 0$

$\Rightarrow (x - 6)(2x + 3) < 0$

$x - 6 < 0$

Then $\boxed{x < 6}$.....(i)

$2x + 3 < 0$

$\boxed{x > \frac{-3}{2}}$.....(ii)

From equation (i) and (ii),

$-\frac{3}{2} < x < 6$

233. What is the number of real roots of the equation? $(6 - x)^4 + (8 - x)^4 = 16$

(a) 6 (b) 2

(c) 4 (d) 0

RRB Group-D – 31/10/2018 (Shift-III)

Ans : (b) Putting x = 6

$(6 - 6)^4 + (8 - 6)^4 = 16$

$2^4 = 16$

$16 = 16$

Putting = 8,

$(6 - 8)^4 + (8 - 8)^4 = 16$

$(-2)^4 = 16$

So it is clear that two real root of equation will be 6 and 8.

234. If the roots α and β of the equation $x^2 - x - 1 = 0$ then what will be the equation whose roots will be $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$.

(a) $x^2 + 3x - 1 = 0$ (b) $x^2 + x - 1 = 0$

(c) $x^2 - x + 1 = 0$ (d) $x^2 + 3x + 1 = 0$

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (d) : Root of $x^2 - x - 1 = 0$ is α and β then–

$$\alpha + \beta = \frac{-b}{a} = -(-1) = 1 \ldots\ldots \text{(i)}$$

And $$\alpha.\beta = \frac{c}{a} = \frac{-1}{1} = -1, \ldots\ldots\ldots \text{(ii)}$$

Square of equation (i)

$$\alpha^2 + \beta^2 + 2\alpha\beta = 1$$

$$\alpha^2 + \beta^2 - 2 = 1$$

$$\alpha^2 + \beta^2 = 3 \text{ [from equation (i)]}$$

That equation whose root are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$

x^2 – (sum of roots) x + (product of root)

$$x^2 - \left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)x + \frac{\alpha}{\beta} \times \frac{\beta}{\alpha} = 0$$

$$x^2 - \left(\frac{\alpha^2 + \beta^2}{\alpha.\beta}\right)x + 1 = 0$$

$$x^2 + 3x + 1 = 0$$

235. If $12x^2 - ax + 7 = ax^2 + 9x + 3$ has only one (repeated) solution, then the positive integral solution of a is:

(a) 2 (b) 4

(c) 3 (d) 5

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (c) $12x^2 - ax + 7 = ax^2 + 9x + 3$

$$x^2(12 - a) - x(9 + a) + 4 = 0 \quad \ldots\ldots\ldots(i)$$

Equation (i) compare to quadratic equation $ax^2+bx+c=0$

Root of equation (i) will be equal (repeated)

If $b^2 = 4ac$

So taking a=3 from option (c) will be same root (repeated)

236. The value of k, for which the quadratic equation $4x^2 + 4\sqrt{3}x + k = 0$ has equal roots is:

(a) –2 (b) 3

(c) 2 (d) –3

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (b) Same quadratic equation's root will be same if discriminant will be $D = b^2 - 4ac = 0$

Here, in $4x^2 + 4\sqrt{3}x + k = 0$

$a = 4, b = 4\sqrt{3}$ and $c = k$

$\left(4\sqrt{3}\right)^2 - 4 \times 4 \times k = 0$ {from $= b^2 - 4ac$}

$48 - 16k = 0$

$16k = 48$

$\boxed{k = 3}$

237. One of the roots of the equation $x^2 - 6x + k = 0$ is x = 2. The other root is:

(a) x = 4 (b) x = –1

(c) x = –4 (d) x = 1

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (a) Equation $x^2 - 6x + K = 0$

$\because$ x = 2 satisfies the equation

$\therefore$ $2^2 - 6 \times 2 + K = 0$

$K = 8$

Now equation $x^2 - 6x + 8 = 0$

$(x-2)(x-4) = 0$, $x = 2, x = 4$

So second root of equation will be $\boxed{x = 4}$

238. If $x^2 + kx + k = 0$ has repeated roots, then the value of k will satisfy:

(a) $k < 0$ or $k > 4$ (b) only $k = 4$

(c) $k = 4$ or $k = 0$ (d) $0 < k < 4$

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (c) Putting D = 0

$D = b^2 - 4ac = 0$..... (1)

So comparing equation $ax^2 + bx + c = 0$ from $x^2 + kx + k = 0$

$a = 1$ $b = k$ $c = k$

So putting value in equation (1)

$k^2 - 4 \times 1 \times k = 0$

$k^2 - 4k = 0$

$k(k - 4) = 0$

$\boxed{k = 0}$

$k - 4 = 0$

Then, $\boxed{k = 4}$

So given option (c) is correct.

239. If $x^2 + kx + k = 0$ has two distinct real solutions, then the value of k will satisfy:

(a) $0 < k < 4$ (b) $k < 0$ only

(c) $k > 4$ only (d) $k < 0$ or $k > 4$

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (d) Root is real and unequal

Then $b^2 - 4ac > 0$

According to the question,

$k^2 - 4k > 0$

$k(k - 4) > 0$

$\boxed{k > 4, \quad k < 0}$

240. The two roots of an quadratic equation are given an $x = \frac{1}{2}$ and $x = \frac{-1}{3}$. The equation can be written as:

(a) $(2x-1)(3x-1) = 0$ (b) $(2x+1)(3x-1) = 0$

(c) $(2x+1)(3x+1) = 0$ (d) $(2x-1)(3x+1) = 0$

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (d) Given root– $x = \frac{1}{2}, \; x = -\frac{1}{3}$

Equation,

$$\left(x - \frac{1}{2}\right)\left(x - \left(\frac{-1}{3}\right)\right) = 0$$

$$\left(x - \frac{1}{2}\right)\left(x + \frac{1}{3}\right) = 0$$

$$\Rightarrow \quad (2x-1)(3x+1) = 0$$

241. One quadratic roots of the equation $x^2 - 4x + k = 0$ is x = 3. The other root is:

(a) $x = -1$ (b) $x = -4$

(c) $x = 1$ (d) $x = 4$

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (c) Given-

$x^2 - 4x + k = 0$ ....(i)

$x = 3$ ....(ii)

From equation (i) and (ii)

$9 - 4 \times 3 + k = 0$

$k = 3$

So

$x^2 - 4x + 3 = 0$

$x^2 - 3x - x + 3 = 0$

$x(x-3) - 1(x-3) = 0$

$(x-3)(x-1) = 0$

$x = 3, 1$

other root is 1.

242. What is the sum of the values of x satisfying $x^{\frac{2}{3}} + x^{\frac{1}{3}} = 2$.

(a) 7 (b) -3

(c) 3 (d) -7

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (d)

$x^{\frac{2}{3}} + x^{\frac{1}{3}} = 2$

By cubing both sides,

$$\left(x^{\frac{2}{3}} + x^{\frac{1}{3}}\right)^3 = (2)^3$$

$x^2 + x + 3 \times 2.x = 8 \Rightarrow x^2 + 7x - 8 = 0$

$\Rightarrow (x+8)(x-1) = 0$

$\boxed{x = -8, 1}$

So, the sum of the value of $x = -8 + 1$

$= -7$

243. If $x < 5$ then, the sign of the value of the expression $-5x^2 + 2x + 7$ will be

(a) Can not be said (b) Non negative

(c) Negative (d) Positive

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (a) Since the value of x is less than 5 but not indicated that the value of x will be positive that negative. Hence the value of the given expression can not be determind.

Type - 8

244. If $x^4 - 6x^2 - 1 = 0$, then what is the value of $(x^6 - x^{-6}) - 3(x^4 + x^{-4})$?

(a) 178 (b) 148

(c) 120 (d) 156

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (c) : $x^4 - 6x^2 - 1 = 0$

On dividing by x^2 both sides we get

$$x^2 - 6 - \frac{1}{x^2} = 0$$

$$x^2 - \frac{1}{x^2} = 6 \qquad \ldots. (1)$$

On cubing both sides of equation,

$$x^6 - \frac{1}{x^6} - 3x^2 \times \frac{1}{x^2}\left(x^2 - \frac{1}{x^2}\right) = 216$$

$$x^6 - \frac{1}{x^6} = 216 + 18$$

$$= 234 \qquad \ldots\ldots(2)$$

On squaring equation (1)

$$x^4 + \frac{1}{x^4} - 2x^2 \times \frac{1}{x^2} = 36$$

$$x^4 + \frac{1}{x^4} = 36 + 2$$

$$= 38 \qquad \ldots\ldots(3)$$

According to the question,

$$(x^6 - x^{-6}) - 3(x^4 + x^{-4})$$

$$= \left(x^6 - \frac{1}{x^6}\right) - 3\left(x^4 + \frac{1}{x^4}\right)$$

On putting the value of equation (2) and (3)-

$= 234 - 3 \times 38$

$= 234 - 114$

$= 120$

245. If x (x + y + z) = 30, y (x + y + z) = 64, z (x + y + z) = 50 then find the value of 2 (x + y + z) Where x,y,z > 0.

(a) 22 (b) 26

(c) 24 (d) 20

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Given,

$x(x + y + z) = 30$ and $x, y, z > 0$

$y(x + y + z) = 64$

$z(x + y + z) = 50$

$(x + y + z)[x + y + z] = 30 + 64 + 50$

$(x + y + z)^2 = (12)^2$

$(x + y + z) = 12$

Then,

$2(x + y + z)$

$= 2 \times 12$

$= 24$

246. If (y + z) = 8 and yz = 6 find the value $(y - z)^2$

(a) 49 (b) 36

(c) 40 (d) 44

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Given,

$(y + z) = 8$

$yz = 6$

$(y-z)^2 = ?$

$(y + z)^2 = y^2 + z^2 + 2yz$

$(8)^2 = y^2 + z^2 + 2 \times 6$

$y^2 + z^2 = 64 - 12$

$y^2 + z^2 = 52$ .....(i)

Now again,

$(y - z)^2 = y^2 + z^2 - 2yz$

$= 52 - 12$

$(y - z)^2 = 40$

247. Simplify: $3x(x - 6) + x^2 + 6x - 9 + 24 - x^3$

(a) $15 + 12x + 4x^2 + x^3$ (b) $15 - 12x + 4x^2 + x^3$

(c) $15 + 12x + 4x^2 - x^3$ (d) $15 - 12x + 4x^2 - x^3$

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Given equation

$\Rightarrow 3x(x - 6) + x^2 + 6x - 9 + 24 - x^3$

$\Rightarrow 3x^2 - 18x + x^2 + 6x - 9 + 24 - x^3$

$\Rightarrow 15 - 12x + 4x^2 - x^3$

248. Simplify:

$x^3 - 3x^2 + 9x - 12 - x^3 - 7x^2 - 8x - 16$

(a) $10x^2 + x - 28$

(b) $-10x^2 + x + 28$

(c) $-10x^2 + x - 28$

(d) $10x^2 - x - 28$

RRB Group-D 30/08/2022 (Shift-III)

Ans. (c): $x^3 - 3x^2 + 9x - 12 - x^3 - 7x^2 - 8x - 16$

$= -10x^2 + x - 28$

249. Simplify: $6(x^3 - 2x^2 + 3x) - (x^3 + 2x - 3)$

(a) $5x^3 - 12x^2 + 16x + 3$

(b) $5x^3 - 12x^2 + 16x - 3$

(c) $5x^3 + 12x^2 + 16x - 3$

(d) $5x^3 + 12x^2 + 16x + 3$

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : $6(x^3 - 2x^2 + 3x) - (x^3 + 2x - 3)$

$= 6x^3 - 12x^2 + 18x - x^3 - 2x + 3$

$= 5x^3 - 12x^2 + 16x + 3$

250. Value of $16x^2 + 4y^2 + 25z^2 - 16xy + 20yz - 40zx$ is equal to :

(a) $(4x - 2y + 5z)^2$

(b) $(4x + 2y + 5z)^2$

(c) $(4x - 2y - 5z)^2$

(d) $(4x + 2y - 5z)^2$

RRB Group-D 13/09/2022 (Shift-III)

Ans. (c) : $16x^2 + 4y^2 + 25z^2 - 16xy + 20yz - 40zx$

$= (-4x + 2y + 5z)^2$ $\{\because (-x + y + z)^2 = x^2 + y^2 + z^2 - 2xy + 2yz - 2zx\}$

$= (4x - 2y - 5z)^2$

251. Simplify the given expression.

$3x(x - 9) - 9x^2 + 2x + 24 - x^3$

(a) $24 + 25x - 6x^2 - x^3$ (b) $24 - 25x - 6x^2 - x^3$

(c) $24 - 25x + 6x^2 - x^3$ (d) $24 - 25x - 6x^2 + x^3$

RRB Group-D 29-09-2022 (Shift-II)

Ans. (d) : $3x(x - 9) - 9x^2 + 2x + 24 - x^3$

$= 3x^2 - 27x - 9x^2 + 2x + 24 - x^3$

$= 24 - 25x - 6x^2 - x^3$

252. If $4^{3x} - 8^{x+1} + 16 = 0$ is written as a quadratic equation where $y = 2^{3x}$, then which of the options below will represent the quadratic equation mentioned above?

(a) $4y^2 - 8y + 16 = 0$ (b) $4y^2 - 4y + 16 = 0$

(c) $y^2 - 4y + 16 = 0$ (d) $y^2 - 8y + 16 = 0$

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (d) : $4^{3x} - 8^{x+1} + 16 = 0$

$(2^{3x})^2 - 2^{3x}.2^3 + 16 = 0$

$y^2 - 8y + 16 = 0$ [$\because 2^{3x} = y$ on puting]

253. Simplify: $3(3x - 2) + x\left(\frac{4x}{2}\right) + 15 - 12$

(a) $2x^2 + 9x - 3$ (b) $2x^2 + 9x + 6$

(c) $2x^2 + 9x + 3$ (d) $2x^2 + 6x - 3$

RRB Group-D 22/08/2022 (Shift-II)

Ans. (a) : $3(3x-2)+x\left(\frac{4x}{2}\right)+15-12$

$= 9x - 6 + 2x^2 + 3$

$= 2x^2 + 9x - 3$

254. If $2^x-2^{x-1} = 8$ then find the value of $2x^2+4x+3$.

(a) 41 (b) 20

(c) 21 (d) 51

RRB RPF Constable – 25/01/2019 (Shift-III)

Ans : (d) $2^x - 2^{x-1} = 8$

$\Rightarrow 2^x(1-2^{-1}) = 2^3$

$\Rightarrow 2^x\left(1-\frac{1}{2}\right) = 2^3$

$\Rightarrow 2^x\left(\frac{1}{2}\right) = 2^3$

Multiply by 2 in both side-

$2^x = 2^4$

$\Rightarrow x = 4$

Put, x = 4 in the equation, $(2x^2+4x+3)$

$2x^2 + 4x + 3 = 2\times(4)^2 + 4\times4 + 3$

$= 2\times16 + 16 + 3 = 32 + 19 = 51$

255. If $a^{x+y} = a^6$ and x is 2 more than y find x.

(a) 1 (b) 2

(c) 3 (d) 4

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans : (d) $a^{x+y} = a^6 \Rightarrow x + y = 6$.....(i)

from the question $x = y + 2 \Rightarrow$ $\boxed{y = x - 2}$

from the equation (i)-

$x + (x - 2) = 6$

$2x = 8 \Rightarrow x = 4$

256. If $\frac{p}{b-c} = \frac{q}{c-a} = \frac{r}{a-b}$ then find the value of p+q+r .

(a) -1 (b) 1

(c) 2 (d) 0

RRB JE - 28/06/2019 (Shift-III)

Ans. (d) $\frac{p}{b-c} = \frac{q}{c-a} = \frac{r}{a-b} = k$ (suppose)

p = (b–c)k = bk–ck

q = (c–a)k = ck–ak

r = (a–b)k = ak–bk

p+q+r = bk–ck+ ck – ak + ak –bk = 0

257. If y = 5 then find the value of $5y\sqrt{y^3-y^2}$.

(a) 500 (b) 250

(c) 50 (d) $50\sqrt{2}$

RRB JE - 26/05/2019 (Shift-II)

Ans : (b) Given–

y = 5, $5y\sqrt{y^3-y^2} = ?$

$= 5y\sqrt{y^3-y^2} = 5\times5\sqrt{(5)^3-(5)^2}$

$= 25\sqrt{125-25} = 25\sqrt{100}$

$= 25 \times 10 = 250$

258. If 3x – y = 5 then find the value of $8^x/2^y$.

(a) 32 (b) 256

(c) 64 (d) 16

RRB JE - 27/05/2019 (Shift-II)

Ans : (a) 3x – y = 5 ..... (i)

$\because \quad \frac{8^x}{2^y} = \frac{2^{3x}}{2^y}$

$= 2^{3x-y}$ (From equation (i))

$= 2^5$

$= 32$

259. Find the value of x in 5x + 7y = 19, 7x + 5y = 17

(a) 1 (b) 2

(c) 3 (d) 4

RRB NTPC 03.04.2016 Shift : 3

Ans : (a) 5x + 7y = 19 ……..(i)

7x + 5y = 17 ……..(ii)

After subtracting equation (i) × 5 and equation (ii) × 7,

25x + 35 y = 95

49x + 35y = 119

– – – .

$-24x = -24$

$x = \frac{24}{24} = 1$

260. If x + 2y = 27 and x – 2y = – 1 then find the value of y.

(a) 3 (b) 4

(c) 7 (d) 6

RRB NTPC 31.03.2016 Shift : 2

Ans : (c) x + 2y = 27 …….(1)

x – 2y = –1 …….(2)

∴ Equation (1) – equation (2)

x + 2y = 27

x – 2y = –1

– + +

4y = 28

y = 7

261. Solve : (x + 2y) (2x –y)

(a) $2x^2 + 5xy + 2y^2$ (b) $2x^2 + 3xy - 2y^2$

(c) $x^2 + 4xy + y^2$ (d) $x^2 + 4xy - y^2$

RRB NTPC 29.03.2016 Shift : 3

Ans : (b) $(x + 2y)(2x - y)$

$= 2x^2 - xy + 4xy - 2y^2$

$= 2x^2 + 3xy - 2y^2$

262. If (2a/m + b/n) = 2 and (a/m-b/n) = 4 then find the value of 'a' and 'b' respectively.

(a) 2m, -2n (b) -2n, 2m

(c) 2m, 2n (d) -2m, 2n

RRB NTPC 18.01.2017 Shift : 1

Ans : (a) $\frac{2a}{m} + \frac{b}{n} = 2$.....(i)

$\frac{a}{m} - \frac{b}{n} = 4$.....(ii)

Adding equation (i) and (ii)

$\frac{2a}{m} + \frac{a}{m} = 6$

$\frac{3a}{m} = 6$

$\boxed{a = 2m}$

Again multiplying by 2 in equation (ii) and subtracting equation (i)

$\frac{2a}{m} - \frac{2b}{n} = 8$

$\frac{\frac{2a}{m} + \frac{b}{n} = 2}{-\frac{3b}{n} = 6}$

$\boxed{b = -2n}$

263. If $\left(x^2 + \frac{1}{16x^2}\right) = \frac{19}{2}$ then find the value of $\left(2x - \frac{1}{2x}\right)$

(a) 6 (b) 12

(c) 32 (d) 41

RRB NTPC 19.04.2016 Shift : 3

Ans : (a) $x^2 + \frac{1}{16x^2} = \frac{19}{2}$

$\Rightarrow 4x^2 + \frac{1}{4x^2} = \frac{19}{2} \times 4$ (Multiply by 4 in both side)

$\Rightarrow (2x)^2 + \frac{1}{(2x)^2} = 38$ .....(i)

$\because \left(2x - \frac{1}{2x}\right)^2 = (2x)^2 + \frac{1}{(2x)^2} - 2$

$= 38 - 2 = 36$

$\Rightarrow 2x - \frac{1}{2x} = \sqrt{36} = 6$

264. If 3.5x = 0.07y then find the result of [y-x/y+x]

(a) 51/49 (b) 49/53

(c) 49/51 (d) 53/57

RRB NTPC 18.04.2016 Shift : 1

Ans : (c) Given-

$3.5x = 0.07y$

$\frac{x}{y} = \frac{0.07}{3.5} = \frac{7}{350}$

$\frac{x}{y} = \frac{1}{50}$

$\therefore \frac{y - x}{y + x} = \frac{50 - 1}{50 + 1} = \frac{49}{51}$

265. If 0.08x + 0.04y = 10 and 0.2 (x–1) + 0.4y = 24.8 then find the value of x.

(a) 125 (b) 150

(c) 1.25 (d) 12.5

RRB NTPC 16.04.2016 Shift : 1

Ans : (a) From the question,

$0.08x + 0.04y = 10$

$\Rightarrow \frac{8}{100}x + \frac{4}{100}y = 10$

$\Rightarrow 8x + 4y = 1000$

$\Rightarrow 2x + y = 250$ ……(i)

Again

$0.2(x-1) + 0.4y = 24.8$

$\Rightarrow 2(x-1) + 4y = 248$

$\Rightarrow 2x - 2 + 4y = 248$

$\Rightarrow 2x + 4y = 250$

$\Rightarrow x + 2y = 125$ …….(ii)

Multiplying 2 in equation (i) and subtracting equation (ii).

$4x - x = 500 - 125$

$\Rightarrow 3x = 375$

$\boxed{x = 125}$

266. Given w = –2, x = 3, y = 0 and z = $-\frac{1}{2}$ then find the value of $x\sqrt{(x + wz)}$

(a) ±6 (b) –6

(c) 6 (d) 5

RRB NTPC 07.04.2016 Shift : 3

Ans :(a) $w = -2$, $x = 3$, $y = 0$ & $z = -\frac{1}{2}$

$x\sqrt{(x + wz)} = 3\sqrt{\left(3 + (-2 \times \frac{-1}{2})\right)}$

$= 3\sqrt{(3+1)} = 3\sqrt{4} = 3 \times (\pm 2) = \pm 6$

Type - 9

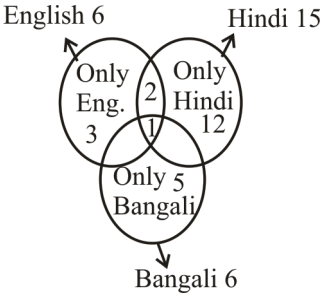
267. In a group of class 6 students can speak English, 15 students can speak Hindi and 6 can speak Bengali. Nobody can speak any other language. If 2 students in the class can speak two languages and one person can speak all the three languages, then how many students are there in the class?

(a) 22 (b) 24

(c) 23 (d) 21

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c)



Total number of students in class = 3 + 2 + 12 + 5 + 1
= 23

268. In a mid-term exam of class 11, 42% students failed in Mathematics, 54% students failed in Physics and 48% students failed in Chemistry. Only 10% students failed in all the three subjects. 20% students failed in both Physics and Chemistry, 15% students failed in both Chemistry and Mathematics, and 18% students failed in both Physics and Mathematics. What is the percentage of those students who failed in two subjects only?

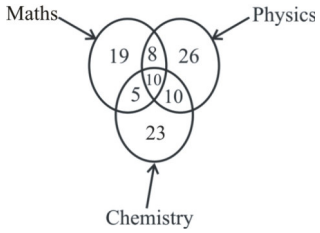
(a) 33% (b) 43%

(c) 53% (d) 23%

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Total number of students = 100%

Venn-diagram of failure students is as follows



Percentage of students who failed in two subject = (8+5+10)% = 23%

269. In an event, 18 people speak English, 20 persons may speak Hindi. 10 people may speak Bengali. 11 people may speak Hindi and English both, 6 people may speak Hindi & Bengali both, 7 peoples may speak Bengali and English 5 persons may speak all languages.

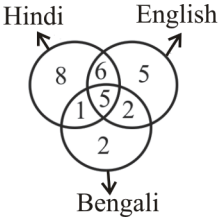
How many people are in group?

(a) 33 (b) 60

(c) 29 (d) 48

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (c) :



Total number of people in the group
= 8 + 6 + 5 + 1 + 5 + 2 + 2 = 29

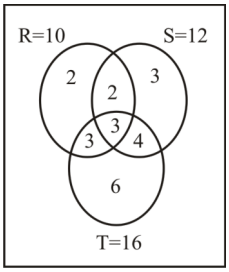
270. R, S and T represent people who like roses, sunflowers and tulips respectively. The number of people is R = 10, S = 12 and T = 16. Three people are such that they like roses, sunflowers and tulip. Two of them like roses and sunflower. Three people like roses and tulips and 4 people like sunflowers and tulip. Then what is the number of people who like only rose?

(a) 6 (b) 2

(c) 12 (d) 14

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,



It is clear from the diagram that the number of people who like only rose=2

271. In a class 25 students like Maths and History, 25 students like only Hindi, 30 students like only English, 20 students like English and Hindi both, 15 students like only History and 15 students like only Maths. 15 students like all 4 subjects. How many total students are there in the class?

(a) 130 (b) 145
(c) 125 (d) 140

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (b) : Total number of students
= 25 + 25 + 30 + 20 + 15 + 15 + 15 = 145

272. In a class of 130 students. 15 students like Maths and History. 25 students like only Hindi. 30 students like only English, 20 students like English and Hindi both, 15 students like only History and 15 students like only Maths. Some students like all 4 subjects. If the total number of students who like English is 60, Hindi is 55, Maths and history is 40 then how many students like all 4 subjects?

(a) 25 (b) 35
(c) 10 (d) 15

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

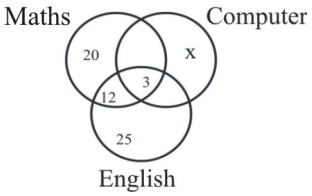
Ans. (c) : As per the question –
Students who like only Mathematics and History = 15
Students who like only English and Hindi = 20
Students who like only Hindi = 25
Students who like only English = 30
Students who like only Mathematics = 15
Students who like only History = 15
Total students who like English = 60
Total students who like Hindi = 55
Total students who like Mathematics and History = 40
From the above,
Students who like all three subjects with English
= 60 – (30 + 20) = 10
Students who like all three subject with Hindi
= 55 – (20 + 25) = 10
Number of students who like two more subjects with Maths and History = 40 – (15 + 15) = 10
Hence number of students who like all four subjects = 10

273. In a class of 65 students, 20 students like only Maths, 25 students like only English and 15 students like both English and Maths. 8 students like Computer and 3 students like all three subjects. There are no students who like Computer and English. Also, there are no students who like Maths and Computer. How many students like only Computer?

(a) 3 (b) 11
(c) 5 (d) 2

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) Let, number of people who like Computer be x.



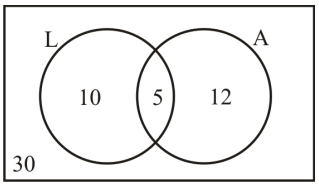
$\because$ 20+25+12+3+x = 65
60+x = 65
x = 65–60
x = 5
Hence, there are 5 students who like only Computer.

274. L and A are classmates as well as good friends. In a class of 30 students, L has 10 unique friends and 5 friends who are common to A. A has a total of 17 friends in the class. How many students are friends with neither L nor A?

(a) 5 (b) 2
(c) 4 (d) 3

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : As per the question,



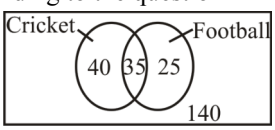
From above diagram,
Number of students who are neither friends of L nor friends of A.
= 30 – (10 + 5 + 12)
= 30 – 27
= 3

275. Please read the following information carefully and answer the given question. In a group of 140 people, 75 people like to watch cricket and 60 people like to watch football. 35 people like to watch both the games. How many people like to watch at least one sports?

(a) 100 (b) 110
(c) 95 (d) 90

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question-



So, those people who like to watch at least one game
= 40 + 35 + 25
= 100

276. In a college, there are 3600 students, out of which 82% are football players, 7% are kabaddi players, 4% are chess players and the remaining are cricket players. The number of cricket players is:

(a) 252 (b) 126

(c) 136 (d) 152

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (a) :

Total number of students in the college = 3600

Number of football players = $3600 \times \frac{82}{100} = 2952$

Number of kabaddi players = $3600 \times \frac{7}{100} = 252$

Number of chess players = $3600 \times \frac{4}{100} = 144$

Number of cricket players = 3600–(2952+252+144)

= 3600 – 3348 = 252

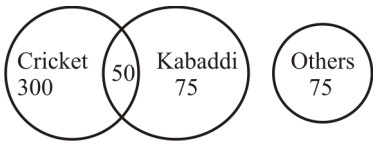
277. Out of 500 students in a college, 350 play cricket, 125 play kabaddi, 75 neither play cricket nor play kabaddi. Find the percentage of the number of the students who play both kabaddi and cricket.

(a) 20% (b) 15%

(c) 12% (d) 10%

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d)



Students playing both cricket and kabaddi = 50

Total number of students = 500

Hence, percentage of students who play both games

$= \frac{50}{500} \times 100 = \boxed{10\%}$

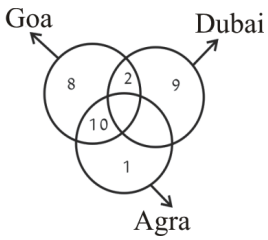
278. In a group of people, 8 persons like only Goa and 9 persons like only Dubai. There is only one person who likes only Agra, 10 person like both Goa and Agra while 2 persons like both Dubai and Goa. There is no such person who likes both Agra and Dubai and there is no one in the group who likes all three. How many total persons are there in the group

(a) 42 (b) 30

(c) 39 (d) 31

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (b)

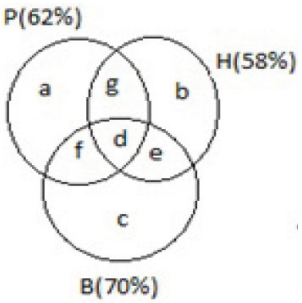


Hence from the above diagram the total number of persons in the group

= 8 + 2 + 9 + 10 + 1

= 30

279. Study the given Venn diagram and answer the question that follows.



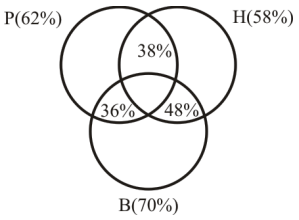
There are 7500 officers in a Stage. Among them, 62% officer punctual (P), 58% officers are honest (H) and 70% officers are brave (B). 38% officers are punctual (P) and honest (H), 48% are honest (H) and brave (B) and 36% are punctual (P) and brave (B). What percentage of officers are punctual (P), honest (H) and brave (B) = ?

(a) 90% (b) 22%

(c) 68% (d) 32%

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) :



$\Rightarrow n(P \cup H \cup B)$

$= n(P)+n(H)+n(B)-[n(P \cap H)+n(H \cap B)+n(B \cap P)]+n(P \cap H \cap B)$

100% = 62%+58%+70%–(38+48+36)% +$n(P \cap H \cap B)$

100% = 190–122+$n(P \cap H \cap B)$

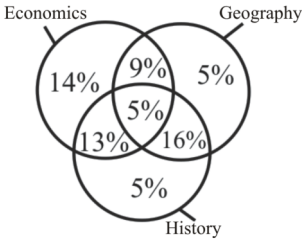
$\therefore$ $n(P \cap H \cap B)$= 100% – 68% = 32%

280. In an examination, 41% of students failed in Economics, 35% of students failed in Geography and 39% of students failed in History, 5% of students failed in all the three subjects, 14% of students failed in Economics and Geography, 21% of students failed in Geography and History and 18% of students failed in History and Economics. Find the percentage of students who failed in only Economics.

(a) 16 % (b) 12 %
(c) 10 % (d) 14 %

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (d) :



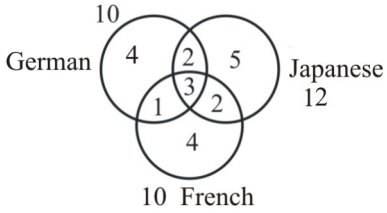
Percentage of students who failed only in Economics = 14%

281. There are 21 persons and there languages – French, German and Japanese. 10 persons speak German, 12 persons speak Japanese, and 10 persons speak French. 4 can speak only French and 5 can speak only Japanese. 4 can speak French as well as German. 3 persons can speak all language. How many persons speak Japanese and German?

(a) 3 (b) 2
(c) 4 (d) 1

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) :



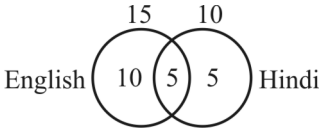
From the above Venn diagram number of people speaking both Japanese and German language = 2.

282. In a group of students, 15 opt for English, 10 opt for Hindi. Five students are studying both languages. How many students are studying only English.

(a) 25 (b) 10
(c) 5 (d) 15

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) :



Therefore, 10 students are studying only English.

283. 14 people buy item A while 13 people buy item B. Two people buy both items. How many people are there in all?

(a) 27 (b) 29
(c) 26 (d) 25

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (d) : Let total number of people = x

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$x = 14 + 13 - 2$

$x = 27 - 2$

$x = 25$

So, the total numebr of people will be 25.

284. In an examination, 35% students failed in one subject and 42% failed in the other subject, among these 30% failed in both the subjects. If total number of students is 2500 then how many students passed only in one subject?

(a) 425 (b) 1750
(c) 1050 (d) 750

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : Failed in only one subject means percentage of students passed in

$= (42 - 30) + (35 - 30)$

$= 12 + 5$

$= 17\ \%$

Hence number of students $= 2500 \times \frac{17}{100}$

$= 425$

285. In a group of 60 students, 65% mentioned their gender as 'Male' and 30% mentioned their gender as 'Female'. How many students have not mentioned their gender?

(a) 2 (b) 3
(c) 5 (d) 4

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (b) Total number of students = 60

According to the question,

$$\text{Number of Males} = 60 \times \frac{65}{100} = 39$$

$$\text{Now, Number of Females} = 60 \times \frac{30}{100} = 18$$

Number of students who have not mentioned their gender = $60 - (39+18)$

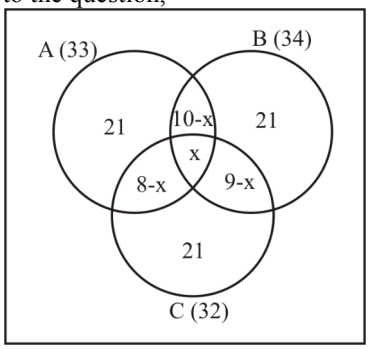
$= 60 - 57 = 3$

286. Last year, there were three Sections in a competitive exam. Out of them 33 students cleared the cut-off in Section A, 34 students cleared the cut-off in Section B and 32 students cleared the cut-off in Section C. 10 Students cleared the cut-off in Section A and Section B, 9 cleared the cut-off in Section B and Section C and 8 cleared the cut-off in Section A and Section C. The number of students who cleared only one Section was equal and was 21 for each Section. How many students cleared all the three Sections?

(a) 9 (b) 8
(c) 6 (d) 7

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (c): Suppose number of students cleared all the three Section be x.
According to the question,



Hence, from Section A

$21 + (10 - x) + x + (8 - x) = 33$

$39 - x = 33$

$x = 6$

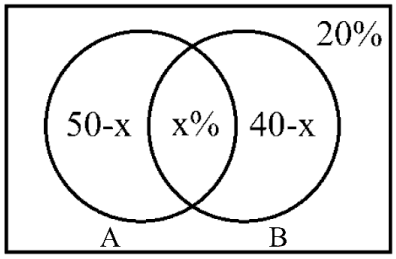
Hence, number of students who cleared the all three Section is 6.

287. A survey conducted in one area found that 50% of people read 'A' newspaper, 40% of people read 'B' newspaper, 20% of people read neither newspaper A nor newspaper B. If the number of people who read both newspapers is 500. Then how many people were surveyed?

(a) 7000 (b) 4500
(c) 5000 (d) 3000

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (c)



From the Venn diagram,

$50 - x + x + 40 - x + 20 = 100$

$110 - x = 100$

$x = 10\%$

$10\% = 500$

$100\% = 5000$

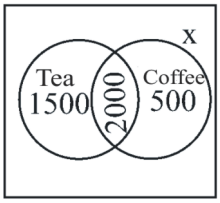
So total number of people is 5000 in the survey.

288. The number of students in a college is 5000. 3500 students like coffee, 2500 students like tea and 2000 students like both tea and coffee. How many students don't like either of these two drinks?

(a) 1500 (b) 1000
(c) 500 (d) 2000

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans. (b) Let the number of students who do not like both the drinks = x



$5000 = 2000 + 1500 + 500 + x$

$x = 5000 - 4000$

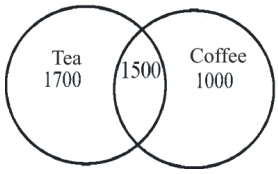
$x = 1000$

289. In a town with a population of 5000, 3200 people take tea, 2500 people take coffee and 1500 people take both tea and coffee. How many of them neither take tea nor coffee?

(a) 800 (b) 770
(c) 900 (d) 1800

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (a)



The number of people who take only tea

$= 3200 - 1500 = 1700$

The number of people who take only coffee

$= 2500 - 1500 = 1000$

Number of people neither take tea nor coffee

$= 5000 - (1700 + 1000 + 1500)$

$= 5000 - 4200 = 800$

So, 800 people neither take tea nor coffee.

Type - 10

290. If $\frac{x}{2}+\frac{2}{y}=1$ and $\frac{y}{2}+\frac{2}{z}=1$, then the value of $\frac{z}{2}+\frac{2}{x}$ is:

(a) –1 (b) 1

(c) 0 (d) 2

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Given,

$\frac{x}{2}+\frac{2}{y}=1$

$xy + 4 = 2y$

$2y - xy = 4$

$y = \frac{4}{2-x}$ _____(i)

$\frac{y}{2}+\frac{2}{z}=1$

$yz + 4 = 2z$ _____(ii)

On putting the value of y in equation (ii),

$\frac{4}{(2-x)}\times z + 4 = 2z$

$4z + 8 - 4x = 4z - 2xz$

$8 - 4x = -2xz$

$4 - 2x = -xz$

$2x = 4 + xz$

$1 = \frac{4}{2x}+\frac{xz}{2x}$

or $\frac{2}{x}+\frac{z}{2}=1$

291. If $a^{2x} = b$, $b^{2y} = c$, $c^{2z} = a$ then the value of xyz is:

(a) 1 (b) $\frac{1}{8}$

(c) 8 (d) 0

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (b) : Given,

$a^{2x} = b$, $b^{2y} = c$, $c^{2z} = a$ then $xyz = ?$

Where,

$a = c^{2z}$

$a = (b^{2y})^{2z}$

$a = (b)^{4yz}$

$a = (a^{2x})^{4yz}$

$a = (a)^{8xyz}$

$a^1 = a^{8xyz}$

$8xyz = 1$

$\boxed{xyz = \frac{1}{8}}$

292. If $P = 2+\sqrt{3}, Q = 2-\sqrt{3}$ then find the value of $\frac{P}{Q}$

(a) $4\sqrt{3}-5$ (b) $7-2\sqrt{6}$

(c) $4\sqrt{6}+5$ (d) $\frac{7+4\sqrt{3}}{1}$

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$P = 2 + \sqrt{3}$

$Q = 2 - \sqrt{3}$

$\frac{P}{Q}=\frac{2+\sqrt{3}}{2-\sqrt{3}}\times\frac{(2+\sqrt{3})}{(2+\sqrt{3})}$

$=\frac{(2+\sqrt{3})^2}{(2)^2-(\sqrt{3})^2}$

$=\frac{4+3+4\sqrt{3}}{4-3}$

$=\frac{7+4\sqrt{3}}{1}$

293. If $a^2 + b^2 = 80$ and $a - b = 4$, then ab = ?

(a) 20 (b) 24

(c) 28 (d) 32

RRB NTPC 05.04.2016 Shift-1

Ans : (d) Given-

$a^2 + b^2 = 80$, $a - b = 4$

$\because (a-b)^2 = a^2 + b^2 - 2ab$

$\Rightarrow (4)^2 = 80 - 2ab$

$\Rightarrow 2ab = 80 - 16$

$\Rightarrow 2ab = 64$

$\Rightarrow ab = \frac{64}{2} \Rightarrow ab = 32$

294. If $40x^2 = 334^2 - 134^2$ then value of x^2 is–

(a) 2340 (b) 234

(c) 1234 (d) 144

RRB NTPC 12.04.2016 Shift : 1

Ans : (a) From the question,

$40x^2 = 334^2 - 134^2$ $\{a^2-b^2 = (a+b)(a-b)\}$

$\Rightarrow 40x^2 = (334 - 134)(334+134)$

$\Rightarrow 40x^2 = 200 \times 468$

$\Rightarrow x^2 = 2340$

23.

Trigonometry

Type - 1

1. If $0° < \theta < 90°$ then the value of $\frac{\cot\theta - 1}{1 - \tan\theta} \div \left(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}\right)$ is equal to :

(a) $\frac{\cos\theta}{2}$ (b) $\sin\theta$

(c) $\cos\theta$ (d) $\frac{\sec\theta}{2}$

RRB NTPC (Stage-2) 16/06/2022 (Shift-III)

Ans. (a) :

$$\frac{\cot\theta - 1}{1 - \tan\theta} \div \left(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}\right)$$

$$= \frac{1 - \tan\theta}{(1 - \tan\theta).\tan\theta} \div \left[\frac{\sin^2\theta + (1+\cos\theta)^2}{(1+\cos\theta)\sin\theta}\right]$$

$$= \frac{1}{\tan\theta} \div \left[\frac{\sin^2\theta + 1 + \cos^2\theta + 2\cos\theta}{(1+\cos\theta)\sin\theta}\right]$$

$$= \frac{1}{\tan\theta} \div \left[\frac{2(1+\cos\theta)}{(1+\cos\theta).\sin\theta}\right]$$

$$= \frac{1}{\tan\theta} \div \frac{2}{\sin\theta}$$

$$= \frac{\cos\theta}{\sin\theta} \times \frac{\sin\theta}{2} = \frac{\cos\theta}{2}$$

2. If $\sqrt{3}\tan2\theta - 3 = 0$ then find the value of $\tan\theta \sec\theta - \sin\theta$ $(0 < \theta < 90°)$

(a) $\frac{1}{6}$ (b) $\frac{5}{6}$

(c) $\frac{2}{3}$ (d) $\frac{2}{3}$

RRB NTPC (Stage-2) 12/06/2022 (Shift-I)

Ans. (a) : $\sqrt{3}\tan2\theta - 3 = 0$

$\tan2\theta = \sqrt{3}$

$\tan2\theta = \tan60° \Rightarrow 2\theta = 60° \Rightarrow \theta = 30°$

$\therefore \tan\theta.\sec\theta - \sin\theta$

$= \tan30°.\sec30° - \sin30°$

$$= \frac{1}{\sqrt{3}} \times \frac{2}{\sqrt{3}} - \frac{1}{2} = \frac{2}{3} - \frac{1}{2} = \frac{1}{6}$$

3. Find the value of $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2$

(a) $7 + \cot^2\theta + \tan^2\theta$

(b) $5 + \cot^2\theta + \tan^2\theta$

(c) $7 - \cot^2\theta + \tan^2\theta$

(d) $5 - \cot^2\theta + \tan^2\theta$

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (a) : $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2$

$= (\sin^2\theta + \text{cosec}^2\theta + 2\sin\theta.\ \text{cosec}\theta) + (\cos^2\theta + \sec^2\theta + 2\cos\theta.\sec\theta)$

$= \sin^2\theta + \text{cosec}^2\theta + 2 + \cos^2\theta + \sec^2\theta + 2$

$= \sin^2\theta + \cos^2\theta + \text{cosec}^2\theta + \sec^2\theta + 4$

$= 1 + 1 + \cot^2\theta + 1 + \tan^2\theta + 4$

$= 7 + \cot^2\theta + \tan^2\theta \quad \left\{\because \text{cosec}^2\theta = 1 + \tan^2\theta,\ \sec^2\theta = 1 + \cot^2\theta\right\}$

4. Simplify $\sqrt{\frac{1+\cos A}{1-\cos A}}$

(a) $\sec A + \tan A$

(b) $\sec A - \tan A$

(c) $\text{cosec}\,A - \cot A$

(d) $\text{cosec}\,A + \cot A$

RRB Group-D 30/08/2022 (Shift-II)

Ans. (d) : $\sqrt{\frac{1+\cos A}{1-\cos A}}$

$$= \sqrt{\frac{1+\cos A}{1-\cos A} \times \frac{1+\cos A}{1+\cos A}}$$

$$= \sqrt{\frac{(1+\cos A)^2}{\sin^2 A}}$$

$$= \frac{1+\cos A}{\sin A}$$

$$= \frac{1}{\sin A} + \frac{\cos A}{\sin A}$$

$= \text{cosec}A + \cot A$

5. Find the value of sec A (1 - cos A) (cosec A + cot A)

(a) cosec A (b) tan A

(c) sec A (d) cot A

RRB Group-D 09/09/2022 (Shift-I)

Ans. (b) : $\sec A(1-\cos A)(\text{cosec}A+\cot A)$

$$=\sec A(1-\cos A)\left(\frac{1}{\sin A}+\frac{\cos A}{\sin A}\right)$$

$$=\sec A(1-\cos A)\frac{(1+\cos A)}{\sin A}$$

$$=\frac{1-\cos^2 A}{\sin A\cos A}$$

$$=\frac{\sin^2 A}{\sin A\cos A}$$

$$=\frac{\sin A}{\cos A}$$

$$=\tan A$$

6. Find the value of $\tan\theta+\frac{1}{\tan\theta}$

(a) $\cos\theta\sec\theta$ (b) $\text{cosec}\,\theta\sin\theta$

(c) $\text{cosec}\,\theta\cot\theta$ (d) $\text{cosec}\,\theta\sec\theta$

RRB Group-D 30/08/2022 (Shift-III)

Ans. (d) : दिया है–

$$\tan\theta+\frac{1}{\tan\theta}=?$$

$$=\frac{\sin\theta}{\cos\theta}+\frac{\cos\theta}{\sin\theta}$$

$$\Rightarrow\frac{\sin^2\theta+\cos^2\theta}{\cos\theta.\sin\theta}$$

$$\Rightarrow\frac{1}{\cos\theta.\sin\theta}$$

$$\Rightarrow \text{cosec}\theta\,.\,\sec\theta$$

7. Find the value of $\sin x+\frac{\cos x}{\tan(90-x)}$

(a) cot x (b) 2 sin x

(c) 2 cosec x (d) tan x

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (b) : Given -

$$\sin x+\frac{\cos x}{\tan(90-x)}$$

$$=\sin x+\frac{\cos x}{\cot x}$$

$$=\sin x+\frac{\cos x}{\frac{\cos x}{\sin x}}$$

$$=\sin x+\frac{\cos x.\sin x}{\cos x}$$

$$=2\sin x$$

8. Find the value of (cosec x + cot x + 1) (sec x – tan x – 1), if x = 45°

(a) –2 (b) 1

(c) 0 (d) –1

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : (cosecx + cotx + 1) (secx – tanx – 1)

x = 45° रखने पर,

(cosec45 + cot 45 + 1) (sec 45 – tan 45 – 1)

$$=\left(\sqrt{2}+2\right)\left(\sqrt{2}-2\right)$$

$$=2-4$$

$$=-2$$

9. If $\tan\theta=4$, Then find the value of

$$\frac{4\cos\theta+2\sin\theta}{2\sin\theta-\cos\theta}$$

(a) $\frac{12}{7}$ (b) $\frac{12}{5}$

(c) $\frac{12}{8}$ (d) $\frac{12}{10}$

RRB Group-D 23/08/2022 (Shift-II)

Ans. (a) : Given $\tan\theta=4$

$$\frac{4\cos\theta+2\sin\theta}{2\sin\theta-\cos\theta}$$

$$=\frac{4+2\tan\theta}{2\tan\theta-1}$$

$$=\frac{4+2\times4}{2\times4-1}$$

$$=\frac{12}{7}$$

10. Which of the following represents the right hand side (RHS) of the given equation ?

$$\sqrt{\frac{1+\sin A}{1-\sin A}}=?$$

(a) $\frac{1}{\text{cosec}\,A}$ (b) sec A + cot A

(c) sin A + cos A (d) sec A + tan A

RRB Group-D 24/08/2022 (Shift-I)

Ans. (d) : Given

$$=\sqrt{\frac{1+\sin A}{1-\sin A}}$$

$$=\sqrt{\frac{1+\sin A}{1-\sin A}\times\frac{1+\sin A}{1+\sin A}}$$

$$=,\sqrt{\frac{(1+\sin A)^2}{(1-\sin^2 A)}}$$

$$=\sqrt{\frac{(1+\sin A)^2}{\cos^2 A}}$$

$= \frac{1+\sin A}{\cos A}$

$= \frac{1}{\cos A} + \frac{\sin A}{\cos A}$

$= \sec A + \tan A$

11. If cot(A+B).cot(A–B) = 1, then the value of $\cot\left(\frac{2A}{3}\right)$ is:

(a) $\frac{\sqrt{3}}{2}$ (b) $\sqrt{3}$

(c) $\frac{\sqrt{2}}{3}$ (d) $\frac{1}{\sqrt{3}}$

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (b) : $\cot(A+B)\cot(A-B) = 1$

$\cot(A+B) = \tan(A-B)$

$\cot(A-B) = \cot[90-(A-B)]$

$A+B = 90° - (A-B)$

$2A = 90°$

$A = 45°$

$\therefore \cot\left(\frac{2A}{3}\right) = \cot\left(\frac{2\times 45°}{3}\right) = \cot 30° = \sqrt{3}$

12. In a triangle ABC, tanA + tanB + tanC = ?

(a) 1

(b) -tanA.tanB.tanC

(c) tanA.tanB + tanB.tanC + tanC.tanA

(d) tanA.tanB.tanC

RRB NTPC 17.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\tan A + \tan B + \tan C = ?$

$A + B + C = 180°$

$A + B = 180° - C$

$\tan(A+B) = \tan(180° - C)$

$\frac{\tan A + \tan B}{1 - \tan A \cdot \tan B} = -\tan C$

$\tan A + \tan B = -\tan C + \tan A \cdot \tan B \cdot \tan C$

$\tan A + \tan B + \tan C = \tan A \cdot \tan B \cdot \tan C$

13. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = \frac{5}{3}$, then the value of sinθ is:

(a) $\frac{3}{4}$ (b) $\frac{2}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{3}$

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (c) : Given that,

$\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = \frac{5}{3}$

$3(\sec\theta + \tan\theta) = 5(\sec\theta - \tan\theta)$

$3\sec\theta + 3\tan\theta = 5\sec\theta - 5\tan\theta$

$2\sec\theta = 8\tan\theta$

$2 \times \frac{1}{\cos\theta} = \frac{8\sin\theta}{\cos\theta}$

$2 = 8\sin\theta$

$\sin\theta = \frac{2}{8} = \frac{1}{4}$

Hence, $\sin\theta = \frac{1}{4}$

14. Solve the following :

$\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = ?$

(a) 0 (b) $2\cos^2\theta$

(c) $2\sec^2\theta$ (d) 1

RRB ALP & Tec. (17-08-18 Shift-III)

Ans : (c) Given that,

$\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = \frac{1-\sin\theta+1+\sin\theta}{1-\sin^2\theta}$

$= \frac{2}{1-\sin^2\theta}$ $\left[\because 1-\sin^2\theta = \cos^2\theta\right]$

$= \frac{2}{\cos^2\theta} = 2\sec^2\theta$

15. Simplify:

$\sin\theta/(1 - \cos\theta)$

(a) $\tan\theta - \sec\theta$ (b) $\text{cosec}\ \theta + \cot\theta$

(c) $\text{cosec}\ \theta - \cot\theta$ (d) $\tan\theta + \sec\theta$

RRB JE - 02/06/2019 (Shift-I)

Ans : (b) $\frac{\sin\theta}{1-\cos\theta}$

$= \frac{\sin\theta(1+\cos\theta)}{(1-\cos\theta)(1+\cos\theta)}$

(Rationalising the numerator and the denominator)

$= \frac{\sin\theta\,(1+\cos\theta)}{1-\cos^2\theta} = \frac{\sin\theta(1+\cos\theta)}{\sin^2\theta}$

$= \frac{1+\cos\theta}{\sin\theta} = \frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta} = \text{cosec}\ \theta + \cot\theta$

16. $\frac{\sin A + \sin B}{\cos A - \cos B} + \frac{\cos A + \cos B}{\sin A - \sin B} = ?$

(a) sin A cos B (b) 0

(c) tan A tan B (d) cos A cos B

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) Given that,

$\frac{\sin A + \sin B}{\cos A - \cos B} + \frac{\cos A + \cos B}{\sin A - \sin B}$

$= \frac{(\sin A + \sin B)(\sin A - \sin B) + (\cos A + \cos B)(\cos A - \cos B)}{(\cos A - \cos B)(\sin A - \sin B)}$

$= \frac{\sin^2 A - \sin^2 B + \cos^2 A - \cos^2 B}{(\cos A - \cos B)(\sin A - \sin B)}$

$$= \frac{\left(\sin^2 A + \cos^2 A\right) - \left(\sin^2 B + \cos^2 B\right)}{\left(\cos A - \cos B\right)\left(\sin A - \sin B\right)}$$

$$\left(\because \sin^2\theta + \cos^2\theta = 1\right)$$

$$= \frac{1-1}{\left(\cos A - \cos B\right)\left(\sin A - \sin B\right)} = 0$$

17. Complete the following–
ΔABC, cos (B+C/2) = ?

(a) cos A (b) sin A/2
(c) sin A + B /2 (d) cot B

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (b) $\because A + B + C = 180^0$

$$B + C = 180 - A$$

$$\frac{B+C}{2} = \left(\frac{180 - A}{2}\right)$$

$$\cos\frac{(B+C)}{2} = \cos\frac{\left(180^0 - A\right)}{2}$$

$$\cos\left(\frac{B+C}{2}\right) = \cos\left(90^0 - \frac{A}{2}\right)$$

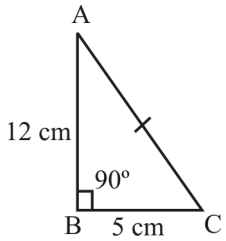
$$\cos\left(\frac{B+C}{2}\right) = \sin\frac{A}{2}$$

18. In a triangle, right-angled at B, AB = 12 cm and BC = 5 cm. What will be the value of
(i) sinA cosA
(ii) sinCcosC respectively ?

(a) $\frac{60}{169}, \frac{60}{169}$ (b) $\frac{25}{169}, \frac{60}{169}$
(c) $\frac{60}{169}, \frac{25}{169}$ (d) $\frac{26}{169}, \frac{25}{169}$

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given that,



From Pythagoras theorem

$AC^2 = AB^2 + BC^2$

$= 144 + 25$

$AC = \sqrt{169}$

$AC = 13$

(i) sin A × cos A $\left(\because \sin\theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}}, \cos\theta = \frac{\text{Base}}{\text{Hypotenuse}}\right)$

$= \frac{5}{13} \times \frac{12}{13}$

$= \frac{60}{169}$

(ii) sin C × cos C

$= \frac{12}{13} \times \frac{5}{13}$

$= \frac{60}{169}$

19. What is the value of the following expression?

$$\frac{\cos 3x + \cos x}{\sin 3x - \sin x}$$

(a) sin x (b) cot x
(c) cos x (d) tan x

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given that,

$$\frac{\cos 3x + \cos x}{\sin 3x - \sin x}$$

We know that-

$$\cos\alpha + \cos\beta = 2\cos\frac{\alpha+\beta}{2}\cdot\cos\frac{\alpha-\beta}{2}$$

$$\sin\alpha - \sin\beta = 2\sin\frac{\alpha-\beta}{2}\cdot\cos\frac{\alpha+\beta}{2}$$

$$\frac{2\cos\frac{3x+x}{2}\cdot\cos\frac{3x-x}{2}}{2\sin\frac{3x-x}{2}\cdot\cos\frac{3x+x}{2}} = \frac{2\cos 2x\cdot\cos x}{2\sin x\cdot\cos 2x}$$

$$= \frac{\cos x}{\sin x} = \cot x$$

20. Simplify the following.

$$\sqrt{2+\sqrt{2+2\cos 4\theta}}$$

(a) sin θ (b) cos θ
(c) 2 cos θ (d) cos 2 θ

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (c) : $\sqrt{2+\sqrt{2+2\cos 4\theta}}$

$\left\{\cos 2\theta = 2\cos^2\theta - 1, \; 2\cos^2\theta = 1 + \cos 2\theta\right\}$

$\Rightarrow \sqrt{2+\sqrt{2\left(1+\cos 4\theta\right)}}$

$\Rightarrow \sqrt{2+\sqrt{2\times 2\cos^2 2\theta}}$

$\Rightarrow \sqrt{2+2\cos 2\theta}$

$\Rightarrow \sqrt{2.2\cos^2\theta}$

$\Rightarrow 2\cos\theta$

21. The value of $4\cos\left(\frac{\pi}{6}-\alpha\right)\sin\left(\frac{\pi}{3}-\alpha\right)$ is equal to :

(a) $3 + 4\sin^2\alpha$ (b) $3 + \sin^2\alpha$

(c) $3 - \sin^2\alpha$ (d) $3 - 4\sin^2\alpha$

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given that,

$4\cos\left(\frac{\pi}{6}-\alpha\right).\sin\left(\frac{\pi}{3}-\alpha\right)$

$= 2\cos A \,.\, \sin B = \sin(A+B) - \sin(A-B)$

$= 2\left[\sin\left(\frac{\pi}{6}-\alpha+\frac{\pi}{3}-\alpha\right)-\sin\left(\frac{\pi}{6}-\alpha-\frac{\pi}{3}+\alpha\right)\right]$

$= 2\sin\left(\frac{3\pi}{6}-2\alpha\right)-\sin\left(\frac{-\pi}{6}\right)$

$= 2\sin\left(\frac{\pi}{2}-2\alpha\right)+\sin\frac{\pi}{6}$

$= 2\left[\cos 2\alpha+\frac{1}{2}\right]$

$= 2\cos 2\alpha + 1$

$= 2[1-2\sin^2\alpha]+1$

$= 2 - 4\sin^2\alpha + 1$

$= 3 - 4\sin^2\alpha$

22. The expression $\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}$ can be written as ;

(a) $1 + \sec A \operatorname{cosec} A$ (b) $\tan A + \cot A$

(c) $\sec A + \cot A$ (d) $1 + \sin A \cos A$

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) Given that,

$$\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}$$

$$=\frac{\sin A}{\cos A}\times\frac{1}{1-\frac{\cos A}{\sin A}}+\frac{\cos A}{\sin A}\times\frac{1}{1-\frac{\sin A}{\cos A}}$$

$$=\frac{\sin^2 A}{\cos A(\sin A-\cos A)}+\frac{\cos^2 A}{\sin A(\cos A-\sin A)}$$

$$=\frac{\sin^2 A}{\cos A(\sin A-\cos A)}-\frac{\cos^2 A}{\sin A(\sin A-\cos A)}$$

$$=\frac{1}{\sin A-\cos A}\left[\frac{\sin^3 A-\cos^3 A}{\sin A.\cos A}\right]$$

$$(a^3-b^3)=(a-b)(a^2+b^2+ab)$$

$$=\frac{1}{(\sin A-\cos A)}\left[\frac{(\sin A-\cos A)(\sin^2 A+\cos^2 A+\sin A.\cos A)}{\sin A.\cos A}\right]$$

$$=\frac{1+\sin A.\cos A}{\sin A.\cos A}$$

$$=\frac{1}{\sin A.\cos A}+\frac{\sin A.\cos A}{\sin A.\cos A}$$

$$=\frac{1}{\sin A.\cos A}+1$$

$$=\sec A.\operatorname{cosec} A+1$$

23. Solve the following equation-

$$\frac{\tan A}{1+\sec A}+\frac{1+\sec A}{\tan A}=?$$

(a) $2\sec A$ (b) $2\cos A$

(c) $2\sin A$ (d) $2\operatorname{cosec} A$

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : From question,

$$\frac{\tan A}{1+\sec A}+\frac{1+\sec A}{\tan A}=?$$

$$=\frac{\sin A/\cos A}{1+\frac{1}{\cos A}}+\frac{1+\frac{1}{\cos A}}{\sin A/\cos A}$$

$$=\frac{\sin A}{1+\cos A}+\frac{\cos A+1}{\sin A}$$

$$=\frac{\sin^2 A+1+\cos^2 A+2\cos A}{\sin A(1+\cos A)}\quad[\because \sin^2 A+\cos^2 A=1]$$

$$=\frac{2(1+\cos A)}{\sin A(1+\cos A)}=\frac{2}{\sin A}$$

$$=2\operatorname{cosec} A$$

24. What is the value of $\sin(48^\circ+\theta) - \cos(42^\circ-\theta)$?

(a) 2 (b) –1

(c) 1 (d) 0

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given that,

$\sin(48^\circ+\theta) - \cos(42^\circ-\theta)$

$= \sin(48^\circ+\theta) - \cos\{90-(48^\circ+\theta)\}$

$= \sin(48+\theta) - \sin(48^\circ+\theta)$

$= 0$

25. The value of $\sqrt{\frac{1+\cos 2A}{1-\cos 2A}}$ = ? (Note– A is non zero)

(a) $\tan A$ (b) $\cos A$

(c) $\sin A$ (d) $\cot A$

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\sqrt{\frac{1+\cos 2A}{1-\cos 2A}} = \sqrt{\frac{1+(2\cos^2 A-1)}{1-(1-2\sin^2 A)}}$

$= \sqrt{\frac{1+2\cos^2 A-1}{1-1+2\sin^2 A}}$

$= \sqrt{\frac{2\cos^2 A}{2\sin^2 A}}$

$= \sqrt{\cot^2 A} = \cot A$

26. Which of the following is a simplified form of the expression :

sinAcosA (tanA – cotA), where (0° ≤ A ≤ 90°)

(a) $2\cos^2A - 1$ (b) $2\sin^2A - 1$

(c) 1 (d) $1 - \cos^2A$

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (b) : sin A cos A (tan A – cot A)

$= \sin A \cos A \left(\frac{\sin A}{\cos A} - \frac{\cos A}{\sin A}\right)$

$= \sin A \,.\, \cos A \left(\frac{\sin^2 A - \cos^2 A}{\sin A.\cos A}\right)$

$= \sin^2A - \cos^2A$

$= \sin^2A - (1 - \sin^2A)$

$= \sin^2A - 1 + \sin^2A$

$= 2\sin^2A - 1$

27. The value of $\cos(\sec^{-1}x + \text{cosec}^{-1}x)$, $|x| \geq 1$ is:

(a) 1 (b) ± 1

(c) 0 (d) 2

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : $\cos(\sec^{-1} x + \text{cosec}^{-1} x)$

According to the question,

Let x = 1

$= \cos(\sec^{-1} 1 + \text{cosec}^{-1} 1)$

$= \cos(\sec^{-1} \sec 0^\circ + \text{cosec}^{-1} \text{cosec } 90^\circ)$

$= \cos(0^\circ + 90^\circ)$

$\Rightarrow \cos 90^\circ = 0$

28. Find the principal value of $\text{Sin}^{-1}\left(\frac{1}{\sqrt{2}}\right)$.

(a) π (b) 0

(c) $\frac{\pi}{2}$ (d) $\frac{\pi}{4}$

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right) = \sin^{-1}(\sin 45^\circ) = 45^\circ = \frac{\pi}{4}$

29. If $r\sin\theta = \frac{7}{2}$ and $r\cos\theta = \frac{7\sqrt{3}}{2}$ then what will be the value of r?

(a) $\sqrt{3}$ (b) 5

(c) 7 (d) –1

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c) Given that,

$r\sin\theta = \frac{7}{2}$ ..... (i)

and $r\cos\theta = \frac{7\sqrt{3}}{2}$ ..... (ii)

From equation (i)^2 + equation (ii)^2

$r^2\left(\sin^2\theta + \cos^2\theta\right) = \frac{49}{4} + \frac{147}{4}$

$r^2 = \frac{196}{4}$

$r = \frac{14}{2}$

$r = 7$

30. If $a\cos\theta - b\sin\theta = c$, then find the value of $a\sin\theta + b\cos\theta$.

(a) $\sqrt{a^2 + b^2 + c^2}$ (b) $\pm\sqrt{a^2 + b^2 - c^2}$

(c) $\pm\sqrt{a^2 + c^2 - b^2}$ (d) $\sqrt{b^2 + c^2 - a^2}$

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given that,

$a\cos\theta - b\sin\theta = c$

On squaring both sides

$\left(a\cos\theta - b\sin\theta\right)^2 = c^2$

$a^2\cos^2\theta + b^2\sin^2\theta - 2ab\sin\theta \times \cos\theta = c^2$

$a^2\left(1 - \sin^2\theta\right) + b^2\left(1 - \cos^2\theta\right) - 2ab\sin\theta \times \cos\theta = c^2$

$a^2 - a^2\sin^2\theta + b^2 - b^2\cos^2\theta - 2ab\sin\theta \times \cos\theta = c^2$

$a^2 + b^2 - c^2 = a^2\sin^2\theta + b^2\cos^2\theta + 2ab\sin\theta \times \cos\theta$

$a^2 + b^2 - c^2 = \left(a\sin\theta + b\cos\theta\right)^2$

$a\sin\theta + b\cos\theta = \pm\sqrt{a^2 + b^2 - c^2}$

31. If tan A + cot A = 2, then find the value of $\tan^2A + \cot^2 A$:

(a) 4 (b) 2

(c) 1 (d) 1/2

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (b) Given that,

tan A + cot A = 2

On squaring both sides

$(\tan A + \cot A)^2 = 4$

$\tan^2 A + \cot^2 A + 2\tan A \cot A = 4$

$\tan^2 A + \cot^2 A + 2\times 1 = 4$ $(\because \tan A \cot A = 1)$

$\tan^2 A + \cot^2 A = 4 - 2 = 2$

32. If $\cos^2 x + \sin x = 5/4$, then find the value of 'sin x'

(a) 3/4 (b) 1/2
(c) - 1/2 (d) 3/2

RRB JE - 24/05/2019 (Shift-I)

Ans : (b)

$\because \cos^2 x + \sin x = \frac{5}{4}$

$1 - \sin^2 x + \sin x = \frac{5}{4}$

$\sin^2 x - \sin x + \frac{1}{4} = 0$

$\sin^2 x - 2 \times \frac{1}{2} \times \sin x + \frac{1}{4} = 0$

$\left(\sin x - \frac{1}{2}\right)^2 = 0$

$\sin x - \frac{1}{2} = 0$

$\sin x = \frac{1}{2}$

33. If $\text{cosec}\theta - \sin\theta = p$ and $\sec\theta - \cos\theta = q$, then which of the following is correct?

(a) $(p^2q)^{\frac{2}{3}} - (pq^2)^{\frac{2}{3}} = 1$

(b) $\sin\theta\sec\theta = \frac{1}{P}$

(c) $\sin\theta\tan\theta = \frac{1}{q}$

(d) $(p^2q)^{\frac{2}{3}} + (pq^2)^{\frac{2}{3}} = 1$

RRB RPF SI – 16/01/2019 (Shift-III)

Ans. (d) Given that,

$\text{cosec}\theta - \sin\theta = p$ $\qquad$ $\sec\theta - \cos\theta = q$

$\therefore \frac{1}{\sin\theta} - \sin\theta = p$ $\qquad$ $\frac{1}{\cos\theta} - \cos\theta = q$

$\frac{1-\sin^2\theta}{\sin\theta} = p$ $\qquad$ $\frac{1-\cos^2\theta}{\cos\theta} = q$

$\cos^2\theta = p\sin\theta$ $\qquad$ $\sin^2\theta = q\cos\theta$

$p = \frac{\cos^2\theta}{\sin\theta}$ $\qquad$ $q = \frac{\sin^2\theta}{\cos\theta}$

$p^2q = \frac{\cos^4\theta}{\sin^2\theta} \times \frac{\sin^2\theta}{\cos\theta}$

$p^2q = \cos^3\theta$

$\left(p^2q\right)^{\frac{1}{3}} = \cos\theta$

$\left(p^2q\right)^{\frac{2}{3}} = \cos^2\theta$....(i)

Similarly,

$\left(q^2p\right)^{\frac{2}{3}} = \sin^2\theta$.....(ii)

Adding equation (i) and equation (ii)

$\left(p^2q\right)^{\frac{2}{3}} + \left(pq^2\right)^{\frac{2}{3}} = 1$ $\qquad$ ($\because \sin^2\theta + \cos^2\theta = 1$)

34. If $\sec^4\theta - \sec^2\theta = 3$, then $\tan^4\theta + \tan^2\theta$ = ?

(a) 2 (b) 0
(c) 3 (d) 1

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (c) If $\sec^4\theta - \sec^2\theta = 3$

$\sec^2\theta(\sec^2\theta - 1) = 3$ $\quad [\because \sec^2\theta - \tan^2\theta = 1]$

$\left(\tan^2\theta + 1\right)\tan^2\theta = 3$

$\tan^4\theta + \tan^2\theta = 3$

So $\boxed{\tan^4\theta + \tan^2\theta = 3}$

35. If $\cot^4\theta + \cot^2\theta = 2.2$, then $\text{cosec}^4\theta - \text{cosec}^2\theta$ =?

(a) 0 (b) 1.1
(c) 2.2 (d) 3.3

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (c) $\cot^4\theta + \cot^2\theta = 2.2$

$\cot^2\theta(\cot^2\theta + 1) = 2.2$ $\qquad$ $\boxed{\therefore \cot^2\theta = \text{cosec}^2\theta - 1}$

$(\text{cosec}^2\theta - 1)(\text{cosec}^2\theta - 1 + 1) = 2.2$

$(\text{cosec}^2\theta - 1)(\text{cosec}^2\theta) = 2.2$

$\text{cosec}^4\theta - \text{cosec}^2\theta = 2.2$

36. If $(\tan\theta + \cot\theta) = 5$, then find the value of $(\tan^2\theta + \cot^2\theta)$?

(a) 23 (b) 27
(c) 25 (d) 21

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (a) $\tan\theta + \cot\theta = 5$ $\qquad$ ----------(i)

On squaring both sides

$\tan^2\theta + \cot^2\theta + 2\tan\theta.\cot\theta = 25$ $\qquad$ [$\tan\theta.\cot\theta = 1$]

$\tan^2\theta + \cot^2\theta = 25 - 2 = 23$

37. If $\sec\theta + \tan\theta = 3.2$, then what is the value of $\sec\theta$?

(a) 2.28 (b) 1.6
(c) 1.75625 (d) 1.92625

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (c) $\sec\theta + \tan\theta = 3.2 = \frac{32}{10} = \frac{16}{5}$.....(i)

On multiplying both sides by $(\sec\theta - \tan\theta)$.

$(\sec\theta + \tan\theta)(\sec\theta - \tan\theta) = \frac{16}{5}(\sec\theta - \tan\theta)$

$\because$ $\quad [\sec^2\theta - \tan^2\theta = 1]$

$\sec\theta - \tan\theta = \frac{5}{16}$.....(ii)

From equation (i) + (ii)

$2\sec\theta = \frac{16}{5} + \frac{5}{16} = \frac{281}{80} \Rightarrow 2\sec\theta = 3.5125$

$\sec\theta = \frac{3.5125}{2} = 1.75625$

38. If $\sin\theta - \cos\theta = 0$, then what is the value of $\sin^4\theta + \cos^4\theta + \tan^4\theta$

(a) $\frac{5}{4}$ (b) $\frac{3}{2}$ (c) $\frac{7}{4}$ (d) 2

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (b) : $\sin\theta - \cos\theta = 0$ then $\sin^4\theta + \cos^4\theta + \tan^4\theta$ value will be−

$\sin\theta - \cos\theta = 0$

$\sin\theta = \cos\theta$

$\because$ $\theta = 45°$, $\sin\theta = \cos\theta$

On putting, $\theta = 45°$

$\sin^4\theta + \cos^4\theta + \tan^4\theta$

$= \sin^4 45° + \cos^4 45° + \tan^4 45°$

$= \left(\frac{1}{\sqrt{2}}\right)^4 + \left(\frac{1}{\sqrt{2}}\right)^4 + (1)^4$

$= \frac{1}{4} + \frac{1}{4} + 1 = \frac{2}{4} + 1 = \frac{1}{2} + 1 = \frac{3}{2}$

39. If $\cot^4\theta + \cot^2\theta = 3.6$, then $\text{cosec}^4\theta - \text{cosec}^2\theta = ?$

(a) 0.6 (b) 3.6

(c) 2.4 (d) 1.8

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (b) : $\cot^4\theta + \cot^2\theta = 3.6$

$\cot^2\theta\,(1 + \cot^2\theta) = 3.6$

$\begin{cases} \text{cosec}^2\theta - \cot^2\theta = 1 \\ \text{cosec}^2\theta = 1 + \cot^2\theta \\ \text{cosec}^2\theta - 1 = \cot^2\theta \end{cases}$

$\cot^2\theta \cdot \text{cosec}^2\theta = 3.6$

$(\text{cosec}^2\theta - 1).\ \text{cosec}^2\theta = 3.6$

$\text{cosec}^4\theta - \text{cosec}^2\theta = 3.6$

40. If $\cos x + \sin x = \sqrt{2}\cos x$, then what is the value of $\cot x$?

(a) $\sqrt{2}$ (b) 1

(c) $\sqrt{2} + 1$ (d) $\sqrt{2} - 1$

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (c) Given that,

$\cos x + \sin x = \sqrt{2}\cos x$

On dividing both sides by sin x

$\cot x + 1 = \sqrt{2}\cot x$

$\sqrt{2}\cot x - \cot x = 1$

$\cot x\left(\sqrt{2} - 1\right) = 1$

$\cot x = \frac{1}{\sqrt{2} - 1}$

or

$\cot x = \frac{\left(\sqrt{2} + 1\right)}{\left(\sqrt{2} - 1\right)\left(\sqrt{2} + 1\right)}$

$\cot x = \frac{\sqrt{2} + 1}{2 - 1}$

$\cot x = \sqrt{2} + 1$

41. If $\sec\theta + \tan\theta = 1.25$, then $\sec\theta - \tan\theta = ?$

(a) 1 (b) 0.80

(c) 0.75 (d) 0.25

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (b) $\sec\theta + \tan\theta = 1.25 = \frac{125}{100}$

On multiplying the numerator and denominator by $(\sec\theta - \tan\theta)$

$\frac{(\sec\theta + \tan\theta)(\sec\theta - \tan\theta)}{(\sec\theta - \tan\theta)} = \frac{125}{100}$

$\frac{\sec^2\theta - \tan^2\theta}{(\sec\theta - \tan\theta)} = \frac{125}{100}$ $\left\{\sec^2\theta - \tan^2\theta = 1\right\}$

$\frac{1}{(\sec\theta - \tan\theta)} = \frac{125}{100}$

$\sec\theta - \tan\theta = \frac{100}{125}$

$\sec\theta - \tan\theta = 0.80$

42. If $\tan^4\theta + \tan^2\theta = 11$, then $\sec^4\theta - \sec^2\theta = ?$

(a) 12 (b) 11

(c) 13 (d) 10

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (b) $\tan^4\theta + \tan^2\theta = 11$

$\tan^2\theta\,(1 + \tan^2\theta) = 11$

$\tan^2\theta.\ \sec^2\theta = 11$ $\{\because 1 + \tan^2\theta = \sec^2\theta\}$

$(\sec^2\theta - 1)\ \sec^2\theta = 11$

$\sec^4\theta - \sec^2\theta = 11$

43. If $\cot^4\theta + \cot^2\theta = 4$, then what is the value of $\text{cosec}^4\theta - \text{cosec}^2\theta = ?$

(a) 4 (b) 0

(c) 2 (d) 3

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (a) $\cot^4\theta + \cot^2\theta = 4$

$(\text{cosec}^2\theta - 1)^2 + \text{cosec}^2\theta - 1 = 4$

$\text{cosec}^4\theta + 1 - 2\,\text{cosec}^2\theta + \text{cosec}^2\theta - 1 = 4$

$\text{cosec}^4\theta - \text{cosec}^2\theta = 4$

44. If $\sec\theta + \tan\theta = 8$, then $\sec\theta - \tan\theta = ?$

(a) 0.5 (b) 0.625

(c) 0.125 (d) 0.8

RRB Group-D – 05/12/2018 (Shift-II)

Ans. (c) Given−

$\sec\theta + \tan\theta = 8$

On multiplying both sides by $(\sec\theta - \tan\theta)$

$(\sec\theta + \tan\theta)\ (\sec\theta - \tan\theta) = 8(\sec\theta - \tan\theta)$

$(\because \sec^2\theta - \tan^2\theta = 1)$

$(\sec\theta - \tan\theta) = \frac{1}{8}$

$(\sec\theta - \tan\theta) = 0.125$

45. If $\tan\alpha = 3 - 2\sqrt{2}$, then what is the value of $\tan\alpha - \cot\alpha$?

(a) –4 (b) $3 + 2\sqrt{2}$

(c) $-4\sqrt{2}$ (d) $-8\sqrt{2}$

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans. (c) $\tan\alpha = 3 - 2\sqrt{2}$

then, $\tan\alpha - \cot\alpha = ?$

$$= \tan\alpha - \frac{1}{\tan\alpha}$$

$$= \left(3-2\sqrt{2}\right) - \frac{1}{3-2\sqrt{2}}$$

$$= \left(3-2\sqrt{2}\right) - \frac{\left(3+2\sqrt{2}\right)}{\left(3-2\sqrt{2}\right)\left(3+2\sqrt{2}\right)}$$

$$= \left(3-2\sqrt{2}\right) - \frac{\left(3+2\sqrt{2}\right)}{9-8}$$

$$= \left(3-2\sqrt{2}\right) - \frac{\left(3+2\sqrt{2}\right)}{1}$$

$$= 3 - 2\sqrt{2} - 3 - 2\sqrt{2}$$

$$= -4\sqrt{2}$$

46. If $\sec\theta + \tan\theta = 6$, then $\sec\theta = ?$

(a) $3\frac{1}{12}$ (b) $3\frac{1}{6}$ (c) 3 (d) $3\frac{1}{3}$

RRB Group-D – 28/11/2018 (Shift-I)

Ans : (a) Given,

$\sec\theta + \tan\theta = 6$ then $\sec\theta = ?$

$\because \sec^2\theta - \tan^2\theta = 1$

$\therefore (\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 1$

$$\therefore \sec\theta - \tan\theta = \frac{1}{\sec\theta + \tan\theta}$$

$$\therefore \sec\theta - \tan\theta = \frac{1}{6} \ldots(i)$$

$$\sec\theta + \tan\theta = 6 \ldots(ii)$$

On adding equation (i) and (ii)

$$\sec\theta - \tan\theta = \frac{1}{6} \ldots\ldots(i)$$

$$\sec\theta + \tan\theta = 6 \ldots\ldots(ii)$$

$$2\sec\theta = \frac{1}{6} + 6$$

$$2\sec\theta = \frac{37}{6}$$

$$\sec\theta = \frac{37}{12} = 3\frac{1}{12}$$

47. If $\cos\theta + \sin\theta = m$, $\sec\theta + \operatorname{cosec}\theta = n$, then what is the value of m/n?

(a) 1 (b) $\sin\theta\cos\theta$

(c) $\sec\theta \operatorname{cosec}\theta$ (d) $\cot\theta\tan\theta$

RRB NTPC 03.04.2016 Shift : 1

Ans : (b) Given,

$\cos\theta + \sin\theta = m$ ……(i)

And, $\sec\theta + \operatorname{cosec}\theta = n$……(ii)

$$\frac{1}{\cos\theta} + \frac{1}{\sin\theta} = n$$

$$\Rightarrow \frac{\sin\theta + \cos\theta}{\cos\theta\sin\theta} = n$$

$$\Rightarrow \frac{m}{\cos\theta\sin\theta} = n \text{ [From equation (i)]}$$

$$\Rightarrow \frac{m}{n} = \sin\theta\cos\theta$$

48. If $\sec\theta + \tan\theta = 4$, $\sec\theta - \tan\theta = ?$

(a) 1 (b) 0.75

(c) 0.25 (d) 0.5

RRB ALP & Tec. (13-08-18 Shift-II)

Ans : (c) Given,

$(\sec\theta + \tan\theta) = 4$

On multiplying both sides by $(\sec\theta - \tan\theta)$

$$\Rightarrow (\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 4(\sec\theta - \tan\theta)$$

$$\Rightarrow (\sec^2\theta - \tan^2\theta) = 4(\sec\theta - \tan\theta)$$

$$\Rightarrow 1 = 4(\sec\theta - \tan\theta)$$

$$\Rightarrow (\sec\theta - \tan\theta) = 1/4$$

$$\Rightarrow (\sec\theta - \tan\theta) = 0.25$$

49. If $\sin\theta = \frac{3}{4}$ and $\cos\theta = \frac{5}{4}$, then the value of $\frac{1+\tan\theta}{1-\cot\theta}$ is :

(a) $-\frac{8}{5}$ (b) $-\frac{12}{5}$

(c) $\frac{2}{5}$ (d) $\frac{11}{5}$

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : Given,

$$\sin\theta = \frac{3}{4}, \cos\theta = \frac{5}{4}$$

$$\because \tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{3/4}{5/4} = \frac{3}{5}$$

$$\text{and } \cot\theta = \frac{1}{\tan\theta} = \frac{5}{3}$$

$$\therefore \frac{1+\tan\theta}{1-\cot\theta} = \frac{1+\frac{3}{5}}{1-\frac{5}{3}} = \frac{8/5}{-2/3}$$

$$= -\frac{8\times 3}{5\times 2}$$

$$= -\frac{12}{5}$$

50. If (1+tanA) (1+tanB) = 2, then what will be the value of tan(A+B)?

(a) 1 (b) 0

(c) 2 (d) –2

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

$(1+\tan A)(1+\tan B)=2$

$1+\tan B+\tan A+\tan A.\tan B=2$

$\tan A+\tan B=1-\tan A.\tan B$

$\dfrac{\tan A+\tan B}{1-\tan A.\tan B}=1 \qquad \left[\tan(A+B)=\dfrac{\tan A+\tan B}{1-\tan A.\tan B}\right]$

$\tan(A+B)=1$

51. If $1+\tan\theta=\sqrt{3}$, then $\sqrt{3}\cot\theta-1$ = ?

(a) $\dfrac{2\sqrt{3}-1}{2}$ (b) $\dfrac{2\sqrt{3}+1}{2}$

(c) $\dfrac{\sqrt{3}-1}{2}$ (d) $\dfrac{\sqrt{3}+1}{2}$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : $1+\tan\theta=\sqrt{3}$

$\tan\theta=\sqrt{3}-1$

$\dfrac{1}{\cot\theta}=\sqrt{3}-1$

$\cot\theta=\dfrac{1}{\sqrt{3}-1}$

On multiplying the numerator and denominator by $\left(\sqrt{3}+1\right)$,

$\cot\theta=\dfrac{\sqrt{3}+1}{\left(\sqrt{3}-1\right)\left(\sqrt{3}+1\right)}$

$\cot\theta=\dfrac{\sqrt{3}+1}{2}$

$\sqrt{3}\cot\theta-1$

$=\sqrt{3}\times\dfrac{\sqrt{3}+1}{2}-1$ (On putting the value of cotθ)

$=\dfrac{3+\sqrt{3}-2}{2}$

$=\dfrac{\sqrt{3}+1}{2}$

52. If $\sin\theta-\cos\theta=0$, and $0\le\theta\le90^\circ$, then the value of $\sin\theta+\cos\theta$ is:

(a) $\dfrac{1}{\sqrt{2}}$ (b) $\sqrt{2}$

(c) $\dfrac{3}{\sqrt{2}}$ (d) $2\sqrt{2}$

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (b) : $\sin\theta-\cos\theta=0$

$\sin\theta=\cos\theta$

$\tan\theta=1$

$\tan\theta=\tan45^\circ$

$\theta=45^\circ$

$\sin\theta+\cos\theta$

$\sin45^\circ+\cos45^\circ$

$\dfrac{1}{\sqrt{2}}+\dfrac{1}{\sqrt{2}}$

$\dfrac{1+1}{\sqrt{2}}=\dfrac{2}{\sqrt{2}}=\sqrt{2}$

53. If θ is an acute angle and $\sin\theta=\cos\theta$, then $2\cot^2\theta+\sin^2\theta-1$= ?

(a) 0 (b) $\dfrac{3}{2}$

(c) -1 (d) 1

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (b) : Given-

$\sin\theta=\cos\theta \qquad (\text{If } \theta=45^\circ \text{ then } \sin\theta=\cos\theta)$

On putting the value of $\theta=45^\circ$

$2\cot^2 45^\circ+\sin^2 45^\circ-1=2\times1+\left(\dfrac{1}{\sqrt{2}}\right)^2-1$

$=2+\dfrac{1}{2}-1$

$=\dfrac{4+1-2}{2}$

$=\dfrac{5-2}{2}$

$=\dfrac{3}{2}$

54. If $\tan\theta=x-\dfrac{1}{4x}$, then $\sec\theta-\tan\theta$ is equal to:

(a) $2x$ or $\dfrac{1}{2x}$ (b) $-2x$ or $\dfrac{1}{2x}$

(c) $2x$ or $\dfrac{1}{2x}$ (d) $2x$ or $-\dfrac{1}{2x}$

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

$\sec^2\theta=1+\tan^2\theta$

$\sec^2\theta=1+\left(x-\dfrac{1}{4x}\right)^2 \qquad \left\{\because \tan\theta=x-\dfrac{1}{4x}\right\}$

$\sec^2\theta=1+x^2+\dfrac{1}{16x^2}-2.x.\dfrac{1}{4x}$

$\sec^2\theta=1+x^2+\dfrac{1}{16x^2}-\dfrac{1}{2}$

$\sec^2\theta=\dfrac{1}{2}+x^2+\dfrac{1}{16x^2}$

$$\sec^2\theta = \left(x + \frac{1}{4x}\right)^2$$

$$\sec\theta = \pm\left(x + \frac{1}{4x}\right)$$

then, $\sec\theta - \tan\theta$

$$= x + \frac{1}{4x} - x + \frac{1}{4x} \quad \left\{\text{On taking } \sec\theta = +\left(x + \frac{1}{4x}\right)\right\}$$

$$= \frac{1}{2x}$$

Again, $\sec\theta - \tan\theta$

$$= -x - \frac{1}{4x} - x + \frac{1}{4x} \quad \left\{\text{On taking } \sec\theta = -\left(x + \frac{1}{4x}\right)\right\}$$

$= -2x$

Hence, option (b) is correct.

55. If $\cot 3\theta \cot 6\theta = 1$ then the value of $\tan 15\theta$:

(a) $-\frac{1}{\sqrt{3}}$ (b) $-\sqrt{3}$

(c) 0 (d) $3\sqrt{3}$

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (a) : $\cot 3\theta \cdot \cot 6\theta = 1$

$$\cot 3\theta = \frac{1}{\cot 6\theta}$$

$$\cot 3\theta = \tan 6\theta \qquad \left[\because \frac{1}{\cot\theta} = \tan\theta\right]$$

$\cot 3\theta = \cot(90° - 6\theta)$

$3\theta = 90° - 6\theta$

$9\theta = 90°$

$\theta = 10°$

Then, $\tan 15\theta = \tan 15 \times 10° = \tan 150° = -\frac{1}{\sqrt{3}}$

56. If $5\tan\alpha = 4$, then find the value of $\frac{5\sin\alpha - 3\cos\alpha}{5\sin\alpha + 2\cos\alpha}$:

(a) $\frac{1}{6}$ (b) 3

(c) $\frac{1}{2}$ (d) 6

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) : From question,

$5\tan\alpha = 4$

$$\tan\alpha = \frac{4}{5} \qquad ...(1)$$

$$\Rightarrow \frac{5\sin\alpha - 3\cos\alpha}{5\sin\alpha + 2\cos\alpha}$$

$$= \frac{\cos\alpha\left[\frac{5\sin\alpha}{\cos\alpha} - 3\right]}{\cos\alpha\left[\frac{5\sin\alpha}{\cos\alpha} + 2\right]}$$

$$= \frac{5\tan\alpha - 3}{5\tan\alpha + 2}$$

$$= \frac{5 \times \frac{4}{5} - 3}{5 \times \frac{4}{5} + 2}$$

$$= \frac{1}{6}$$

57. If $\text{cosec } A - \cot A = 3$ then $\text{cosec } A + \cot A$ = ?

(a) $\frac{1}{3}$ (b) $\frac{3}{2}$

(c) $\frac{1}{5}$ (d) $\frac{1}{2}$

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (a) : $\text{cosec } A - \cot A = 3$

On multiplying the numerator and denominator by (cosec A + cot A)

$$\Rightarrow \frac{(\text{cosec}A - \cot A)(\text{cosec}A + \cot A)}{\text{cosec}A + \cot A} = 3$$

$$\Rightarrow \frac{\text{cosec}^2 A - \cot^2 A}{\text{cosec}A + \cot A} = 3$$

$$\Rightarrow \frac{1}{\text{cosec}A + \cot A} = 3$$

$$\Rightarrow \text{cosec}A + \cot A = \frac{1}{3}$$

58. If $\cos x - 3\sin x = \sqrt{3}\sin x$, then the value of tan x is :

(a) $\frac{3-\sqrt{3}}{6}$ (b) $3 + \sqrt{3}$

(c) $3 - \sqrt{3}$ (d) $\sqrt{3}$

RRB NTPC 15.03.2021 (Shift-II) Stage I

Ans. (a) : Given-

$\cos x - 3\sin x = \sqrt{3}\sin x$

then $\tan x$ = ?

Where-

$\cos x - 3\sin x = \sqrt{3}\sin x$

$\Rightarrow \cos x = 3\sin x + \sqrt{3}\sin x$

$\Rightarrow \cos x = \sin x\left(3 + \sqrt{3}\right)$

$$\Rightarrow \frac{\sin x}{\cos x} = \frac{1}{\left(3 + \sqrt{3}\right)}$$

On multiplying the numerator and denominator by $(3-\sqrt{3})$

$\Rightarrow \quad \tan x = \frac{1}{3+\sqrt{3}} \times \frac{3-\sqrt{3}}{3-\sqrt{3}}$

$\Rightarrow \quad \tan x = \frac{3-\sqrt{3}}{(3)^2-\left(\sqrt{3}\right)^2}$

$\Rightarrow \quad \tan x = \frac{3-\sqrt{3}}{9-3}$

$\Rightarrow \quad \boxed{\tan x = \frac{3-\sqrt{3}}{6}}$

59. If $\tan\theta = \frac{p}{q}$ then $\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta}$ find the value.

(a) $\frac{2pq}{p^2+q^2}$ (b) $\frac{p^2-q^2}{p^2+q^2}$

(c) $\frac{q^2-p^2}{p^2+q^2}$ (d) $\frac{2p}{p^2+q^2}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : $\tan\theta = \frac{p}{q}$

or $\frac{\sin\theta}{\cos\theta} = \frac{p}{q}$

Comparing both the sides putting $\sin\theta = p$ and $\cos\theta = q$ in the given expression

$\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta} = \frac{p\times p - q\times q}{p\times p + q\times q}$

$= \frac{p^2-q^2}{p^2+q^2}$

60. If $\sec\theta + \tan\theta = 2-\sqrt{3}$ then find the value of $\sqrt{3}\sin\theta + \cos\theta$?

(a) 4 (b) 2

(c) 3 (d) 1

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

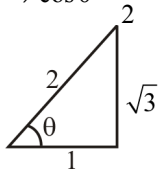
Ans. (b) : $\sec\theta + \tan\theta = 2-\sqrt{3}$ .....(i)

$\therefore \sec\theta - \tan\theta = 2+\sqrt{3}$ .....(ii)

From equation (i) and (ii)

$2\sec\theta = 4 \Rightarrow \sec\theta = 2$

$\Rightarrow \cos\theta = \frac{1}{2}$



$\sqrt{3}\sin\theta + \cos\theta$

$= \sqrt{3}\times\frac{\sqrt{3}}{2} + \frac{1}{2}$

$\frac{3}{2} + \frac{1}{2} = 2$

61. If $\sin x - 5\cos x = 2\sqrt{6}\cos x$, then the value of cot x is :

(a) $5+2\sqrt{6}$ (b) $5-2\sqrt{6}$

(c) 1 (d) $2\sqrt{6}$

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) : $\sin x - 5\cos x = 2\sqrt{6}\cos x$

$\sin x = 5\cos x + 2\sqrt{6}\cos x$

$\sin x = (5+2\sqrt{6})\cos x$

$\frac{\sin x}{\cos x} = 5+2\sqrt{6}$

$\frac{\cos x}{\sin x} = \frac{1}{5+2\sqrt{6}}$

$\cot x = \frac{1}{5+2\sqrt{6}} \times \frac{5-2\sqrt{6}}{5-2\sqrt{6}} = \frac{5-2\sqrt{6}}{25-24} = 5-2\sqrt{6}$

62. If $\sin x - 3\cos x = \sqrt{3}\cos x$, then find the value of cot x.

(a) $3-\sqrt{3}$ (b) $3+\sqrt{3}$

(c) $\sqrt{3}$ (d) $\frac{3-\sqrt{3}}{6}$

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (d) : $\sin x - 3\cos x = \sqrt{3}\cos x$

On multiplying by $\frac{1}{\cos x}$ both sides

or $\frac{\sin x}{\cos x} - 3\frac{\cos x}{\cos x} = \sqrt{3}$

$\tan x - 3 = \sqrt{3}$

$\tan x = 3+\sqrt{3}$

$\cot x = \frac{1}{3+\sqrt{3}} \times \frac{3-\sqrt{3}}{3-\sqrt{3}}$

$= \frac{3-\sqrt{3}}{(3)^2-\left(\sqrt{3}\right)^2}$

$= \frac{3-\sqrt{3}}{9-3}$

$\cot x = \frac{3-\sqrt{3}}{6}$

63. If $\cos x - 3\sin x = \sqrt{5}\sin x$, then the value of tan x is

(a) $\frac{3-\sqrt{5}}{4}$ (b) $\frac{3+\sqrt{5}}{4}$

(c) $\frac{3-\sqrt{5}}{6}$ (d) $3-\sqrt{5}$

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (a) : $\cos x - 3\sin x = \sqrt{5}\sin x$

$\cos x - \sqrt{5}\sin x = 3\sin x$

$\cos x = 3\sin x + \sqrt{5}\sin x$

$\frac{\cos x}{\sin x} = \left(3+\sqrt{5}\right)$

$\Rightarrow \quad \cot x = \left(3+\sqrt{5}\right)$

$\tan x = \frac{1}{\cot x} = \frac{1}{3+\sqrt{5}} \times \frac{3-\sqrt{5}}{3-\sqrt{5}}$

$\boxed{\tan x = \frac{3-\sqrt{5}}{4}}$

64. If $\tan\alpha = 1/2$, $\tan\beta = \frac{1}{3}$ then find the value of $\alpha + \beta$

(a) 0^0 (b) 135^0

(c) 90^0 (d) 45^0

RRB JE - 24/05/2019 (Shift-III)

Ans : (d) $\tan\alpha = \frac{1}{2}$ $\tan\beta = \frac{1}{3}$ $\alpha + \beta = ?$

$\tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha.\tan\beta}$

$= \frac{\frac{1}{2}+\frac{1}{3}}{1-\frac{1}{2}\times\frac{1}{3}} = \frac{\frac{3+2}{6}}{1-\frac{1}{6}} = \frac{\frac{5}{6}}{\frac{5}{6}} = 1$

$\tan(\alpha+\beta) = 1 = \tan 45°$

$\alpha + \beta = 45°$

65. If $\cot\theta = \frac{a}{b}$, then find the value of $\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta}$

(a) b/a (b) (a – b)/(a + b)

(c) a/b (d) a^2/b^2

RRB JE - 25/05/2019 (Shift-I)

Ans : (b)

$\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \frac{\sin\theta\left(\frac{\cos\theta}{\sin\theta} - 1\right)}{\sin\theta\left(\frac{\cos\theta}{\sin\theta} + 1\right)}$

$= \frac{\cot\theta - 1}{\cot\theta + 1} \qquad \left[\because \cot\theta = \frac{a}{b}\right]$

$= \frac{\frac{a}{b}-1}{\frac{a}{b}+1} = \frac{a-b}{a+b}$

66. If $\tan\theta = \frac{4}{3}$, then the value of $\sin\theta + \cos\theta$?

(a) $\frac{6}{5}$ (b) $\frac{7}{5}$

(c) 1 (d) $\frac{4}{5}$

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (b) $\tan\theta = \frac{4}{3}$ then $\sin\theta + \cos\theta = ?$

$\tan\theta = \frac{\text{Perpendicular}}{\text{Base}}$

Perpendicular = 4

Base = 3

Then hypotenuse $= \sqrt{(4)^2 + (3)^2} = \sqrt{25}$

Hypotenuse = 5

$\sin\theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}} = \frac{4}{5}$

$\cos\theta = \frac{\text{Base}}{\text{Hypotenuse}} = \frac{3}{5}$

then $\sin\theta + \cos\theta = \frac{4}{5} + \frac{3}{5} = \frac{7}{5}$

67. If 4 cotθ = 5, then find the value of $\frac{(5\sin\theta + 3\cos\theta)}{(5\sin\theta - 3\cos\theta)}$

(a) 3 (b) 9

(c) 7 (d) 4

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (c) $4\cot\theta = 5 \Rightarrow \cot\theta = \frac{5}{4}$

$\frac{5\sin\theta + 3\cos\theta}{5\sin\theta - 3\cos\theta} = \frac{\sin\theta\left(5 + 3\frac{\cos\theta}{\sin\theta}\right)}{\sin\theta\left(5 - 3\frac{\cos\theta}{\sin\theta}\right)}$

$= \frac{5+3\cot\theta}{5-3\cot\theta} = \frac{5+3\times\frac{5}{4}}{5-3\times\frac{5}{4}} = \frac{5+\frac{15}{4}}{5-\frac{15}{4}} = \frac{35}{5} = 7$

68. If $\tan\theta = \frac{5}{6}$, then what is the value of $\frac{12\sin\theta - 5\cos\theta}{12\sin\theta + 5\cos\theta}$?

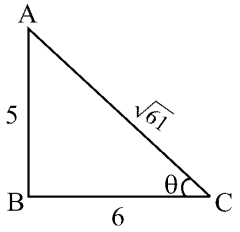
(a) $\frac{2}{3}$ (b) $\frac{1}{3}$

(c) $\frac{3}{4}$ (d) $\frac{1}{4}$

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (b) : Given,

$\tan\theta = \frac{5}{6}$ then $\frac{12\sin\theta - 5\cos\theta}{12\sin\theta + 5\cos\theta} = ?$



From Pythagoras theorem,

$AC^2 = AB^2 + BC^2$

$AC^2 = 5^2 + 6^2$

$AC^2 = 61$

$AC = \sqrt{61}$

$\therefore \sin\theta = \frac{5}{\sqrt{61}}, \quad \cos\theta = \frac{6}{\sqrt{61}}$

$$= \frac{12\sin\theta - 5\cos\theta}{12\sin\theta + 5\cos\theta}$$

$$= \frac{12\times\frac{5}{\sqrt{61}} - 5\times\frac{6}{\sqrt{61}}}{12\times\frac{5}{\sqrt{61}} + 5\times\frac{6}{\sqrt{61}}}$$

$$= \frac{\frac{60-30}{\sqrt{61}}}{\frac{60+30}{\sqrt{61}}}$$

$$= \frac{\frac{30}{\sqrt{61}}}{\frac{90}{\sqrt{61}}}$$

$$= \frac{30}{\sqrt{61}}\times\frac{\sqrt{61}}{90} = \frac{1}{3}$$

69. If tanA = $\frac{3}{4}$, then

$\{1/2\} + \{(1+\cos A)(1-\cos A)/(1+\sin A)(1-\sin A)\} - 1 = ?$

(a) $\frac{1}{16}$ (b) $\frac{12}{25}$

(c) $\frac{-9}{25}$ (d) $\frac{-1}{9}$

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (a) : If $\tan A = \frac{3}{4}$

$$\left\{\frac{1}{2}\right\} + \left\{\frac{(1+\cos A)(1-\cos A)}{(1+\sin A)(1-\sin A)}\right\} - 1 = ?$$

$$= \frac{1}{2} + \left\{\frac{(1-\cos^2 A)}{1-\sin^2 A}\right\} - 1 \quad = \frac{1}{2} + \left\{\frac{\sin^2 A}{\cos^2 A}\right\} - 1$$

$$= \frac{1}{2} + \tan^2 A - 1 \quad = \frac{1}{2} + \left(\frac{3}{4}\right)^2 - 1$$

$$= \frac{1}{2} + \frac{9}{16} - 1 = \frac{8+9-16}{16} \quad = \frac{17-16}{16}$$

$\boxed{? = \frac{1}{16}}$

70. If sin x = $\frac{4}{5}$ then cosec x + cot x =

(a) 31/12 (b) 35/12

(c) 2 (d) 1/2

RRB NTPC 17.01.2017 Shift-1

Ans : (c) cosec x + cot x

$$\frac{1}{\sin x} + \frac{\cos x}{\sin x}$$

$$\frac{1}{\frac{4}{5}} + \frac{3/5}{\frac{4}{5}}$$

$$\frac{5}{4} + \frac{3}{4} = \frac{8}{4} = 2$$

$\boxed{\text{cosec}x + \cot x = 2}$

71. If sinθ = 5/13, then find the value of cosθ.

(a) 8/13 (b) 12/13

(c) 23/13 (d) 1

RRB NTPC 04.04.2016 Shift : 1

Ans : (b) $\sin\theta = \frac{5}{13}$

$$\sin^2\theta = \frac{25}{169}$$

$$\cos\theta = \sqrt{1-\sin^2\theta} = \sqrt{1-\frac{25}{169}} = \sqrt{\frac{144}{169}} = \frac{12}{13}$$

72. If 5 tanθ = 4, find the value of (3sin θ – 2 cosθ) ÷ (2 sinθ + 3 cosθ).

(a) 6/23 (b) 2/23

(c) 4/23 (d) 5/23

RRB NTPC 31.03.2016 Shift : 3

Ans : (b) Given-

$$5\tan\theta = 4 \Rightarrow \tan\theta = \frac{4}{5}$$

$$\frac{3\sin\theta - 2\cos\theta}{2\sin\theta + 3\cos\theta}$$

$$= \frac{3\left(\frac{\sin\theta}{\cos\theta}\right) - 2\left(\frac{\cos\theta}{\cos\theta}\right)}{2\left(\frac{\sin\theta}{\cos\theta}\right) + 3\left(\frac{\cos\theta}{\cos\theta}\right)}$$

(On dividing the numerator and denominator by cosθ)

$$= \frac{3\tan\theta - 2\times 1}{2\tan\theta + 3} = \frac{3\times\frac{4}{5} - 2}{2\times\frac{4}{5} + 3} = \frac{\frac{12-10}{5}}{\frac{8+15}{5}} = \frac{2}{23}$$

73. If $\sqrt{3}$tanθ = 1 find the value of cos2θ..

(a) 1/2 (b) $1/\sqrt{3}$

(c) 1/3 (d) 1

RRB NTPC 12.04.2016 Shift : 1

Ans : (a) From the question,

$$\sqrt{3}\tan\theta = 1$$

$$\Rightarrow \tan\theta = \frac{1}{\sqrt{3}} = \tan 30^0$$

$$\therefore \theta = 30^0$$

$$\therefore \cos 2\theta = \cos 2\times 30^0$$

$$= \cos 60^0 = \frac{1}{2}$$

74. If $2\cos\theta = \sqrt{3}$, then $\cos\theta \times \tan\theta$ = ?

(a) 1 (b) $\sqrt{3}/3$

(c) $\sqrt{3}/2$ (d) 1/2

RRB NTPC 06.04.2016 Shift : 2

Ans : (d) Given,

$$2\cos\theta = \sqrt{3}$$

$$\cos\theta = \frac{\sqrt{3}}{2}$$

$$\cos\theta = \cos 30^0$$

$$\theta = 30^0$$

$$\cos\theta \times \tan\theta = \cos 30° \times \tan 30° = \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{3}} = \frac{1}{2}$$

75. If $A + B = 90°$ and $\cos B = \frac{1}{3}$, then the value of sin A

(a) 1/2 (b) 1/4

(c) 1/3 (d) 2/3

RRB NTPC 27.04.2016 Shift : 1

Ans : (c) $A + B = 90°$

$$B = 90° - A \quad \text{....(i)}$$

$$\because \cos B = \frac{1}{3}$$

$$\cos(90° - A) = \frac{1}{3} \quad \text{[From equation (i)]}$$

$$\sin A = \frac{1}{3}$$

76. If $\tan\theta = \frac{7}{24}$ then find the value of P such that $\frac{\tan\theta - \sec\theta}{\sin\theta} = \frac{-P}{28}$

(a) 25 (b) 75

(c) 50 (d) 100

RRB ALP & Tec. (09-08-18 Shift-III)

Ans : (b) Given,

$$\tan\theta = \frac{7}{24} = \frac{\text{Perpendicular}}{\text{Base}}$$

$$\therefore \text{Hypotenuse} = \sqrt{(\text{Base})^2 + (\text{Perpendicular})^2}$$

$$= \sqrt{24^2 + 7^2} = \sqrt{625} = 25$$

$\therefore$ From the question

$$\frac{\tan\theta - \sec\theta}{\sin\theta} = \frac{-P}{28}$$

$$\Rightarrow \frac{\frac{7}{24} - \frac{25}{24}}{\frac{7}{25}} = \frac{-P}{28}$$

$$\Rightarrow \frac{-18}{24} \times \frac{25}{7} = \frac{-P}{28}$$

$$P = \frac{18 \times 25 \times 28}{24 \times 7} = 75$$

77. If $\tan 15° = 2 - \sqrt{3}$, what is the value of $\tan 15° \cot 75° + \tan 75° \cot 15°$

(a) 10 (b) 8

(c) 12 (d) 14

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (d) : $\tan 15° \cot 75° + \tan 75° \cot 15°$

$$\tan 15°.\tan 15° + \cot 15°.\cot 15°$$

$$\tan^2 15° + \frac{1}{\tan^2 15°}$$

If, $\tan 15° = (2 - \sqrt{3})$

then, $\frac{1}{\tan 15°} = 2 + \sqrt{3}$

Hence, $\tan^2 15° + \frac{1}{\tan^2 15°} = \left(\tan 15° + \frac{1}{\tan 15°}\right)^2 - 2$

$$= (2 - \sqrt{3} + 2 + \sqrt{3})^2 - 2$$

$$= 16 - 2 = 14$$

78. If $\sin\theta - \text{cosec}\theta = \sqrt{2}$, then the value of $\sin^3\theta - \text{cosec}^3\theta$ is

(a) $2\sqrt{3}$ (b) $5\sqrt{2}$

(c) $\frac{1}{\sqrt{2}}$ (d) 0

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

$$\sin\theta - \text{cosec}\theta = \sqrt{2}$$

by cubing both sides

$$\Rightarrow (\sin\theta - \text{cosec}\theta)^3 = \left(\sqrt{2}\right)^3$$

$$\sin^3\theta - \text{cosec}^3\theta - 3\sin\theta.\text{cosec}\theta\,(\sin\theta - \text{cosec}\theta) = 2\sqrt{2}$$

$$\sin^3\theta - \text{cosec}^3\theta - 3\sin\theta \cdot \frac{1}{\sin\theta}(\sin\theta - \text{cosec}\theta) = 2\sqrt{2}$$

$$\Rightarrow \sin^3\theta - \text{cosec}^3\theta - 3\sqrt{2} = 2\sqrt{2}$$

$$\sin^3\theta - \text{cosec}^3\theta = 5\sqrt{2}$$

Type - 2

79. If $\cot^2\theta = 1 + \cos^2\theta - \sin^2\theta$, $0° < \theta < 90°$ Then Find the value of $\tan^2\theta + \text{cosec}^2\theta$.

(a) $\frac{3}{2}$ (b) $\frac{1}{2}$

(c) 3 (d) -1

RRB NTPC (Stage-2) 12/06/2022 (Shift-II)

Ans. (c) : $\cot^2\theta = 1 + \cos^2\theta - \sin^2\theta$

$$\frac{\cos^2\theta}{\sin^2\theta} = \cos^2\theta + \cos^2\theta$$

$$\frac{\cos^2\theta}{\sin^2\theta} = 2\cos^2\theta$$

$$\frac{1}{\sin^2\theta} = 2$$

$$\text{cosec}\,\theta = \sqrt{2}$$

$\theta = 45^\circ$

So, $\tan^2\theta + \text{cosec}^2\theta$

$= \tan^2 45^\circ + \text{cosec}^2 45^\circ$

$= 1 + \left(\sqrt{2}\right)^2$

$= 1 + 2$

$= 3$

80. Find the value of $2\sec^2A + 4\text{cosec}^2A - 2\tan^2A - 4\cot^2A$:

(a) 4 (b) 2

(c) 8 (d) 6

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : $2\sec^2A + 4\text{cosec}^2A - 2\tan^2A - 4\cot^2A$

$\Rightarrow 2\sec^2A - 2\tan^2A + 4\text{cosec}^2A - 4\cot^2A$

$\Rightarrow 2(\sec^2A - \tan^2A) + 4(\text{cosec}^2A - \cot^2A)$

$\Rightarrow 2 \times 1 + 4 \times 1$

$\Rightarrow 2 + 4$

$\Rightarrow 6$

81. Find the value of $\sin^2\theta + \cos^2\theta - (\sec^2\theta - \tan^2\theta) + \tan\theta\cos\theta - \sin\theta$

(a) $\sec^2\theta$ (b) $4\sin\theta\cos\theta$

(c) -1 (d) 0

RRB Group-D 13/09/2022 (Shift-III)

Ans. (d) : $\sin^2\theta + \cos^2\theta - (\sec^2\theta - \tan^2\theta) + \tan\theta\cos\theta - \sin\theta$

$= 1 - (1) + \dfrac{\sin\theta}{\cos\theta} \times \cos\theta - \sin\theta$

$= 0 + \sin\theta - \sin\theta \quad \left\{\begin{array}{l}\because \sin^2\theta + \cos^2\theta = 1 \\ \sec^2\theta = 1 + \tan^2\theta\end{array}\right\}$

$= 0$

82. If $\sin^2x + 3\cos^2x = 2$, और $(0^0 < x < 90^0)$ then find the value of cosec x

(a) $\dfrac{2\sqrt{3}}{3}$ (b) $\sqrt{3}$

(c) 2 (d) $\sqrt{2}$

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (d) : $\sin^2x + 3\cos^2x = 2$

$\sin^2x + \cos^2x + 2\cos^2x = 2$

$1 + 2\cos^2x = 2$

$\cos^2 x = \dfrac{1}{2}$

$\cos x = \dfrac{1}{\sqrt{2}}$

$x = 45^\circ$

Hence $\text{cosec}\,x = \text{cosec}\,45^\circ = \sqrt{2}$

83. If $3\sin^2\theta + 7\cos^2\theta = 6$ and $0 < \theta \leq 90^\circ$ then find the value of θ :

(a) 90° (b) 30°

(c) 60° (d) 45°

RRB GROUP - D – 29/09/2022 (Shift–II)

Ans. (b) : According to the question,

$3\sin^2\theta + 7\cos^2\theta = 6$

From the option (b)

$'\theta = 30^0'$

$3\sin^2(30) + 7\cos^2 30 = 6$

$3\left(\dfrac{1}{2}\right)^2 + 7\left(\dfrac{\sqrt{3}}{2}\right)^2 = 6$

$\dfrac{3}{4} + \dfrac{21}{4} = 6$

$\dfrac{24}{4} = 6$

$6 = 6$

L.H.S. = R.H.S.

Hence $\theta = 30^\circ$

84. If $p\sin^2\beta + q\cos^2\beta = r$ then find the value of $\cot^2\beta$

(a) $\dfrac{p-r}{r-q}$ (b) $\dfrac{r-q}{r-p}$

(c) $\dfrac{r-q}{p-r}$ (d) $\dfrac{r-p}{r-q}$

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (a) : $p\sin^2\beta + q\cos^2\beta = r$

$p\sin^2\beta + q\left(1 - \sin^2\beta\right) = r$

$p\sin^2\beta + q - q\sin^2\beta = r$

$(p-q)\sin^2\beta = r - q$

$\sin^2\beta = \dfrac{r-q}{p-q}$

$\cos^2\beta = 1 - \sin^2\beta$

$= 1 - \dfrac{(r-q)}{p-q}$

$= \dfrac{p-q-r+q}{p-q}$

$= \dfrac{p-r}{p-q}$

$\cot^2\beta = \dfrac{\cos^2\beta}{\sin^2\beta} = \dfrac{\frac{p-r}{p-q}}{\frac{r-q}{p-q}}$

$\boxed{\cot^2\beta = \dfrac{p-r}{r-q}}$

85. If A is an acute angle then find the value of $\frac{1+\tan^2 A}{1+\cot^2 A}$:

(a) $\cos^2 A$ (b) $\tan^2 A$

(c) $\sin^2 A$ (d) $\sec^2 A$

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (b) : $\frac{1+\tan^2 A}{1+\cot^2 A} =$

$$\because \left(\tan A = \frac{\sin A}{\cos A}, \cot A = \frac{\cos A}{\sin A}\right)$$

$$= \frac{1+\frac{\sin^2 A}{\cos^2 A}}{1+\frac{\cos^2 A}{\sin^2 A}} \qquad \left(\because \sin^2 A + \cos^2 A = 1\right)$$

$$= \frac{\frac{\cos^2 A + \sin^2 A}{\cos^2 A}}{\frac{\sin^2 A + \cos^2 A}{\sin^2 A}}$$

$$= \frac{1}{\cos^2 A} \times \frac{\sin^2 A}{1}$$

$$= \frac{\sin^2 A}{\cos^2 A}$$

$$= \tan^2 A$$

86. Find the value of $2 - \frac{\sin^2\alpha}{1-\cos\alpha} + \frac{1-\cos\alpha}{\sin\alpha} - \frac{\sin\alpha}{1+\cos\alpha}$

(a) $1 - \sin\alpha$ (b) $1 - \cos\alpha$

(c) $1 + \sin\alpha$ (d) $1 + \cos\alpha$

RRB Group-D 26/08/2022 (Shift-III)

Ans. (b) : Given

$$2 - \frac{\sin^2\alpha}{1-\cos\alpha} + \frac{1-\cos\alpha}{\sin\alpha} - \frac{\sin\alpha}{1+\cos\alpha}$$

$$= 2 - \left[\frac{\left(1-\cos^2\alpha\right)}{1-\cos\alpha}\right] + \frac{(1-\cos\alpha)(1+\cos\alpha) - \sin^2\alpha}{\sin\alpha(1+\cos\alpha)}$$

$$= 2 - (1+\cos\alpha) + \frac{\left(1-\cos^2\alpha\right) - \sin^2\alpha}{\sin\alpha(1+\cos\alpha)}$$

$$= 2 - 1 - \cos\alpha + \frac{\sin^2\alpha - \sin^2\alpha}{\sin\alpha(1+\cos\alpha)}$$

$$= 1 - \cos\alpha + 0$$

$$= 1 - \cos\alpha$$

87. Find the value of $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$

(a) $5 + \operatorname{cosec}^2 A - \sec^2 A$

(b) $5 + \operatorname{cosec}^2 A + \sec^2 A$

(c) $5 + \sec A + \operatorname{Cosec} A$

(d) $5 - \operatorname{cosec}^2 A + \sec^2 A$

RRB Group-D 06/09/2022 (Shift-I)

Ans. (b) : $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$

$= \sin^2 A + \operatorname{cosec}^2 A + 2 + \cos^2 A + \sec^2 A + 2$

$= (\sin^2 A + \cos^2 A) + 4 + \operatorname{cosec}^2 A + \sec^2 A$

$= 1 + 4 + \operatorname{cosec}^2 A + \sec^2 A$

$= 5 + \operatorname{cosec}^2 A + \sec^2 A$

88. If sec4A = cosec (3A – 50º) where 4A and 3A is an acute angle then find the value of A + 75°:

(a) 95º (b) 67º

(c) 78º (d) 105º

RRB Group-D 18/08/2022 (Shift-II)

Ans. (a) : sec4A = cosec (3A – 50º)

cosec (90º – 4A) = cosec (3A – 50º)

90º – 4A = 3A – 50º

90º + 50º = 3A + 4A

7A = 140º

A = 20º

$\Rightarrow$ A + 75º = ?

$\Rightarrow$ 20º + 75º

$\Rightarrow$ 95º

89. If $\cos^4\theta - \sin^4\theta = k$ then find the value of $\frac{1+k}{1-k}$

(a) $\cot^2\theta$ (b) $\sin^2\theta$

(c) $\tan^4\theta$ (d) $\operatorname{cosec}^2\theta$

RRB Group-D 29/08/2022 (Shift-II)

Ans. (a) : $\cos^4\theta - \sin^4\theta = k$

$$(\cos^2\theta - \sin^2\theta)(\cos^2\theta + \sin^2\theta) = k$$

$$\cos 2\theta \times 1 = k \qquad \left[\because \cos^2\theta + \sin^2\theta = 1,\ \cos^2\theta - \sin^2\theta = \cos 2\theta\right]$$

$$k = \cos 2\theta$$

$$\frac{1+k}{1-k} = \frac{1+\cos 2\theta}{1-\cos 2\theta}$$

$$= \frac{\sin^2\theta + \cos^2\theta + \cos^2\theta - \sin^2\theta}{\sin^2\theta + \cos^2\theta + \cos^2\theta - \sin^2\theta}$$

$$= \frac{2\cos^2\theta}{2\sin^2\theta} = \cot^2\theta$$

90. If θ is an acute angle and $(\operatorname{cosec}\theta - \cot\theta)^2 = \frac{1-\cos\theta}{A}$ then find the value of denominator A.

(a) $1 + \sin\theta$

(b) $\cot\theta$

(c) $1 + \cos\theta$

(d) $\operatorname{cosec}\theta - 1$

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (c) : Given -

$$\left(\text{cosec}\theta - \cot\theta\right)^2 = \frac{1-\cos\theta}{A}$$

$$\left(\frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}\right)^2 = \frac{1-\cos\theta}{A}$$

$$\left(\frac{1-\cos\theta}{\sin\theta}\right)^2 = \frac{1-\cos\theta}{A}$$

$$\frac{(1-\cos\theta)(1-\cos\theta)}{\sin^2\theta} = \frac{1-\cos\theta}{A}$$

$$\frac{1-\cos\theta}{\sin^2\theta} = \frac{1}{A}$$

$$A = \frac{\sin^2\theta}{1-\cos\theta} = \frac{1-\cos^2\theta}{1-\cos\theta}$$

$$= \frac{(1-\cos\theta)(1+\cos\theta)}{1-\cos\theta} \qquad \{a^2-b^2 = (a+b)(a-b)\}$$

A= 1 + cosθ

91. If tanθ = 1 (θ is an acute angle) then the value of $2\sin\theta\cos\theta - \text{cosec}^2\theta$ is:

(a) $1-\sqrt{2}$ (b) 1

(c) –1 (d) –3

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$\tan\theta = 1$

$\tan\theta = \tan 45°$

$\theta = 45°$

$$2\sin\theta\cos\theta - \text{cosec}^2\theta = 2\sin 45°\cos 45° - \text{cosec}^2 45°$$

$$= 2\times\frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}} - \left(\sqrt{2}\right)^2$$

$$= 2\times\frac{1}{2} - 2$$

=1–2

= –1

92. If $\sqrt{3}\sin\theta - \cos\theta = 0$ (θ is an acute angle), then the value of $\cos^3\theta - \sqrt{3}\sin^3\theta$ will be:

(a) $\frac{\sqrt{3}}{2}$ (b) -1

(c) $\frac{3}{8}$ (d) $\frac{\sqrt{3}}{4}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$\sqrt{3}\sin\theta - \cos\theta = 0$

$\sqrt{3}\sin\theta = \cos\theta$

$$\sqrt{3} = \frac{\cos\theta}{\sin\theta}$$

$\cot\theta = \sqrt{3}$

$\theta = 30^0$

$$\cos^3\theta - \sqrt{3}\sin^3\theta = \cos^3 30^0 - \sqrt{3}\sin^3 30^0$$

$$= \left(\frac{\sqrt{3}}{2}\right)^3 - \sqrt{3}\left(\frac{1}{2}\right)^3$$

$$= \frac{3\sqrt{3}-\sqrt{3}}{8}$$

$$= \frac{\sqrt{3}}{4}$$

93. If $\tan\theta + \cot\theta = 6$, then find the value of $\tan^2\theta + \cot^2\theta$.

(a) 34 (b) 54

(c) 44 (d) 24

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (a) : Given,

$\tan\theta+\cot\theta = 6$

On squaring both sides,

$(\tan\theta+\cot\theta)^2 = 6^2$

$$(6)^2 = \tan^2\theta + \cot^2\theta + 2\tan\theta\cdot\frac{1}{\tan\theta}$$

$\tan^2\theta + \cot^2\theta = 36–2 = 34$

94. If $2(\cos\theta + \sec\theta) = 5$, then $\sec^2\theta + \cos^2\theta$ find the value?

(a) $\frac{4}{17}$ (b) $\frac{17}{4}$

(c) $\frac{25}{2}$ (d) $\frac{25}{2}$

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : Given,

$2(\cos\theta + \sec\theta) = 5$

$$\cos\theta + \sec\theta = \frac{5}{2}$$

On squaring both sides,

$$(\cos\theta + \sec\theta)^2 = \left(\frac{5}{2}\right)^2$$

$$\cos^2\theta + \sec^2\theta + 2\cos\theta.\sec\theta = \frac{25}{4}$$

$$\cos^2\theta + \sec^2\theta + 2 = \frac{25}{4}$$

$$\cos^2\theta + \sec^2\theta = \frac{25}{4} - 2$$

$$\cos^2\theta + \sec^2\theta = \frac{17}{4}$$

95. If $\tan\theta+\cot\theta = 5$, then the value of $\tan^2\theta+\cot^2\theta + 2\tan^2 60^\circ$ is:

(a) $10\sqrt{3}$ (b) $29\sqrt{3}$

(c) 25 (d) 29

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$\tan\theta + \cot\theta = 5$

$\tan\theta + \frac{1}{\tan\theta} = 5$

$\tan^2\theta + \frac{1}{\tan^2\theta} + 2 = 25$ .....(On squaring both sides)

$\tan^2\theta + \cot^2\theta = 23$

then, $\tan^2\theta + \cot^2\theta + 2\tan^2 60^\circ$

$23 + 2 \times 3 = 29$

96. If $\sin\theta - \cos\theta = 0$, (angle in first quadrant) then the value of $\sin^3\theta + 3\cos^3\theta$ is:

(a) $\frac{1}{\sqrt{2}}$ (b) 2

(c) $\sqrt{2}$ (d) $2\sqrt{2}$

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,

$\sin\theta - \cos\theta = 0$

$\sin\theta = \cos\theta$

$\frac{\sin\theta}{\cos\theta} = 1$

$\tan\theta = 1, \quad \theta = 45^\circ$

$\sin^3\theta + 3\cos^3\theta$ (Putting $\theta = 45^\circ$)

$= \sin^3 45^\circ + 3\cos^3 45^\circ$

$= \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} + 3 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}$

$= \frac{1}{2\sqrt{2}} + \frac{3}{2\sqrt{2}}$

$= \frac{1+3}{2\sqrt{2}}$

$= \frac{4}{2\sqrt{2}}$

$= \frac{2}{\sqrt{2}}$

$= \frac{\sqrt{2} \times \sqrt{2}}{\sqrt{2}}$

$= \sqrt{2}$

97. The least value of $2\sin^2\theta + 3\cos^2\theta$ is :

(a) 3 (b) 1

(c) 5 (d) 2

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (d) : $2\sin^2\theta + 3\cos^2\theta$

$\Rightarrow 2\sin^2\theta + 3(1 - \sin^2\theta)$

$\Rightarrow 2\sin^2\theta + 3 - 3\sin^2\theta$

$\Rightarrow 3 - \sin^2\theta$

For the minimum value $3 - \sin^2\theta$ the value of $\sin^2\theta$ will be maximum then put $\sin^2\theta = 1$

$\Rightarrow 3 - 1 \quad \Rightarrow \boxed{2}$

98. The minimum value of $9\sin^2\theta + 10\cos^2\theta$ is:

(a) 1 (b) 8

(c) 9 (d) 0

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (c) : $9\sin^2\theta + 10\cos^2\theta$

$= 9\sin^2\theta + 9\cos^2\theta + \cos^2\theta$

$= 9(\sin^2\theta + \cos^2\theta) + \cos^2\theta$

$= 9 + \cos^2\theta \quad \{\because \sin^2\theta + \cos^2\theta = 1\}$

For the minimum value $9 + \cos^2\theta$ the value of $\cos^2\theta$ will be minimum

$\therefore \quad 0 \le \cos^2\theta \le 1$

Hence the minimum value of $9 + \cos^2\theta = 9 + 0$

$= 9$

99. Solve the following

$$1 + \frac{1+\cos\theta}{\sin\theta} - \frac{\sin^2\theta}{1+\cos\theta} - \frac{\sin\theta}{1-\cos\theta} = ?$$

(a) $\cos\theta$ (b) $-\cos\theta$

(c) $\sin\theta$ (d) $-\sin\theta$

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (a) : $1 + \frac{1+\cos\theta}{\sin\theta} - \frac{\sin^2\theta}{1+\cos\theta} - \frac{\sin\theta}{1-\cos\theta} = ?$

$= 1 + \frac{1+\cos\theta}{\sin\theta} - \frac{(1-\cos\theta)(1+\cos\theta)}{1+\cos\theta} - \frac{\sin\theta}{1-\cos\theta}$

$= 1 - (1-\cos\theta) + \frac{1+\cos\theta}{\sin\theta} - \frac{\sin\theta}{1-\cos\theta}$

$= 1 - 1 + \cos\theta + \frac{\sin^2\theta - \sin^2\theta}{\sin\theta(1-\cos\theta)}$

$= \cos\theta + 0$

$= \cos\theta$

100. The minimum value of $4\sin^2\theta + 5\cos^2\theta$ is:

(a) 0 (b) 2

(c) 1 (d) 4

RRB NTPC 29.01.2021 (Shift-II) Stage I

Ans. (d) : Minimum value of $4\sin^2\theta + 5\cos^2\theta$

$4(1 - \cos^2\theta) + 5\cos^2\theta$

$4 - 4\cos^2\theta + 5\cos^2\theta$

$4 + \cos^2\theta$

$0 \le \cos^2\theta \le 1$

Hence minimum value of $4\sin^2\theta + 5\cos^2\theta = 4 + 0 = 4$

101. If $\cos x + \frac{1}{\cos x} = 2$, then find the value of $\cos^n x + \frac{1}{\cos^n x}$

(a) 8 (b) 6
(c) 2 (d) 4

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) : $\cos x + \frac{1}{\cos x} = 2$ ....(Given)

On taking x = 0°

$\cos 0° + \frac{1}{\cos 0°} = 2$

$1 + \frac{1}{1} = 2$

$2 = 2$

So, substituting x=0° in $\cos^n x + \frac{1}{\cos^n x}$

$\cos^n 0° + \frac{1}{\cos^n 0°}$

$= (1)^n + \frac{1}{(1)^n}$

$= 1 + \frac{1}{1} = 2$

Hence, $\cos^n x + \frac{1}{\cos^n x}$ will be 2.

102. If $\cos^4\theta - \sin^4\theta = \frac{3}{5}$, then find the value $1 - 2\sin^2\theta + 2\sin\theta\cos\theta$

(a) 0 (b) $\frac{8}{5}$
(c) $\frac{9}{5}$ (d) $\frac{7}{5}$

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (d) : Given,

$\cos^4\theta - \sin^4\theta = \frac{3}{5}$

$(\cos^2\theta + \sin^2\theta)(\cos^2\theta - \sin^2\theta) = \frac{3}{5}$

$\cos^2\theta - \sin^2\theta = \frac{3}{5}$

$\cos 2\theta = \frac{3}{5}$ $(\because \cos^2\theta - \sin^2\theta = \cos 2\theta)$

then, $(1 - 2\sin^2\theta) + 2\sin\theta.\cos\theta$

$\cos 2\theta + \sin 2\theta$ $\left[\because \begin{matrix}\cos 2\theta = 1 - 2\sin^2\theta \\ \sin 2\theta = 2\sin\theta.\cos\theta\end{matrix}\right]$

$\cos 2\theta + \sqrt{1 - \cos^2 2\theta}$

$\frac{3}{5} + \sqrt{1 - \frac{9}{25}}$

$\frac{3}{5} + \frac{4}{5} = \frac{7}{5}$

103. If θ is acute angle and tanθ +cotθ = 2, then find the value of the following :
$\tan^{15}\theta + \cot^{20}\theta + 2\tan^{20}\theta + \cot^{15}\theta$

(a) 6 (b) 3
(c) 5 (d) 4

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (d) $\tan\theta + \cot\theta = 2 \Rightarrow \tan\theta + \frac{1}{\tan\theta} = 2$

$\therefore \tan\theta = 1$ and $\cot\theta = 1$

$\tan^{15}\theta + \cot^{20}\theta + 2\tan^{20}\theta.\cot^{15}\theta$

then $(1)^{15} + (1)^{20} + 2 \times 1^{20} \times 1^{15}$

1+1+2=4

104. If sinθ + cosecθ = 2 then the value of $\sin^8\theta + \text{cosec}^8\theta$ is:

(a) 2^4 (b) 2
(c) 1 (d) 2^8

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) $\sin\theta + \text{cosec}\theta = 2$

$\sin\theta + \frac{1}{\sin\theta} = 2$

$\sin^2\theta - 2\sin\theta + 1 = 0$

$(\sin\theta - 1)^2 = 0$

$\sin\theta = 1$

$\sin\theta = \sin 90°$

$\boxed{\theta = 90°}$

$? = \sin^8\theta + \text{cosec}^8\theta$

$= \sin^8 90° + \text{cosec}^8 90°$

$= (1)^8 + (1)^8$

$= 1 + 1$

$= 2$

105. What is the value of $(1 - \cos^2\theta)(\cot^2\theta + 1) - 1$

(a) 0 (b) $\sec^2\theta$
(c) 2 (d) -2

RRB JE - 23/05/2019 (Shift-I)

Ans : (a) $(1 - \cos^2\theta)(\cot^2\theta + 1) - 1$

$\{1 - \cos^2\theta = \sin^2\theta$

$1 + \cot^2\theta = \text{cosec}^2\theta\}$

$= \sin^2\theta \times \text{cosec}^2\theta - 1 = 1 - 1 = 0$

106. Simplify : cos θ/(1 + sin θ)

(a) cosec θ + cot θ (b) sec θ - tan θ
(c) cosec θ - cot θ (d) sec θ + tan θ

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans : (b) Given,

$$\frac{\cos\theta}{1+\sin\theta}$$

On multiplying the denominator and numerator by (1 – sin θ)

$$=\frac{(1-\sin\theta)\times\cos\theta}{\cos^2\theta}=(\sec\theta-\tan\theta)$$

107. Simplify: sin (A+B) sin (A-B)

(a) $\sin^2 A - \sin^2 B$ (b) $\sin^2 A + \sin^2 B$

(c) cos 2A (d) $\cos^2 A - \cos^2 B$

RRB JE - 24/05/2019 (Shift-III)

Ans : (a) sin (A+B) sin (A–B)

formula: $(a + b)(a – b) = a^2 – b^2$

$(\sin A.\cos B + \cos A.\sin B)(\sin A.\cos B – \cos A.\sin B)$

$(\sin A.\cos B)^2 – (\cos A.\sin B)^2$

$\sin^2 A.\cos^2 B – \sin^2 B.\cos^2 A$

$\sin^2 A(1–\sin^2 B) – \sin^2 B(1–\sin^2 A)$

$\sin^2 A – \sin^2 A.\sin^2 B – \sin^2 B + \sin^2 A.\sin^2 B$

$\boxed{\sin^2 A – \sin^2 B}$

108. Simplify: cos θ (1 – tan θ) + sin θ (1 – cot θ)

(a) sin θ + cos θ (b) sin θ – cos θ

(c) 0 (d) tan θ + cot θ

RRB JE - 27/05/2019 (Shift-I)

Ans : (c) cos θ (1 – tan θ) + sin θ (1 – cot θ)

$$=\cos\theta\left(1-\frac{\sin\theta}{\cos\theta}\right)+\sin\theta\left(1-\frac{\cos\theta}{\sin\theta}\right)$$

$$=\cos\theta-\cos\theta\frac{\sin\theta}{\cos\theta}+\sin\theta-\sin\theta\frac{\cos\theta}{\sin\theta}$$

$= \cos\theta – \sin\theta + \sin\theta – \cos\theta = 0$

109. Simplify:

$$\frac{\sin\theta-2\sin^3\theta}{2\cos^3\theta-\cos\theta}$$

(a) tan θ (b) sin θ – cos θ

(c) 2 sin θ cos θ (d) sin θ + cos θ

RRB JE - 31/05/2019 (Shift-I)

Ans : (a) $\dfrac{\sin\theta-2\sin^3\theta}{2\cos^3\theta-\cos\theta}=\dfrac{\sin\theta(1-2\sin^2\theta)}{\cos\theta(2\cos^2\theta-1)}$

$$=\frac{\sin\theta.\cos 2\theta}{\cos\theta.\cos 2\theta}=\tan\theta$$

110. Simplify:

$$\frac{\tan A}{(1+\tan^2 A)^2}+\frac{\cot A}{(1+\cot^2 A)^2}$$

(a) 2 sin A cos A (b) sin A-cos A

(c) sin A cos A (d) $(\sin A+\cos A)^2$

RRB JE - 31/05/2019 (Shift-III)

Ans. (c) $\dfrac{\tan A}{(1+\tan^2 A)^2}+\dfrac{\cot A}{(1+\cot^2 A)^2}$

$$=\frac{\frac{\sin A}{\cos A}}{(\sec^2 A)^2}+\frac{\frac{\cos A}{\sin A}}{(\operatorname{cosec}^2 A)^2}$$

$$=\frac{\sin A}{\cos A}\cos^4 A+\frac{\cos A}{\sin A}\sin^4 A$$

$= \sin A . \cos^3 A + \cos A . \sin^3 A$

$= \sin A . \cos A (\cos^2 A + \sin^2 A)$

$= \sin A . \cos A \quad (\because \sin^2 A + \cos^2 A = 1)$

111. Simplify: $(\sin^2\theta/\cos\theta) + (\cos^2\theta/\cos\theta)$

(a) tan θ (b) cot θ

(c) cosec θ (d) sec θ

RRB JE - 28/06/2019 (Shift-III)

Ans. (d) $\dfrac{\sin^2\theta}{\cos\theta}+\dfrac{\cos^2\theta}{\cos\theta}=\left(\dfrac{\sin^2\theta+\cos^2\theta}{\cos\theta}\right)$

$$\frac{1}{\cos\theta}=\sec\theta$$

112. In triangle ABC, find the value of $\tan^2\frac{A}{2}+\tan^2\frac{B}{2}+\tan^2\frac{C}{2}$

(a) > 1 (b) ≥ 1

(c) <1 (d) ≤ 1

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) ∵ In Δ ABC,

$A + B + C = \pi$

We know that–

$$\left(\tan\frac{A}{2}-\tan\frac{B}{2}\right)^2+\left(\tan\frac{B}{2}-\tan\frac{C}{2}\right)^2+\left(\tan\frac{C}{2}-\tan\frac{A}{2}\right)^2\geq 0$$

$$\Rightarrow 2\left(\tan^2\frac{A}{2}+\tan^2\frac{B}{2}+\tan^2\frac{C}{2}\right)$$

$$-2\left(\tan\frac{A}{2}.\tan\frac{B}{2}+\tan\frac{B}{2}.\tan\frac{C}{2}+\tan\frac{C}{2}.\tan\frac{A}{2}\right)\geq 0....(I)$$

$A + B + C = \pi$

$$\frac{A+B+C}{2}=\frac{\pi}{2}$$

$$\frac{A+B}{2}=\frac{\pi}{2}-\frac{C}{2}$$

$$\tan\left(\frac{A}{2}+\frac{B}{2}\right)=\tan\left(\frac{\pi}{2}-\frac{C}{2}\right)$$

$$\frac{\tan\frac{A}{2}+\tan\frac{B}{2}}{1-\tan\frac{A}{2}\tan\frac{B}{2}}=\cot\frac{C}{2}$$

$$\frac{\tan\frac{A}{2}+\tan\frac{B}{2}}{1-\tan\frac{A}{2}\tan\frac{B}{2}}=\frac{1}{\tan\frac{C}{2}}$$

$$\tan\frac{A}{2}\tan\frac{C}{2}+\tan\frac{B}{2}\tan\frac{C}{2}=1-\tan\frac{A}{2}\tan\frac{B}{2}$$

$$\tan\frac{A}{2}\tan\frac{B}{2}+\tan\frac{B}{2}\tan\frac{C}{2}+\tan\frac{A}{2}\tan\frac{C}{2}=1.....(ii)$$

Substituting values from equation (ii) in equation (i),

$$2\left(\tan^2\frac{A}{2}+\tan^2\frac{B}{2}+\tan^2\frac{C}{2}\right)-2\times 1\geq 0$$

$$\Rightarrow\left(\tan^2\frac{A}{2}+\tan^2\frac{B}{2}+\tan^2\frac{C}{2}\right)\geq 1$$

Type - 3

113. If $\text{cosec}\,\theta \times \tan\theta = \frac{2}{\sqrt{3}}$ and θ is an acute angle then find the value of θ :

(a) 30º (b) 60º

(c) 90º (d) 45º

RRB NTPC (Stage-2) 16/06/2022 (Shift-II)

Ans. (a) : Given -

$$\text{cosec}\,\theta \times \tan\theta = \frac{2}{\sqrt{3}}$$

From the option (a) putting the value of $\theta = 30^\circ$

$$\text{cosec}\,30^\circ \times \tan 30^\circ = \frac{2}{\sqrt{3}}$$

$$2 \times \frac{1}{\sqrt{3}} = \frac{2}{\sqrt{3}}$$

$$\frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}}$$

LHS = RHS

Hence $\theta = 30^\circ$

114. When $\alpha = 30^\circ$, then find the value of $\sin\alpha \cos\alpha$:

(a) $\frac{\sqrt{3}}{4}$ (b) $\frac{3}{4}$

(c) $\frac{\sqrt{3}}{3}$ (d) $\frac{\sqrt{3}}{2}$

RRB NTPC (Stage-2) 17/06/2022 (Shift-II)

Ans. (a) : Given

$\alpha = 30^\circ$, then $\sin\alpha.\cos\alpha = ?$

$\sin 30^\circ . \cos 30^\circ$

$$= \frac{1}{2} \times \frac{\sqrt{3}}{2}$$

$$= \boxed{\frac{\sqrt{3}}{4}}$$

115. Slove the following :
$\sin 60^\circ + \tan 30^\circ + \cos 45^\circ$

(a) $\frac{3\sqrt{2}+5\sqrt{3}}{4}$ (b) $\frac{5\sqrt{2}+3\sqrt{3}}{4}$

(c) $\frac{3\sqrt{2}+5\sqrt{3}}{6}$ (d) $\frac{5\sqrt{2}+3\sqrt{3}}{6}$

RRB NTPC (Stage-2) 15/06/2022 (Shift-I)

Ans. (c) : $\sin 60^\circ + \tan 30^\circ + \cos 45^\circ$

$$= \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{3}} + \frac{1}{\sqrt{2}}$$

$$= \frac{3\sqrt{2} + 2\sqrt{2} + 2\sqrt{3}}{2\sqrt{6}}$$

$$= \frac{2\sqrt{3} + 5\sqrt{2}}{2\sqrt{6}} \times \frac{2\sqrt{6}}{2\sqrt{6}}$$

$$= \frac{4 \times 3\sqrt{2} + 10 \times 2\sqrt{3}}{4 \times 6}$$

$$= \frac{4\left(3\sqrt{2} + 5\sqrt{3}\right)}{4 \times 6}$$

$$= \boxed{\frac{3\sqrt{2} + 5\sqrt{3}}{6}}$$

116. Slove the following

$$\frac{\cos^2(45^\circ + \theta) + \cos^2(45^\circ - \theta)}{\text{cosec}^2 30^\circ \sin^2 45^\circ - \sec^2 60^\circ}$$

(a) $-\frac{1}{6}$ (b) $-\frac{1}{2}$

(c) $\frac{1}{6}$ (d) $\frac{1}{2}$

RRB NTPC (Stage-2) 12/06/2022 (Shift-I)

Ans. (b) : $\frac{\cos^2(45^\circ + \theta) + \cos^2(45^\circ - \theta)}{\text{cosec}^2 30^\circ \sin^2 45^\circ - \sec^2 60^\circ}$

$$= \frac{\cos^2(45^\circ + \theta) + \sin^2(45^\circ + \theta)}{4 \times \frac{1}{2} - 4}$$

$$\left[\because \cos^2(45^\circ - \theta) = \cos^2\left(90^\circ - (45^\circ - \theta)\right) = \sin^2(45^\circ + \theta)\right]$$

$$= \frac{1}{2 - 4} = -\frac{1}{2}$$

117. If $\sin^2\beta - \sin 30^\circ = 0$ and find the value of β :

(a) 45° (b) 0º

(c) 90º (d) 60º

RRB NTPC (Stage-2) 15/06/2022 (Shift-III)

Ans. (a) :

If $\sin^2\beta - \sin 30^\circ = 0$

$\sin^2\beta = \sin 30^\circ$

$$\sin^2\beta = \frac{1}{2}$$

$$\sin\beta = \frac{1}{\sqrt{2}}$$

$\sin\beta = \sin 45^\circ$

$\beta = 45^\circ$

118. Express sin 58º + cos 82º in terms of trigonometric ratios of angles between 0° and 45°.

(a) cos 32º + cos 8º
(b) sin 32º + sin 8º
(c) cos 32º + sin 8º
(d) sin 32º + cos 8º

RRB Group-D 29/08/2022 (Shift-II)

Ans. (c) : sin58° + cos82°

= sin(90° – 32°) + cos(90° – 8°)

= cos32° + sin8°

119. Find the value of sec33ºcosec57º – cot57º tan33º + cot47ºcot43º

(a) 0 (b) –1
(c) 2 (d) 1

RRB Group-D 13/09/2022 (Shift-II)

Ans. (c) :

sec33°cosec57° – cot57°tan33° + cot47°cot43°

= sec(90° – 57°) cosec57° – cot57° tan(90° – 57°) + cot (90° – 43°) cot43°

= $\text{cosec}^2 57° - \cot^2 57° + \tan 43° \cot 43°$

$= 1 + 1 \qquad \left[\because \text{cosec}^2\theta - \cot^2\theta = 1,\ \tan\theta\cot\theta = 1\right]$

= 2

120. Find the value of $\frac{\sin^2 54° + \sin^2 36°}{\tan^2 40° - \text{cosec}^2 50°}$

(a) –1 (b) 1
(c) 0 (d) 2

RRB Group-D 08/09/2022 (Shift-III)

Ans. (a) : $\frac{\sin^2 54° + \sin^2 36°}{\tan^2 40° - \text{cosec}^2 50°}$

$= \frac{\sin^2(90° - 36°) + \sin^2 36°}{\tan^2(90° - 50°) - \text{cosec}^2 50°}$

$= \frac{\cos^2 36° + \sin^2 36°}{\cot^2 50° - \text{cosec}^2 50°}$

$= \frac{\cos^2 36° + \sin^2 36°}{-(\text{cosec}^2 50° - \cot^2 50°)}$

$= \frac{1}{-1} \qquad \left[\because \cos^2\theta + \sin^2\theta = 1,\ \text{cosec}^2\theta - \cot^2\theta = 1\right]$

$= -1$

121. Find the value of $\frac{\cos^2 22° + \cos^2 68°}{2(\sin^2 22° + \sin^2 68°)} - \sin^2 16° - \cos 16° \sin 74°$

(a) $\frac{3}{2}$ (b) 2
(c) $-\frac{1}{2}$ (d) 0

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) :

$\frac{\cos^2 22° + \cos^2 68°}{2(\sin^2 22° + \sin^2 68°)} - \sin^2 16° - \cos 16° \sin 74°$

$= \frac{\cos^2 22° + \cos^2(90° - 22°)}{2(\sin^2 22° + \sin^2(90° - 22°))} - (\sin^2 16° + \cos 16°.\sin(90 - 16°)$

$= \frac{\cos^2 22° + \sin^2 22°}{2(\sin^2 22° + \cos^2 22°)} - (\sin^2 16° + \cos 16°.\cos 16°)$

$= \frac{1}{2 \times 1} - (\sin^2 16° + \cos^2 16°)$

$= \frac{1}{2} - 1$

$= -\frac{1}{2}$

122. tan 100º + tan 125º + tan 100º tan 125º is equal to:

(a) 0 (b) –1
(c) 1/2 (d) 1

RRB NTPC 11.03.2021 (Shift-II) Stage Ist

Ans. (d) : tan 100º + tan 125º + tan 100º tan 125º = ?

$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \cdot \tan B}$

$\tan(100 + 125°) = \frac{\tan 100° + \tan 125°}{1 - \tan 100° \cdot \tan 125°}$

$\tan(225°) = \frac{\tan 100° + \tan 125°}{1 - \tan 100° \cdot \tan 125°}$

$\tan(180° + 45°) = \frac{\tan(100°) + \tan 125°}{1 - \tan 100 \cdot \tan 125}$ {tan (180+θ) = tanθ}

$\tan 45° = \frac{\tan 100° + \tan 125°}{1 - \tan 100 \tan 125°}$

1– tan 100º. tan 125º = tan 100º + tan 125º

1 = tan 100º + tan 125º+tan 100º tan 125º

123. In a triangle ABC that is right angled at C, ∠A = ∠B . The value of sin A sin B + cosAcosB is:

(a) $\frac{1}{2}$ (b) 0
(c) 1 (d) $\frac{1}{\sqrt{2}}$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

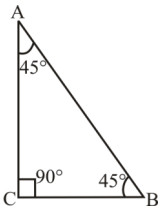
Ans. (c) : Given-

$\because \angle C = 90°$

and $\angle A = \angle B$

then $\angle A = 45°$

$\angle B = 45°$



$\therefore$ sinA sinB + cosA · cosB

$= \sin45° \sin45° + \cos45° \cdot \cos45°$

$= \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}$

$= \frac{1}{2} + \frac{1}{2} = 1$

124. Find the value

$$\cot19° \left(\cot71° \cos^2 21° + \frac{1}{\tan71° \sec^2 69°} \right)$$

(a) 1/2 (b) 1

(c) 0 (d) –1

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\cot19° \left(\cot71° \cdot \cos^2 21° + \frac{1}{\tan 71° \cdot \sec^2 69°} \right)$$

$= \cot19° \left(\tan19° \cdot \cos^2 21° + \cot 71° \cdot \cos^2 69 \right)$

$= \cot19° . \tan19° \, (\cos^2 21° + \sin^2 21°)$

$\{\because \cot(90° - \theta) = \tan\theta\}$

$\left\{\because \cot\theta \cdot \tan\theta = 1 \text{ and } \sin^2\theta + \cos^2\theta = 1\right\}$

$= \cos^2 21° + \sin^2 21°$

$= 1$

125. If $\sqrt{\frac{1 - \cos2\theta}{1 + \cos2\theta}} = \frac{1}{\sqrt{3}}$, then the value of θ is:

(a) $2n\pi + \frac{\pi}{6}$ (b) $n\pi + \frac{\pi}{3}$

(c) $n\pi + \frac{\pi}{6}$ (d) $n\pi + \frac{\pi}{4}$

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (c) : $\sqrt{\frac{1 - \cos2\theta}{1 + \cos2\theta}} = \frac{1}{\sqrt{3}}$

On squaring both sides-

$\frac{1 - \cos2\theta}{1 + \cos2\theta} = \frac{1}{3}$

$\Rightarrow \frac{1 - (1 - 2\sin^2\theta)}{1 + 2\cos^2\theta - 1} = \frac{1}{3}$

$\Rightarrow \frac{\sin^2\theta}{\cos^2\theta} = \frac{1}{3}$

$\Rightarrow \tan^2\theta = \frac{1}{3}$

$\Rightarrow \tan\theta = \frac{1}{\sqrt{3}} = \tan30°$

$\therefore$ Value of $\theta = n\pi + \frac{\pi}{6}$

126. $\sin25° \cos35° + \cos25° \sin35° = ?$

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{\sqrt{2}}$

(c) 1 (d) $\frac{1}{2}$

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (a) $\therefore$ sinA.cosB + cosA.sinB = sin (A + B)

$\sin25° . \cos35° + \cos25° \sin35° = \sin(25° + 35°)$

$= \sin60°$

$= \frac{\sqrt{3}}{2}$

127. Find the value of $\cos37° \sec143° + \sin34° \operatorname{cosec}146°$

(a) –1 (b) 1

(c) $\frac{1}{2}$ (d) 0

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\cos37° \sec143° + \sin34° \operatorname{cosec}146°$

$\frac{\cos37°}{\cos143°} + \frac{\sin34°}{\sin146°} = \frac{\cos37°}{\cos(180° - 37°)} + \frac{\sin34°}{\sin(180° - 34°)}$

$= \frac{\cos37°}{-\cos37} + \frac{\sin34°}{\sin34} = -1 + 1 = 0$

128. Find the value of the following.

$$\frac{\cos15° - \sin75°}{\cos15° + \sin75°}$$

(a) ∞ (b) 1

(c) $2\cos15°$ (d) 0

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : $\frac{\cos15° - \sin75°}{\cos15° + \sin75°}$

$= \frac{\cos(90° - 75°) - \sin75°}{\cos15° + \sin75°}$

$= \frac{\sin75° - \sin75°}{\cos15° + \sin75°}$ $\{\because \cos(90° - \theta) = \sin\theta\}$

$= \frac{0}{\cos15° + \sin75°}$

$= 0$

129. Find the value of

$$\frac{\sin 27^\circ.\cos 63^\circ}{\cos^2 27^\circ} - \frac{\sec 27^\circ.\operatorname{cosec} 63^\circ}{\tan^2 45^\circ}.$$

(a) –1 (b) 0

(c) 1 (d) 2

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) : $\frac{\sin 27^\circ.\cos 63^\circ}{\cos^2 27^\circ} - \frac{\sec 27^\circ.\operatorname{cosec} 63^\circ}{\tan^2 45^\circ}$

$= \frac{\sin 27^\circ.\cos(90^\circ - 27^\circ)}{\cos^2 27^\circ} - \frac{\sec 27^\circ.\operatorname{cosec}(90^\circ - 27^\circ)}{\tan^2 45^\circ}$

$\left\{\begin{array}{l}\because \tan 45^\circ = 1 \\ \cos(90 - \theta) = \sin\theta \\ \operatorname{cosec}(90 - \theta) = \sec\theta\end{array}\right\}$

$= \frac{\sin^2 27^\circ}{\cos^2 27^\circ} - \frac{\sec^2 27^\circ}{1}$

$= \tan^2 27^\circ - \sec^2 27^\circ$

$= (-\sec^2 27^\circ + \tan^2 27^\circ)$

$= -(\sec^2 27^\circ - \tan^2 27^\circ) \quad \{\because \sec^2\theta - \tan^2\theta = 1\}$

$= -1$

130. If θ = 30º, then what will be the value of sinθcosθ?

(a) $\frac{\sqrt{3}}{6}$ (b) $\frac{\sqrt{3}}{4}$

(c) $\frac{\sqrt{3}}{2}$ (d) $\frac{3}{8}$

RRB NTPC 17.02.2021 (Shift-II) Stage I

Ans. (b) : $\theta = 30^\circ$

$\sin\theta\cos\theta$

$= \sin 30^\circ \cos 30^\circ$

$= \frac{1}{2} \times \frac{\sqrt{3}}{2}$

$= \frac{\sqrt{3}}{4}$

131. If $\cos 2\theta = \frac{1}{2}$, the the value of sin (75°–θ) will be:

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$

(c) $\sqrt{2} - 1$ (d) $\sqrt{2} + 1$

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (b)

$\cos 2\theta = \frac{1}{2} = \cos 60^\circ$

$2\theta = 60^\circ$

$\theta = 30^\circ$

$\therefore \sin(75^\circ - \theta) = \sin(75^\circ - 30) = \sin 45^\circ = \frac{1}{\sqrt{2}}$

132. If $\tan 2\theta = \cot(\theta + 6^\circ)$ then find out the value of θ :

(a) 24° (b) 12°

(c) 45° (d) 28°

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\tan 2\theta = \cot(\theta + 6^\circ)$

$\tan 2\theta = \tan[90^\circ - (\theta + 6^\circ)]$

$2\theta = 90^\circ - \theta - 6^\circ$

$3\theta = 84^\circ$

$\Rightarrow \theta = 28^\circ$

133. If θ = 45º, then what will be the value of $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta}$?

(a) 0 (b) -1

(c) 1 (d) ∞

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given,

$\theta = 45^\circ$

$= \frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta}$

$= \frac{\sin 45^\circ + \cos 45^\circ}{\sin 45^\circ - \cos 45^\circ}$

$= \frac{\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}}}$

$= \frac{2}{\sqrt{2}} / 0$

$= \infty \quad \left(\because \frac{1}{0} = \infty\right)$

134. The value of cos 75º + sin 15º is equal to:

(a) $\frac{\sqrt{2}}{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{\sqrt{2}}$

(c) $\frac{\sqrt{3}+1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}-1}{\sqrt{2}}$

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : $\cos 75^\circ + \sin 15^\circ$

$= \cos(90^\circ - 15^\circ) + \sin 15^\circ \quad \{\because \cos(90^\circ - \theta) = \sin\theta\}$

$= \sin 15^\circ + \sin 15^\circ$

$= 2\sin 15^\circ \quad \left(\text{From } \sin 15^\circ = \frac{\sqrt{3}-1}{2\sqrt{2}}\right)$

$= 2 \times \frac{\sqrt{3}-1}{2\sqrt{2}}$

$= \frac{\sqrt{3}-1}{\sqrt{2}}$

135. If $\cos 2\theta = \sin\theta$ and θ lies between 0° and 90°, then θ will be:

(a) 45° (b) 30°

(c) 60° (d) 90°

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : $\cos 2\theta = \sin\theta$

On putting, $\theta = 30^\circ$,

$\cos 60^0 = \sin 30^0$

$\frac{1}{2} = \frac{1}{2}$

Hence the value of θ will be 30°

136. If $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, then the angle θ is.

(a) 45^0 (b) 90^0

(c) 300^0 (d) 240^0

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$= \frac{\cos\theta(\tan\theta + 1)}{\cos\theta(\tan\theta - 1)} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$= \frac{\tan\theta + 1}{\tan\theta - 1} = \frac{\sqrt{3}-1}{\sqrt{3}+1}$

$= \sqrt{3}\tan\theta + \sqrt{3} + \tan\theta + 1 = \sqrt{3}\tan\theta - \tan\theta - \sqrt{3} + 1$

$= \sqrt{3} + \tan\theta + 1 + \tan\theta + \sqrt{3} - 1 = 0$

$2\tan\theta + 2\sqrt{3} = 0$

$2\tan\theta = -2\sqrt{3}$

$\tan\theta = -\sqrt{3}$

$\tan\theta = \tan 300^\circ$

$\theta = 300^\circ$

137. Find the value of $\sin 15^\circ$?

(a) $\frac{\sqrt{6}-\sqrt{2}}{4}$ (b) $\frac{\sqrt{6}-\sqrt{2}}{3}$

(c) $\frac{\sqrt{6}-\sqrt{2}}{2}$ (d) $\frac{\sqrt{3}-\sqrt{2}}{4}$

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (a) : $\sin 15^\circ = \sin(60^\circ - 45^\circ)$

$= \sin 60^\circ \times \cos 45^\circ - \cos 60^\circ \times \sin 45^\circ$

$= \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}} - \frac{1}{2} \times \frac{1}{\sqrt{2}}$

$= \frac{\sqrt{3}-1}{2\sqrt{2}}$

On multiplying the numerator and denominator by $\sqrt{2}$

$= \frac{\sqrt{6}-\sqrt{2}}{4}$

138. If $\sin 2A = \cos 75^\circ$, then the smallest positive value of A is:

(a) 15° (b) 7.5°

(c) 30° (d) 75°

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (b) : $\sin 2A = \cos 75^\circ$

$\cos(90^\circ - 2A) = \cos 75^\circ \quad \{\because \sin A = \cos(90^\circ - A)\}$

$90^\circ - 2A = 75^\circ$

$2A = 90^\circ - 75^\circ$

$2A = 15^\circ$

$A = \frac{15^\circ}{2}$

$A = 7.5^\circ$

139. The value of $\cos 12^\circ + \cos 84^\circ + \cos 168^\circ + \cos 96^\circ$ is:

(a) –1 (b) 0

(c) 1 (d) 0.5

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : $\cos 12^\circ + \cos 84^\circ + \cos 168^\circ + \cos 96^\circ$

$= \cos 12^\circ + \cos 84^\circ + \cos(180^\circ - 12^\circ) + \cos(180^\circ - 84^\circ)$

$= \cos 12^\circ + \cos 84^\circ - \cos 12^\circ - \cos 84^\circ$

$= 0$

140. If $\sin(A + B) = \frac{\sqrt{3}}{2}$ and $\cos(A - B) = \frac{\sqrt{3}}{2}$, then which of the following will be possible values of A and B?

(a) $A = 45^\circ, B = 15^\circ$ (b) $A = 50^\circ, B = 10^\circ$

(c) $A = 45^\circ, B = 30^\circ$ (d) $A = 10^\circ, B = 45^\circ$

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,

$\sin(A + B) = \frac{\sqrt{3}}{2}$

$\sin(A + B) = \sin 60^\circ$

$A + B = 60^\circ$ .....(i)

and $\cos(A - B) = \frac{\sqrt{3}}{2}$

$\cos(A - B) = \cos 30^\circ$

A - B = 30° ……(ii)

On adding equation (i) and (ii),

$2A = 90°$

$A = 45°$

On putting the value of A in equation (i)

$45^o + B = 60^o$

$B = 15°$

Hence, $A = 45^o$, $B = 15^o$

141. If $\sqrt{3}\tan 2\theta - 3 = 0$ then the value of θ is:

(a) 45^0 (b) 60^0

(c) 150^0 (d) 30^0

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (d)

$\Rightarrow \quad \tan 2\theta = \frac{3}{\sqrt{3}} = \sqrt{3}$

$\Rightarrow \quad \tan 2\theta = \tan 60^o$

$\Rightarrow \quad 2\theta = 60^o$

$\Rightarrow \quad \theta = 30^o$

142. If sin (A – B) = sin A cos B – cos A sin B, then what is the value of sin15°?

(a) $\frac{\sqrt{3}-1}{4}$ (b) $\frac{\sqrt{6}-\sqrt{2}}{2}$

(c) $\frac{\sqrt{3}-\sqrt{2}}{2}$ (d) $\frac{\sqrt{6}-\sqrt{2}}{4}$

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d) sin (A – B) = sinA cosB – cosA sinB

$\sin 15^0 = \sin(60° - 45°) = \sin 60^0 \cos 45^0 - \cos 60^0 \sin 45^0$

$\sin 15^0 = \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}} - \frac{1}{2} \times \frac{1}{\sqrt{2}}$

$\sin 15° = \frac{\sqrt{3}}{2\sqrt{2}} - \frac{1}{2\sqrt{2}}$

$\sin 15^0 = \frac{\sqrt{3}-1}{2\sqrt{2}}$

$\sin 15^0 = \frac{\left(\sqrt{3}-1\right)\sqrt{2}}{2 \times 2} = \frac{\sqrt{6}-\sqrt{2}}{4}$

143. The value of $\cos(-780^0)$ is

(a) $\sqrt{3}/2$ (b) $-\sqrt{3}/2$

(c) $1/2$ (d) $-1/2$

RRB RPF SI – 13/01/2019 (Shift-II)

Ans : (c) $\cos(-780^0)$

$= \cos 780^0$ [$\because \cos(-\theta) = \cos\theta$]

$= \cos(2 \times 360^0 + 60^0)$

$= \cos 60^0 = \frac{1}{2}$

144. tan (60° + 30°) – tan (60° – 30°) = ?

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$

(c) Infinite (d) 1

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (c) tan (60° + 30°) – tan (60° – 30°)

= tan 90° - tan 30°

$= \frac{1}{0} - \frac{1}{\sqrt{3}} = \frac{\sqrt{3}-0}{0} = \frac{\sqrt{3}}{0} = \infty$ (Infinite)

145. $\frac{2\sin 30°}{1+\cos 30°} + \frac{1+\cos 30°}{\sin 30°} = ?$

(a) 4 (b) 8

(c) $4 - 2\sqrt{3}$ (d) $6 - \sqrt{3}$

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (d) $\frac{2\sin 30°}{1+\cos 30°} + \frac{1+\cos 30°}{\sin 30°}$

$= \frac{2\sin^2 30° + (1+\cos 30°)^2}{\sin 30°(1+\cos 30°)} = \frac{2 \times \frac{1}{4} + \left(1+\frac{\sqrt{3}}{2}\right)^2}{\frac{1}{2}\left(1+\frac{\sqrt{3}}{2}\right)}$

$= \frac{\frac{1}{2} + \frac{\left(2+\sqrt{3}\right)^2}{4}}{\frac{1}{2} \times \frac{\left(2+\sqrt{3}\right)}{2}} = \frac{2+7+4\sqrt{3}}{2+\sqrt{3}} = \frac{9+4\sqrt{3}}{2+\sqrt{3}}$

On multiplying the numerator and denominator by (2–$\sqrt{3}$)

$= \frac{9+4\sqrt{3}}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}}$

$= \frac{18+8\sqrt{3}-9\sqrt{3}-12}{4-3} = 6 - \sqrt{3}$

146. $\frac{\tan 45^0}{1+\cos 45^0} + \frac{1+\sin 45^0}{\cot 45^0} = ?$

(a) $3 - \frac{\sqrt{2}}{2}$ (b) $\sqrt{2}$

(c) $3 - 2\sqrt{2}$ (d) $-\frac{\sqrt{2}}{2}$

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (a) : =

$\frac{\tan 45^0}{1+\cos 45^0} + \frac{1+\sin 45^0}{\cot 45^0}$

$= \frac{1}{1+\frac{1}{\sqrt{2}}} + \frac{1+\frac{1}{\sqrt{2}}}{1}$

$= \frac{\sqrt{2}}{\sqrt{2}+1} + \frac{\sqrt{2}+1}{\sqrt{2}}$

$$= \frac{2+(\sqrt{2}+1)^2}{\sqrt{2}(\sqrt{2}+1)} = \frac{2+2+1+2\sqrt{2}}{\sqrt{2}(\sqrt{2}+1)}$$

$$= \frac{5+2\sqrt{2}}{\sqrt{2}(\sqrt{2}+1)}$$

On multiplying the numerator and denominator by $\sqrt{2}(\sqrt{2}-1)$

$$= \frac{\left(5+2\sqrt{2}\right)}{\sqrt{2}\left(\sqrt{2}+1\right)} \times \frac{\sqrt{2}\left(\sqrt{2}-1\right)}{\sqrt{2}\left(\sqrt{2}-1\right)}$$

$$= \frac{10+4\sqrt{2}-5\sqrt{2}-4}{2(2-1)}$$

$$= \frac{6-\sqrt{2}}{2} \quad = 3-\frac{\sqrt{2}}{2}$$

147. Given that $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$, then what is the value of $\tan 75^0$?

(a) $2+2\sqrt{3}$ (b) $2-\sqrt{3}$

(c) $2+\sqrt{3}$ (d) $2-2\sqrt{3}$

RRB Group-D – 27/11/2018 (Shift-I)

Ans. (c) : On putting,

$A = 45°$ and $B = 30°$,

$$\Rightarrow \frac{\tan 45° + \tan 30°}{1 - \tan 45° \tan 30°} = \tan(45° + 30°)$$

$$\Rightarrow \frac{\tan 45° + \tan 30°}{1 - \tan 45° \tan 30°} = \tan 75°$$

$$\Rightarrow \frac{1+\frac{1}{\sqrt{3}}}{1-1\times\frac{1}{\sqrt{3}}} = \tan 75°$$

$$\Rightarrow \frac{1+\frac{1}{\sqrt{3}}}{1-\frac{1}{\sqrt{3}}} = \frac{\sqrt{3}+1}{\sqrt{3}-1} = \tan 75°$$

On multiplying the numerator and denominator by $(\sqrt{3}+1)$

$$\Rightarrow \frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$$

$$\Rightarrow \frac{\left(\sqrt{3}+1\right)^2}{\left(\sqrt{3}-1\right)\left(\sqrt{3}+1\right)}$$

$$\Rightarrow \frac{\left(\sqrt{3}+1\right)^2}{\left(\sqrt{3}-1\right)\left(\sqrt{3}+1\right)} = \frac{\left(\sqrt{3}\right)^2+(1)^2+2\times\sqrt{3}\times 1}{\left(\sqrt{3}\right)^2-(1)^2}$$

$$= \frac{3+1+2\sqrt{3}}{3-1} = \frac{4+2\sqrt{3}}{2} = \tan 75°$$

$$= \frac{2\left(2+\sqrt{3}\right)}{2} = \tan 75° = 2+\sqrt{3} = \tan 75°$$

148. If $\text{cosec}(A-B) = \frac{\sec A \sec B}{\tan A - \tan B}$, then cosec 15°= ?

(a) $\sqrt{6}-\sqrt{3}$ (b) $\sqrt{6}-\sqrt{2}$

(c) $\sqrt{6}+\sqrt{3}$ (d) $\sqrt{6}+\sqrt{2}$

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (d) :

Suppose

$A = 60°$

$B = 45°$

$$\text{cosec}(60° - 45°) = \frac{\sec 60° \times \sec 45°}{\tan 60° - \tan 45°}$$

$$\text{cosec}\, 15° = \frac{2\times\sqrt{2}}{\sqrt{3}-1}$$

On multiplying the numerator and denominator by $(\sqrt{3}+1)$

$$= \frac{2\sqrt{2}}{\sqrt{3}-1} \times \frac{\left(\sqrt{3}+1\right)}{\left(\sqrt{3}+1\right)} = \frac{2\sqrt{2}\left(\sqrt{3}+1\right)}{\left(\sqrt{3}\right)^2-(1)^2}$$

$$= \frac{2\sqrt{6}+2\sqrt{2}}{3-1} = \frac{2\sqrt{6}+2\sqrt{2}}{2} = \frac{2\left(\sqrt{6}+\sqrt{2}\right)}{2}$$

$$\text{cosec}\, 15° = \sqrt{6}+\sqrt{2}$$

149. sec 30º + cos 30º = ?

(a) 7/6 (b) $7/\sqrt{3}$

(c) $\sqrt{3}/6$ (d) $7\sqrt{3}/6$

RRB ALP CBT-2 Trade (Fitter) 21-01-2019 (Shift-I)

Ans. (d) : sec 30º + cos 30º

$$= \frac{2}{\sqrt{3}} + \frac{\sqrt{3}}{2} = \frac{4+3}{2\sqrt{3}} = \frac{7}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{7\sqrt{3}}{6}$$

150. sec 45º – tan 60º = ?

(a) $-\sqrt{3}+\sqrt{2}$ (b) $-\sqrt{3}-\sqrt{2}$

(c) $\frac{\sqrt{3}}{2}$ (d) $\sqrt{3}+\sqrt{2}$

RRB ALP CBT-2 Heat Eng. 23-01-2019 (Shift-III)

Ans. (a) : Sec 45º – tan 60º = $\sqrt{2}-\sqrt{3} = -\sqrt{3}+\sqrt{2}$

151. Find the value of

$$\frac{5\cos^2 60^0 + 4\sec^2 30^0 - \tan^2 45^0}{\sin^2 30^0 + \cos^2 30^0} = ?$$

(a) 1 (b) 2

(c) $\frac{49}{12}$ (d) $\frac{67}{12}$

RRB Group-D – 09/10/2018 (Shift-II)

Ans. (d) : $\frac{5\cos^2 60^0 + 4\sec^2 30^0 - \tan^2 45^0}{\sin^2 30^0 + \cos^2 30^0}$

$\because \sin^2\theta + \cos^2\theta = 1$

$$= \frac{5\times\left(\frac{1}{2}\right)^2 + 4\times\left(\frac{2}{\sqrt{3}}\right)^2 - (1)^2}{1} = \frac{5\times\frac{1}{4}+4\times\frac{4}{3}-1}{1}$$

$$= \frac{5}{4}+\frac{16}{3}-1 = \frac{15+64-12}{12} = \frac{67}{12}$$

Type - 4

152. Value of A for the equation :
tan A + tan 2A + tan 3A = tan A tan 2A tan 3A

(a) $\frac{\pi}{3}, \frac{2\pi}{3}$ (b) $\frac{5\pi}{6}$

(c) only $\frac{\pi}{3}$ (d) only $\frac{2\pi}{3}$

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (a) : $\tan A + \tan 2A + \tan 3A = \tan A \tan 2A \tan 3A$

$\tan A + \tan 2A = \tan A \tan 2A \cdot \tan 3A - \tan 3A$

$\tan A + \tan 2A = \tan 3A(\tan A \tan 2A - 1)$

$\frac{\tan A + \tan 2A}{1 - \tan A \tan 2A} = -\tan 3A$

$\tan(A + 2A) = -\tan 3A$

$2\tan 3A = 0$

$\tan 3A = 0$

$\tan 3A = \tan \pi$

$3A = \pi$

$A = \frac{\pi}{3}, \frac{2\pi}{3}$

Hence the value of A $\frac{\pi}{3}$ and $\frac{2\pi}{3}$

153. Find the value of $\sin^2 5° + \sin^2 10° + \sin^2 80° + \sin^2 85°$.

(a) 0 (b) 1

(c) 2 (d) 3

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (c) :

$\sin^2 5° + \sin^2 10° + \sin^2 80° + \sin^2 85°$

$= \sin^2 5° + \sin^2 10° + \sin^2 (90° - 10°) + \sin^2 (90° - 5°)$

$= \sin^2 5° + \sin^2 10° + \cos^2 10° + \cos^2 5°$

$= (\sin^2 5° + \cos^2 5°) + \sin^2 10° + \cos^2 10°$

$= 1 + 1$ .....[$\because \sin^2\theta + \cos^2\theta = 1$]

$= 2$

154. Evaluate:

$3\tan 25^\circ \tan 35^\circ \tan 45^\circ \tan 55^\circ \tan 65^\circ$

(a) 0 (b) 3

(c) 4 (d) $3\sqrt{3}$

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (b) :

$3\tan 25^\circ . \tan 35^\circ . \tan 45^\circ . \tan 55^\circ . \tan 65^\circ$

$= 3\tan 25^\circ . \tan 35^\circ . \tan 45^\circ . \tan(90^\circ - 35^\circ) . \tan(90^\circ - 25^\circ)$

$= 3\tan 25^\circ . \tan 35^\circ . \tan 45^\circ . \cot 35^\circ \cot 25^\circ$

$= 3.\tan 45^\circ = 3 \times 1 = 3$

$\{\because \tan(90^\circ - \theta) = \cot\theta$, $\tan\theta . \cot\theta = 1$, $\tan 45^\circ = 1\}$

155. Find the value of $\tan 1^\circ . \tan 2^\circ . \tan 3^\circ$ ..... $\tan 89^\circ$

(a) $\sqrt{3}$ (b) 0

(c) 1 (d) $\frac{1}{\sqrt{3}}$

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (c) :

$\tan 1^0 \tan 2^0 \tan 3^0 \cdots \tan 87^0 \tan 88^0 \tan 89^0$

$(\because \tan(90° - \theta) = \cot\theta)$

$\tan 1^0 \tan 2^0 \tan 3^0 \cdots \cot 3^0 \cot 2^0 \cot 1^0$

$= 1$ $(\because \tan\theta . \cot\theta = 1)$

156. What is the value of the following expression?
$(\tan 2^\circ \tan 88^\circ)(\tan 3^\circ \tan 87^\circ) \ldots (\tan 43^\circ \tan 47^\circ) \tan 45^\circ$

(a) 0 (b) 1

(c) –1 (d) ∞

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) : From the question,

$(\tan 2° \tan 88°)(\tan 3° \tan 87°)$ ..... $(\tan 43° \tan 47°) \tan 45°$

$= \tan 2° . \tan(90° - 2°) . \tan 3 . \tan(90° - 3°)$ ..... $\tan 43° \tan(90 - 43°) . \tan 45°$

$= (\tan 2° . \cot 2°)(\tan 3° . \cot 3°)$ ..... $(\tan 43° . \cot 43°) . \tan 45°$

$= 1 \times 1$ ..... 1×1 [$\tan\theta . \cot\theta = 1$]

$= 1$

157. Find the value of $\cos^2(270 - \phi) - \sin^2(180 - \phi) + \sin^2\left(\frac{\pi}{2}\right)\sin^2(270 - \phi)$

(a) $\sin^2(\phi)$ (b) $\cos^2(\phi)$

(c) $\sin^2\left(\frac{\pi}{2}\right)$ (d) $\sin^2(\phi) - 1$

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\cos^2(270 - \phi) - \sin^2(180 - \phi) + \sin^2\left(\frac{\pi}{2}\right)\sin^2(270 - \phi)$

$\{\because \cos(270 - \theta) = -\sin\theta$, $\sin(180 - \theta) = \sin\theta$, $\sin(270 - \theta) = -\cos\theta\}$

$(-\sin\phi)^2 - \sin^2\phi + 1.(-\cos\phi)^2$

$= \sin^2\phi - \sin^2\phi + \cos^2\phi$

$= \cos^2\phi$

158. Value of $\cos1^\circ\cos2^\circ\cos3^\circ.....\cos179^\circ$ is :

(a) 0 (b) –1

(c) 1 (d) $\frac{1}{2}$

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (a) : $\cos1°\cos2°\cos3°$ ..... $\cos179°$

$= 0$ $\{ \because \cos90° = 0 \}$

159. Find the value of the expression [cosec (75° + θ) – sec (15° - θ) - tan (55° + θ) + cot (35° – θ)].

(a) 1 (b) 0

(c) -1 (d) $\frac{3}{2}$

RRB NTPC 18.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\left[\text{cosec}(75^\circ+\theta)-\sec(15^\circ-\theta)-\tan(55^\circ+\theta)+\cot(35^\circ-\theta)\right]$

= cosec $\{90^\circ - (15^\circ - \theta)\}$ – sec $(15^\circ - \theta)$ – tan $\{90° - (35° - \theta)\}$ + cot $(35° - \theta)$

= sec $(15° - \theta)$ – sec $(15° - \theta)$ – cot $(35° - \theta)$ + cot $(35° - \theta)$

= 0

160. If

$6\left(\sec^2 59^\circ - \cot^2 31^\circ\right) + \frac{2}{3}\sin90^\circ - 3\tan^2 56^\circ y\tan^2 34^\circ = \frac{y}{3}$

then the value of y is:

(a) 3 (b) 1

(c) 4 (d) 2

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (d) : $6\left(\sec^2 59^\circ - \cot^2 31^\circ\right) +$

$\frac{2}{3}\sin 90^\circ - 3\tan^2 56^\circ y \tan^2 34^\circ = \frac{y}{3}$

$6\left(\sec^2 59^\circ - \tan^2 59^\circ\right) + \frac{2}{3}\times1 - 3\tan^2 56^\circ y \cot^2 56^\circ = \frac{y}{3}$

$\left\{\because \tan(90-\theta) = \cot\theta \right\}$

$\left\{\sec^2\theta - \tan^2\theta = 1\right\}$

$6\times1 + \frac{2}{3} - 3y = \frac{y}{3}$

$\frac{20}{3} = \frac{10y}{3}$

$y = 2$

161. The value of $5\sin14^\circ \sec76^\circ + 3\cot15^\circ \cot75^\circ + 2\tan45^\circ$ is :

(a) 0 (b) 10

(c) 1 (d) 8

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : $5\sin14^\circ \sec76^\circ + 3\cot15^\circ \cot75^\circ + 2\tan45^\circ$

$=5\sin14^\circ \sec(90^\circ-14^\circ)+3\cot(90^\circ-75^\circ)\cot75^\circ+2\tan45^\circ$

$\left(\because \sin(90-\theta) = \cos\theta \right)$

$\left(\cos(90-\theta) = \sin\theta \right)$

$= 5\sin14^\circ \text{cosec}14^\circ + 3\tan75^\circ \cot75^\circ + 2\tan45^\circ$

$= 5 \times 1 + 3 \times 1 + 2 \times 1 = 5 + 3 + 2 = 10$

162. Find the value of $\sin\frac{7\pi}{4}\sin\frac{\pi}{4}\sin\frac{3\pi}{4}\sin\frac{5\pi}{4}$

(a) $\frac{1}{4}$ (b) $\frac{1}{8}$

(c) $\frac{1}{16}$ (d) $\frac{3}{16}$

RRB JE - 22/05/2019 (Shift-I)

Ans : (a)

$\sin\frac{7\pi}{4}\sin\frac{\pi}{4}\sin\frac{3\pi}{4}\sin\frac{5\pi}{4}$

$= \sin\left(\pi+\frac{3\pi}{4}\right)\sin\frac{\pi}{4}\sin\frac{3\pi}{4}\sin\left(\pi+\frac{\pi}{4}\right)$

$= \left(-\sin\frac{3\pi}{4}\right)\sin\frac{\pi}{4}\sin\frac{3\pi}{4}\left(-\sin\frac{\pi}{4}\right)$

$= \sin\frac{3\pi}{4}\sin\frac{\pi}{4}\sin\frac{3\pi}{4}\sin\frac{\pi}{4}$

$= \sin\left(\pi-\frac{\pi}{4}\right)\sin\frac{\pi}{4}\sin\left(\pi-\frac{\pi}{4}\right)\sin\frac{\pi}{4}$

$= \sin\frac{\pi}{4}\sin\frac{\pi}{4}\sin\frac{\pi}{4}\sin\frac{\pi}{4} = \frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}} = \frac{1}{4}$

163. Simplify: $\sin780^0 \sin480^0 + \cos120^0 \sin30^0$

(a) 2/3 (b) 1/3

(c) 0 (d) 1/2

RRB JE - 24/05/2019 (Shift-I)

Ans : (d) $\sin780^0 \sin480^0 + \cos120^0 \sin30^0$

$= \sin(2\times360°+60°)\sin(360° + 120°) + \cos120° \sin30°$

$= \sin60° \sin(120°) + \cos120° \sin30°$

$= \sin60° \sin(90° + 30°) + \cos(90° + 30°)\sin30°$

$= \sin60° \cos30° - \sin30°\sin30°$

$= \frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{2} - \frac{1}{2}\times\frac{1}{2} = \frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

164. Simplify:

$\cos5^0 + \cos24^0 + \cos175^0 + \cos204^0 + \cos300^0$

(a) 1/2 (b) 1

(c) -1/2 (d) 0

RRB JE - 25/05/2019 (Shift-I)

Ans : (a)
$\cos 5^0 + \cos 24^0 + \cos 175^0 + \cos 204^0 + \cos 300^0$
$= \cos5° + \cos24° + \cos(180° - 5°) + \cos(180° + 24°) + \cos(270° + 30°)$
$= \cos5° + \cos24° - \cos5° - \cos24° + \sin30°$
$= \sin30° = \frac{1}{2}$

165. Find the value of tan 10° tan 15° tan 80° tan 75°
(a) 1/3 (b) 1
(c) 1/2 (d) 2/3

RRB JE - 25/05/2019 (Shift-II)

Ans : (b) $\tan10°.\tan15°.\tan80°.\tan75°$
$= \tan10°.\tan15°.\tan(90°-10°)\tan(90°-15°)$
$= \tan10°.\tan15°.\cot10°.\cot15°$
$= \tan10°.\tan15° \times \frac{1}{\tan10°} \times \frac{1}{\tan15°}$
$= 1$

166. Find the value of $\tan^2 60^o - 2\tan^2 45^o - \cot^2 30^o + 2\sin^2 30^o + 3/4\ \text{cosec}^2 45^o$
(a) $-\frac{\sqrt{3}}{2}$ (b) 0
(c) 2 (d) – 1

RRB JE - 31/05/2019 (Shift-I)

Ans : (b) $\tan^2 60^o - 2\tan^2 45^o - \cot^2 30^o + 2\sin^2 30^o + 3/4\ \text{cosec}^2 45^o$
$(\sqrt{3})^2 - 2 \times 1 - (\sqrt{3})^2 + 2\left(\frac{1}{2}\right)^2 + \frac{3}{4} \times \left(\sqrt{2}\right)^2$
$3 - 2 - 3 + 2 \times \frac{1}{4} + \frac{3}{4} \times 2$
$3 - 5 + \frac{1}{2} + \frac{3}{2}$
$\frac{6-10+1+3}{2} = \frac{10-10}{2} = 0$

167. tan 34° tan42° tan48° tan56° + tan60° cot 30° - cosec30° sec60° = ?
(a) 0 (b) 1.5
(c) 1 (d) 2

RRB Group-D – 26/09/2018 (Shift-III)

Ans : (a) $\tan 34° \tan42° \tan48° \tan56° + \tan60° \cot 30° - \text{cosec}30° \sec60°$
$= \tan(90°-56°)\tan(90°-48°)\tan48°\tan56° + \tan60°\cot(90°-60°) - \text{cosec}(90°-60°)\sec60°$
$= \cot56°\cot48°\tan48°\tan56° + \tan^2 60° - \sec^2 60°$
$= 1 \times 1 + (-1) = 1 - 1 = 0$ $\left\{\begin{matrix}\tan\theta.\cot\theta = 1 \\ \sec^2\theta - \tan^2\theta = 1\end{matrix}\right\}$

168. What is the sum of the values of all six trigonometric ratios when the angle $\alpha = 45^0$?
(a) $2 + 3\sqrt{2}$ (b) $\frac{6+3\sqrt{2}}{2}$
(c) 6 (d) $2 + 4\sqrt{2}$

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (a) : Sum of all six trigonometry ratio
$= \sin\alpha + \cos\alpha + \tan\alpha + \cot\alpha + \sec\alpha + \text{cosec}\alpha$
$= \sin45^0 + \cos45^0 + \tan45^0 + \cot45^0 + \sec45^0 + \sec45^0 + \text{cosec}45^0$
$= \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} + 1 + 1 + \sqrt{2} + \sqrt{2} = \frac{2}{\sqrt{2}} + 2 + 2\sqrt{2}$
$= \sqrt{2} + 2 + 2\sqrt{2} = 3\sqrt{2} + 2 = 2 + 3\sqrt{2}$

169. $\sin^2 60^0 + \cos^2 30^0 + \cot^2 45^0 + \sec^2 60^0 = ?$
(a) $\frac{7}{2}$ (b) $\frac{5}{2}$
(c) $\frac{13}{2}$ (d) $\frac{15}{2}$

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (c) : $\sin^2 60^0 + \cos^2 30^0 + \cot^2 45^0 + \sec^2 60^0 = ?$
$= \left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 + (1)^2 + (2)^2$
$= \frac{3}{4} + \frac{3}{4} + 1 + 4 = \frac{6}{4} + 5 = \frac{6+20}{4} = \frac{26}{4} = \frac{13}{2}$

170. What is the value of the following expression $(\tan0^o \tan1^o \tan2^o \tan3^o \tan4^o \ldots\ldots\tan89^o)$
(a) 0 (b) 1
(c) 2 (d) 1/2

RRB NTPC 28.04.2016 Shift : 2

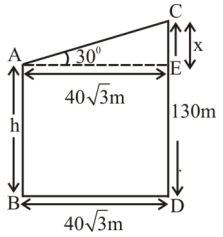
Ans : (a) $\because \tan0^o = 0$
$\therefore \tan0^o \tan1^o \tan2^o \tan3^o \ldots\ldots\tan89^o = 0$

Type - 5

171. The horizontal distance between two towers is $40\sqrt{3}$m. The angle of depression of the top of the first tower when seen from the top of the second tower is 30°. If the height of the second tower is 130m, find the height of the first tower.
(a) 85 m (b) 90 m
(c) 80 m (d) 95 m

RRB NTPC 30.12.2020 (Shift-II) Stage Ist

Ans. (b) :



In ΔACE,
$\tan30^0 = \frac{x}{AE}$

$\tan 30^0 = \dfrac{x}{40\sqrt{3}}$

$x = 40\sqrt{3} \times \dfrac{1}{\sqrt{3}}$

$\boxed{x = 40m}$

Hence $h = (130 - x)m$

$= (130 - 40)$

$\boxed{h = 90m}$

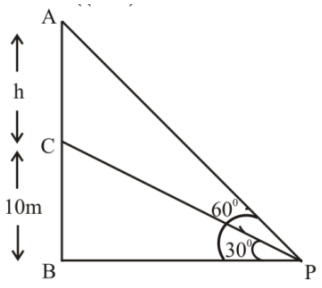
172. A window in a building is at a height of 10 meters from the ground. The angle of depression of a point P on the ground from the window is 30º. The angle of elevation of the top of the building from the point P is 60º. What is the height of the building?

(a) 30 meters (b) 35 meters

(c) 40 meters (d) 20 meters

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (a) : Building



x m

In Δ BPC,

$\tan 30^o = \dfrac{BC}{BP} = \dfrac{10}{x}$

$\dfrac{1}{\sqrt{3}} = \dfrac{10}{x}$

$x = 10\sqrt{3}$ ... (1)

In Δ ABP,

$\tan 60^o = \dfrac{AB}{BP}$

$\sqrt{3} = \dfrac{h+10}{x}$

$h + 10 = \sqrt{3}x$

$h + 10 = \sqrt{3} \times 10\sqrt{3}$ (From equation 1)

$h + 10 = 30$

$h = 20$

Hence height of the building = h + 10 = 20 + 10 = 30 m

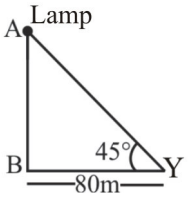
173. From a point Y on a level ground, the angle of elevation of the top of a lamp post is 45^0. If the distance of point Y from the foot of the lamp post is 80 m, the height of the lamp post will be:

(a) 82 m (b) 70 m

(c) 80 m (d) 78 m

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (c)



Hence

$\tan 45° = \dfrac{AB}{BY}$

AB = Height of lamp post and BY base.

$\tan 45° = \dfrac{AB}{80}$

$1 = \dfrac{AB}{80}$

$AB = 80$ m

Hence, the height of the lamp post will be 80m.

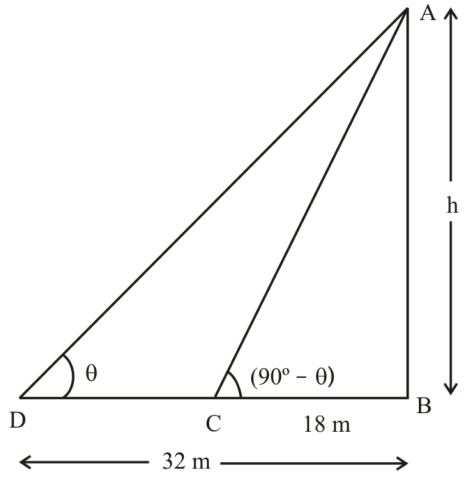
174. The angles of elevation of the top of a tower from two points on the ground 18 m and 32 m away from the foot of the tower are complementary. The height of the tower is:

(a) 32m (b) 36m

(c) 20m (d) 24m

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (d) :



Let AB = h be a tower of height whose distance from base B to points C and D are 18m and 32m respectively.

Let, ∠ADB = θ

then $\angle ACB = 90° - \theta$

Now in right angled triangle ΔABC

$$\tan(90° - \theta) = \frac{AB}{BC}$$

$$\cot\theta = \frac{h}{18} \quad \text{... (1)}$$

Similarly, in ΔABD,

$$\tan\theta = \frac{h}{32} \quad \text{... (2)}$$

On multiplying equation (1) and (2),

$$\cot\theta \times \tan\theta = \frac{h}{18} \times \frac{h}{32}$$

$$1 = \frac{h^2}{576}$$

$$h^2 = 576$$

$$h = \sqrt{576}$$

$$h = 24 \text{ m}$$

Hence height of the tower = 24 m.

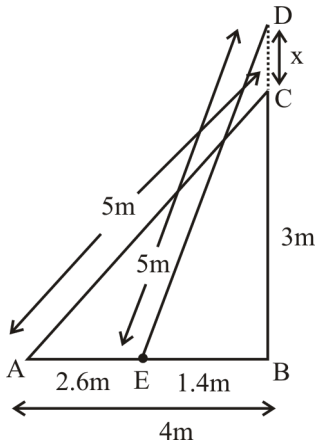
175. 5 m long ladder is leaning against a wall and it reaches the wall at a point 3 m high. If the foot of the ladder is moved 2.6 m towards the wall then the distance by which the top of the ladder slider slides upwards on the wall is:

(a) 1.08 m (b) 5.6 m

(c) 1.8 m (d) 4.8 m

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (c)



In right angled triangle ΔBED

$$ED^2 = EB^2 + DB^2$$

$$5^2 = (1.4)^2 + (3 + x)^2$$

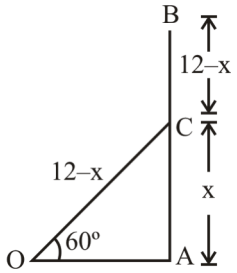
$$25 = 1.96 + (3 + x)^2$$

$$23.04 = (3 + x)^2$$

$$3 + x = 4.8$$

$$\boxed{x = 1.8\,\text{m}}$$

176. A tree, 12 m height, is broken by the wind in such a way that its top touches the ground and makes an angle of 60° with the ground. At what height from the bottom of earth tree broken by the wind ?

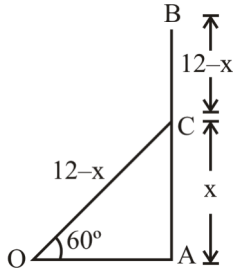


(a) $\left(2\sqrt{3} - 3\right)$m (b) $24\sqrt{3}$m

(c) $\left(24\sqrt{3} - 36\right)$m (d) $\left(24\sqrt{2} - 30\right)$m

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) :



$$\sin\theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}}$$

$$\sin 60° = \frac{x}{12 - x}$$

$$\frac{\sqrt{3}}{2} = \frac{x}{12 - x}$$

$$2x = 12\sqrt{3} - \sqrt{3}x$$

$$x\left(\sqrt{3} + 2\right) = 12\sqrt{3}$$

$$x = \frac{12\sqrt{3}}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$$

$$x = \left(24\sqrt{3} - 36\right)\text{m}$$

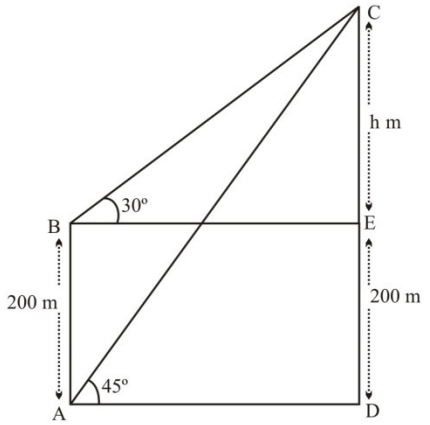
177. From the top and the bottom of 200 m high building, the angles of elevation of the top of a tower are 30° and 45° respectively. What is the height (in m) of the tower?

(a) $100\sqrt{3}(\sqrt{3} - 1)$ (b) $300(\sqrt{3} + 1)$

(c) $100(\sqrt{3 + 1})$ (d) $100\sqrt{3}(\sqrt{3} + 1)$

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,



From ΔACD,

$\tan 45^\circ = \frac{h+200}{AD}$ [tan 45° = 1]

AD = h + 200

From ΔBCE,

$\tan 30^\circ = \frac{h}{BE}$

$\tan 30^\circ = \frac{h}{h+200}$ {∵ AD = BE = h + 200}

$\frac{1}{\sqrt{3}} = \frac{h}{h+200}$

$h + 200 = \sqrt{3}h$

$200 = h\left(\sqrt{3}-1\right)$

$h = \frac{200}{\sqrt{3}-1}$

$h = \frac{200}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$

$= \frac{200\left(\sqrt{3}+1\right)}{2}$

$h = 100\left(\sqrt{3}+1\right)$

Hence height of the tower = $100\left(\sqrt{3}+1\right)+200$

$= 100\sqrt{3}+300$

$= 100\sqrt{3}\left(1+\sqrt{3}\right)$ m

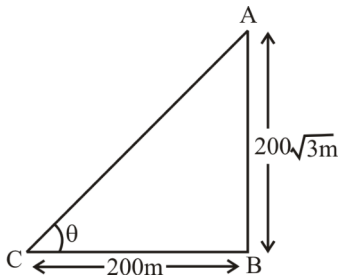
178. Find the angle of elevation of a $200\sqrt{3}$ m tower's top from a point 200 m away from its base.

(a) 45° (b) 60°

(c) 90° (d) 30°

RRB NTPC 03.02.2021 (Shift-II) Stage I

Ans. (b) :



Given- Height of the tower = 200 $\sqrt{3}$ m

and distance from base of tower = 200 m

In ΔABC,

$\tan\theta = \frac{AB}{BC}$

$= \frac{200\sqrt{3}}{200}$

$\tan\theta = \sqrt{3}$

$\tan\theta = \tan 60^\circ$

$\theta = 60^\circ$

Hence the angle of elevation of a tower's top will be 60°.

179. An observer 1.5m tall is 24.5m away from a 26m high tower. The angle of elevation of the top of the tower from the eye of the observer is:

(a) 60° (b) 30°

(c) 75° (d) 45°

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

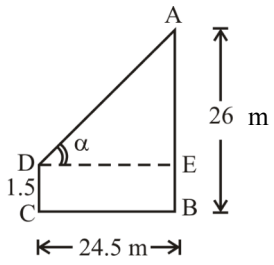
Ans. (d) : Given,

Let the angle of elevation of the top of the tower from the eye of the observer be α.

DC = Length of observer = 1.5 m

AB = Height of the tower = 26 m

BC = 24.5 m.



∵ AB = 26 m

∴ AE = AB – BE

= 26 – 1.5 {∵ EB = DC = 1.5 m}

= 24.5 m

Now, in ΔAED

$\tan\alpha = \frac{AE}{DE}$

$\Rightarrow \tan\alpha = \frac{24.5}{24.5}$

$\Rightarrow \tan\alpha = 1$

$\Rightarrow \tan\alpha = \tan 45^\circ$

$\Rightarrow \alpha = 45^\circ$

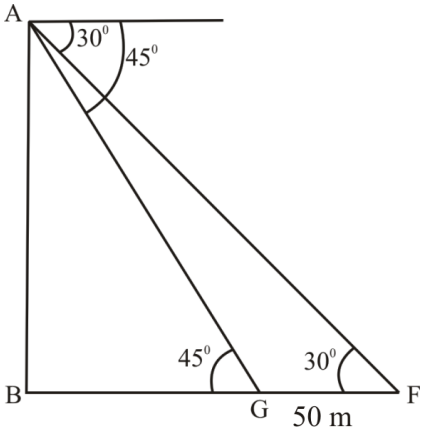
180. The angles of depression of two houses of the same height from the top of a building are 45° and 30° towards the east. If the two houses are 50 m apart, what will be the height of the building in metres?

(a) $50\left(\sqrt{3}+1\right)$ (b) $45\left(\sqrt{3}-1\right)$

(c) $35\left(\sqrt{3}-1\right)$ (d) $25\left(\sqrt{3}+1\right)$

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (d) :



In ΔABG,

$\tan 45^0 = \frac{AB}{BG}$

$1 = \frac{AB}{BG}$

$BG = AB$

In ΔABF,

$\tan 30^0 = \frac{AB}{BG + GF}$

$\frac{1}{\sqrt{3}} = \frac{AB}{AB + 50}$

$AB + 50 = \sqrt{3}AB$

$AB = \frac{50}{\sqrt{3}-1}$ m

$\frac{50}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{50(\sqrt{3}+1)}{(\sqrt{3})^2 - (1))^2} = \frac{50(\sqrt{3}+1)}{2}$

$= 25\left(\sqrt{3}+1\right)$

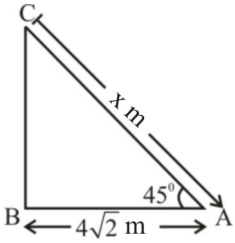
181. The angle of elevation of a ladder leaning against a wall is 45°. The foot of the ladder is $4\sqrt{2}$ metres away from wall. The length of the ladder is:

(a) 7 m (b) 8 m

(c) 5 m (d) 6 m

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (b) :



Let the length of ladder be x meters.

AB = $4\sqrt{2}$ m

and $\angle BAC = 45^\circ$

$\tan 45^\circ = \frac{BC}{AB} = \frac{BC}{4\sqrt{2}}$

$1 = \frac{BC}{4\sqrt{2}}$

$\Rightarrow BC = 4\sqrt{2}$

From Phthagoras theorem,

$AC^2 = BC^2 + AB^2$

$x^2 = \left(4\sqrt{2}\right)^2 + \left(4\sqrt{2}\right)^2$

$x^2 = 32 + 32$

$x^2 = 64$

$x = \sqrt{64}$

$x = 8$ m

Hence the length of ladder is 8m.

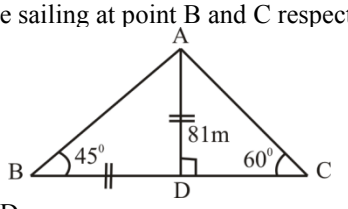
182. Two ships are sailing in the sea on the two sides of a light house. The angles of elevation of the top of the lighthouse as observed from the ships are 45° and 60° respectively. If the lighthouse is 81 m height, then the distance between two ships:

(a) $\frac{81}{\sqrt{3}}$ m (b) $\frac{\left[81\left(1+\sqrt{3}\right)\right]}{\sqrt{3}}$ m

(c) $\frac{\left(1+\sqrt{3}\right)}{\sqrt{3}}$ m (d) $\frac{\left(1+\sqrt{3}\right)}{81\sqrt{3}}$ m

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let the height of light house be AD and the ships are sailing at point B and C respectively.



In ΔABD,

$$\tan 45° = \frac{81}{BD}$$

$$1 = \frac{81}{BD}$$

$$BD = 81m$$

In ΔADC,

$$\tan 60° = \frac{81}{DC}$$

$$DC = \frac{81}{\sqrt{3}} m$$

Hence distance between both the ships

$$(BC) = BD + DC = 81 + \frac{81}{\sqrt{3}} = \frac{81(\sqrt{3}+1)}{\sqrt{3}} \text{ m}$$

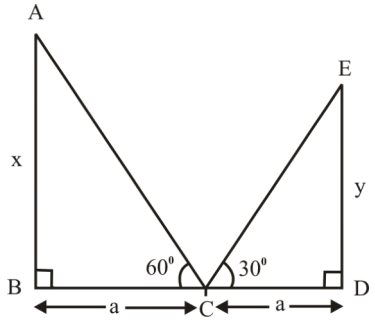
183. The top of two towers of heights x and y standing on level ground, subtend angles of 60º and 30º respectively at the midpoint of the line joining their feet. The value of x : y is

(a) 3 : 1 (b) 2 : 1

(c) 1: 3 (d) 1 : 2

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,



In ΔABC,

$$\tan 60^0 = \frac{x}{a} \Rightarrow \sqrt{3} = \frac{x}{a}$$

$$x = a\sqrt{3}$$

In ΔEDC

$$\tan 30^0 = \frac{y}{a} \Rightarrow \frac{1}{\sqrt{3}} = \frac{y}{a}$$

$$y = \frac{a}{\sqrt{3}}$$

$$x : y = a\sqrt{3} : \frac{a}{\sqrt{3}}$$

$$x : y = 3 : 1$$

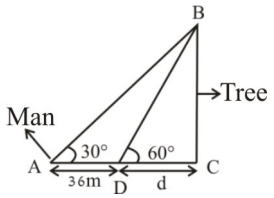
184. A man standing on the banks of a river observes that the angle subtended by a tree on the opposite bank is 60º. He walk 36 meters backward on the bank and observes the angle to be 30º. What is the breadth of the river?

(a) 20 meters (b) 18 meters

(c) 10 meters (d) 28 meters

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) :



Let breadth of the river = d m

In ΔABC,

$$\tan 30° = \frac{BC}{36+d}$$

$$BC = \frac{36+d}{\sqrt{3}} \text{ ------- (1)}$$

Again in ΔBDC,

$$\tan 60° = \frac{BC}{d}$$

$$\sqrt{3}d = BC$$

From equation (1)-

$$\sqrt{3}d = \frac{(36+d)}{\sqrt{3}}$$

$$3d = 36+d$$

$$2d = 36$$

$$d = 18m$$

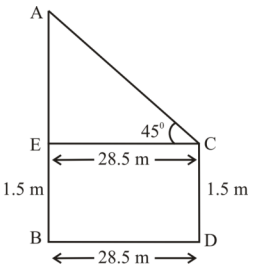
185. An observer 1.5 m tall is standing 28.5 m away at the same level as the foot of a tower. If angle of elevation of the observer watching the top of the tower is 45 degrees then what is the height of the tower?

(a) 30 m (b) 25 m

(c) 20 m (d) 35 m

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (a) : From the question,



In ΔAEC-

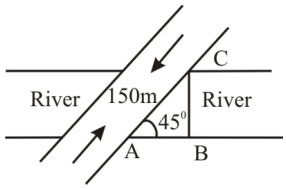
$$\tan 45° = \frac{AE}{EC} = \frac{AE}{28.5}$$

AE = 28.5 m

AB = AE + EB = 28.5 + 1.5

AB = 30 m

186. A bridge built across a river makes an angle of 45º with the river bank as shown in the given figure. If the length of the bridge is 150 m, then what is the width of the river?



(a) 70 m (b) $75\sqrt{2}$ m

(c) $63\sqrt{2}$ m (d) 65 m

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let width of the river is x m.

$$\because \sin\theta = \frac{\text{Perpendicular}}{\text{Hypotenuse}}$$

$$\sin 45° = \frac{x}{150}$$

$$\frac{1}{\sqrt{2}} = \frac{x}{150}$$

$$x = \frac{150}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$$

Hence $x = 75\sqrt{2}$ m

187. A 5 m long ladder is placed against a wall and reaches a height of 3 m on the wall. How for should ladder be taken towards the wall so that its end reaches a height of 4.8 m?

(a) 2.96 m

(b) 1.4 m

(c) 2.2 m

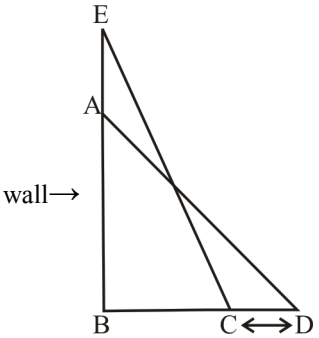
(d) 2.6 m

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (d) : AB = 3 m

BE = 4.8 m

(ladder) AD = EC = 5 m



In ΔABD,

$$BD = \sqrt{(AD)^2 - (AB)^2}$$

$$= \sqrt{(5)^2 - (3)^2}$$

$$= \sqrt{25 - 9}$$

$$= \sqrt{16} = 4 \text{ m}$$

In ΔEBC,

$$BC = \sqrt{(EC)^2 - (EB)^2}$$

$$= \sqrt{(5)^2 - (4.8)^2}$$

$$= \sqrt{25 - 23.04} = \sqrt{1.96} = 1.4 \text{ m}$$

CD = BD – BC

= 4 – 1.4 = 2.6 m

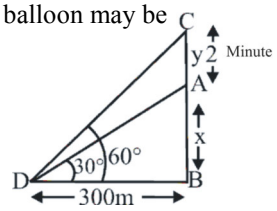
188. The angle of elevation of a hot air balloon going upward in vertical direction when viewed from a distance of 300 m from the point of flight, changes from 30º at 10:00 am to 60º at 10 : 02 am. Find the speed of the balloon in the vertical direction.

(a) 2 m/sec. (b) 2.18 m/sec.

(c) 3.4 m/sec. (d) 2.9 m/sec.

RRB JE - 22/05/2019 (Shift-III)

Ans : (d) Suppose position of balloon may be A to C in 2 minutes.



In ΔABD,

$$\tan 30° = \frac{x}{300}$$

$$\frac{1}{\sqrt{3}} = \frac{x}{300}$$

$$x = \frac{300}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 100\sqrt{3} \text{ m}$$

In ΔCBD,

$$\tan 60° = \frac{x + y}{300}$$

$$\sqrt{3} = \frac{x + y}{300}$$

$$x + y = 300\sqrt{3}$$

$$100\sqrt{3} + y = 300\sqrt{3}$$

$$y = 200\sqrt{3}$$

$$\therefore \text{ Speed of balloons } = \frac{y}{t} = \frac{200\sqrt{3}}{2 \times 60} = \frac{5}{3}\sqrt{3}$$

$$= \frac{5 \times 1.732}{3} = 5 \times 0.577 = 2.885 = 2.9 \text{ m/sec}$$

189. An aeroplane is flying at a steady altitude 'h'. At 10:00 am, it appears at an elevation angle of 30°. After 1 minute, it appears at an elevation angle of 60°. If the speed of the aeroplane is 960 km/h, find the value of 'h'.

(a) 15 km. (b) 13.86 km.
(c) 20 km. (d) 12.46 km.

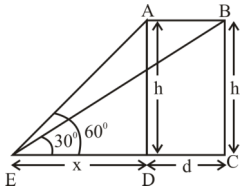
RRB JE - 26/05/2019 (Shift-I)

Ans : (b)

$\therefore$ Speed = distance/time

$$960 = \frac{CD}{1\,minute}$$

$$\frac{960\times1}{60} = d \Rightarrow d = 16km$$



From $\Delta AED-$

$$\tan 60° = \frac{h}{x} \Rightarrow x\sqrt{3} = h .....(i)$$

From $\Delta BEC-$

$$\tan 30^0 = \frac{h}{x+d} \Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{16+x} .....(ii)$$

From equation (i) and (ii)–

$$\frac{1}{\sqrt{3}} = \frac{x\sqrt{3}}{16+x}$$

16 + x = 3x

2x = 16

x = 8 km

$\therefore$ $h = x\sqrt{3} = 8\sqrt{3}$

h = 1.732 × 8 = 13.86 km

190. The elevation angles formed when looking at the top of the tree from two points located 'x' meters and 'y' meters from both the foot of the tree are α, β respectively. If α + β = 90°, then find the height of the tree.

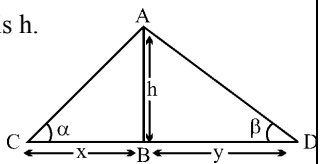
(a) $\frac{(x+y)^2}{2}$ (b) $\sqrt{xy}$

(c) $x\cos a + y\cos B$ (d) $(x-y)^2$

RRB JE - 31/05/2019 (Shift-II)

Ans : (b)

Suppose height of the tree is h.



$\alpha + \beta = 90°$ ----(i)

In ΔABC,

$$\tan\alpha = \frac{h}{x}$$ ----(ii)

In ΔABD,

$$\tan\beta = \frac{h}{y}$$

$$\tan(90-\alpha) = \frac{h}{y}$$ {From equation (i)}

$$\cot\alpha = \frac{h}{y}$$ ----(iii)

From equation (ii) and (iii)-

$$\tan\alpha\cot\alpha = \frac{h}{x}\times\frac{h}{y}$$

$$1 = \frac{h^2}{xy}$$

$$h = \sqrt{xy}$$

191. The angle of depression of the foot of a building from the top of a tower of $32\sqrt{3}$ meters height is 60°. How far is the building from the tower?

(a) 32 meters (b) $16\sqrt{3}$ meters

(c) $32\sqrt{3}$ meters (d) 16 meters

RRB RPF SI – 06/01/2019 (Shift-II)

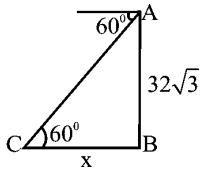
Ans. (a) : Height of the tower (AB) = $32\sqrt{3}$ m

Let the distance of the building from the tower be x meters.

Then $\tan 60^0 = \frac{AB}{CB}$

$$\sqrt{3} = \frac{32\sqrt{3}}{x}$$

x = 32 m



192. From the top of the stage the elevation angle of the top of the tower at a distance of $50\sqrt{3}$ meters is 30°. If the height of the tower is 60 meters; what will be the height of the stage?

(a) $20\sqrt{3}$ m (b) 10 m

(c) 40 m (d) $45\sqrt{3}$ m

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (b) Let the height of the stage = y m

As per question—

$$\tan 30° = \frac{x}{50\sqrt{3}}$$

$$\frac{1}{\sqrt{3}} = \frac{x}{50\sqrt{3}}$$

x = 50 m

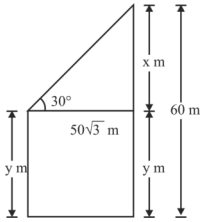
$\because$ x + y = 60

y = 60 – x

y = 60 – 50

y = 10 m

So, height of the stage = 10 m



193. The angle of elevation of a point A from the top of a tower to the ground is 30°. When moving to the point X at 20 meters towards the foot of the tower, the elevation angle changes to 60°. What is the distance of the tower from point A?

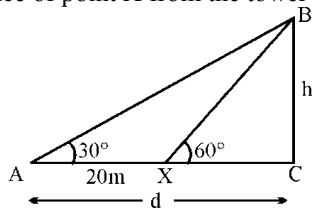
(a) $5\sqrt{11}$ m (b) 30 m

(c) 5 m (d) 16m

RRB Group-D – 28/09/2018 (Shift-III)

Ans : (b) Let the height of the tower (CB) = h m
and distance of point A from the tower = d m

$\therefore$ distance of point X from the tower = (d – 20)m



From the figure, $\tan 30° = \frac{h}{d}$

$$\frac{1}{\sqrt{3}} = \frac{h}{d}$$

$$h = \frac{d}{\sqrt{3}}$$

and

$$\tan 60° = \frac{h}{(d-20)} \Rightarrow \sqrt{3} = \frac{h}{(d-20)}$$

On putting the value of 'h'

$$\sqrt{3} = \frac{d}{\sqrt{3}(d-20)}$$

$3 (d – 20) = d$

$3d – d = 60$

$2d = 60$

$d = 30$

So distance of point A from the tower = 30 m.

194. A 5 meter long staircase with a stable base on the road can reach two windows 4 meter and 3 meter high on the other side of the road. What is the width of the road?

(a) 6.2 m

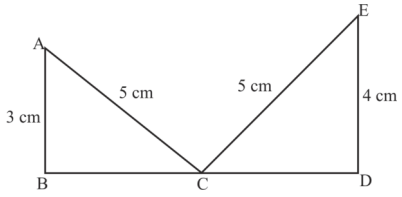
(b) 6 m

(c) 7 m

(d) 5.5 m

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (c)



$BD = \sqrt{BC^2} + \sqrt{CD^2}$

$= \sqrt{5^2 - 3^2} + \sqrt{5^2 - 4^2}$

$= \sqrt{4^2} + \sqrt{3^2} \quad = 4 + 3 = 7$ m

So breadth of the road = 4 + 3 = 7m

195. From the top of a platform of 7 meters height, the elevation angle of a tower which is 47 meters in height is 30°. How far is the tower located from the platform.

(a) $45\sqrt{3}$ m (b) 40 m

(c) $40\sqrt{3}$ m (d) $15\sqrt{3}$ m

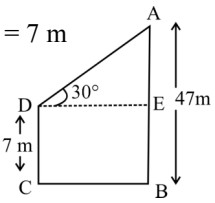
RRB Group-D – 18/09/2018 (Shift-II)

Ans. (c) :

$\because$ AB = height of tower = 47 m

CD = BE = height of platform = 7 m

$\therefore$ AE = 47 – 7 = 40 m



from ΔADE ,

$$\tan 30° = \frac{AE}{ED} = \frac{40}{DE}$$

$\because$ DE = BC

(Distance between platform to tower)

$\therefore$ $\frac{1}{\sqrt{3}} = \frac{40}{DE}$

$DE = 40\sqrt{3}$ m or $BC = 40\sqrt{3}$ m

196. From the initial position of a woman standing on the ground floor of a 43.5 m tall tower, the angle of elevation of the top was 60º. She moves in a straight line from the position of the tower in such a way that the angle of elevation of the tower becomes 30º from its final position. Then what will be the changed distance?

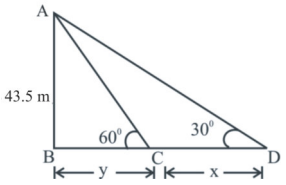
(a) $\frac{29}{3}\sqrt{3}$ meter (b) $29\sqrt{3}$ meter

(c) $\frac{29}{2}\sqrt{3}$ meter (d) 29 meter

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (b) : Let the initial distance of the woman from the tower = y m, distance after relocation = x

(AB) height of tower = 43.5 m



In ΔABC,

$$\tan 60° = \frac{AB}{BC}$$

$$\sqrt{3} = \frac{43.5}{y}$$

$$y = \frac{43.5}{\sqrt{3}}$$

$\boxed{3y = 43.5\sqrt{3}}$.....(i)

In ΔABD,

$$\tan 30° = \frac{AB}{BD}$$

$$\frac{1}{\sqrt{3}} = \frac{43.5}{x+y}$$

$$\boxed{x+y = 43.5\sqrt{3}} \text{.....(ii)}$$

On putting the value $43.5\sqrt{3}$ in equation (ii)

$$x + y = 3y$$

$$x = 2y$$

$$y = \frac{x}{2}$$

Again putting the value of y in equation (i)

$$3 \times \frac{x}{2} = 43.5\sqrt{3}$$

$$x = \frac{43.5\sqrt{3} \times 2}{3}$$

$$x = \frac{87\sqrt{3}}{3}$$

$$= 29\sqrt{3} \text{ m}$$

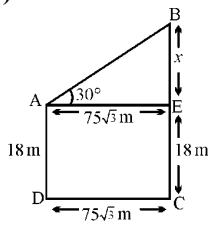
197. From the top of a platform 18 meters high, the elevation angle of the top of the tower is 30°. If the platform is located $75\sqrt{3}$ meters away from the tower, then what is the height of the tower?

(a) 93 m (b) $50\sqrt{3}$ m

(c) 75 m (d) $37.5\sqrt{3}$ m

RRB Group-D – 01/11/2018 (Shift-II)

Ans : (a)



In ΔABE,

$$\tan 30° = \frac{x}{75\sqrt{3}}$$

$$\frac{1}{\sqrt{3}} = \frac{x}{75\sqrt{3}}$$

$$x = 75\text{m}$$

So height of the tower $= 18 + 75 = 93\text{m}$

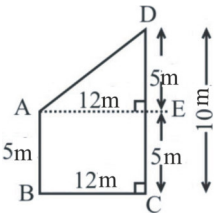
198. Two pillars of 5 meters and 10 meters stand straight on the ground. If the distance between their bottoms is 12 meters, find the distance between their vertices.

(a) 11 meters (b) 12 meters

(c) 13 meters (d) 14 meters

RRB NTPC 04.04.2016 Shift : 3

Ans : (c)



Let the distance between the vertices of the pillars = AD m

$$AE = BC = 12 \text{ m}$$

$$DE = CD - CE = 10 - 5$$

$$DE = 5 \text{ m}$$

From Pythagoras theorem in ΔAED,

$$AD^2 = AE^2 + DE^2 = (12)^2 + (5)^2 = 144 + 25$$

$$AD^2 = 169 \Rightarrow AD = 13 \text{ m}$$

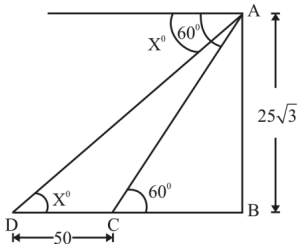
199. The shadow of a tower of $25\sqrt{3}$ height increases by 50 meters when the angle of depression by the sun is 60° to x°. Find the measure of x.

(a) 45^0 (b) 30^0

(c) 75^0 (d) 90^0

RRB NTPC 19.04.2016 Shift : 1

Ans : (b)



In ΔABC

$$\tan 60^0 = \frac{25\sqrt{3}}{BC}$$

$$\sqrt{3} = \frac{25\sqrt{3}}{BC}$$

$$BC = 25 \text{ …… (1)}$$

Again in ΔABD,

$$\tan x = \frac{25\sqrt{3}}{50 + BC}$$

$$\tan x = \frac{25\sqrt{3}}{50+25} = \frac{25\sqrt{3}}{75} = \frac{1}{\sqrt{3}}$$

$$\tan x = \tan 30^0$$

$$x = 30^0$$

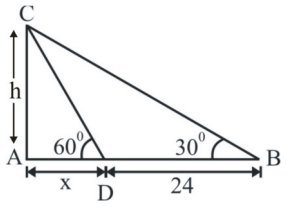
200. The length of the shadow of a pillar decreases by 24 meters. When the angle of elevation of the sun increases from 30° to 60°, the length of the pillar is.

(a) $10\sqrt{3}$ (b) $8\sqrt{3}$

(c) $16\sqrt{3}$ (d) $12\sqrt{3}$

RRB NTPC 18.04.2016 Shift : 2

Ans : (d)



In ΔABC,

$$\tan 30^0 = \frac{h}{x+24}$$

$$\frac{1}{\sqrt{3}} = \frac{h}{x+24}$$

$$\sqrt{3}\,h = x + 24 \quad \text{.....(I)}$$

In ΔADC,

$$\tan 60^0 = \frac{h}{x}$$

$$\sqrt{3} = \frac{h}{x}$$

$$h = \sqrt{3}\,x \quad \text{.....(II)}$$

On putting the value of h in equation (I)

$$\sqrt{3} \times \sqrt{3}x = x + 24$$

$$3x = x + 24$$

$$2x = 24$$

$$x = 12$$

In ΔADC,

$$\tan 60^0 = \frac{h}{12}$$

$$\sqrt{3} = \frac{h}{12}$$

$$h = 12\sqrt{3}\ \text{m}$$

201. The angle of depression of two stones in the same direction from an aeroplane vertically above a straight road is 30° and 45° respectively. If the plane is flying at an altitude of 1.365 km, then what is the distance between the two stones?

(a) 1 km (b) 2 km

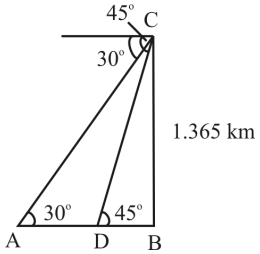
(c) 3 km (d) 4 km

RRB NTPC 16.04.2016 Shift : 2

Ans : (a) ∵ From ΔDBC

$$\tan 45^\circ = \frac{1.365}{DB}$$

DB = 1.365 km



From Δ ABC,

$$\tan 30^\circ = \frac{1.365}{AB}$$

$$AB = 1.365\sqrt{3}$$

∵ AD = AB – DB

$$AD = 1.365\sqrt{3} - 1.365 = 1.365\left(\sqrt{3} - 1\right)$$

$$= 1.365 \times 0.73 = 0.99 \approx 1\ \text{km}$$

So distance between the stones is 1 km.

202. From the top of a platform of 5 m height, the angle of elevation of a tower was 30°. If the tower was 45 m high, how far was the platform from the tower?

(a) 40 m (b) $40\sqrt{3}$ m

(c) $45\sqrt{3}$ m (d) $15\sqrt{3}$ m

RRB ALP & Tec. (21-08-18 Shift-II)

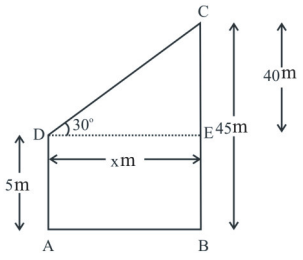
Ans : (b)

From ΔDEC,

$$\tan 30^0 = \frac{CE}{DE}$$

$$\tan 30^0 = \frac{40}{x} \Rightarrow \frac{1}{\sqrt{3}} = \frac{40}{x}$$

$$x = 40\sqrt{3}\ \text{m}$$



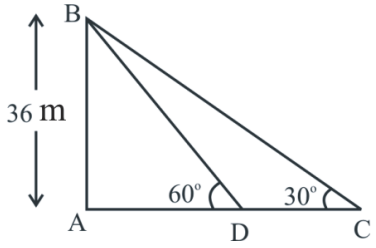
203. The angle of elevation of the top of a 36 m long tower from the initial position of a woman on the ground was 60°. She walked away in a manner that the bottom of the tower, her initial position and the final position were all in the same straight line. The angle of elevation from the top of the tower from to her final position was 30°. How much did she walk from her initial position?

(a) 24m (b) $36\sqrt{3}$ m

(c) $24\sqrt{3}$ m (d) $12\sqrt{3}$ m

RRB ALP & Tec. (21-08-18 Shift-II)

Ans : (c)



In ΔABC

$$\tan 30^\circ = \frac{AB}{AC}$$

$$\tan 30^\circ = \frac{36}{AC}$$

$AC = 36 \times \sqrt{3}$

$AD + DC = 36 \times \sqrt{3}$ ..... (i)

In Δ ABD

$$\tan 60^o = \frac{AB}{AD} = \frac{36}{AD}$$

$$AD = \frac{36}{\sqrt{3}} \text{ ..... (ii)}$$

From equation (i) and (ii)

$$\frac{36}{\sqrt{3}} + DC = 36\sqrt{3}$$

$$DC = 36\left(\sqrt{3} - \frac{1}{\sqrt{3}}\right)$$

$$= 36 \times \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 24\sqrt{3} \text{ m}$$

204. The angle of elevation of the top of a hill from the foot of the tower is 60° and the angle of elevation of the top of the tower from the foot of the hill is 30°. If the tower is 50m high, then what is the height of the hill?

(a) 100m (b) 120m

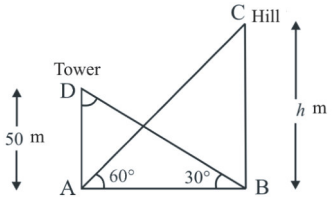
(c) 180m (d) 150m

RRB ALP & Tec. (14-08-18 Shift-I)

Ans : (d) In ΔABD

$$\tan 30° = \frac{50}{AB} \Rightarrow \frac{1}{\sqrt{3}} = \frac{50}{AB}$$

$$\Rightarrow AB = 50\sqrt{3} \text{ m}$$



$\therefore$ In Δ ABC,

$$\tan 60° = \frac{h}{50\sqrt{3}}$$

$$\Rightarrow h = 50\sqrt{3} \times \sqrt{3}$$

$$\Rightarrow h = 150 \text{ m}$$

So the height of the hill is 150 meters.

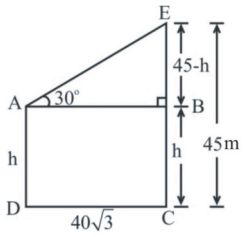
205. From the top of a platform, the angle of elevation of a tower was 30°. The tower was 45 m high and the horizontal distance between the platform and the tower was $40\sqrt{3}$ m. What was the height of the platform?

(a) 40 m (b) 5 m

(c) 45 m (d) $20\sqrt{3}$ m

RRB ALP & Tec. (14-08-18 Shift-II)

Ans : (b) Given the height of the tower (EC) = 45 meters



$\angle EAB = 30^o$

Horizontal distance (DC) = $40\sqrt{3}$ meters = AB

Let the height of the platform is h meters.

$\therefore$ In ΔABE -

$$\tan 30^o = \frac{EB}{AB}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{45 - h}{40\sqrt{3}}$$

$$\Rightarrow 45 - h = 40$$

$$\Rightarrow h = 45 - 40$$

$$\Rightarrow h = 5 \text{ meter}$$

Type - 6

206. If $\sqrt{2}\sin(5x - 5)^o = \tan 45^o$, then the value of x (in degrees) is:

(a) 16 (b) 12

(c) 14 (d) 10

RRB NTPC 09.02.2021 (Shift-II) Stage I

Ans. (d) : $\sqrt{2}\sin(5x - 5)^\circ = \tan 45^\circ$

$$\sqrt{2}\sin(5x-5)° = 1$$

$$\sin(5x-5)° = \frac{1}{\sqrt{2}}$$

$$\sin(5x-5)° = \sin 45°$$

$$5x - 5^\circ = 45^\circ$$

$$5x = 50^\circ$$

$$x = 10^\circ$$

207. If x = 3cosAcosB, y = 3cosAsinB and z = 3sinA, find the value of $x^2 + y^2 + z^2$

(a) 9 (b) 6

(c) 12 (d) 3

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Given-

$x = 3\cos A\cos B$

$y = 3\cos A\sin B$

$z = 3\sin A$

$\therefore x^2 + y^2 + z^2$

$= 9\cos^2 A\cos^2 B + 9\cos^2 A\sin^2 B + 9\sin^2 A$

$= 9\cos^2 A\left(\cos^2 B + \sin^2 B\right) + 9\sin^2 A$

$= 9\cos^2 A \times 1 + 9\sin^2 A \quad \left(\because \sin^2\theta + \cos^2\theta = 1\right)$

$= 9\left(\cos^2 A + \sin^2 A\right)$

$= 9 \times 1$

$= 9$

208. If $x\cos 45^\circ \sin 120^\circ + \sin 60^\circ = -x\sin 90^\circ + 1$, then the value of x is:

(a) $\dfrac{\left(2+\sqrt{3}\right)}{\sqrt{2}+\sqrt{3}}$ (b) $\dfrac{\left(2-\sqrt{3}\right)}{2\sqrt{2}+\sqrt{3}}$

(c) $\dfrac{\left(2-\sqrt{3}\right)}{\sqrt{2}+\sqrt{3}}$ (d) $\dfrac{2\sqrt{2}-\sqrt{6}}{2\sqrt{2}+\sqrt{3}}$

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (d) : $x\cos 45^\circ \sin 120^\circ + \sin 60^\circ = -x\sin 90^\circ + 1$

$$x \times \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} = -x \times 1 + 1$$

$$\left(\frac{\sqrt{3}}{2\sqrt{2}} + 1\right) x = 1 - \frac{\sqrt{3}}{2}$$

$$\left(\frac{\sqrt{3}+2\sqrt{2}}{2\sqrt{2}}\right) x = \frac{2-\sqrt{3}}{2}$$

$$x = \frac{2\sqrt{2}-\sqrt{6}}{2\sqrt{2}+\sqrt{3}}$$

209. If $\sec\theta = 5x$ and $\tan\theta = \dfrac{5}{x}$, then the value of $10\left(x^2 - \dfrac{1}{x^2}\right)$ is

(a) $\dfrac{3}{5}$ (b) $\dfrac{1}{5}$

(c) $\dfrac{2}{5}$ (d) 2

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (c) : $\sec\theta = 5x \quad ...(i)$

$\tan\theta = 5/x \quad ...(ii)$

From equation (i) and equation (ii)-

$$\sec^2\theta - \tan^2\theta = 25\left(x^2 - \frac{1}{x^2}\right)$$

$$1 = 25\left(x^2 - \frac{1}{x^2}\right)$$

$$\left(x^2 - \frac{1}{x^2}\right) = \frac{1}{25}$$

$$10\left(x^2 - \frac{1}{x^2}\right) = \frac{10}{25}$$

$$10\left(x^2 - \frac{1}{x^2}\right) = \frac{2}{5}$$

210. If $x + \dfrac{1}{x} = 2\cos\theta$, then what is the value of $x^2 + \dfrac{1}{x^2}$?

(a) $\cos 2\theta$ (b) $\sin 2\theta$

(c) $2\cos 2\theta$ (d) $2\sin 2\theta$

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (c) : $x + \dfrac{1}{x} = 2\cos\theta$

On squaring both sides,

$$\left(x + \frac{1}{x}\right)^2 = \left(2\cos\theta\right)^2$$

$$x^2 + \frac{1}{x^2} + 2 = 4\cos^2\theta$$

$$x^2 + \frac{1}{x^2} = 4\cos^2\theta - 2$$

$$x^2 + \frac{1}{x^2} = 2\left(2\cos^2\theta - 1\right)$$

$$\boxed{x^2 + \frac{1}{x^2} = 2\cos 2\theta}$$

211. If $x = r\sin A\cos C$, $y = r\sin A\sin C$ and $z = r\cos A$, then find the value of $x^2 + y^2 + z^2$

(a) $2r^2$ (b) $2r$

(c) 0 (d) r^2

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (d) : Given-

$x = r\sin A.\cos C$

$y = r\sin A.\sin C$

$z = r\cos A$

$x^2 + y^2 + z^2 = r^2\sin^2 A.\cos^2 C + r^2\sin^2 A.\sin^2 C + r^2\cos^2 A$

$= r^2 [\sin^2 A (\cos^2 C + \sin^2 C) + \cos^2 A]$

$= r^2 [\sin^2 A + \cos^2 A]$

$\{\because \sin^2\theta + \cos^2\theta = 1\}$

$x^2 + y^2 + z^2 = r^2$

212. **$\cos(x-y) = \frac{\sqrt{3}}{2}$ and $\sin(x+y) = 1$, where x and y are positive acute angles and $x \geq y$, then x and y are:**

(a) 50º, 40º (b) 70º, 20º

(c) 60º, 30º (d) 80º, 10º

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (c) : $\cos(x-y) = \frac{\sqrt{3}}{2}$

$(x - y) = 30°$ .....(i)

$\sin(x + y) = 1$

$x + y = 90°$ .....(ii)

From equation (i) and equation (ii),

$x - y = 30°$

$x + y = 90°$

$2x = 120°$

$x = 60°$

On putting the value of x in equation (i)

$60° - y = 30°$

$y = 30°$

Hence, x = 60º, y = 30º

213. **If $x = a\sin\theta$, and $y = b\tan\theta$, then find the value of $\frac{a^2}{x^2} - \frac{b^2}{y^2}$.**

(a) 2 (b) -1

(c) 0 (d) 1

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (d) : $x = a\sin\theta$, $y = b\tan\theta$

$$\frac{a}{x} = \frac{1}{\sin\theta}, \frac{b}{y} = \frac{1}{\tan\theta}$$

then, $$\frac{a^2}{x^2} - \frac{b^2}{y^2} = \frac{1}{\sin^2\theta} - \frac{\cos^2\theta}{\sin^2\theta}$$

$$= \frac{1-\cos^2\theta}{\sin^2\theta} \quad (\because \sin^2\theta + \cos^2\theta = 1)$$

$$= \frac{\sin^2\theta}{\sin^2\theta}$$

$$= 1$$

214. **If $\sin(A-B) = \frac{1}{2}$ and $\cos(A+B) = \frac{1}{2}$ with $0^0 < (A+B) \leq 90^0, A > B$ then find the measure of A and B.**

(a) $35^\circ, 15^\circ$ (b) $40^\circ, 35^\circ$

(c) $25^\circ, 20^\circ$ (d) $45^\circ, 15^\circ$

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (d) :

$\sin(A-B) = \frac{1}{2}$ $\cos(A+B) = \frac{1}{2}$

$\sin(A-B) = \sin 30°$ $\cos(A+B) = \cos 60°$

$A - B = 30°$ ___(i) $A + B = 60°$ ____(ii)

On adding equation (i) and equation (ii)

$A - B = 30°$

$A + B = 60°$

$2A = 90°$

$A = 45°$

On putting the value of A in equation (i)

$A - B = 30°$

$45° - B = 30°$

$45° - 30° = B$

$\boxed{B = 15^\circ}$

215. **If $x = r\sin A\cos B$, $y = r\sin A\sin B$ and $z = r\cos A$, then find the value of $x^2 + y^2 + z^2$**

(a) $r^2(\cos^2 B + \cos^2 A)$ (b) $2r^2$

(c) $3/2\ r^2$ (d) r^2

RRB JE - 24/05/2019 (Shift-II)

Ans : **(d)** $x = r\sin A\cos B$

$y = r\sin A\sin B$

$z = r\cos A$

$x^2 + y^2 + z^2 = (r\sin A\cos B)^2 + (r\sin A\sin B)^2 + (r\cos A)^2$

$= r^2\sin^2 A\cos^2 B + r^2\sin^2 A\sin^2 B + r^2\cos^2 A$

$= r^2\sin^2 A(\cos^2 B + \sin^2 B) + r^2\cos^2 A$

$= r^2\sin^2 A + r^2\cos^2 A$ $[\sin^2 B + \cos^2 B = 1]$

$= r^2(\sin^2 A + \cos^2 A) = r^2$

216. **If $x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$, then find the value of $x^2 - y^2$**

(a) $a^2 + b^2$ (b) $\sqrt{a^2 + b^2}$

(c) $a + b$ (d) $a^2 - b^2$

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (d)

$x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$

$x^2 - y^2 = ?$

$x^2 - y^2 = (a\sec\theta + b\tan\theta)^2 - (a\tan\theta + b\sec\theta)^2$

$= a^2\sec^2\theta + b^2\tan^2\theta + 2ab\sec\theta\tan\theta - a^2\tan^2\theta - b^2\sec^2\theta - 2ab\sec\theta\tan\theta$

$= a^2\sec^2\theta + b^2\tan^2\theta - a^2\tan^2\theta - b^2\sec^2\theta$

$= a^2(\sec^2\theta - \tan^2\theta) - b^2(\sec^2\theta - \tan^2\theta)$

$x^2 - y^2 = (a^2 - b^2)(\sec^2\theta - \tan^2\theta)$

$x^2 - y^2 = a^2 - b^2$ $\{\because \sec^2\theta - \tan^2\theta = 1\}$

217. If $0° < \theta \le 90°$, then what is the value of θ, where $\cos^2\theta - 3\cos\theta + 2 = 2\sin^2\theta$

(a) 30° (b) 60°

(c) 90° (d) 45°

RRB RPF SI – 10/01/2019 (Shift-I)

Ans : (c) If $0° < \theta \le 90°$

then $\cos^2\theta - 3\cos\theta + 2 = 2\sin^2\theta$

$\cos^2\theta - 3\cos\theta + 2 = 2(1 - \cos^2\theta)$

$\cos^2\theta - 3\cos\theta + 2 = 2 - 2\cos^2\theta$

$3\cos^2\theta = 3\cos\theta$

$3\cos^2\theta - 3\cos\theta = 0$

$\cos^2\theta - \cos\theta = 0$

$\cos\theta(\cos\theta - 1) = 0$

If $\cos\theta = 0° = \cos 90°$

then $\theta = 90°$

If $\cos\theta = 1 = \cos 0°$

$\theta = 0°$

218. If $x = r\cos\theta\cos\phi$, $y = r\cos\theta\sin\phi$ and $z = r\sin\theta$, then find the value of $x^2 + y^2 + z^2$

(a) y^2 (b) x^2

(c) r^2 (d) z^2

RRB Group-D – 26/10/2018 (Shift-II)

Ans : (c) Given-

$x = r\cos\theta\cos\phi$ .....(1)

$y = r\cos\theta\sin\phi$ ..... (2)

$z = r\sin\theta$ .....(3)

On squaring and adding equation (i), (ii) and (iii)–

$$x^2 + y^2 + z^2 = r^2\cos^2\theta\cos^2\phi + r^2\cos^2\theta\sin^2\phi + r^2\sin^2\theta$$

$$= r^2\cos^2\theta\left[\cos^2\phi + \sin^2\phi\right] + r^2\sin^2\theta$$

$$= r^2\cos^2\theta + r^2\sin^2\theta \qquad \left[\because \sin^2\phi + \cos^2\phi = 1\right]$$

$$= r^2\left(\sin^2\theta + \cos^2\theta\right)$$

$$\boxed{x^2 + y^2 + z^2 = r^2}$$

219. If $3\sec^2 x - 2\tan^2 x = 6$ and $0^0 \le x \le 90^0$ then x = ?

(a) 60^0 (b) 45^0

(c) 30^0 (d) 90^0

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (a) $3\sec^2 x - 2\tan^2 x = 6$

$3(1 + \tan^2 x) - 2\tan^2 x = 6$ $[\sec^2 x = 1 + \tan^2 x]$

$3 + 3\tan^2 x - 2\tan^2 x = 6$

$\tan^2 x = 3$

$\tan x = \sqrt{3}$

$\tan x = \tan 60^\circ$

$x = 60°$

220. If $2x = \sec A$ and $\left(\frac{2}{x}\right) = \tan A$, then find the value of $2\left(x^2 - \frac{1}{x^2}\right) = ?$

(a) 1 (b) 1/2

(c) 1/4 (d) 1/3

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (b)

$2x = \sec A$ ..... (i)

$\frac{2}{x} = \tan A$ ..... (ii)

On squaring and subtracting both the equations,

$$4x^2 - \frac{4}{x^2} = \sec^2 A - \tan^2 A$$

$$\left\{\sec^2 A - \tan^2 A = 1\right\}$$

$$4\left(x^2 - \frac{1}{x^2}\right) = 1$$

$$2\left(x^2 - \frac{1}{x^2}\right) = \frac{1}{2}$$

221. If $8\sec^2 x - 7\tan^2 x = 11$ and $0^0 \le x \le 90^0$, then find the value of x

(a) 90^0 (b) 45^0

(c) 30^0 (d) 60^0

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (d) : If $8\sec^2 x - 7\tan^2 x = 11$ and $0^0 \le x \le 90^0$ then x = ?

$$\Rightarrow \quad 8\sec^2 x - 7\tan^2 x = 11$$

$$\Rightarrow \quad 8\left(1 + \tan^2 x\right) - 7\tan^2 x = 11$$

$$\Rightarrow \quad 8 + 8\tan^2 x - 7\tan^2 x = 11$$

$$\Rightarrow \quad \tan^2 x = 11 - 8$$

$$\Rightarrow \quad \tan^2 x = 3$$

$$\Rightarrow \quad \tan x = \sqrt{3}$$

$\Rightarrow =$ $\tan x = \tan 60°$

$x = 60°$

24.

Co-ordinate Geometry

Type - 1

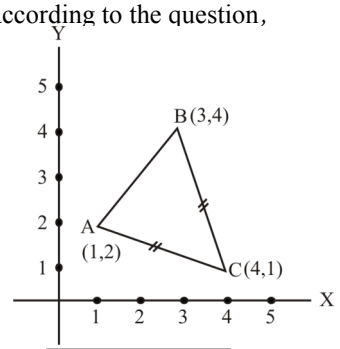
1. The points A (1, 2), B (3, 4) and C (4, 1) are the vertices of a triangle which is :

(a) Isosceles (b) Right-angled

(c) Equilateral (d) Scalene

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,



$$AB = \sqrt{(3-1)^2 + (4-2)^2} = \sqrt{4+4} = \sqrt{8}$$

$$BC = \sqrt{(4-3)^2 + (1-4)^2} = \sqrt{1+9} = \sqrt{10}$$

$$CA = \sqrt{(1-4)^2 + (2-1)^2} = \sqrt{9+1} = \sqrt{10}$$

Thus side, BC = CA ≠ AB

Hence, the triangle is a isosceles triangle.

2. The intercepts made by the plane $3x - 4y - 2z = 6$ with the coordinate axis are:

(a) $-2, \frac{3}{2}, 3$ (b) $2, \frac{3}{2}, -3$

(c) $-2, -\frac{3}{2}, 3$ (d) $2, -\frac{3}{2}, -3$

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : Standard equation of intercepts

$$= \frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1 \text{ ..... (i)}$$

Plane $3x - 4y - 2z = 6$ ..... (Given)

Dividing both side by 6

$$\frac{3x}{6} - \frac{4y}{6} - \frac{2z}{6} = \frac{6}{6}$$

$$\frac{x}{2} - \frac{2y}{3} - \frac{z}{3} = 1$$

$$\frac{x}{2} + \frac{y}{\left(-\frac{3}{2}\right)} + \frac{z}{(-3)} = 1$$

Comparing with Intercepts equation

$a = 2$

$b = -\frac{3}{2}$

$c = -3$

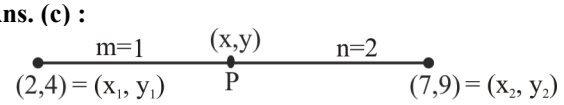
3. Find the coordinates of the point which will divide the line joining the point (2, 4) and (7, 9) internally in the ratio 1 : 2 :

(a) $\left(\frac{3}{8}, \frac{3}{11}\right)$ (b) $\left(\frac{5}{3}, \frac{1}{3}\right)$

(c) $\left(\frac{11}{3}, \frac{17}{3}\right)$ (d) $\left(\frac{8}{3}, \frac{11}{3}\right)$

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (c) :



We know that

$$x = \frac{nx_1 + mx_2}{m+n}, \quad y = \frac{ny_1 + my_2}{m+n}$$

$$x = \frac{2\times 2 + 1\times 7}{1+2} = \frac{4+7}{3} = \frac{11}{3}$$

$$y = \frac{2\times 4 + 1\times 9}{1+2} = \frac{8+9}{3} = \frac{17}{3}$$

So, the point $= \left(\frac{11}{3}, \frac{17}{3}\right)$

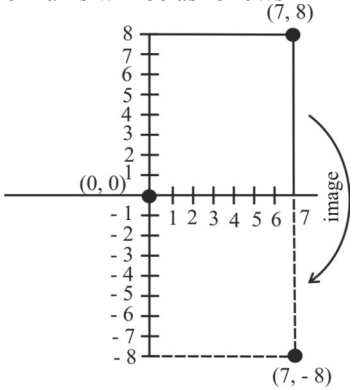
4. The image of the point (7, 8) when reflected along the x - axis is :

(a) (8, 7) (b) (–7, –8)

(c) (–7, 8) (d) (7, –8)

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : The reflected image of the point (7, 8) with respect to the x-axis will be as follows–



Hence, (7, – 8) is reflected image.

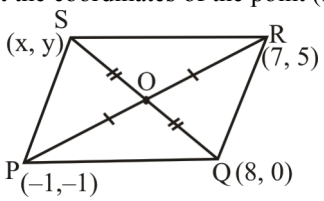
5. In a parallelogram PQRS, P = (–1,–1), Q = (8,0) and R = (7, 5) find the coordinates of 'S' ?

(a) (–2, 4) (b) $\left(-2, \frac{7}{2}\right)$

(c) $\left(-\frac{3}{2}, 4\right)$ (d) (–1,4)

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Let the coordinates of the point (S) = (x, y)



Coordinates of midpoint = $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Coordinates of the midpoint of point P (-1, -1) and point R (7, 5)-

$\frac{-1+7}{2}, \frac{-1+5}{2}$

= (3, 2).....(i)

Coordinates of the midpoint of point Q (8,0) and point S (x, y) -

$\frac{8+x}{2}, \frac{y+0}{2}$

$=\left(\frac{8+x}{2}, \frac{y}{2}\right)$

On compairing with equation (i),

$(3, 2) = \left(\frac{8+x}{2}, \frac{y}{2}\right)$

$3 = \frac{8+x}{2} \qquad 2 = \frac{y}{2}$

$x = -2 \qquad y = 4$

$(x, y) = (-2, 4)$

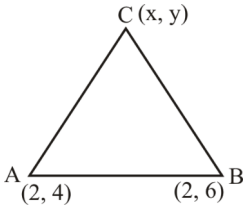
6. Find the third vertex of an equilateral triangle whose two vertices are (2, 4) and (2, 6).

(a) (2, 5) (b) $(\sqrt{3}, 5)$

(c) $(2+\sqrt{3}, 5)$ (d) $(2\sqrt{3}, 5)$

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the third vertex of an equilateral triangle is (x, y).



In equilateral triangle, all sides have equal length.

AB = BC = AC

Here, AB $= \sqrt{(2-2)^2+(6-4)^2}$

$= \sqrt{(2)^2} = 2 = 2$ units

And AC $= \sqrt{(2-x)^2+(4-y)^2} = 2$ units _____(i)

BC = $\sqrt{(2-x)^2+(6-y)^2} = 2$ units _____(ii)

On comporing the eqution (i) and (ii)

$\Rightarrow \sqrt{(2-x)^2+(4-y)^2} = \sqrt{(2-x)^2+(6-y)^2}$

On squaring both sides–

$\Rightarrow (2-x)^2 + (4-y)^2 = (2-x)^2 + (6-y)^2$

$\Rightarrow 16 + y^2 - 8y = 36 + y^2 - 12y \Rightarrow 4y = 20$

$\therefore y = 5$ _____(iv)

Now, putting y = 5 in eq^n (i),

$\sqrt{(2-x)^2+1} = 2$

On squaring both sides–

$\Rightarrow (2-x)^2 + 1 = 4 \Rightarrow (2-x)^2 = 3 \Rightarrow 2 - x = \pm\sqrt{3}$

$\Rightarrow x = 2 \pm \sqrt{3}$

So, $(x, y) = (2 \pm \sqrt{3}, 5) = (2 + \sqrt{3}, 5)$

7. Find the co-ordinates of the point, which internally divides the line segment joining the point (–4, 4) and (4, 0) in the ratio of 3 : 1.

(a) (0, 4) (b) (2, 1)

(c) (−3, 4) (d) (1, 3)

RRB RPF SI – 05/01/2019 (Shift-II)

Ans. (b) : We know that-

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}$$

$$= \frac{3\times4 + 1\times(-4)}{3+1}$$

$$= \frac{12-4}{4}$$

$$= \frac{8}{4}$$

$$x = 2$$

$$y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

$$= \frac{3\times0 + 1\times4}{3+1} = \frac{4}{4}$$

$y = 1$

Hence, the co-ordinates of required points = (2, 1)

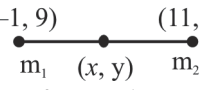
8. The co-ordinates of a point, which internally divides the line segment joining the point (-1, 9) and (11, 1) in the ratio of 3:1 are as follows.

(a) (5, 5) (b) $\left(\frac{13}{2}, 4\right)$

(c) (2, 7) (d) (8, 3)

RRB Group-D – 28/09/2018 (Shift-III)
RRB RPF Constable – 20/01/2019 (Shift-III)

Ans : (d) If the coordinate of the interior point of the line segment joining the two points (x_1, y_1) and (x_2, y_2) are (x, y), which is divided this line segment in the ratio of $m_1 : m_2$



$m_1 = 3, m_2 = 1$

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \quad y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

$$x = \frac{3\times11 + 1\times(-1)}{3+1}, \quad y = \frac{3\times1 + 1\times9}{3+1}$$

$$x = \frac{33-1}{4}, \quad y = \frac{3+9}{4}$$

$x = 8, y = 3$,

Hence, the co-ordinate of required point is (8, 3).

9. Find the ratio in which the line 4x + y = 13 divide the segment which is joining to the point (1, 6) and (6, 1).

(a) 1:3 (b) 2:5

(c) 2:3 (d) 1:4

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans. (d**) :**

Equation of a line passing through two points $(x_1\ y_1)$ and (x_2, y_2)

$$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$$

$\therefore$ Equation of a line passing through the points (1, 6) (6, 1)

$$y - 6 = \frac{1-6}{6-1}(x-1)$$

$y - 6 = -x + 1$

or $x + y = 7$ .....(i)

Again equation of a given lines $4x + y = 13$ .....(ii)

From the equation (i) and (ii)−

The co-ordinate of the intersection point of both the lines (x, y) = (2, 5)

Let the point (1, 6) and (6, 1) is divided in the ratio of m:n by the point (2, 5).

$$x = \frac{mx_2 + nx_1}{m+n}$$

$$2 = \frac{m\times6 + n\times1}{m+n}$$

$2m + 2n = 6m + n$

$4m - n = 0$

$4m = n$

$$\frac{m}{n} = \frac{1}{4} = 1:4$$

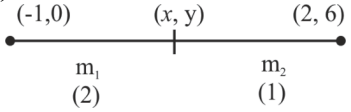
10. The line segment joined by the points (-1, 0) and (2, 6). What will be the co-ordinate of points who divides the line in the ratio of 2:1?

(a) (0, 4) (b) (1, 3)

(c) (1, 4) (d) (0, 5)

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (c)



Let the co-ordinates of interior point is (x, y) -

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \ y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

$$x = \frac{2\times2 + 1\times(-1)}{2+1}, \ y = \frac{2\times6 + 1\times0}{2+1}$$

$$x = \frac{4-1}{3}, \ y = \frac{12}{3}$$

$x = 1, y = 4$

Hence, interior point $(x, y) = (1, 4)$

11. At which point, the line segment associated with points (4, 5) and (7, 11) divided internally in the ratio of 2 : 1.

(a) (6, 8) (b) (5, 10)

(c) (5, 9) (d) (6, 9)

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (d) The coordinate of the points P(x, y) internally dividing the line segment joining the two points A (x_1,y_1) and B (x_2,y_2) in the ratio of m:n.

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2} \qquad y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

$x_1 = 4, y_1 = 5, m_1 = 2$

$x_2 = 7, y_2 = 11, m_2 = 1$

$$x = \frac{2\times7 + 1\times4}{2+1}, \quad y = \frac{2\times11 + 1\times5}{2+1}$$

$$x = \frac{14+4}{3}, \quad y = \frac{22+5}{3}$$

$$x = \frac{18}{3}, \quad y = \frac{27}{3}$$

$x = 6 \qquad y = 9$

So required point will be (6, 9).

12. The coordinates of the points that divides the line segment joining the points (–7, 6) and (5, 0) internally in the ratio of 1 : 3

(a) (–3, 4) (b) (–4, 4.5)

(c) (3, 1) (d) (1, 3)

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Given, $x_1 = -7, x_2 = 5 \quad m_1 = 1$

$y_1 = 6, y_2 = 0 \quad m_2 = 3$

The point divides the line segment internally, then the coordinate of the point is

$$(x, y) = \left(\frac{m_2x_1 + m_1x_2}{m_1 + m_2}, \frac{m_2y_1 + m_1y_2}{m_1 + m_2}\right)$$

$$= \left(\frac{3\times(-7) + 1\times5}{1+3}, \frac{3\times6 + 1\times0}{1+3}\right)$$

$$= \left(\frac{-21+5}{4}, \frac{18}{4}\right) = \left(\frac{-16}{4}, \frac{18}{4}\right)$$

Hence, the co-ordinate of required point

(x,y) = (–4, 4.5)

13. Find the coordinate of the point, which internally divides the line segment joining the point (-3, 7) and (9, -1) in the ratio of 3:1.

(a) (0, 5) (b) (6, 1)

(c) (3, 3) (d) $\left(\frac{9}{2}, 2\right)$

RRB Paramedical Exam – 21/07/2018 (Shift-III)

Ans. (b) Formula of internal division

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}$$

$$y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$$

according to the question,

The ratio of the line joining the internal division of the points (–3, 7) and (9, –1) is 3:1

Where, $x_1 = -3, x_2 = 9, y_1 = 7, y_2 = -1, m_1 = 3, m_2 = 1$

Then, $x = \frac{3\times9 + 1(-3)}{3+1}$

$$x = \frac{27-3}{4}$$

$$x = \frac{24}{4} = 6$$

$$y = \frac{3\times(-1) + 1\times7}{3+1}$$

$$y = \frac{4}{4}$$

$$y = 1$$

Hence, co-ordinates of internal division will be (6, 1).

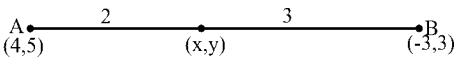
14. The coordinates of a point, which internally divides the line segment joining the point (4, 5) and (-3, 3) in the ratio of 2 : 3 is–

(a) 11/5, 17/5 (b) 13/5, 17/5

(c) 12/5, 13/5 (d) 6/5, 21/5

RRB Group-D – 24/10/2018 (Shift-III)

Ans. (d) :



$m_1 = 2$ $m_2 = 3$

As per the question,

$$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2} = \frac{2\times(-3) + 3\times4}{2+3}$$

$$x = \frac{6}{5}$$

$$y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2} = \frac{2\times3 + 3\times5}{2+3}$$

Hence, $(x, y) = \left(\frac{6}{5}, \frac{21}{5}\right)$

15. The coordinates of the point that internally divides the line segment joining the points (–5, 5) and (7, –3) internally in the ratio of 3 : 1 are given by:

(a) (–2, 3) (b) (4, –1)

(c) $\left(\frac{5}{2}, 0\right)$ (d) (1, 1)

RRB ALP & Tec. (29-08-18 Shift-I)

Ans : (b) Let the coordinate of required points (x, y)

$$(x, y) = \frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n}$$

$x_1 = -5$ $x_2 = 7$ $x = ?$

$y_1 = 5$ $y_2 = -3$ $y = ?$

$$(x, y) = \left(\frac{3\times7 + 1\times(-5)}{3+1}, \frac{3\times(-3) + 1\times5}{3+1}\right)$$

$$= \left(\frac{21-5}{4}, \frac{-9+5}{4}\right) = \left(\frac{16}{4}, \frac{-4}{4}\right) = (4, -1)$$

Hence, coordinate of required points is (4,–1).

Type - 2

16. The area (in square units) of the triangle formed by the vertices (0, 2), (2, 3) and (3, 1) is:

(a) 3.5 (b) 5.5

(c) 2.5 (d) 4.4

RRB Group-D 18/08/2022 (Shift-II)

Ans. (c) : Vertices $= \underset{x_1y_1}{(0,2)} \quad \underset{x_2y_2}{(2,3)} \quad \underset{x_3y_3}{(3,1)}$

Area of Triangle,

$$= \frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$$

$$= \frac{1}{2}|0(3-1) + 2(1-2) + 3(2-3)|$$

$$= \frac{1}{2}|0 - 2 - 3|$$

$$= \frac{1}{2}|-5|$$

$$= \frac{1}{2}\times5 = 2.5$$

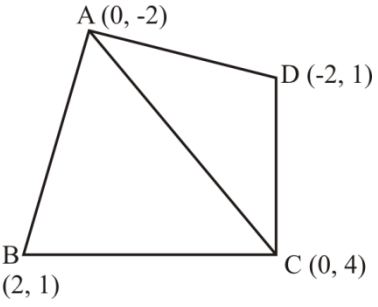
17. The area (in square units) of the quadrilateral ABCD, formed by the vertices A (0, –2), B (2, 1) C (0, 4), and D (–2, 1) is:

(a) 13 (b) 12

(c) 15 (d) 14

RRB Group-D 18/08/2022 (Shift-I)

Ans. (b) :



Area of triangle -

$$= \frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$$

Area of □ABCD = Area of ΔABC + Area of ΔADC

$$= \frac{1}{2}|0(1-4) + 2(4+2) + 0(-2-1)| + \frac{1}{2}|0(4-1) + 0(1+2) - 2(-2-4)|$$

$$= \frac{1}{2} \times 12 + \frac{1}{2} \times 12$$

= 6 + 6

= 12 square unit

18. The area of a triangle with vertices (3, –2), (2, –3) and (p, –4) is 8 square units. Find the value of p.

(a) 17 (b) –16

(c) 15 (d) –15

RRB Group-D 30/08/2022 (Shift-II)

Ans. (a) : Area of triangle =

$$\frac{1}{2}\left[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right]$$

$$8 = \frac{1}{2}\left[3(-3-(-4)) + 2(-4-(-2)) + P(-2-(-3))\right]$$

$$2 \times 8 = 3(-3+4) + 2(-4+2) + P(-2+3)]$$

16 = 3 × 1 + 2 (–2) + P

16 = 3 – 4 + P

16 = – 1 + P

P = 16 + 1

P = 17

19. ΔABC is a triangle whose vertices are A(0, 0), B(a, 5) and C(–5, 5). If the triangle is right-angled at A, then find the value of a.

(a) 3 (b) 5

(c) 6 (d) 2

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (b**) :** By applying pythagoras theorem in ΔABC

$$(BC)^2 = (AC)^2 + (AB)^2$$

$$(a+5)^2 + (5-5)^2 = (-5-0)^2 + (5-0)^2 + (a-0)^2 + (5-0)^2$$

$$(a+5)^2 + 0 = 25 + 25 + a^2 + 25$$

$$a^2 + 25 + 10a = 75 + a^2$$

$$10a = 75 - 25 = 50$$

$$a = \frac{50}{10} = 5$$

$$\boxed{a = 5}$$

20. Find the area of a triangle whose vertices are (a, b + c), (a, b – c) and (– a, c).

(a) 2 bc (b) 2 ac

(c) 2 b (a + c) (d) c (a – b)

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (b**) :** Solve at–

$x_1 = a, x_2 = a, x_3 = -a$

$y_1 = b + c, y_2 = b - c, y_3 = c$

From the formula of

Area of Δ

$$= \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

$$= \frac{1}{2}[a(b - c - c) + a(c - b - c) + (-a)(b + c - b + c)]$$

$$= \frac{1}{2}[a(b - 2c) + a(-b) + (-a)(2c)]$$

$$= \frac{1}{2}[ab - 2ac - ab - 2ac] = \frac{1}{2} \times -4ac = -2ac = 2ac$$

∵ The area of a triangle can't be negative.

21. The area in square units of a triangle formed by the coordinate axis and the straight line 5x + 7y = 35 is:

(a) 35 (b) $\frac{35}{2}$

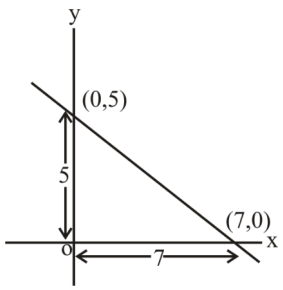
(c) $\frac{2}{35}$ (d) $\frac{25}{2}$

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : Given, 5x + 7y = 35

On dividing both side by 35.

$$\frac{x}{7} + \frac{y}{5} = 1$$



Area of triangle $= \frac{1}{2} \times 7 \times 5 = \frac{35}{2}$

22. Find the area of a triangle formed by (1, 0), (–1, 0), (0, 1).

(a) 1.5 sq. units (b) 0 sq. units

(c) 1 sq. units (d) 2 sq. units

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given point (1,0), (−1,0) and (0,1)

$x_1 = 1$ $x_2 = -1$ $x_3 = 0$

$y_1 = 0$ $y_2 = 0$ $y_3 = 1$

$$\text{Area of } \Delta = \frac{1}{2}\left[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right]$$

$$= \frac{1}{2}\left[1(0-1) - 1(1-0) + 0(0-0)\right]$$

$$= \frac{1}{2}(-1-1) = -\frac{2}{2}$$

= 1 sq. units

Note- The area of a triangle can't be negative.

23. Find the area of a triangle whose vertices are (1, 2), (-4, -3) and (4, 1)

(a) 7 square units (b) 10 square units

(c) 14 square units (d) 20 square units

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) Area of triangle

$$= \frac{1}{2}\left[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right]$$

$$= \frac{1}{2}\left[1(-3-1) + (-4)(1-2) + 4(2-(-3))\right]$$

$$= \frac{1}{2}\left[-4 + 4 + 20\right] = \frac{20}{2} = 10 \text{ square units}$$

24. The vertex point of a triangle are (a, b + c), (b, c + a) and (c, a + b) then find the area of triangle.

(a) ab + bc + ca (b) 0

(c) a–b–c (d) a + b + c

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (b) Area of triangle

$$= \frac{1}{2}\left[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right]$$

$$= \frac{1}{2}\left[a\{c + a - (a + b)\} + b\{a + b - (b + c)\} + c\{b + c - (c + a)\}\right]$$

$$= \frac{1}{2}\left[a(c + a - a - b) + b(a + b - b - c) + c(b + c - c - a)\right]$$

$$= \frac{1}{2}\left[ac - ab + ab - bc + bc - ac\right]$$

$$= \frac{1}{2} \times 0 = 0$$

25. The coordinate points of the vertex of a triangle are given (3, 5), (-2, 0) and (6, 4) then find the area of triangle.

(a) 20 sq. units (b) 7 sq. units

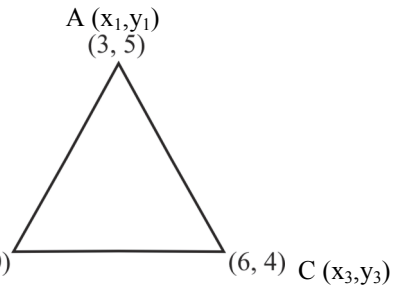
(c) 10 sq. units (d) 14 sq. units

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (c) Given that vertex of triangle (3, 5), (–2, 0) and (6, 4)

Formula — Area of Δ =

$$\frac{1}{2}\left[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right]$$



$$= \frac{1}{2}\left[3(0-4) + (-2)(4-5) + 6(5-0)\right]$$

$$= \frac{1}{2}\left[3(-4) + (-2)(-1) + 6(5)\right] = \frac{1}{2}\left[-12 + 2 + 30\right]$$

$$= \frac{1}{2}\left[20\right]$$

= 10 square units

26. If A = (1, 1), B = (-2, 7) and C = (3, -3), then $\frac{1}{AB} + \frac{1}{BC} + \frac{1}{CA} = ?$

(a) $\frac{31\sqrt{5}}{150}$ (b) $\frac{31}{60}\sqrt{5}$

(c) $\frac{150}{31}$ (d) $\frac{31}{150}$

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (a) A = (1, 1), B = (-2, 7) and C = (3, -3)

Distance between the two points = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Distance between points A and B = $\sqrt{(-2-1)^2 + (7-1)^2}$

$$= \sqrt{(-3)^2 + (6)^2}$$

$$= \sqrt{9+36}$$

$$= \sqrt{45} = 3\sqrt{5}$$

Similarly,

Distance between points B and C $= \sqrt{(3+2)^2 + (-3-7)^2}$

$$= \sqrt{(5)^2 + (-10)^2}$$

$$= \sqrt{25+100}$$

$$= \sqrt{125}$$

$$= 5\sqrt{5}$$

And,

Distance between points C and A $= \sqrt{(3-1)^2 + (-3-1)^2}$

$$= \sqrt{2^2 + (-4)^2}$$

$$= \sqrt{4+16}$$

$$= \sqrt{20} \Rightarrow 2\sqrt{5}$$

$$\Rightarrow \frac{1}{AB} + \frac{1}{BC} + \frac{1}{CA} = \frac{1}{3\sqrt{5}} + \frac{1}{5\sqrt{5}} + \frac{1}{2\sqrt{5}}$$

$$= \frac{1}{\sqrt{5}}\left(\frac{1}{3} + \frac{1}{5} + \frac{1}{2}\right)$$

$$= \frac{1}{\sqrt{5}}\left(\frac{10+6+15}{30}\right)$$

$$= \frac{1}{\sqrt{5}} \times \frac{31}{30} \Rightarrow \frac{31}{30\sqrt{5}}$$

$$= \frac{31}{30\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{31\sqrt{5}}{150}$$

27. If the points of vertex of a given triangle are (4, 1), (1, 1) and (3, 5) then triangle is–

(a) Isosceles but not right angled

(b) Right angled but not isosceles.

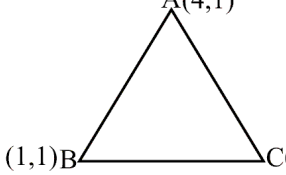
(c) Both right angled and isosceles

(d) A symmetrical triangle

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (d)

If two points are (x_1,y_1) and (x_2,y_2) then distance between them = $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$



$AB = \sqrt{(1-4)^2+(1-1)^2} = \sqrt{(-3)^2} = 3$

$AC = \sqrt{(3-4)^2+(5-1)^2} = \sqrt{1+16} = \sqrt{17}$

$BC = \sqrt{(3-1)^2+(5-1)^2} = \sqrt{4+16} = 2\sqrt{5}$

Because three sides of the triangle is different, so the triangle will be a symmetrical triangle.

28. If two straight line x -5y = 2 and x + 2y = 9 cut each other at a point A, further it is cut x-axis at the point B and C respectively then find the area of triangle ABC.

(a) 3.2 square units (b) 3.5 square units
(c) 3.7 square units (d) 3.1 square units

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (b) ∵ Point B and C are located on the x-axis.
∴ The coordinate of point B and C on substituting y = 0 in the given equation x-5y = 2 and x + 2y = 9 will be (2,0) and (9,0) respectively.
Again lines x –5y = 2 and x + 2y = 9 intersect each other on point A.

$x - 5y = 2$ ------(i)
$x + 2y = 9$ ------(ii)

On solving equation (i) and (ii)

$x = 7, y = 1$

So coordinate of point A = (7, 1)

$x_1 = 2, x_2 = 9, x_3 = 7$

$y_1 = 0, y_2 = 0, y_3 = 1$

Hence area of triangle ABC

$$= \frac{1}{2}\left[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right]$$

$$= \frac{1}{2}\left[2(0-1)+9(1-0)+7(0-0)\right]$$

$$= \frac{1}{2}\left[-2+9\right] = \frac{7}{2} = 3.5 \text{ square units.}$$

29. The area of the triangle whose vertices are given by (2,4), (–3,–1) and (5,3) is:

(a) 7 sq. units (b) 14 sq. units
(c) 20 sq. units (d) 10 sq. units

RRB ALP & Tec. (17-08-18 Shift-I)

Ans : (d) ∵ Area of triangle

$$= \frac{1}{2}\left[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right]$$

$x_1 = 2, y_1 = 4, x_2 = -3, y_2 = -1, x_3 = 5, y_3 = 3$

$$= \frac{1}{2}\left[2(-1-3)+(-3)(3-4)+5(4+1)\right]$$

$$= \frac{1}{2}\left[-8+3+25\right] = \frac{1}{2}\times 20 = 10 \text{ square units}$$

Type - 3

30. The graphs of the equations 3x – 2y – 11 = 0 and x + y = 7 intersect at P (∝, β). What is the value of (3∝ + 5β)?

(a) 13 (b) 23
(c) 25 (d) 11

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (c) : Given,

$3x - 2y - 11 = 0$

$3x - 2y = 11$ …. (i)

$x + y = 7$ …. (ii)

On multipying by 2 in equation (ii) and adding them,

$3x - 2y = 11$

$2x + 2y = 14$

$5x = 25$

$x = \frac{25}{5}$

$\boxed{x = 5}$

On putting the value of x in equation (i),

$3 \times 5 - 2y = 11$

$-2y = -4$

$y = 2$

$P(\alpha, \beta) = (5, 2)$

Then, According to the question,

$3\alpha + 5\beta$

$= (3 \times 5 + 5 \times 2)$

$= 25$

31. The straight line kx – 3y = 6 passes through the point (3,2). What is the value of k ?

(a) 4 (b) 3
(c) 6 (d) 2

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (a) : Straight line kx – 3y = 6 passes through the point (3,2)

$\therefore\ k \times 3 - 3 \times 2 = 6$

$k \times 3 = 12$

$k = 4$

32. If the centre of a circle is (-2,3) and its radius is 4, then find the equation of the circle.

(a) $x^2 + y^2 + 4x + 6y - 3 = 0$
(b) $x^2 + y^2 + 4x - 6y - 3 = 0$
(c) $x^2 + y^2 - 4x + 6y + 3 = 0$
(d) $x^2 + y^2 - 4x + 6y - 3 = 0$

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (b) : Given, co-ordinate of centre = (–2, 3)

Radius (r) = 4

Equation of circle,

$(x+2)^2 + (y-3)^2 = (4)^2$ [∵ Formula, $(x-\alpha)^2 + (y-\beta)^2 = r^2$

Where, (α, β) co-ordinate of centre and r = radius]

$\Rightarrow x^2 + 4x + 4 + y^2 + 9 - 6y = 16$

$\Rightarrow x^2 + y^2 + 4x - 6y - 3 = 0$

33. Find the equation of the tangents to the circle $x^2 + y^2 = 9$ at x = 2.

(a) $2x + \sqrt{5}y = 9$
$2x - \sqrt{5}y = 9$

(b) $-2x + \sqrt{5}y = 9$
$2x - \sqrt{5}y = 9$

(c) $-2x - \sqrt{5}y = 9$
$2x - \sqrt{5}y = 9$

(d) $-2x + \sqrt{5}y = 9$
$2x - \sqrt{5}y = 9$

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given-

$x^2 + y^2 = 9$ ...(i)

At, x = 2 $4 + y^2 = 9$

$\Rightarrow y^2 = 5$

$\Rightarrow y = \pm\sqrt{5}$

On differentiating equation (i),

$\Rightarrow \frac{dy}{dx} = \frac{-x}{y}$

$\Rightarrow \left(\frac{dy}{dx}\right)_{(2,\sqrt{5})} = m_1 = \frac{-2}{\sqrt{5}}$

$\Rightarrow \left(\frac{dy}{dx}\right)_{(2,-\sqrt{5})} = m_2 = \frac{2}{\sqrt{5}}$

Equation of tangent-

$\Rightarrow y - y_1 = m(x - x_1)$

$\Rightarrow y - \sqrt{5} = \frac{-2}{\sqrt{5}}(x - 2)$ ($\because$ on putting $m = m_1$)

$\Rightarrow 2x + \sqrt{5}y = 9$

Again $y + \sqrt{5} = \frac{2}{\sqrt{5}}(x - 2)$ {$\because$ on putting $m = m_2$ }

$\Rightarrow 2x - \sqrt{5}y = 9$

Hence, option (a) is correct.

34. The equation of a straight line passing through (–2, 5) and (1, 3) is:

(a) 2x–3y–19 = 0 (b) 2x+2y+19 = 0
(c) 3x–2y–11 = 0 (d) 2x+3y–11 = 0

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : The equation of straight line passing through two points $(x_1\ y_1)$ and $(x_2\ y_2)$.

$$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$$

As per question, the required equation is

$$y - 5 = \frac{3-5}{1+2}(x + 2)$$
$$3y - 15 = -2x - 4$$
$$2x + 3y - 11 = 0$$

35. Find the relation between x and y such that the point (x, y) is equidistant from (6, 2) and (4, 6).

(a) 2x – y = 3 (b) 2x + y = –3
(c) x + 2y = 3 (d) x – 2y = –3

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) : Given,

A = [6, 2] (x_1, y_1)
B = [4, 6] (x_2, y_2)
P[x, y]

$d_{AP} = d_{BP}$

$\Rightarrow$ From formula–

$$\sqrt{(x - x_1)^2 + (y - y_1)^2} = \sqrt{(x - x_2)^2 + (y - y_2)^2}$$
$$= (x - 6)^2 + (y - 2)^2 = (x - 4)^2 + (y - 6)^2$$
$$= x^2 + 36 - 12x + y^2 + 4 - 4y = x^2 + 16 - 8x + y^2 + 36 - 12y$$
$$= -12x + 8x - 4y + 12y + 40 - 52 = 0$$
$$-4x + 8y - 12 = 0$$
$$\boxed{x - 2y = -3}$$

36. Equation of the line, passing through (2, 3) and perpendicular to the line joining to (–5, 6) and (–6, 5) is:

(a) x + y – 5 = 0 (b) x – y + 5 = 0
(c) x – y – 5 = 0 (d) x + y +5 = 0

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : Let, the slope of the PN line = m

And, the slope of the AB line = n

P(2, 3)
A (–5, 6) N B (–6, 5)

$$n = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-6}{-6+5}$$

n = 1

According to the question, If both the lines are perpendicular then.

$n \cdot m = -1$
$1 \cdot m = -1$
$m = -1$

Hence, the equation of the line which slop m = –1 and passing through (2, 3)-

$y - y_1 = m(x - x_1)$
$y - 3 = -1(x - 2)$
$y - 3 = -x + 2$
$x + y - 5 = 0$

37. Find the equation of line which slope is -4 and bisect the y axis at y = 2

(a) $2x + \frac{y}{4} = 1$ (b) $2x + \frac{y}{2} = 1$

(c) $2x + \frac{y}{3} = 1$ (d) $2x + y = 1$

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (b) Intersection of y = 2

Hence coordinates = (0, 2) = (x_1, y_1)

Gradient (m) = –4

Equation of line passing through a point (x_1, y_1) which slope has m.

Equation of line $\Rightarrow y - y_1 = m(x - x_1)$

$\Rightarrow y - 2 = -4(x - 0)$

$\Rightarrow y - 2 = -4x$

$4x + y = 2$

$$\boxed{2x + \frac{y}{2} = 1}$$

Type - 4

38. Find the number of points on the x-axis that are at a distance of 'c' units (c<3) from the point (2, 3)

(a) 0 (b) 2

(c) 3 (d) 1

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (a) : Distance of 'c' units from the point (2, 3) let the other points on X-axis be (x, 0)

Therefore, the number of required point will be equal to the number of possible value of x

By distance formula –

$$\left(\sqrt{(x-2)^2 + (0-3)^2}\right)^2 = c^2$$

$(x-2)^2 + 9 = c^2$

$(x-2)^2 = c^2 - 9$

$(x-2)^2 < 0 \quad (\because c < 3)$

$(x-2)^2 \not< 0 \quad (\because a^2 \geq 0)$

It is a contradiction, that there is no point exists. Hence the number of points on the x-axis at a distance of c unit is 0.

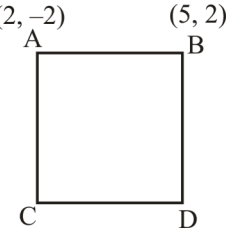
39. If (2, – 2) and (5, 2) are two consecutive vertices of a square, then the length of each side of the square will be:

(a) $\sqrt{5}$ units (b) $\frac{5}{\sqrt{2}}$ units

(c) $5\sqrt{2}$ units (d) 5 units

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (d) :



Length of side of Square = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(5-2)^2 + (2+2)^2} = \sqrt{(3)^2 + (4)^2} = \sqrt{9+16} = \sqrt{25}$

= 5 units

40. If the distance between two points (x, 7) and (1, 15) is 10 units, then the possible values of x = ?

(a) 4, 5 (b) 3, 7

(c) 5, -7 (d) 7, -5

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (d) : Distance between points (x, 7) and (1, 15)

$x_1 = 1, x_2 = x$

$y_1 = 15, y_2 = 7$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(x-1)^2 + (7-15)^2} = 10$$

On squaring both sides,

$(x-1)^2 + (7-15)^2 = 100$

$(x-1)^2 + 64 = 100$

$(x-1)^2 = 100 - 64 = 36$

$x - 1 = \pm 6$

x = (+ 6 + 1) and (– 6 + 1)

x = 7, –5

Hence value of x is 7 and -5.

41. The distance from the origin to the line 4x + 3y = 6 is:

(a) $\frac{7}{5}$ (b) $\frac{3}{5}$

(c) $\frac{4}{5}$ (d) $\frac{6}{5}$

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (d) : Distance of the line ax + by + c = 0 from point (x, y)

$$d = \left[\frac{ax + by + c}{\sqrt{a^2 + b^2}}\right]$$

So, distance of $4x + 3y + 6 = 0$ From origin (0, 0) is

$$d = \frac{4 \times 0 + 3 \times 0 + 6}{\sqrt{16 + 9}}$$

$$d = \frac{6}{\sqrt{25}}$$

$$\boxed{d = \frac{6}{5}}$$

42. Find the value of the angle subtended between the graph of linear equation 35X–35Y+15=0 and X-axis.

(a) 35º (b) 50º

(c) 45º (d) 55 º

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (c) : $35X-35Y+15=0$

$\Rightarrow 35Y = 35X + 15$

$\Rightarrow Y = \frac{35X}{35} + \frac{15}{35}$

$\Rightarrow Y = X + \frac{15}{35}$

Comparing with y= m*x* + c,m = $\tan\theta = 1 \Rightarrow \boxed{\theta = 45°}$

43. Find the length of the tangent drawn from the point (2, 3) to the circle $x^2 + y^2 = 4$.

(a) 2 (b) 3

(c) 1 (d) 4

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : The equation of the given circle is

$x^2 + y^2 = 4$

$x^2 + y^2 - 4 = 0$

On comparing with the general equation of the circle

$x_1^2 + y_1^2 + 2gx_1 + 2hy_1 + k = 0$

For the length of the tangent drawn from the point (2, 3) to the given circle,

$x_1 = 2, y_1 = 3, g = 0, h = 0, k = -4$

Length of the tangent = $\sqrt{x_1^2 + y_1^2 + 2gx_1 + 2hy_1 + k}$

$= \sqrt{2^2 + 3^2 - 4}$

$= \sqrt{4 + 9 - 4}$

$= \sqrt{9}$

$= 3$

44. If the length of the tangent from (2, 5) to $x^2 + y^2 - 5x + 4y + k = 0$ is $\sqrt{37}$ units, then the value of k is:

(a) –2 (b) –1

(c) 2 (d) 1

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : On comparing $x^2 + y^2 - 5x + 4y + k = 0$ with $x^2 + y^2 + 2gx + 2fy + c = 0$,

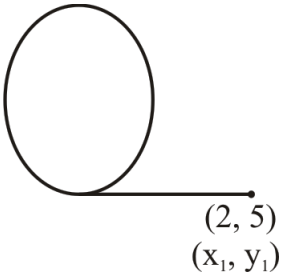
$2g = -5$

$g = -5/2$

and $2f = 4$

$f = 2$

$c = k$



Length of the tangent = $\sqrt{x_1^2 + y_1^2 + 2gx_1 + 2fy_1 + k}$

$\sqrt{37} = \sqrt{(2)^2 + (5)^2 + 2\left(-\frac{5}{2}\right)(2) + 2(2)(5) + k}$

On squaring both sides-

$37 = 4 + 25 - 10 + 20 + k$

$37 = 49 - 10 + k$

$k = 37 - 39$

$k = -2$

45. The position of the point (1, 2) with respect to the circle $x^2 + y^2 - 3x - 4y + 1 = 0$

(a) Lies on the circle

(b) Cannot be decided

(c) Lies outside the circle

(d) Lies inside the circle

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (d) : $x^2 + y^2 - 3x - 4y + 1 = 0$

Equation of the circle, $x^2 + y^2 + 2gx + 2fy + c = 0$

$S = x^2 + y^2 - 3x - 4y + 1$……..(Given)

On putting the value of the point (1, 2) in the equation of given circle,

$S = 1 + 4 - 3 - 8 + 1$

$S = -5$ (– ve) $\Rightarrow$ The point (1, 2) will be inside the circle.

Note-

(i) When S > 0, then the point will be outside the circle.

(ii) When S < 0, then the point will be inside the circle.

(iii) When S = 0, then the point will be on the circumference of the circle.

46. The position of the point (3, 4) with respect to the circle $x^2 + y^2 - 3x - 4y + 1 = 0$

(a) Lies on it
(b) Lies outside of it
(c) Lies inside it
(d) Cannot be decided

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : Given,

$S = x^2 + y^2 - 3x - 4y + 1 = 0$ _____ (i)

We know that for any point (x,y),

$S > 0$ then the point (x, y) will be outside the circle.

$S < 0$, then the point (x, y) will be inside the circle.

$S = 0$ then the point (x, y) will lie on the circle.

On putting the value of (x, y) = (3, 4) in eq^n (i),

$S = 9+16-9-16+1 = 1$

$\Rightarrow S > 0$, Hence (3, 4) will be outside the circle.

47. Find the radius of the circle $x^2 + y^2 + 7x + 4y + 9 = 0$

(a) $\frac{\sqrt{13}}{2}$

(b) $\frac{\sqrt{19}}{2}$

(c) $\frac{\sqrt{29}}{2}$

(d) $\frac{\sqrt{23}}{2}$

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (c) : Compairing $x^2 + y^2 + 7x + 4y + 9 = 0$ with $x^2 + y^2 + 2gx + 2fy + c = 0$

$2g = 7$ $\quad 2f = 4$ and $\quad c = 9$

$g = 7/2$ $\quad f = 2$

So radius $= \sqrt{g^2 + f^2 - c}$

$$= \sqrt{\left(\frac{7}{2}\right)^2 + 4 - 9}$$

$$= \sqrt{\frac{49}{4} + 4 - 9}$$

$$= \sqrt{\frac{49 + 16 - 36}{4}} = \sqrt{\frac{29}{4}} = \boxed{\frac{\sqrt{29}}{2}}$$

48. The angle between two circles $x^2 + y^2 - 12x - 6y + 41 = 0$ and $x^2 + y^2 + kx + 6y - 59 = 0$ is 45°. Find the value of k.

(a) ± 3 (b) -4
(c) 4 (d) ± 4

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : Comparing the equation of circle $x^2 + y^2 - 12x - 6y + 41 = 0$ and $x^2 + y^2 + kx + 6y - 59 = 0$ with equation $x^2 + y^2 + 2gx + 2fy + c = 0$,

$g_1 = -6$, $f_1 = -3$, $c_1 = 41$

$g_2 = k/2$, $f_2 = 3$, $c_2 = -59$

We know that,

$$\cos\theta = \frac{c_1 + c_2 - 2g_1.g_2 - 2f_1.f_2}{2\sqrt{g_1^2 + f_1^2 - c_1}\sqrt{g_2^2 + f_2^2 - c_2}}$$

$$\cos 45^\circ = \frac{41 - 59 - 2(-6)\frac{k}{2} - 2(-3)3}{2\sqrt{36 + 9 - 41}\sqrt{\frac{k^2}{4} + 9 + 59}}$$

$$\frac{1}{\sqrt{2}} = \frac{-18 + 6k + 18}{2 \times 2\sqrt{\frac{k^2}{4} + 68}}$$

$$\frac{1}{\sqrt{2}} = \frac{6k}{4\sqrt{\frac{k^2}{4} + 68}}$$

On squaring both sides–

$$\frac{1}{2} = \frac{36k^2}{16\left(\frac{k^2}{4} + 68\right)}$$

$$4\left(\frac{k^2}{4} + 68\right) = 18k^2$$

$$4\left(\frac{k^2 + 272}{4}\right) = 18k^2$$

$k^2 + 272 = 18k^2$

$17k^2 = 272$

$k^2 = 16$

$K = \pm 4$

49. Which type of line represented by the line $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$

(a) Concurrent
(b) Parallel
(c) Intersection
(d) None of these

RRB RPF SI – 16/01/2019 (Shift-III)

Ans : (b) Given equation-

$6x - 3y + 10 = 0$

Let slope $= m_1$

$$\therefore m_1 = -\left(\frac{\text{Cofficient of x}}{\text{Cofficient of y}}\right) = -\left(\frac{6}{-3}\right) = 2$$

Equation

$2x - y + 9 = 0$

Let slope $= m_2$

$$m_2 = -\left(\frac{\text{Cofficient of x}}{\text{Cofficient of y}}\right) = -\left(\frac{2}{-1}\right) = 2$$

$\because m_1 = m_2 = 2$

So the lines will be parallel.

25.

Geometry

Type - 1

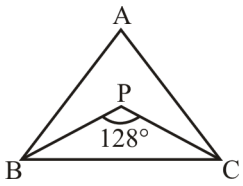
1. In Δ ABD, the bisectors of ∠B and ∠C intersect at P inside the triangle. If ∠BPC = 128°, then what is the measure of ∠A?

(a) 82° (b) 76°
(c) 78° (d) 52°

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (b) : Given,

∠ BPC = 128°



$\because \angle BPC = 90° + \frac{\angle A}{2}$

$\Rightarrow 128° = 90° + \frac{\angle A}{2}$

$\Rightarrow \frac{\angle A}{2} = 38°$

$\Rightarrow \angle A = 76°$

2. The bisector of ∠QPR of ΔPQR meets the side QR at S. If PQ = 12 cm, PR = 15 cm and QR = 18 cm, then the length of SR is

(a) 8 cm (b) 13 cm
(c) 10 cm (d) 12 cm

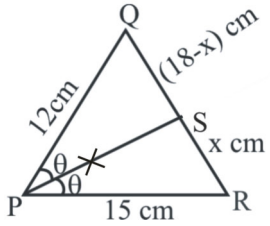
RRB NTPC (Stage-II) –14/06/2022 (Shift-II)

Ans. (c) : Given,

PQ = 12 cm

PR = 15 cm

QR = 18 cm



Let SR = x cm

Then,

From Angle Bisector Theorem–

$\frac{PQ}{PR} = \frac{QS}{SR}$

$\frac{12}{15} = \frac{18-x}{x}$

$9x = 90$

$x = \frac{90}{9}$

$x = 10$

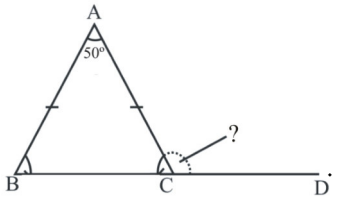
Hence, SR = 10 cm

3. ABC is an isosceles triangle in which AB = AC and ∠BAC = 50° .Side BC is extended to D. Find the measure of ∠ACD.

(a) 115° (b) 110°
(c) 100° (d) 130°

RRB NTPC (Stage-II) 17/06/2022 (Shift-I)

Ans. (a) :



Let ∠ABC = ∠ACB = K

∠BAC +∠ABC + ∠ACB = 180°

50° + K + K =180°

2K = 130°

K = 65°

So, ∠ACD + ∠ACB = 180°

∠ACD + 65° = 180°

∠ACD = 180° – 65°

∠ACD = 115°

4. If two angles of a triangle measure 60º and 80º respectively, then the measure of the third angle of this triangle is:

(a) 50º (b) 70º
(c) 60º (d) 40º

RRB Group-D 22/08/2022 (Shift-I)

Ans. (d) : Sum of all three angles of a triangle be 180°.

According to the question,

Third angle of a triangle = 180º – (80º + 60º)

= 180º – 140º

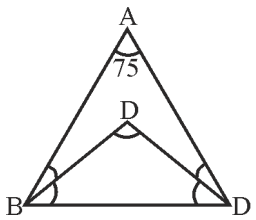
= 40º

5. The internal bisectors of ∠B and ∠C of ΔABC meet at D. If ∠A = 75º, the ∠BDC is:

(a) 102.5º (b) 105.5º
(c) 112.5º (d) 127.5º

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) :



$\angle BDC = 90 + A/2$

$= 90 + 75/2$

$= 127.5^{\circ}$

6. In triangle ABC, if the angles are in the ratio 4 : 3 : 5, find the angles.

(a) 20°, 50°, 70° (b) 60°, 45°, 75°

(c) 20°, 15°, 25° (d) 40°, 30°, 50°

RRB Group-D 01/09/2022 (Shift-I)

Ans. (b) : According to the question,

Let A = 4x, B = 3x, C = 5x

In ΔABC $4x + 3x + 5x = 180^{\circ}$

$12x = 180^{\circ}$

$x = 15^{\circ}$

$A = 4 \times 15^{\circ} = 60^{\circ}, B = 3 \times 15 = 45^{\circ}$

$C = 5 \times 15 = 75^{\circ}$

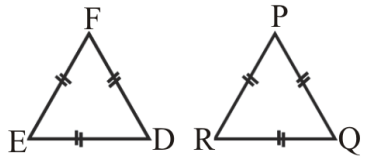
7. In two triangle ΔDEF and ΔPQR, IF DE = QR EF = PR and FD = PQ then :

(a) $\Delta FED \cong \Delta PRQ$ (b) $\Delta DEF \cong \Delta PQR$

(c) $\Delta EDF \cong \Delta RPQ$ (d) $\Delta PQR \cong \Delta EFD$

RRB Group-D 06/09/2022 (Shift-II)

Ans. (a) :



In ΔFED and ΔPRQ -

$\because$ DE = QR, EF = PR, FD = PQ

Hence, from the theorem side-side-side

$\therefore \Delta FED \cong \Delta PRQ$

8. In a triangle ABC, the lengths of its sides $\overline{AB}, \overline{AC}$ and $\overline{BC}$ and are 4 cm, 5 cm and 6 cm respectively. An angle bisector $\overline{AD}$ is drawn from A onto $\overline{BC}$, intersecting at D. Find m($\overline{BD}$), correct to two places of decimal.

(a) 1.50 cm (b) 2.25 cm

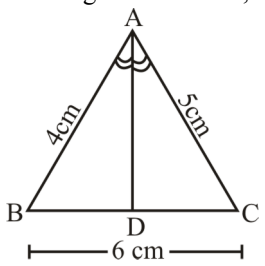
(c) 3.00 cm (d) 2.67 cm

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (d) : Given- $\overline{AB} = 4cm$, $\overline{AC} = 5cm$, $\overline{BC} = 6cm$

According to question,

From the theorem of angular biosector,



$$\frac{DC}{BD} = \frac{AC}{AB}$$

$$\frac{DC + BD}{BD} = \frac{AC + AB}{AB}$$

$$\frac{6}{BD} = \frac{5+4}{4}$$

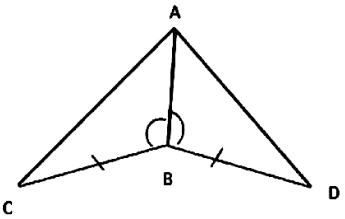
$$BD = \frac{6 \times 4}{9}$$

$$BD = \frac{24}{9}$$

$= 2.666$

$= 2.67cm$

9. In the given figure ∠ABC = ∠ABD, BC = BD then Δ CAB = Δ.....

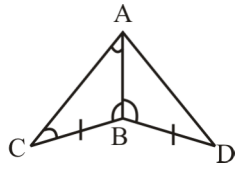


(a) ABD (b) DAB

(c) DBA (d) ADB

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (b) :



In ΔACB and ΔABD

BC = BD -------- (given)

AB = AB ------- (Common)

∠ABC = ∠ABD

Hence, from the theorem side-side-angle

Δ CAB ≅ Δ DAB

10. The area (in cm^2) of an equilateral triangle of side 3 cm is:

(a) $\frac{\sqrt{243}}{6}$ (b) $\frac{\sqrt{243}}{3}$

(c) $\frac{\sqrt{243}}{4}$ (d) $\frac{\sqrt{243}}{2}$

RRB GROUP-D – 16/09/2022 (Shift-II)

Ans. (c) : Given :– Side of a triangle = 3cm

$\because$ Area of equilateral $\Delta = \frac{\sqrt{3}}{4}a^2$

$\Rightarrow \frac{\sqrt{3}}{4} \times 3^2 \Rightarrow \frac{9\sqrt{3}}{4} = \frac{\sqrt{243}}{4}$

11. D and E are the mid point of sides AB and AC respectively and BC = 6 cm. If DE || BC the find the length of DE.

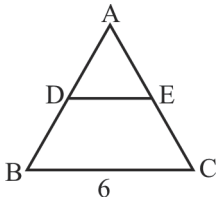
(a) 2.5 cm (b) 3 cm

(c) 5 cm (d) 6 cm

RRB Group-D 06/09/2022 (Shift-II)

Ans. (b) : According to the question,

In ΔABC,



$DE \| BC$

$\therefore \quad DE = \frac{BC}{2}$ (मध्य बिन्दु प्रमेय से)

$DE = \frac{6}{2}$

$= 3$ cm

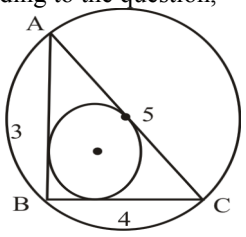
12. Circles are inscribed and circumscribed to a triangle whose sides are 3 cm, 4 cm and 5 cm. What is the ratio of radius of the incircle to that of the circumcircle?

(a) 1 : 5 (b) 2 : 5

(c) 3 : 5 (d) 5 : 2

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,



AB = 3cm, BC = 4cm, AC = 5cm

From Phythagoras theorem–

$AC^2 = AB^2 + BC^2$

$5^2 = 3^2 + 4^2$

$25 = 9 + 16$

$25 = 25$

Hence, the given triangle is a right angled triangle.

radius of incircle-

$r = \frac{AB + BC - CA}{2} = \frac{3+4-5}{2} = 1$

Radius of circumcircle (R) $= \frac{AC}{2} = \frac{5}{2}$

Hence, ratio of radius of both circles $= 1 : \frac{5}{2} = 2 : 5$

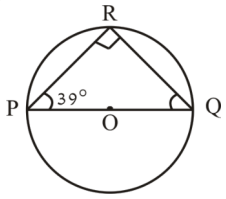
13. PQ is a diameter of a circle whose centre is O. If a point R lies on the circle and $\angle RPO$ is 39º, then find the measure of $\angle RQP$.

(a) 51º (b) 125º

(c) 129º (d) 151º

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (a) :



$\because$ PQ is the diameter of circle

But the angle subtended in a semicircle is a right angle.

$\therefore \quad \angle PRQ = 90°$

In Δ RPQ –

$\angle RPQ + \angle PRQ + \angle PQR = 180°$

$39° + 90° + \angle PQR = 180°$

$\angle PQR = 180° - 129° = 51°$

14. The sides of a triangle are in the ratio 3 : 4 : 5 The triangle is :

(a) Obtuse triangle

(b) Right triangle

(c) Acute triangle

(d) Either acute triangle or right triangle

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (b) : Given:

Ratio of the sides of a triangle = 3 : 4 : 5

Let the sides be 3x, 4x and 5x respectively.

By Pythagoras theorem,

$(5x)^2 = (3x)^2 + (4x)^2$

$25x^2 = 9x^2 + 16x^2$

$25x^2 = 25x^2$

Hence, this triangle is a right angled triangle.

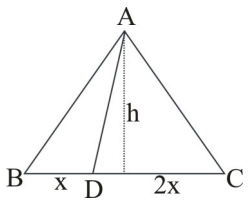
15. The base BC of a triangle, ABC is divided at D such that BD = $\frac{1}{2}$DC. The area of triangle ABC is _____ times the area of triangle ADC.

(a) Four (b) $\frac{3}{2}$

(c) Two (d) Three

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (b) :



According to the question-

$DC = 2x$

$BC = 3x$

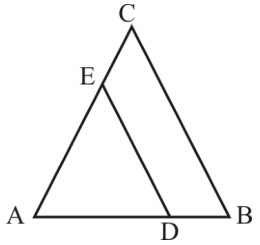
Area of $\Delta ABC = \frac{1}{2} \times 3x \times h$

$$\text{Area of } \Delta ADC = \frac{1}{2} \times 2x \times h$$

$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta ADC} = \frac{\frac{1}{2} \times 3x \times h}{\frac{1}{2} 2x \times h} = \frac{3}{2}$$

$$\text{Area of } \Delta ABC = \frac{3}{2} \text{ Area of } \Delta ADC$$

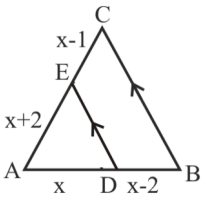
16. In the given figure, DE||BC. If AD = x, DB = x - 2, AE = x + 2 and EC = x– 1, then find the value of x.



(a) 5 (b) 3
(c) 4 (d) 2

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) :



DE BC

$\Rightarrow$ If a line is drawn parallel to one side of a triangle it divides the other two sides in equal proportion.

$$\Rightarrow \quad \frac{AD}{DB} = \frac{AE}{EC}$$

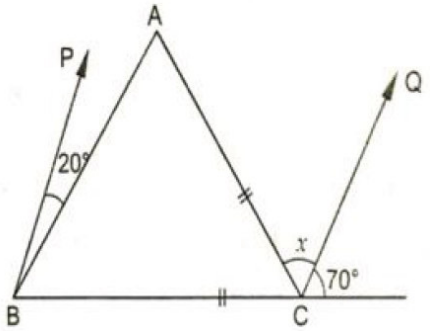
$$\frac{x}{x-2} = \frac{x+2}{x-1}$$

$$(x + 2)(x - 2) = x(x - 1)$$

$$x^2 - 4 = x^2 - x$$

$$x = 4$$

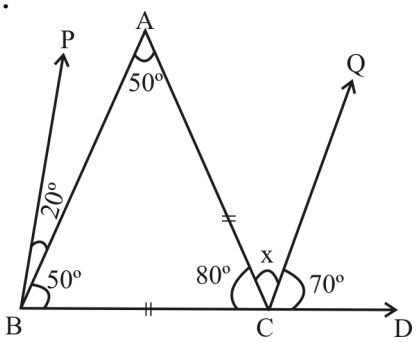
17. In the given figure, if BP || CQ and AC = BC, then the measure of x is:



(a) 20º (b) 25º
(c) 30º (d) 35º

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (c) :



Given that, BP || CQ and

AC = BC

$\angle PBC = \angle QCD = 70^\circ$

$\angle PBA + \angle ABC = 70^\circ$

$\angle ABC = 70^\circ - 20^\circ = 50^\circ$

$\therefore \quad \angle BAC = 50^\circ$

$\angle BCA = 180^\circ - 2 \times 50^\circ = 80^\circ$

$\angle BCA + \angle ACQ + \angle QCD = 180^\circ$

$80^\circ + x + 70^\circ = 180^\circ$

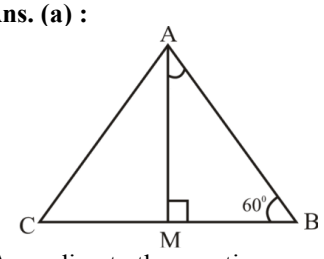
$x = 30^\circ$

18. Angles A, B and C of a triangle are in arithmetic progression. M is a point on BC such that AM is perpendicular to BC. What is $\frac{BM}{AB}$?

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$
(c) $\frac{1}{3}$ (d) $\frac{1}{4}$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (a) :



According to the question,

Because angle A, B and C are in arithmetic progression

$A + C = 2B$ – – – – (1)

$A + B + C = 180^\circ$ – – (2)

(On Substituting the value of A + C from equation (1))

$2B + B = 180^\circ$

$3B = 180^\circ$

$B = 60^\circ$

$$\cos 60^\circ = \frac{BM}{AB} \quad \left(\frac{\text{Base}}{\text{Hypotenuse}}\right)$$

$$\frac{1}{2} = \frac{BM}{AB}$$

19. In ΔABC $\angle A : \angle B : \angle C$: = 2 : 3 : 5, then find the measure of the supplementary angle of $\angle A$.

(a) 154° (b) 36°
(c) 144° (d) 54°

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (c) : Given,

$\angle A : \angle B : \angle C = 2 : 3 : 5$

$\therefore\ 2x + 3x + 5x = 180^\circ$

$10x = 180^\circ$

$x = 18^\circ$

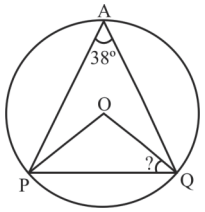
$\therefore\quad \angle A = 2x = 2 \times 18^\circ = 36^\circ$

Hence the supplementary angle of $\angle A = 180^\circ - \angle A$

$= 180^\circ - 36^\circ$

$= 144^\circ$

20. In the given figure, PO and OQ are the radius of the circumcircle of the triangle APQ. If $\angle PAQ = 38^\circ$, then what will be the $\angle PQO$?

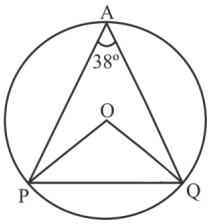


(a) 52° (b) 76°

(c) 112° (d) 104°

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (a) :



Given,

$\angle PAQ = 38^\circ$

In triangle POQ = OP = OQ, $\angle PQO = \angle QPO$

$\because\quad \angle POQ = 2 \times \angle PAQ$ {$\because$ From theorem}

$\angle POQ = 2 \times 38^\circ$

$\angle POQ = 76^\circ$

$\therefore\quad$ In ΔPOQ,

$\angle PQO + \angle QPO + \angle POQ = 180^\circ$

$2\angle PQO + 76^\circ = 180^\circ$

$\boxed{\angle PQO = 52^\circ}$

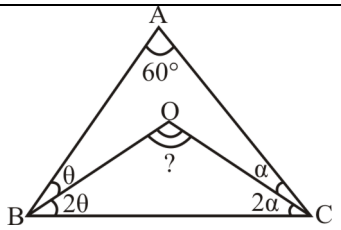
21. In ΔABC, $\angle BAC = 60^\circ$ and O is a point inside ΔABC. If $\angle OBC$ is two times $\angle OBA$ and $\angle OCB$ is two times $\angle OCA$, then what will be the measure of $\angle BOC$?

(a) 60° (b) 100°

(c) 80° (d) 120°

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) :



In ΔABC,

$60^\circ + 3\theta + 3\alpha = 180^\circ$

$3(\theta + \alpha) = 120^\circ$

$(\theta + \alpha) = 40^\circ$

Now, In ΔBOC,

$\angle BOC = 180^\circ - (2\theta + 2\alpha)$

$= 180^\circ - 2(\theta + \alpha)$

$= 180^\circ - 2 \times 40^\circ$

$= 180^\circ - 80^\circ$

$= 100^\circ$

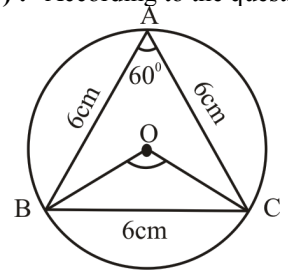
22. ABC is an equilateral triangle and O is its circumcentre. If the side of triangle is 6 cm, then the $\angle BOC$ is:

(a) 36° (b) 60°

(c) 120° (d) 30°

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,



$\because$ Each angle in equilateral triangle is 60°.

$\because$ We know that, the angle subtended by an arc of a circle on the circumference of a circle is half of the angle subtended at the centre.

$\because\ \angle BOC = 2 \times \angle BAC$

$\angle BOC = 2 \times 60^\circ$

$\therefore\ \angle BOC = 120^\circ$

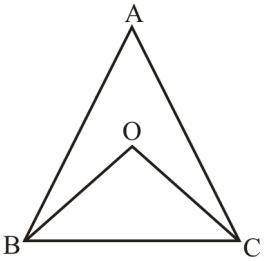
23. In a triangle ABC, incenter is at O, find angle BAC if angle BOC = 110°.

(a) 40° (b) 50°

(c) 30° (d) 20°

RRB NTPC 03.02.2021 (Shift-II) Stage I

Ans. (a) :



Given– $\angle BOC = 110^\circ$

$$\angle BOC = 90° + \frac{1}{2}\angle A$$

$$110^0 = 90^0 + \frac{\angle A}{2}$$

$$\frac{\angle A}{2} = 20°$$

$$\angle A = 40°$$

Hence, $\angle BAC = 40°$

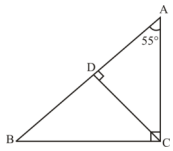
24. If ΔABC is right angled at C $CD \perp AB, \angle A = 55^0$ then, $\angle ACD$ = ?

(a) 60^0 (b) 45^0

(c) 35^0 (d) 55^0

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) :



Given–

$CD \perp AB, \angle A = 55^0$

In right angle ΔADC,

$\angle DAC + \angle CDA + \angle ACD = 180°$

$55° + 90° + \angle ACD = 180°$

$\angle ACD = 180° - 145°$

$\angle ACD = 35°$

25. The perimeters of two similar triangles, ΔPQR and ΔXYZ are 48 cm and 24 cm respectively. If XY = 12 cm, then PQ is:

(a) 12 cm (b) 8 cm

(c) 24 cm (d) 18 cm

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\because \Delta PQR \sim \Delta XYZ$

$$\therefore \frac{48}{24} = \frac{PQ}{12}$$

$PQ = 48/2$

$PQ = 24$ cm.

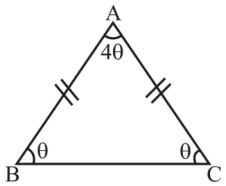
26. The number of non-congruent acute isosceles triangles in which one angle is 4 times another angle is:

(a) 3 (b) 4

(c) 1 (d) 2

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (c) :



So,

$\theta + \theta + 4\theta = 180°$

$6\theta = 180°$

$\theta = 30°$

So, equal angle = 30º, 30º

And remaining third angle = 4θ = $4 \times 30° = 120°$ (Obtuse angle)

Which is invalid triangle According to the question.

(ii) If both equal angle is 4θ and third angle is θ-

$4\theta + 4\theta + \theta = 180°$

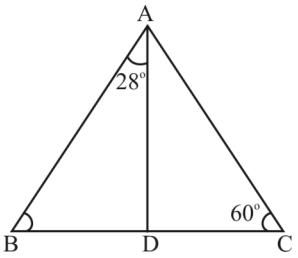
$9\theta = 180°$

$\theta = 20°$

So, equal angle = 80º, 80º

And the remaining 3rd angle is 20º which is an acute angled isosceles is a triangle. Thus only one triangle is possible.

27. If, $\frac{AB}{AC} = \frac{BD}{DC}$ then $\angle ABC$ is:



(a) 32° (b) 74°

(c) 92° (d) 64°

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (d) : In ΔABC,

By angle bisector theorem-

$\therefore \angle BAD = \angle DAC$

$\Rightarrow \angle DAC = 28°$

Now, in ΔABC,

$\angle ABC + \angle BAC + \angle ACB = 180°$

$\angle ABC + 56° + 60° = 180°$

$\angle ABC = 180° - 116°$

$\angle ABC = 64°$

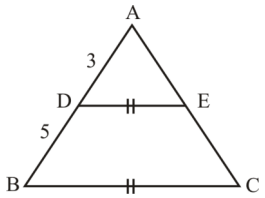
28. In a triangle ABC. Point D and E are on the side AB and AC such that DE is parallel to BC and $\frac{AD}{BD} = \frac{3}{5}$. If AC = 4cm, then the value of AE is.

(a) 1.5 cm (b) 2 cm

(c) 1.8 cm (d) 2.4 cm

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (a) :



From Thales theorem,

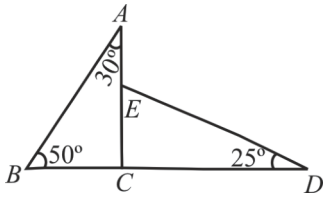
$\Delta ABC \sim \Delta ADE$

$\frac{AD}{AB} = \frac{AE}{AC}$

$\frac{3}{8} = \frac{AE}{4}$

$AE = \frac{3}{2} = 1.5\,cm$

29. In the given diagram, if $\angle BAC = 30^o$, $\angle ABC = 50^o$ and $\angle CDE = 25^o$, then $\angle AED$ is equal to:

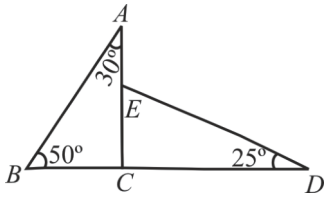


(a) 75º (b) 95º

(c) 105º (d) 115º

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (c) :



In ΔABC

$\because \angle BCA = 180° - \angle BAC - \angle ABC$

$= 180° - 30° - 50°$

$= 100°$

$\therefore \angle ACD = 180° - 100°$

$\angle ACD = 80°$ [From linear pair property]

$\because$ Exterior angle is the sum of two interior angle of a triangle.

$\Rightarrow \angle AED = \angle ACD + \angle CDE$

$= 80^0 + 25^0$

$= 105°$

30. In ΔABC, if $\angle A = 3\ \angle B$ and $\angle C = 2\ \angle B$, then what are values of $\angle A$, $\angle B$ and $\angle C$?

(a) 90°, 60° and 30° (b) 60°, 30° and 90°

(c) 30°, 90° and 60° (d) 90°, 30° and 60°

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) : $\because \angle A = 3\angle B$ and $\angle C = 2\angle B$

$\therefore$ Let $\angle B = x^o$, $\angle A = 3x^o$ and $\angle C = 2x^o$

$\because$ Sum of angles of a triangle is 180º.

$\angle A + \angle B + \angle C = 180°$

$3x + x + 2x = 180°$

$6x = 180°$

$x = \frac{180°}{6} = 30°$

Hence, $\angle A = 3x = 3\times30 = 90°$

$\angle B = x = 30°$

$\angle C = 2x = 2\times30 = 60°$

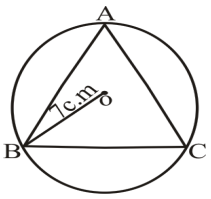
31. A circle of radius 7 cm circumscribed an equilateral triangle. The length of the side of the equilateral triangle is:

(a) $7\sqrt{2}$cm (b) 7 cm

(c) $7\sqrt{3}$cm (d) $5\sqrt{3}$cm

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (c) :



Let side of equilateral triangle = a cm

then circumradius of equilateral triangle $= \frac{a}{\sqrt{3}}$

So, $\frac{a}{\sqrt{3}} = 7$ …….. (Radius of circumcircle 7 cm.)

$a = 7\sqrt{3}$

Hence, the length of equilateral triangle (a) = $7\sqrt{3}$ cm.

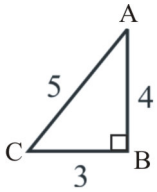
32. ABC is a right-angled triangle. If the lenghts of two sides containing the right angle are 4 cm and 3 cm. What will be the radius of its incircle.

(a) 1 cm (b) 2 cm

(c) 3 cm (d) 4 cm

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (a)



Hypotenuse $= \sqrt{4^2 + 3^2} = 5\,cm$

$\therefore$ Radius of incircle =

$\frac{\text{Perpendicular} + \text{Base} - \text{Hypotenuse}}{2}$

$= \frac{4+3-5}{2} = \frac{2}{2} = 1cm$

33. In triangle ABC, ∠A is 12º more than the measure of ∠C. The measure of ∠B is 4 times as great as the measure of ∠C. What are the measures of the angles A, B and C respectively?

(a) 40º, 112º, 18º (b) 40º, 120º, 28º
(c) 35º, 92º, 23º (d) 40º, 112º, 28º

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : $\angle A + \angle B + \angle C = 180^\circ$ ..... (i)

According to the question,

$\angle A = \angle C + 12^\circ$ ..... (ii)

$\angle B = 4 \times \angle C$ ..... (iii)

From equation (i), (ii) and (iii)

$\angle C + 12^\circ + 4\angle C + \angle C = 180^\circ$

$\angle C = 28^\circ$

$\angle B = 112^\circ$

$\angle A = 40^\circ$

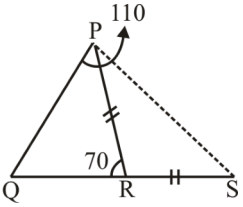
Hence, $\angle A$, $\angle B$ and $\angle C \Rightarrow 40^\circ, 112^\circ$ and 28°

34. In ΔPQR, QR is extended up to S so that RS = RP. If ∠PRQ = 70º and ∠QPS = 110º then find the measure of ∠PQS.

(a) 55º (b) 50º
(c) 65º (d) 35º

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (d) :



$\because \angle PRQ + \angle PRS = 180^\circ$ ..... (Linear pair)

$\therefore \angle PRS = 180^\circ - 70^\circ = 110^\circ$

And in ΔPRS,

$\because$ PR = RS ..... (Given)

$\therefore \angle RSP = \angle RPS$ ..... (i)

(The angle opposite to equal side will be equal)

and $\angle PRS + \angle RSP + \angle RPS = 180^\circ$ ..... (The sum of the three interior angles of a triangle is 180^0.)

$\because \angle RSP = \angle RPS$

So, $2\angle RSP = 180^\circ - 110^\circ = 70^\circ$ ($\because \angle PRS = 110^\circ$)

$\angle RSP = \frac{70^\circ}{2} = 35^\circ = \angle RPS$

Again in ΔPQS

$\angle PQS = 180^\circ - (110^\circ + 35^\circ)$

$= 180^\circ - 145^\circ = 35^\circ$

Hence, $\angle PQS = 35^\circ$

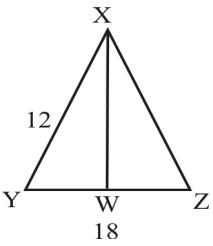
35. In ΔXYZ, XY = 12 cm and YZ = 18, XW, the angle bisector of YXZ, meets YZ at W, such that YW : WZ is 4 : 5.

Find the length of the third side of the triangle.

(a) 18 cm (b) 14 cm
(c) 15 cm (d) 12 cm

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (c) : According to the question –



$\because$ As per the angle bisector theorem, the angle bisector of a triangle bisect the opposite side in such a way that the ratio of the two line-segments is proportional to the ratio of the other two sides.

then, If XZ = x cm

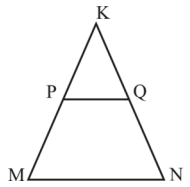
$\frac{12}{x} = \frac{4}{5}$

$4x = 60$

$x = 15$ cm.

So, XZ = 15cm.

36. In the given ΔKMN, PQ is parallel to MN. If $\frac{KP}{PM} = \frac{4}{13}$ and KN = 20.4 cm, find KQ



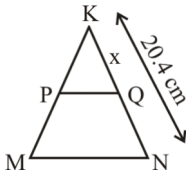
(a) 3.6 cm (b) 5.1 cm
(c) 8.2 cm (d) 4.8 cm

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) : The parallel line divides the intersecting transversals passing through the parallel line in equal proportion.

$\therefore$ PQ ∥ MN and KM and KN are transverals.

then, $\frac{KP}{PM} = \frac{KQ}{QN}$



$\frac{4}{13} = \frac{x}{(20.4 - x)}$

$4(20.4 - x) = 13x$

$81.6 - 4x = 13x$

$81.6 = 13x + 4x$

$81.6 = 17x$

$x = \frac{81.6}{17}$

$x = 4.8$

Hence, KQ = 4.8 cm

37. If A, B and C are the interior angles of a ΔABC, Simplify :

$$\frac{\cos^2\left(\frac{B+C}{2}\right)+\cos^2\frac{A}{2}}{\sec^2\frac{C}{2}-\cot^2\left(\frac{A+B}{2}\right)}$$

(a) 0 (b) 2
(c) 1 (d) Not defined

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) : $\dfrac{\cos^2\left(\frac{B+C}{2}\right)+\cos^2\frac{A}{2}}{\sec^2\frac{C}{2}-\cot^2\left(\frac{A+B}{2}\right)}$

($\because \angle A, \angle B$ and $\angle C$ are the interior angles of ΔABC)

Then $\angle A+\angle B+\angle C = 180^\circ$

Dividing both side by 2

$$\frac{\angle A}{2}+\frac{\angle B}{2}+\frac{\angle C}{2}=\frac{180^\circ}{2}$$

$$\frac{\cos^2\left(\frac{180^\circ}{2}-\frac{A}{2}\right)+\cos^2\frac{A}{2}}{\sec^2\frac{C}{2}-\cot^2\left(\frac{180^\circ}{2}-\frac{C}{2}\right)} \qquad \begin{pmatrix}\because \cos(90-\theta)=\sin\theta \\ \cot(90-\theta)=\tan\theta \\ \sin^2\theta+\cos^2\theta=1 \\ \sec^2\theta-\tan^2\theta=1\end{pmatrix}$$

$$= \frac{\sin^2\frac{A}{2}+\cos^2\frac{A}{2}}{\sec^2\frac{C}{2}-\tan^2\frac{C}{2}}=1$$

38. The angles of a triangle are $2x^\circ$, $(3x^\circ - 8^\circ)$ and $(5x^\circ - 12^\circ)$. The greatest angle of the triangle is:

(a) 112° (b) 88°
(c) 118° (d) 40°

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (b) : $\because$ Sum of three angles of triangle is 180°

$\therefore 2x^\circ + 3x^\circ - 8^\circ + 5x^\circ - 12^\circ = 180^\circ$

$10x^\circ - 20^\circ = 180^\circ$

$10x^\circ = 200^\circ$

$x = 20^\circ$

First angle $= 2 \times 20^\circ = 40^\circ$

Second angle $= 3 \times 20^\circ - 8 = 52^\circ$

Third angle $= 5 \times 20^\circ - 12 = 88^\circ$

Hence the greatest angle $= 88^\circ$

39. If the angles of the triangle are in the ratio 1:2:3, then what is the smallest angle?

(a) 40° (b) 25°
(c) 15° (d) 30°

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d) Let the angles of triangle are x, 2x, 3x

$\because$ sum of three angles of triangle $= 180°$

$x + 2x + 3x = 180°$

$6x = 180°$

$\boxed{x = 30°}$

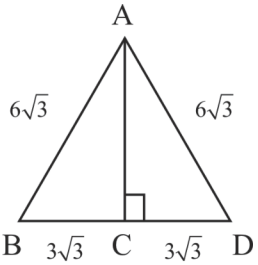
So smallest angle will be 30°

40. If one side of an equilateral triangle is $6\sqrt{3}$ cm, then what is its height?

(a) 9 cm (b) 6 cm
(c) 3 cm (d) $3\sqrt{3}$ cm

RRB RPF SI – 13/01/2019 (Shift-II)

Ans : (a) Side of equilateral triangle $= 6\sqrt{3}$



In triangle ABC-

$(AC)^2 = (AB)^2 - (BC)^2$

$= \left(6\sqrt{3}\right)^2 - \left(3\sqrt{3}\right)^2 = 108 - 27$

$(AC)^2 = 81$

height = 9 cm

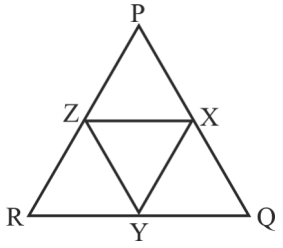
41. The midpoints of the sides of an equilateral triangle PQR are X, Y and Z. If the circumference of triangle PQR is 24 cm, then what will be the circumference of traingle XYZ?

(a) 96 cm (b) 36 cm
(c) 12 cm (d) 48 cm

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (c) According to the question-

PQ + QR + PR = 24 cm



In a triangle, the line joining the midpoints of two sides is parallel and half of the third side.

$ZX = \frac{1}{2}$ QR ..... (i)

$XY = \frac{1}{2}$ PR .....(ii)

$ZY = \frac{1}{2}$ PQ .....(iii)

Adding the equation (i), (ii) and (iii)

$ZX + XY + ZY = \frac{1}{2}(QR + PQ + PR)$

$\frac{1}{2} \times 24 = 12$ cm

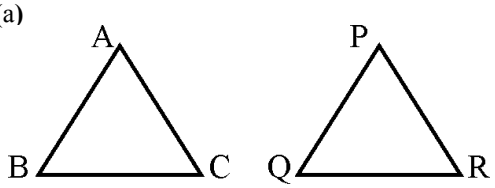
So circumference of $\Delta XYZ = 12$ cm

42. ΔABC, and ΔPQR are similar and their perimeters are 36 and 24 respectively. If PQ = 10 then find the value of AB.

(a) 15 (b) 16
(c) 20 (d) 18

RRB JE - 26/06/2019 (Shift-I)

Ans : (a)



$\because$ $\Delta ABC \sim \Delta PQR$

$\therefore$ $\frac{\text{Perimeter of } \Delta ABC}{\text{Perimeter of } \Delta PQR} = \frac{AB}{PQ}$

$\frac{36}{24} = \frac{AB}{10}$

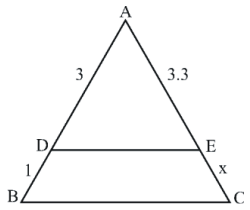
$AB = \frac{360}{24} = 15$

43. In ΔABC, the points D and E are on the sides AB and AC respectively such that DE ∥ BC and AD : DB = 3 : 1. If EA = 3.3 cm, find the value of AC.

(a) 5.5 cm (b) 4 cm
(c) 4.4 cm (d) 1.1 cm

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (c)



According to the Thales theorem,

$\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{3}{1} = \frac{3.3}{EC}$

$EC = 1.1$

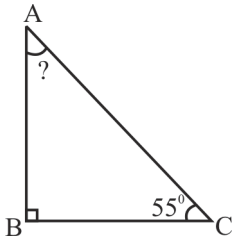
$AC = AE + EC = 3.3 + 1.1 = 4.4$

44. If one acute angle of a right angle triangle is 55º, then what will be the value of the other acute angle?

(a) 25º (b) 30º
(c) 40º (d) 35º

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (d)



$\because$ the sum of the three interior angles of a triangle is 180°

$180^\circ = \angle A + \angle B + \angle C$

$180^\circ = \angle A + 90^\circ + 55^\circ$

$180^\circ - 145^\circ = \angle A$

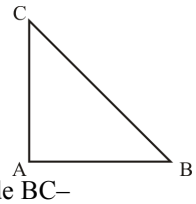
$\angle A = 35^\circ$

45. ABC is a right angle triangle whose angle A is right angle. Which side needs to bisect for the formation of two other right-angled triangles?

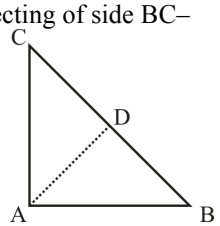
(a) AB (b) CA
(c) at the center (d) BC

RRB Group-D – 20/09/2018 (Shift-I)

Ans. (d)



On bisecting of side BC–



Right angled triangle = Δ ADB, Δ ADC

ABC is a right angled triangle whose angle A is right angled, for the formation of two other right triangle, side BC will be bisected.

46. Which of the following are sides of a right angled triangle?

(a) 84 cm, 13 cm, 85 cm
(b) 84 cm, 63 cm, 115 cm
(c) 15 cm, 112 cm, 111 cm
(d) 76 cm, 100 cm, 57 cm

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (a) : from pythagoras theorem

In right angle triangle, the square of hypotenuse is equal to the square of other two sides.

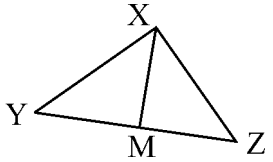
$\therefore (85)^2 = (13)^2 + (84)^2$

$7225 = 169 + 7056$

$7225 = 7225$

Sides of right angle Δ will be 85, 84 and 13

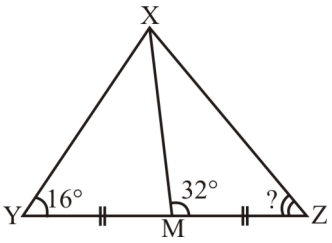
47. In the diagram M is the mid point of YZ, ∠XMZ = 32° and ∠XYZ = 16°. The value of ∠XZY is–



(a) 84° (b) 81°
(c) 74° (d) 68°

RRB Group-D – 27/09/2018 (Shift-I)

Ans. (c)



In the given triangle → M is the mid point of YZ, then YM = ZM

$\because$ $\angle XYM + \angle YXM = 32°$ (Exterior Angle)

$\angle YXM = (32° - 16°) = 16°$

$\therefore$ YM = XM = ZM (Same Angle)

Now, In triangle XMZ,

side, XM = ZM $\Rightarrow \angle MXZ = \angle MZX$

then, $\angle XZM = \dfrac{180° - 32°}{2} = 74°$

or $\angle XZY = 74°$

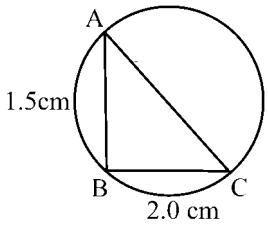
48. Two adjacent sides of a right angled triangle are 1.5 cm and 2 cm long. The area of its circumcircle will be–

(a) 1.75π cm^2 (b) 1.25π cm^2

(c) 1.5625π cm^2 (d) 1.5π cm^2

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (c) :



(hypotenuse)^2 = (base)^2 + (perpendicular)^2

$(AC)^2 = (1.5)^2 + (2)^2$

$(AC)^2 = 2.25 + 4$

$(AC)^2 = 6.25$

$AC = \sqrt{6.25} = 2.5\,cm$

$\because$ The radius of circum circle is half of hypotenuse.

$$R = \frac{AC}{2} = \frac{2.5}{2} = \frac{5}{4}$$

area of circum circle $= \pi R^2$

$$= \left(\frac{5}{4}\right)^2 \times \pi = \frac{25}{16} \times \pi = 1.5625\pi \text{ cm}^2$$

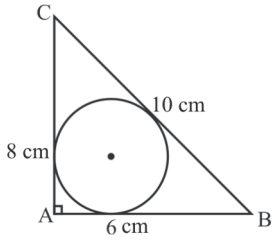
49. ABC is a right angled triangle in which $\angle A = 90^\circ$, AB = 6 cm and AC = 8 cm. What will be perimeter of a circle whose centre O is inside the triangle?

(a) $4.5\ \pi$ (b) 3π

(c) 3.5π (d) 4π

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (d)



Area of triangle $= \dfrac{1}{2} \times 6 \times 8 = 24\text{cm}^2$

$$S = \frac{a+b+c}{2} = \frac{8+6+10}{2} = 12$$

Radius of incircle (r) = $\dfrac{\text{Area of triangle}(\Delta)}{\text{Semiperimeter of triangle}(S)}$

$$r = \frac{\Delta}{S} = \frac{24}{12}$$

$\boxed{r = 2}$

Perimeter of circle $= 2\pi r$

$= 2 \times \pi \times 2 = 4\pi$

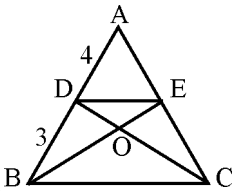
50. In triangle ABC, the points D and E lie on the sides AB and AC respectively. DE is parallel to the base BC. O is the intersection point of BE and CD. If AD : DB = 4:3, find the ratio of DO and DC.

(a) 4 : 11 (b) 3 : 7

(c) 5 : 12 (d) 5 : 7

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (a)



DE || BC

$\therefore$ Δ ADE ~ Δ ABC

$$\frac{AD}{AB} = \frac{DE}{BC}$$

$$\frac{4}{7} = \frac{DE}{BC} \quad (\because AB = AD + DB = 4 + 3 = 7)$$

from ΔDOE and ΔBOC

$\angle ODE = \angle OCB$ (Alternate interior angle)

$\angle OED = \angle OBC$ (Alternate interior angle)

$\angle DOE = \angle BOC$ (Vertically opposite angle)

$\therefore$ Δ DOE ~ Δ COB

So $\dfrac{DO}{CO} = \dfrac{DE}{CB}$

$$\frac{DO}{CO} = \frac{4}{7}$$

or $\dfrac{CO}{DO} + 1 = \dfrac{7}{4} + 1$

$$\frac{DC}{DO} = \frac{11}{4}$$

or DO : DC = 4 : 11

51. Triangle ABC is similar to triangle PQR. If AB = 5 cm and PQ = 3 cm, then find the value of $\frac{ar(\Delta ABC)}{ar(\Delta PQR)}$.

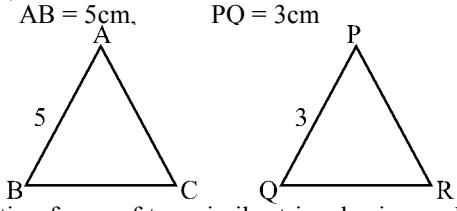
(a) $\frac{9}{25}$ (b) $\frac{3}{5}$

(c) $\frac{5}{3}$ (d) $\frac{25}{9}$

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (d) : $\Delta ABC \sim \Delta PQR$

AB = 5cm, PQ = 3cm



The ratio of area of two similar triangles is equal to the ratio of their corresponding sides square.

$$\frac{area(\Delta ABC)}{area(\Delta PQR)} = \left(\frac{5}{3}\right)^2 = \frac{25}{9}$$

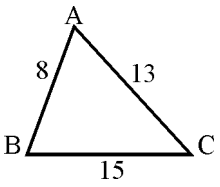
52. The lengths of the three sides of a triangle are 8 cm, 13 cm and 15 cm respectively. What will be the ratio of their altitudes?

(a) 195 : 120 : 104 (b) 15 : 13 : 8

(c) 28 : 23 : 21 (d) 104 : 195 : 120

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (a)



Ratio of altitudes

$$= \frac{1}{8} : \frac{1}{13} : \frac{1}{15}$$

$$= 15\times13 : 8 \times 15 : 13 \times 8$$

$$= 195 : 120 : 104$$

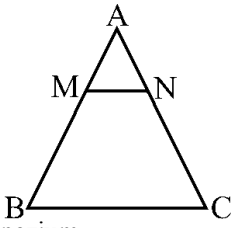
53. In triangle ABC, point M is on side AB and point N is on side AC such that BMNC becomes a trapezium. The ratio of side MN and side BC is 7:9. Find the ratio of the area of triangle AMN and the area of trapezium BMNC.

(a) 7 : 9 (b) 32 : 49

(c) 49 : 32 (d) 49 : 81

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (c)



$\because$ BMNC is a trapezium

$\therefore$ MN || BC

$\therefore$ $\Delta AMN \sim \Delta ABC$

So, $\frac{\text{Area of } \Delta AMN}{\text{Area of } \Delta ABC} = \left(\frac{MN}{BC}\right)^2 = \left(\frac{7}{9}\right)^2 = \frac{49}{81}$

$$\therefore \frac{\text{Area of } \Delta AMN}{\text{Area of } \square BMNC} = \frac{49}{81-49} = \frac{49}{32} \Rightarrow 49 : 32$$

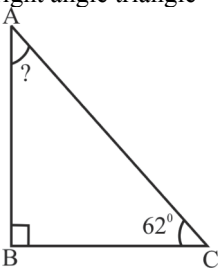
54. The acute angle of a right angled triangle is 62°. Find the value of the second acute angle.

(a) 38° (b) 28°

(c) 45° (d) 36°

RRB Group-D – 15/10/2018 (Shift-III)

Ans. (b) : Given right angle triangle



$\angle B = 90°$

$\angle C = 62°$

$\angle A = ?$

Sum of interior angles of triangle is 180°

$\angle A = 180° - (90° + 62°)$

$= 180° - 152° = 28°$

55. If 8, p and 17 are pythagoras triplet, then the value of p will be–

(a) 15 (b) 9

(c) 14 (d) 13

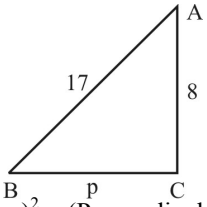
RRB Group-D – 01/10/2018 (Shift-I)

Ans. (a) : According to the question,

8, p and 17 is Pythagoras triplet

then p = ?

From the figure,



$(\text{hypotenuse})^2 = (\text{Perpendicular})^2 + (\text{base})^2$

$(17)^2 = (8)^2 + (p)^2$

$289 = 64 + (p)^2$

$289 - 64 = (p)^2$

$225 = p^2$

$\boxed{p = 15}$

56. The area of a triangle ABC is 63 square unit. Two parallel lines DE, FG are drawn such that it divides AB and AC into three equal parts. What is the area of quadrilateral DEFG?

(a) 28 Square unit (b) 35 Square unit

(c) 21 Square unit (d) 48 Square unit

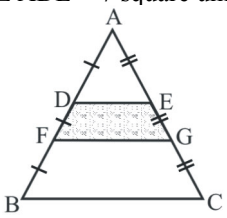
RRB NTPC 02.04.2016 Shift : 2

Ans : (c) In similar Δ ADE and ΔABC–

$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta ABC} = \left(\frac{AD}{AB}\right)^2$$

$$\frac{\text{Area of } \Delta ADE}{63} = \left(\frac{AD}{3AD}\right)^2$$

Area of Δ ADE = 7 square unit



$\Rightarrow$ $\Delta AFG \sim \Delta ABC$

$\therefore$ $$\frac{\text{Area of } \Delta AFG}{\text{Area of } \Delta ABC} = \left(\frac{AF}{AB}\right)^2$$

$\Rightarrow$ $$\frac{\text{Area of } \Delta AFG}{63} = \left(\frac{2AD}{3AD}\right)^2$$

$\Rightarrow$ Area of $\Delta AFG = \frac{4}{9} \times 63 = 28$ Square unit

$\therefore$ Area of □DEFG = $\Delta AFG - \Delta$ ADE

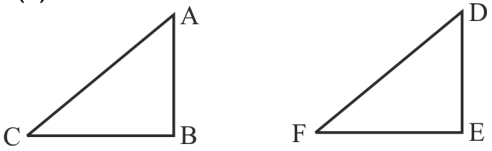
= 28 – 7 = 21 Square unit

57. If ΔABC and ΔDEF are similar triangles, in which BC = 4 cm, EF = 7 cm and the area of ΔABC is 144 square cm, then find the area of ΔDEF.

(a) 252 Square cm (b) 504 Square cm
(c) 441 Square cm (d) 324 Square cm

RRB NTPC 02.04.2016 Shift : 1

Ans : (c)



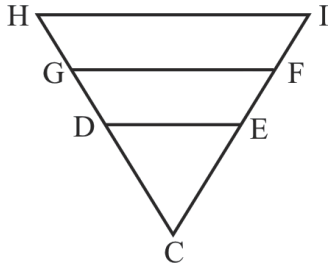
$\because \Delta ABC \sim \Delta DEF$

$$\therefore \frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \left(\frac{BC}{EF}\right)^2$$

$$\frac{144}{\text{Area of } \Delta DEF} = \left(\frac{4}{7}\right)^2$$

$$\text{Area of } \Delta DEF = \frac{144 \times 49}{16} = 441 \text{ Square cm}$$

58.

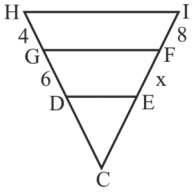


HI, GF and DE are parallel lines, If DG = 6, GH = 4 and FI = 8, then EF = ?

(a) 8 (b) 9
(c) 12 (d) 16

RRB NTPC 31.03.2016 Shift : 1

Ans : (c)



From the Thales theorem

In ΔCGF,

Let EF = x

$$\frac{CD}{GD} = \frac{CE}{EF}$$

or $$\frac{CD}{CE} = \frac{GD}{EF} \text{.....(1)}$$

Again in ΔCHI,

$$\frac{CD}{DH} = \frac{CE}{EI}$$

$$\frac{CD}{CE} = \frac{DH}{EI} \text{.....(2)}$$

$\therefore$ From equation (1) and (2)

$$\frac{GD}{EF} = \frac{DH}{EI}$$

$$\frac{6}{x} = \frac{6+4}{x+8}$$

$10x = 6x + 48$

$4x = 48$

$x = 12$

$EF = 12$

59. If the ratio of the angles of a triangle is 1:2:3, find the value of the largest angle?

(a) 30° (b) 60°
(c) 90° (d) 120°

RRB NTPC 19.04.2016 Shift : 1

Ans : (c) If the angles of triangle are x, 2x and 3x respectively.

Then $x + 2x + 3x = 180°$

$6x = 180°$

$x = 30°$

$\therefore$ Largest angle $= 3x = 3 \times 30 = 90°$

60. If $\Delta ABC \cong \Delta XYZ$ and angle BAC = 55°, then angle ZXY = ?

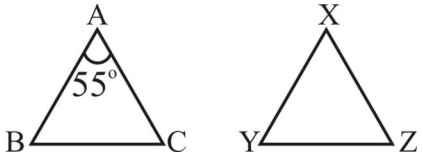
(a) 65° (b) 135°
(c) 55° (d) 67.5°

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (c) Given– $\angle BAC = 55°$

$\Delta ABC \cong \Delta XYZ$

So from congruence rules–



$\angle A = \angle X$

or $\angle BAC = \angle ZXY$

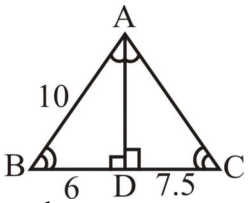
$55^o = \angle ZXY$

61. In ΔABC, AB = 10 cm. BD = 6 cm and DC = 7.5 cm. ∠A is bisected internally to intersect BC at D. What is the length of CA?

(a) 12 cm (b) 10 cm
(c) 10.5 cm (d) 12.5 cm

RRB ALP & Tec. (30-08-18 Shift-III)

Ans : (d) According to the question
In ΔABC,



By angle bisector theorem,

$$\frac{AB}{DB}=\frac{AC}{DC}$$

$$\frac{10}{6}=\frac{AC}{7.5}, \qquad AC=\frac{10\times 7.5}{6}$$

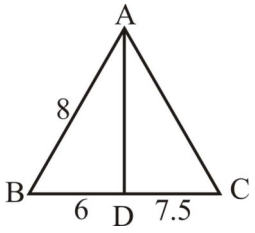
AC = 12.5 cm

62. In ΔABC, AB = 8 cm. The bisector of ∠A is internally meets on BC at D. and BD = 6 cm and DC = 7.5 cm. What will be the value of CA?

(a) 10.5 cm (b) 12.5 cm
(c) 12 cm (d) 10 cm

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (d)



From the interior angle Bisector theorem−

$$\frac{AB}{BD}=\frac{AC}{CD}$$

$$\frac{8}{6}=\frac{AC}{7.5}$$

$$AC=\frac{8\times 7.5}{6}$$

AC = 10 cm

63. In ΔABC, D and E are points on AB and AC respectively in which DE is parallel to BC. If AD = 2 cm, BD = 3 cm then what is the value of $\frac{ar(\Delta ADE)}{ar(\Delta ABC)}$?

(a) $\frac{16}{81}$ (b) $\frac{4}{9}$
(c) $\frac{4}{25}$ (d) $\frac{2}{5}$

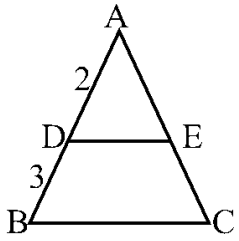
RRB Group-D – 22/09/2018 (Shift-III)

Ans. (c) : In ΔABC

∵ DE//BC ∴ ΔADE ~ ΔABC

AD = 2 cm

BD = 3 cm



In similar ΔADE and ΔABC

$$\frac{ar(\Delta ADE)}{ar(\Delta ABC)}=\frac{AD^2}{AB^2}$$

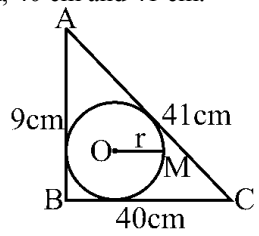
$$=\frac{(2)^2}{(2+3)^2}=\frac{4}{25}$$

64. What is the radius of a circle formed inside a triangle with sides 9 cm, 40 cm and 41 cm?

(a) 3.5 cm (b) 3 cm
(c) 2.5 cm (d) 4 cm

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (d) A right-angled triangle is formed by the sides of 9 cm, 40 cm and 41 cm.



Then area of $\Delta=\frac{1}{2}\times 9\times 40$

$=180\text{cm}^2$

Semi perimeter $(s)=\frac{1}{2}[40+41+9]$

= 45 cm

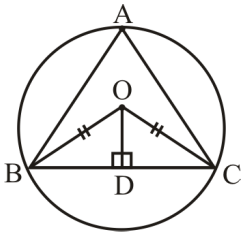
The radius of the incircle $(r)=\frac{\Delta}{s}=\frac{180}{45}=4\text{cm}$

65. If 'O' is the circumcentre of triangle ABC and OD is perpendicular to BC, find the value of angle ∠BOD.

(a) (1/2) ∠A (b) 90° ∠A
(c) ∠A (d) 2∠A

RRB RPF SI – 16/01/2019 (Shift-III)

Ans : (c)



∵ The angle substended by the arc of a circle at the center is twice the angle subtended at the circumference by the same arc.

$\angle BOC = 2\angle A$

$\therefore \angle BOD = \frac{\angle BOC}{2} = \frac{2\angle A}{2} = \angle A$

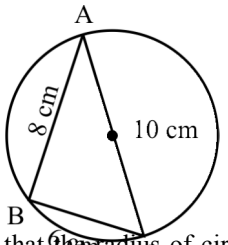
66. The area of the circumcircle of a right angled triangle with sides 6 cm, 8 cm and 10 cm will be–

(a) 16π cm^2 (b) 25π cm^2

(c) 24.5π cm^2 (d) 9π cm^2

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (b) :



We know that the radius of circumcircle of right angle triangle = Hypotenuse/2

∴ Circle's radius (r) = 5 cm

∴ Area of the circumcircle $= \pi r^2 = \pi \times (5)^2 = 25\pi$ cm^2

Type - 2

67. If the opposite angles of a cyclic quadrilateral are in the ratio 3 : 7, then the measure of the bigger angle among the two is

(a) 70º (b) 140º

(c) 105º (d) 126º

RRB Group-D 29/08/2022 (Shift-I)

Ans. (d) : Let opposite angles are 3x, 7x

Sum of opposite angle of a cyclic quadrilateral be 180°

$3x + 7x = 180$

$x = 18$

Hence, measure of biggest angle = $18 \times 7 = 126$º

68. If, in the quadrilateral ABCD, the measures of the angles A, B, C, and D are in the ratio 2 : 3 : 5 : 6, then the quadrilateral is a:

(a) Trapezium (b) Square

(c) Kite (d) Parallelogram

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : $\angle A = 2 \times \frac{45}{2} = 45^\circ$

$\angle B = 3 \times \frac{45}{2} = 67.5^\circ$

$\angle C = 5 \times \frac{45}{2} = 122.5^\circ$

$\angle D = 6 \times \frac{45}{2} = 135^\circ$ (∵ Property of trapezium)

$\angle A + \angle D = 45^\circ + 135^\circ = 180^\circ$

$\angle B + \angle C = 67.5^\circ + 122^\circ = 180^\circ$

Hence, quadrilateral ABCD is trapezium.

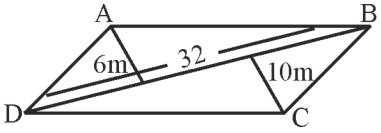
69. The diagonal of a quadrilateral is 32 m long, and its two offsets are 6 m and 10 m long. The area of the quadrilateral is –

(a) 250 m^2 (b) 276 m^2

(c) 256 m^2 (d) 220 m^2

RRB Group-D 22/08/2022 (Shift-I)

Ans. (c) : Let quadrilateral ABCD where DB = 32 m.



area of □ABCD = area of ΔABD + area of ΔBDC

$= \frac{1}{2} \times 32 \times 6 + \frac{1}{2} \times 32 \times 10$

$= 96 + 160$

$= 256 \text{m}^2$

70. The measures of three angles of a quadrilateral are given as 110º, 55º and 125º. The measure of its fourth angle is _____.

(a) 60º (b) 90º

(c) 70º (d) 110º

RRB Group-D 19-09-2022 (Shift-III)

Ans. (c) : Given,

Sum of angles of four corners of a quadrilateral = 360

$110^\circ + 55^\circ + n + 125^\circ = 360^\circ$

$290 + n = 360^\circ$

$n = 70^\circ$

Hence, option (c) is the correct.

71. If the angles of a quadrilateral are in the ratio of 4 : 9 : 11 : 12, then the largest of these angles is:

(a) 166º (b) 168º

(c) 120º (d) 72º

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the angle of the quadrilateral be 4x, 9x, 11x and 12x respectively.

Sum of the angles of the quadrilateral = 360º

$4x + 9x + 11x + 12x = 360^\circ$

$36x = 360^\circ$

$x = 10$

Hence the greatest angle of quadrilateral = $12x = 12 \times 10 = 120°$

72. The sum of the angles of a quadrilateral is ___.

(a) 180º (b) 270º

(c) 90º (d) 360º

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (d) : The sum of all the angles of any quadrilateral is 360º.

73. The angles of a quadrilateral are in the ratio of 5:8:10:13. The smallest of these angles is:

(a) 45º (b) 35º

(c) 55º (d) 50º

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : ∵ Sum of all angles of a quadrilateral = 360º
Let the angle of the quadrilateral be 5x, 8x, 10x, 13x respectively.

$5x + 8x + 10x + 13x = 360º$

$36x = 360º$

$x = 10$

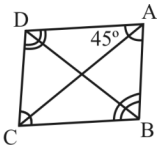
So the smallest angle $= 5x = 5 \times 10 = 50º$

74. The diagonals of a quadrilateral ABCD bisect each other. In this quadrilateral, if ∠A = 45º then ∠B = ?

(a) 120º (b) 135º
(c) 125º (d) 115º

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (b) :



As the diagonals divided equally, hence ABCD is a parallelogram

$\angle A + \angle B = 180º$

$45º + \angle B = 180º$

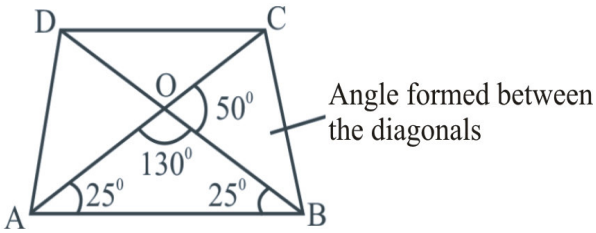
$\angle B = 180º - 45º = 135º$

75. The diagonals of a quadrilateral are inclined 25° on one side of the quadrilateral. The acute angle to be drawn between the diagonals will be–

(a) 40° (b) 50°
(c) 55° (d) 25°

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (b)



In ΔAOB

$\angle A + \angle B + \angle O = 180°$

$25° + 25° + \angle O = 180°$

Obtuse angle $\angle AOB = 180° - 50° = 130°$

Acute angle $(\angle COB) = 180° - 130°$

$= 50°$

Therefore, the angle formed between the diagonals will be an acute angle of 50º.

76. The ratio of four angles of a quadrilateral is 3:4:5:6. What will be the value of smallest angle?

(a) 49° (b) 60°
(c) 45° (d) 36°

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (b) : Let four interior angles of quadrilateral are 3x, 4x, 5x, 6x respectively

Sum of four interior angles of quadrilateral = 360°

$3x+4x+5x+6x = 360°$

$18x = 360°$

$x = 20°$

So, smallest angle $3x = 3 \times 20$

$= 60°$

77. The values of two adjacent angles of a quadrilateral are 125° and 35° and the other two angles are equal. Find the value of equal angles.

(a) 90° (b) 100°
(c) 135° (d) 80°

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (b) ∵ Sum of all interior angles of quadrilateral = 360°

Two angles of quadrilateral are equal

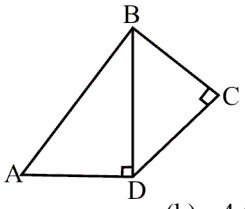
Let each of them = x°

∴ $125° + 35° + x° + x° = 360°$

$2x° = 360° - 160°$

$x = 100°$

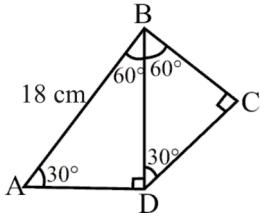
78. In the given figure ∠BAD = 30⁰, ∠DBC = 60⁰ If the length of $\overline{AB}$ is 18 cm, find the length of $\overline{BC}$ –



(a) 7.5cm (b) 4.5cm
(c) 9cm (d) 6cm

RRB Group-D – 12/12/2018 (Shift-I)

Ans. (b)



From ΔABD,

$$\frac{AB}{\sin 90°} = \frac{BD}{\sin 30°}$$

$$BD = \frac{AB}{2} = \frac{18}{2}$$

BD = 9 cm

From ΔBDC,

$$\frac{BD}{\sin 90°} = \frac{BC}{\sin 30°}$$

$$BC = \frac{1}{2} \times BD = \frac{1}{2} \times 9$$

BC = 4.5 cm

79. The value of each of the three acute angles of a quadrilateral is 82°. Find the value of the fourth angle.

(a) 125° (b) 114°
(c) 120° (d) 100°

RRB Group-D – 25/10/2018 (Shift-II)

Ans : (b) Let the value of fourth angle $= x°$
$\because$ Sum of four interior angles of quadrilateral $= 360°$
$\therefore$ $x + 82° + 82° + 82° = 360°$
$x = 360° - 246° = 114°$

80. Three angles of a quadrilateral are same, and the value of the fourth angle is 150°. What is the value of each of the same angles?

(a) 75° (b) 90°
(c) 80° (d) 70°

RRB Group-D – 08/10/2018 (Shift-I)

Ans. (d) : Sum of four angles of quadrilateral is 360°
Given-
Fourth angle $=$ 150°
Sum of other three angles $= 360°–150° = 210°$
Hence, the value of each angle $= \frac{210°}{3} = 70°$

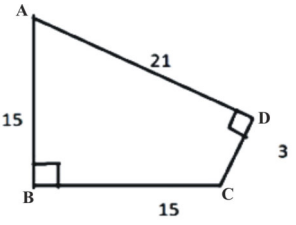
81. The value of each of the two angles of a quadrilateral is 65°. The other two angles are also equal. Find the value of these angles.

(a) 100^0 (b) 115^0
(c) 125^0 (d) 105^0

RRB Group-D – 03/10/2018 (Shift-II)

Ans : (b) Sum of four angles of any quadrilateral is 360°
Let these angle = x°
Then $65^0 + 65^0 + x^0 + x^0 = 360°$
$2x^0 = 360°–130°$
$\boxed{x = 115^0}$
Hence, the value of each of the remaining angles $= 115^0$

82. Find the area of the quadrilateral shown in the following figure (underlined is not measured).



(a) 144 (b) 54
(c) 63 (d) 123

RRB Group-D – 10/10/2018 (Shift-III)

Ans : (a)
Area of quadrilaterals ABCD = area of ΔABC + area of ΔADC.

$\frac{1}{2} \times AB \times BC + \frac{1}{2} \times CD \times DA$

$\left(\frac{1}{2} \times 15 \times 15 + \frac{1}{2} \times 3 \times 21\right)$

$= \frac{1}{2}(15 \times 15 + 3 \times 21) = \frac{1}{2}(225 + 63) = \frac{288}{2}$

$\boxed{= 144}$

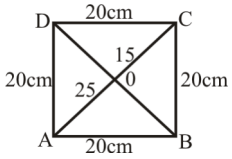
Type - 3

83. The length of each side of a rhombus is 20 cm, and the length of one of its diagonal is 30 cm. Find the length (in cm) of its other diagonal.

(a) $\sqrt{7}$ (b) $6\sqrt{7}$
(c) $\sqrt{175}$ (d) $10\sqrt{7}$

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (d) :



In ΔAOB–
$AB^2 = AO^2 + OB^2$
$20^2 = 15^2 + OB^2$
$OB^2 = 400 – 225$
$OB^2 = 175$
$OB = \sqrt{25 \times 7} = 5\sqrt{7}$
Hence, length of second diagonal $= 2 \times OB$
$= 2 \times 5\sqrt{7}$
$= 10\sqrt{7}$ cm

84. The diagonals of a rhombus shaped field are 96 m and 110 m long. What is the perimeter (in m) of the filed?

(a) 296 (b) 292
(c) 288 (d) 300

RRB Group-D 08/09/2022 (Shift-II)

Ans. (b) : Diagonal $d_1 = 98$ m, $d_2 = 110$ m

Side of rhombus (a) $= \sqrt{\left(\frac{d_1}{2}\right)^2 + \left(\frac{d_2}{2}\right)^2}$

$= \sqrt{\left(\frac{96}{2}\right)^2 + \left(\frac{110}{2}\right)^2}$

$= \sqrt{(48)^2 + (55)^2}$

$= \sqrt{2304 + 3025}$

$= 73$ m

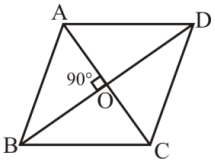
Perimeter of rhombus = 4a
$= 4 \times 73$
$= 292$ m

85. Find the perimeter of a rhombus whose diagonals are of lengths 5 cm and 12 cm.

(a) 24 cm (b) 25 cm
(c) 26 cm (d) 20 cm

RRB Group-D 30/08/2022 (Shift-I)

Ans. (c) :



AC = 5 cm, BD = 12 cm

$OA = \frac{5}{2}$ cm $OB = \frac{12}{2}$ cm

In right angled (ΔAOB)

$AB = \sqrt{OA^2 + OB^2}$

$= \sqrt{\frac{25}{4} + \frac{144}{4}} = \frac{13}{2}$

Perimeter of rhombus $= 4 \times \frac{13}{2}$

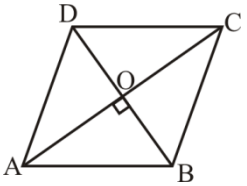
$= 26$ cm

86. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. The length of the side of the rhombus is:

(a) 10 cm (b) 8 cm
(c) 9 cm (d) 20 cm

RRB Group-D 05/09/2022 (Shift-II)

Ans. (a) :



AC = 16 cm, BD = 12 cm

$OA = \frac{16}{2}$ $OB = \frac{12}{2}$

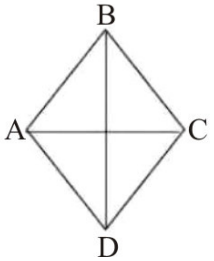
= 8 cm = 6 cm

In right angled ΔAOB

$AB = \sqrt{8^2 + 6^2}$

$= \boxed{10 \text{ cm}}$

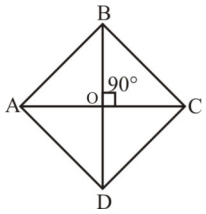
87. In rhombus ABCD ∠ACB = 50° then the value of ∠BDC



(a) 40° (b) 50°
(c) 55° (d) 60°

RRB Group-D 08/09/2022 (Shift-III)

Ans. (a) :



∠ACB = 50°

Since the diagonals of rhombus perpendicular to bisect each other

∠BOC = 90°

∠OBC = 180° – (90° + 50°)

∠OBC = 40°

∠BDC = 40°

88. The adjacent angles of a rhombus are in the ratio of 3 : 6. The smallest angle of the rhombus is:

(a) 40° (b) 120°
(c) 60° (d) 80°

RRB NTPC 28.12.2020 (Shift-I) Stage Ist

Ans. (c) : Let adjacent angles of rhombus be 3x° & 6x°

Now, sum of adjacent angles of Rhombus = 180°

$\therefore 3x° + 6x° = 180°$

$9x° = 180°$

$x° = 20°$

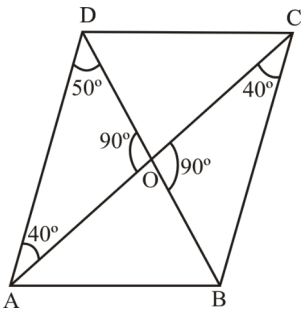
The smallest angle $= 3 \times 20 = 60°$

89. In a rhombus ABCD, if ∠ACB = 40°, then ∠ADB = ?

(a) 50° (b) 70°
(c) 60° (d) 45°

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (a) :



The diagonals of rhombus bisect each other at right angle (90°).

∠AOD = 90°

∠ACB = ∠DAO = 40° [Transversal line AC cuts AD|| BC]

In ΔDAO

$\angle AOD + \angle OAD + \angle ADO = 180^0$

$90^0 + 40^0 + \angle ADO = 180^0$

$\angle ADO = 180^0 - 130^0$

$\boxed{\angle ADB = 50^0}$ $\{\because \angle ADO = \angle ADB\}$

90. All four angles of a quadrilateral are the same. Find their values?

(a) 110° (b) 80°

(c) 75° (d) 90°

RRB Group-D – 09/10/2018 (Shift-I)

RRB RPF SI – 12/01/2019 (Shift-I)

Ans. (d) : Sum of four angles of quadrilateral = 360°

$\therefore$ Each angle $= \frac{360°}{4} = 90°$

91. The length of one side of a rhombus is 12 cm and the length of one of its diagonals is also 12 cm. The length of second diagonal will be _ cm.

(a) $12\sqrt{3}$ (b) $6\sqrt{3}$

(c) 24 (d) $9\sqrt{3}$

RRB RPF SI – 10/01/2019 (Shift-I)

Ans : (a) Let second diagonal of rhombus is d_2

Side (a) of rhombus $= \frac{1}{2}\sqrt{d_1^2 + d_2^2}$

Where d_1 & d_2 is diagonal of rhombus

$12 = \frac{1}{2}\sqrt{12^2 + d_2^2}$

$12 \times 2 = \sqrt{12^2 + d_2^2}$

Squaring on both sides

$(24)^2 = 12^2 + d_2^2$

$d_2^2 = (24)^2 - (12)^2$

$= (24 + 12)(24 - 12)$

$= 36 \times 12 = 432$

$\therefore$ $d_2 = 12\sqrt{3}$cm.

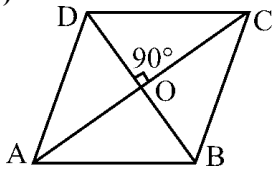
92. The length of one side of a rhombus is $\frac{17}{3}$ cm and its one diagonal is $\frac{16}{3}$ cm. Find the length of second diagonal.

(a) $\frac{20}{3}$ cm (b) $\frac{32}{3}$ cm

(c) 10 cm (d) $\frac{16}{3}$cm

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (c)



Side of rhombus $= \frac{17}{3}$cm

First diagonal $AC = \frac{16}{3}$cm

$\because$ AO = OC and BO = OD

$\therefore$ $AO = OC = \frac{AC}{2}$

$= \frac{16}{3} \Big/ 2$

$AO = \frac{8}{3}$cm

ΔAOB in, $AB^2 = AO^2 + BO^2$

$BO = \sqrt{AB^2 - AO^2}$

$= \sqrt{\left(\frac{17}{3}\right)^2 - \left(\frac{8}{3}\right)^2}$

$= \sqrt{\frac{289}{9} - \frac{64}{9}}$

$= \sqrt{\frac{225}{9}}$

$= \frac{15}{3}$

BO = 5

So OB = OD = 5 cm

Second diagonal BD = BO + OD = 5 + 5 = 10 cm

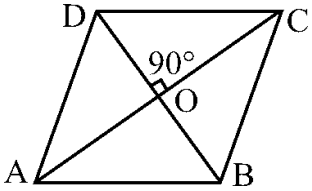
93. The length of the side of rhombus is $\sqrt{5}$ cm and it's area is 4 cm^2. What will be the sum of the lengths of its diagonals?

(a) 5 cm (b) 6 cm

(c) 8 cm (d) 7 cm

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (b)



AB = 5 cm

In ABCD,

First diagonal = AC

Second diagonal = BD

$4AB^2 = AC^2 + BD^2$

$4 \times \sqrt{5^2} = AC^2 + BD^2$

$20 = AC^2 + BD^2$

$\therefore$ Area of rhombus $= \frac{1}{2} \times AC \times BD = 4$

$AC \times BD = 8$

$(AC + BD)^2 = AC^2 + BD^2 + 2AC \times BD$

$= 20 + 2 \times 8$

$= 36$

$\therefore$ (AC + BD) = 6 cm.

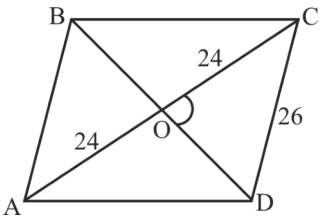
94. The length of one side of a rhombus is 26 cm and the length of one diagonal is 48 cm, then what will be the length of the second diagonal?

(a) 24 cm (b) 20 cm

(c) 25 cm (d) 22 cm

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b)



$(OD)^2 = (CD)^2 - (OC)^2$ (From pythagoras theorem)

$(OD)^2 = (26)^2 - (24)^2$

$(OD)^2 = 676 - 576$

$(OD)^2 = 100$

OD = 10 cm

Diagonal BD = OB + OD $\{\because$ OB = OD$\}$

BD = 20 cm

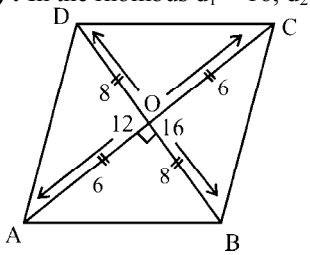
95. The length of diagonals of a rhombus are 16 cm and 12 cm. What is the perimeter of the rhombus?

(a) 56 cm (b) 20 cm

(c) 28 cm (d) 40 cm

RRB Group-D – 06/12/2018 (Shift-II)

Ans. (d) : In the rhombus $d_1 = 16$, $d_2 = 12$ perimeter = ?



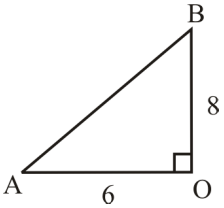
Diagonals of rhombus bisect each other at right angles.

AO = OC

BO = OD

$\angle AOB = \angle BOC = \angle COD = \angle DOA = 90°$

Sides of rhombus AB,



$AB^2 = AO^2 + BO^2$

$AB^2 = 6^2 + 8^2$

$AB^2 = 100$

AB = 10

Perimeter of rhombus = 4a

= 4 × 10

= 40 cm

96. The length of one side of a rhombus is 4 cm and length of one diagonal is 6 cm. The length of second diagonal wil be ___cm.

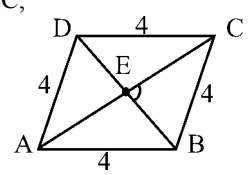
(a) $\sqrt{14}$ (b) $\frac{\sqrt{14}}{2}$

(c) $\sqrt{7}$ (d) $2\sqrt{7}$

RRB Group-D – 16/11/2018 (Shift-I)

Ans. (d) In a rhombus, all sides are equal and diagonals of rhombus bisect each other at right angles.

In ΔBEC,



$BC^2 = CE^2 + EB^2$ $\left[BE = \frac{BD}{2} \Rightarrow BD = 3\right]$

$4^2 = CE^2 + 3^2$

$CE = \sqrt{7}$

$CA = 2 \times CE$

$CA = 2 \times \sqrt{7}$

$CA = 2\sqrt{7}$

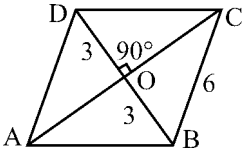
97. The length of one side of rhombus and one of the two diagonals is 6 m. The area of rhombus is _____ cm^2.

(a) 18 (b) $9\sqrt{3}$

(c) $27\sqrt{3}$ (d) $18\sqrt{3}$

RRB Group-D – 18/09/2018 (Shift-I)

Ans. (d) :



According to the figure,

In ΔOBC

$(OC)^2 = (BC)^2 - (OB)^2$

$(OC)^2 = (6)^2 - (3)^2$ (from phythagoras theorem)

$(OC) = 3\sqrt{3}$

Area of $\Delta OBC = \frac{1}{2} \times 3 \times 3\sqrt{3} = \frac{9\sqrt{3}}{2} cm^2$

Area of rhombus ABCD = 4 × area of ΔOBC

$= 4 \times \frac{9\sqrt{3}}{2} cm^2$

$= 18\sqrt{3} cm^2$

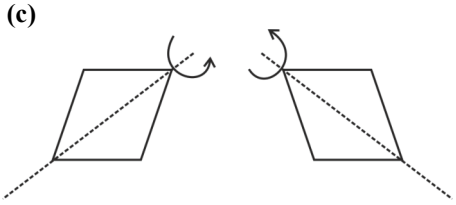
98. The order of rotational symmetry of a rhombus is–

(a) 1 (b) 4

(c) 2 (d) 0

RRB NTPC 22.04.2016 Shift : 2

Ans : (c)



Hence the rotational symmetry will be 2.

Type - 4

99. Find the area of the parallelogram whose base is 15 cm and the corresponding height is 6 cm.

(a) 80 cm^2 (b) 45 cm^2
(c) 90 cm^2 (d) 60 cm^2

RRB Group-D 24-08-2022 (Shift-I)

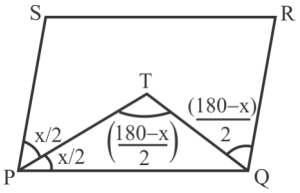
Ans. (c) : Area of parallelogram = base × height
= 15 × 6
= 90 cm^2

100. In a parallelogram PQRS, the bisectors of consecutive angles of P and Q interest at T. What is the measure ∠PTQ ?

(a) 80º (b) 90º
(c) 70º (d) 50º

RRB Group-D 30-08-2022 (Shift-III)

Ans. (b) : According to the question,

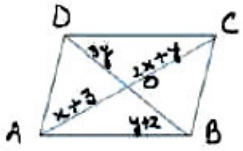


In ΔPTQ,

$$\angle PTQ = 180 - \left(\frac{x}{2} + \frac{(180 - x)}{2}\right)$$

$\angle PTQ = 180 - 90^\circ$
$\angle PTQ = 90^\circ$

101. Find x if ABCD is a parallelogram as given in figure below, with two diagrams AC and BD interesting at O and OA = x + 3, OB = y + 2, OC = 2x + y, OD = 3y



(a) 2 (b) 3
(c) 4 (d) 1

RRB GROUP-D – 17/08/2022 (Shift-I)

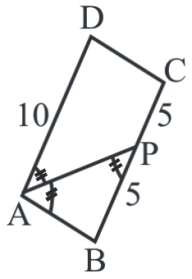
Ans. (a) : Diagonals of a parallelogram based equally each other
∴ AO = OC
∴ x + 3 = 2x + y
∴ x + y = 3 _____ (i)
Again DO = OB
∴ 3y = y + 2
or 3y – y = 2
2y = 2
y = 1
∴ from equation (i)
x + 1 = 3
x = 2

102. P is the mid-point of side BC of a parallelogram ABCD such that ∠BAP = ∠DAP. If AD = 10 cm, then CD = ?

(a) 5 cm (b) 6 cm
(c) 10 cm (d) 8 cm

RRB NTPC 15.02.2021 (Shift-II) Stage Ist

Ans. (a) : $BP = PC = \frac{AD}{2} = \frac{10}{2} = 5$
$\angle BAP = \angle DAP$ (Given)



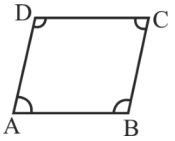
$\angle DAP = \angle BPA$ (AD ∥ BC, alternate angle)
Hence $\angle BAP = \angle BPA$
AB=BP (If two angles of a triangle are equal then sides opposite to them are also equal)
Hence AB = CD = 5cm

103. If one angle of a parallelogram is 28º less than thrice the smallest angle, then the largest angle of the parallelogram is:

(a) 122º (b) 126º
(c) 128º (d) 124º

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (c) ∵ $\angle A + \angle B + \angle C + \angle D = 360^\circ$



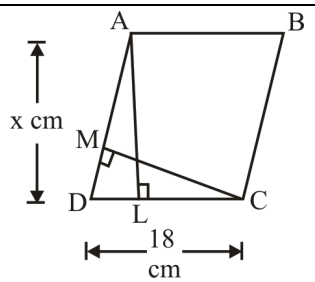
Let the smallest angle of the parallelogram be x.
According to the question, one angle must be -
= 3x – 28º
∵ ∠A = ∠C And ∠B = ∠D
So, x + x + 3x – 28º + 3x– 28º = 360º
8x = 360º+56º
x = 52º
Hence, the greatest angle of a parallelogram = 3×52–28º = 128º

104. In the parallelogram ABCD, AL and CM are perpendicular to CD and AD respectively. AL = 20 cm, CD = 18 cm and CM = 15 cm. The perimeter of the parallelogram is:

(a) 84 cm (b) 80 cm
(c) 64 cm (d) 76 cm

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (a) : Given,
In the parallelogram ABCD,
AL ⊥ CD
And CM ⊥ AD
AL = 20 cm
CD = 18 cm
CM = 15 cm



In a parallelogram, the opposite sides are equal.

AD = BC

and AB = CD

Area of parallelogram = Base × Height

AD × CM = CD × AL

x × 15 = 18 × 20

x = 24 cm

Perimeter of the parallelogram

(ABCD) = AB + BC + CD + AD

= 2 (AD + CD)

= 2 (24 + 18)

= 2 × 42

= 84 cm

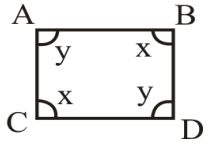
105. If one angle of a parallelogram is 39º less than twice the smallest angle, then the smallest angle of the parallelogram is:

(a) 72^0 (b) 75^0

(c) 74^0 (d) 73^0

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (d) : The opposite angles of a parallelogram are equal.



$\angle ACD = \angle ABD = x$

$\angle BAC = \angle BDC = y$

Then, According to the question,

Let the smallest angle is x

$y = 2x - 39^0$ ……(i)

By quadrilateral rule–

$x + y + x + y = 360^0$

$2x + 2y = 360^0$

$2(x + y) = 360^0$

$x + y = 180^0$ ..... (ii)

On putting the value of y from eq^n (i) to eq^n (ii)

$x + (2x - 39^0) = 180^0$

$3x = 180^0 + 39^0$

$x = \frac{219^0}{3} = 73^0$

Hence the smallest angle of parallelogram (x) = 73°

106. If one angle of a parallelogram is 48º less than twice the smallest angle, then the measure of the largest angle of the parallelogram will be.

(a) 128^0 (b) 140^0

(c) 120^0 (d) 104^0

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the smallest and the largest angle of parallelogram be x and y respectively.

Then x + y = 180° …(i)

As per the question

2x – 48 = y

On putting the value of y = 180° – x (from equation (i))

2x – 48° = 180° – x

3x = 180° + 48° = 228°

$x = \frac{228°}{3} = 76°$

Hence, the largest angle (y) = 180° – 76° = 104°

107. The Sum of the consecutive angles of a parallelogram is equal to:

(a) 90^0 (b) 120^0

(c) 180^0 (d) 360^0

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : The sum of consecutive angles of a parallelogram is equal to 180º.

108. ABCD is a parallelogram in which $\angle A = x + 20º$ and $\angle C = 3x - 10º$. The value of x is _____.

(a) 40° (b) 30°

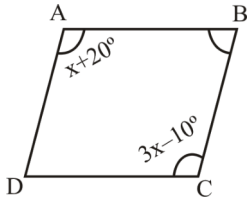
(c) 15° (d) 60°

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : The opposite angles of a parallelogram are equal i.e.

$\angle A = \angle C$

$\angle B = \angle D$



$x + 20º = 3x - 10º$

$2x = 30º$

$x = 15º$

109. The sides of a parallelogram are 3x + 2 and 5x + 4. It has a perimeter of 44 cm and an area of 64 cm^2. The value of the acute angle between its sides in degrees is:

(a) Between 60º and 75º

(b) Less than 30º

(c) Between 30º and 60º

(d) Greater than 75º

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : Perimeter of parallelogram=2(3x+2) + 2(5x+4)

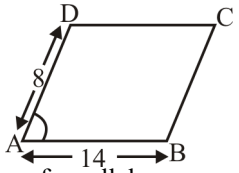
$\Rightarrow 16x + 12 = 44$

$16x = 32$

$x = 2$

Hence the adjacent sides = 3x + 2, 5x + 4

= 8 cm, 14 cm



Given that the area of parallelogram = 64 cm^2

$ab \sin\theta = 64$

$8 \times 14 \sin\theta = 64$

$$\sin\theta = \frac{4}{7} = 0.571$$

$$\sin 30° = \frac{1}{2} < \sin\theta = \frac{4}{7} < \sin 60° = \frac{\sqrt{3}}{2}$$

Acute angle $= 30° < \theta < 60°$

Hence, option (c) will be true.

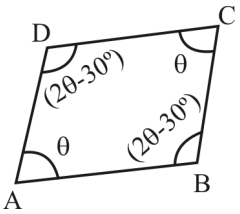
110. If one angle of a parallelogram is 30º less than twice the measure of the smallest angle, then the measure of the largest angle of the parallelogram is

(a) 120º (b) 110º

(c) 105º (d) 90º

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (b)



Let the smallest angle of parallelogram = θ

Then the largest angle = 2θ–30°

Hence, in the parallelogram

$\theta + 2\theta - 30° = 180°$

$3\theta = 210°$

$\theta = 70°$

Value of the largest angle $= 2\theta - 30° = 2 \times 70° - 30°$

$= 110°$

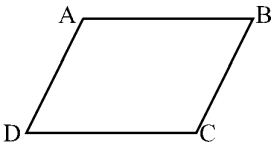
111. In a parallelogram ABCD, ∠A = (3x-25)° and ∠C = (2x+15)°, In which angle A and angle C are opposite to angle. Find the angle A–

(a) 105° (b) 85°

(c) 95° (d) 115°

RRB RPF SI – 13/01/2019 (Shift-II)

Ans : (c)



Given,

∠A = (3x–25)°

∠C = (2x+15) °

∠A = ∠C

[Opposite angles of a parallelogram are equal]

(3x –25)° = (2x+15)°

x = 40°

∠A = (3x – 25)° = 120 – 25 = 95°

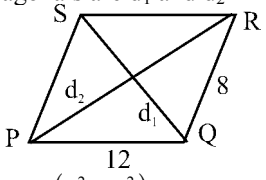
112. A parallel quadrilateral PQRS with lengths of sides 8 cm and 12 cm has a diagonal 10 cm long. The second diagonal is approximately.

(a) 18 cm (b) 17.8 cm

(c) 17 cm (d) 17.5 cm

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (b) If the adjacent sides of a parallelogram are a and b and the diagonals are d_1 and d_2 -



$$d_1^2 + d_2^2 = 2\left(a^2 + b^2\right)$$

Given, a = 12cm, b = 8cm, d_1 = 10cm

$$\therefore d_2^2 = 2\left(12^2 + 8^2\right) - 10^2$$

$= 2 \times (144 + 64) - 100 = 2 \times 208 - 100$

$= 416 - 100 = 316$

$\therefore d_2 = \sqrt{316} = 17.8$ cm

113. The smallest side of a parallelogram is 4.8 cm and the largest side is 1.5 times to the smallest side. Find the circumference of a parallelogram.

(a) 48 cm (b) 36 cm

(c) 24 cm (d) 72 cm

RRB Group-D – 23/10/2018 (Shift-II)

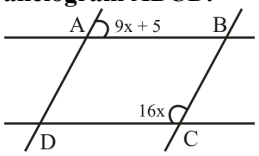
Ans. (c) : Smallest sides of parallelogram =4.8cm

Largest sides of parallelogram = 4.8 × 1.5 = 7.20 cm

So circumference of Parallelogram = 2(small side + large side)

= 2 × (4.8 + 7.2) = 2 × 12.0 = 24 cm

114. Find the value (in degrees) of angle ABC in the given parallelogram ABCD.



(a) 112° (b) 102°

(c) 78° (d) 68°

RRB Group-D – 11/10/2018 (Shift-I)

Ans : (d) ∠D = 9x + 5 (Corresponding angles)

Then $9x + 5 + 16x = 180°$

(∴ sum of adjacent angles is 180° in parallelogram)

$\Rightarrow 25x = 180° - 5° \Rightarrow 25x = 175° \Rightarrow x = \frac{175°}{25}$

$\Rightarrow x = 7$

Then $16x = 16 \times 7 = 112°$

According to the question,

$16x + \angle ABC = 180°$

$\Rightarrow 112 + \angle ABC = 180°$

$\Rightarrow \angle ABC = 180° - 112°$

$\angle ABC = 68°$

115. The order of rotational symmetry of a parallelogram is:

(a) 1 (b) 4

(c) 2 (d) 0

RRB NTPC 26.04.2016 Shift : 2

Ans : (c) The order of rotational symmetry of a Parallelogram is 2.

Type - 5

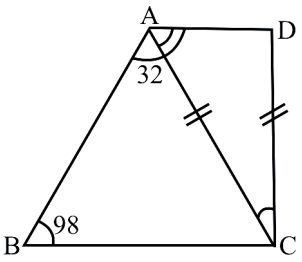
116. ABCD is a trapezium in which AC || CD. If ∠ABC = 98° and ∠BAC = 32°, what is the measure of ∠ACD?

(a) 80^0 (b) 75^0

(c) 65^0 (d) 70^0

RRB Group-D 05/09/2022 (Shift-III)

Ans. (a) :



AC = CD

Hence, ∠D = ∠A

∠ABC + ∠BAC + ∠CAD = 180

90 + 32 + ∠CAD = 180

∠CAD = 50

Again, ∠ACD + ∠CAD + ∠CDA = 180

50 + 50 + ∠ADC = 180

∠ADC = 80°

117. An object is in the form of a trapezium with height 5 m and parallel sides being 4 m and 6 m. What is the cost of painting the object if the rate of painting is ₹50 per square meter.

(a) ₹1,200 (b) ₹1,000

(c) ₹800 (d) ₹1,250

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (d) :

Area of trapezium $= \frac{1}{2} \times$ Sum of parallel sides × Height

$= \frac{1}{2} \times (4+6) \times 5 = 25\ m^2.$

Total outlay in painting = 25 × 50

= ₹ 1250

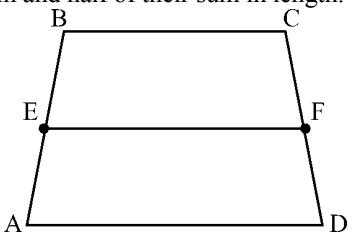
118. If in a trapezium ABCD, E and F are the midpoints of the two transverse sides AB and CD, then FE = ?

(a) $\frac{2}{3}(AB - CD)$ (b) $\frac{1}{2}(AD + BC)$

(c) $\frac{\sqrt{3}}{2}(AB + CD)$ (d) $\sqrt{3}(AB + CD)$

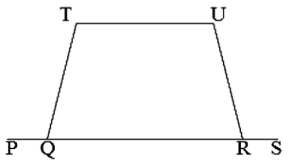
RRB Group-D – 19/09/2018 (Shift-III)

Ans. (b) : In any trapezium, the line joining the midpoint of the asymmetric sides is parallel to the parallel sides of the trapezium and half of their sum in length.



$FE = \frac{1}{2}(AD + BC)$

119. In the given diagram, TU||PS and points Q and R are located on PS also ∠PQT = x°, ∠RQT = (x - 50)° and ∠TUR = (x + 25)°. What is the meassure of ∠URS



(a) 130° (b) 115°

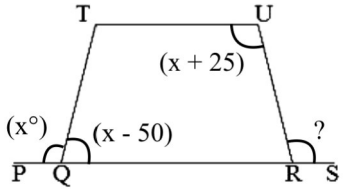
(c) 140° (d) 135°

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (c) : Given– TU||PS

∠PQT = x°, ∠RQT = (x - 50)°

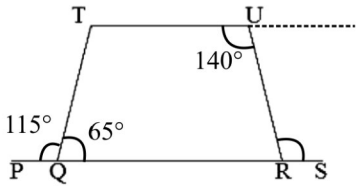
∠TUR = (x + 25)° ∠URS = ?



x + x – 50 = 180°

2x = 230

$\boxed{x = 115°}$



Alternate angle ∠TUR = ∠URS

∠URS = 140°

120. Trapezium is a quadrilateral whose:

(a) All sides are equal.

(b) Opposite sides are equal.

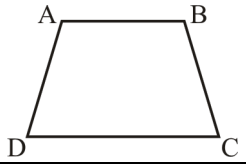
(c) Two pairs of parallel opposite sides are.

(d) One pair of parallel opposite sides is.

RRB NTPC 28.03.2016 Shift : 3

Ans : (d) Trapezium is a quadrilateral with a pair of parallel opposite sides.

AB || DC



121. The order of rotational symmetry of a trapezium is.

(a) 2 (b) 0

(c) 1 (d) 3

RRB NTPC 11.04.2016 Shift : 2

Ans : (c) The rotational symmetry of a trapezium is one order.

Note : If a shape is partially rotated, If the shape looks the same even after rotating, then this property is called rotatary symmetry.

Type - 6

122. In a circle AB and CD are produced to meet at E outside the circle. If AB = 9 cm and AE = 12 cm and ED = 4 cm, then what is the length of the chord CD?

(a) 5.5 cm (b) 4 cm

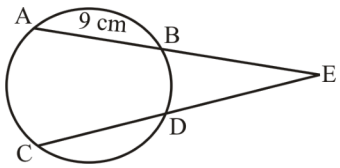
(c) 5 cm (d) 4.5 cm

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (c) : Given,

AB = 9 cm, AE = 12 cm.

ED = 4 cm.



$\therefore$ BE = AE – AB

= 12 – 9 = 3 cm.

$\because$ BE × AE = ED × CE

3 × 12 = 4 × CE

CE = 9 cm

$\therefore$ CD = CE – ED

= 9 – 4

= 5 cm.

123. Two chords AB and CD of a circle intersect at a point F outside the circle.

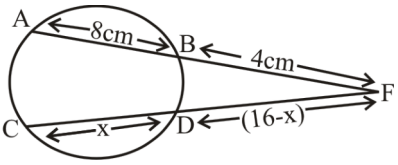
If AF = 12 cm, BF = 4 cm and CF = 16 cm, find the length of CD.

(a) 13 cm (b) 12 cm

(c) 11 cm (d) 10 cm

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (a) :



By theorem,

If two chords AB and CD of a circle are intersect at a point F to outside the circle them,

AF×BF = CF×DF

12×4 = 16×(16–x)

3 = 16 – x

x = 13 cm

Hence, length of CD = 13cm.

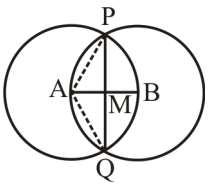
124. Two equal circles, each having a radius of 24 cm, intersect each other, such that each passes through the center of the other. The length of the common chord is ____cm.

(a) $36\sqrt{3}$ (b) $24\sqrt{3}$

(c) $36\sqrt{2}$ (d) $30\sqrt{3}$

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) :



In ΔPAM,

$AP^2 = PM^2+AM^2$

$(24)^2 = PM^2+(12)^2$

$PM^2 = 24^2 – 12^2$

$PM = 12\sqrt{3}$ cm

$\therefore$ $PQ = 24\sqrt{3}$ cm

125. The perimeter of a circle whose radius is 15 cm is:

(a) 50 π cm (b) 40 π cm

(c) 20 π cm (d) 30 π cm

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (d) : r = 15 cm

The perimeter of a circle = 2πr

= 2π × 15

= 30π

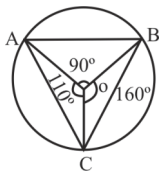
126. A, B & C are the points on a circle in such a manner that chord AB and AC make angle of 90º & 110º respectively with centre O and ∠BAC > ∠BAO then find the value of ∠BAC.

(a) 55º (b) 45º

(c) 100º (d) 80º

RRB NTPC 26.07.2021 (Shift-II) Stage Ist

Ans. (d) : Given-



$\angle AOB = 90^\circ$

$\angle AOC = 110^\circ$

$\because$ The sum of angles at the centre of circle $= 360^\circ$

$\therefore \angle AOB + \angle AOC + \angle BOC = 360^\circ$

$90^\circ + 110^\circ + \angle BOC = 360^\circ$

$\angle BOC = 360^\circ - 200^\circ = 160^\circ$

$$\angle BAC = \frac{\angle BOC}{2} = \frac{160}{2} = 80^\circ$$

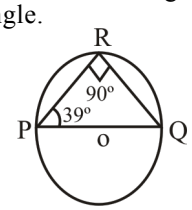
127. PQ is the diameter of a circle whose center is O. If a point R lies on the circle and ∠RPO is 39º, then what will be the measure of ∠RQP?

(a) 125º (b) 51º

(c) 129º (d) 151º

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (b) : We know that the angle formed in a semi circle is a right angle.



So, $\angle PRQ = 90^\circ$

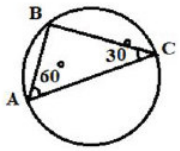
Then, $\angle PRQ + \angle RPQ + \angle RQP = 180^\circ$

$90^\circ + 39^\circ + \angle RQP = 180^\circ$

$\angle RQP = 180^\circ - 129^\circ$

So, $\angle RQP = 51^\circ$

128. In the given picture, A, B and C are three points on a circle. If AB = 3 cm and BC = 4 cm then find the measure of the radius of the circle.



(a) 5 cm (b) $\frac{5}{2}$ cm

(c) $\frac{7}{2}$ cm (d) 3 cm

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (b) : ΔABC is a right angled triangle.

Given - AB = 3cm

BC = 4cm

From Pythagoras theorem-

$AC^2 = AB^2 + CB^2$

$AC^2 = 3^2 + 4^2$

$AC^2 = 9 + 16$

$AC^2 = 25$

$AC = 5$

Hence radius of the circle $= \frac{AC}{2} = \frac{5}{2}$ cm

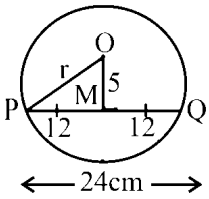
129. A chord of length 24 cm is at a distance of 5 cm from the centre of a circle. The radius of the circle is _____ cm.

(a) 13 (b) 10

(c) 12 (d) 14

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (a) :



In the right angled triangle PMO from Pythagoras theorem,

$PM^2 + OM^2 = OP^2$

$(12)^2 + (5)^2 = r^2$

$144 + 25 = r^2$

$r^2 = 169$

$\boxed{r = 13\,cm}$

130. Point A, B and C lie on a circle with centre O. If ∠ACB = 46.5º then find the measure of the ∠AOB on the minor $\overset{\frown}{AB}$.

(a) 90º (b) 93º

(c) 94º (d) 92º

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

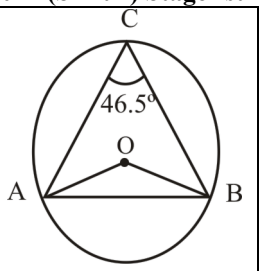
Ans. (b) : According to the question–

$\angle AOB = 2 \times \angle ACB$

$\because$ The angle at the centre is twice of the angle at the circumference subtended in same segment.

$\therefore \angle AOB = 2 \times 46.5$

$\angle AOB = 93^\circ$



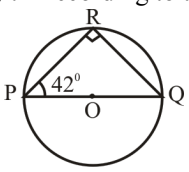
131. PQ is a diameter of circle whose centre is O. If a point R lies on a circle and ∠RPO is 42°, then find ∠RQP.

(a) 48° (b) 39°

(c) 25° (d) 51°

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,



Given, $\angle RPO = 42^\circ$

$\because$ Angle subtended in a semicircle is a right angle.

Hence, $\angle PRQ = 90^\circ$

In Δ PQR,

$\angle PRQ + \angle RQP + \angle QPR = 180^\circ$

$90^\circ + \angle RQP + 42^\circ = 180^\circ$

$\angle RQP = 180^\circ - 132^\circ$

$\therefore \angle RQP = 48^\circ$

132. The radius of the circle in which a central angle of 60° intercepts an arc of length 35 cm is:

(a) 35π cm (b) $\frac{35}{\pi}$cm

(c) $\frac{105}{\pi}$cm (d) $\frac{100}{\pi}$cm

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : Length of arc = 35 cm

$$\theta = 60^{o} = \frac{\pi}{180} \times 60 = \left(\frac{\pi}{3}\right)^{o}$$

$$\theta = \frac{l}{r}$$

$$\frac{\pi}{3} = \frac{35}{r}$$

$$\boxed{r = \frac{105}{\pi}\text{cm}}$$

133. Find the degree measure of an angle subtended at the centre of a circle of radius 28 cm by an arc of length 22 cm.

(a) 55º (b) 40º

(c) 45º (d) 50º

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (c) : $\ell = 2\pi r \times \frac{\theta}{360^{o}}$

$$22 = 2 \times \frac{22}{7} \times 28 \times \frac{\theta}{360^{o}}$$

$$\theta = \frac{360^{o}}{8} = 45^{o}$$

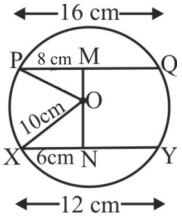
134. A circle of radius 10 cm has XY and PQ parallel chords of 12 cm and 16 cm each. Both the chords are at opposite from centre. Find the distance between chords ?

(a) 18 cm (b) 12.8 cm

(c) 12 cm (d) 14 cm

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (d) : Let the distance between chords be MN.



From Pythagoras theorem –

$ON^2 = 10^2 - 6^2$

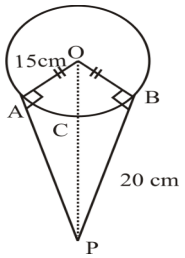
ON = 8 cm

$OM^2 = 10^2 - 8^2$

OM = 6 cm

MN = ON + OM = 8 + 6 = 14 cm

135. In the given figure, if PB = 20 cm and OA = 15 cm, then find the shortest distance between the circle and P

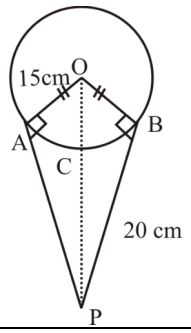


(a) 15 cm (b) 25 cm

(c) 20 cm (d) 10 cm

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) :



OC = OA = OB = 15 cm (radius of same circle)

In right angled triangle POB

$OB^2 + PB^2 = OP^2$ (Pythagoras theorem)

$(15)^2 + (20)^2 = OP^2$

$OP^2 = 225 + 400 = 625$

$OP^2 = (25)^2$

OP = 25

Minimum distance between point P and C in circle

$(PC) = OP - OC$

$= 25 - 15$

$= 10$ cm

136. The angle of a sector is 30º. If its radius is 42 cm, then the length of the arc of the sector is

(a) 32 cm (b) 20 cm

(c) 22 m (d) 22 cm

RRB NTPC 26.07.2021 (Shift-I) Stage Ist

Ans. (d) :

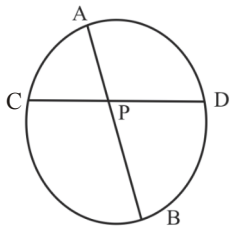
Length of arc $= \frac{\text{Angle made by radius at centre}}{360^{o}} \times 2\pi r$

Where, r = radius of the circle.



Now, length of arc $= \frac{30^{o}}{360^{o}} \times 2 \times \frac{22}{7} \times 42 = 22$ cm.

137. In the given circle, chords AB and CD intersect internally at P. If $\overline{CP} = 3$ cm and $\overline{DP} = 8$ cm and the numerical values of the lengths of $\overline{AP}$ and $\overline{BP}$ are both natural numbers, then which of the following options cannot be the length of $\overline{AB}$?



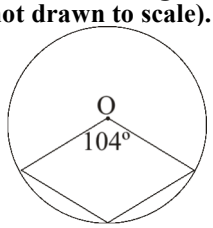
(a) 14 cm (b) 25 cm
(c) 10 cm (d) 20 cm

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (d) : Given-
CP = 3 cm, DP = 8 cm
Let AP = x cm and BP = y cm
AP × BP = CP × DP
x × y = 3 × 8

x × y = 24
(I) On taking x = 24, y = 1
x + y = 24 + 1 = 25
(II) On taking x = 6, y = 4
x + y = 6 + 4 = 10
(III) On taking x = 12, y = 2
x + y = 12 + 2 = 14
Therefore length of AB cann't be 20 cm.

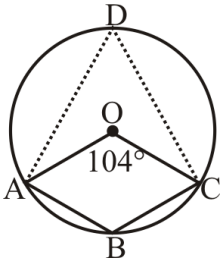
138. In the given circle with center O, the obtuse angle at the center measures 104º. In the quadrilateral drawn inside the circle, what is the measure of the angle opposite to ∠O? (Figure is not drawn to scale).



(a) 124° (b) 132°
(c) 128° (d) 152°

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

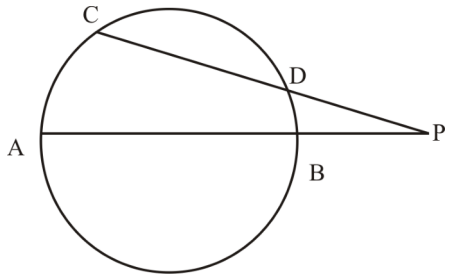
Ans. (c) : Given-



∠AOC = 104°
∠ADC = $\frac{104°}{2}$ = 52° (The angle subtended by the same arc at the center is twice the angle at the circumference)
According to the question-
In cyclic □ABCD -

∠ADC + ∠ABC = 180° (The sum of opposite angles of cyclic quadrilateral is 180º)
52° + ∠ABC = 180°
∠ABC = 180° – 52°
∠ABC = 128°
Therefore, the value of angle opposite to ∠O will be 128°.

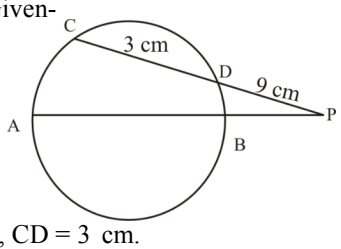
139. In the given circle, diameter AB is extended to meet chord CD extended at P. If the lengths of the line segment AP, CD and DP are 18 cm, 3 cm and 9 cm, respectively, what is the length of the radius of the circle?



(a) 3 cm (b) 9 cm
(c) 12 cm (d) 6 cm

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (d) : Given-



AP = 18 cm, CD = 3 cm.
DP = 9 cm.
Let AB = x cm. (diameter)
BP = (18 – x) cm.
According to the question-
DP × CP = BP × AP
9 × 12 = (18 – x) × 18
(18 – x) = 6
x = 12 cm.

$\text{Radius} = \frac{\text{diameter}}{2}$

$\text{Radius} = \frac{AB}{2} = \frac{12}{2} = 6$ cm.

140. Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm.

(a) 62º 36' (b) 22º 36'
(c) 2º 36' (d) 12º 36'

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : We know that in a circle of radius r unit. If an arc of ℓ unit subtends an angle θ radian at the centre,

then $\theta = \frac{\ell}{r}$ $\left[\text{Angle} = \frac{\text{Arc}}{\text{radius}}\right]$

Here r = 100 cm and ℓ = 22 cm

$\therefore\ \theta = \frac{22}{100}$ Radian

$\theta = \frac{22}{100} \times \frac{180}{\pi}$ Degree

$\theta = \frac{22 \times 180 \times 7}{22 \times 100}$

$\theta = 12\frac{3}{5}$ Degree

$\boxed{\theta = 12º36'}$ $[1º = 60']$

141. The circumference of a circle is 132 cm. What will be the circumference of the part whose center angle is 135°?

(a) 93.5 cm (b) 101.5 cm
(c) 92.5 cm (d) 91.5 cm

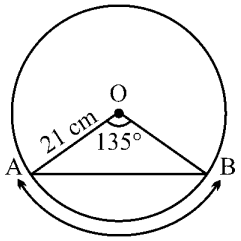
RRB JE - 26/05/2019 (Shift-II)

Ans : (d) According to the question

Circumference of circle = $2\pi r = 132$

$$2\times\frac{22}{7}\times r = 132$$

$$r = \frac{132\times 7}{2\times 22} = 21 \text{ cm}$$



$$\text{Circumference} = 2\pi\frac{r\theta}{360} + 2r$$

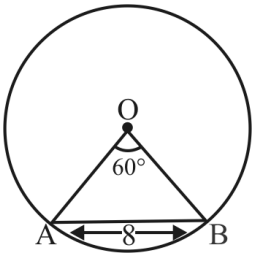
$$= \frac{132\times 135}{360} + 2\times 21 = 49.5+42 = 91.5 \text{ cm}$$

142. A chord of 8 cm length makes an angle of 60° at the center, what will be the value of radius of the circle?

(a) 8 cm (b) 6 cm
(c) 4 cm (d) 12 cm

RRB JE - 30/05/2019 (Shift-II)

Ans : (a)



According to the figure,

$\angle AOB = 60°$

$\because$ $\angle A = \angle B = 60°$

So ΔOAB will be equilateral triangle

$\because$ OA = OB = AB = 8 cm

$\because$ OA and OB is radius

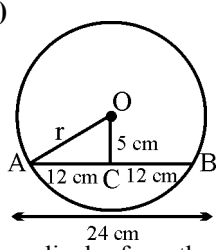
So r = 8 cm

143. If there is a chord of length 24 cm at a distance of 5 cm from the center, find the radius of the circle.

(a) 13 cm
(b) 17 cm
(c) 25 cm
(d) 15 cm

RRB JE - 28/06/2019 (Shift-III)

Ans. (a)



The perpendicular from the center of the circle on chord divides the chord into two equal parts.

$OA^2 = OC^2 + AC^2$ {where AC = 12 cm}

$r^2 = 5^2 + 12^2$

$r^2 = 25 + 144 = 169$

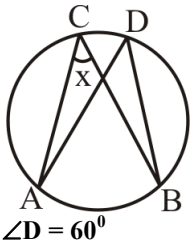
r = 13 cm

144. Read the given question and decide which of the following information is sufficient to answer the question.

What is the value of $\angle ACB$

Information:

(1)

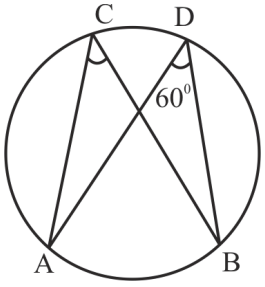


(2) $\angle D = 60^0$

(a) Either 1 or 2 is sufficient.
(b) Both 1 and 2 are sufficient.
(c) Only is 2 sufficient.
(d) Only 1 are sufficient.

RRB Group-D – 17/09/2018 (Shift-I)

Ans : (b) $\angle ADB = \angle ACB = 60°$



So both information will be required,

The value of the angle subtended by an arc (chord) on the remaining circumference of the circle is same.

$\angle C = \angle D$

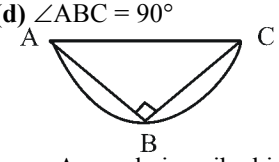
Hence information-2, $\angle D = 60°$ and information -1, $\angle ACB = \angle ADB = 60°$

145. In a semicircle, A and C denote the diameter and B is a point on the semicircle. So the angle ABC will always be.

(a) Can not be determined
(b) Acute angle
(c) Obtuse angle
(d) Right angle

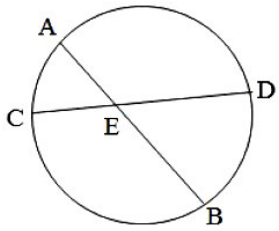
RRB Group-D – 24/09/2018 (Shift-II)

Ans : (d) ∠ABC = 90°



Theorem— An angle inscribed in a semi circle is a right angle.

146.

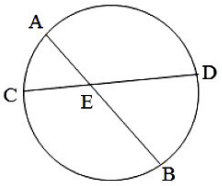


In above circle, given m $\overline{AE}$ = 4 cm, m $\overline{BE}$ = 15 cm and m $\overline{CE}$ = 2.5 cm. What will be the value of m $\overline{DE}$?

(a) 16.5 cm (b) 20 cm
(c) 24 cm (d) 30 cm

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (c)



Given−

m $\overline{AE}$ = 4 cm.

m $\overline{BE}$ = 15 cm

m $\overline{CE}$ = 2.5 cm

m $\overline{DE}$ = ?

$\boxed{AE \times BE = CE \times DE}$

$4 \times 15 = 2.5 \times DE$

$DE = \frac{4 \times 15}{2.5}$

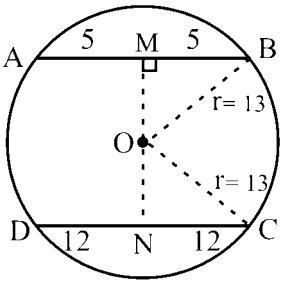
DE = 24 cm.

147. AB and CD are two parallel sides on opposite ends of the centre of the circle. If AB = 10 cm, CD = 24 cm and radius of the circle is 13 cm. Then what is the distance between the two sides.

(a) 16 cm (b) 17 cm
(c) 18 cm (d) 15 cm

RRB Group-D – 26/10/2018 (Shift-III)

Ans : (b)



From pythagoras theorem in ΔONC

$r^2 = ON^2 + NC^2$

$ON = \sqrt{r^2 - NC^2}$

$ON = \sqrt{13^2 - 12^2} = \sqrt{169 - 144}$

ON = 5 cm

Like wise $MO = \sqrt{13^2 - 5^2} = 12$ cm

So distance between of both sides.

= MO + NO

= 12 + 5 = 17 cm

148. A 16 cm long arc is cut in a circle of 20 cm diameter. Find the distance of the arc from the center of the circle.

(a) 6 cm (b) 12.8 cm
(c) 12 cm (d) 18.9 cm

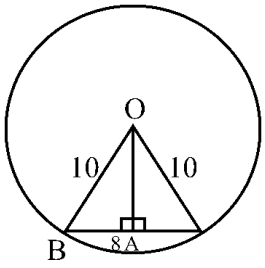
RRB Group-D – 16/11/2018 (Shift-I)

Ans : (a) Diameter = 20 cm

Arc cut by 16 cm

∵ The perpendicular drawn on the chord from the center of a circle bisects the chord.

$\therefore AB = \frac{16}{2} = 8$ cm



$OB^2 = OA^2 + AB^2$ {From pythagoras theorem}

$100 = OA^2 + 64$

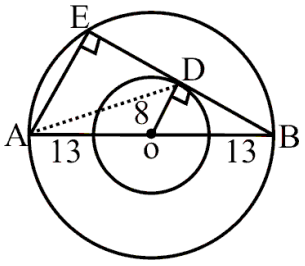
OA = 6 cm

149. The radius of two concentric circles are 13 cm and 8 cm. AB is the diameter of the larger circle, BD is the tangent to the smaller circle which touches it at D. The length of AD is equal to:

(a) 17 cm (b) 18 cm
(c) 19 cm (d) 16 cm

RRB Group-D – 11/12/2018 (Shift-III)

Ans : (c)



DB is the tangent to the smaller circle and the tangent to the circle makes an angle of 90º from the centre of the circle to the circumference.

So,

Given in, {OB = 13 cm, OD = 8 cm from pythagoras theorem}

In ΔODB,

$(BD)^2 = (OB)^2 - (OD)^2$

$BD = \sqrt{(13)^2 - (8)^2}$

$BD = \sqrt{169 - 64} = \sqrt{105}$

Again in ΔAEB,

$EB = 2DB = 2\sqrt{105}$ cm

AB = 2OB = 26 cm

From the pythagoras theorem

$(AE)^2 = (AB)^2 - (EB)^2$

AB = 2OB = 26 cm

Again in ΔAED

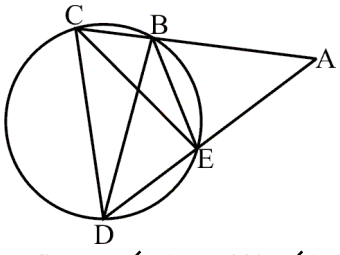
$(AD)^2 = (AE)^2 + (ED)^2$

$(AD)^2 = (16)^2 + \left(\sqrt{105}\right)^2$

$(AD) = \sqrt{256 + 105} = \sqrt{361}$

AD = 19 cm

150.



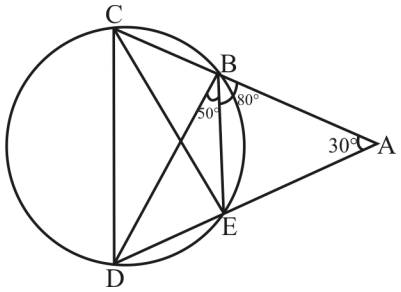
In the above figure, $\angle BAE = 30°$, $\angle ABE = 80°$ and $\angle DBE = 50°$, what is the value of $\angle BCE$?

(a) 25° (b) 10°

(c) 20° (d) 5°

RRB Group-D – 10/12/2018 (Shift-I)

Ans. (c) :



Given

$\angle BAE = 30°$

$\angle ABE = 80°$

$\angle DBE = 50°$

From ΔBAE

$\angle BEA + 80 + 30 = 180°$ [$\because$Sum of the interior angles of a triangle = 180°]

$\therefore \angle BEA = 180° - 110° = 70°$

$\angle DEB = 180° - 70°$ [angle of straight line = 180°]

$= 110°$

In cyclic quadrilateral CBED

$\angle DCB = 70°$ [$\because$Sum of opposite angle of cyclic quadrilateral = 180°]

$\because \angle DBE = 50°$ [angle formed on circumference from chord is equal]

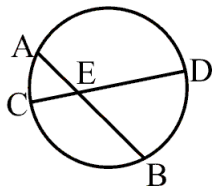
$\therefore \angle DCE = 50°$

$\because \angle DCB = 70°$

$\therefore \angle BCE = 70° - 50° = 20°$

So, $\angle BCE = 20°$

151.



In the above circle, $m\overline{AE} = 5cm, m\overline{BE} = 15cm$ and $m\overline{CE} = 25cm$, what will be the length of $m\overline{DE}$?

(a) 2.5 cm (b) 1 cm

(c) 3 cm (d) 2 cm

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (c) : given

$m\overline{AE} = 5cm, m\overline{BE} = 15cm$

$m\overline{CE} = 25cm, m\overline{DE} = ?$

We know that,

If chord AB and CD is intersecting each other of inside the circle on point E, then

$AE \times BE = CE \times DE$

$DE = \dfrac{AE \times BE}{CE}$

$= \dfrac{5 \times 15}{25} = 3cm$

So, $m\overline{DE} = 3cm$.

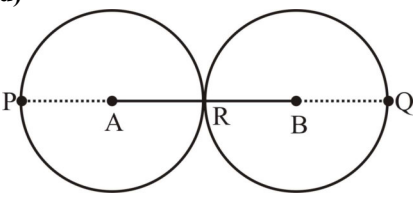
152. The radius of circle A and circle B is 4 units. If the point P is located on A and the point Q is located on B, and Both circle touch each other exactly at a point. Then what will be the maximum length of PQ.

(a) 0 (b) 4

(c) 8 (d) 16

RRB NTPC 30.03.2016 Shift : 2

Ans : (d)



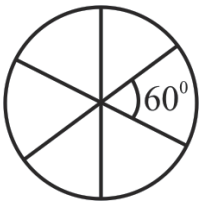
Circle A and circle B touch at a point R in the figure then,

AR = BR = 4 unit (radius of circle)
PR and QR is diameter of circle A and circle B.
Then PR = QR = 2AR
PR = QR = 2×4 = 8 unit
Or maximum length of PQ =2×PR = 2×8 = 16 unit

153. If a circle is divided into 6 equal parts. What will be the measure of each angle?
(a) 45 (b) 60
(c) 30 (d) 90

RRB NTPC 28.04.2016 Shift : 1

Ans : (b)
∵ Angle formed by all 6 sides on the center of circle =360°



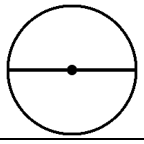
∴ According to the question

$$= \frac{360°}{6} = 60°$$

154. The largest chord of a circle is.
(a) Radius (b) Diameter
(c) Line segment (d) Sector

RRB NTPC 29.04.2016 Shift : 2

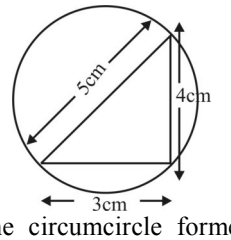
Ans : (b) Largest chord of circle is "diameter" which passes through the center of the circle.



155. The two sides forming the right-angle in a triangle are 3 cm and 4 cm long respectively. What will be the area of the circumcircle of this triangle?
(a) $5\pi\ cm^2$ (b) $7\pi\ cm^2$
(c) $6.75\pi\ cm^2$ (d) $6.25\pi\ cm^2$

RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (d)



The centre of the circumcircle formed on any right triangle is at the midpoint of the hypotenuse of the triangle, which is the diameter of the circle.

So radius of circumcircle $= \frac{\sqrt{4^2+3^2}}{2} = \frac{\sqrt{25}}{2} = 5/2$ cm

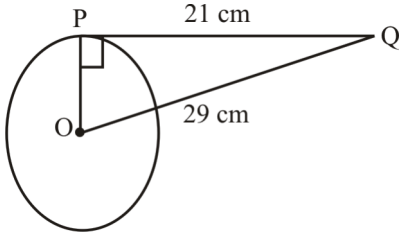
area of circle $= \pi r^2 = \pi \times \left(\frac{5}{2}\right)^2 = \pi \times \frac{25}{4} = 6.25\pi\ cm^2$

Type - 7

156. From a point Q, the length of the tangent to a circle is 21cm and the distance of Q from the centre 'O' of the circle is 29cm. Find the radius of the circle.
(a) 20 cm (b) 8 cm
(c) 50 cm (d) 30 cm

RRB NTPC (Stage-II) 17/06/2022 (Shift-II)

Ans. (a) : According to the question,



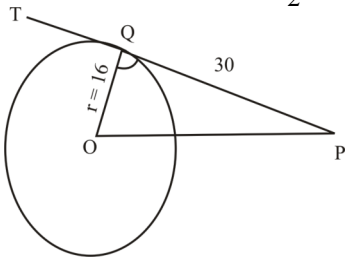
Given,
PQ = 21cm
OQ = 29 cm
OP = ?

$$OP = \sqrt{(OQ)^2 - (PQ)^2}$$
$$= \sqrt{(29)^2 - (21)^2}$$
$$= \sqrt{841 - 441}$$
$$= \sqrt{400}$$
= 20 cm
Hence, the radius of the circle (OP)= 20 cm

157. PT is a tangent drawn from P, given outside the circle, with center O touching the circle at Q. If PQ = 30 cm and the diameter of the circle is 32cm, then what is the length of OP?
(a) 36 cm (b) 34 cm
(c) 32 cm (d) 38 cm

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

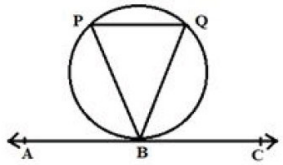
Ans. (b) : Diameter (d) = 32 cm , r = $\frac{32}{2} = 16$cm



From Pythagoras theorem,

$$(OP)^2 = (PQ)^2 + (OQ)^2$$
$$= (30)^2 + (16)^2 = 900 + 256$$
$$(OP)^2 = 1156 \qquad \boxed{OP = 34\,cm}$$

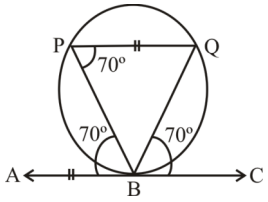
158. Line ABC is a tangent to a circle at B. If PQ ‖ AC and ∠QBC = 70°, ∠PBQ is = ?



(a) 70^0 (b) 110^0
(c) 40^0 (d) 20^0

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (c) :



The angle between the chord and the tangent is equal to the angle in the alternate segment.

$\therefore \angle QBC = \angle BPQ$

$70^\circ = \angle BPQ$

$\angle BPQ = 70^\circ$

Hence, $\angle BPQ = \angle PBA = 70^\circ$

$\therefore \angle PBQ = 180^\circ - \{\angle PBA + \angle QBC\}$

$= 180^\circ - \{70^\circ + 70^\circ\}$

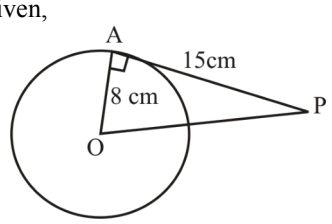
$= 180^\circ - 140^\circ = 40^\circ$

159. If a tangent to a circle from a point P meets the circle at A with AP = 15 cm. Given that the radius of the circle is 8 cm, find the distance of point P from the centre of the circle.

(a) 15 cm (b) 20 cm
(c) 17 cm (d) 12 cm

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,



$\because AP = 15$ cm

$OA = 8$ cm

$\because$ The radius of any circle is perpendicular to the tangent to that circle.

Hence, angle A in ΔOAP will be a right angle triangle.

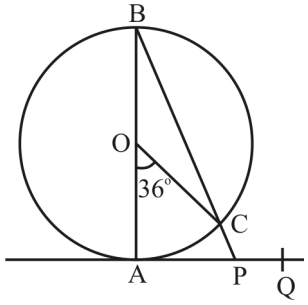
Then, from the Pythagoras theorem,

$OP = \sqrt{(15)^2 + 8^2} = \sqrt{225 + 64}$

$OP = \sqrt{289}$

OP = 17 cm

160. In the given figure, AB is the diameter of the circle. AP is a tangent to circle at A. Extended BC meets the tangent at P. $\angle AOC = 36^0$. Find $\angle BPQ$.



(a) 72° (b) 126°
(c) 108° (d) 54°

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : From the given figure-

$\angle ABC = \frac{1}{2}\angle AOC$ {The angle subtended by same chard in same segment at the centre is twice subtended the angle to at same chard in same segment the circumference.}

$\angle ABC = \frac{1}{2} \times 36^\circ = 18^\circ$

$\angle BAP = 90^\circ \quad \because AB \perp AP$

A tangent to a circle is perpendicular to the radius through the point of contact.

In Δ ABP

$\angle BPQ = \angle ABC + \angle BAP$ (exterior angle property)

$= 18^\circ + 90^\circ$

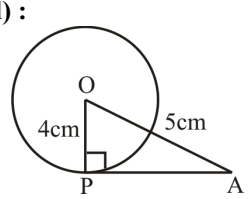
$= 108^\circ$

161 The length of a tangent drawn to a circle of radius 4 cm from a point 5 cm away from the center of the circle is:

(a) $5\sqrt{3}$ cm (b) $3\sqrt{3}$ cm
(c) 5 cm (d) 3 cm

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) :



$\because$ The radius of the circle is perpendicular to the tangent.

$\therefore \angle OPA = 90^\circ$

$OA^2 = OP^2 + AP^2$ (From Pythagoras theorem)

$25 = 16 + AP^2$

$9 = AP^2$

$AP = 3$cm

162. If the radii of two circles are 4.5 cm and 3.5 cm and the length of the transverse common tangent is 6 cm, then the distance between the two centers will be:

(a) 9 cm (b) 8 cm
(c) 12 cm (d) 10 cm

RRB NTPC 12.01.2021 (Shift-I) Stage Ist

Ans. (d) : The length of the transverse common tangent

$= \sqrt{(\text{Distance between centers})^2 - (\text{Sum of radii})^2}$

$6 = \sqrt{(\text{Distance between centers})^2 - (4.5+3.5)^2}$

on squaring both sides-

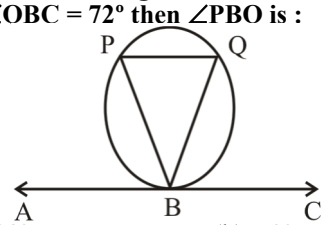
$36 = (\text{Distance between centers})^2 - 64$

$\Rightarrow$ Distance between centers $= \sqrt{36+64}$

$= \sqrt{100}$

$= 10$ cm.

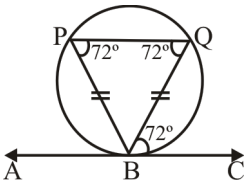
163. Line ABC is a tangent to a circle B. If BP = BQ and ∠OBC = 72° then ∠PBO is :



(a) 108° (b) 72°
(c) 36° (d) 70°

RRB NTPC 10.01.2021 (Shift-I) Stage Ist

Ans. (c) :



∠QBC = 72° (Given)

∠QPB = 72° (alternate segment angle)

∠QPB = ∠PQB = 72° ($\because$ BP = BQ)

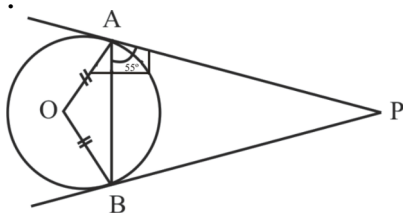
∠PBQ = 180°–2×72° = 180 – 144 = 36°

164. From an external point P, tangents PA and PB are drawn to a circle with centre O. ∠PAB = 55°, find ∠AOB

(a) 100^0 (b) 35^0
(c) 125^0 (d) 110^0

RRB NTPC 08.01.2021 (Shift-II) Stage Ist

Ans. (d) :



Given,

$\angle PAB = 55^\circ$

$\angle OAP = 90^\circ \ (\because OA \perp AP)$

$\angle OAB = 90^\circ - 55^\circ = 35^\circ$

$\angle OAB = \angle OBA = 35^\circ$

In ΔAOB

$\angle AOB + \angle OBA + \angle OAB = 180^0$

$\angle AOB + 35^0 + 35^0 = 180^\circ$

$= 110^\circ$

165. A circle touches the side BC of triangle ABC at P. Side AB and AC are produced to touch the circle at points Q and R respectively. The length of AQ is:

(a) $\frac{1}{2}(BC + CA + AB)$

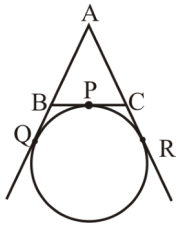
(b) $\frac{1}{4}(BC + CA + AB)$

(c) $\frac{1}{3}(BC + CA + AB)$

(d) $\frac{1}{2}(2BC + CA + AB)$

RRB NTPC 07.01.2021 (Shift-I) Stage Ist

Ans. (a) : The tangents drawn from external point to a circle are of equal length.



$\therefore$ BP = BQ

And, CP = CR

And AQ = AR

AB + BQ = AC + CR

Now, AB + BP = AC + CP .....(i)

Perimeter of ΔABC = AB + BC + CA

= AB + BP + CP + CA [$\because$ BC = BP + CP]

= (AB + BP) + (AC + CP)

= 2(AB + BP) From equation (i)

AB + BC + CA = 2AQ

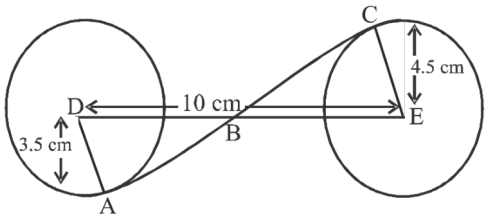
or $AQ = \frac{1}{2}(AB + BC + CA)$

166. Find the length of a transverse common tangent of the two circles whose radii are 3.5 cm, 4.5 cm and the distance between their centres is 10 cm.

(a) 6 cm/6 cm (b) 8 cm/8 cm
(c) 6.4 cm/6.4 cm (d) 3.6cm/3.6 cm

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (a)



Length of transverse common tangent line

$= \sqrt{(\text{distance between the centers})^2 - (\text{sum of both radius's})^2}$

$= \sqrt{10^2 - (3.5+4.5)^2} = \sqrt{100-64} = \sqrt{36} = 6$ cm

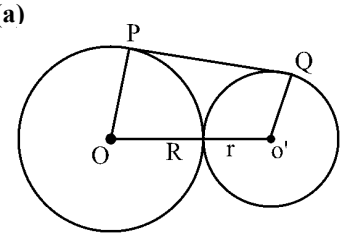
167. Two circles touch each other externally at point X. PQ is simple common tangent touching both circles at P and Q point. If the radius of circles are R and r, find the value of PQ^2.

(a) 4Rr (b) $2\pi Rr$

(c) $\frac{3}{2}$ Rr (d) 2Rr

RRB RPF Constable – 25/01/2019 (Shift-III)

Ans : (a)



$PQ = \sqrt{d^2 - (r_1 - r_2)^2}$

Where d = O O' = (R + r)

$r_1 = R$

$r_2 = r$

Then, $PQ = \sqrt{(R+r)^2 - (R-r)^2}$

$= \sqrt{R^2 + r^2 + 2Rr - R^2 - r^2 + 2Rr}$

$= \sqrt{4Rr}$

$PQ = 2\sqrt{Rr}$

$PQ^2 = \left(2\sqrt{Rr}\right)^2 = 4Rr$

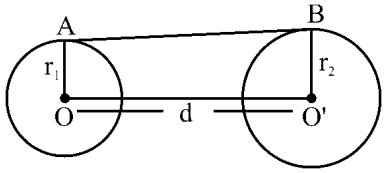
168. Radius r_1 and r_2 the distance between the centers of the two circles is d find the length of their tangent lines.

(a) $\sqrt{d^2\left(r_1^2 r_2^2\right)}$ (b) $\sqrt{d^2 - (r_1 - r_2)^2}$

(c) $\sqrt{d^2 - (r_1^2 r_2^2)}$ (d) $\sqrt{d^2 - (r_1 + r_2)^2}$

RRB JE - 01/06/2019 (Shift-I)

Ans : (b)

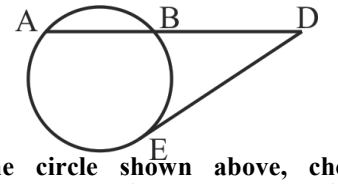


Length of tangent AB

$AB = \sqrt{(\text{distance between centre's})^2 - (\text{difference of radius})^2}$

$= \sqrt{d^2 - (r_1 - r_2)^2}$

169.



In the circle shown above, chord AB is extended so that it meets tangent line DE to D. If AB = 5 cm and DE = 6 cm, Find the length of BD.

(a) 6 cm (b) 5 cm

(c) 4 cm (d) $\sqrt{30}$ cm

RRB RPF Constable – 18/01/2019 (Shift-III)

Ans : (c) According to chord tangent theorem

$DE^2 = DA \times BD$

$DE^2 = (AB+BD) \times BD$

$6^2 = (5+BD) \times BD$

$36 = 5BD + BD^2$

$\Rightarrow BD^2 + 5BD - 36 = 0$

$\Rightarrow BD^2 + 9BD - 4BD - 36 = 0$

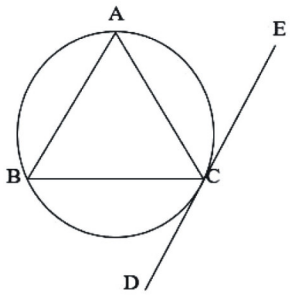
$\Rightarrow BD(BD+9) - 4(BD+9) = 0$

$(BD-4)(BD+9) = 0$

$BD - 4 = 0, BD \neq -9$

$BD = 4$ cm

170. Answer the question based on the figure given below.



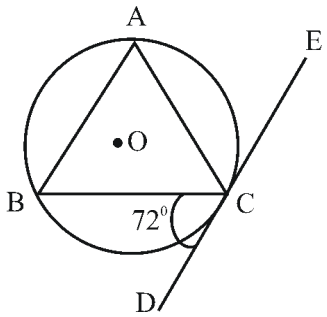
If AB is parallel to EC and ∠BCD = 72°, then what will be the value of ∠BAC?

(a) 75° (b) 72°

(c) 73° (d) 67°

RRB RPF SI – 05/01/2019 (Shift-II)

Ans : (b)



Given,

∠BCD = 72°

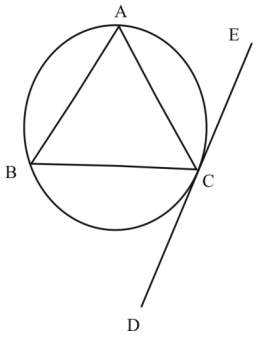
∠BAC = ?

If the angle between the line and the chord passing through one end of the chord of the circle is equal to the angle substended by the chord in the alternate segment, then this line is the tangent line of the circle.

Let the center of the circle be O and AC is the chord of this circle. A straight line DE going through the C point is drawn such that ∠BCD = ∠BAC where ∠BAC is located in alternating circle.

So, ∠BAC = 72°

171.



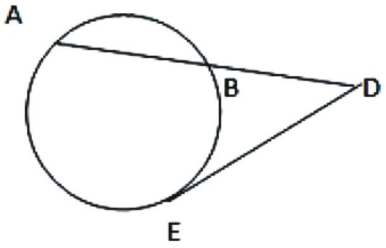
If ∠BCD = 82° then find the value of ∠BAC ?

(a) 85° (b) 77°
(c) 83° (d) 82°

RRB Group-D – 26/09/2018 (Shift-II)

Ans. (d) : The angle formed by the chord of a circle along the line of the circle is equal to the angle made by the chord on the alternate segment of the circle.
$\therefore \angle BAC = \angle BCD = 82°$

172. In the circle below, chord AB is extended to point D to join tangent DE. If AB = 9 cm and BD = 3 cm, find the length of DE.

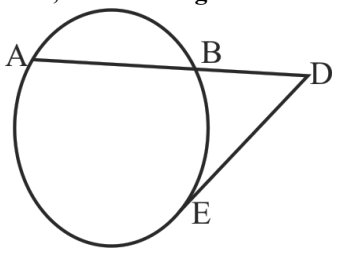


(a) 4 cm (b) $\sqrt{27}$ cm
(c) 6 cm (d) 5 cm

RRB Paramedical Exam – 21/07/2018 (Shift-I)

Ans : (c) According to chord tangent theorem
$DE^2 = DB \times DA = 3 \times 12$
$DE^2 = 36$
$DE = 6$ cm

173. In the circle below, chord AB is extended to meet tangent DE at point D. If AB = 24 cm and DE = 9 cm, find the length of BD.

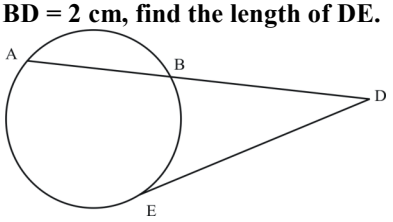


(a) 3 cm (b) $4\sqrt{6}$ cm
(c) 5 cm (d) 4 cm

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) : According to chord tangent theorem
$AD \times BD = (DE)^2$
(Suppose $BD = x$)
$(24 + x) \times x = (9)^2$
$24x + x^2 = 81$
$x^2 + 24x - 81 = 0$
$x^2 + 27x - 3x - 81 = 0$
$x(x + 27) - 3(x + 27) = 0$
$x + 27 = 0, x = -27$ (Negative)
$x - 3 = 0$
$x = 3$
length of BD = 3 cm

174. In the circle below, chord AB is extended to join point D with tangent DE. If AB = 6 cm and BD = 2 cm, find the length of DE.



(a) $\sqrt{12}$cm (b) 4cm
(c) 4.5cm (d) 5 cm

RRB Group-D – 05/10/2018 (Shift-I)

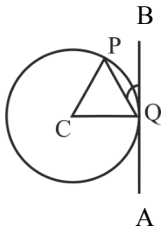
Ans. (b) : From the given figure-
$\therefore DE^2 = AD \times BD$
$DE^2 = (AB + BD) \times BD$
$= (6 + 2) \times 2 = 8 \times 2$
$DE^2 = 16$
$DE = 4$ cm

175. P is a point on a circle whose center is C. A straight line whose length is equal to the radius of the circle drawn from P to another point Q. Find the value of the acute angle in radian Q formed by the tangent of the circle drawn on Q.

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$
(c) $\frac{\pi}{2}$ (d) $\frac{\pi}{3}$

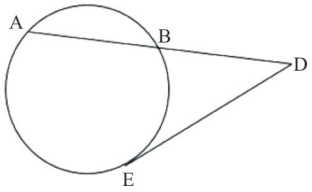
RRB Group-D – 10/10/2018 (Shift-I)

Ans : (a)



From the figure– CP = CQ
Given – radius r = PQ
$\therefore$ CP = CQ = PQ (equilateral triangle)
$\because$ Value of each angle of equilateral triangle = 60°
So value of acute angle on ∠PQB
$= 90° - 60° = 30° = \frac{\pi}{6}$ radian

176.



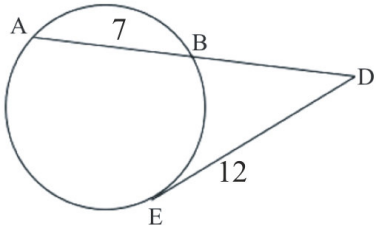
In the given circle, the line AB is extended to meet with the tangent DE at the D point. If AB = 7 cm and DE = 12 cm, then the length of BD will be?

(a) 7 cm (b) 9 cm

(c) $2\sqrt{21}$ cm (d) 8 cm

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (b)



According to chord tangent theorem

$DE^2 = AD \times BD$

If BD = x then

$12^2 = (7 + x) \times x$

$x^2 + 7x - 144 = 0$

$x^2 + 16x - 9x - 144 = 0$

$x(x+16) - 9(x+16) = 0$ or $x + 16 = 0, x - 9 = 0$

$x = 9, x = -16$ (invalid)

So, BD = x = 9 cm

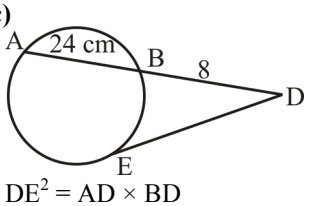
177. In a circle, chord AB is extended to touch tangent DE to D. If AB = 24 cm and BD = 8 cm, then the length of DE is known.

(a) 12 cm (b) 18 cm

(c) 16 cm (d) 24 cm

RRB Group 'D' 07/12/2018 (Shift-I)

Ans : (c)



$DE^2 = AD \times BD$

$DE^2\ (24 + 8) \times 8$

$DE^2 = 32 \times 8$

$DE = \sqrt{16 \times 16}$

DE = 16 cm.

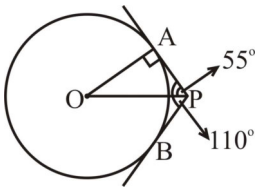
178. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 110^0 then the angle POA is :

(a) 50° (b) 70°

(c) 35° (d) 45°

RRB ALP & Tec. (20-08-18 Shift-III)

Ans : (c)



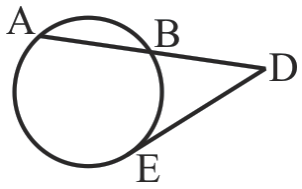
$\because \angle AOB + \angle APB = 180°$

$\angle AOB = 180° - 110° = 70°$

then, $\angle POA = \frac{1}{2}\angle AOB$

$= \frac{1}{2} \times 70° = 35°$

179.



In the circle above chord $\overline{AB}$ is extended to meet the tangent $\overline{DE}$ at D. If $\overline{AB}$ = 12 cm and $\overline{DE}$ = 8 cm. Find the length of $\overline{BD}$.

(a) 6 cm

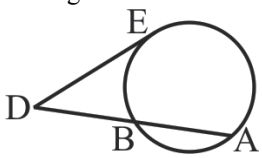
(b) $\sqrt[4]{6}$ cm

(c) 5 cm

(d) 4 cm

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (d) Suppose length of BD = x cm



formula-$(DE)^2 = DB \times DA$

$(8)^2 = x \times (x + 12)$

$\Rightarrow \quad 64 = x^2 + 12x$

$\Rightarrow \quad x^2 + 12x - 64 = 0$

$\Rightarrow \quad x^2 + (16 - 4)x - 64 = 0$

$\Rightarrow \quad x^2 + 16x - 4x - 64 = 0$

$\Rightarrow \quad x(x + 16) - 4(x + 16) = 0$

$\Rightarrow \quad (x + 16)(x - 4) = 0$

$\Rightarrow \quad x = -16$ (invalid)

$\Rightarrow \quad x = 4$ cm.

So, DB = 4 cm.

180. To draw a pair of tangents to a circle which are inclined to each other at an angle of 75°, it is required to draw tangents at the end points of those two radius of the circle, the angle between them is.

(a) 65° (b) 75°

(c) 95° (d) 105°

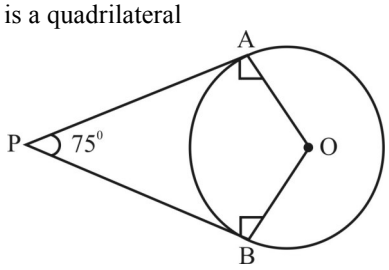
RRB ALP & Tec. (09-08-18 Shift-II)

Ans : (d) From the figure,

$\angle PAO = \angle PBO = 90°$

$\angle APB = 75°$

$\because$ PAOB is a quadrilateral



$\because$ Sum of four angles of quadrilaterals is $360°$

$\because$ PAOB is a quadrilateral−

$\therefore \angle APB + \angle PBO + \angle PAO + \angle AOB = 360°$

$75° + 90° + 90° + \angle AOB = 360°$

$\boxed{\angle AOB = 360° - 255° = 105°}$

Type - 8

181. The measure of each interior angle of a regular octagon is:

(a) 165º (b) 180º

(c) 135º (d) 140º

RRB Group-D 28-09-2022 (Shift-II)

Ans. (c) : We know that,

Interior angle of a regular polygon of n sides

$$= \frac{(n-2)\times 180^\circ}{n}$$

$= 135^\circ$

182. Each interior angle of a regular polygon measures 168º. How many sides does this polygon have?

(a) 36 (b) 20

(c) 30 (d) 24

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (c) : Each interior angle of regular polygon

$$= \frac{(n-2)180^\circ}{n}$$

$$\frac{(n-2)180^\circ}{n} = 168^\circ$$

$45n - 90^\circ = 42n$

$3n = 90$

$n = 30$

Hence number of sides of polygon = 30

183. If each interior angle of a regular polygon is 135º, then the number of sides that polygon has is:

(a) 15 (b) 12

(c) 8 (d) 10

RRB Group-D 18/08/2022 (Shift-II)

Ans. (c) : Measure of interior angle $= \frac{(2n-4)\times 90^\circ}{n}$

According to the question,

$$\frac{(2n-4)\times 90^\circ}{n} = 135^\circ$$

$2n - 4 = 1.5n$

$2n - 1.5n = 4$

$0.5n = 4$

$$n = \frac{4}{0.5}$$

$n = 8$

184. If an exterior angle of a regular polygon is 40º, then the number of sides in the regular polygon is :

(a) 10 (b) 8

(c) 7 (d) 9

RRB Group-D 01/09/2022 (Shift-III)

Ans. (d) : from exterior angle $= \frac{360}{n}$

$$n = \frac{360}{40} = 9$$

number of sides of given polygon (n) = 9

185. Find the number of sides in a regular polygon if its each interior angle is 160º.

(a) 15 (b) 18

(c) 17 (d) 14

RRB Group-D 18/08/2022 (Shift-III)

Ans. (b) :

each internal angle of a regular polygon = 160º

exterior angle of a regular polygon = 180º – 160º

= 20º

number of sides of regular polygon $= \frac{360^\circ}{20^\circ}$

= 18

186. If the number of sides of a regular polygon is 12, then the measure of each exterior angle is :

(a) 30º (b) 40º

(c) 48º (d) 36º

RRB Group-D 13/09/2022 (Shift-III)

Ans. (a) :

measure of exterior angle $= \frac{360^\circ}{n}$

n = 12

$$= \frac{360}{12}$$

$= 30^\circ$

187. A regular polygon in which each interior angle is 140º is a/an:

(a) octagon (b) nonagon

(c) decagon (d) heptagon

RRB Group-D 27-09-2022 (Shift-II)

Ans. (b) : Each interior angle of a regular polygon = 140º

So each exterior angle of a regular polygon = 180 - 140 = 40º

The regular polygon has $\frac{360}{40} = 9$ Sides.

Hence A regular polygon in which each interior angle is 140º is a nonagon.

188. The interior angles of an 8-sided polygon are in the ratio 1 : 3 : 4 : 6 : 7 : 11 : 13 : 15. Find the measure of the largest interior angle in this polygon.

(a) 288° (b) 234°

(c) 270° (d) 300°

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (c) :

Sum of all internal angle of a regular polygon

$= (2n–4) \times 90$

where n = 8

where $= (2 \times 8 – 4) \times 90$

$= (16 – 4) \times 90$

$= 1080^0$

Let angle of 8 sides of a regular polygon be x, 3x, 4x, 6x, 7x, 11x, 13x, 15x

According to question,

$x + 3x + 4x + 6x + 7x + 11x + 13x + 15x = 1080^0$

$60x = 1080$

$x = 18^0$

let smaller angle of two supplementary angle be = 15x

$= 15 \times 18$

$= 270^0$

189. If every interior angle of a regular polygon is 144°, then the polygon has ____ sides.

(a) 15 (b) 12

(c) 8 (d) 10

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (d) : Each interior angle $= 144^\circ$

Each exterior angle = 180° – 144° = 36°

For each exterior angle $= \frac{360^\circ}{n}$

Where n = number of sides in polygon

Then $36^\circ = \frac{360^\circ}{n}$

$n = 10$

190. The ratio of the numbers of sides of two regular polygons is 1 : 2. If each interior angle of the first polygon is 140°, then the measure of each interior angle of the second polygon is:

(a) 140º (b) 160º

(c) 170º (d) 150º

RRB NTPC 25.01.2021 (Shift-II) Stage Ist

Ans. (b) : Let the number of sides of the first polygon = x

Number of sides of the second polygon = 2x

Each interior angle of the first polygon = 140° .....(given)

Each exterior angle of the first polygon = 180° – 140° = 40°

Each exterior angle of the first polygon = $\frac{360^\circ}{x}$

Where, x = Number of sides in the polygon.

$40^\circ = \frac{360^\circ}{x}$

$x = 9$

Number of sides of the second polygon = 2x = 2×9 = 18

Each exterior angle $= \frac{360^\circ}{18} = 20^\circ$

Each interior angle of the second polygon

= 180º – 20º = 160°

191. Two regular polygons have the same number of sides. If the lengths of the sides are in the ratio 3:5, then the ratio of their respective areas is:

(a) 9 : 25 (b) 4 : 7

(c) 3 : 23 (d) 6 : 11

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (a) : The ratio of respective areas = $(3)^2:(5)^2$

= 9 : 25

192. 4 angles of a pentagon are 70°, 110°, 135° and 95°. Find the measure of the fifth angle of the pentagon.

(a) 134° (b) 132°

(c) 128° (d) 130°

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let fifth angle = xº

Sum of interior angles of a polygon $= (n-2)\times 180^\circ$

$\because$ Number of sides (n) $= 5$

$\therefore$ Sum of angle of pentagon $= (5-2)\times 180^\circ = 540^\circ$

According to the question-

$70^\circ + 110^\circ + 135^\circ + 95^\circ + x^\circ = 540^\circ$

$x^\circ = 540^\circ - 410^\circ$

Hence, the fifth angle $= x^\circ = 130^\circ$

193. If the difference between the interior and exterior angles of a polygon is 36º, then find the number of sides in the polygon.

(a) 8 (b) 7

(c) 6 (d) 5

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let each interior angle = xº

So, exterior angle = 180° – xº

According to the question,

$x^\circ – (180 – x^\circ) = 36^\circ$

$2x = 216^\circ$

$x = 108^\circ$

Exterior angle $= 180° - 108°$
$= 72°$

No of sides in the polygon $= \frac{360°}{x} = \frac{360°}{72°} = 5$

194. The ratio of an interior angle to the exterior angle of a regular polygon is 4 : 1. The number of sides of the polygon is:

(a) 12 (b) 10
(c) 5 (d) 6

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the interior and exterior angles of polygon be 4x and 'x'.
Interior + Exterior angle $= 180°$
$4x+x=180°$
$5x = 180°$
$x = 36°$
Hence Exterior angle $= 36°$

If polygon has 'n' sides then exterior angle $= \frac{360}{n}$

$36 = \frac{360}{n}$

$n = \frac{360}{36} = 10$

Hence the number of sides in polygon (n) = 10

195. The difference of interior angles and exterior angles on the vertices of a quadrilateral is 160°. Find the sides of a polygon?

(a) 36 (b) 42
(c) 40 (d) 38

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) :

Interior angle+Exterior $= 180^o$ (by theorem)
$-$ Interior angle$-$Exterior $= -160^o$
$2 \times$ Exterior angle $= 20^o$
Exterior $= 10^o$

Number of sides of a polygon $= \frac{360°}{10°} = 36^o$

196. Each interior angle of a regular polygon is 140º. Find the number of sides of the polygon.

(a) 15 (b) 18
(c) 9 (d) 12

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (c) : Let number of sides of the polygon is n.
$\because$ Each interior angle of polygon $= 140^o$

$\Rightarrow \left(\frac{n-2}{n}\right) \times 180^o = 140^o$

$\Rightarrow \left(\frac{n-2}{n}\right) = \frac{140}{180}$

$\Rightarrow 9n - 18 = 7n$

$\Rightarrow 2n = 18$

$\Rightarrow n = 9$

Hence the number of sides of polygon n = 9

197. Find the ratio of the measure of an angles of a regular pentagon to that of a regular octagon.

(a) 5 : 6 (b) 6 : 7
(c) 4 : 5 (d) 7 : 8

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (c) : Measure of Interior angle of regular pentagon

$= \frac{(5-2)}{5} \times 180^o = \frac{3}{5} \times 180^o$

Measure of interior angle of regular octagon

$= \frac{(8-2)}{8} \times 180^o = \frac{6}{8} \times 180^o$

Required Ratio $= \frac{3}{5} : \frac{6}{8} = 24 : 30 = 4 : 5$

198. In a polygon, the sum of the interior angles is triple the sum of the exterior angles. The number of sides is:

(a) 6 (b) 9
(c) 7 (d) 8

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : Sum of interior angles of n sides polygon $= (n-2) \times 180^o$
Sum of exterior angles of polygon $= 360^o$
According to the question,

$(n-2) \times 180^o = 3 \times 360^o$

$n - 2 = 6 \Rightarrow n = 8$

199. If the difference between the exterior and the interior angles of a regular polygon is 60º, with an interior angle being greater than the corresponding exterior angle, then find the number of sides of the polygon.

(a) 6 (b) 5
(c) 7 (d) 8

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : We know that,
Interior angle + Exterior angle $= 180^0$ ...(i)
Given, Interior angle– Exterior angle $= 60^0$ ...(ii)
From equation (i) and equation (ii)
2 Interior angle $= 240^0$
Interior angle $= 120^0$
Exterior angle $= 60^0$ [From equation (i)]

Number of sides of polygon $= \frac{360^0}{\text{Exterior angle}}$

$= \frac{360^0}{60^0} = 6$

200. Every interior angle of a regular octagon is 135º. Find the exterior angle of the octagon.

(a) 45° (b) 75°
(c) 65° (d) 55°

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

Interior angle + exterior angle = 180º

135° + exterior angle = 180º

exterior angle = 180º – 135º

= 45°

201. The sum of the interior angles of a polygon measure 3240º. How many sides does the polygon have?

(a) 10 (b) 20

(c) 5 (d) 15

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (b) :

The sum of interior angles of a polygon

= (n – 2) × 180°

3240° = (n – 2) × 180°

n – 2 = 18

n = 20

Hence number of sides in the polygon is 20.

202. The interior angle of a regular polygon is 108º. The number of the sides of the polygon is:

(a) 108 (b) 5

(c) 360 (d) 15

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (b) : Internal angle of an equilateral polygon = 108º

Each external angle = 180º – internal angle

= 180º – 108º

= 72º

Number of sides in an equilateral polygon (n)

$$= \frac{360^\circ}{\text{Each external angle}}$$

$$= \frac{360^\circ}{72^\circ}$$

$$= \boxed{n = 5}$$

203. The exterior angle of a rectangular polygon is 72º. Find the internal angle.

(a) 180º (b) 120º

(c) 108º (d) 160º

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (c) : In any polygon,

Interior angle + Exterior angle = 180º

Interior angle + 72º= 180º

⇒Interior angle= 108º

204. If each interior angle of a regular polygon is 120°, then find the number of diagonals of the polygon.

(a) 9 (b) 4

(c) 8 (d) 6

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : If a polygon has n number of sides, then all interior angles of the polygon $= \frac{(n-2)\times 180}{n}$

According to the question, $\frac{(n-2)\times 180}{n} = 120$

180 n – 360 = 120 n

180 n – 120 n = 360

60 n = 360

$$n = \frac{360}{60} = 6$$

Hence, number of sides n = 6

Then number of diagonal = $\frac{n(n-3)}{2}$

Number of diagonals in polygon $= \frac{6(6-3)}{2}$

$$= \frac{6\times 3}{2} = \frac{18}{2}$$

= 9 diagonals

205. If the interior angles of a pentagon are in the ratio 1 : 3 : 5 : 7 : 11, then the measure of smallest interior angle is

(a) 15º (b) 10º

(c) 25º (d) 20º

RRB NTPC 16.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let interior angle of given pentagon are x, 3x, 5x, 7x and 11x.

∵ Sum of all interior angle of pentagon is = 540º

27x = 540°

$$x = \frac{540}{27} = 20^\circ$$

Hence, smallest angle is x = 20º

206. What is the measure of each exterior angle of a regular octagon?

(a) 30^0 (b) 45^0

(c) 50^0 (d) 60^0

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (b) :

Each exterior angle of octagon $= \frac{360^0}{8} = 45^0$

207. The difference between the interior and exterior angles at the vertex of a regular polygon is 140º. The number of sides of the polygon is:

(a) 18 (b) 20

(c) 24 (d) 22

RRB NTPC 08.02.2021 (Shift-I) Stage Ist

Ans. (a) : No. of sides of polygon

$$= \frac{(2n-4)\times 90^\circ}{n} - \frac{360^\circ}{n} = 140$$

$180n - 360 - 360 = 140n$

$180n - 140n = 720$

$40n = 720$

$n = 18$

208. The exterior angles of any polygon sum upto:

(a) 270° (b) 180°

(c) 360° (d) 90°

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (c) : The sum of the exterior angles of any polygon is 360^0.

209. The ratio of interior and exterior angles of a regular polygon is 4:1. What is the number of sides in the polygon?

(a) 12 (b) 6

(c) 8 (d) 10

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (d) Suppose interior angle and exterior angle is 4x and x.

Interior angle = 180º - Exterior angle

$4x = 180^\circ - x$

$5x = 180^\circ$

$x = 36^\circ$

$$\text{Number of sides} = \frac{360^\circ}{\text{Exterior angle}} = \frac{360^\circ}{36^\circ} = 10^\circ$$

210. What will be the sum of the interior angles in degrees of a polygon with 7 sides?

(a) 180° (b) 360°

(c) 540° (d) 900°

RRB RPF Constable – 20/01/2019 (Shift-III)

Ans : (d) Sum of interior angles of polygon

$= (2n-4) \times 90^\circ = (2 \times 7-4) \times 90^\circ$

$= 10 \times 90^\circ = 900^\circ$

211. Each interior angle in a regular polygon is 108°, then what is the number of sides?

(a) 6 (b) 15 (c) 5 (d) 7

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (c) Number of sides are n then

$$\text{Each interior angle of regular polygon} = \frac{(n-2)\times 180}{n}$$

$$108 = \frac{(n-2)\times 180}{n}$$

$108n = 180n - 360$

$180n - 108n = 360$

$72n = 360$

$$n = \frac{360}{72}$$

Number of sides $n = 5$

212. What will be the total sides of a regular polygon whose exterior angle is 10°?

(a) 36 (b) 63 (c) 46 (d) 38

RRB RPF SI – 06/01/2019 (Shift-II)

Ans : (a) Each exterior angle of polygon

$$= \frac{360^0}{n(\text{number of sides})}$$

$$n = \frac{360^\circ}{10^\circ} = 36^\circ$$

213. The sum of all interior angles of a common polygon is 1440°. How many diagonals does the polygon have?

(a) 27 (b) 44

(c) 35 (d) 20

RRB RPF Constable – 22/01/2019 (Shift-II)

Ans : (c) The some of the interior angles of a polygon of n sides, $(\sum\theta) = n \times 180 - 360$

$1440 = n \times 180 - 360$

$n \times 180 = 1440 + 360$

$n \times 180 = 1800$

$n = 10$

If n sides is in any polygon then number of their diagonals $D = \frac{n}{2}(n-3)$

So number of these diagonals.

$D = \frac{10}{2}(10-3)$

$D = 5 \times 7$

$D = 35$

214. The interior angle of a regular polygon is 150°. This polygon is a ___.

(a) Octagon (b) Decagon

(c) Dodecagon (d) Heptagon

RRB JE - 22/05/2019 (Shift-I)

Ans : (c)

Each interior angle of a regular polygon with n sides.

$$= \frac{(n-2)\times 180}{n}$$

$$150 = \frac{(n-2)\times 180}{n}$$

$150n = 180n - 360$

$30n = 360$

$$n = \frac{360}{30} = 12$$

Therefore this polygon will be a dodecagon.

215. Select the incorrect Stagement

1) All sides of a regular polygon are equal.

2) Its all interior angles are equal.

3) The sum of its exterior angles is 360°

4) The sum of its interior angles are (n–2) × 360°

(a) Stagement 1 (b) Stagement 4

(c) Stagement 2 (d) Stagement 3

RRB JE - 29/05/2019 (Shift-II)

Ans : (b) Sum of regular polygon's interior angles

$= (n-2) \times 180^\circ$

Hence, all other Stagement is true but Stagement (4) is false.

216. Each interior angle of a regular polygon is 36° greater than its exterior angle. Find out the number of sides of polygon–

(a) 4 (b) 10

(c) 8 (d) 5

RRB JE - 02/06/2019 (Shift-I)

Ans : (d) Suppose number of sides of polygon = n
As per the question,

$$\frac{(2n-4)\times 90}{n}-\frac{360°}{n}=36°$$

$180n - 360° – 360° = 36n$

$144n = 720°$

$$n=\frac{720}{144}=5$$

Hence, number of sides = 5

217. The sum of the angles of regular polygon is 2160°. The number of sides of polygon is–

(a) 12 (b) 16
(c) 18 (d) 14

RRB JE - 27/06/2019 (Shift-I)

Ans : (d) Sum of interior angles of regular Polygon.

$= 2160°$

$(2n – 4)\ 90° = 2160°$

$(2n – 4) = 24$

$2n = 28$

$n = 14$

218. What is the total number of sides of regular polygon with each interior angle equal to 168°?

(a) 20 (b) 30
(c) 15 (d) 31

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (b) Each interior angle of regular polygon

$$=\frac{(n-2)\pi}{n}$$

$$\frac{(n-2)180^0}{n}=168^0$$

$180°n–360°=168°n$

$12°n = 360°$

$n = 30$

So, number of sides (n) = 30

219. In a polygon, each exterior angle is 120°, then the number of sides is-

(a) 6 (b) 4
(c) 3 (d) 5

RRB NTPC 07.04.2016 Shift : 3

Ans :(c)

$$\text{Number of sides of polygon}=\frac{360°}{\text{each exterior angle}}$$

$$=\frac{360}{120}=3$$

220. In a regular polygon, each exterior angle is 60° then the number of sides:

(a) 7 (b) 5
(c) 6 (d) 8

RRB NTPC 26.04.2016 Shift : 2

Ans : (c) Each exterior angle of polygon $=\frac{360^0}{n}$

$\therefore \quad n=\frac{360^0}{60^0}=6$

221. The number of diagonals in a polygons with 27-sides is-

(a) 320 (b) 324
(c) 322 (d) 325

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (b) : The number of diagonals in a polygon with n-sides

$$=\frac{n}{2}\times(n-3)$$

$\because n = 27$

$\therefore$ Number of diagonal $=\frac{27}{2}\times(27-3)$

$$=\frac{27\times 24}{2}=27\times 12 = 324$$

222. The sum of all interior angles of a polygon is 1260°. Find the number of sides of the polygon.

(a) 9 (b) 8 (c) 10 (d) 11

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) : Suppose number of sides of polygon = n
According to the question-

$(n-2)\pi = 1260, \quad (n-2)180 = 1260$

$n – 2 = 7, \quad n = 7 + 2$, $\boxed{n = 9}$

223. The sum of the interior angles of a regular octagon is___

(a) 1080 (b) 720
(c) 540 (d) 900

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (a) Sum of interior angle of an regular polygon with n sides = (2n – 4) × 90°
$\therefore$ Sum of interior angle of an octagon = (2 × 8 – 4) × 90 = 1080

224. The measure of each interior angle of a pentagon is _____.

(a) 180^0 (b) 108^0
(c) 115^0 (d) 120^0

RRB Group-D – 05/10/2018 (Shift-II)

Ans. : (b) Exterior angle of any polygon,

$$=\frac{360^0}{\text{number of sides}}$$

Exterior angle $=\frac{360^0}{5}=72^0$

interior angle = 180° – 72° = 108°

225. What is the diagonal's number in a 19-sides?

(a) 304 (b) 114
(c) 152 (d) 76

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (c) Number of diagonals in polygon with n sides

$$=\frac{n(n-1)}{2}-n=\frac{19\times(19-1)}{2}-19$$

$$=\frac{19\times 18}{2}-19=19\times 9-19$$

$= 19\ (9 – 1) = 19 \times 8 = 152$

226. What will be the ratio of the measurement of the interior angles of a regular octagon to the interior angles of a regular dodecagon?

(a) 4 : 5 (b) 8 : 12
(c) 12 : 8 (d) 9 : 10

RRB Group-D – 12/10/2018 (Shift-III)

Ans : (d) Sum of interior angles of polygon with n sides = $(2n - 4) \times 90^0$

Each interior angle of octagon $= \frac{(2\times 8-4)\times 90^0}{8}$

$= \frac{12\times 90}{8} = \frac{1080}{8}$

Each interior angle of dodecagon $= \frac{(2\times 12-4)\times 90^0}{12}$

$= \frac{1800}{12}$

ratio $= \frac{1080}{8} : \frac{1800}{12} = 9:10$

227. The number of diagonals in a polygon of 26-sides will be–

(a) 325 (b) 300
(c) 299 (d) 650

RRB Group-D – 25/09/2018 (Shift-I)

Ans : (c) Diagonals number of polygon $= \frac{n}{2}\times(n-3)$

number of diagonals in polygon with 26 sides

$= \frac{26}{2}(26-3) = 13 \times 23 = 299$

228. The number of diagonals in a polygon with in 19-sides will be –

(a) 161 (b) 133
(c) 171 (d) 152

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (d) : Number of diagonals $= \frac{n}{2}(n-3)$

$= \frac{19}{2}(19-3) = \frac{19}{2}\times 16$

$= 19 \times 8 = 152$

229. The measure of each interior angle of a normal octagon is–

(a) 115^0 (b) 125^0
(c) 120^0 (d) 135^0

RRB Group-D – 04/10/2018 (Shift-II)

Ans : (d) Measure of interior angles of polygon

$= \frac{(n-2)180}{n}$

$= \frac{(8-2)\times 180}{8} = 135^0$

230. The value of each interior angle of a regular heptagon is _____

(a) 128.57^0 (b) 126.37^0
(c) 148.24^0 (d) 137.56^0

RRB Group-D – 05/10/2018 (Shift-I)

Ans. (a) : ∵ Each interior angle of regular polygon with n sides

$= \frac{(2n-4)\times 90}{n}$

∴ Each interior angle of regular heptagon

$= \frac{(2\times 7-4)\times 90}{7}$

$= \frac{900}{7} = 128.57^0$

231. What is the value of each interior angle of a regular pentagon?

(a) 148.24° (b) 137.56°
(c) 128.57° (d) 108°

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (d) Value of interior angle of polygon with n sides

$= \frac{(n-2)}{n}180$

Each interior angle of regular pentagon

$= \frac{(5-2)}{5}180$

$= \frac{3\times 180}{5} = \frac{540}{5} = 108°$

232. The number of diagonals in a polygon with 28 sides is–

(a) 350 (b) 280
(c) 304 (d) 175

RRB Group-D – 11/12/2018 (Shift-I)

Ans. (a) : Number of sides (n) = 28

Number of diagonals $= \frac{n(n-3)}{2}$

$= \frac{28(28-3)}{2} = \frac{28\times 25}{2} = 350$

233. What is the number of diagonals in a polygon with 17-sides:–

(a) 118 (b) 120
(c) 121 (d) 119

RRB Group-D – 31/10/2018 (Shift-III)

Ans : (d) Number of diagonals in Polygon $= \frac{n}{2}(n-3)$

$= \frac{17}{2}(17-3) = \frac{17}{2}\times 14 = 119$

234. The number of sides of a regular polygon whose internal angle is 150° will be–

(a) 15 (b) 13
(c) 12 (d) 14

RRB NTPC 17.01.2017 Shift-3

Ans : (c) Let number of sides = n

Each interior angle of regular polygon $= \frac{(2n-4)90^0}{n}$

$150 = \frac{180n-360}{n}$

$150\ n = 180n - 360$

$30n = 360^0 \Rightarrow n = 12$

235. In a regular polygon, each exterior angle is 36°. Find the number of its sides.

(a) 11 (b) 9

(c) 10 (d) 8

RRB NTPC 07.04.2016 Shift : 2

Ans : (c) In polygon

$$\text{Each exterior angle} = \frac{360^0}{\text{number of sides}}$$

$$\Rightarrow 36^0 = \frac{360^0}{\text{number of sides}}$$

$\therefore$ Number of sides = 10

Type - 9

236. The larger of two supplementary angles is 36º more than the smaller. The smaller angle is:

(a) 72° (b) 108°

(c) 63° (d) 27°

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (a) :

Let smaller angle of two supplementary angle be = x^0

$\therefore$ largest angle = $x^0 + 36^0$

According to the question,

$x^0 + x^0 + 36^0 = 180^0$

$2x^0 = 180^0 - 36^0$

$$x^0 = \frac{144^0}{2} = 72^0$$

Hence, smaller angle will be 72°.

237. Two angles are complementary. The larger angle is 6º less than thrice the measure of the smaller angle. What is the measure of the larger angle?

(a) 63º (b) 57º

(c) 66º (d) 54º

RRB Group-D 18/08/2022 (Shift-II)

Ans. (c) : Let larger angle be x and smaller angle be y

$x + y = 90º$ ..... (i)

According to the question,

$3y - 6 = x$

$x - 3y = -6$ .....(ii)

Equation (ii) – equation (i)

$x = 66º$

$y = 24º$

Hence, larger angle is 66°.

238. Two adjacent angles form an angle of 100º. The larger angle is 20º less than five times the smaller angle. The larger angle is:

(a) 75º (b) 90º

(c) 70º (d) 80º

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let the small angle = x

then the large angle = 5x - 20º

According to the question,

$x + 5x - 20º = 100º$

$6x = 120º$

$\boxed{x = 20º}$

Hence the larger angle = $5 \times 20º - 20º$

$= 100º - 20º$

$= 80º$

239. What is the sum of the angle complementary to 15º and the angle supplementary to 125º?

(a) 135º (b) 120º

(c) 130º (d) 150º

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (c) : Two angle is called complementary when their messures add to 90 degrees.

$\angle A + \angle B = 90º$

Supplementry angles are two angles whose measures add up to 180º

$\angle A + \angle B = 180º$

According to the question,

Complementry angle = $\angle A + \angle B = 90º$

$= \angle 15º + \angle B = 90º$

$\angle B = 75º$

Supplementry angle = $\angle A + \angle B = 180º$

$= 125 + \angle B = 180º$

$\angle B = 55º$

Sum of Angle = $75º + 55º = 130º$

240. If two complementary angles are in the ratio of 11:7, then find the smaller angle.

(a) 35° (b) 55°

(c) 45° (d) 25°

RRB RPF SI – 11/01/2019 (Shift-II)

Ans : (a) Because sum of two complementary angle is 90°

$$\text{Small angle} = \frac{7}{11+7} \times 90 = \frac{7}{18} \times 90 = 35^o$$

241. The supplement of an angle is 15° more than three times its complementary. What will be the value of the angle?

(a) 57.5° (b) 72.5°

(c) 52.5° (d) 65°

RRB Group-D – 16/10/2018 (Shift-III)

Ans : (c) Suppose an angle = x°

According to the question

$180° - x° = 3(90° - x°) + 15°$

$2x° = 270° + 15° - 180°$

$2x° = 105°$

$\boxed{x = 52.5°}$

242. How many degrees does an angle that is 1/5 of its supplementary angle?

(a) 45° (b) 30°

(c) 60° (d) 75°

RRB NTPC 04.04.2016 Shift : 2

Ans : (b) Suppose an angle = x°

Its supplementary angle = 5x°

Sum of two supplementary angle = 180°

$x + 5x = 180°$

$6x = 180 \Rightarrow x = 30°$

Required angle = 30°

243. If two supplementary angles are in the ratio 4:5, Find the larger angle.

(a) 80° (b) 50°

(c) 60° (d) 100°

RRB NTPC 16.04.2016 Shift : 1

Ans : (d) Suppose angle is 4x° and 5x° respectively

We know that sum of two supplementary angle is 180°.

$\therefore 4x° + 5x° = 180°$

$9x° = 180°$

$x° = 20°$

$\therefore$ large angle $(5x°) = 5 \times 20° = 100°$

244. If (6y+70)° and (3y+47)° are supplementary angles, find the value of y.

(a) 12 (b) 15

(c) 7 (d) 10

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) $(6y + 70)° + (3y + 47)° = 180°$

$6y° + 70° + 3y° + 47° = 180°$

$9y° + 117° = 180°$

$9y° = 180° - 117°$

$9y° = 63°, \quad y° = 7°$

245. If (7x + 5)° and (x + 5)° are complementary angles, then find value of x.

(a) 10° (b) 20°

(c) 30° (d) 40°

RRB NTPC 12.04.2016 Shift : 3

Ans : (a) We know that sum of complementary angles is equal to 90°

$\therefore$ According to the question,

$(7x + 5)° + (x+5)° = 90°$

$\Rightarrow 7x° + 5° + x° + 5° = 90°$

$\Rightarrow 8x° = 90° - 10°$

$8x° = 80°$

$x° = \frac{80°}{8°} = 10°$

246. The ratio of two complementary angles are 4:5, find the ratio of the square of the first angle to the square of the second angle.

(a) 16 : 25 (b) 64 : 125

(c) 100 : 125 (d) 25 : 16

RRB NTPC 28.04.2016 Shift : 2

Ans : (a) Suppose both complementary angle are 4x° and 5x° respectively

$\therefore 4x° + 5x° = 90°$

$9x° = 90°$

$x° = 10°$

$\therefore$ First complementary angle = 40°

Second complementary angle = 50°

$\therefore$ Required ratio $= (40)^2 : (50)^2$

$= 1600 : 2500 = 16 : 25$

Type - 10

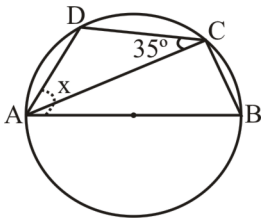
247. ABCD is a cyclic quadrilateral. AB is a diameter of the circle. If ΔACD = 35º find the value of ΔBAD.

(a) 70º (b) 55º

(c) 45º (d) 60º

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (b) :



∠ACB 90º (Diameter makes a right angle to the circumference)

∠BCD = ∠ACB + ∠ACD

= 90º + 35º

= 125º

∠BAD + ∠BCD = 180º (From cyclic quadrilateral)

∠BAD = 180º – ∠BCD

∠BAD = 180º – 125º

∴ ∠BAD = 55º

248. ABCD is a cyclic quadrilateral whose side AB is a diameter of the circle through A, B, C and D. If ∠ADC = 129°, then what is the measure of ∠BAC ?

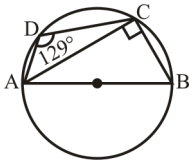
(a) 51º (b) 49º

(c) 39º (d) 41º

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (c) : Given,

In cyclic quadrilateral–



∠ADC = 129º

AB = diameter

∠BAC = ?

∠ACB = 90º

In semicircle make angle Right angle.

∠ABC + ∠ ADC = 180º

∠ABC = 180º – 129º

∠ABC = 51º

Then, In Δ ABC,

∠BAC + ∠ACB + ∠ABC = 180º

∠BAC + 90º + 51º = 180º

∠BAC = 180º – 141º

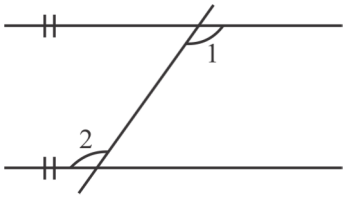
∠BAC = 39º

249. A pair of parallel lines is intersected by a transversal such that ∠1 and ∠2 form a pair of alternate interior angles. If m∠1 = 35º. What is the measure of ∠2?

(a) 35º (b) 145º
(c) 55º (d) 65º

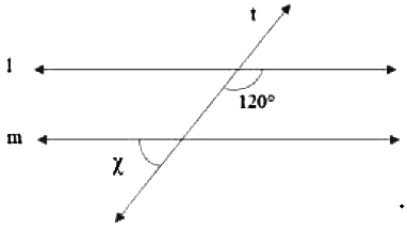
RRB Group-D 30-08-2022 (Shift-II)

Ans. (a) : According to the question,



∠1 = ∠2 (They are alternate interior angles)
m∠1 = 35º (Given)
∴ ∠2 = 35º

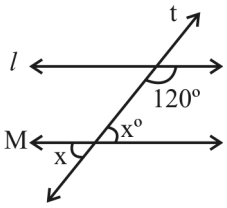
250. If the given figure line *l* is parallel to m and t is the transversal. Find the measure of angle x.



(a) 40º (b) 120º
(c) 60º (d) 30º

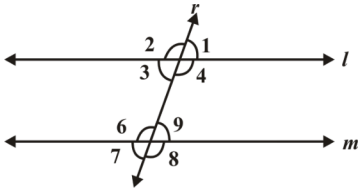
RRB Group-D 24-08-2022 (Shift-I)

Ans. (c) :



by interior angle formula-
x + 120º = 180º
x = 60º

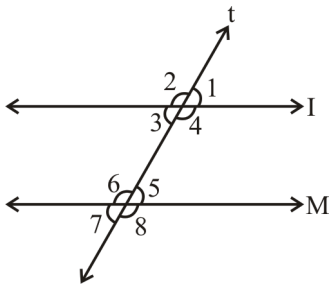
251. In the given figure, 1 || m and t is a transversal. If ∠1 and ∠2 are in the ratio 4 : 11, the measures of the angles ∠7 and ∠8, respectively, are :



(a) 110º and 70º (b) 87º and 93º
(c) 132º and 48º (d) 65º and 115º

RRB Group-D 09/09/2022 (Shift-I)

Ans. (c) :



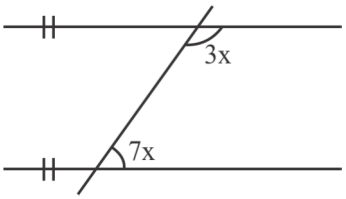
∠1 : ∠2 = 4 : 11
Let ∠1 = 4x
and, ∠2 = 11x
∠1 + ∠2 =180^0
4x + 11x = 180^0
15x = 180^0
x = 12^0
∠1 = 4 × 12^0 = 48^0
∠2 = 11 × 12^0 = 132^0
∴ ∠2 + ∠7 = 180
∠7 = 180^0 – 132^0
= 48^0
and,
∠1 + ∠8 = 180^0
∠8 = 180^0 – 48^0
= 132^0
Hence, ∠7 and ∠8 का माप = 48° and 132°

252. If the ratio of two interior angles on the same side of a transversal line intersecting the two parallel lines is 3 : 7, then what is the positive difference between the measures of these two interior angles?

(a) 54º (b) 80º
(c) 72º (d) 64º

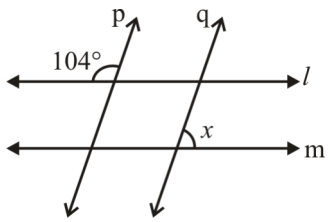
RRB Group-D 30-08-2022 (Shift-II)

Ans. (c) : According to the question
Let the angles be 3x and 7x.



∵ Sum of interior angles of same side of transversal line = 180º
∴ 3x+ 7x = 180º
x = 180º
Required difference = 7x – 3x
= 4x = 4 × 18 = 72º

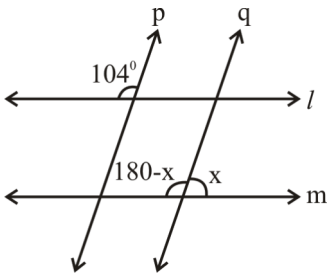
253. In the given figure, t ll m and p ll q. The value of x is:



(a) 96° (b) 104°
(c) 76° (d) 82°

RRB GROUP-D – 27/09/2022 (Shift-I)

Ans. (c) :



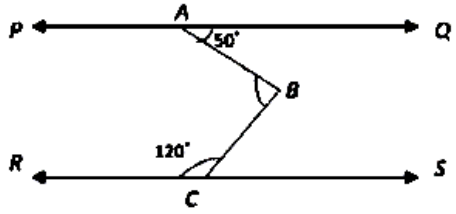
एकान्तर कोण से–

$180^0 - x = 104^0$

$x = 180^0 - 104^0$

$x = 76^0$

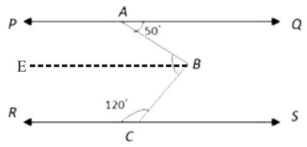
254. What is the measure of ∠ABC in the given figure, given that PQ || RS?



(a) 70º (b) 140º
(c) 90º (d) 110º

RRB Group-D 13/09/2022 (Shift-III)

Ans. (d) :



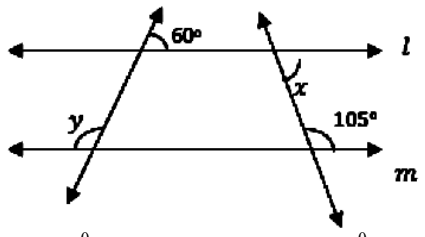
∠ABE = 50°

∠CBE = 180° – 120° = 60°

∠ABC = 50° + 60°

= 110°

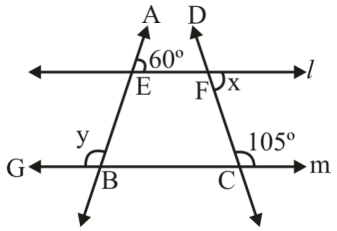
255. In the adjoining figure line l is parallel to m. What is the value of 2x + y?



(a) 270^0 (b) 150^0
(c) 320^0 (d) 225^0

RRB GROUP-D – 17/08/2022 (Shift-III)

Ans. (a) :



Given,

$l \parallel m$

∠AEl = ∠ABC ------- (संगत कोण)

∠ABC = 60º

and ∠ABC + ∠ABG = 180 ----(एक ही रेखा पर बने कोण)

∠ABG = 180-60 = 120º

y = 120º --------(i)

∠DFl = ∠DCm …….(संगत कोण)

∠DFl = 105º

∠DFl + ∠lFC = 18º ---- (एक ही रेखा पर बने कोण)

∠lFC = 180º –105º=75º

x = 75º -----(ii)

Hence, equation (i) and (ii),

2x + y

= 75° × 2 + 120°

= 150º + 120º

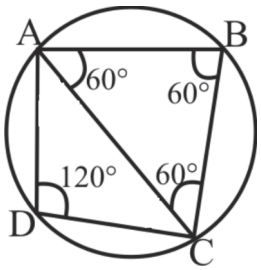
= 270º

256. If ABCD is a cyclic quadrilateral and ABC is an equilateral triangle find the angle of ∠CDA

(a) 45^0 (b) 90^0
(c) 120^0 (d) 60^0

RRB NTPC 01.02.2021 (Shift-II) Stage Ist

Ans. (c) :



∵ In any cyclic quadrilateral the sum of opposite angle of quadrilateral is 180º

Hence,

∠CDA + ∠ABC = 180^0

∠CDA + 60° = 180^0

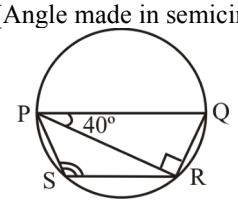
∠CDA = $180^0 - 60^0 = 120^0$

257. PQRS is a cyclic trapezium where PQ is parallel to RS and PQ is the diameter. If $\angle QPR = 40^0$ then $\angle PSR$ is equal to:

(a) 120º (b) 140 º
(c) 130 º (d) 110 º

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

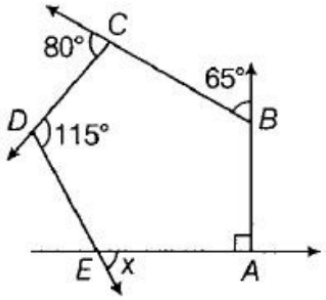
Ans. (c) : ∵ Angle made in semicircle is right angle.
∴ ∠PRQ = 90º [Angle made in semicircle]



In ΔPQR,
∠PQR = 180º – (40º + 90º)
= 50º

∵ The sum of opposite angles in a cyclic quadrilateral is 180º
∴ ∠PSR + ∠PQR = 180º
∠PSR = 180º - 50º = 130º

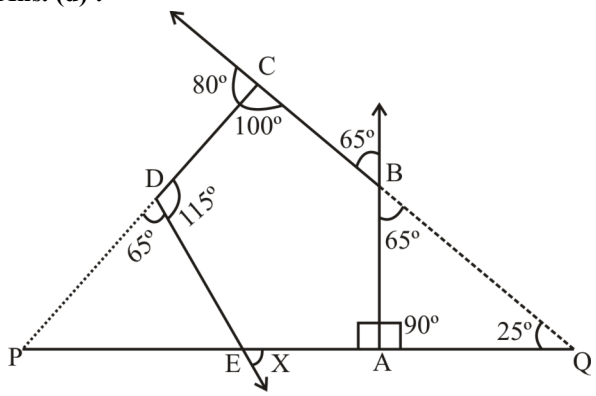
258. In the given figure, value of x is:



(a) 65º (b) 70º
(c) 55º (d) 60º

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) :



In the given figure, on extending CD and AE to P and CB and EA to Q.
In ΔPCQ
∠P + ∠C + ∠Q = 180°
∠P + 100 + 25 = 180°
∠P + 125 = 180°
∠P = 55°
In ΔPDE
∠E = 180° – 55° – 65°
∠E = 60°
∠x = ∠E (∵ Vertically opposite angle)
∠x = 60°

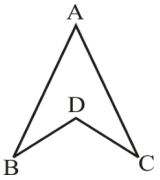
259. When an arm of an angle is extended to double its length, then the measure of the angle:

(a) remains the same (b) triples
(c) doubles (d) becomes half

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (a) : If the length of the side of an angle increased two times then the measure of that angle remains the same.

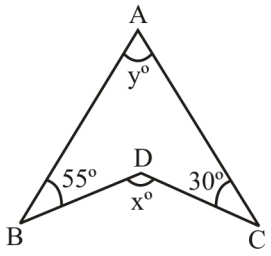
260. If the given figure, ∠ABD = 55º and ∠ACD = 30º. If ∠BAC = yº and non-reflex ∠BDC = xº, then what is the value of 'x – y'?



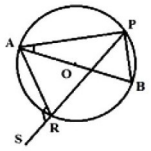
(a) 95 (b) 15
(c) 85 (d) 105

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (c) :
Given,
$\angle ABD = 55^0$
$\angle ACD = 30^0$
$\angle BAC = y^0$
and
$\angle BDC = x^0$
In figure –
$x^o = y^o + 55^o + 30^o$
$(x^o – y^o) = 85^o$



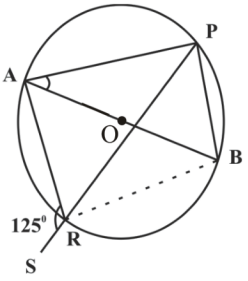
261. In the figure, O is the centre of the circle. If ∠ARS = 125º, then find the measure of ∠PAB.



(a) 125^0 (b) 55^0
(c) 145^0 (d) 35^0

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question –



$\angle ARP = 180^0 – 125^0 = 55^0$
Angle formed in semicircle will be right angle.

$\angle APB = 90^0$

$\angle APB + \angle ARB = 180^0$ (Cyclic quadrilateral)

$90^0 + \angle ARP + \angle PRB = 180^0$

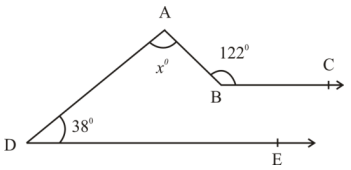
$90^0 + 55^0 + PRB = 180^0$

$\angle PRB = 35^0$

$\angle PAB = \angle PRB = 35^0$

Angle formed at circumference of circle by a chord in same segment is always same.

262. In the given figure, BC || DE then find the value of x

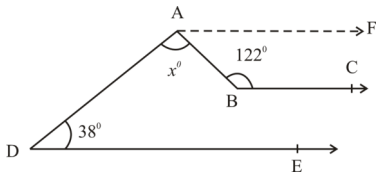


(a) 20^0 (b) 84^0

(c) 142^0 (d) 38^0

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question –



BC || DE || AF

$\angle FAB + \angle ABC = 180^0$ (Interior angle)

$\angle FAB = 180^0 - 122^0 = 58^0$

$\angle FAD + \angle ADE = 180^0$ (Interior angle)

$\angle FAB + \angle BAD + 38^0 = 180^0$

$58^0 + x^0 + 38^0 = 180^0$

$x^0 = 180^0 - 96^0$

$x = 84^0$

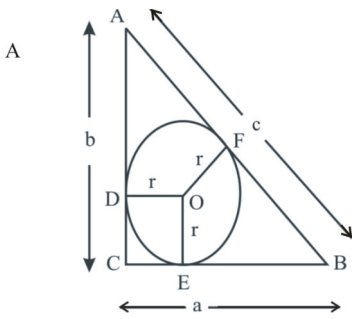
263. a, b and c are the sides of a right triangle with c as hypotenuse. The radius r, of the circle which touches the three sides of the triangle is:

(a) $r = \frac{(a+b+c)}{2}$ (b) $r = \frac{(a-b-c)}{2}$

(c) $r = \frac{(a-b+c)}{2}$ (d) $r = \frac{(a+b-c)}{2}$

RRB NTPC 10.01.2021 (Shift-II) Stage Ist

Ans. (d) :



AB = c

BC = a

AC = b

The tangent of the circle and the external points will be equal

AD = AF

CD = CE

BE = BF

EODC is a square, OE = CD = r

$c = AF + FB$

$c = AD + BE$

$c = (CA - DC) + (BC - CE)$

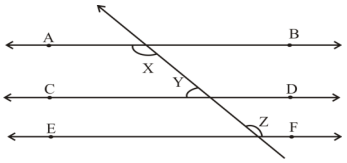
$c = b - r + a - r$

$c = a + b - 2r$

$2r = a + b - c$

$r = \left(\frac{a+b-c}{2}\right)$

264.



In the given figure, the three parallel lines are cut through by a transversal. Of the marked angles, the greater two are of equal measure. The ratio of a greater angle to the smaller angle is 7 : 3. What is the measure of the greater angle?

(a) 110° (b) 90°

(c) 18° (d) 126°

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (d) : Let, y is a smaller angle

So, y = 3x

and, z is a greater angle

So, z = 7x

$\angle z = \angle x$ by corresponding angle

$\angle x + \angle y = \angle z + \angle y = 180^o$

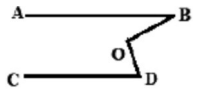
$7x + 3x = 180^o$

$10x = 180^o$

$x = 18^o$

So, now, greater angle = $\angle z = 7x = 7 \times 18 = 126^0$

265. In the given figure, AB and CD are parallel lines. O is a point such that angle CDO = 70º and angle DOB = 100º. Find angle ABO.

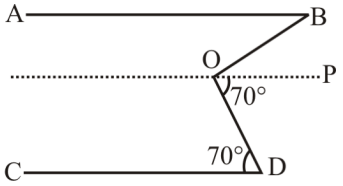


(a) 50º (b) 80º

(c) 60º (d) 30º

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,



$\angle CDO = 70^\circ$

$\angle CDO = \angle POD$ (Alternate opposite angle)

$\angle POD = 70^\circ$

$\angle BOP = 100 - 70 = 30^\circ$

$\angle ABO = \angle BOP$ (Alternate opposite angle)

$\angle ABO = 30^\circ$

266. The sum of two angles is 155° and their difference is $\frac{\pi}{2}$. The value of the greater angle (in radians) is:

(a) $\frac{53\pi}{72}$ (b) $\frac{47\pi}{72}$

(c) $\frac{49\pi}{72}$ (d) $\frac{51\pi}{72}$

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (c) : Let two angles are $\angle A$ and $\angle B$ respectively

According to the question,

$$\angle A + \angle B = 155^\circ \quad \text{.....(i)}$$

$$\angle A - \angle B = \frac{\pi}{2} = 90^\circ \quad \text{.....(ii)}$$

$$2\angle A = 245^\circ$$

$$\angle A = \frac{245^\circ}{2}$$

On putting the value of $\angle A$ in equation (i)-

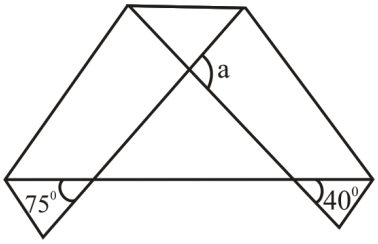
$$\angle A + \angle B = 155^\circ$$

$$\angle B = 155^\circ - \frac{245^\circ}{2} = \frac{65^\circ}{2}$$

$\therefore$ Value of greater angle in radian

$$= \frac{245^\circ}{2} \times \frac{\pi}{180} = \frac{49\pi}{72}$$

267. What is the value of a?

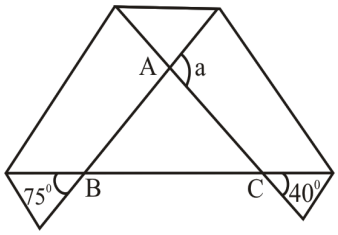


(a) 65° (b) 75°

(c) 105° (d) 115°

RRB NTPC 29.03.2016 Shift : 3

Ans : (d)



$\angle ABC = 75^\circ$ (opposite angle)

$\angle ACB = 40^\circ$ (opposite angle)

$\therefore \angle BAC = 180^\circ - (75^\circ + 40^\circ)$

$= 180^\circ - 115^\circ = 65^\circ$

but $\angle BAC + a = 180^\circ$ (angle of Linear pair)

$a = 180^\circ - 65^\circ = 115^\circ$

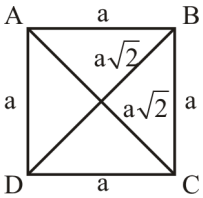
268. The sum of the diagonals of a square is ___ the perimeter of the square.

(a) less than $\frac{3}{4}$ of (b) larger than

(c) equal to (d) less than $\frac{1}{2}$ of

RRB Group-D – 16/11/2018 (Shift-III)

Ans. (a) :



Sum of diagonals $a\sqrt{2} + a\sqrt{2} = 2a\sqrt{2}$

Perimeter $= a + a + a + a = 4a$

$\frac{3}{4}$ times of perimeter $= 4a \times \frac{3}{4} = 3a$

$\Rightarrow 2a\sqrt{2} < 3a$

Thus, the sum of the diagonals of a square is less than $\frac{3}{4}$ th times of the perimeter of the square.

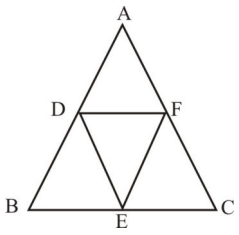
269. In an equilateral triangle ABC, D, E, F are the midpoints of AB, BC and AC respectively. So the quadrilateral BEFD is:

(a) A square (b) A rectangle

(c) A parallelogram (d) A rhombus

RRB NTPC 29.03.2016 Shift : 1

Ans : (c)



In a triangle, the line joining the midpoints of two sides is Parallel and half of the third side.

DF || BC

and $DF = \frac{1}{2}BC$ .....(i)

$\therefore$ E is the mid point of BC

$\therefore$ $BE = \frac{1}{2}BC$ .....(ii)

From the equation (i) and equation (ii)

DF = BE

$\because$ DF || BC $\Rightarrow$ DF || BE

So quadrilateral BEFD is a parallelogram

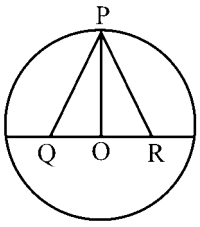
270. An equilateral triangle is constructed in such a way that the two end of the triangle are placed on the diameter of the circle and the third is placed on the circle. If the area of the circle is 48π then what will be the side of the triangle.

(a) 8 (b) 4

(c) $8/\sqrt{3}$ (d) $4\sqrt{3}$

RRB NTPC 10.04.2016 Shift : 3

Ans : (a) From the figure,



Let the radius of the circle = r

$\therefore$ Area of circle = πr^2

$= 48\pi = \pi r^2$

$r = \sqrt{48} = 4\sqrt{3}$

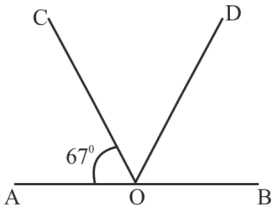
Radius = length of OP which is perpendicular of equilateral triangle PQR.

$\Rightarrow 4\sqrt{3} = \frac{\sqrt{3}}{2}a$

$\therefore a = 4 \times 2 = 8$

Hence, the length of side of triangle a = 8

271. In the given figure, AOB is a straight line, $\angle AOC = 67^0$ and the bisector of $\angle BOC$ is OD. What is the value of $\angle BOD$ in degrees?



(a) 56° (b) 55.5°

(c) 55° (d) 56.5°

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (d) $\angle AOC = 67°$

$\therefore \angle BOC = 180° - 67°$

$\angle BOC = 113°$

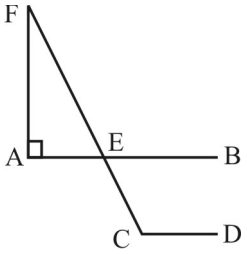
Bisector of $\angle BOC$ is OD

So, $\angle BOD = \frac{\angle BOC}{2}$

$\angle BOD = \frac{113°}{2}$

$\angle BOD = 56.5°$

272. In the figure, AB || CD and $\angle AFE = 30°$ then $\angle FCD$ is:

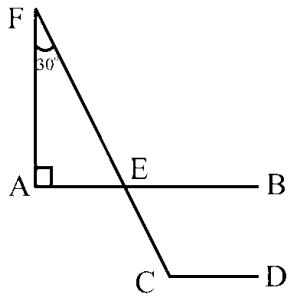


(a) 60° (b) 120°

(c) 90° (d) 45°

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) :



Given,

AB || CD

$\angle AFE = 30°$

$\angle FCD = ?$

From ΔAEF

$\angle AFE = 30°$ (given)

$\angle FAE = 90°$

$\because$ Sum of all three angles of Δ is $180°$

$\therefore 90° + 30° + \angle AEF = 180°$

$\therefore \angle AEF = 180° - 120° = 60°$

$\angle BEC = 60°$ (Vertically opposite angle)

$\angle FEB + \angle BEC = 180°$ (Alternate angle)

$\angle FEB + 60° = 180°$

$\angle FEB = 120°$

$\because \angle FEB = \angle FCD$ (Corresponding angle)

$\therefore \quad \angle FCD = 120°$

273. There are two vertical pillars of heights 8 m and 12 m. One rope is drawn from the top of both the pillars to the bottom of the other. At what height from the ground do the ropes cut each other?

(a) 24/5 m

(b) 22/7 m

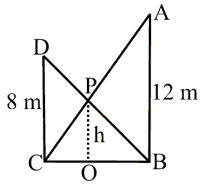
(c) 29/6 m

(d) 31/8 m

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (a) : Given-

heights of pillars = 8 m, 12 m

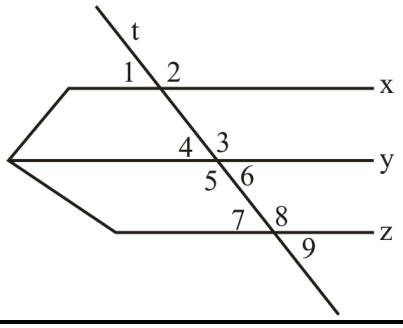


The rope cuts each other at a height of h meter from the ground.

$$\text{From, } OP = \frac{AB \times CD}{AB + CD}$$

$$h = \frac{12 \times 8}{12 + 8} = \frac{12 \times 8}{20} = \frac{24}{5} \text{m}$$

274.



x, y and z are parallel lines and t is a transversal intersecting them all. Which of the following lists of angles is the same?

(a) 2, 3, 5

(b) 2, 6, 8

(c) 1, 4, 9

(d) 4, 5, 7

RRB NTPC 31.03.2016 Shift : 1

Ans : (c) $\angle 1 = \angle 4$ (Corresponding angle)

$\angle 4 = \angle 6$ (Vertical opposite angle)

$\angle 6 = \angle 9$ (Corresponding angle)

So angles 1, 4, 9 are equal/same

275. Consider the following Stagements, and choose the correct option:–

When two straight lines intersect each other, then

1. Adjacent angles are complementary.

2. Opposite angles are complementary.

(a) Both 1 and 2 are incorrect.

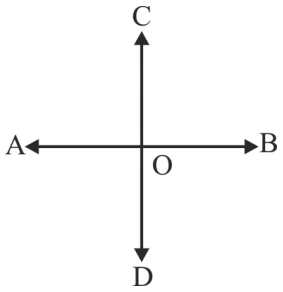
(b) Both 1 and 2 are correct.

(c) 1 is incorrect and 2 is correct.

(d) 1 is correct and 2 is incorrect.

RRB NTPC 16.04.2016 Shift : 1

Ans : (d)



When two straight lines intersect each other then adjacent angle be complementary angle.

276. Horizontal lines are on the same line.

(a) Equal in length

(b) Parallel to each other

(c) Intersecting each other

(d) Form triangle

RRB NTPC 29.04.2016 Shift : 1

Ans : (b) Horizontal line on one line is parallel of each other.

26.

Elementary Statistics/Probability

Type - 1

1. If each of the observations of 14, 22, 16, 24, 12, 8, 4, 18, 12. 10 is increased by 10 then what will be their new mean ?

(a) 16 (b) 26
(c) 14 (d) 24

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (d) : Mean $= \frac{\text{Sum of observation}}{\text{Number of observation}}$

$= \frac{14+22+16+24+12+8+4+18+12+10}{10}$

$= \frac{140}{10} = 14$

New Mean = 14 + 10 = 24

2. The scores obtained by 10 students in a test are 82, 60, 62, 63, 78, 75, 86, 75, 91, 46 Find the arithmetic mean of their scores.

(a) 70.6 (b) 71.8
(c) 72.2 (d) 72.8

RRB NTPC (Stage-II) –16/06/2022 (Shift-I)

Ans. (b) : Arithmetic Mean $= \frac{\text{Total sum of Scores}}{\text{Number of Students}}$

$= \frac{82+60+62+63+78+75+86+75+91+46}{10}$

$= \frac{718}{10}$

= 71.8

3. If the mean of numbers 33, x, 47, 83 and 109 is 67, what is the mean of 50, 64, 100, 126 and x?

(a) 84 (b) 81.8
(c) 80.6 (d) 80

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : According to the question,

$67 = \frac{33+x+47+83+109}{5}$

$335 = x + 272$

$x = 63$

Now,

$\frac{50+64+100+126+63}{5}$

= 80.6

4. If, for x > 0, the mean of 22.5, 56, 42.5, 2x+1, x–2, 3x, 36 is 30, then the value of x is _____.

(a) 7 (b) 4
(c) 9 (d) 6

RRB Group-D 26/08/2022 (Shift-III)

Ans. (c) : Given, mean = 30

According to the question,

$22.5 + 56 + 42.5 + 2x + 1 + x - 2 + 3x + 36 = 7 \times 30$

$\Rightarrow$ $156.0 + 6x = 210$

$\Rightarrow$ $6x = 54$

$\Rightarrow$ $x = 9$

Hence options (c) is correct.

5. What is the mean of the following distribution?

Marks	10	30	50	70	90
Number of students	17	28	32	24	19

(a) 52.4 (b) 50
(c) 51 (d) 49.2

RRB Group-D 09/09/2022 (Shift-II)

Ans. (b) : Given,

माध्य $= \frac{\sum fx}{\sum f}$

$= \frac{10\times17+30\times28+50\times32+70\times24+90\times19}{17+28+32+24+19}$

$= \frac{6000}{120} = 50$

6. Find the arithmetic mean of the given frequency distribution.

Marks	Frequency
50	3
28	4
85	6
40	7

(a) 52.6 (b) 56.2
(c) 40.95 (d) 50.5

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (a) :

Marks (x)	Frequency (f)	fx
50	3	150
28	4	112
85	6	510
40	7	280
	Σf=20	Σfx=1052

Mean $= \frac{\sum fx}{\sum f} = \frac{1052}{20} = 52.6$

7. The mean of 36 numbers was found to be 42. Later, it was discovered that a number 47 had been mistakenly read as 41. Find the correct mean of the given numbers. (Rounded of two decimal places)

(a) 42.17 (b) 43.74
(c) 43.62 (d) 42.83

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (a) : The mean of 36 numbers = 42

Sum of 36 number = 36 × 42 = 1512

Correct total sum = 1512 – 41 + 47= 1518

$$\text{Total mean} = \frac{1518}{36}$$

$$= 42.1666 = \boxed{42.17}$$

8. Find the arithmetic mean of the following data.
12, 13, 18, 12, 15, 15, 16, 13, 19, 17

(a) 15.5 (b) 14

(c) 13.5 (d) 15

RRB Group-D 28-09-2022 (Shift-II)

Ans. (d) : $\text{Arithmetic mean} = \frac{\text{Sum of all observation}}{\text{Number of observation}}$

$$= \frac{12+13+18+12+15+15+16+13+19+17}{10}$$

$$= \frac{150}{10} = 15$$

9. Find the arithmetic mean of the following data.

x	**6**	**10**	**18**	**24**	**30**	**36**
f	**4**	**3**	**4**	**2**	**1**	**1**

(a) 13 (b) 16

(c) 17 (d) 12

RRB Group-D 29-09-2022 (Shift-II)

Ans. (b) :

x	f	x.f
6	4	24
10	3	30
18	4	72
24	2	48
30	1	30
36	1	36
total	$\Sigma f = 15$	$\Sigma fx = 240$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$= \frac{240}{15}$$

$$= 16$$

10. If the mean of 22, 25, 27, 24 and x is 26, then the value of x is:

(a) 35 (b) 32

(c) 28 (d) 41

RRB Group-D 23/08/2022 (Shift-II)

Ans. (b) :

$$\text{Mean} = \frac{\text{Sum of terms}}{\text{No. of terms}}$$

$$26 = \frac{22+25+27+24+x}{5}$$

$$130 = 98 + x$$

$$x = 32$$

11. The mean of the values 1, 2, 3, 4, ..., n with respective frequencies 1, 2, 3, ..., n is:

(a) $\frac{2n-1}{3}$ (b) $\frac{2n+1}{3}$

(c) $\frac{n+1}{2}$ (d) $\frac{n-1}{2}$

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (b) : $\sum f_1 x_1 = (1\times1)+(2\times2)+(3\times3)+\text{-----}n\times n$

Where, f_1 = Frequency, x_1 = Observation

$$= 1^2 + 2^2 + 3^2 + \text{-----} n^2$$

$$= \frac{n(n+1)(2n+1)}{6}$$

and $\sum f_1 = 1 + 2 + 3 + \text{-------} n$

$$= \frac{n(n+1)}{2}$$

$$\text{Mean} = \frac{\sum f_1 x_1}{\sum f_1} = \frac{\frac{n(n+1)(2n+1)}{6}}{\frac{n(n+1)}{2}} = \frac{2n+1}{3}$$

12. If the mean of the following data is 15, then find the value of k.

x	**5**	**10**	**15**	**20**	**25**
f	**6**	**k**	**6**	**10**	**5**

(a) 6 (b) 10

(c) 8 (d) 7

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (c) :

x	f	f ×x
5	6	30
10	k	10k
15	6	90
20	10	200
25	5	125
	$\Sigma f = 27 + k$	$\Sigma f.x. = 445 + 10k$

$$\text{Mean} = \frac{445+10k}{27+k} = 15$$

$$405 + 15k = 445 + 10k$$

$$k = 8$$

13. The following table gives a frequency distribution whose arithmetic mean is 33. Find the product of the possible values of k from the distribution.

Value (X)	**Frequency (f)**
29	4
30	3
30 + k	3k
34	2
62	1

(a) 5 (b) 2

(c) 3 (d) 4

RRB NTPC 24.07.2021 (Shift-II) Stage Ist

Ans. (b) :

Value (x)	**Frequency (f)**	**f×x**
29	4	116
30	3	90
30+k	3k	$90k+3k^2$
34	2	68
62	1	62
	$\Sigma f = 10+3k$	$\Sigma fx = 336+90k+3k^2$

We know that,

$$\text{Arithmetic Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$33 = \frac{336 + 90k + 3k^2}{10 + 3k}$$
$330 + 99k = 336 + 90k + 3k^2$
$3k^2 + 90k - 99k + 336 - 330 = 0$
$3k^2 - 9k + 6 = 0$
$k^2 - 3k + 2 = 0$
$(k - 2)(k - 1) = 0$
$k = 2, 1$
Hence, the number of possible value of k = 2

14. If mean of the following distribution is 26, then what is the value of k ?

Class	0-10	10-20	20-30	30-40	40-50
Frequency	8	10	k	6	12

(a) 10 (b) 1
(c) 4 (d) 8

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

Class	Midpoint (x)	Frequency (f)	fx
0-10	5	8	40
10-20	15	10	150
20-30	25	k	25k
30-40	35	6	210
40-50	45	12	540

$$\text{Mean} = \frac{\sum fx}{\sum f} = \frac{40 + 150 + 25k + 210 + 540}{8 + 10 + k + 6 + 12}$$
$$26 = \frac{940 + 25k}{36 + k}$$
$936 + 26k = 940 + 25k$
$k = 4$

15. Find the mean height of persons from the following data.

Height (cm)	No. of persons
120	3
130	4
140	5
150	6
160	2

(a) 145 cm (b) 140 cm
(c) 160 cm (d) 150 cm

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (b) : From question,

Height (cm) (x_i)	No. of persons (f_i)	$f_i x_i$
120	3	360
130	4	520
140	5	700
150	6	900
160	2	320
	$\sum f_i = 20$	$\sum f_i x_i = 2800$

$$\text{Mean height of persons} = \frac{\sum (f_i x_i)}{\sum f_i} = \frac{2800}{20}$$
$= 140$ cm

16. The mean of 25 observations is 36. If the mean of its first 13 observations is 32 and the last 13 observations is 40, then what will be its 13th observation ?

(a) 38 (b) 23
(c) 36 (d) 40

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,
Let its 13th observation is x
$\therefore$ $x = 13(40 + 32) - 25 \times 36$
$x = 13 \times 72 - 25 \times 36$
$x = 936 - 900 \Rightarrow x = 36$

17. The mean of 100 observations is 50. If one observation 50 is replaced by 150, then what will be the new mean ?

(a) 49.5 (b) 51
(c) 50.5 (d) 52

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : New Mean $= 50 + \frac{150 - 50}{100}$
$= 50 + 1$
$= 51$

18. The marks obtained in a test by students of a class are given below.
Scores of how many students are within a, +2/–2 range of the average score of the class?
23, 2, 15, 38, 21, 19, 24, 26

(a) 3 (b) 2
(c) 4 (d) 1

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (a) : Average of total students
$= \frac{23 + 2 + 15 + 38 + 21 + 19 + 24 + 26}{8} = 21$
According to question,
3 students are within a +2/-2 range of average score of classes which are 23, 21, 19.

19. Find the mean of x + 77, x + 7, x + 5, x + 3 and x – 2.

(a) x + 18 (b) x + 8
(c) x – 3 (d) x – 8

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (a) : We know that,
$$\text{Mean} = \frac{\text{Sum of terms}}{\text{No. of terms}}$$
$$= \frac{(x-2) + (x+3) + (x+5) + (x+7) + (x+77)}{5}$$
$$= \frac{5x + 90}{5}$$
$$= \frac{5(x+18)}{5} = (x + 18)$$

20. Calculate the mean of following set of values–
2.2, 4.2, 6.4, 8.3, 10.5

(a) 6.50 (b) 7
(c) 6.32 (d) 6.12

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (c) : Mean value of the set

$$= \frac{2.2+4.2+6.4+8.3+10.5}{5}$$

$$= \frac{31.6}{5} = 6.32$$

21. Find the arithmetic mean of 36, 53, 50, 43, 57, 50, 40, 35, 39 and 34.

(a) 52.4 (b) 43
(c) 50 (d) 43.7

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (d) :

$$\text{Arithmetic mean} = \frac{\text{Sum of observations}}{\text{Total number of observations}}$$

$$= \frac{36+53+50+43+57+50+40+35+39+34}{10}$$

$$= \frac{437}{10} = 43.7$$

22. The arithmetic mean of X observations is m. If two observations 0 and m are added, then the new mean will be:

(a) $\frac{mx}{x+1}$ (b) m
(c) $\frac{m}{x+1}$ (d) $\frac{m(x+1)}{x+2}$

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) : Sum of x observations = mx
If 0 and m are added to them, then the new mean –

$$\text{Mean} = \frac{mx+0+m}{x+2}$$

$$= \frac{m(x+1)}{x+2}$$

23. Find the mean of the following data:

x:	19	21	23	25	27	29	31
f:	13	15	16	18	16	15	13

(a) 30 (b) 28
(c) 20 (d) 25

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d) :

x	f	fx
19	13	247
21	15	315
23	16	368
25	18	450
27	16	432
29	15	435
31	13	403
Total = $\sum f = 106$		$\sum fx = 2650$

$$\text{Mean}(\bar{x}) = \frac{\sum fx}{\sum f} = \frac{2650}{106}$$

$$\bar{x} = 25$$

24. Find the missing frequency(p) for the following distribution whose mean is 8:

x:	3	5	7	9	11	13
f:	6	8	15	p	8	4

(a) 18 (b) 12
(c) 10 (d) 25

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (d):

x	f	fx
3	6	18
5	8	40
7	15	105
9	p	9p
11	8	88
13	4	52
Sum =	**$\sum f = 41 + p$**	**$\sum (fx) = 303 + 9p$**

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$8 = \frac{303+9p}{41+p}$$

$8(41+p) = 303 + 9p$
$328 + 8p = 303 + 9p$
$9p - 8p = 328 - 303$
$p = 25$

25. Find the mean of the following distribution.

x :	5	6	7	8	9
f :	4	8	14	11	3

(a) 8.325 (b) 7.025
(c) 5.225 (d) 9.125

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\Sigma fx = 5 \times 4 + 6 \times 8 + 7 \times 14 + 8 \times 11 + 9 \times 3$
$= 20 + 48 + 98 + 88 + 27$
$= 281$

$\Sigma f = 4 + 8 + 14 + 11 + 3$
$= 40$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f} = \frac{281}{40}$$

$= 7.025$

26. Find the missing value of p for the following distribution, whose mean is 12.58.

x:	5	8	10	12	p	20	25
f:	2	5	8	22	7	4	2

(a) 20 (b) 15
(c) 10 (d) 13

RRB NTPC 11.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$\sum fx = 5\times2 + 8\times5 + 10\times8 + 12\times22 + 7\times p + 20\times4 + 25\times2$
$= 10 + 40 + 80 + 264 + 7p + 80 + 50$
$= 524 + 7p$

$\Sigma f = 2 + 5 + 8 + 22 + 7 + 4 + 2$
$= 50$

$\because$ $\text{Mean} = \frac{\Sigma f.x}{\Sigma f}$

$$12.58 = \frac{524+7p}{50}$$

$7p = 629 - 524$
$7p = 105$
$p = 15$

27. The arithmetic mean of marks obtained by students of a class was 58. 20% of them achieved by the mean of the marks was 60 and the marks obtained by 30% the mean was 40. then find the mean of the marks obtained by remaining students?

(a) 65 (b) 66
(c) 68 (d) 70

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans : (c) Let the number of students in the class = 100

and mean of marks obtained by the remaining 50% students = x

According to the question-

$$20\times60+30\times40+50\times x=100\times58$$
$$1200+1200+50\times x=5800$$
$$2400+50x=5800$$
$$50x=5800-2400=3400$$
$$x=\frac{3400}{50}=68$$

Then the mean of marks obtained by the remaining student is 68.

28. The mean of the observations x, $x+3$, $x+5$, $x+8$, $x+9$ is 9. What will be the mean of the last three observations.

(a) $\frac{32}{3}$ (b) $\frac{31}{3}$
(c) $\frac{35}{3}$ (d) $\frac{34}{3}$

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (d) $\text{Mean}=\frac{\text{sum of total term}}{\text{number of terms}}$

$$9=\frac{x+x+3+x+5+x+8+x+9}{5}$$
$$45=5x+25$$
$$5x=45-25$$
$$5x=20$$
$$x=4$$

Value of last three terms

$$x+5=4+5=9$$
$$x+8=12$$
$$x+9=13$$
$$\text{Mean}=\frac{9+12+13}{3}=\frac{34}{3}$$

29. Find the missing frequency 'x' in this figure. Given that the arithmetic mean is 28.

Profit %	0-10	10-20	20-30	30-40	40-50	50-60
Number of shops	12	18	27	x	17	6

(a) 20 (b) 15
(c) 12 (d) 24

RRB JE - 30/05/2019 (Shift-II)

Ans : (a)

Profit %	X	Shop's number (f)	f.x
0 – 10	5	12	60
10 – 20	15	18	270
20 – 30	25	27	675
30 – 40	35	x	35x
40 – 50	45	17	765
50 – 60	55	6	330

$\sum f=80+x \quad \sum fx=2100+35x$

$$\text{arithmetic mean}=\frac{\sum fx}{\sum f}$$
$$28=\frac{2100+35x}{80+x}$$
$$2240+28x=2100+35x$$
$$7x=140$$
$$x=20$$

30. If the mean of the given observation K, 2K + 1, 2K + 5, 2K + 9 is 30. then find the value of K?

(a) 15 (b) 5
(c) 12 (d) 20

RRB JE - 27/06/2019 (Shift-I)

Ans : (a) $\text{Mean}=\frac{\text{sum of total term}}{\text{number of terms}}$

$$30=\frac{K+2K+1+2K+5+2K+9}{4}$$
$$120=7K+15$$
$$7K=105$$
$$K=15$$

31. Since a mistake of 68 instead of 86 was typed, then the mean of the class was increased by 1/2. What is the total number of students?

(a) 34 (b) 36
(c) 38 (d) 40

RRB RPF Constable – 19/01/2019 (Shift-II)

Ans : (b) Let the number of students is x and mean of all class y mark

So total marks got by the students = xy

According to the question-

$$xy+(86-68)=x\left(y+\frac{1}{2}\right)$$
$$\Rightarrow xy+18=xy+\frac{x}{2}$$
$$\Rightarrow \frac{x}{2}=18$$
$$\Rightarrow x=18\times2$$
$$\Rightarrow x=36$$

Hence the number of students = 36

32. The mean of the five observation x, $x+3$, $x+4$, $x+6$ and $x+7$ is 11. What will be the mean of the last three observations?

(a) 12 (b) 12.67
(c) 19 (d) 13

RRB RPF SI – 16/01/2019 (Shift-II)

Ans : (b) Mean $= \frac{\text{sum of total term}}{\text{number of terms}} = \frac{\sum x}{N}$

$$11 = \frac{x+(x+3)+(x+4)+(x+6)+(x+7)}{5}$$

$55 = 5x + 20$

$35 = 5x$

$$x = \frac{35}{5} = 7$$

Mean of last three observation

$$= \frac{(x+4)+(x+6)+(x+7)}{3}$$

$$= \frac{(7+4)+(7+6)+(7+7)}{3} = \frac{38}{3} = 12.67$$

33. The following list is given for the frequency distribution of diameter (D) of 101 steel balls.

D (mm)	43	44	45	46	47	48
Number	13	15	22	21	16	14

Find the mean of the diameter in mm.

(a) 45.4 (b) 45.5

(c) 45.7 (d) 45.6

RRB Paramedical Exam –20/07/2019 (Shift-I)

Ans : (b)

D (mm) (x)	43	44	45	46	47	48
n. (f)	13	15	22	21	16	14
fx	559	660	990	966	752	672

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$= \frac{559+660+990+966+752+672}{13+15+22+21+16+14}$$

$$= \frac{4599}{101} = 45.53$$

34. The mean of the marks obtained by 40 students in an examination is 72.5. Since a mistake of 48 instead of 84 was written. Find the right mean?

(a) 71.3 (b) 72.4

(c) 77.5 (d) 73.4

RRB RPF SI – 13/01/2019 (Shift-III)

Ans : (d) As per question sum of marks obtained by 40 students during mistake $= 40 \times 72.5 = 2900$

According to the question-

$$\text{right mean} = \frac{2900+(84-48)}{40}$$

$$= \frac{2936}{40} = 73.4$$

35. If the mean of the given data 2, x, 7, 3, y, 9, 6, where x and y are constant is 6. If x and y replaced by 3x+1 and y+3 respectively, then mean increased by 2. Find the value of x?

(a) 7 (b) 8

(c) 10 (d) 5

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (d) Mean $= \frac{\text{sum of total marks}}{\text{number of marks}}$

$$6 = \frac{2+x+7+3+y+9+6}{7}$$

$x + y + 27 = 42$

$x + y = 42 - 27$

$x + y = 15$ .....(i)

According to the question,

$$\frac{27+3x+1+y+3}{7} = 8$$

$31 + 3x + y = 56$

$3x + y = 56 - 31$

$3x + y = 25$ .....(ii)

On subtracting equation (i) from equation (ii)–

$3x + y = 25$

$x + y = 15$

$2x = 10$

$x = 5$

36. The mean of the 8 smallest numbers in a group is 17. While the mean of the all numbers is 20. If the smallest eight numbers leave, then the mean of the reamining number is 22. So find out the total numbers in the group?

(a) 20 (b) 22

(c) 18 (d) 19

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (a) : Let the total numbers in a group $= x$

According to the question-

$8 \times 17 + (x-8)22 = x \times 20$

$136 + 22x - 176 = 20x$

$-40 + 22x = 20x$

$2x = 40$

$x = 20$

Total numbers in a group $= 20$

37. The mean of 21 observations (all different) is 40. If the median increased by 21 them the value of observations increased, the mean of observations will be.

(a) 50 (b) 50.5

(c) 30 (d) 45

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (a) The Total sum of 21 observation $= 21 \times 40 = 840$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

+21

If the value of median is increased to 21, the value of the observations increases.

increase value of observation $= (21 - 11) \times 21 = 210$

$$\text{Mean of observation} = \frac{\text{Total mean} + \text{increase value}}{21}$$

$$= \frac{840+210}{21} = 50$$

38. The mean of the 8 smallest numbers in a group is 12.5. While the mean of all 14 numbers in the group is 14. Find the mean of the 6 greatest numbers?

(a) 16.50 (b) 16.00
(c) 17.00 (d) 15.50

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (b)
Mean of the 8 smallest numbers in the group = 12.5
sum of the smallest eight numbers = 8 × 12.5 = 100
Mean of all 14 numbers = 14
14 sum of 14 numbers = 14 × 14 = 196
sum of 6 largest numbers = 196–100 = 96

$$\text{mean of 6 largest numbers} = \frac{96}{6} = 16$$

Hence required mean = 16

39. The arithmetic mean of a set of numbers is 12. The mean of another set of numbers is 15. If combined mean of both sets is 12.5. Then find the ratio of frequency of both sets?

(a) 3 : 1 (b) 5 : 1
(c) 3 : 2 (d) 5 : 2

RRB Group-D – 24/10/2018 (Shift-II)

Ans. (b) : Let the number of terms in the first set of number (frequency) = n_1
and the number of terms in the second set of number (frequency)= n_2
According to the question–

$$\Rightarrow 12\times n_1 + 15\times n_2 = (n_1 + n_2)\times 12.5$$
$$\Rightarrow 12n_1 + 15n_2 = 12.5n_1 + 12.5n_2$$
$$\Rightarrow 15n_2 - 12.5n_2 = 12.5n_1 - 12n_1$$
$$\Rightarrow 2.5n_2 = .5n_1 \Rightarrow \frac{n_1}{n_2} = \frac{5}{1}$$

Hence the ratio of frequency of both the groups = 5 : 1

40. Find the median of the given observation – 67, 34, 57, 32, 12, 92, 51, 62, 62 57, 93 and 5

(a) 56.5 (b) 32
(c) 57 (d) 62

RRB Group-D – 06/12/2018 (Shift-III)

Ans. (c) : Arranging the given numbers in ascending order 5, 12, 32, 34, 51, 57, 57, 62, 62, 67, 92, 93
total numbers (n) = 12 (even)

$$\text{median} = \left[\frac{\left(\frac{n}{2}\right)\text{th term} + \left(\frac{n}{2}\right)\text{th term}}{2}\right]$$
$$= \left[\frac{6^{\text{th}}\text{ term} + 7^{\text{th}}\text{ term}}{2}\right]$$
$$= \left[\frac{57+57}{2}\right] = \frac{114}{2} = 57$$

41. If the mean of the observation set x_1, x_2 …..x_{10} is 20. Then find the mean of the set x_1+4, x_2+8…..x_{10}+40?

(a) 34 (b) 32
(c) 42 (d) 52

RRB Group-D – 15/11/2018 (Shift-I)

Ans : (c) $\frac{x_1 + x_2 + x_3 + ---- x_{10}}{10} = 20$

$x_1 + x_2 + x_3 + ---- x_{10} = 200$ ----(i)

then mean =

$$= \frac{(x_1+4)+(x_2+8)+(x_3+12)+----(x_{10}+40)}{10}$$
$$= \frac{x_1 + x_2 + x_3 + ---- x_{10} + 4 + 8 + 12 + --- 40}{10}$$
$$= \frac{200 + 5(4+40)}{10} \quad \text{[from equation(i)]}$$
$$= \frac{200+220}{10} = \frac{420}{10} = 42$$

42. In an examination, the mean of scores of the 36 students was 72.50. On revising the points, it was found that a student mark was written 65 by mistake instead of 56. Then find the correct mean?

(a) 71.50
(b) 72.25
(c) 72
(d) 73

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (b) Correct mean $= \frac{36\times 72.50 + (56-65)}{36}$

$$= \frac{2610-9}{36} = \frac{2601}{36} = 72.25$$

43. The mean score of a group of 17 members was 15, where as mean score of another group of n members was 12. If their combined mean was 13.7, then find the value of n?

(a) 12 (b) 13
(c) 14 (d) 11

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (b) Total score of 17 members = 17 ×15 = 255
Total score of n members = 12n
According to the question,

$$\frac{255+12n}{17+n} = 13.7$$
$$13.7n + 232.9 = 255 + 12n$$
$$13.7n - 12n = 255 - 232.9$$
$$1.7n = 22.1$$
$$n = 13$$

44. The mean weight of six children is 17.5 kg. If the person weights of five children are 14, 19, 23, 21 and 13 kg respectively, find the weight of the sixth child.

(a) 17 kg (b) 15 kg
(c) 16 kg (d) 18 kg

RRB Group-D – 05/11/2018 (Shift-III)

Ans. (b) : Suppose the weight of sixth child is x kg,

$$\therefore\ 17.5 = \frac{14+19+23+21+13+x}{6}$$
$$105.0 = 90 + x$$
$$x = 15$$

So weight of sixth child = 15kg

45. On the basis of given below data. Find out the mean of the digits?

marks	0	1	2	3	4	8
Number of students	6	5	4	3	2	5

(a) 3.3 (b) 2.8
(c) 2.5 (d) 3.2

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (b)

Mark (x)	0	1	2	3	4	8	
Number of students (f)	6	5	4	3	2	5	$\Sigma f=25$
fx	0	5	8	9	8	40	$\Sigma fx=70$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$= \frac{70}{25} = 2.8$$

46. The four numbers a, b, c and d are such that their overall average is 23. The average of a and b is 19.5. then find out the average of c and d?

(a) 26.5 (b) 25.5
(c) 24.5 (d) 27.5

RRB Group-D – 01/10/2018 (Shift-I)

Ans. (a) :
The four numbers are a, b, c, d whose average is 23
Sum of all numbers $= 4 \times 23 = 92$
Sum of a and b $= 2 \times 19.5 = 39.0$
Sum of c and d = sum of 4 numbers -sum of 2 numbers
$= 92 - 39$
Sum of c and d = 53

Average of c and d $= \frac{53}{2}$

Average of c and d = 26.5

47. If the mean of the numbers 27+x, 31+x, 89+x, 107+x and 156 + x is 82. Then find the mean of the numbers 130+x, 126+x, 68+x, 50+x and 1+x?

(a) 30 (b) 75
(c) 50 (d) 70

RRB Group-D – 23/09/2018 (Shift-II)

Ans : (b) $\text{Mean} = \frac{\text{sum of terms}}{\text{number of terms}}$

$$\Rightarrow \frac{27+x+31+x+89+x+107+x+156+x}{5} = 82$$

$$\Rightarrow 410 + 5x = 410$$

$$\Rightarrow 5x = 410 - 410$$

$$\Rightarrow 5x = 0$$

$$x = \frac{0}{5} = 0$$

Again

$$\frac{130+x+126+x+68+x+50+x+1+x}{5} \left(\text{Putting } x = 0\right)$$

$$= \frac{130+126+68+50+1}{5} = \frac{375}{5} = 75$$

Required mean $= 75$

48. If the arithmetic mean of the series $x_1, x_2, x_3, \ldots\ldots\ldots x_n$ is 1. Then find the mean of the series $\frac{x_1}{k}, \frac{x_2}{k}, \frac{x_3}{k}, \ldots\ldots\ldots \frac{x_n}{k}$ (where k > 0)?

(a) $\frac{1}{k}$ (b) k
(c) $\frac{2}{k}$ (d) 2k

RRB Group-D – 19/09/2018 (Shift-I)

Ans : (a) $\text{mean} = \frac{\text{sum of terms}}{\text{number of terms}}$

$$1 = \frac{x_1 + x_2 + x_3 + \text{------} x_n}{n} \text{-----(I)}$$

So,

$$\text{mean} = \frac{\left(\frac{x_1}{k} + \frac{x_2}{k} + \text{----} \frac{x_n}{k}\right)}{n}$$

$$\text{mean} = \frac{1}{k}\frac{\left(x_1 + x_2 + x_3 + \text{---} x_n\right)}{n}$$

$$\text{mean} = \frac{1}{k} \quad \{\text{from equation (I)}\}$$

49. If the arithmetic mean of 10 numbers is 35 and each number is increased by 2, find the mean of the new set of numbers.

(a) 28 (b) 34
(c) 40 (d) 37

RRB NTPC 05.04.2016 Shift : 3

Ans :(d) Arithmetic mean of 10 numbers = 35
Sum of 10 numbers = 35 × 10 = 350
If each number increased by 2,
New sum of 10 numbers = 350 + 10 × 2 = 370
∴ New arithmetic mean of 10 numbers $\frac{370}{10} = 37$
when each number is increased by n, then the arithmetic mean also increased by n,
∴ Each number increased by 2, New arithmetic mean will be = 35 + 2 = 37

50. The mean of the marks obtained by 12 students of a class is 67.4. If the mean of marks obtained by 15 students of another class is 72.3, then what will be the combined mean of both the classes?

(a) 70.12 (b) 69.85
(c) 71.23 (d) 68.94

RRB NTPC 03.04.2016 Shift : 2

Ans : (a) Sum of marks obtained by 12 students
$= 12 \times 67.4$
$= 808.8$
Sum of marks obtained by 15 students = 15×72.3
$= 1084.5$

$$\text{Combined mean of both classes} = \frac{808.8 + 1084.5}{12 + 15}$$

$$= \frac{1893.3}{27}$$

$$= 70.12$$

51. The mean of the four different observations is 17.5. When a new observation whose value is 20 is added to it, then what will be its new mean?

(a) 18 (b) 17.5
(c) 19 (d) 18.5

RRB NTPC 28.03.2016 Shift : 2

Ans :(a) Mean of four observation = 17.5
Sum of four observation = $17.5 \times 4 = 70.0$
Adding new observation = 70 + 20 = 90

New mean $= \frac{90}{5} = 18$

52. The arithmetic mean of 20 observation is 15.5, later it was found that an observation written 42 by mistake instead of 24. Find out the correct mean?

(a) 14 (b) 14.4
(c) 14.6 (d) 15

RRB NTPC 28.03.2016 Shift : 3

Ans : (c) We know that,

$$\text{Mean} = \frac{\text{Sum of all observation}}{\text{Total number of observation}}$$

Mean of 20 observation is 15.5
So, Sum of all observation = 20×15.5
$= 310$
Later it was found that 24 was written by mistake instead of 42.
Sum of observation after correction = 310 + 24 – 42
$= 292$

Hence, correct mean $= \frac{292}{20} = 14.6$

53. The mean of 22 observations is 10. When two more observations is included then new mean becomes 11. What will be the mean of two new observations?

(a) 19 (b) 20
(c) 21 (d) 22

RRB NTPC 19.04.2016 Shift : 1

Ans : (d) Mean of two new observation

$$= \frac{24 \times 11 - 22 \times 10}{2}$$

$$= \frac{264 - 220}{2} = \frac{44}{2} = 22$$

54. The mean of 8 observations is 10. Three more observations is added the new mean becomes 12. Find out the mean of three new observations?

(a) 16 (b) 18
(c) 17.33 (d) 15

RRB NTPC 16.04.2016 Shift : 2

Ans : (c) Total sum of 8 observations = $8 \times 10 = 80$
Sum of observation on including three other observations
$= 11 \times 12 = 132$
$\therefore$ Sum of three new observations = 132 – 80 = 52

So mean of three new observations $= \frac{52}{3} = 17.33$

55. Find out the mean of the given below data–

$$1, \frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{1}{4}, 2, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}$$

(a) $\frac{15}{18}$ (b) $\frac{13}{18}$
(c) $\frac{7}{9}$ (d) $\frac{8}{9}$

RRB NTPC 11.04.2016 Shift : 1

Ans : (b) $\text{Mean} = \frac{\text{Sum of numbers}}{\text{number of terms}}$

$$= \frac{1 + \frac{1}{2} + \frac{1}{2} + \frac{3}{4} + \frac{1}{4} + 2 + \frac{1}{2} + \frac{1}{4} + \frac{3}{4}}{9}$$

$$= \frac{\frac{4 + 2 + 2 + 3 + 1 + 8 + 2 + 1 + 3}{4}}{9} = \frac{26}{36} = \frac{13}{18}$$

56. If the mean of the given data 18, 16, 22, 13, ? is 16 then find the value of '?'.

(a) 9 (b) 11
(c) 10 (d) 12

RRB NTPC 06.04.2016 Shift : 1

Ans : (b)

$$\text{Mean} = \frac{18 + 16 + 22 + 13 + ?}{5}$$

$$16 = \frac{69 + ?}{5} \Rightarrow 69 + ? = 16 \times 5$$

$$? = 80 - 69 = 11$$

57. The mean of 9 observations is 18. Four more observations is added, the new mean becomes 19. What will be the mean of four new observations?

(a) 21.25 (b) 20.25
(c) 19 (d) 22

RRB NTPC 22.04.2016 Shift : 3

Ans : (a) Sum of 9 observations = $18 \times 9 = 162$
Sum of 13 observations = $19 \times 13 = 247$

So mean of four new observations $= \frac{247 - 162}{4}$

$$= \frac{85}{4} = 21.25$$

58. Find out the mean of first 6 prime numbers?

(a) 14/3 (b) 3
(c) 41/6 (d) 13/2

RRB NTPC 29.03.2016 Shift : 1

Ans : (c) First 6 prime numbers = 2, 3, 5, 7, 11, 13

$$\therefore \text{ mean } = \frac{2 + 3 + 5 + 7 + 11 + 13}{6} = \frac{41}{6}$$

59. If the mean of 10, 4, 1, 15, 15, x, 12 and 14 is 10. Find the value of X.

(a) 7 (b) 8
(c) 10 (d) 9

RRB ALP CBT-2 Mec. - Diesel 23-01-2019 (Shift-I)

Ans. (d) :

$$\text{Mean} = \frac{\text{Sum of total observations}}{\text{Number of total observations}}$$

$$10 = \frac{10+4+1+15+15+x+12+14}{8}$$

$80 = 71 + x$

$x = 9$

60. Find the mean value of 2, 5, 8, 14, 21?

(a) 9.5 (b) 9

(c) 8.5 (d) 10

RRB ALP CBT-2 Trade (Fitter) 21-01-2019 (Shift-I)

Ans. (d) :

$$\text{Mean} = \frac{\text{Sum of total observations}}{\text{No of total observations}}$$

$$= \frac{2+5+8+14+21}{5}$$

$$= \frac{50}{5}$$

$=10$

Type - 2

61. What will be the median of the given data?
1, 1.1, 2.3, 0.1, 0.9, 5, 3.9, 2.5, 4.2, 4.6

(a) 2.6 (b) 2.4

(c) 2.5 (d) 2.3

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : On arranging the data in ascending order ⇒
0.1, 0.9, 1, 1.1, 2.3, 2.5, 3.9, 4.2, 4.6, 5

Number of term = 10 (even)

$$\text{Median} = \frac{\frac{10}{2}\text{th term} + \left(\frac{10}{2}+1\right)\text{th term}}{2}$$

$$= \frac{5^{\text{th}}\text{ term} + 6^{\text{th}}\text{ term}}{2}$$

$$= \frac{2.3+2.5}{2} = 2.4$$

62. Given are the scores of a batsman in the last 10 innings. Find the median score of the batsman in these innings.
65, 180, 81, 6, 63, 27, 122, 8, 165, 50

(a) 63 (b) 64.5

(c) 65 (d) 64

RRB NTPC (Stage-2) 17/06/2022 (Shift-III)

Ans. (d) : On arranging the given observation in ascending order

6, 8, 27, 50, 63, 65, 81, 122, 165, 180

n = 10 (even)

$$\text{Median} = \frac{\frac{n}{2}^{\text{th}}\text{ term} + \left(\frac{n}{2}+1\right)^{\text{th}}\text{ term}}{2}$$

$$= \frac{5^{\text{th}}\text{ term} + 6^{\text{th}}\text{ term}}{2}$$

$$= \frac{63+65}{2} = 64$$

63. What is the median of 15, 2, 7, 8, 11, 5 and 14?

(a) 8 (b) 7.5

(c) 7 (d) 9.5

RRB NTPC (Stage-II) –12/06/2022 (Shift-II)

Ans. (a) : On arranging the numbers in ascending orders–

2, 5, 7, 8, 11, 14, 15

$$\text{Median} = \frac{n+1}{2}\text{ th term (Where n = number of terms)}$$

$$= \frac{(7+1)^{\text{th}}}{2} = \frac{8^{\text{th}}}{2} = 4^{\text{th}}\text{ term} = 8$$

64. Find the median of the numbers given below:
2, 7, 5, 6, 7, 5, 4, 4, 0, 3, 0, 3, 1, 1, 3

(a) 3.5 (b) 4.5

(c) 3 (d) 4

RRB NTPC (Stage-II) –13/06/2022 (Shift-I)

Ans. (c) : On writing the numbers in ascending order–

0, 0, 1, 1, 2, 3, 3, 3, 4, 4, 5, 5, 6, 7, 7

N = 15 (Odd number)

$$\text{Required median} = \left(\frac{15+1}{2}\right)\text{th term}$$

$$= 8\text{th term}$$

$$= 3$$

65. If an observation 70 is removed from the data 60, 68, 70, 72, 74, 76, 78, 80, then the median is increased by:

(a) 0.5 (b) 1.5

(c) 2 (d) 1

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (d) : Given observations– 60, 68, 70, 72, 74, 76, 78, 80 Number of term = 8 (even)

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{\text{th}}\text{ term} + \left(\frac{n}{2}+1\right)^{\text{th}}\text{ term}}{2}$$

$$= \frac{\left(\frac{8}{2}\right)^{\text{th}}\text{ term} + \left(\frac{8}{2}+1\right)^{\text{th}}\text{ term}}{2}$$

$$= \frac{4^{\text{th}}\text{ term} + 5^{\text{th}}\text{ term}}{2}$$

$$= \frac{72+74}{2}$$

$$= \frac{146}{2}$$

Median = 73

Number of term on removing 70 = 7 (odd)

$$\therefore \quad \text{Median} = \frac{n+1}{2}\text{ th term}$$

$$= \frac{7+1}{2} = 4^{\text{th}}\text{ term}$$

$$= 74$$

Then, Increased median = 74 – 73

$= 1$

66. Calculate the value of $\frac{\text{Range}}{\text{Median}}$ for the set of data given below:
134, 98, 194, 122, 108, 156

(a) $\frac{48}{67}$ (b) $\frac{3}{4}$

(c) $\frac{8}{9}$ (d) $\frac{48}{61}$

RRB NTPC (Stage-II) 16/06/2022 (Shift-III)

Ans. (b) : Ascending order of the given sets 98, 108, 122, 134, 156, 194 n = 6 (even)

Range = Maximum value – minimum Value = 194 – 98 = 96

If the number of term is even

$$\text{Median} = \frac{\frac{n}{2}\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}}{2}$$

$$= \frac{3\text{th term} + 4\text{th term}}{2}$$

$$= \frac{122+134}{2} = 128$$

$$\frac{\text{Range}}{\text{Median}} = \frac{96}{128} = \frac{3}{4}$$

67. Find the median of:

CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70
F	2	4	7	9	10	12	6

(a) 40 (b) 43

(c) 42 (d) 41

RRB Group-D 24-08-2022 (Shift-I)

Ans. (b) : According to the question,

CI	F	CF
0 – 10	2	2
10 – 20	4	6
20 – 30	7	13
30 – 40	9	22 – c.f
40 – 50	10 = f	32
50 – 60	12	44
60 – 70	6	50
	n = 50	

$\frac{n}{2} = 25$, is included in cumulative frequency 32

So, 40–50 will be median class.

$$\text{Median} = l + \frac{\left(\frac{n}{2} - \text{C.f}\right)}{f} \times h$$

$$= 40 + \frac{(25-22)}{10} \times 10$$

$$= 40 + 3$$

$$= 43$$

68. The nominal marks obtained by students who appeared in a test are given below. Find the median marks of the students.

Marks	11	20	8	16	29	22
No. of students	14	5	11	9	3	8

(a) 13 (b) 13.5

(c) 8 (d) 10.5

RRB GROUP-D – 27/09/2022 (Shift-II)

Ans. (b) : On writing the given number in ascending order -

Marks	No. of students	Cumulative frequency (CF)
8	11	11
11	14	25
16	9	34
20	5	39
22	8	47
29	3	50

n = 50

Median =

$$\frac{\frac{n}{2}\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}}{2} = \frac{25\text{th term} + 26\text{th term}}{2} = \frac{11+16}{2}$$

$$= \frac{27}{2} = 13.5$$

69. The following observations are arranged in ascending order.
29, 32, 48, 50, x, x+2 72, 78, 84, 95
If the median is 63, then what is the value of x ?

(a) 31 (b) 62

(c) 50 (d) 63

RRB GROUP-D – 19/09/2022 (Shift-II)

Ans. (b) : Given -

On ascending order -

29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

n = 10 (even)

$$\text{Median} = \frac{1}{2}\left[\frac{n}{2}\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}\right]$$

$$63 = \frac{1}{2}(5^{\text{th}}\text{ term} + 6^{\text{th}}\text{ term})$$

$$126 = x + x + 2$$

$$2x = 124$$

$$x = 62$$

70. Find the median of the data 11, 16, 33, 15, 51, 18, 71, 75, 22, 17.

(a) 18 (b) 24

(c) 20 (d) 22

RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (c) : Given data-

11, 16, 33, 15, 51, 18, 71, 75, 22, 17

In ascending order-

11, 15, 16, 17, 18, 22, 33, 51, 71, 75 n = 19 (even)

Where n is even

$$\text{For even} = \frac{\frac{n^{\text{th}}}{2}\text{term} + \left(\frac{n}{2}+1\right)^{\text{th}}\text{term}}{2}$$

$$= \frac{\frac{10^{\text{th}}}{2}\text{term} + \left(\frac{10}{2}+1\right)^{\text{th}}\text{term}}{2}$$

$$= \frac{5^{\text{th}}\text{ term} + 6^{\text{th}}\text{ term}}{2} = \frac{18+22}{2}$$

$$= \frac{40}{2} = 20$$

71. If the upper quartile represents 75% of the data and if the lower quartile represents 25% of the data, then which will show the median?
(a) 20% (b) 100%
(c) 50% (d) 80%

RRB Group-D – 05/12/2018 (Shift-III)

Ans : (c) Median $= \frac{75\% + 25\%}{2} = \frac{100\%}{2} = 50\%$

72. The median of 151, 153, 158, 165, 150, 140, 170, 153, 158 and 151 is:
(a) 165 (b) 151
(c) 140 (d) 153

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) :
On writing the given data in ascending order
140, 150, 151, 151, 153, 153, 158, 158, 165, 170
Number of terms (n) = 10 (even)

$$\text{Median} = \frac{\frac{n}{2}^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

$$= \frac{\frac{10}{2}^{th}\text{ term} + \left(\frac{10}{2}+1\right)^{th}\text{ term}}{2}$$

$$= \frac{5^{th}\text{ term} + 6^{th}\text{ term}}{2} = \frac{153+153}{2} = \frac{306}{2} = 153$$

73. The median of the data in ascending order 7, 11, 12, (x – y), (x + y), 20, 21, 29 is 16. Find the value of x.
(a) 15 (b) 14
(c) 12 (d) 16

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (d) : Data in Ascending order:-
7, 11, 12, (x – y), (x + y), 20, 21, 29
Mediam (M) = 16
Number of terms (n) = 8
Then, Median (M) $\Rightarrow$

$$16 = \frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2}$$

$$16 = \frac{x - y + x + y}{2}$$

$$16 = \frac{2x}{2}$$

$$x = 16$$

Hence, x = 16.

74. What is the median for the following series?
2, 5, 4, 1, 8
(a) 4 (b) 3.5
(c) 7 (d) 4.5

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (a) : On writing the above series in ascending order-
1, 2, 4, 5, 8
Where n = 5 (Odd number)

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\text{ term} = \left(\frac{5+1}{2}\right)^{th} = 3^{rd}\text{ term}$$

i.e. Median = 4

75. In the given data if 30 is replaced by 100 then find the difference of the two medians.
80, 90, 40, 30, 20, 10, 70, 60, 50
(a) 60 (b) 50
(c) 10 (d) 40

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (c) : 80, 90, 40, 30, 20, 10, 70, 60, 50
On Writing in ascending order to the given number,
10, 20, 30, 40, 50, 60, 70, 80, 90
Where, n = 9

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\text{ term} \quad [\because n = \text{odd number}]$$

$$= \frac{9+1}{2}^{th}\text{ term} = \frac{10}{2}^{th}\text{ term} = 5^{th}\text{ term}$$

$\therefore$ Median = 50
according to the question, putting 100 in place of 30
Given data will as follows –10, 20, 40, 50, 60, 70, 80, 90, 100

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\text{ term} = \left(\frac{9+1}{2}\right)^{th}\text{ term} = \frac{10}{2}^{th}\text{ term}$$

$= 5^{th}$ term
Median = 60
Hence, Required difference = 60 – 50
= 10

76. The median of 4, 4, 5, 7, 6, 7, 7, 12, 3 :
(a) 4 (b) 6
(c) 5 (d) 7

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : On writing the numbers in ascending order
3, 4, 4, 5, 6, 7, 7, 7, 12
No. of terms = odd

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\text{ term}$$

$$= \left(\frac{9+1}{2}\right)^{th}\text{ term} = 5^{th}\text{ term}$$

Hence, Median = 6

77. What is the median of the following data?
78, 56, 22, 34, 45, 54, 39, 68, 54, 84
(a) 54 (b) 53
(c) 55 (d) 51

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (a) : For the median of data-
78, 56, 22, 34, 45, 54, 39, 68, 54, 84
Number of term = 10 (even)
Arrange in the ascending order-
22, 34, 39, 45, 54, 54, 56, 68, 78, 84

$$\text{Median} = \frac{\left(\frac{n}{2}\right)\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}}{2}$$

$$= \frac{\left(\frac{10}{2}\right)\text{th term} + \left(\frac{10}{2}+1\right)\text{th term}}{2}$$

$$= \frac{5\text{th term} + 6\text{th term}}{2} = \frac{54+54}{2} = 54$$

78. Find the median of 7, 14, 13, 12, 20, 11, 15 and 8.

(a) 11 (b) 12.5
(c) 11.5 (d) 12

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (b) : 7, 14, 13, 12, 20, 11, 15, 8
Arrange in ascending order- 7, 8, 11, 12, 13, 14, 15, 20
Number of terms (n) = 8
Note- If the series of numbers are odd then to calculate median, arrange the series in ascending/descending order and the number which is positioned in between would be the median. If the numbers are in even then add the 2 numbers which are positioned in between and divide it by 2.

$$\text{If even number then median} = \frac{\frac{n}{2}\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}}{2}$$

$$\text{Median} = \frac{\frac{8}{2}\text{th term} + \left(\frac{8}{2}+1\right)\text{th term}}{2}$$

$$= \frac{12+13}{2} = \frac{25}{2} = 12.5$$

79. The given data is arranged in ascending order and its median is 17. Find the value of x.
8, 10, 12, 15, x, x+2, 20, 25, 30, 32

(a) 16 (b) 18
(c) 19 (d) 17

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (a) : 8, 10, 12, 15, *x*, *x*+2, 20, 25, 30, 32
n = 10 (Even)

$$\text{Median for even terms} = \frac{\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

$$\therefore \text{ Median} = \frac{\frac{10}{2}^{th}\text{ term} + \left(\frac{10}{2}+1\right)^{th}\text{ term}}{2} = \frac{x+(x+2)}{2}$$

$$\therefore \quad 17 = \frac{(2x+2)}{2}$$

$$17 = x + 1$$

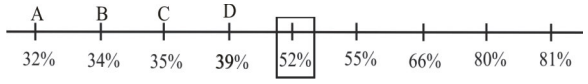
$$x = 16$$

80. 40% is the passing criteria in an examination. Out of 9 students who appeared, 4 failed and the remaining received 80%, 55%, 52%, 66% and 81% marks. The median of the percentage marks is equal to :

(a) 58% (b) 66%
(c) 52% (d) 81%

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,
The criteria of pass the exam is 40%.
∵ 4 examinees have failed.
Let the % marks of 4 candidates be – A% , B%, C% and D% respectively.
Hence on putting all the percentage marks in ascending order.



Number of candidates = 9 (odd)

$$\text{Median of obtained marks} = \left(\frac{n+1}{2}\right)\text{term}$$

Hence, the median of the obtained marks = 52%

81. The following observations are arranged in ascending order. If the median of the data is 19, then find the value of x.
6, 9, 15, x + 4, x + 8, x + 12, 30, 32

(a) 13 (b) 8
(c) 10 (d) 5

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (a) : 6,9,15, (x + 4), (x + 8) , (x +12), 30, 32
Number of terms (n) = 8 (even)

$$\Rightarrow \quad \text{Median} = \frac{\frac{n}{2}^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

$$19 = \frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2}$$

$$38 = x + 4 + x + 8$$

$$26 = 2x$$

$$x = 13$$

82. The digits given below are arranged in ascending order. If their median is 10, then find the value of p.
3, 5, 6, 2p +3, 3p +2, 15, 25, 51

(a) 2 (b) 3
(c) 27.5 (d) 38

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (b) When the number of terms is even then

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

Where n = number of term.
here n = 8 and median = 10 (Given)

$$10 = \frac{\left(\frac{8}{2}\right)^{th}\text{ term} + \left(\frac{8}{2}+1\right)^{th}\text{ term}}{2}$$

$$10 = \frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2}$$

$$10 = \frac{2p+3+3p+2}{2}$$

$$5p = 20 - 5 = 15$$

$$p = \frac{15}{5} = 3$$

83. Find the median of 45, 76, 32, 58, 16, 27, 64 and 35.

(a) 35 (b) 45
(c) 40 (d) 42

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (c) : 45, 76, 32, 58, 16, 27, 64 and 35 on writing in asccending order
16, 27, 32, 35, 45, 58, 64, 76, n = 8 (even),
n = No. of term.

$$\text{Mean} = \frac{\frac{n}{2}\text{th term} + \left(\frac{n}{2}+1\right)\text{th term}}{2}$$

$$= \frac{\frac{8}{2}\text{th term} + \left(\frac{8}{2}+1\right)\text{th term}}{2}$$

$$= \frac{4\text{th term} + 5\text{th term}}{2}$$

$$\text{Mean} = \frac{35+45}{2} = \frac{80}{2}$$

$\boxed{\text{Mean} = 40}$

84. The median of a set of 7 distinct observation is 21.5. If each of the largest 3 observations of the set is increased by 4, then the median of the new set -

(a) will be four times the original median
(b) will remain the same as that of the original set
(c) will decrease by 4
(d) will increase by 4

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (b) : The median of seven different observations writing them in ascending order $\frac{7+1}{2}$ then will be equal to 4th term. So if three largest term i.e. 5th, 6th and 7th term of the number written in ascending order in increased by 4 then there is no change in the median of 4th term nor their order will change i.e. median will remain same as the original median.

85. Find the median of the data 40, 50, 30, 20, 80, 70, 90, 50. Next, if 30 is replaced by 120, find the new median. The mean of the two medians found is.....

(a) 60 (b) 110
(c) 55 (d) 50

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (c) : According the data in ascending-
= 20, 30, 40, 50, 50, 70, 80, 90 $\Rightarrow$ n = 8 (even)

$$\text{Median} = \frac{\left(\frac{n}{2}\right)\text{term} + \left(\frac{n}{2}+1\right)\text{term}}{2}$$

$$\frac{\left(\frac{8}{2}\right)^{th}\text{term} + \left(\frac{8}{2}+1\right)^{th}\text{term}}{2}$$

$$\frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2} = \frac{50+50}{2} = 50$$

On interchanging numbers
20, 40, 50, 50, 70, 80, 90, 120

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{th}\text{term} + \left(\frac{n}{2}+1\right)^{th}\text{term}}{2}$$

$$= \frac{\left(\frac{8}{2}\right)^{th}\text{term} + \left(\frac{8}{2}+1\right)\text{term}}{2}$$

$$\frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2} = \frac{50+70}{2} = 60$$

$$\text{Mean} = \frac{50+60}{2} = 55$$

86. Find out the median of the given observations– (a + 4), (a – 3.5), (a – 2.5), (a – 3), (a – 2), (a + 0.5), (a + 5) and (a – 0.5).

(a) a – 1.25 (b) a – 2.5
(c) a – 1.5 (d) a – 0.75

RRB JE - 27/05/2019 (Shift-II)

Ans : (a) Arranging the numbers in ascending –
(a–3.5), (a–3), (a–2.5), (a–2), (a–0.5), (a+0.5), (a+4), (a+5)
order (n) = 8 (even)

$$\text{median} = \frac{\left(\frac{n}{2}\right)^{th}\text{term} + \left(\frac{n}{2}+1\right)^{th}\text{terms}}{2}$$

$$= \frac{4^{th}\text{ term} + 5^{th}\text{ term}}{2}$$

$$= \frac{a-2+a-0.5}{2}$$

$$= \frac{2a-2.5}{2}$$

$$= \boxed{a-1.25}$$

87. Find out the median of the given below data?

In ₹ daily income	10-14	15-19	20-24	25-29	30-34	35-39
No. of employee	5	10	15	20	10	5

(a) 20 (b) 12.33
(c) 26.4 (d) 25.13

RRB JE - 30/05/2019 (Shift-I)

Ans : (d)

daily income in (₹)	Number of staff	Cumulative frequency
9.5 – 14.5	5	5
14.5 – 19.5	10	15
19.5 – 24.5	15	30 =cf
24.5 – 29.5	20	50
29.5 – 34.5	10	60
34.5 – 39.5	5	65

n = 65

$$\therefore \frac{n}{2} = \frac{65}{2} = 32.5$$

it is included in the cumulative frequency 50
So median class interval will be (24.5 – 29.5)
minimum limit (L) = 24.5
square height (h) = 5
frequency (f) = 20
The cumulative frequency of the class before the median class. (cf) = 30

$$\therefore \text{ median} = L + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$$

$$= 24.5 + \left(\frac{32.5-30}{20}\right) \times 5$$

$$= 24.5 + \frac{2.5}{4}$$

$$= 24.5 + 0.625$$

$$= 25.125 \approx 25.13$$

88. Find out the median of the positive factors of 48.

(a) 16 (b) 12
(c) 8 (d) 7

RRB RPF SI – 12/01/2019 (Shift-III)

Ans : (d) All positive factors of 48 are−
$1, 2, 3, 4, \boxed{6}, \boxed{8}, 12, 16, 24, 48$
Number of terms (n) = 10 (even)

$$\therefore \text{Median} = \frac{\left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]}{2}$$

$$\frac{5^{th}\text{ term} + 6^{th}\text{ term}}{2}$$

$$= \frac{6+8}{2} = \frac{14}{2} = 7$$

89. What will be the median of the given below data 1.9, 8.4, 3.6, 5.8

(a) 5.1 (b) 4.7
(c) 5.2 (d) 5.6

RRB Paramedical Exam –21/07/2019 (Shift-III)

Ans : (b) Ascending order of the given data − 1.9, 3.6, 5. 8, 8.4
n = 4 (even)

$$\text{Median} = \frac{1}{2}\left[\frac{n}{2}^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]$$

$$\text{Median} = \frac{1}{2}\left[2^{nd}\text{ term} + 3^{rd}\text{ term}\right]$$

$$= \frac{1}{2}[3.6+5.8] = \frac{1}{2}\times 9.4 = 4.7$$

90. Find out the median of the given below data-
$\mathbf{1, \frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{1}{4}, 2, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}}$

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$
(c) $\frac{1}{6}$ (d) $\frac{3}{4}$

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans : (b) On arranging the numbers in ascending order-

$$\frac{1}{4}, \frac{1}{4}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{3}{4}, 1, 2$$

n = 9 (Odd)

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\text{ term} = \left(\frac{9+1}{2}\right)^{th}\text{ term}$$

$$= 5^{th}\text{ term} = \frac{1}{2}$$

91. What will be the median of the given below data 5, 2, 2, 7, 3 and 8

(a) 3.5 (b) 4.5
(c) 4 (d) 3

RRB RPF Constable – 22/01/2019 (Shift-III)

Ans : (c) Arranging the numbers in ascending order-
2, 2, 3, 5, 7, 8
n = 6

$$\text{Median} = \frac{\left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]}{2}$$

$$= \frac{3+5}{2} = \frac{8}{2} = 4$$

92. If a school has 50 girls of class X the height survey data (in cm) is as follows:

Length (in cm)	No. of girls
less than 140 cm	4
less than 145cm	11
less than 150 cm	29
less than 155 cm	40
less than 160 cm	46
less than 165 cm	50

Find the median of their height.

(a) 144.03 cm (b) 148.89 cm
(c) 145.03 cm (d) 149.03 cm

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (b)

length (in cm)	frequency	Cumulative frequency
135–140	4	4
140–145	7	11
145–150	18=f	29
150–155	11=f_b	40
155–160	6	46
160–165	4	50
	Σf=N=50	

$$\text{Median} = L + \left(\frac{\frac{N}{2} - f_b}{f}\right)\times i \quad \text{where } \frac{N}{2} = \frac{50}{2} = 25$$

$$= 145 + \frac{(25-11)}{18}\times 5$$ L – lower limit

$$= 145 + \frac{70}{18}$$ f – original frequency

$145 + 3.88 = 148.88 \approx 148.89$

93. The following graph shows the price of 12 months of cabbage what is the median of their values?



(a) 55 (b) 40
(c) 50 (d) 60

RRB Group-D – 17/09/2018 (Shift-III)

Ans. (c) : Arranging the numbers in ascending order-
30, 40, 40, 40, 40, 50, 50, 50, 80, 80, 80, 80
number of terms (n) = 12(even)

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{th}\text{ terms} + \left(\frac{n}{2}+1\right)^{th}\text{ terms}}{2}$$

$$= \frac{\left(\frac{12}{2}\right)^{th}\text{ terms} + \left(\frac{12}{2}+1\right)^{th}\text{ terms}}{2}$$

$$= \frac{6^{th}\text{ term} + 7^{th}\text{ term}}{2} = \frac{50+50}{2} = 50$$

94. The mean of the given data 12, 13, 15, 18, X, 28, 18, 12, 6 and 8 is 15. Find out the median of the given data?

(a) 14.5 (b) 13.5
(c) 14 (d) 13

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (c) : Mean = 15

$$\frac{6+8+12+12+13+15+18+18+28+x}{10} = 15$$

$$= 130 + x = 150$$

$$x = 150 - 130 = 20$$

Arranging the numbers in ascending order-

$\therefore 6, 8, 12, 12, \boxed{13, 15}, 18, 18, 20, 28$

n = 10(even)

$$\text{mediam} = \frac{1}{2}\left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}\left[\left(\frac{10}{2}\right)^{th}\text{ term} + \left(\frac{10}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}[5^{th}\text{ term} + 6^{th}\text{ term}]$$

$$\text{median} = \frac{13+15}{2} = \frac{28}{2} = 14$$

95. Find the median of the first 10 numbers of a fibonacci series. A fibonacci number is the sum of the last two numbers in that series. The first two fibonacci numbers are 0 and 1 respectively.

(a) 4 (b) 3
(c) 5 (d) 4.5

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (a)
Number = 0, 1, 1, 2, 3, 5, 8, 13, 21, 34
number of terms (n) = 10 (even)

$$\text{median} = \frac{(5\text{th term} + 6\text{th term})}{2} = \frac{3+5}{2} = 4$$

96. What will be the median of the given data– 5, 17, 68, 17, 32, 45, 64, 37, 93, 45, 78, 32, 35 and 45

(a) 41 (b) 44
(c) 42 (d) 43

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (a) : Arranging the numbers in ascending order-
5, 17, 17, 32, 32, 35, 37, 45, 45, 45, 64, 68, 78, 93
number of terms = 14 (even)

$$\text{median} = \frac{1}{2}\left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}(7^{th}\text{ term} + 8^{th}\text{ term})$$

$$= \frac{1}{2}[37+45]$$

$$= \frac{82}{2} = 41$$

97. Find the median of the all prime number from 1 to 55.

(a) 22 (b) 20
(c) 21 (d) 19

RRB Group-D – 08/10/2018 (Shift-III)

Ans : (c) According to the questions
All prime number from 1 to 55 = 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53

n = 16 (even)

$$\therefore \text{ median} = \frac{\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

$$= \frac{\left(\frac{16}{2}\right)^{th}\text{ term} + \left(\frac{16}{2}+1\right)^{th}\text{ term}}{2}$$

$$= \frac{8\text{th term} + 9\text{th term}}{2} = \frac{19+23}{2}$$

$$= \frac{42}{2}$$

$$= 21$$

So median of all prime numbers between 1 to 55 = 21

98. Points scored by 12 people are 6, 17, 8, 9, 16, 10, 15, 21, 9, 11, 12 and 16. find the median.

(a) 11.5 (b) 11.6
(c) 10.4 (d) 12

RRB Group-D – 01/10/2018 (Shift-II)

Ans. (a) : Arranging the numbers in ascending order-
6, 8, 9, 9, 10, 11, 12, 15, 16, 16, 17, 21
$\because$ n = 12 (even)

$$\text{Median} = \left[\frac{\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}\right]$$

$$= \left[\frac{\left(\frac{12}{2}\right)^{th}\text{ term} + \left(\frac{12}{2}+1\right)^{th}\text{ term}}{2}\right]$$

$$= \frac{6^{th}\text{ term} + 7^{th}\text{ term}}{2} = \frac{11+12}{2}$$

$$= \frac{23}{2} = 11.5$$

99. By a Kabaddi team, in a series of matches obtained marks are given as follows–
17, 2, 7, 27, 15, 5, 14, 8, 10, 24, 48, 10, 8, 7, 18, 28 find the median of the marks obtained by the team?
(a) 11 (b) 12
(c) 16 (d) 15

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (b) : Arranging the marks in ascending order-
− 2, 5, 7, 7, 8, 8, 10, 10, 14, 15, 17, 18, 24, 27, 28, 48
total terms number(n) is = 16(even)

$$\text{median} = \left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right] \div 2$$

$$= \frac{8\text{th term} + 9\text{th term}}{2} = \frac{10+14}{2} = \frac{24}{2} = 12$$

100. What will be the median of the given following data–
7, 21, 2, 17, 3, 13, 7, 4, 9, 7, 9
(a) 4 (b) 17
(c) 7 (d) 9

RRB NTPC 17.01.2017 Shift-3

Ans : (c) Ascending order to the given data−
2, 3, 4, 7, 7, $\boxed{7}$, 9, 9, 13, 17, 21
n = 11 (odd)

$$\text{median} = \frac{11+1}{2}^{th}\text{ term} = 6^{th}\text{ term} = 7$$

101. Find the median of the given following data–
9 , 0 , 2 , 8 , 5 , 3 , 5 , 4 , 1 , 5 , 2 , 7
(a) 5 (b) 6.5
(c) 4.5 (d) 4

RRB NTPC 04.04.2016 Shift : 2

Ans : (c) Ascending order to the the given data—
0, 1, 2, 2, 3, 4, 5, 5, 5, 7, 8, 9
n = 12 even

$$\text{median} = \frac{1}{2}\left[\frac{12}{2}^{th}\text{ term} + \left(\frac{12}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}[6^{th}\text{ term} + 7^{th}\text{ term}] \quad = \frac{1}{2}(4+5) = \frac{9}{2} = 4.5$$

102. The median of the following numbers arranged in ascending order is 2.5, so find x?
0 , 0 , 1 , 1 , 2 , 2 , x, 3, 3, 4, 5, 7
(a) 2 (b) 3
(c) 4 (d) 0

RRB NTPC 03.04.2016 Shift : 2

Ans : (b) 0, 0, 1, 1, 2, 2, x, 3, 3, 4, 5, 7
n = 12 (even)

$$\text{median} = \frac{1}{2}\left[\frac{n}{2}^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]$$

$$2.5 = \frac{1}{2}\left[\frac{12}{2}\text{th term} + \left(\frac{12}{2}+1\right)\text{th term}\right]$$

$$= \frac{1}{2}[6\text{th term} + 7\text{th term}]$$

$$2.5 = \frac{1}{2}[2+x]$$

$$\Rightarrow 2 + x = 5$$

$$\Rightarrow x = 3$$

103. For the given following data what will be the median? 25, 23, 26, 29, 31, 39 and 11
(a) 25 (b) 26
(c) 29 (d) 31

RRB NTPC 02.04.2016 Shift : 1

Ans : (b) Arranging the numbers in ascending order-
11, 23, 25, 26, 29, 31, 39
Number of terms = 7 (odd)

$$\therefore \text{ Median } = \left(\frac{7+1}{2}\right)^{th}\text{ term } = \text{ 4th term } = 26$$

104. Find the median of the given number– 55, 53, 59, 56, 61, 69, and 31
(a) 55 (b) 56
(c) 59 (d) 61

RRB NTPC 02.04.2016 Shift : 2

Ans : (b) Arranging the numbers in ascending order-
31, 53, 55, 56, 59, 61, 69
n = 7 (odd)

$$\text{median} = \left(\frac{n+1}{2}\right)^{th}\text{ term} = \left(\frac{7+1}{2}\right)^{th}\text{ term}$$

= 4th term
= 56

105. What will be the median of the given number.
2, 3, 4, 3, 0, 5, 1, 1, 3, 2
(a) 0 (b) 3
(c) 2.5 (d) 2.4

RRB NTPC 31.03.2016 Shift : 3

Ans : (c) 0, 1, 1, 2, 2, 3, 3, 4, 5
n = 10 (even)

$$\text{median} = \frac{1}{2}\left[\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}\left[\left(\frac{10}{2}\right)^{th}\text{ term} + \left(\frac{10}{2}+1\right)^{th}\text{ term}\right]$$

$$= \frac{1}{2}[5\text{th term} + 6\text{th term}]$$

$$= \frac{1}{2}(3+2) = \frac{5}{2} = 2.5$$

106. If the numbers 3, 6, 7, 11, x, 15, 19, 20, 25 and 28 are in ascending order and median of these numbers are 13, then find the value of x?
(a) 11 (b) 12
(c) 13 (d) 14

RRB NTPC 28.03.2016 Shift : 3

Ans : (a)
Given number 3, 6, 7, 11, x, 15, 19, 20, 25, 28
number of terms = 10 (even)

$$\therefore \quad \text{Median} = \frac{\left(\frac{n}{2}\right)^{th}\text{ term} + \left(\frac{n}{2}+1\right)^{th}\text{ term}}{2}$$

$$13 = \frac{\left(\frac{10}{2}\right)\text{th term} + \left(\frac{10}{2}+1\right)\text{th term}}{2}$$

$$13 = \frac{5\text{th term} + 6\text{th term}}{2}$$

$$26 = x + 15$$

$$x = 11$$

107. What will be the median of the given data as follows -3, 4, 0, 4, -2, -5, 1, 7, 10, 5

(a) 2 (b) 2.5
(c) 2.75 (d) 3

RRB NTPC 11.04.2016 Shift : 2

Ans : (b) Arranging the numbers in ascending order-
–5, –3, –2, 0, 1, 4, 4, 5, 7, 10
n = 10 (even)

$$\therefore \text{ median} = \frac{1}{2}\left[\left(\frac{n}{2}\right)^{th} \text{ term} + \left(\frac{n}{2}+1\right)^{th} \text{ term}\right]$$

$$= \frac{1}{2}\left[5\text{th term} + 6\text{th term}\right] = \frac{1}{2}\times\left[1+4\right] = 2.5$$

108. Find out the median of the given numbers as follows 3, 3, 5, 7, 8, 8, 8, 9, 11, 12, 12

(a) 9 (b) 7
(c) 8 (d) 12

RRB NTPC 19.01.2017 Shift : 3

Ans : (c) Arranging the number in ascending order-
3, 3, 5, 7, 8, 8, 8, 9, 11, 12, 12
$\Rightarrow$ number of terms (n) = 11 (odd)

$$\text{median} = \left(\frac{n+1}{2}\right)^{th} \text{ term}$$

$$= \frac{11+1}{2} \text{ th term} = 6\text{th term} = 8$$

109. What will be the median of the given data- 87, 21, 53, 12, 86, 98, 23, 64, 87, 23, 23, 87, 56, 12, 53

(a) 53.5 (b) 54
(c) 53 (d) 56.5

RRB NTPC 28.04.2016 Shift : 3

Ans : (c) Arranging in ascending order to the given data–
12, 12, 21, 23, 23, 23, 53, 53, 56, 64, 86, 87, 87, 87, 98
Total number of terms (n) = 15 (odd)

$$\text{median} = \left(\frac{n+1}{2}\right)^{th} \text{ terms value}$$

$$\text{So, median} = \left(\frac{15+1}{2}\right)^{th} \text{ terms value} = 8\text{th terms value}$$

So median = 53

110. The median of the following term was determined: 32, 12, 23, 17, 28, 25, 43. Later it was found that 17 was written by mistake instead of 29. Now what will be the changeable median?

(a) 29 (b) 17
(c) 23 (d) 28

RRB NTPC 29.04.2016 Shift : 1

Ans : (d) 32, 12, 23, 17, 28, 25, 43
Arranging in ascending order to the given data–
12, 23, 25, 28, 29, 32, 43
n = 7 (odd)

$$\text{median} = \left(\frac{n+1}{2}\right)^{th} \text{ term}$$

$$= \left(\frac{7+1}{2}\right)^{th} \text{ term} = 4\text{th term} = 28$$

Type - 3

111. What is the mode of the observations 5, 4, 4, 6, 7, 6, 9, 7, 6, 5?

(a) 4 (b) 7
(c) 5 (d) 6

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : Given,
5, 4, 4, 6, 7, 6, 9, 7, 6, 5
$\therefore$ In the given observation 6 appears maximum number of times (3 times).
$\therefore$ Mode = 6

112. Find the mode of the following data.
15, 26, 15, 29, 19, 18, 19, 15, 24, 23, 15, 19

(a) 29 (b) 26
(c) 19 (d) 15

RRB NTPC (Stage-II) –16/06/2022 (Shift-II)

Ans. (d) : The Given data– 15, 26, 15, 29, 19, 18, 19, 15, 24, 23, 15, 19
In the given observation, 15 appears maximum number of frequency = 4
Hence, The mode of following data = 15.

113. In the data set given below, what is the difference between the Median and the Mode? {2.1, 5, 6, 7, 8, 9.3, 11, 15, 17, 19.21, 27, 31, 31, 33, 16.5, 14, 10}

(a) 19 (b) 10
(c) 17 (d) 15

RRB NTPC (Stage-II) –12/06/2022 (Shift-I)

Ans. (c) : Arranging the numbers in ascending order,
2.1, 5, 6, 7, 8, 9.3, 10, 11, 14, 15, 16.5, 17, 19.21, 27, 31, 31, 33
Mode = 31 (has come 2 times)
and, total number of terms n = 17 (odd)

$$\therefore \text{ Median} = \left(\frac{n+1}{2}\right) \text{th term}$$

$$= \left(\frac{17+1}{2}\right) \text{th term}$$

$$= 9\text{th term} = 14$$

$\therefore$ Difference between Median and Mode
= 31 – 14 = 17

114. What is the mode of the following data ?
43, 41, 46, 48, 43, 50, 41, 48, 54, 46, 43, 48, 50, 46, 48, 50, 54

(a) 50 (b) 54
(c) 48 (d) 46

RRB Group-D 08/09/2022 (Shift-I)

Ans. (c) : The frequency of 48 is 4, which is the highest
Hence Mode of the given data = 48

115. Find the mode of the following data.
66, 69, 83, 69, 84, 74, 71, 83, 69, 71, 84, 74, 83, 66, 74, 83, 66, 90, 90

(a) 74 (b) 90
(c) 84 (d) 83

RRB Group-D 06/09/2022 (Shift-III)

Ans. (d) : $\because$ Frequency of 83 is 4, which is the highest.
Hence mode = 83

116. In the given data, X is the size of a shirt and F denotes the sale per day. Which sized shirt is in most demand?

X	24	26	28	30	34	36	38	40	42
F	45	67	120	46	76	53	41	22	33

(a) 40 (b) 42
(c) 28 (d) 34

RRB Group-D 05/09/2022 (Shift-III)

Ans. (c) : 28 sized shirt is in most demand

117. If the mode of the following data is 12, then find the value of k.
11, 15, 8, 9, k, 11, 12, 12, 15, 14
(a) 11 (b) 13
(c) 15 (d) 12

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (d) : Mode = the value that appears most often in a set of data value-
Hence, according to data = 11, 15, 8, 9, k, 11, 12, 12, 15, 14
k = 12

118. The marks obtained by 7 students in a class in mathematics are 43, 44, 65, 41, 53, 65, and 62, The mode of the data is:
(a) 53 (b) 65
(c) 41 (d) 62

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (b) : 43, 44, 65, 41, 53, 65, 62
The mode of the data = 65

119. The following are the weights (in kg) of 25 students:
58, 55, 53, 50, 53, 51, 52, 54, 53, 52, 54, 53, 58, 53, 59, 55, 53, 52, 51, 54, 53, 59, 55, 53, 52.
What is the most commonly observed weight (in kg)?
(a) 53 (b) 54
(c) 52 (d) 55

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : The weight of the given 25 students has the highest frequency is 53 which came 8 times.

120. Find out the mode of 21, 22, 22, 23, 23, 24, 24, 24.
(a) 24
(b) 22
(c) 21
(d) 23

RRB ALP CBT-2 Mec. & Diesel 21-01-2019 (Shift-I)

Ans. (a) : Mode- Mode is a value which occurs the maximum number of times in a given data set.
From the question, 21, 22, 22, 23, 23, 24, 24, 24
Hence, mode = 24

121. What will be the mode of the given data as follows– 3, 12, 4, 6, 8, 5, 4
(a) 5 (b) 8
(c) 4 (d) 3

RRB RPF SI – 06/01/2019 (Shift-II)

Ans : (c) Mode = the highest frequency number
Mode = 4

122. Find out the mode of the given distribution–

Class interval	1–10	10–20	20–30	30–40	40–50	50–60
Frequency	3	16	26	31	16	8

(a) 34.5 (b) 35
(c) 42 (d) 32.5

RRB JE - 27/06/2019 (Shift-I)

Ans : (d)

Class interval	1–10	10–20	20–30	30–40	40–50	50–60
frequency	3	16	(26) F_0	(31) F_1	(16) F_2	8

Most frequency class is (30-40)
So mode category(30-40)
$\therefore$ $L_1 = 30, L_2 = 40$
$F_1 = 31, F_2 = 16, F_0 = 26$

formula– $\text{Mode} = L_1 + \dfrac{(L_2 - L_1)(F_1 - F_0)}{2F_1 - F_0 - F_2}$

$\text{Mode} = 30 + \dfrac{(40-30)(31-26)}{2\times 31 - 26 - 16}$

$\text{Mode} = 30 + \dfrac{50}{20}$

Mode = 30 + 2.5
Mode = 32.5

123. A survey conducted by a group of students on 20 households in a local area resulted in the following frequency tables relating to the number of members of the household family-

Size of family	Family numbers
1–3	7
3–5	9
5–7	2
7–9	1
9–11	1

Find the mode of the given data.
(a) 3.571 (b) 3.444
(c) 3.628 (d) 3.286

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (b)

Size of family	Family numbers
1–3	$7 = f_0$
3–5	$9 = f_1$
5–7	$2 = f_2$
7–9	1
9–11	1

The frequency of category 3-5 is the highest so mode category is 3-5
$L = 3, f_0 = 7, f_1 = 9, f_2 = 2$ and $h = 2$

$\text{mode} = L + \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right)\times h$

$= 3 + \dfrac{9-7}{18-7-2}\times 2 = 3 + \dfrac{2}{9}\times 2 = \dfrac{31}{9} = 3.444$

124. In Wicket taken by a bowler in 12 cricket matches are as follows:
2, 6, 4, 3, 5, 0, 3, 2, 1, 3, 2, 3
What will be the mode of the given data?
(a) 4 (b) 2
(c) 3 (d) 1

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (c) : Mode of the given data = 3

125. What will be the mode of the given following data?
25, 45, 58, 87, 45, 54, 65, 12, 25, 59, 42, 60
(a) 25 (b) 45
(c) 45, 54 (d) 45, 25

RRB Group-D – 09/10/2018 (Shift-I)

Ans. (d**) :** given data− 25, 45, 58, 87, 45, 54, 65, 12, 25, 59, 42, 60
In the given data the number 25 and 45 appeared equally and maximum.
So Required mode is 25, 45

126. The details of the mumber of persons who have teken loan from the bank on the basis of their age group are given below.

age group	20−30	30−40	40−50	50−60	60−70
No. of people	37	38	70	42	13

Find the mode.
(a) 45.33 (b) 44.89
(c) 45.67 (d) 45.12

RRB Group-D – 15/11/2018 (Shift-III)

Ans : (a) :

Age category	Age category persons number
20 - 30	37
30 - 40	38
40 - 50	70 mode category
50 - 60	42
60 - 70	13

here - L = Minimum limit of mode category = 40
f_1 = Number of mode category = 70
f_0 = Number of the persons belongs to upper class of mode class = 38
f_2 = Number of persons belongs to the class below the mode class = 42
i = higher limit – lower limit (quadratic) = 10

$$\text{mode } (z) = L + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

$$= 40 + \frac{70-38}{70\times 2 - 38 - 42} \times 10 = 40 + \frac{32}{140-80} \times 10$$

$$= 40 + \frac{320}{60} = 40 + 5.33 = 45.33$$

127. Below, details of 100 students present in the class is given on the basis of ther presence (day).

The number of days of presence	6-10	10-14	14-18	18-22	22-26
Number of students	9	28	34	18	11

What will be the mode of the data?
(a) 15.09 (b) 15.01
(c) 14.71 (d) 15.04

RRB Group-D – 12/11/2018 (Shift-I)

Ans. (a) :

Number	frequncy
6-10	9
10-14	$28 = f_0$
14-28	$34 = f_1$
18-22	$18 = f_2$
22-26	11

$$z\,(\text{Mode}) = L + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

$L = 14$ $f_1 = 34$ $f_0 = 28$
$f_2 = 18$ $i = 4$

$$z = 14 + \frac{34-28}{68-28-18} \times 4 = 14 + \frac{24}{22}$$

$z = 15.09$

128. What will be the mode of the given data?
12, 1, 10, 1, 9, 3, 4, 9, 7, 9
(a) 9 (b) 12
(c) 1 (d) 7

RRB NTPC 17.01.2017 Shift-1

Ans : (a) In the given data , mode = 9 (3 times)
∵ mode is the highest frequency number.

129. What will be the mode of the given data as follows– 32, 34, 35, 36, 35, 34, 33, 35, 33, 31 and 37
(a) 33 (b) 34
(c) 35 (d) 32

RRB NTPC 04.04.2016 Shift : 3

Ans :(c) 32, 34, 35, 36, 35, 34, 33, 35, 33, 31, 37
∵ highest frequence is 3 of the number 35.
So mode = 35

130. What will be the mode of the given data as follows – 12, 14, 15, 16, 15, 14, 13, 15, 13, 11 and 17
(a) 13 (b) 14
(c) 15 (d) 12

RRB NTPC 03.04.2016 Shift : 3

Ans :(c) If the frequency of a number is the most frequent in the data, then that number is the mode of the given data.
So mode of data = 15

131. What will be the mode of the given data follows as– 2, 4, 5, 6, 5, 4, 3, 5, 3, 1 and 7
(a) 3 (b) 4
(c) 5 (d) 2

RRB NTPC 02.04.2016 Shift : 3

Ans : (c) 2, 4, 5, 6, 5, 4, 3, 5, 3, 1, 7
Frequency of 5 is highest in the given data.
∴ mode = 5

132. If the mode of the given data is 52, then find the value of x?
52, 45, 49, 54, 56, x-3, 56
(a) 52 (b) 55
(c) 54 (d) 56

RRB NTPC 29.03.2016 Shift : 2

Ans : (b) ∵ Mode of figures = 52
∴ x – 3 = 52 ⇒ $\boxed{x = 55}$

133. What will be the mode of the given data– $1, \frac{1}{2}, \frac{1}{2}, \frac{3}{4}, \frac{1}{4}, 2, \frac{1}{2}, \frac{1}{4}, \frac{2}{4}$
(a) $\frac{1}{4}$ (b) $\frac{1}{2}$
(c) $\frac{3}{4}$ (d) 1

RRB NTPC 07.04.2016 Shift : 3

Ans :(b)
∵ frequency of $\frac{1}{2}$ is maximum (3) in data.
∴ mode = $\frac{1}{2}$

Type - 4

134. If the mean is 25 and the standard deviation is 5 then the coefficient of variation is:
(a) 48% (b) 27%
(c) 20% (d) 60%
RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Given,
Mean = 25
Standard deviation = 5
We know that,

$$\text{Coefficient of variation} = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

$$= \frac{5}{25} \times 100 = 20\%$$

135. Calculate the standard deviation for the following data.
3, 4, 5, 6, 7
(a) $\sqrt{2}$ (b) $\sqrt{6}$
(c) 2 (d) $\sqrt{3}$
RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (a) : Standard deviation $= \sqrt{\frac{\sum\left|x-\bar{x}\right|^2}{n}}$

where $x \rightarrow$ term
$\bar{x} \rightarrow$ mean
$n \rightarrow$ number of terms

$$\text{mean } (\bar{x}) = \frac{\text{Sum of total terms}}{\text{Total number of terms}}$$

$$\bar{x} = \frac{3+4+5+6+7}{5} = \frac{25}{5} = 5$$

$$= \sqrt{\frac{\sum\left|x-\bar{x}\right|^2}{n}}$$

$$= \sqrt{\frac{(3-5)^2+(4-5)^2+(5-5)^2+(6-5)^2+(7-5)^2}{5}}$$

$$= \sqrt{\frac{4+1+0+1+4}{5}}$$

$$= \sqrt{\frac{10}{5}} = \sqrt{2}$$

136. If mean is 40 and standard deviation is 5 then C.V. (Coefficient of variation) is
(a) 20% (b) 12.5%
(c) 5% (d) 100%
RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (b) : Given,
Mean = 40, Standard deviation = 5

$$\text{Coefficient of Variation} = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

$$= \frac{5}{40} \times 100 = 12.5\%$$

137. Find the standard deviation of {11, 7, 10, 13, 9}.
(a) 1 (b) 2
(c) 4 (d) 5
RRB RPF SI – 10/01/2019 (Shift-II)

Ans : (b) Standard deviation $= \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$

Where
$\bar{x} \rightarrow$ mean
$n \rightarrow$ The number of terms

$$\bar{x} = \frac{11+7+10+13+9}{5} = \frac{50}{5} = 10$$

$\sum (x-\bar{x})^2 = (11-10)^2 + (7-10)^2 + (10-10)^2 + (13-10)^2 + (9-10)^2 = 1 + 9 + 0 + 9 + 1 = 20$

$$\text{Standard deviation} = \sqrt{\frac{20}{5}} = 2$$

138. The value of the 5 variance is 16. If each value becomes double then find the new value of standard deviation?
(a) 16 (b) 4
(c) 10 (d) 8
RRB JE - 28/05/2019 (Shift-I)

Ans : (d) We know that-
Standard deviation $=$ $\sqrt{\text{Variance}}$
Standard deviation $= 4$
Note : if the figures are added subtracted, multiplied or divided by a given number, then the standard deviation is the same process.
Hence the new standard deviation $= 4 \times 2 = 8$

139. The variance of the 5 values is 36. If each value becomes double, then what will be the standard deviation?
(a) 12 (b) 6
(c) 18 (d) 10
RRB JE - 30/05/2019 (Shift-III)

Ans : (a) Variance $= \sigma^2$
Standard deviation $= \sqrt{\sigma^2} = \sqrt{36}$
Standard deviation $= \sigma = 6$
New standard deviation $= \lambda\sigma$
(Where λ = n times each value)
$= 2 \times 6$
$= 12$

140. What will be the standard deviation of the given following data–
6, 12, 9, 7, 8, 4, 3, 12, 15, 4
(a) 3.80 (b) 2
(c) 3.48 (d) 4
RRB JE - 26/06/2019 (Shift-I)

Ans. (a)

x	6	12	9	7	8	4	3	12	15	4
$d = (x-\bar{x})$	−2	+4	1	−1	0	−4	−5	+4	+7	−4
d^2	4	16	1	1	0	16	25	16	49	16

$\Sigma d^2 = 144$

$$\text{Mean } (\bar{x}) = \frac{6+12+9+7+8+4+3+12+15+4}{10} = 8$$

$$\text{Standard deviation} = \sqrt{\frac{\Sigma d^2}{n}} = \sqrt{\frac{144}{10}} = \sqrt{14.4} = 3.8$$

141. What will be the standard deviation of the first n natural number?

(a) $\sqrt{\frac{n^2-1}{12}}$ (b) $\frac{n(2n+1)}{3}$

(c) $\sqrt{\frac{n^2+1}{6}}$ (d) $\frac{n(n+1)}{12}$

RRB JE - 02/06/2019 (Shift-II)

Ans. (a) σ (S.D) $= \sqrt{\frac{\left(\Sigma x_i^2\right)}{n} - \left(\frac{\Sigma x_i}{n}\right)^2}$

First 'n' natural number

$\Sigma x_i = 1 + 2 + 3 + \text{----- } + n = \frac{n(n+1)}{2}$

$\left(\Sigma x_i\right)^2 = (1^2 + 2^2 + 3^2 + \text{----- } + n^2) = \frac{n(n+1)(2n+1)}{6}$

$\sigma = \sqrt{\frac{n(n+1)(2n+1)}{6\times n} - \left(\frac{n(n+1)}{2n}\right)^2}$

$\sigma = \sqrt{\frac{(n+1)(2n+1)}{6} - \frac{(n+1)^2}{4}}$

$\sigma = \sqrt{(n+1)\frac{(4n+2-3n-3)}{12}}$

$\sigma = \sqrt{\frac{(n+1)(n-1)}{12}} = \sqrt{\frac{n^2-1}{12}}$

142. Sachin Tendulkar scored run in ten innings agains Australia 38, 70, 48, 34, 42, 55, 63, 46, 54, and 44. Find the average deviation with respect to mean.

(a) $\frac{44}{5}$ (b) $\frac{43}{5}$

(c) $\frac{41}{5}$ (d) $\frac{42}{5}$

RRB Group-D – 05/12/2018 (Shift-III)

Ans : (b)

Average $= \frac{34+38+42+44+46+48+54+55+63+70}{10}$

$= \frac{494}{10} = \frac{247}{5}$

Mean= $\underbrace{34+38+42+44+46}$ $\underbrace{48+54+55+63+70}$

$= \frac{204}{5}$ $= \frac{290}{5}$

Standard deviation $= \frac{247}{5} - \frac{204}{5} = \frac{43}{5}$

143. If the standard deviation of the given numbers is 255. Then find the value of 'd'
1, 1 + d, 1 + 2d.....1+ 100d

(a) 20.2 (b) 10.1

(c) 20.0 (d) 10.5

RRB Group-D – 16/11/2018 (Shift-II)

Ans : (b) 1,1 + d, 1 + 2d.....1+ 100 d is in arithmetic progression.

$\because$ Number of total terms = 101

Arithmatic mean $\left(\bar{x}\right) = \frac{1+(1+d)+.....(1+100d)}{101}$

$= \frac{101(1+50d)}{101}$

$\bar{x} = 1 + 50d$

mean deviation $= \frac{1}{101}\sum_{i=0}^{100} | x_i - \bar{x} |$

$= \frac{1}{101}(| -50d | + | -49d | + ... | -d | + 0 + | d | + | 2d | + ... + | 50d |)$

$255 = \frac{2d}{101}\frac{(50\times 51)}{2}$

$255 = \frac{d}{101}\times 50 \times 51$

$d = \frac{255\times 101}{50\times 51} = \frac{25755}{2550} = 10.1$

144. What will be the standard deviation of the given data–3, 10, 10, 4, 7, 10, 5

(a) $\frac{49}{7}$ (b) $\frac{19}{7}$

(c) $\frac{50}{7}$ (d) $\frac{18}{7}$

RRB NTPC 17.01.2017 Shift-1

Ans : (d) Data 3, 10, 10, 4, 7, 10, 5

Mean $= \frac{3+10+10+4+7+10+5}{7} = \frac{49}{7}$

Mean = 7

Mean deviation $= \sum_{i=1}^{N}\frac{|M - Xi|}{N}$

$= \frac{|7-3|+|7-10|+|7-10|+|7-4|+|7-7|+|7-10|+|7-5|}{7}$

$= \frac{4+3+3+3+0+3+2}{7}$

$\boxed{\text{mean deviation} = \frac{18}{7}}$

145. What will be the standard deviation of the given set {10, 11, 12, 9, 8}

(a) 1 (b) $\sqrt{2}$

(c) 2 (d) $2\sqrt{2}$

RRB NTPC 31.03.2016 Shift : 2

Ans : (b) $\bar{x} = \frac{10+11+12+9+8}{5} = \frac{50}{5} = 10$

$\sum_{i=1}^{5}\left(x_i - \bar{x}\right)^2 = (10-10)^2 + (11-10)^2 + (12-10)^2 + (9-10)^2 + (8-10)^2$

$= 0 + 1 + 4 + 1 + 4 = 10$

$\therefore$ Standard deviation $= \sqrt{\frac{\sum_{i=1}^{5}\left(x_i - \bar{x}\right)^2}{N}} = \sqrt{\frac{10}{5}} = \sqrt{2}$

146. If the standard deviation of a distribution is 6, then what is the value of variance?

(a) 8 (b) 24
(c) 36 (d) 12

RRB NTPC 18.01.2017 Shift : 3

Ans : (c) Variance = (Standard deviation)^2
$= (6)^2 = 36$

147. If the variance of a data set is 196, the standard deviation will be?

(a) ±14 (b) 14
(c) 96 (d) 98

RRB NTPC 11.04.2016 Shift : 1

Ans : (b) Standard deviation
$= \sqrt{\text{variance}} = \sqrt{196} = 14$

148. The variance of a data set is 169, then what will be the standard deviation?

(a) ±13 (b) 13
(c) 69 (d) 845

RRB NTPC 26.04.2016 Shift : 2

Ans : (b) Standard deviation $= \sqrt{\text{variance}}$
$= \sqrt{169} = \pm 13 = 13$

149. In an observations $x_1, x_2, x_3, ...x_n$, frequency will be given as $f_1, f_2, f_3 .....f_x$. What will be the standard deviation $\bar{x}$

(a) $\sqrt{\dfrac{\sum_{i=1}^{n} f_i (x_i - \bar{x})}{\sum_{i=1}^{n} f_i}}$ (b) $\sqrt{\dfrac{\sum_{i=1}^{n} f_i (x_i - \bar{x})^2}{\sum_{i=1}^{n} f_i}}$

(c) $\sqrt{\dfrac{\sum_{i=1}^{n} f_i (x_i^2 - \bar{x})}{\sum_{i=1}^{n} f_i}}$ (d) $\sqrt{\sum_{i=1}^{n} f_i (x_i - \bar{x})}$

RRB NTPC 26.04.2016 Shift : 3

Ans : (b) Standard deviation $= \sqrt{\dfrac{\sum_{i=1}^{n} f_i (x_i - \bar{x})^2}{\sum_{i=1}^{n} f_i}}$

where $\bar{x}$ = mean

150. Mean of given observation $x_1, x_2, x_3, ...x_n$ is $\bar{x}$. What will be the standard deviation of the n observation?

(a) $\sqrt{\dfrac{\sum_{1}^{n} (x_i - \bar{x})}{n}}$ (b) $\sqrt{\dfrac{\sum_{1}^{n} (x_i - \bar{x})^2}{n}}$

(c) $\sqrt{\dfrac{\sum_{1}^{n} (x_i^2 - \bar{x})}{n}}$ (d) $\sqrt{\dfrac{\sum_{1}^{n} (x_i - \bar{x})^2}{n}}$

RRB NTPC 30.04.2016 Shift : 3

Ans : (b) Standard deviation $(S.D.) = \sqrt{\dfrac{\sum_{1}^{n} (x_i - \bar{x})^2}{n}}$

where $\sum_{1}^{n} (x_1 - \bar{x})^2$ = variables

Type - 5

151. Let $f(x) = x^2$ in R, then the range of f will be:

(a) Whole numbers
(b) Non negative numbers
(c) Positve real numbers
(d) Negative real numbers

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : The square of any number will be always positive real numbers.
$\therefore f(x) = x^2$
$\Rightarrow$ Range of $f = [0, \infty] = R^+$
Hence, the range of f will be positive real numbers.

152. Calculate the variance from the following data: 3, 6, 5, 2, 4

(a) 2.5 (b) 2.2
(c) 2 (d) 3

RRB NTPC 02.03.2021 (Shift-II) Stage Ist

Ans. (c) : Variance $= \dfrac{(x_i - \bar{x})^2}{N}$

Mean $(\bar{x}) = \dfrac{20}{5} = 4$

$$\frac{(x_i - \bar{x})^2}{N} = \frac{(3-4)^2 + (6-4)^2 + (5-4)^2 + (2-4)^2 + (4-4)^2}{5}$$

$$= \frac{(-1)^2 + (2)^2 + (1)^2 + (-2)^2 + (0)^2}{5}$$

$$= \frac{1+4+1+4}{5}$$

$$= \frac{10}{5} = 2$$

153. Find the variance of the following data points: 6, 7, 5, 9, 12, 15

(a) $\dfrac{37}{6}$ (b) $\dfrac{37}{3}$

(c) $\dfrac{81}{3}$ (d) $\dfrac{67}{6}$

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : Given data = 6, 7, 5, 9, 12, 15

Variance $(\sigma^2) = \dfrac{\sum (Xi - M)^2}{n}$ [where, M = Mean]

Mean of data (M) $= \dfrac{\text{Sum of data}}{n}$

$$= \frac{6+7+5+9+12+15}{6} = \frac{54}{6} = 9$$

Variance $(\sigma^2) = \dfrac{\sum (x_i - M)^2}{n}$

$$= \frac{(6-9)^2 + (7-9)^2 + (5-9)^2 + (9-9)^2 + (12-9)^2 + (15-9)^2}{6}$$

$$= \frac{9+4+16+0+9+36}{6}$$

$= 74/6 = 37/3$

154. The variance of 20 observations is 5. If each observation is multiplied by 2, then the variance of the resulting observations will be

(a) 2×5 (b) 2×5^2

(c) 5 (d) $2^2 \times 5$

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : Number of observations = 20

$$\text{Variance} = \frac{1}{n}\sum\left(x_i - \bar{x}\right)^2$$

$$5 = \frac{1}{20}\sum\left(x_i - \bar{x}\right)^2$$

$$\sum\left(x_i - \bar{x}\right)^2 = 100 \text{ .....(i)}$$

If each observation is multiplied by 2 then new variance will be

$$= \frac{1}{n}\sum\left(2x_i - 2\bar{x}\right)^2$$

$$= \frac{1}{20}\sum\left(x_i - \bar{x}\right)^2 \times 4$$

$$= \frac{1}{20} \times 100 \times 4$$

Variance = $20 = 2^2 \times 5$

155. In a frequency distribution, the mid value of a class is 12 and its width is 6. The lower limit of the class is

(a) 12 (b) 9

(c) 18 (d) 6

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (b) : Maximum limit of distribution = M,
Range = R
Minimum limit of distribution = L

According to question, $\frac{M+L}{2} = 12$

M+L = 24 ……..(i)

M–L = 6 ……..(ii)

For solving eq^n (i) and eq^n (ii)

L = 9

156. The following are the weights (in kg) of 25 students:
58, 55, 53, 50, 53, 51, 52, 54, 53, 52, 54, 53, 58, 53, 59, 55, 53, 52, 51, 54, 53, 59, 55, 53, 52
What is the range of the given data.

(a) 6 (b) 8

(c) 9 (d) 7

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : The range of the given data = 59 – 50 = 9

157. Find the range of data - 9, 5, 9, 3, 4, 7, 8, 4, 8, 9, 5, 9

(a) 3 (b) 5

(c) 6 (d) 4

RRB RPF Constable – 24/01/2019 (Shift-III)

Ans : (c) Data range = highest value − lowest value
= 9 – 3 = 6

158. Find the range of data-11, 13, 9, 17, 13, 19, 10, 11

(a) 6 (b) 10

(c) 11 (d) 13

RRB RPF SI – 12/01/2019 (Shift-II)

Ans : (b) Range of the given data = highest value – lowest value
= 19 – 9 = 10

159. The standard deviation of a group of values is 4.5. If each value increases by K. then find the variance of group of new values?

(a) 10.5 (b) 20.25

(c) 100.25 (d) 4.5

RRB JE - 26/06/2019 (Shift-I)

Ans. (b) If in each value is increased by K, the standard deviation will have no effect.
Variance = (Standard deviation)^2
= $(4.5)^2 = 20.25$

160. The variance of a set of values X_1, X_2, ... X_n by which of the following formula has given?

(a) $\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2$

(b) $\left(\frac{\sum x}{n}\right)^2 - \frac{\sum x^2}{n}$

(c) $\left(\frac{\sum x}{n}\right)^2$

(d) $\frac{\sum x^2}{n} - \frac{\sum x}{n}$

RRB JE - 01/06/2019 (Shift-II)

Ans : (a) Variance $(\sigma^2) = \frac{\Sigma x^2}{n} - \left(\frac{\Sigma x}{n}\right)^2$

161. What will be the range of first 7 prime number?

(a) 15 (b) 8.3

(c) 9 (d) 17

RRB JE - 27/06/2019 (Shift-III)

Ans : (a) First 7 prime number= 2, 3, 5, 7, 11, 13, 17
Range = maximum number – minimum number
Range = 17 – 2 = 15

162. A set of four numbers. The mean of these three smallest numbers is 19 and the mean of three largest numbers is 23. What will be the range of this set?

(a) 18 (b) 12

(c) 14 (d) 15

RRB Group-D – 24/09/2018 (Shift-II)

Ans : (b) Sum of the three smallest number in four numbers = 19 × 3 = 57
sum of three smallest numbers = 23 × 3 = 69
Range of sets = 69 – 57 = 12

163. The mean of three numbers is 20. The range of this data set is 12, while the difference between two smallest numbers is 3. Find the largest number.

(a) 28 (b) 25

(c) 27 (d) 24

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (c) : Suppose numbers = x, y, z where x < y < z
As per the question-

$x + y + z = 60 - (i)$

$z - x = 12 \Rightarrow z = 12 + x$ .....(ii)

$y - x = 3 \Rightarrow y = 3 + x$ .....(iii)

On solving equation (i),(ii) and (iii)
$x + y + z = 60$
$x + 3 + x + 12 + x = 60$
$3x + 15 = 60$
$3x = 45$
$x = 15$
$y = 18$
$z = 12 + x$
$z = 12 + 15$
$z = 27$
$\boxed{z = 27}$ largest number $(z) = 27$

164. What will be the range of the following data?
6, 7, 8, 9, 5, 6, 7, 4, 8, 9, 5, 9
(a) 2 (b) 3
(c) 4 (d) 5

RRB NTPC 31.03.2016 Shift : 1

Ans : (d) lowest limit = 4
highest limit = 9
Range = highest limit – lowest limit = 9 – 4 = 5

165. What will be the range of the following data?
12, 11, 18, 28, 19, 13, 19, 18
(a) 11
(b) 17
(c) 18
(d) 19

RRB NTPC 30.03.2016 Shift : 2

Ans : (b) The difference between the highest and lowest values of the given data is called range.
Range = 28–11 = 17

166. If the standard deviation of a population is 9.5, then what will be its variance?
(a) 19 (b) 90.25
(c) 81.25 (d) 93.25

RRB NTPC 19.04.2016 Shift : 1

Ans : (b) Variance = $(\text{Standard deviation})^2$
$= (9.5)^2$
$= 90.25$

167. If the standand deviation of a population is 4.5, then what will be its variance?
(a) 20.25 (b) 20
(c) 9 (d) 18

RRB NTPC 16.04.2016 Shift : 1

Ans : (a) Variance = $(\text{Standard deviation})^2$
$= (4.5)^2 = 20.25$

168. If the variance of data 2, 4, 5, 6, 8, 18 is 23.33 then what will be the variance of the given following data 4, 8, 10, 12, 16, 36
(a) 11.66 (b) 46.66
(c) 93.3333 (d) 483

RRB NTPC 11.04.2016 Shift : 1

Ans : (b) The number of data is doubled, so their variance will also be doubled.
$\therefore$ Variance $= 2 \times 23.33$
$= 46.66$

169. The following information is $60\sum x^2 = 18000$, $\sum x = 960$ variance is related to the size of a sample.
(a) 55 (b) 44
(c) 22 (d) 16

RRB NTPC 07.04.2016 Shift : 3

Ans :(b) $60\sum x^2 = 18000$

$$\sum x^2 = \frac{18000}{60} \Rightarrow \boxed{\sum x^2 = 300}$$

$\because \quad \sum x = 960$

$$\text{Average of 60 terms} = \frac{960}{60} = 16$$

$$\sum x^2 = (16)^2 \Rightarrow \boxed{\sum x^2 = 256}$$

$\therefore$ Variance $= 300 - 256 = 44$

170. What will be the range of the following data?
3, 1, 4, 6, 5, 7, 3, 8, 1, 4
(a) 3 (b) 8
(c) 7 (d) 6

RRB NTPC 26.04.2016 Shift : 1

Ans : (c) Arranging the numbers in asceding order-
1, 1, 3, 3, 4, 4, 5, 6, 7, 8
Rang = largest number – smallest number
= 8 – 1 = 7

Type - 6

171. If the difference between the mean and the mode of certain observations is 69, then the difference between the mean and the median is_____.
(a) 24 (b) 21
(c) 23 (d) 22

RRB NTPC (Stage-II) 15/06/2022 (Shift-III)

Ans. (c) : Mode = 3 × Median −2 Mean .....(i)
According to the question,
Mean – Mode = 69 .....(ii)
Mode = Mean − 69
From equation (i),
3 Median − 2 Mean = Mean − 69
3 Mean − 3 Median = 69
3 (Mean − Median) = 69

$$\text{Mean} - \text{Median} = \frac{69}{3} = 23$$

172. The maximum weight lifted by 750 participants are recorded and it is found that the Mean and the Median of this distribution are both more than the Mode. If the Mean and the Median are 184 Kg and 178 Kg respectively, then which of the following is the most likely value of the Mode (in Kg).
(a) 168 (b) 166
(c) 162 (d) 172

RRB NTPC (Stage-II) –13/06/2022 (Shift-II)

Ans. (b) : Given,
Mean of 750 participants = 184 kg
and Median = 178 kg
Mode = ?
We know that, Mode = 3 Median – 2 Mean
= 3 × 178 – 2 × 184
= 534 – 368
= 166

173. The numbers 4, 6, 10, x, 20, 24, 32 are arranged in ascending order. Find the value of x if their mean and their median are equal.

(a) 20 (b) 8
(c) 16 (d) 12

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (c) :
$$\text{Mean} = \frac{4+6+10+x+20+24+32}{7}$$
$$= \frac{96+x}{7}$$
$\because$ Number of terms = 7
Hence, Median = middle term = (x)
According to the question,
Mean = Median
$\because \frac{96+x}{7} = x$
$6x = 96$
$x = 16$

174. If the difference between the mode and median is 2, then find the difference between the median and mean (in the given order) using empirical relation.
(a) 1 (b) 2
(c) 4 (d) 3

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (a) : Given,
Mode – Median = 2 ——— (i)
$\therefore$ Mode = 3 × Median – 2 × Mean ———(ii)
From equation (i) and (ii) —
3 × Median – 2 × Mean − Median = 2
$\Rightarrow$ 2 × Median– 2 × Mean = 2
$\Rightarrow$ Median – Mean= 1

175. For a given data, if mean and mode are 42 and 60, respectively, then find the median of the data empirical relation.
(a) 46 (b) 48
(c) 44 (d) 50

RRB Group-D 26/08/2022 (Shift-III)

Ans. (b) : Given, Mean = 42
Mode = 60
We know that,
Mode = 3 Median – 2 Mean
$\Rightarrow$ $\text{Median} = \frac{\text{Mode}+2\text{Mean}}{3}$
$\Rightarrow$ $\text{Median} = \frac{60+2\times42}{3}$
$\Rightarrow$ Median = 48

176. For a certain data the mode is 24.6 and the mean is 20.1. Find the median of the data.
(a) 23.5 (b) 24.1
(c) 21.6 (d) 22.2

RRB Group-D 06/09/2022 (Shift-II)

Ans. (c) : Mode = 3 × Median – 2 × mean
According to the question,
24.6 = 3 × Median – 2 × 20.1
$\text{Median} = \frac{24.6+40.2}{3}$
Median = 21.6

177. The mode and median of some data are 23.6 and 24 respectively. Find the mean of the data. (use the empiricial formula).
(a) 24.2 (b) 23.2
(c) 24.8 (d) 23.6

RRB Group-D 06/09/2022 (Shift-I)

Ans. (a) : According to the question,
Mode = 3 × Median – 2 × mean
23.6 = 3 × 24 – 2 Mean
2 mean = 72 – 23.6
$\text{Mean} = \frac{48.4}{2} = 24.2$

178. Which of the following options gives the correct empirical relationship between mean, median and mode of a data set?
(a) Mean – Mode = 3 (Mean + Median)
(b) Mean – Mode = 3 (Mean – Median)
(c) Mean + Mode = 3 (Mean – Median)
(d) Mean + Mode = 3 (Mean + Median)

RRB GROUP-D – 29/09/2022 (Shift-I)

Ans. (b) : Mean – Mode = 3 (Mean – Median)

179. Which of the following is the correct empirical formula?
(a) $\frac{\text{Mode}-\text{Mean}}{3} = \text{Median} - \text{Mean}$
(b) $\frac{\text{Mode}-\text{Mean}}{3\times2} = \text{Median} - \text{Mean}$
(c) 3 (mode-mean) = median-Mean
(d) $\frac{3}{2}$(Mode–Mean) = Median – Mean

RRB Group-D 24-08-2022 (Shift-I)

Ans. (a) : Correct formula
$$\text{Median} - \text{Mean} = \frac{\text{Mode}-\text{Mean}}{3}$$

180. If the mode of a distribution is 27 and its median is 35, then the mean of the distribution is _____ (using empirical relation).
(a) 43.5 (b) 39
(c) 62 (d) 37.5

RRB GROUP-D – 15/09/2022 (Shift-III)

Ans. (b) : Mode = 27
Median = 35
Mean = ?
$\because$ Mode = 3 × Median – 2 × mean
27 = 3 × 35 – 2 × mean
2 × mean = 105 – 27
$\text{Mean} = \frac{78}{2} = 39$

181. For a certain number of observations the median is 55 and the mean is 58. Find the mode.
(a) 49 (b) 52
(c) 51 (d) 50

RRB Group-D 19-09-2022 (Shift-III)

Ans. (a) : Given, Median = 55, Mean = 58
By formula-
Mode = 3 median – 2 mean
Mode = 3 × 55 – 2 × 58
= 165 – 116
= 49

182. Sakshi attended to the following number of clients at the front desk during her internship for 15 days :
18, 20, 16, 17, 32, 12, 6, 16, 12, 13 17, 28, 24, 45,17.
Find the average of the mode and median of the given data.
(a) 19.5 (b) 34
(c) 18.25 (d) 17
RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (d) : 18, 20, 16, 17, 32, 12, 6, 16, 12, 13 17, 28, 24, 45,17
On writing the data in ascending order
6, 12, 12, 13, 16, 16, 17, **17**, 17, 18, 20, 24, 28, 32, 45
Mode = 17 (has come 3 times)

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th} \text{term}$$

$$\cdot\left(\frac{15+1}{2}\right)^{th} \text{term} = 8^{th} \text{term} = 17$$

$$\text{Average} = \frac{\text{Mode} + \text{Median}}{2} = \frac{17+17}{2} = 17$$

183. Given below is the marks obtained by 20 students in mathmatics out of 30 marks.
7, 9, 12, 12, 13, 12, 14, 14, 14, 14, 15, 16, 17, 18, 18, 19, 20, 18, 20, 13.Then (2 × median – mode) of the data is equal to:
(a) 14 (b) 18
(c) 12 (d) 0
RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (a) : On arranging the given number in ascending order
7, 9, 12, 12, 12, 13, 13, 14, 14, 14, 14 15, 16, 17, 18, 18, 18, 19, 20, 20
$n = 20(\text{even})$

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{th} \text{term} + \left(\frac{n+2}{2}\right)^{th} \text{term}}{2}$$

$$= \frac{\left(\frac{20}{2}\right)^{th} \text{term} + \left(\frac{20+2}{2}\right)^{th} \text{term}}{2}$$

$$= \frac{10^{th} \text{term} + 11^{th} \text{term}}{2}$$

$$= \frac{14+14}{2} = 14$$

Mode = 14
$\therefore$ 2×Median – Mode = 2× 14 – 14 = 14

184. In the frequency distribution, if the mid-value of the class is 35 and the value of the lower boundary is 30, then the value of its upper boundary is:
(a) 40 (b) 30
(c) 10 (d) 20
RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (a) : According to the question,

$$\text{Mid–value} = \frac{\text{Upper limit} + \text{Lower limit}}{2}$$

$$35 = \frac{\text{Upper limit} + 30}{2}$$

Upper limit = 70 – 30
= 40

185. The mean of three numbers is 53. The range of this data set is 28 while the difference between the two smallest numbers is 8. The greatest of the three numbers is:
(a) 71 (b) 72
(c) 73 (d) 69
RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (d) : Let three numbers are x, y and z.
According to the question,
$\therefore$ $x + y + z = 53 \times 3 = 159$ … (i)
$x - z = 28$ … (ii)
$y - z = 8$ … (iii)
Putting the value of x from equation (ii) and value of y from equation (iii) in equation (i),
$z + 28 + z + 8 + z = 159$
$3z = 159 - 36$
$3z = 123$
$z = 41$
Putting the value of z in equation (ii) and (iii),
$x = 28 + 41 = 69$
$y = 41 + 8 = 49$
Hence, the greatest number = 69

186. If the standard deviation of a set of numbers is 3 and the arithmetic mean of these numbers is 6, what is the coefficient of variation of these numbers?
(a) 75 (b) 125
(c) 100 (d) 50
RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (d) :

$$\text{coefficient of variation} = \frac{\text{Standard deviation}}{\text{mean}} \times 100$$

$$= \frac{3}{6} \times 100$$

Coefficient of Variation = 50

187. Find the median and the mode for the following set of numbers.
2, 2, 3, 5, 5, 5, 6, 8, 9
(a) Median = 2, Mode = 5
(b) Median = 5, Mode = 2
(c) Median = 0, Mode = 9
(d) Median = 5, Mode = 5
RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : Set of numbers $\rightarrow$ 2, 2, 3, 5, 5, 5, 6, 8, 9

Number of term $\rightarrow$ 9 (odd)

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th} \text{ term}$$

$$= \left(\frac{9+1}{2}\right)^{th}$$

$= 5^{th}$ term

Hence, median = 5

2, 2, 3, 5, 5, 5, 6, 8, 9

$\because$ Mode the value that occurs most often

$\therefore$ Mode = 5

188. Find the median and the mode of the following data:

2, 3, 5, 7, 2, 3, 3, 5, 7 and 9

(a) 4, 3 (b) 3, 4

(c) 3, 3 (d) 4, 4

RRB NTPC 22.02.2021 (Shift-I) Stage Ist

Ans. (a) : The ascending order of the given data = 2, 2, 3, 3, 3, 5, 5, 7, 7, 9

Number of terms (n) = 10

$\because$ The number of terms is even,

$$\therefore \text{Median} = \frac{\left(\frac{n}{2}\right)^{th} \text{ term} + \left(\frac{n}{2}+1\right)^{th} \text{ term}}{2}$$

$$= \frac{\left(\frac{10}{2}\right)^{th} \text{ term} + \left(\frac{10}{2}+1\right)^{th} \text{ term}}{2} = \frac{5^{th}\text{ term} + 6^{th}\text{ term}}{2}$$

$$\text{Median} = \frac{3+5}{2} = \frac{8}{2} = 4$$

And Mode = The number with the highest frequency.

Hence, the mode of above data = 3

189. The mean of three number is 32. The range of this data set is 28 while the difference between the two smallest numbers is 8. the greatest of the three numbers is:

(a) 52 (b) 51

(c) 50 (d) 48

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let the smallest number be x.

Middle number = x + 8

The greatest number = x + 28

According to question–

$\Rightarrow$ x + x + 8 + x + 28 = 3 × 32

$\Rightarrow$ 3x + 36 = 96

$\Rightarrow$ 3x = 60

$\Rightarrow$ x = 20

Hence the greatest no. of the three no. is (20 + 28) = 48

190. The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who took 50 instead of 40 for one observation. What is the correct mean and standard deviation ?

(a) 39.09,5 (b) 39.9,50

(c) 39.0,5 (d) 39.9,5

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (d) : $\bar{x} = 40$, $\sigma = 5.1$, n =100

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

$$\sum_{i=1}^{100} x_i = 40 \times 100$$

$$\sum_{i=1}^{100} x_i = 4000$$

Incorrect mean = 4000 – 50 + 40 = 3990

$$\text{Correct mean} = \frac{\text{Incorrect mean}}{\text{Number of obsevations}}$$

$$= \frac{3990}{100}$$

Correct mean = 39.9

$$\sigma = \sqrt{\frac{1}{n}\sum_{i=1}^{n} x_i^2 - \left(\bar{x}\right)^2}$$

$$(5.1)^2 = \frac{1}{100}\sum_{i=1}^{n} x_i^2 - (40)^2$$

$$(26.01 + 1600) \times 100 = \sum_{i=1}^{100} x_i^2$$

$$\sum_{i=1}^{100} x_i^2 = 162601$$

$$= 162601 - (50)^2 + (40)^2$$

$$= 162601 - 2500 + 1600$$

$$= 161701$$

Correct Standard Deviation

$$= \sqrt{\frac{1}{n}\sum_{i=1}^{n} x_i^2 - \left(\bar{x}\right)^2}$$

$$= \sqrt{\frac{161701}{100} - (39.9)^2}$$

$$= \sqrt{1617.01 - 1592.01}$$

$$= \sqrt{25}$$

Correct Standard Deviation = 5

191. Find the mode, if mean and median are 4 and 5 respectively.

(a) 11 (b) 7

(c) 5 (d) 9

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (b) : We know that–

Mode = 3 Median – 2 Mean

$$= 3 \times 5 - 2 \times 4 \quad \left\{\begin{array}{l}\because \text{Median} = 5 \\ \text{Mean} = 4\end{array}\right\}$$

$= 15 - 8 = 7$

192. There are three positive integers a, b and c such that their average is 35 and a $\leq$ b $\leq$ c. If the median is (a + 18), find the least possible value of c.

(a) 41 (b) 42

(c) 39 (d) 40

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question,

$$\frac{a+b+c}{3}=35$$

$a + b + c = 105$

The median of a, b and c will be, $b = a + 18$

$\because b = a+18$

$\therefore a + a + 18 + c = 105$

$2a + c = 87$

on putting $a = 22$,

$b = 40$

$c = 87 – 44 = 43$

on putting $a = 23$

$b = 41$

$c = 87 – 46 = 41$

It is clear that minimum possible value of $c = 41$

193. Find the sum of mean, median and mode of the given data.

9, 35, 20, 25, 25, 15, 25

(a) 75 (b) 72

(c) 47 (d) 50

RRB NTPC 30.01.2021 (Shift-I) Stage Ist

Ans. (b) :

$$\text{Mean} = \frac{9+35+20+25+25+15+25}{7}$$

$$= \frac{154}{7} = 22$$

On writing the data in ascending order

9, 15, 20, 25, 25, 25, 35

N = 7 terms (odd)

$$\text{Median} = \left(\frac{N+1}{2}\right)^{th} \text{term}$$

$$= \left(\frac{7+1}{2}\right)\text{term} = 4 \text{ term}$$

Median = 25

Mode = The number that occurs the highest number of times

= 25

Sum of mean, median and mode = 22 + 25 + 25

= 72

194. The standard deviation of 12 values is 3. If each value is increased by 4, then find the variance of the new set of values.

(a) 25 (b) 16

(c) 7 (d) 9

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (d) : Standard deviation of 12 values = 3

($\because \sigma$ = Standard deviation)

Variance $= \sigma^2 = (3)^2 = 9$

195. Let a set S = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4}. Then the value of 4 × mean + 2 × mode – 8 × median is :

(a) –4 (b) 14

(c) 10 (d) 4

RRB NTPC 21.01.2021 (Shift-I) Stage Ist

Ans. (a) : Set = {1, 2, 2, 3, 3, 3, 4, 4, 4, 4, }

Mode = 4

$$\text{Mean} = \frac{1+2+2+3+3+3+4+4+4+4}{10}$$

$$= \frac{30}{10} = 3$$

In case the data is even (n = 10)

$$\text{Median} = \frac{1}{2}\left[\left(\frac{n}{2}\right)^{th}\text{term} + \left(\frac{n}{2}+1\right)^{th}\text{term}\right]$$

$$= \frac{1}{2}\left[\frac{10^{th}}{2}\text{term} + \left(\frac{10}{2}+1\right)^{th}\text{term}\right]$$

$$= \frac{1}{2}(5^{th}\text{ term} + 6^{th}\text{ term})$$

$$= \frac{1}{2}(3+3) = \frac{1}{2}\times 6$$

$= 3$

Hence, 4 × mean + 2 × mode – 8 × median

$= 4 \times 3 + 2 \times 4 – 8 \times 3$

$= 12 + 8 – 24$

$= 20 – 24$

$= – 4$

196. The following are the weights (in kg) of 25 students:

58, 55, 53, 50, 53, 51, 52, 54, 53, 52, 54, 53, 58, 53, 59, 55, 53, 52, 51, 54, 53, 59, 55, 53, 52

Among the following options, what is the weight (in kg) that appears least number of times in the given data?

(a) 52 (b) 58

(c) 50 (d) 54

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (c) : In the given weight of 25 students 50 kg is the weight that appears least number of times.

197. The following are the weights (in kg) of 25 students:

58, 55, 53, 50, 53, 51, 52, 54, 53, 52, 54, 53, 58, 53, 59, 55, 53, 52, 51, 54, 53, 59, 55, 53, 52

What is the weight (in kg) of the heaviest student?

(a) 56 (b) 58

(c) 55 (d) 59

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (d) : In the given weight of 25 students 59 kg students is heaviest.

198. If the median and mean are 36 and 35 respectively, then find the mode.

(a) 32 (b) 34

(c) 38 (d) 30

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : Mode = 3 × median–2 × mean

= 3 × 36 – 2×35

= 108 –70

= 38

199. The mass of five meteorites found on earth are 23.5 kg, 15 kg, 20 kg, 22 kg and 16 kg. For this data, which of the following measures is 19.3 kg?

(a) Mean (b) Mean deviation

(c) Median (d) Mode

RRB NTPC 11.02.2021 (Shift-I) Stage Ist

Ans. (a) : $\text{Mean} = \dfrac{\text{Sum of terms}}{\text{Number of terms}}$

$= \dfrac{23.5+15+20+22+16}{5} = \dfrac{96.5}{5} = 19.3$

Hence 19.3 will be the value of mean.

200. For the data set 1, 2, 3, 5, 2, 3, 4, 6, 6, 8, 3, 4, 5 which of the following options is incorrect?
1, 2, 3, 5, 2, 3, 4, 6, 6, 8, 3, 4, 5

(a) Mean = Mode (b) Mean = Median
(c) Median > Mode (d) Mode < Mean

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (a) : 1, 2, 3, 5, 2, 3, 4, 6, 6, 8, 3, 4, 5
In ascending order
1, 2, 2, 3, 3, 3, 4, 4, 5, 5, 6, 6, 8
No. of term (n) = 13

$\text{Median} = \left(\dfrac{13+1}{2}\right)^{\text{th}} \text{term} \Rightarrow 7^{\text{th}} \text{term} = 4$

Mode = 3

$\text{Mean} = \dfrac{\text{Sum of total terms}}{\text{Number of terms}}$

$= \dfrac{1+2+2+3+3+3+4+4+5+5+6+6+8}{13}$

$= \dfrac{52}{13} = 4$

(a) Mean ≠ Mods, [4 ≠ 3]
(b) Mean = Median, [4 = 4]
(c) Mode < Median, [3 < 4]
(d) Mean > Mode, [4 > 3]
Therefore option (a) is wrong.

201. Find the difference between median and mode of the following data
2, 3, 5, 7, 2, 3, 3, 5, 7 and 9

(a) 2 (b) 1
(c) –2 (d) –1

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (b) : On writing the number in ascending order–
2, 2, 3, 3, 3, 5, 5, 7, 7, 9
Number of terms = 10 (even)

$\text{Median} = \dfrac{\left(\dfrac{n}{2}\right)^{\text{th}} \text{term} + \left(\dfrac{n}{2}+1\right)^{\text{th}} \text{term}}{2}$

$= \dfrac{\left(\dfrac{10}{2}\right)^{\text{th}} \text{term} + \left(\dfrac{10}{2}+1\right)^{\text{th}} \text{term}}{2}$

$= \dfrac{5^{\text{th}} \text{term} + 6^{\text{th}} \text{term}}{2}$

$\text{median} = \dfrac{3+5}{2} \Rightarrow 4$

Mode = the number which will have the highest frequency in the data
∴ Mode = 3
Required difference = 4 – 3 = 1

202. Find the sum of the mean and median of the given data
12, 10, 16, 18, 20, 26, 14, 28

(a) 17 (b) 44
(c) 18 (d) 35

RRB NTPC 25.01.2021 (Shift-I) Stage Ist

Ans. (d) : On arranging data in ascending order = 10, 12, 14, **16, 18**, 20, 26, 28 (n = 8)
Median =

$\left(\dfrac{\left(\dfrac{n}{2}\right)^{\text{th}} \text{term} + \left(\dfrac{n}{2}+1\right)^{\text{th}} \text{term}}{2}\right) = \left(\dfrac{\left(\dfrac{8}{2}\right)^{\text{th}} \text{term} - \left(\dfrac{5}{2}\right)^{\text{th}} \text{term}}{2}\right)$

$\dfrac{4^{\text{th}} \text{ term} + 5^{\text{th}} \text{ term}}{2} = \dfrac{16+18}{2} = 17$

$\text{Mean} = \dfrac{10+12+14+16+18+20+26+28}{8} = \dfrac{144}{8} = 18$

Sum of median and mean = 17 +18 = 35

203. If mean = (3 median – mode)/p, then the value of p is

(a) 1 (b) 2
(c) $\dfrac{1}{3}$ (d) $\dfrac{1}{2}$

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : 2 mean = [3 median – mode]

or mean = $\dfrac{3 \text{ median} - \text{mode}}{2}$.....(1)

Given that mean = $\dfrac{3 \text{ median} - \text{mode}}{P}$.....(2)

Comparing equation (i) & (ii)
we found

$\boxed{p = 2}$

204. Mean of the number 2, 4, 5, 8, 2 and 3 is m. The numbers 4, 3, 3, 5, m, 3 and p have mean m+1, median q and mode r. What is the value of (p + q – r)?

(a) 20 (b) 13
(c) 14 (d) 21

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (c) : $\text{Mean} = \dfrac{\sum n}{N} = \dfrac{2+4+5+8+2+3}{6}$

m = 4
Mean of 3, 3, 3, 4, 5, p, m is (m + 1)

$m + 1 = \dfrac{3+3+3+4+5+p+4}{7}$ [m = 4]

5 × 7 = p + 22
35 = p + 22
p = 13
Given numbers = 4, 3, 3, 5, m, 3, p
After putting the value of m and p
4, 3, 3, 5, 4, 3, 13
On writing numbers in ascending order
3, 3, 3, 4, 4, 5, 13

$\text{Median (q)} = \left(\dfrac{n+1}{2}\right)^{\text{th}} \text{term}$ { n = 7 odd}

$= \left(\dfrac{7+1}{2}\right)^{\text{th}} \text{term} = 4\text{th term}$

∴ q = 4
Mode (r) = The number having greater frequency is mode
r = 3 (Here frequency of 3 is maximum)
Hence: p + q – r = 13 + 4 – 3 = 14

205. If mode of a series is greater than its mean by 9, then find the difference between the mode and the median.

(a) 8 (b) 4
(c) 6 (d) 10

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (c) : Let, Mean = x
Then, mode = x + 9
According to the question,
Mode = 3 Median – 2 Mean
x + 9 = 3× Median – 2x
3x + 9 = 3× Median
Median = x + 3
Mode −Median = (x + 9) – (x + 3)
= x +9 – x–3
= 6

206. Find the difference between the median and the mean of the following data:
12, 20, 3, 14, 5, 8 and 15

(a) 4 (b) 1
(c) 3 (d) 2

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (b) : Given data 12, 20, 3, 14, 5, 8 and 15
On arranging data in ascending order 3, 5, 8, 12, 14, 15, 20

$$\text{Median} = \left\{\frac{(n+1)}{2}\right\}^{th} \text{ term}$$

$$= \left(\frac{7+1}{2}\right)^{th} \text{ term} \quad \{\because n = 7\}$$

$= 4^{th}$ term
Hence, Median = 12

Again, $\text{Mean} = \frac{\text{Sum of all terms}}{\text{No. of terms}}$

$$= \frac{3+5+8+12+14+15+20}{7} = \frac{77}{7} = 11$$

Mean = 11
According to the question-
Required Difference = Median – Mean
= 12 – 11= 1

207. The mean of three numbers is 33 and the range of data is 29. The middle number is 27 more than the sum of the other two numbers. What is the largest number among these three numbers?

(a) 46 (b) 45
(c) 48 (d) 47

RRB Group-D – 03/12/2018 (Shift-II)

Ans : (a) Suppose three number is x > y > z
as per question—

$$\frac{x+y+z}{3} = 33$$

x + y + z = 99 ----------(I)
x – z = 29 ----------(II)
and y = x + z – 27
y + 27 = x + z ----------(III)
from equation (I) and (III) -
y + y + 27 = 99
2y = 72,
y = 36
Putting the value of y in equation (III)
y + 27 = x + z
36 + 27 = x + z
x + z = 63 ----------(IV)
equation (II) + (IV)
2x = 92,
x = 46
'Putting the value of x in equation (IV)-
z = 63 – 46
z = 17
So number x, y and z is 46, 36, 17
So, largest number = 46

208. The mean of three numbers is 35 and the range of data was 24. Difference between the largest and middle number is equal to three times of the difference between the smallest and the middle number. Which is the largest numbers among these three numbers.

(a) 51 (b) 50
(c) 49 (d) 52

RRB Group-D – 23/10/2018 (Shift-III)

Ans : (c) Suppose numbers is as a, b, c where a> b> c

$$\text{Mean} = \frac{a+b+c}{3} = 35$$

a+b+c = 105 .....(1)
range a-c = 24 .....(2)
and a-b = 3(b-c) .....(3)
where a-b = 3b -3c
a+3c = 4b
a + c = 4b-2c .....(4)
Substituting the value of a+c from aquation (4) in equation (1)
b+ 4b-2c=105
5b-2c= 105.....(5)
Substituting a = 24 + C in equation (1) from equation (2),
24+c + b + c =105
b+2c = 81 .....(6)
Solving equation (5) and (6)
b = 31 c= 25
from equation (1)
a+31+25= 105
a + 56 = 105
$\boxed{a = 49}$
Hence, the largest number = a = 49

209. The mean of a distribution is 24 and the standard deviation is 6. Then what is the value of variance cofficient.

(a) 50% (b) 25%
(c) 100% (d) 75%

RRB RPF SI – 11/01/2019 (Shift-I)

Ans : (b)

$$\text{Variance coefficient} = \frac{\text{standard deviation}}{\text{mean}} \times 100$$

$$= \frac{6}{24} \times 100 = 25\%$$

210. If the standard deviation of the population is 10, then what will be the variance coefficient?

(a) 100 (b) 30
(c) 5 (d) 20

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans : (a)
Standard deviation of population= 10
So variance coefficient = (standard deviation)^2
$= (10)^2 = 100$

211. The mean of the distribution is 14 and the standard deviation is 5. Find the variance coefficient.
(a) 60.4% (b) 27.9%
(c) 35.7% (d) 48.3%

RRB JE - 01/06/2019 (Shift-I)

Ans : (c) Variance coefficient $= \frac{\text{standard deviation}}{\text{mean}}$

$= \frac{5}{14} \times 100$

$= \frac{500}{14} = 35.7\%$

212. The ratio of number of blue and red balls in a bag is constant. When the number of red balls was 68 then the number of blue balls was 36. Number of blue balls being 63, what is the number of red balls in the bag?
(a) 119 (b) 98
(c) 110 (d) 102

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (a) blue : red = 36 : 68
= 9: 17
When the number of blue balls is 63, then let the number of red balls be n.

$\frac{63}{n} = \frac{9}{17}$

$9n = 63 \times 17$

$n = \frac{63 \times 17}{9}$

$n = 7 \times 17$

$n = 119$

Hence the number of red balls = 119

213. In the given following data find out the LCM of mode, median and mean?
7, 2, 10, 4, 3, 12, 8, 4, 6, 4.
(a) 30 (b) 20
(c) 12 (d) 60

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (d) 7, 2, 10, 4, 3, 12, 8, 4, 6, 4
On arranging the numbers in asceding order- 2, 3, 4, 4, 4, 6, 7, 8, 10, 12
$\Rightarrow$ Mode = 4 (the highest frequency)

$$\text{Median} = \frac{1}{2}\left[\frac{n^{th}}{2} + \left(\frac{n}{2}+1\right)^{th}\right]$$

$$\text{Median} = \frac{1}{2}\left(5^{th} + 6^{th}\right)\text{term} \begin{cases} \text{where n = terms number} \\ n = 10 \end{cases}$$

$$= \frac{1}{2}(4+6) = 5 = \frac{1}{2} \times 10 = 5$$

Mean

$$= \frac{\text{sum of total number}}{\text{total number}} = \frac{2+3+4+4+4+6+7+8+10+12}{10}$$

$$\text{mean} = \frac{60}{10} = 6$$

LCM of 4, 5, 6 = 2 × 2 × 3 × 5 = 60

214. For the following data what is the (mode×median+mean)
9, 1, 11, 3, 2, 12, 8, 4, 6, 4.
(a) 34 (b) 31
(c) 26 (d) 29

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (c) Mode = 4(maximum)
On arranging the numbers in asceding order-
1, 2, 3, 4, 4, 6, 8, 9, 11, 12

$$\text{mean} = \frac{1+2+3+4+4+6+8+9+11+12}{10}$$

$$= \frac{60}{10} = 6$$

Total number(n) = 10 (even)

$$\text{median} = \frac{\frac{n}{2}\text{terms value} + \left(\frac{n}{2}+1\right)\text{terms value}}{2}$$

$$= \frac{5^{th}\text{ terms value} + 6^{th}\text{ terms value}}{2}$$

$$= \frac{4+6}{2} = \frac{10}{2} = 5$$

= mode × median + mean
= (4 × 5) + 6 = 26

215. If the mean and median of the numbers 3, 4, a, b, 10 are 6 and 5 respectively where a>b, What will be the value of a and b.
(a) 7,6 (b) 5,8
(c) 6,7 (d) 8,5

RRB Group-D – 19/09/2018 (Shift-III)

Ans. (b) : mean of 3,4,a,b, 10 is 6 and median 5 a < b

$$\text{Mean} = \frac{\text{sum of total number}}{\text{total number}}$$

$$6 = \frac{3+4+a+b+10}{5}$$

$30 = 17 + a + b$

$a + b = 13$

median is 5–

number of terms (n) = 5

$$\text{median} = \left(\frac{5+1}{2}\right)^{th}\text{ term} = 3^{rd}\text{ term}$$

$5 = a$

$a + b = 13$

$5 + b = 13$

$b = 8$

$a = 5, \quad b = 8$

216. The mean of the three numbers was 15 and the range of the data was 9. Difference between highest number and middle number is equals to two times of the difference between middle number and smallest number which is the highest number among the three numbers?
(a) 20 (b) 21
(c) 19 (d) 22

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (a) Suppose three numbers is a, b and c where $a < b < c$

$$\frac{a+b+c}{3} = 15$$

$$\Rightarrow a+b+c = 45 - - - - - (I)$$

then $c - a = 9$ --------(II)

and $c - b = 2(b - a)$

$\Rightarrow c - b = 2b - 2a$

$$\Rightarrow 3b = 2a + c \Rightarrow b = \frac{2a+c}{3} - - - - (III)$$

Substituting the value of 'b' from equation (III) in equation (I).

$$a + \left(\frac{2a+c}{3}\right) + c = 45$$

$$\Rightarrow 5a + 4c = 135 - - - - - - (IV)$$

from equation (IV) + equation (II) × 5—

$9c = 180 \Rightarrow c = 20$

from equation (II)

$20 - a = 9 \Rightarrow a = 11$

from equation (III) - $b = \frac{2\times 11 + 20}{3} = 14$

So the largest number = 20

217. The four integers a, b, c and d arranged in ascending order, the range of the set is 20. The difference between c and a is equal to the difference between d and b. The arithmetic mean of the numbers is 25. In the following what will be the value of a?

(a) 13 (b) 15

(c) 14 (d) 16

RRB Group-D – 16/11/2018 (Shift-I)

Ans. (b**)** As per question,

$c - a = k$ ...(i)

$d - b = k$ ...(ii)

on subtracting

$c - a - d + b = 0$

$b + c = a + d$ ...(iii)

$\because$ mean = 25

$$\frac{a+b+c+d}{4} = 25$$

$a + (b + c) + d = 100$

$a + d + a + d = 100$ [from equation (iii)]

$a + d = 50$ ...(iv)

but $d - a = 20$

$d = 20 + a$

$\therefore$ $a + 20 + a = 50$

$2a = 30$

$a = 15$

218. 4 out of 5 cricketers have played the innings of 13, 9, 5, 11 respectively. If the mean of the data set is 9. Then what will be the number of innings played by that 5th player?

(a) 9 (b) 8

(c) 7 (d) 6

RRB NTPC 05.04.2016 Shift-1

Ans : (c) Total number of innings played by all five players= $5 \times 9 = 45$

Total number of innings of four Players

$= 13+9+5+11 = 38$

$\therefore$ Fifth player's total number of innings = 45–38 = 7

219. The mean of 8 observations is 10.5. In the given observation of the seven observations are 3, 15, 7, 19, 12, 17 and 8. Find the 8th observation-

(a) 10 (b) 11

(c) 3 (d) 12

RRB NTPC 04.04.2016 Shift : 1

Ans : (c) Sum of seven observation = 3 + 15 + 7 + 19 + 12 + 17 + 8 = 81

$\therefore$ 8th observation= $8 \times 10.5 - 81$

$= 84.0 - 81 = 3$

220. What will be the mean, mode and median of the given numbers– 3, 4, 5, 3, 6, 3, 4, 5, 3

(a) 4, 4, 4 (b) 4, 4, 3

(c) 3, 4, 4 (d) 4, 3, 4

RRB NTPC 31.03.2016 Shift : 1

Ans : (d) Arranging the numbers in ascending order-

3, 3, 3, 3, 4, 4, 5, 5, 6

$$\text{Mean} = \frac{3+3+3+3+4+4+5+5+6}{9} = \frac{36}{9} = 4$$

Mode = 3 (the highest frequent number)

$\because$ Number of terms (n) = 9 (odd)

$$\therefore \text{Median} = \left(\frac{n+1}{2}\right)^{\text{th}} \text{ term } = \left(\frac{9+1}{2}\right)^{\text{th}} \text{term}$$

$= 5^{\text{th}}$ term = 4

221. What will be the median, mode and mean of the given numbers?

9, 5, 8, 9, 9, 7, 8, 9, 8

(a) 9, 9, 9 (b) 9, 8, 9

(c) 8, 9, 8 (d) 8, 9, 9

RRB NTPC 31.03.2016 Shift : 2

Ans : (c) Arranging the numbers in ascending order-

5, 7, 8, 8, 8, 9, 9, 9, 9

$\because$ terms number = 9 (odd)

$$\therefore \text{median} = \left(\frac{n+1}{2}\right) \text{th term}$$

$$= \frac{9+1}{2} = 5^{\text{th}} \text{ term } = 8$$

mode = 9 (the highest frequent number)

$$\text{mean} = \frac{5+7+8+8+8+9+9+9+9}{9}$$

$$= \frac{72}{9} = 8$$

222. What will be the mode and median of the given digits–

8, 6, 8, 7, 8, 6, 8, 7, 6

(a) 7 and 8 (b) 6 and 7

(c) 8 and 7 (d) 6 and 8

RRB NTPC 30.03.2016 Shift : 1

Ans : (c) Arranging the numbers in ascending order-

6, 6, 6, 7, 7, 8, 8, 8, 8

mode = 8 (most frequent)

number of terms = 9 (odd)

$$\therefore \text{median} = \left(\frac{9+1}{2}\right) = 5^{\text{th}} \text{ term } = 7$$

223. What will be the range, mode and median of the given following data?

13, 14, 13, 12, 15, 21, 16, 18, 13

(a) 9, 13, 14 (b) 6, 13, 14

(c) 8, 13, 14 (d) 5, 13, 14

RRB Paramedical Exam – 20/07/2018 (Shift-III)

Ans : (a) Range = 21–12 = 9
Mode = 13 (Most frequent)
On arranging the data in ascending order-
12, 13, 13, 13, 14, 15, 16, 18, 21
$\because$ n = 9 (odd)
$\therefore$ Median $= \left(\frac{9+1}{2}\right)^{th}$ term = 5th term = 14

224. What will be the mean and mode of the given following data?
1, 9, 5, 4, 2, 1, 9, 9, 2, 1, 9, 1, 2, 1
(a) 4 and 9 (b) 5 and 1
(c) 4 and 1 (d) 5 and 9

RRB NTPC 29.03.2016 Shift : 3

Ans : (c) Mean
$= \frac{1+9+5+4+2+1+9+9+2+1+9+1+2+1}{14}$
$= \frac{56}{14} = 4$
Mode of data = 1(term of most frequent)

225. The mean of a distribution is 13 and the standard deviation is 7. What is the value of variance coefficient?
(a) 50% (b) 76.77%
(c) 53.85% (d) 38.88%

RRB NTPC 19.04.2016 Shift : 1

Ans : (c)
Variance coeffcient $= \frac{\text{Standard deviation}}{\text{mean}} \times 100\%$
$= \frac{7}{13} \times 100 = 53.85\%$

226. The mean of 20 observations is 19. One another observation is included and the new mean is 20. What is 21st observation?
(a) 20 (b) 30
(c) 40 (d) 42

RRB NTPC 19.04.2016 Shift : 2

Ans : (c) Total sum of 20 observations=20 × 19 = 380
Sum on inclusion of new observation = 21 × 20 = 420
$\therefore$ Value of 21st observation = 420 – 380 = 40

227. The mean of a distribution is 18 and the standard deviation is 4.5. What is the value of variance coefficient?
(a) 50% (b) 25%
(c) 100% (d) 75%

RRB NTPC 19.04.2016 Shift : 2

Ans : (b) Distribution mean = 18
Standard deviation = 4.5
$\therefore$ Variance coefficient $= \frac{4.5}{18} \times 100\ \%$
$= \frac{450}{18} = 25\%$

228. The mean of a distribution is 11 and the standard deviation is 5. What is the value of variance coefficient?
(a) 45.45% (b) 35.35%
(c) 25.25% (d) 55.55%

RRB NTPC 18.04.2016 Shift : 1

Ans : (a)
Variance coefficient $= \frac{\text{Standard deviation}}{\text{mean}} \times 100\%$
$= \frac{\sigma}{x} \times 100\%$
$= \frac{5}{11} \times 100\%$
$= 45.45\%$

229. If the standard deviation of a population is 8, then what will be its variance?
(a) 64 (b) 16
(c) 32 (d) 24

RRB NTPC 18.04.2016 Shift : 2

Ans : (a) Standard deviation of variance coefficient= 8
Variance = $(\text{Standard deviation})^2$
$= (8)^2 = 64$

230. The mean of a distribution is 21 and the standard deviation is 7. Find the variance coefficient?
(a) 16.66% (b) 66.66%
(c) 33.33% (d) 100%

RRB NTPC 16.04.2016 Shift : 3

Ans : (c) Variance coefficient $= \frac{7}{21} \times 100 = 33.33\%$

231. The average of the results of 35 tests is 21. The average of the first 17 results is 19 and that of the last 17 is 22. What is the vlaue of the result of the 18th test?
(a) 42 (b) 36
(c) 38 (d) 34

RRB NTPC 12.04.2016 Shift : 2

Ans : (c) Average of 35 tests = 21
Sum of 35 tests = 35×21 = 735
Average of 17 tests = 19
Sum of 17 tests = 17×19 = 323
Average of last 17 tests = 22
Sum of last 17 tests = 17×22 = 374
Value of 18th tests = 735 – 374 – 323 = 38

232. The mean of a distribution is 15 and the standard deviation is 5. What is the value of variance coefficient?
(a) 16.66% (b) 66.66%
(c) 33.33% (d) 100%

RRB NTPC 12.04.2016 Shift : 3

Ans : (c)
Variance coefficient $= \frac{\text{Standard deviation}}{\text{mean}} \times 100\%$
$= \frac{5}{15} \times 100$
$= \frac{100}{3} = 33.33\%$

233. If the value of the mode is 14 and arithmetic mean is 5, then find the value of median?
(a) 8 (b) 18
(c) 12 (d) 14

RRB NTPC 10.04.2016 Shift : 3

Ans : (a) mode = 3 × median – 2 × mean

$14 = 3\times \text{median} - 2 \times 5$

$3\times \text{median} = 14 + 10$

$\text{median} = \frac{24}{3} = 8$

234. What is the value of mode as well as median of the given following numbers–
3, 4, 5, 5, 3, 6, 7, 3, 5, 5, 6

(a) 5 and 5 (b) 3 and 5
(c) 5 and 4 (d) 3 and 4

RRB NTPC 09.04.2016 Shift : 3

Ans : (a) 3, 4, 5, 5, 3, 6, 7, 3, 5, 5, 6

Arrange in asecending order = 3,3,3,4,5,5,5,5,6,6,7

mode = 5 (most frequent)

$\therefore$ where n = 11(odd)

$\text{Median} = \left(\frac{n+1}{2}\right)^{th} = \left(\frac{11+1}{2}\right)^{th} = 6^{th}\ \text{term} = 5$

235. The variance of a given data is 324, then what will be the value of standard deviation?

(a) ±18 (b) 18
(c) 324 (d) 162

RRB NTPC 07.04.2016 Shift : 2

Ans : (b) Standard deviation $= \sqrt{\text{Variance}}$

$\therefore$ Variance = 324

$\therefore$ Standard deviation $= \sqrt{324}$

$= 18$

236. If the mean value of height of 12 males is 1.70 m and that of 8 females is 1.60 m. Then what is the sum (in meters) of the total height of 8 females?

(a) 12.9 (b) 12.8
(c) 12.4 (d) 13

RRB NTPC 19.01.2017 Shift : 1

Ans : (b) Sum = number × mean

The sum of the height of 8 females = 8×1.60 = 12.8m

237. The mean of a distribution is 80 and the standard deviation is 16. What is the value of variance coefficient?

(a) 10% (b) 20%
(c) 40% (d) 60%

RRB NTPC 22.04.2016 Shift : 1

Ans : (b) distribution mean = 80

Standard deviation = 16

$\text{Variance coefficient} = \frac{\text{Standard deviation}}{\text{Mean}} \times 100\%$

$= \left(\frac{16}{80}\right) \times 100\ \%$

$= \frac{1}{5} \times 100\ \%$

$= 20\%$

238. If the standard deviation of the population is 13, then what will be the variance of the population?

(a) 78 (b) 39
(c) 26 (d) 169

RRB NTPC 22.04.2016 Shift : 3

Ans : (d) Required variance = $(\text{standard deviation})^2$

$= 13 \times 13 = 169$

239. What is the value of median, mode and mean of the given following numbers?
9, 8, 3, 5, 1, 9, 8, 2, 9

(a) 9, 9, 6
(b) 9, 6, 9
(c) 8, 9, 6
(d) 8, 5, 6

RRB NTPC 26.04.2016 Shift : 1

Ans : (c) Arranaging the number in ascending oreder-

1, 2, 3, 5, 8, 8, 9, 9, 9

n = 9 (odd)

$\text{Median} = \left(\frac{n+1}{2}\right)^{th}\ \text{term} = \left(\frac{9+1}{2}\right)^{th}\ \text{term}$

$= 5^{th}\ \text{term} = 8$

$\text{Mean} = \frac{\text{sum of all numbers}}{\text{Total numbers}}$

$= \frac{9+8+3+5+1+9+8+2+9}{9} = \frac{54}{9} = 6$

Mode = 9 (Most frequent)

Hence median, mode and mean is 8, 9, 6.

240. If the standard deviation of a distribution is 9. Then find the value of variance.

(a) 18 (b) 27
(c) 81 (d) 36

RRB NTPC 28.04.2016 Shift : 2

Ans : (c) Variance = $(\text{Standard deviation})^2$

$= (9)^2 = 81$

241. The mean length of 6 rods is 44.2 cm. If the mean length of 5 rods is 46 cm. then what is the value of length of the 6th rods?

(a) 35 (b) 35.2
(c) 35.1 (d) 35.5

RRB NTPC 30.04.2016 Shift : 3

Ans : (b) Mean length of 6 rods = 44.2 cm.

Total length of 6 rods = 44.2 × 6 = 265.2

Mean length of 5 rods = 46 cm

Total length of 5 rods = 46 × 5 = 230

Length of 6th rod = 265.2 – 230 = 35.2 cm

PROBABILITY

242. Five salesmen, A, B, C, D and E, of a company are considered for a three member trade delegation to represent the company at an international trade conference. What is the probability that A gets selected?

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$

(c) $\frac{2}{5}$ (d) $\frac{4}{5}$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) : Probability of A, being selected

$$= \frac{\text{Favourable prospect}}{\text{Total prospect}}$$

$$\frac{{}^{3}C_{1}}{{}^{5}C_{1}} = \frac{\frac{3\times 2!}{2!}}{\frac{5\times 4!}{4!}} = \frac{3}{5}$$

243. There are 20 people in a party. If every person shakes hand with every other person, then what will be the total number of handshakes?

(a) 145 (b) 190

(c) 180 (d) 155

RRB NTPC 08.02.2021 (Shift-II) Stage I

Ans. (b) : The total number of handshakes $= {}^{20}C_2$

$$= \frac{20!}{2!\times(20-2)!} \qquad \left\{\because {}^{n}C_{r} = \frac{n!}{r!(n-r)!}\right\}$$

$$= \frac{20!}{2!\times 18!}$$

$$= \frac{20\times 19\times 18!}{2\times 18!}$$

$=190$

244. A bag contains cards numbered between 33 and 92. If one card is drawn from the bag, the probability of the number on the drawn card is a perfect square is:

(a) $-\frac{1}{12}$ (b) $\frac{5}{59}$

(c) $\frac{1}{15}$ (d) $\frac{4}{59}$

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (c) : Perfect square numbers between 33 and 92 are.

36, 49, 64 and 81

We know that,

$\text{Probability } P(E) = \frac{n(E)}{n(S)}$

$l = a + (n-1)d$

Where d = last term

a = First term

n = Total number

d = Difference

$92 = 33+(n-1)1$

$92-33+1 = n$

$60 = n$

$P(E) = \frac{4}{60}$

$\Rightarrow P(E) = \frac{1}{15}$

245. Kings and Queens of black colour are taken out from a deck of 52 playing cards. A card is drawn from the remaining well-shuffled cards. Probability of getting a spade card is:

(a) $\frac{11}{13}$ (b) $\frac{11}{48}$

(c) $\frac{11}{52}$ (d) $\frac{1}{4}$

RRB NTPC 01.04.2021 (Shift-I) Stage Ist

Ans. (b) : The total number of cards in a deck of cards = 52

The number of black cards = 13+13 = 26

Number of cards remaining after drawing the black colour of king and queen = 48

Number of spades in the remaining cards = 11

Probability of drawn cards being spades $= \frac{11}{48}$

246. A box contains 2 black, 6 green and 4 yellow balls. If 2 balls are picked up at random, the probability that both are green is:

(a) 1/6 (b) 1/22

(c) 3/11 (d) 5/22

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : Total balls = 2 + 6 + 4 = 12

$$\text{Probability of green balls} = \frac{6_{c_2}}{12_{c_2}} = \frac{\frac{6\times 5}{2\times 1}}{\frac{12\times 11}{2\times 1}}$$

$$= \frac{30}{12\times 11}$$

$$= \frac{5}{22}$$

247. A dice is cast twice, and the sum of the appearing numbers is 10. The probability that the number 5 has appeared at least once is:

(a) 2/3 (b) 1/4

(c) 1/2 (d) 1/3

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (d) : On throwing the dice twice

No. of probability of appearing the sum "10"

$= (4,6)\ (6,4)\ (5,5)$

$n(S) = 3$

Probability that number '5' has appeared at least "once" $= (5, 5)$

$n(E) = 1$

$$P(E) = \frac{n(E)}{n(S)} = \frac{1}{3}$$

248. A letter of english alphabet is chosen at random. Probability of getting a vowel is:

(a) $\frac{5}{26}$ (b) $\frac{5}{21}$

(c) $\frac{1}{4}$ (d) $\frac{6}{25}$

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (a) :

Total letter in English alphabet $n(s) = 26$

Number of vowels $= n(E) = 5$

Probability of selected letter to be vowel

$$= \frac{n(E)}{n(s)}$$

$= 5/26$

249. If 9 students are standing on a circular path, then the probability that 2 of them are always standing together is:

(a) $\frac{2}{7}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{7}{8}$

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) : As per the question,

Take 2 particular people as 1 unit

Then total outcomes (s) = (9-1)! = 8!

Hence,

Total number of events = 7! × 2!

Required probability $= \frac{7! \times 2!}{8!} = \frac{7! \times 2}{8! \times 7!} = \frac{2}{8} = \frac{1}{4}$

250. A box contains 6 white, 2 black and 3 red balls. if a ball is drawn at random, what is the probability that it will not be white?

(a) $\frac{5}{11}$ (b) $\frac{6}{11}$

(c) $\frac{5}{6}$ (d) $\frac{6}{5}$

RRB NTPC 09.01.2021 (Shift-I) Stage Ist

Ans. (a) : Total Ball = 6 + 2 + 3 = 11

Probability of an event P(E)

$$= \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

Number of favorable outcome of ball will not be white = 5

Total number of outcomes = Total Balls

So, probability of ball that will not be white $= \frac{5}{11}$

251. There are 30 balls in a bag on which the numbers 1, 2, 3……30 are marked, one ball is drawn randomly from the bag. Find the probability that the number marked on the ball taken out of the bag is divisible by 4 or 6.

(a) $\frac{1}{15}$ (b) $\frac{2}{5}$

(c) $\frac{3}{10}$ (d) $\frac{1}{3}$

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (d) : The number of balls $= 30$

$\therefore\ n(S) = 30$

The balls marked remove divisible by 4 or 6.

$= 4, 6, 8, 12, 16, 18, 20, 24, 28$ and 30

$n(A) = 10$

Hence required probability $P(A) = \frac{n(A)}{n(S)} = \frac{10}{30} = \frac{1}{3}$

252. There are 20 balls in a bag which are numbered 1, 2, 3……20. Find the probability that the number marked on the ball taken out of the bag is divisible by 3 or 5.

(a) $\frac{1}{10}$ (b) $\frac{9}{20}$

(c) $\frac{2}{5}$ (d) $\frac{1}{2}$

RRB NTPC 06.04.2021 (Shift-II) Stage Ist

Ans. (b) : Number of balls $= 20$

$\therefore\ n(s) = 20$

The number of balls marked by a number divisible by 3 or 5

$= 3, 5, 6, 9, 10, 12, 15, 18$ and 20

$\therefore\ n(A) = 9$

Required probability $P(A) = \frac{n(A)}{n(s)} = \frac{9}{20}$

253. Two cards are drawn from a pack of 52 cards. The probability that out of 2 cards, one card is red and one card is black is :

(a) $\frac{26}{51}$ (b) $\frac{13}{25}$

(c) $\frac{25}{51}$ (d) $\frac{1}{2}$

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : The total number of cards is = 52
which has 26 red cards and 26 black cards.

$$n(S) = 52_{C_2} = \frac{52\times 51}{2\times 1} = 26\times 51$$

and

$$n(E) = 26_{C_1} \times 26_{C_1}$$
$$= 26\times 26$$

$$P(E) = \frac{n(E)}{n(S)}$$

Where,

P(E) = Probability
n(E) = Events to be founds
n(S) = Total possible events

$$P(E) = \frac{26\times 26}{26\times 51} = \frac{26}{51}$$

254. If tossing three coins at a time, the probability of getting at least one heads is:

(a) $\frac{1}{2}$ (b) $\frac{1}{8}$
(c) $\frac{3}{8}$ (d) $\frac{7}{8}$

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (d) : Probability of results in tossing three coins at a time = {HHH, TTT, THT, TTH, HHT, HTH, THH, HTT}
So number of probable results at tossing three coins = 8
Now, Probable results of getting at least one head = {HHH, THT, TTH, HHT, HTH, THH, HTT}
So, number of probable results of getting at least one head = 7
Hence, Probability of getting at least one head $= \frac{7}{8}$

255. What is the probability that a two digit number is not a prime number when a number is chosen at random?

(a) 7/30 (b) 23/30
(c) 21/90 (d) 67/90

RRB JE - 29/05/2019 (Shift-II)

Ans : (b) Total number of two digits = 90
Total prime numbers of two digits = 21
Total composite numbers of two digits = 69
$\therefore$

$$\text{Probability} = \frac{\text{number of favorable results}}{\text{number of total results}} = \frac{69}{90} = \frac{23}{30}$$

256. When a pair of dice is thrown, what is the probability of the sum of numbers being odd?

(a) 1 (b) 0.25
(c) 0.4 (d) 0.5

RRB JE - 29/05/2019 (Shift-II)

Ans : (d) When two dice are thrown,
The probability of occurrence of some event is n (s) = 36
The probability of odd sum of numbers = n (E) = 18
$\therefore$ The probability that the sum is odd = $\frac{n(E)}{n(S)} = \frac{18}{36} = \frac{1}{2} = 0.5$

257. Satish puts 5 yellows and 3 blue balls in a closed box. His brother Manish picks two balls at random. Calculate the probability that balls picked are of the same colour.

(a) $\frac{15}{28}$ (b) $\frac{15}{23}$
(c) $\frac{13}{28}$ (d) $\frac{11}{23}$

RRB RPF Constable – 17/01/2019 (Shift-III)

Ans : (c) Number of total balls = 8
Probability of picking balls of the same colour

$$= \frac{{}^5C_2 + {}^3C_2}{{}^8C_2} \qquad \left[{}^nc_r = \frac{n!}{r!(n-r)!}\right]$$

$$= \frac{\frac{5!}{3!\times 2!} + \frac{3!}{1!\times 2!}}{\frac{8!}{2!\times 6!}}$$

$$\frac{\frac{5\times 4\times 3!}{2\times 1\times 3!} + \frac{3\times 2!}{2!\times 1}}{\frac{8\times 7\times 6!}{2\times 1\times 6!}}$$

$$= \frac{\frac{5\times 4}{2\times 1} + 3}{\frac{8\times 7}{2\times 1}}$$

$$= \frac{\frac{5\times 4}{2} + 3}{8\times 7/2} = \frac{\frac{26}{2}}{\frac{56}{2}} = \frac{13}{28}$$

258. In a shooting competition, to hit a target, probability 1/2 for A, 2/3 for B and 3/4 for C. If they hit the target together, then what will be the probability of penetration for each of them?

(a) 1/6 (b) 3/8
(c) 2/3 (d) 1/4

RRB JE - 28/05/2019 (Shift-I)

Ans : (d) Probability of A goal (A) = $\frac{1}{2}$
And the probability of not penetrating the goals of A

$$(A') = 1 - \frac{1}{2} = \frac{1}{2}$$

Probability of B goal (B) = $\frac{2}{3}$

And probability of not hitting B goal $(B') = 1-\frac{2}{3}=\frac{1}{3}$

Probability of C's target (C) $= \frac{3}{4}$

and probability of not hitting the goals of

$(C') = 1-\frac{3}{4}=\frac{1}{4}$

Probability of hitting the target of one when B and C are Hitting simultaneously

$= (A\times B'\times C')+(A'\times B\times C') + (A'\times B'\times C)$

$= \frac{1}{2}\times\frac{1}{3}\times\frac{1}{4}+\frac{1}{2}\times\frac{2}{3}\times\frac{1}{4}+\frac{1}{2}\times\frac{1}{3}\times\frac{3}{4}$

$= \frac{1}{24}+\frac{2}{24}+\frac{3}{24}=\frac{6}{24}=\frac{1}{4}$

259. One black, one red and one green dice are thrown together, what is the probability of sum of three numbers is ≥17

(a) 7/216 (b) 5/216
(c) 1/54 (d) 1/36

RRB JE - 30/05/2019 (Shift-III)

Ans : (c) The probability of the sum of the numbers exceeding from 17 or 17 when throwing all three passes together—
Favourable events = (5, 6, 6), (6, 5, 6), (6, 6, 5), (6,6,6)
Total events $= 6 \times 6 \times 6 = 216$

$\therefore$ Intended probability $= \frac{4}{216}=\frac{1}{54}$

260. Find the probability that if a dice is thrown twice, the sum of the digits is 10.

(a) 3 (b) 1/36
(c) 1/12 (d) 5/36

RRB RPF SI – 05/01/2019 (Shift-II)

Ans : (c) 2 times a dice is thrown—
Total probability $N(S) = 6^2 = 36$
The probability of the sum of digits being 10 is N(E) = (4, 6) (6, 4) (5, 5) = 3

So intended probability $P(E) = \frac{N(E)}{N(S)}$

$= \frac{3}{36}=\frac{1}{12}$

261. What will be the probability to remove face card from card dick?

(a) $\frac{6}{13}$ (b) $\frac{12}{13}$
(c) $\frac{3}{13}$ (d) $\frac{3}{26}$

RRB Group-D – 12/10/2018 (Shift-I)

Ans. (c) : Total number of cards = 52
Number of face card = 12
so probability of face card $= \frac{12}{52}=\frac{3}{13}$

262. To ace out the deck of cards probability can be

(a) $\frac{12}{13}$ (b) $\frac{15}{26}$
(c) $\frac{9}{13}$ (d) $\frac{1}{13}$

RRB Group-D – 16/10/2018 (Shift-I)

Ans. (d) : The number of card is 52.
The number of Ace in deck of card is 4.
Probability of getting ace out of the deck of cards

$= \frac{4}{52}=\frac{1}{13}$

263. A box contains 100 pens, out of which eight are defective. One pen is out from the box. Find the probability that the pen is not failse.

(a) 23/25 (b) 8/100
(c) 100/8 (d) 25/23

RRB Group-D – 29/10/2018 (Shift-III)

Ans : (a)
Number of total pens = 100
Number of waste pens = 8

Probability of taking waste pens $= \frac{8}{100}$

Probability of not having waste pen

$= 1-\frac{8}{100}=\frac{92}{100}=\frac{23}{25}$

264. If a box contains 3 white cushions, 4 red cushions and 5 blue cushions. What is the probability of selection of one white or blue cushion?

(a) 2/3 (b) 3/4
(c) 1/4 (d) 1/9

RRB NTPC 28.04.2016 Shift : 2

Ans : (a) White cushion = 3
red cushion = 4
blue cushion = 5

$$\boxed{\text{Probability} = \frac{\text{favourable events}}{\text{total events}}}$$

Total events $= {}^{12}C_1$

favorable probabilities to choose 1 white or 1 blue cushion $= {}^{3}C_1 + {}^{5}C_1$

So probability $= \frac{{}^{3}C_1 + {}^{5}C_1}{{}^{12}C_1}$ $\left[{}^{n}C_r = \frac{\lfloor n}{\lfloor r \ \lfloor n-r}\right]$

$= \frac{\frac{\lfloor 3}{\lfloor 1 \lfloor 3-1}+\frac{\lfloor 5}{\lfloor 1 \lfloor 5-1}}{\frac{\lfloor 12}{\lfloor 1 \ \lfloor 12-1}}$

$= \frac{\frac{\lfloor 3}{\lfloor 2}+\frac{\lfloor 5}{\lfloor 4}}{\frac{\lfloor 12}{\lfloor 11}} = \frac{\frac{3\times\lfloor 2}{\lfloor 2}+\frac{5\times\lfloor 4}{\lfloor 4}}{\frac{12\times\lfloor 11}{\lfloor 11}} = \frac{3+5}{12}=\frac{8}{12}=\frac{2}{3}$

Note :- use $\boxed{+}$ for 'or' and $\boxed{\times}$ for 'and'.

265. When a coin is tossed once, what are the probability of coming Head?

(a) 1 (b) 1/2
(c) 2 (d) Zero

RRB NTPC 29.04.2016 Shift : 1

Ans : (b) Head favorable probability when a coin is tossed

Required probability $= \frac{\text{Favourable events}}{\text{total events}}=\frac{1}{2}$

So probability to come Head $= \frac{1}{2}$

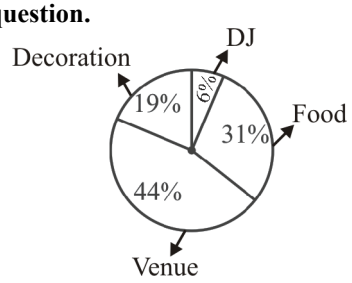
27.

Data Interpretation

Type - 1

1. The following pie chart shows the expenditure distribution of a party. The blue part represents decoration expense, green part represents DJ expense, red part represents the food expenses and yellow part represents venue expenses.

Study the pie chart and answer the following question.



How much was spent on decoration and DJ together if the total expenditure was ₹32,700?

(a) ₹7359 (b) ₹8175

(c) ₹8347 (d) ₹7725

RRB NTPC (Stage-2) 16/06/2022 (Shift-I)

Ans. (b) : Total expenditure on decoration and D J

$= 19 + 6 = 25\%$

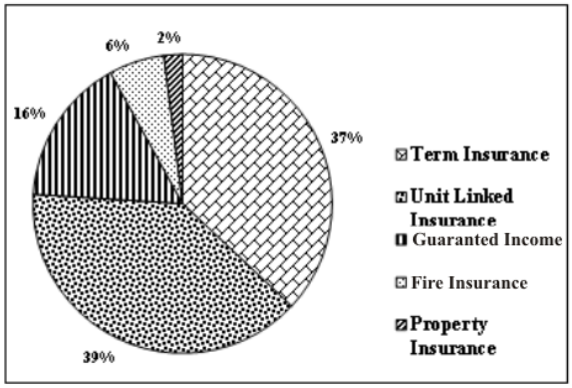
$\because$ $100\% = 32700$

$25\% = \frac{32700}{100} \times 25$

$= ₹\ 8175$

2. Study the given pie-chart and answer the question that follows.

The pie-chart presents the total share of different insurance products offered by an insurance company.



If the total insurance sold by the company in a given year was 3600, then how many fire and property insurances were sold in that year?

(a) 2160 (b) 2880

(c) 5760 (d) 720

RRB Group-D 02/09/2022 (Shift-I)

Ans. (b) :

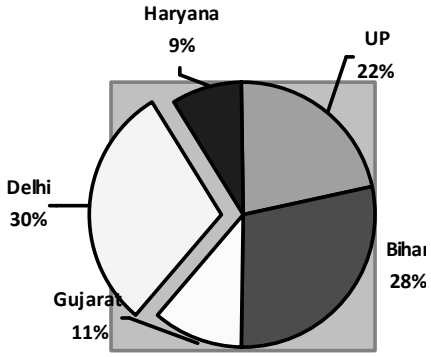
The total insurance sold by the company = 36000

Fire and property insurance sold by the company

$$= 36000 \times \left(\frac{6+2}{100}\right)$$

$$= 36000 \times \frac{8}{100} = 2880$$

3. The given pie-chart shows the percentage distribution of the number of people from different provinces migrating to USA upon getting their green card. Study the pie-chart and answer the question.



What is the central angle of the sector corresponding to the number of people migrating from Delhi?

(a) 100.8° (b) 40°

(c) 108° (d) 32.4°

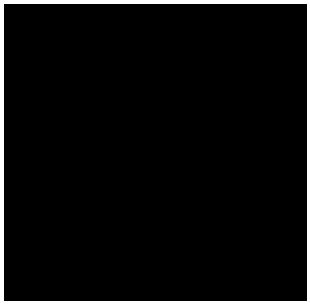
RRB Group-D 30/08/2022 (Shift-III)

Ans. (c) : According to the question,

The central angle of the sector corresponding to the number of people migrating from Delhi

$$= \frac{30}{100} \times 360^\circ = 3 \times 36 = 108^\circ$$

4. The given circle graph shows the monthly budget of a middle-class family in the form of central angle. Study the circle graph and answer the question.



If the amount on food and education during a month was ₹15,000, then what was the total approximate amount spent in that month?

(a) ₹ 45,000 (b) ₹ 48,000
(c) ₹ 30,000 (d) ₹ 44,250

RRB Group-D 05/09/2022 (Shift-III)

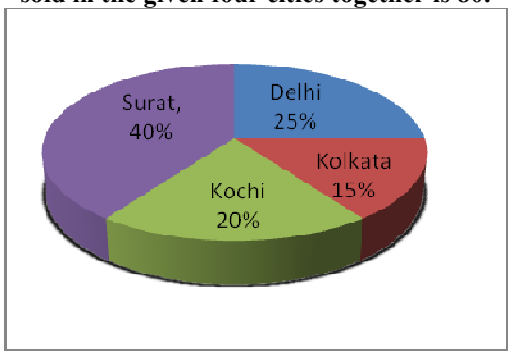
Ans. (d) : Central angle of amount spent on food = 64°
Central angle of amount spent on education = 58°
Central angle of amount spent on education + food
= 64 + 58 = 122°
According to the question,
122° = 15000

$$360° = \frac{15000}{122} \times 360° = ₹\ 44262.29$$

From options,
Hence the total approximate amount spent in that month = ₹44250

5. Study the given pie-chart and answer the following question.

The given pie chart depicts the number of cars sold in four cities. The total number of cars sold in the given four cities together is 80.



In Delhi, the respective ratio between the number of cars sold to female and male customers is 2 : 3. What is the number of cars sold to female customers in Delhi?

(a) 4 (b) 12
(c) 8 (d) 6

RRB GROUP-D – 26/09/2022 (Shift-III)

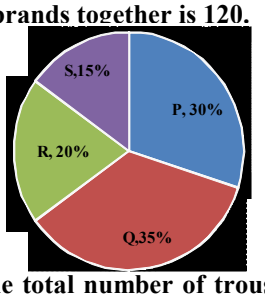
Ans. (c) : Total number of cars sold in all the cities = 80

$$\text{The number of cars sold in Delhi city} = 80 \times \frac{25}{100} = 20$$

$$\text{The number of cars sold to female customers} = 20 \times \frac{2}{5} = 8$$

6. Study the given pie-chart and answer the following question.

The given pie chart depicts the number of trousers purchased of four brands (P, Q, R and S). The total number of trousers purchased of the four brands together is 120.



Out of the total number of trousers purchased of brands Q and R, one-third were slim fit trousers. What is the total number of slim fit trousers purchased of brands Q and R?

(a) 24 (b) 18
(c) 33 (d) 22

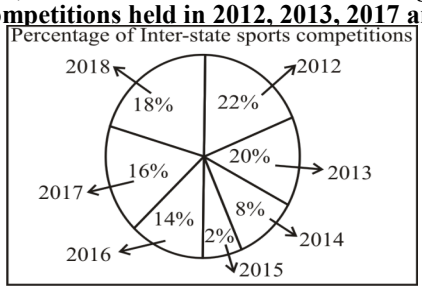
RRB GROUP-D – 28/09/2022 (Shift-II)

Ans. (d) : Total number of trouser's = 120
Total number of trouser purchased of brands Q and R

$$= 120 \times (35 + 20)\% = 120 \times \frac{55}{100}$$

The total number of slim fit trousers purchased of brands Q and R $= 120 \times \frac{55}{100} \times \frac{1}{3} = 22$

7. The pie-chart shows the percentage of inter-Stage sports competitions in different years from 2012 to 2018. Considering the total number of inter-Stage sports competitions to be 200, find the total number of inter-Stage sports competitions held in 2012, 2013, 2017 and 2018.



(a) 154 (b) 168
(c) 152 (d) 148

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Number of inter-Stage sports competition in

$$2012 = 200 \times \frac{22}{100} = 44$$

Number of inter-Stage sports competition in 2013 =

$$200 \times \frac{20}{100} = 40$$

Number of inter-Stage sports competition in 2017 =

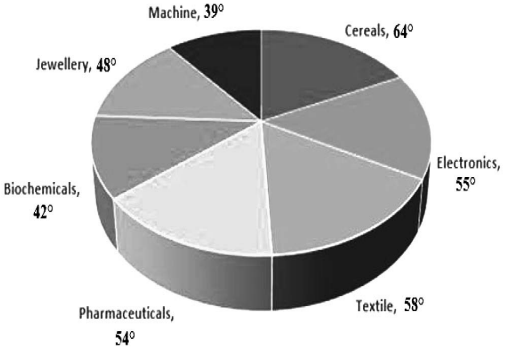
$$200 \times \frac{16}{100} = 32$$

Number of inter-Stage sports competition in 2018 =

$$200 \times \frac{18}{100} = 36$$

∴ Total number of inter-Stage sports held in 2012, 2013, 2017 & 2018 = 44 + 40 + 32 + 36 = 152

8. Study the following circle graph carefully that shows the spending of a country on various products imported from neighbouring country during a particular year and answer the question that follows.



If the amount spent on importing textiles and cereals during the year was ₹2 crore, then what was the total amount (approximately) spent on importing all the various products from the country in that year?

(a) ₹5.9 crore (b) ₹3 crore
(c) ₹6.5 crore (d) ₹4.25 crore

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question, (64° + 58°) = ₹ 2 crore

$122° = ₹2 \text{ crore}$

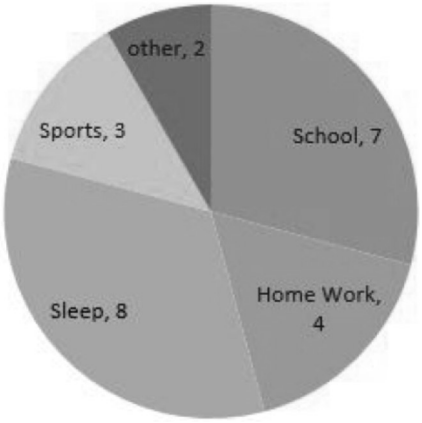
$\therefore \quad 360° = \frac{2}{122^\circ} \times 360^\circ$

$= ₹\ 5.90 \text{ crore}$

Hence, total amount spent on importing all the various products from the country in that year was ₹5.9 crore.

Direction:- (3-6) Study the pie chart and answer the question that follows.

The pie chart shows the numbers of hours used for different activities of the day. Total hours in a day are 24.



9. Which part of the day is spent in school and other activities ?

(a) $\frac{3}{8}$ (b) $\frac{2}{9}$
(c) $\frac{7}{24}$ (d) $\frac{5}{8}$

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (a) :
Time spent in school and other activities = 2 + 7 = 9 hr.

$\therefore$ Required time $= \frac{9}{24} = \frac{3}{8}$

10. What is the measure of the central angle with respect to sleep ?

(a) 120º (b) 145º
(c) 135º (d) 160º

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (a) : $\because$ 24 hr = 360º

$\therefore$ 1 hr $= \frac{360^\circ}{24}$

$\because$ 8 hr spent in sleeping

$\therefore$ Required central angle $= \frac{360^\circ}{24} \times 8$

$= 120^\circ$

11. What is the percentage of hours spent on sports in a day?

(a) 13.5% (b) 15%
(c) 12.5% (d) 12%

RRB NTPC 14.03.2021 (Shift-I) Stage Ist

Ans. (c) : Spent time on sports = 3 hr
Total time = 24 hr

$\therefore$ Required percentage $= \frac{3}{24} \times 100 = 12.5\%$

12. If a student devotes 4 h to other activities instead of 2 h and reduces 1 h each from school and sports activities, then what will be the approximate percentage decrease in school hours ?

(a) 18% (b) 13%
(c) 14% (d) 15%

RRB NTPC 14.03.2021 (Shift-I) Stage I

Ans. (c) : The time spent on school = 7 hr
Now spent time on school = 6 hr .....(After reducing)

$\therefore$ Required percentage $= \frac{(7-6)}{7}$

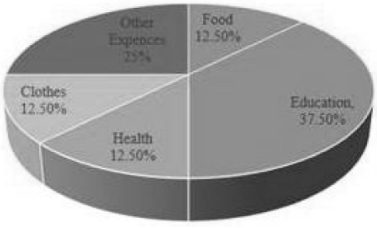
$= \frac{1}{7} \times 100$

$= 14.28$

$= 14\%$

Direction - (Que. 7 - 10)

13. The following pie diagram shows the total expenditure (in percentage) incurred by 'X' in one month. Answer the given question based on the pie diagram.



If X does not incur 'Other Expenses' and all other expenses remain the same, what would be the approximate percentage share of education expenses in X's total expenditure?

(a) 50% (b) 33%

(c) 28% (d) 37%

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : Total expenditure = 100%
Expenditure on other expenses = 25%
If X does not spent on other expenses
Total expenditure = 75%

$\therefore$ Expenditure on education $= \frac{37.50}{75} \times 100\% = 50\%$

14. If X decides to save money and reduce expenditure uniformly by 20% on all beads, what would be the CHANGE in the percentage share of Education in the total expenditure incurred by X?

(a) 7.5% (b) 0%
(c) 20% (d) 9.38%

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (a) : 20% is deducted on each item.

Change of shares to be spent on education $= 37.50 \times \frac{20}{100}$
$= 7.5\%$

15. The expenditure incurred on education is as much as that incurred on:

(a) Clothes and Health
(b) Food and Clothes
(c) Health and Food
(d) Food and other expenses

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (d) : Expenditure on education = 37.5%
Expenditure on food and other expenses
= 25% + 12.5% = 37.5%
$\therefore$ Option (d) is correct.

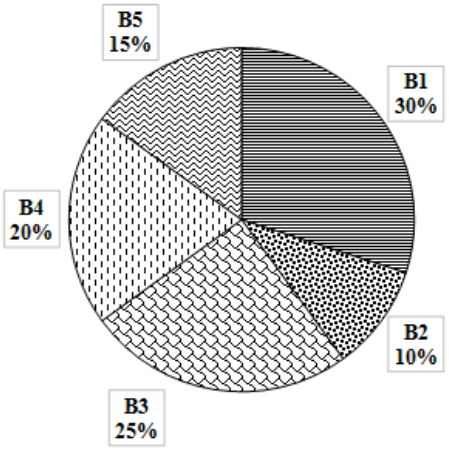
16. The highest percentage of total expenditure is incurred on:

(a) Health and Clothes
(b) Food and Other Expenses
(c) Food and Health
(d) Clothes and Food

RRB NTPC 18.01.2021 (Shift-II) Stage Ist

Ans. (b) : Food and other expenses is the maximum percentage of total expenditure in the given opion.

17. Observe the pie chart below and answer the question. The pie-chart shows the percentage distribution of the sales of school bags from five branches B1, B2, B3, B4 and B5 of a company.



What is the central angle of the sector corresponding to the sales of school bags from branch B3 of the company ?

(a) 80^0 (b) 45^0
(c) 90^0 (d) 120^0

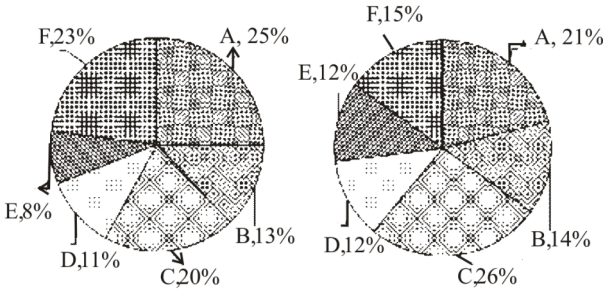
RRB NTPC 09.03.2021 (Shift-II) Stage Ist

Ans. (c) : The angle of the sector corresponding to the sales of school bags from branch B-3 of the company.

$= \frac{25}{100} \times 360^\circ = 90^\circ$

Direction. (Qus no. 12-13): Study the following pie chart and then answer the given question

UG students in 6 colleges = 28400 PG students in 6 colleges = 25600



18. What is the difference between the number of under-graduate(UG) students and the number of post-graduate (PG) students in college F?

(a) 2048 (b) 2272
(c) 2692 (d) 1481

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (c) : Required difference in college F
$28400 \times 23\% - 25600 \times 15\%$
$= 284 \times 23 - 256 \times 15 = 6532 - 3840 = 2692$

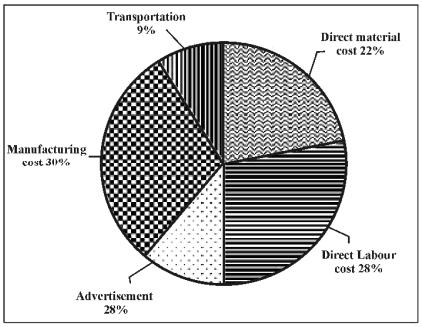
19. What is the ratio of the number of postgraduate (PG) students to that of undergraduate (UG) student in college C ?

(a) 416:355 (b) 71:64
(c) 12:10 (d) 13:10

RRB NTPC 05.04.2021 (Shift-II) Stage Ist

Ans. (a) : Number of Post-Graduate (PG) students in college C $= 25600 \times \frac{26}{100}$
Number of Under-Graduate (UG) students in college C
$28400 \times \frac{20}{100}$
Required ratio = 256×26 : 284×20 = 416 : 355

20. The following pie chart shows the percentage distribution of the expenditure incurred in manufacturing furniture. Study the pie chart and answer the question that follows.



What is the central angle of the sector corresponding to the expenditure incurred on Direct labour cost

(a) 110.9º (b) 100.8º
(c) 150º (d) 90º

RRB NTPC 04.03.2021 (Shift-II) Stage Ist

Ans. (b) : We know that,

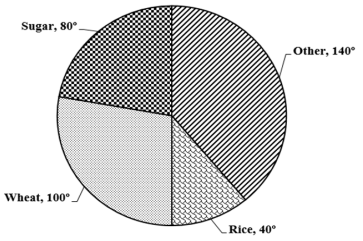
$100\% = 360º$

$1\% = \frac{360º}{100}$

$\because$ Direct labour cost is 28%

Therefore, $\frac{360º}{100} \times 28$

21. **Study the given pie chart that shows the annual Agricultural yield of a certain place and answer the question that follows.**



If the total production is 8100 tonnes, then the yield of rice (in tonnes) will be:

(a) 2025 (b) 900
(c) 4860 (d) 3240

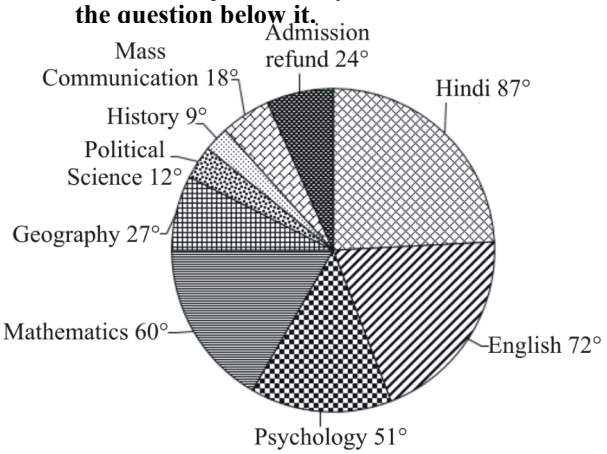
RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (b) : Total production = 8100 Tonnes

Yield of rice = $8100 \times \frac{40^0}{360^0}$

= 900 Tonnes

Direction: (16-17) There are 1800 students in a college. The given pie-chart represents (in degrees) the number of students studying various subjects. Study the chart and answer the question below it.



22. **How many students are studying mathematics in the college ?**

(a) 300 (b) 240
(c) 280 (d) 260

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) :

Number of students studying mathematics in the college

$= \frac{\text{Number of total students}}{360°} \times$ Angle of sector corresponding to Mathematics

$= \frac{1800}{360} \times 60° = 300$

23. **If the course called political science is discontinued and the students studing in it are equally distributed among history and mass communications courses, then calculate the increase in the number of students in mass communication course?**

(a) 30 (b) 90
(c) 120 (d) 75

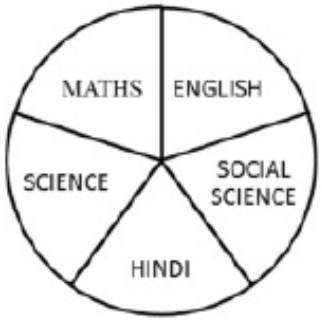
RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) : Angular expansion of students studying Political Science = 12^0

Equally distributed share in History and Mass Communication = $\frac{12}{2} = 6°$

The increase in Mass Communication of Political Science = $\frac{1800}{360} \times 6 = 30$

24. **Observe the figure carefully and answer the question given below**



If the total number of students is 120, and the number of students is distributed equally across all the subjects, how many students study languages english and Hindi.

(a) 36 (b) 24
(c) 48 (d) 12

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

Ans. (c) : Let the total number of students in each subject = x

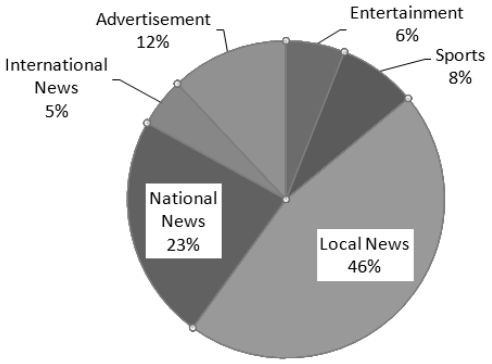
Total number of students = 5x

$\Rightarrow$ 5x = 120

$\Rightarrow$ x = 24

Number of students studying languages(Hindi + English) = 24 + 24 = 48

Direction:(19-22) The given pie chart shows the percentage-wise distribution of new items published under various sections in a newspaper in the last month. Study the pie chart and answer the following question.



25. If a total of 4800 items were published in the month, then how many of them were advertisements?

(a) 612 (b) 320
(c) 428 (d) 576

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (d) : Total items published in that month = 4800

Advertisement Items $= 4800 \times \frac{12}{100} = 576$

26. Find the ratio of Advertisements to Sports items published.

(a) 2 : 1 (b) 1 : 2
(c) 3 : 2 (d) 2 : 3

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (c) : Required ratio $= \frac{\text{Advertisement Items}}{\text{Sport Items}}$

$= \frac{4800 \times 12\%}{4800 \times 8\%} = 3 : 2$

27. If in the next month the number of advertisements double while the number of all other news items remain the same what would be the approximate share of local news as a percentage of the total number of published news items?

(a) 41% (b) 52%
(c) 37% (d) 22%

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (a) : Number of advertisement = 12%
2 times of the advertisement = 12% × 2 = 24%
Share of local news items as a percentage of the total number of published news items

$\frac{46}{46+23+5+24+6+8} \times 100$

$= \frac{46}{112} \times 100 = 41\%$ (Approximate)

28. If the total number of news items published in 4 week period were 48000 and if 30 news items can be published on any one page, then how many pages will be there related to Advertisement and Sports news in 2 weeks?

(a) 160 (b) 120
(c) 320 (d) 240

RRB NTPC 27.03.2021 (Shift-II) Stage Ist

Ans. (a) : The total number of news items published in 4 weeks = 48000
Advertisement items in 2 weeks

$= 48000 \times \frac{12}{100} \times \frac{1}{2} = 2880$

Number of page of advertisement $= \frac{2880}{30} = 96$

(1 page = 30 news items)
The number of sports items in two weeks $= 48000 \times \frac{8}{100} \times \frac{1}{2} = 1920$
Number of pages of sports items in 2 weeks $= \frac{1920}{30} = 64$
Total number of pages of advertisements and sports items in 2 weeks-
$= 96 + 64 = 160$

29.



The above pie-chart shows the amount by each of the departments on their annual functions. Find the amount spent by Admin and HR, if L and D expense amounts to ₹6,400.

(a) ₹ 30,400 (b) ₹ 37,475
(c) ₹ 33,155 (d) ₹31,740

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

Ans. (a) : Let, total amount = ₹ x
The amount spent by L & D = ₹6400 ... (Given)

$x \times \frac{40^\circ}{360^\circ} = 6400$

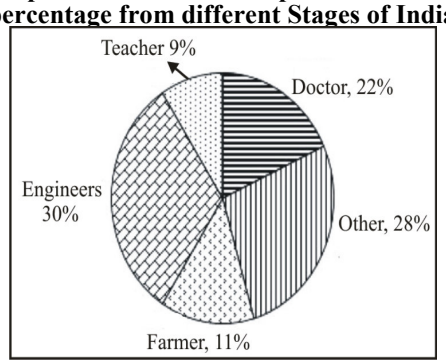
$x = 6400 \times 9$

$\boxed{x = 57600}$

Amount spent by a Admin and HR

$= 57600 \times \frac{(100^\circ + 90^\circ)}{360^\circ} = 57600 \times \frac{190^\circ}{360^\circ} =$ ₹30,400

30. The following pie chart shows the number of people of various occupations in terms of percentage from different Stages of India.



For the farmer sector what is the approximate measure of the central angle?

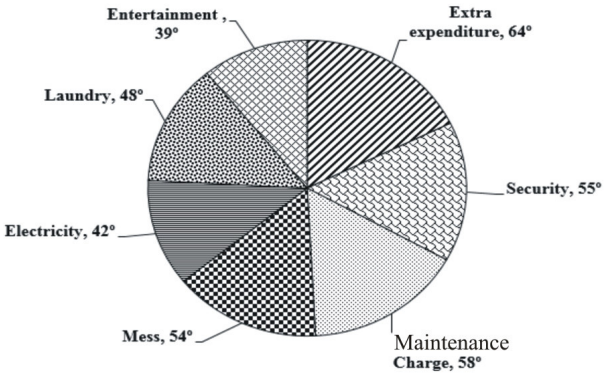
(a) 35º (b) 25º
(c) 30º (d) 40º

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (d) : As per question,

$$\text{Required central angle} = 360 \times \frac{11}{100}$$
$$= 39.6^\circ$$
$$= 40^\circ \text{ (Approx)}$$

31. The given pie chart shows the expenditure (in lakh rupees) made by the private hostel on various items during a year. Answer the given question on the basis of the pie chart.



If the total expenditure incurred by the hostel during this year was 50 lakhs then what was the total expenditure (approx) on the maintenance charge and security?

(a) 41 lakhs (b) 16 lakhs
(c) 8 lakhs (d) 21 lakhs

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,

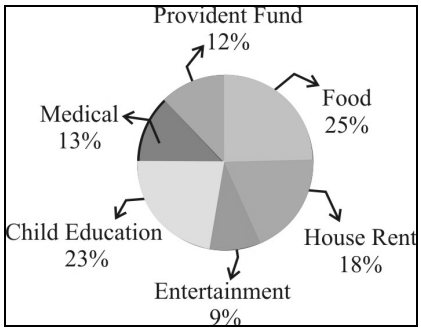
$360^\circ = 50$ lakhs

Total central angle of security and maintenance charge $= 55^\circ + 58^\circ$

$= 113^\circ$

$$\therefore \text{ Total required expenditure} = \frac{5000000 \times 113}{360}$$
$$= ₹1,569,444.44$$
$$= ₹16 \text{ lakhs (Approx)}$$

32. This chart represent the household lost per month of a family if the family's income is Rs. 33,650 then the total expenditure incurred by the family on entertainment and food in a month.



(a) Rs. 11, 144 (b) Rs. 11, 441
(c) Rs. 11, 442 (d) Rs. 11, 414

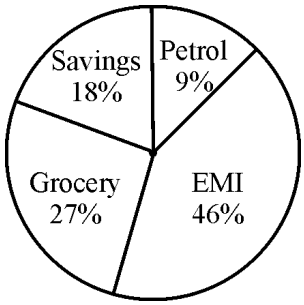
RRB RPF SI – 16/01/2019 (Shift-II)

Ans : (b) Total expenditure on family entertainment and food.

$$= 33650 \times \frac{25+9}{100} = 33650 \times \frac{34}{100}$$

= Rs. 11,441

33. The percentage details of Ramu's monthly household expenses are as follows in four sections. If he earns Rs. 55000/month So, how much is the EMI he pays each month.



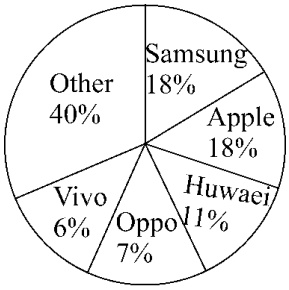
(a) Rs. 25300 (b) Rs. 24000
(c) Rs. 26300 (d) Rs. 25000

RRB RPF SI – 11/01/2019 (Shift-III)

Ans : (a) Payment of EMI every month

$$= \frac{46}{100} \times 55000 = 46 \times 550 = \text{Rs. } 25300$$

34. The given pie graph shows the total sales of various mobile companies for the year 2017.



If the total sales in the year 2017 was 5000 crores then the sales in crore made by Vivo company was.

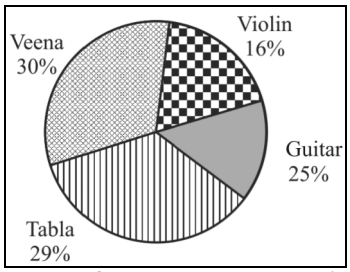
(a) 300 (b) 250
(c) 350 (d) 2000

RRB RPF Constable – 17/01/2019 (Shift-I)

Ans : (a)

$$\text{Sales by Vivo Company} = \frac{6}{100} \times 5000$$
$$= 300 \text{ Crore}$$

Note : (29-31) The pie chart below displays the instrument played by the student of a musical class. Read the following graph and answer the following questions.



35. The angle of sector corresponding to violin is.....

(a) 16.8º (b) 16º
(c) 57.6º (d) 48º

RRB RPF Constable – 22/01/2019 (Shift-I)

Ans. (c) : Total angles = 360º
Percentage of violin = 16%

$$\text{Angles of violin} = \frac{360\times16}{100} = 57.6^\circ$$

36. If there are 300 students in total, then what is the difference between tabla player and veena players.

(a) 30 (b) 90
(c) 3 (d) 9

RRB RPF Constable – 22/01/2019 (Shift-I)

Ans. (c) : Total numbers of students = 300

$$\text{Number of students playing tabla} = \frac{300\times29}{100} = 87$$

$$\text{Number of students playing veena} = \frac{300\times30}{100} = 90$$

Required difference = 90 – 87 = 3

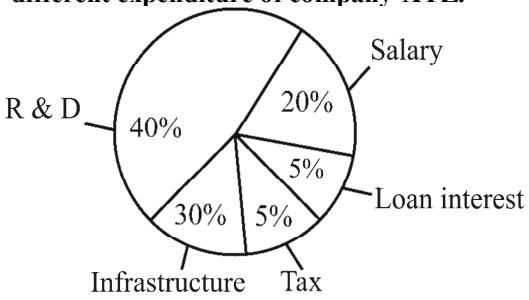
37. What is the ratio of student who play guitar to violinists?

(a) 5:4 (b) 5:6
(c) 25:16 (d) 8:15

RRB RPF Constable – 22/01/2019 (Shift-I)

Ans : (c) Let total students are 100.
Then the guitarist = 25
Violinist = 16
Required ratio = 25:16

38. The following pie chart Q3 2015 shows different expenditure of company XYZ.



If company XYZ has spend Rs. 100 lakh crore on various department then how much will it cost in R&D (lakh crore)

(a) 30 (b) 20
(c) 10 (d) 40

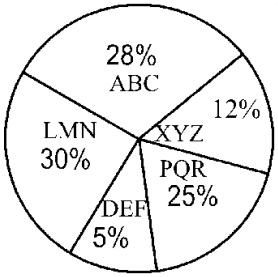
RRB Group-D – 04/10/2018 (Shift-I)

Ans. (d) From the pie chart,

$$\text{Expenditure on R \& D} = 100\times\frac{40}{100}$$

= Rs. 40 (Lakh crore)

39. Following chart gives information about mobile manufacturer companies in India.



If the total number of mobile phones manufactured by the companies is 12,40,000 then how many mobiles were manufactured by the company XYZ.

(a) 1,48,800 (b) 7,200
(c) 28,800 (d) 57,600

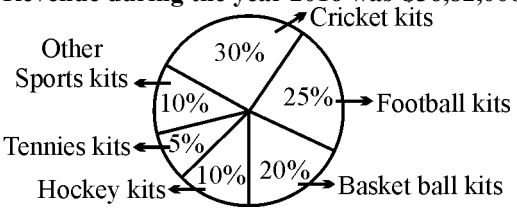
RRB Group-D – 08/10/2018 (Shift-III)

Ans : (a)
Percentage of mobile phones manufactured by XYZ = 12%

$$= 12,40,000\times\frac{12}{100} = 1,48,800$$

So number of mobile phone manufactured by XYZ company is 1,48,800

40. The following pie diagram shows information on the sale of sport by the company XYZ. Revenue during the year 2016 was $36,82,000



How much revenue was received by company XYZ through the sale (in $) of cricket kit in 2016

(a) 11,04,600 (b) 2,76,150
(c) 5,52,300 (d) 1,38,075

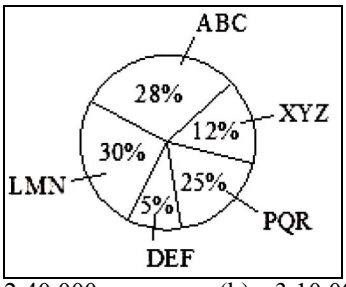
RRB Group-D – 23/10/2018 (Shift-I)

Ans. (a) : According to the question-
Revenue received during 2016 = $36,82,000
Sale of cricket kit = 30%
Revenue from the sale of cricket kit

$$= \frac{36,82,000\times30}{100} = \$1104600$$

41. The data given below shows information about the mobile phone manufacturing companies in India. If the total mobile phones manufactured are 12,40,000

Total number of mobile phones manufactured by company PQR?



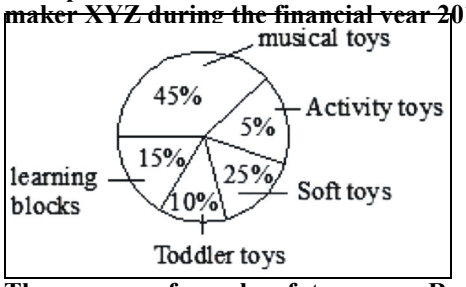
(a) 12,40,000 (b) 3,10,000
(c) 6,20,000 (d) 30,1000

RRB Paramedical Exam – 20/07/2018 (Shift-II)

Ans : (b) Total number of mobile phone manufactured = 12,40,000
So number of mobile phones manufactured by PQR company

$$= 12,40,000 \times \frac{25}{100} = 3,\ 10,\ 000$$

42. This pie chart shows sales information of toy maker XYZ during the financial year 2017-18.

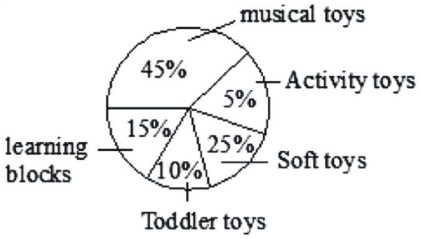


The revenue for sale of toys was Rs. 38,72, 000/–What kind of toys earned the best revenue for the company.

(a) Tolder toy (b) Musical toy
(c) Soft toy (d) Learning toy

RRB Group-D – 03/10/2018 (Shift-I)

Ans : (b)

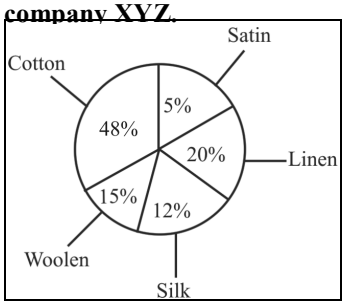


Total revenue = Rs. 3872000

$$\text{Maximum revenue} = \frac{3872000 \times 45}{100} = \text{Rs.}1742400$$

So revenue of musical toy was maximum.

43. The given pie chart shows the information on different types of cloth production in 2015 by company XYZ.



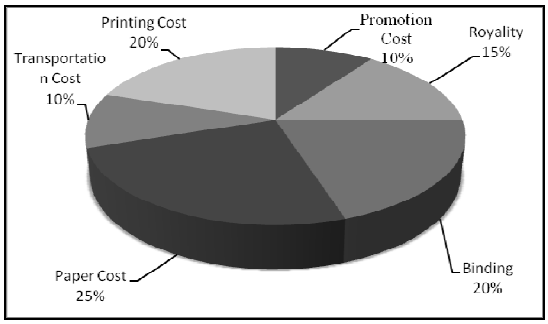
If the total production of clothes in 2015 is 150000 tonnes, then how many satin in tonnes were produced in 2015.

(a) 7500 (b) 60,000
(c) 15000 (d) 30,000

RRB Group-D – 08/10/2018 (Shift-II)

Ans : (a) Total production of clothes made by company XYZ in the year 2015 = 1,50,000 tonnes.
Total production of the satin by XYZ company in the year 2015 $= \frac{1,50,000 \times 5}{100} = 7500$
Hence total production of satin by XYZ company in the year 2015 = 7500 tonnes

44.



The pie graph represents the expenditure of a publishing house in Karnataka. If the total expenditure is Rs. 50,000, then the binding cost is.

(a) 12,500 (b) 10,000
(c) 7,500 (d) 5,000

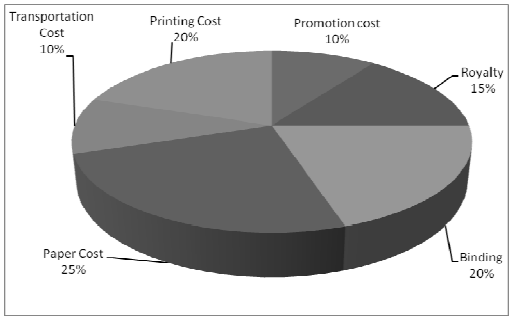
RRB Group-D – 31/10/2018 (Shift-II)

Ans : (b) – Total expense = Rs. 50,000

$$\text{Binding cost} = 50,000 \times \frac{20}{100}$$

$$\text{Binding cost} = \boxed{\text{Rs. } 10,000}$$

45.



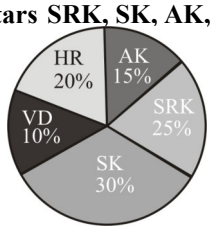
Pie graph shows the expenses of a publishing agency of Karnataka. If the total expenditure is Rs. 50,000, then the total expenditure on transport is.

(a) Rs. 5000 (b) Rs. 7000
(c) Rs. 10000 (d) Rs. 2500

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (a)
Total expense 50000 rupees of publishing agency
100% = 50000
1% = 500
Transportation charges = 10%
= 10 × 500
= Rs. 5000

Note : (40-42) pie chart shows favorite stars of a family people.
(Bollywood stars SRK, SK, AK, HR and VD)



Study the pie chart carefully and answer the questions based on it.

46. The ratio of those who like SK to those who like SRK is ?
(a) 6/5 (b) 5/6
(c) 1/2 (d) 2/1

RRB NTPC 11.04.2016 Shift : 2

Ans. (a) : SRK = 25 %
SK = 30 %
SK : SRK = 30 : 25
= 6 : 5

47. Which is the sector angle of HR.
(a) 36^0 (b) 72^0
(c) 54^0 (d) 108^0

RRB NTPC 11.04.2016 Shift : 2

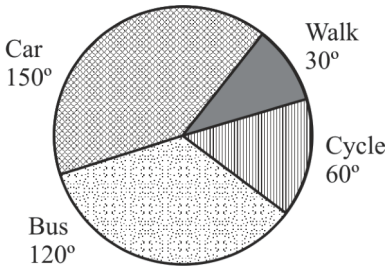
Ans. (b) : Percentage of HR = 20%
Total angles = 360^0
Angle of sector corresponding to HR = $360\times\frac{20}{100}=72^0$

48. If there are 40 people in the family, the difference between those who like AK and those who like VD
(a) 2 (b) 3
(c) 4 (d) 6

RRB NTPC 11.04.2016 Shift : 2

Ans. (a) : Number of family members = 40
Number of people who like AK $=40\times\frac{15}{100}$
$=6$
Number of people who like VD $=40\times\frac{10}{100}$
$=4$
Required difference = 6 − 4
= 2

49. In a school, 1200 students were asked about their arrival vehicles and information received is indicated by the following pie chart, then based on the information given, find out how many students come to school by car.

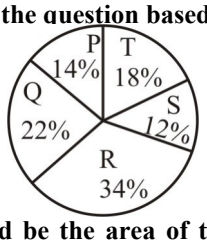


(a) 1000 (b) 900
(c) 500 (d) 750

RRB NTPC 28.03.2016 Shift : 2

Ans. (c) : Total students = 1200
Angle out of 360º of students arriving by car = 150°
Number of students arriving by car $=1200\times\frac{150^0}{360^0}$
= 500

Note (44-46): The following pie chart shows the 5 Stages P, Q, R, S and T forest area. Consider the chart and answer the question based on it.



50. What would be the area of the Stage Q if the total area is 61700 sq. km.
(a) 11686 sq. km (b) 12,340 sq. km
(c) 13,574 sq. km (d) 19,744 sq. km

RRB NTPC 04.04.2016 Shift : 2

Ans. (c) : The area of Stage Q
$=61700\times\frac{22}{100}=617\times22=13574$ sq. km

51. Sector angle of Stage P is.....
(a) 50.4^0 (b) 64.8^0
(c) 43.2^0 (d) 79.2^0

RRB NTPC 04.04.2016 Shift : 2

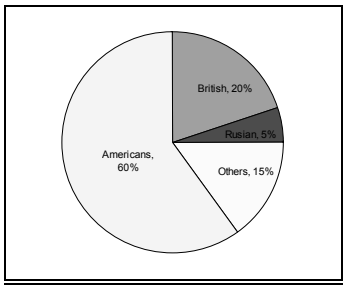
Ans. (a) : Sum of sector angles of all Stages = 360^0
Sector angles of Stage P $=\frac{360\times14}{100}$ $\left[\because 100\%=360^0,\ 14\%=\frac{360\times14}{100}\right]$
$=50.4^0$

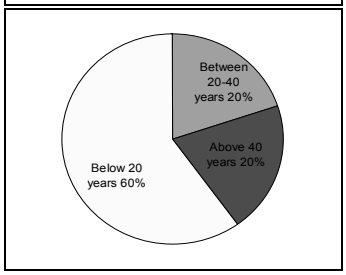
52. The ratio of forest area of Stage R to the combined forest area of Stages T and S is.
(a) 17/16 (b) 17/15
(c) 11/15 (d) 11/16

RRB NTPC 04.04.2016 Shift : 2

Ans. (b) :
Intended ratio = (Forest area of Stage R) : (Forest area of Stages T and S)
$=34\% : (18+12)\%$
$=34 : 30$
$=17 : 15$
$=\frac{17}{15}$

53.





Below 20 years
Between 20-40 years
Above 40 years

The given figures depict the country-wise and age-wise distribution of the people who visit China for business setup.
If in a given year, 500,000 people visited China, then the ratio of the number of Americans with the age group between 20 and 40 years to the Russians with the age group below 20 years who visited China is:

(a) 4 : 1 (b) 1 : 2
(c) 2 : 1 (d) 1 : 4

RRB ALP & Tec. (31-08-18 Shift-III)

Ans : (a) Number of American people

$$= 500000 \times \frac{60}{100}$$
$$= 300000$$

The number of American's between the age of 20 and 40

$$= 300000 \times \frac{20}{100} = 60000$$

And,
The number of Russian under the age of 20

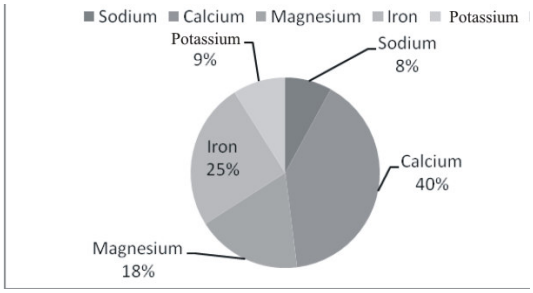
$$= \left(500000 \times \frac{5}{100}\right) \times \frac{60}{100} = 15000$$

So,

$$\frac{\text{American between 20 and 40 years old}}{\text{Russian below 20 years of age}} = \frac{60000}{15000}$$
$$= \frac{4}{1} = 4:1$$

54. The given graph shows the distribution of minerals in the human body. Based on the given data, what is the ratio of calcium to sodium found in the human body ?

Distribution of various Minerals in Human Body

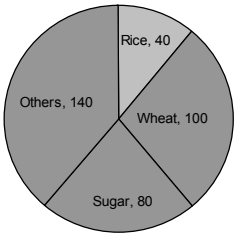


(a) 3 : 1 (b) 4 : 1
(c) 2 : 1 (d) 5 : 1

RRB ALP & Tec. (20-08-18 Shift-II)

Ans : (d) Calcium = 40%
Sodium = 8%
Required ratio = Calcium : Sodium = 40 : 8
= 5 : 1

55. In the following pie chart, annual production of some of the yield (in tonnes) is given.
If the total production is 9000 tonnes, then the yield of rice is _____ tonnes.



(a) 3000 (b) 1000
(c) 2000 (d) 1500

RRB ALP & Tec. (09-08-18 Shift-III)

Ans : (b) Rice production $= 9000 \times \frac{40^\circ}{360^\circ} = 1000$ tonnes

Type - 2

56. The loan disbursement at ABC bank in the last 5 years is as shown in the table.

Sr. No.	Years	Rupees (in Crore)
1	2016	75
2	2017	85
3	2018	125
4	2019	145
5	2020	190

Which year has the maximum percentage growth in the loan disbursement over the previous years?

(a) 2020 (b) 2017
(c) 2019 (d) 2018

RRB NTPC (Stage-2) 14/06/2022 (Shift-I)

Ans. (d) :
Percentage growth in year 2020

$$= \frac{190-145}{145} \times 100 = \frac{4500}{145} = 31.03\%$$

Percentage growth in year 2017 =

$$= \frac{85-75}{75}\times 100 = \frac{10}{3}\times 4 = 13.33\%$$

Percentage growth in year 2019 =

$$= \frac{145-125}{125}\times 100 = \frac{20}{5}\times 4 = 16\%$$

Percentage growth in year 2018

$$= \frac{125-85}{85}\times 100$$

$$= \frac{40}{85}\times 100$$

$$= 47.05\ \%$$

Hence, in year 2018 has the maximum percentage growth in the loan disbursement over the previous years.

57. The following table presents the expenditure of a company on various heads over five years.

Expenditures of a company (in Lakhs)

Year	Expenditature Heads				
	Salary	Transport	Taxes	Advertising	Offers and Promotions
2017	361	93	83	142	52
2018	273	67	65	133	86
2019	645	110	152	108	95
2020	712	108	165	112	48
2021	652	111	132	101	75

(Reference- Expenditures of a company (in Lakhs), Expenditure Heads, Year, Salary, Transport, Taxes, Advertising, Offers and Promotions)

The company's total expenditure in 2017 was approximately what percentage of its total expenditure in 2021?

(a) 71% (b) 61%

(c) 68% (d) 55%

RRB NTPC (Stage-2) 15/06/2022 (Shift-I)

Ans. (c) : According to the question,

Total expenditure of 2017 = 361 + 93 + 83 + 142 + 52

= 731 Lakhs

Total expenditure of 2021 = 652+111+132+101+75

= 1071 Lakhs

$$\text{Percentage} = \frac{731}{1071}\times 100$$

$$= 68.25$$

$$\approx 68\%$$

58. The following table shows the data of the number of students setected in the Entrance examination of M.phil of a Central University from five different Stages during the given years. Study the table and answer the question based on it.

Stage / Year	Kashmir	Bihar	Madhya Pradesh	Punjab	Delhi
2017	300	440	250	350	280
2018	400	400	280	400	320
2019	450	350	240	260	260
2020	500	380	400	320	400
2021	430	420	540	280	350

The number of students select from Bihar in 2020 is approximately what percent of the total number of students selected from Delhi in all the given years together ?

(a) 20.5% (b) 23.6%

(c) 15.5% (d) 15.0%

RRB Group-D 18/08/2022 (Shift-II)

Ans. (b) : From the given table

Number of students selected from Bihar in the year 2020 = 380

Total number of students selected from Delhi in all the given years = 280 + 320 + 260 + 400 + 350 = 1610

$$\% = \frac{380}{1610}\times 100$$

$$= 23.60\%$$

59. The following table shows the population of six different cities, A, B, C, D, E and F, the ratio of males to females among them and the ratio of adults to children in the total population. Study the table and answer the question.

City	Population	Male:Female	Adult:Children
A	410400	13 : 11	5 : 3
B	369900	5 : 4	7 : 2
C	442800	5 : 7	7 : 5
D	465500	17 : 18	4 : 3
E	499500	5 : 4	5 : 4
F	424500	5 : 7	17 : 13

What is the difference between the total number of adults and the total number children in city A?

(a) 1,02,600 (b) 1,04,600

(c) 1,02,000 (d) 1,12,600

RRB NTPC (Stage-2) 13/06/2022 (Shift-II)

Ans. (a) : Given,

Ratio of adult to children in city A = 5 : 3

Total population in city A = 410400

$$\text{Total no. of adults in city A} = \frac{5}{8}\times 410400$$

$$\text{Total no. of children's in city A} = \frac{3}{8}\times 410400$$

$$\therefore \text{ Required difference} = \frac{5}{8}\times 410400 - \frac{3}{8}\times 410400$$

$$= \frac{1}{8}\times 410400[5-3]$$

$$= \frac{2}{8}\times 410400$$

$$= \frac{410400}{4}$$

$$= 1,02,600$$

Hence option (a) is correct.

60. The given table shows the number of candidates who appeared for the interview and the number of candidates who got selected for the post of Assistant Professor in XYZ university, from different Stages over the years, Study the table and answer the question.

Year / Stage	2020		2021		2022	
	Interviewed	Selected	Interviewed	Selected	Interviewed	Selected
A	1200	800	1500	700	1800	1000
B	1500	600	1600	800	2000	1120
C	2000	680	2200	900	1800	1100
D	1600	700	1500	950	1800	1200
E	1500	490	1100	400	1300	800

In the year 2020, the total number of candidates who got selected from different Stages is approximately what percentage of the total number of candidates who appeared for the interview from different Stages in the same year?

(a) 55% (b) 41.9%
(c) 45.5% (d) 50%

RRB Group-D 30-08-2022 (Shift-III)

Ans. (b) : According to the question,
Total number of candidates interviewed in 2020
= 1200 + 1500 + 2000 + 1600 + 1500 = 7800
Total number of condition selected in 2020
= 800 + 600 + 680 + 700 + 490 = 3270

$$\text{Required \%} = \frac{3270}{7800} \times 100 = 41.92\%$$

61. The following table shows the marks obtained by A, B, C and D in four subjects namely Maths, Hindi, English and Science. The total marks for each subject is 100. Study the table and answer the question based on it.

Subject/Students ↓ →	A	B	C	D
Mathematics	90	85	83	78
Hindi	86	78	74	82
English	75	74	70	74
Science	92	88	64	70

What is the ratio of 'Sum of marks obtained by A in Hindi and B in English' to sum of marks obtained by C in English and D in science ?

(a) 7 : 6 (b) 8 : 7
(c) 5 : 6 (d) 5 : 7

RRB Group-D 06/09/2022 (Shift-I)

Ans. (b) : According to the question,
The sum of marks obtained by A in Hindi and B in English = 86 + 74
= 160
The sum of marks obtained by C in English and D in Science = 70 + 70
= 140
Hence the required ratio = 160 : 140
= 8 : 7

62. Study the following table and answer the question given below.

Name of the Company	Sale (in lakhs)		
	1999	2000	2001
ACG	32	43	35
TYD	61	52	29
POD	54	25	36
BKN	19	38	52

Which company has the highest total sale value over the three years. What is the difference between the value of the highest combined sales and the lowest combined sales registered by any company from 1999 to 2001.

(a) BKN, ₹27,00,000 (b) TYD, ₹27,00,000
(c) TYD, ₹33,00,000 (d) BKN, ₹33,00,000

RRB NTPC (Stage-2) 16/06/2022 (Shift-II)

Ans. (c) : According to the question :–
Total sale value of company ACG
= 32 + 43 + 35 = 110 Lakhs
Total sale value of company TYD
= 61 + 52 + 29 = 142 Lakhs
(Highest sale)
Total sale value of company POD
= 54 + 25 + 36 = 115 Lakhs
Total sale value of company BKN
= 19 + 38 + 52 = 109 Lakhs
Required Difference = Highest sale – Lowest sale
142 Lakh – 109 lakh
= 33 Lakh or (33,00,000)

63. The following table gives the number of fresh registrations of scooters and motorcycles in a city in three years. In which year(s) did the number of fresh registrations of both scooters and motorcycles separately and together register fluctuation of more than 50%?

Vehicle \ Year	2004-05	2005-06	2006-07
Scooters	904	1316	2017
Motorcycles	1654	2019	722

(a) 2006-2007
(b) 2005-2006
(c) Both 2005-06 and 2006-07
(d) Neither 2005-06 nor 2006-07

RRB NTPC 13.03.2021 (Shift-I) Stage Ist

Ans. (d) : Percentage increase in the number of scooters in the year 2005–06 $= \frac{(1316-904)}{904} \times 100 = 45.57\%$
Percentage increase in the number of scooters in the year 2006–07 $= \frac{(2017-1316)}{1316} \times 100 = 53.27\%$
Percentage increase in the number of motorcycles in the year 2005–06 $= \frac{(2019-1654)}{1654} \times 100 = 22.06\%$

Percentage decrease in the number of motorcycles in the year 2006–07 $= \frac{(2019-722)}{2019} \times 100 = 64.23\%$

Percentage increase in the number of scooters and motorcycles together in 2005-06

$$= \frac{(1316+2019)-(904+1654)}{(904+1654)} \times 100 = 30.37\%$$

Percentage decrease in the number of scooters and motorcycles together in 2006-07

$$= \frac{(1316+2019)-(2017+722)}{(1316+2019)} \times 100 = 17.87\%$$

Hence, neither 2005–06 nor 2006–07 has seen fluctuation of more than 50%

Direction (Q. N. 51-54) : Observe the table below and answer the following question:

Year	Population	Consumption of electricity (GW)
2015	**20**	**25**
2016	**30**	**40**
2017	**40**	**60**
2018	**50**	**80**
2019	**60**	**100**

1 GW = 100 Million Watt

Population in Million

64. In the year 2016, what was the consumption of electricity per person?

(a) 133.33W (b) 333.33W
(c) 266.67W (d) 166.67W

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (a) : In 2016 years, consumption of electricity per person

$$= \frac{40 \times 100}{30}$$

$$= \frac{400}{3}$$

$$= 133.33 \text{ W}$$

65. By what percentage did the consumption of electricity increase from 2015 to 2019?

(a) 100% (b) 75%
(c) 25% (d) 300%

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (d) : Percentage increase of electricity consumption from 2015 to 2019 $= \frac{(100-25)}{25} \times 100$

$$= \frac{75}{25} \times 100$$

$$= 300\%$$

66. In which year did electricity consumption grow by 50%?

(a) 2016 (b) 2017
(c) 2018 (d) 2019

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (b) : From option (b)

Percentage increase in electricity consumption in 2017

$$= \frac{60-40}{40} \times 100$$

$$= \frac{20}{40} \times 100$$

$$= 50\%$$

Hence, electricity consumption grow by 50% in the year 2017.

67. Which of the following is true with regards to consumption of electricity per person based on the figures given in the table above?

(a) Increased by more than 40% in 2019 as compared to 2015
(b) Neither increased nor decreased between 2015 and 2019
(c) Decreased between 2015 and 2019
(d) Increased between 2015 and 2019

RRB NTPC 28.01.2021 (Shift-I) Stage Ist

Ans. (d) : In terms of per capita electricity consumption based on the data given in the above table that is increase between 2015 and 2019.

68. This table shows the number of males and females in some groups. Which of the groups listed has the highest ratio of females to males?

Group Name	No. of Male	No. of Female
C	**950**	**414**
B	**650**	**414**
M	**700**	**410**
S	**720**	**408**
R	**740**	**405**

(a) Group C (b) Group B
(c) Group S (d) Group R

RRB NTPC 21.01.2021 (Shift-II) Stage Ist

Ans. (b) : From the given options–

(a) Ratio of female and male in Group C $= \frac{414}{950} = 0.43$

(b) Ratio of female and male in Group B $= \frac{414}{650} = 0.64$

(c) Ratio of female and male in Group S $= \frac{408}{720} = 0.57$

(d) Ratio of female and male in Group R $= \frac{405}{740} = 0.55$

Hence, It is clear that the ratio of Group B is maximum.

Direction: (Q.56–59) : The given table shows the details of the expenditure incurred (in crores) by a tea garden during the years 2013 to 2017. Study the table carefully and answer the following question.

Year	Items of Expenditure(₹ in Crores)				
	Salary	Fuel etc	Bonus	Interest on loans	Taxes
2013	60.5	20.0	0.8	4.88	18.6
2014	68.4	23.4	0.4	7.00	22.6
2015	62.8	19.4	0.86	8.85	16.8
2016	67.2	28.8	0.89	6.28	17.5
2017	84.0	30.2	0.96	10.11	21.6

69. In which year was the total expenditure on 'Taxes' and 'Interest on loans' less than expenditure on 'Fuel etc.'

(a) 2014 (b) 2016
(c) 2013 (d) 2015

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (b) : From option (b),
In 2016, total expenditure on Interest on loans and Taxes = 6.28 +17.5 =23.78
Total expenditure of Fuel in 2016 = 28.8
$\because$ 28.8 > 23.78
So, in 2016, expenditure on Interest on loans and Taxes are less than that on Fuel.

70. The average yearly expenditure on 'Salary' from 2013 to 2017 was approximately.

(a) ₹69.58 Crores (b) ₹68.00 Crores
(c) ₹68.58 Crores (d) ₹67.58 Crores

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) : As per table,
Expenditure on Salary from 2013-2017
= 60.5 + 68.4+62.8+67.2+84
=342.9 crores
In total time (years) = 5 years

$$\text{Average annual expenditure} = \frac{342.9}{5} = ₹68.58 \text{ Crores}$$

71. The range of expenditure incurred over the five year period is most similar for which of the following items of expenditure.

(a) Salary and Fuel etc
(b) Fuel etc and Interest on loans
(c) Salary and Taxes
(d) Interest on loans and Taxes

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (d) : The expenditure incurred over the five year period is most similar for Interest on loans and Taxes.

72. In which year was the percentage increase of the expenditure on Salary, as compared to the previous year, more than 20%.

(a) 2015 (b) 2016
(c) 2017 (d) 2014

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (c) : From given table, by option (c)
Expenditure on Salary in 2016 = 67. 2 Crores
Expenditure on Salary in 2017 = 84.0 Crores
Increament percent of expenditure on Salary in 2017, as reference to 2016.

$$\frac{84-67.2}{67.2}\times 100 = 25\%$$

Hence, in 2017 expenditure on Salary is increased by 25% which is more than 20% in comparison to previous year.

73. The given table shows the marks obtained by a student in different subjects in the first and second sessions. The total score of each test was one hundred.

Subject	Eng.	Hindi	Maths	Science	Social Science
Obtained Marks of first Session	65	70	88	82	71
Obtained Marks of Second Session	67	68	94	85	75

In which subject does the student improve his performance the least.

(a) English (b) Hindi
(c) Science (d) Social Science

RRB NTPC 23.07.2021 (Shift-II) Stage Ist

Ans. (a) : Marks improved by the student in various subjects-
In English $\rightarrow$ 67 – 65 = 2 marks
In Math $\rightarrow$ 94 – 88 = 6 marks
In Science $\rightarrow$ 85 – 82 = 3 marks
In Social science $\rightarrow$ 75 – 71 = 4 marks
Hence, it is clear that the student improves his performance the least in English subject.

74. The following table shows the number of students that appeared and were selected in the entrance exam of the department of engineering of a certain university from 5 different cities A, B, C, D and E.

City	Appeared	Selected
A	2800	1900
B	3000	1800
C	2800	1950
D	2400	2000
E	2600	1700

In which of the following cities have the minimum percentage of selection in the entrance exam of the university.

(a) A (b) B
(c) E (d) C

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (b) : Percentage of students from different cities who got selected in the entrance examination of the university.

$$\text{From the city A} = \frac{1900}{2800}\times 100 = 67\cdot 86\ \%$$

$$\text{From the city B} = \frac{1800}{3000}\times 100 = 60\ \%$$

$$\text{From the city C} = \frac{1950}{2800}\times 100 = 69\cdot 64\ \%$$

$$\text{From the city D} = \frac{2000}{2400}\times 100 = 83\cdot 33\%$$

$$\text{From the city E} = \frac{1700}{2600}\times 100 = 65\cdot 38\ \%$$

So, it is clear that the percentage of students who got selected in the university entrance examination from city B is minimum.

75. Study the following table carefully to answer the question.

Expenditure (in million $) of a company A over the years.

Items of expenditure	Years			
	2012	2013	2014	2015
Salary	145	115	200	255
Transport	48	60	71	82
Interest on loans	25	18	14	13
Taxes	4	3.5	2	6.5

What is the ratio between the expenditure on taxes in the year 2014 to the total expenditure on transport for all the years respectively?

(a) 1 : 135.5 (b) 1 : 133.5
(c) 1 : 131.5 (d) 1 : 130.5

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (d) : Expenditure on taxes in 2014 = 2
Total expenditure on transport for all the years
= 48 + 60 + 71 + 82
= 261

$$\text{Required ratio} = \frac{2}{261}$$

$$= \frac{1}{130.5}$$

76. According to the given table, how many schools won less than 15 gold medals in any of the two consecutive years? X = Schools, Y = Year.

Y → / X ↓	2001	2002	2003	2004
School A	20	13	16	11
School B	15	18	14	25
School C	14	21	16	9
School D	19	8	14	21
School E	5	12	16	17

Number of Gold Medals won by different schools in different years during Interschool competition.

(a) 3 (b) 1
(c) 2 (d) 4

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : According to given table,
School-D won less than 15 gold medals in 2002 and 2003.
School-E won less then 15 gold medals in 2001 and 2002.
Hence, two school are their which won less than 15 gold medals in any of two consecutive years.

77. According to the given table, which of the following has the highest growth rate of production from 2001 to 2005?

Years	Gold	Silver	Copper	Iron
2001	24	87	12	27
2002	56	89	20	29
2003	65	95	35	16
2004	75	101	43	37
2005	85	103	54	69

Production of four elements (Thousand tonnes)

(a) Iron (b) Silver
(c) Copper (d) Gold

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : From option–
Percentage growth of Iron

$$= \frac{69-27}{27} \times 100 = 155.55\%$$

Percentage growth of Silver

$$= \frac{103-87}{87} \times 100 = 18.390\%$$

Percentage growth of Copper

$$= \frac{54-12}{12} \times 100 = 350\%$$

Percentage growth of Gold

$$= \frac{85-24}{24} \times 100 = 254.16\%$$

Hence, the highest growth rate of production from 2001 to 2005 is Copper.

78. Read the given information and answer the question that follows.

In a certain month, a woman spent her monthly salary on different item as given in the following table.

Item	Clothing	House rent	Food	Education	Miscellaneous
Amount spent (in ₹)	800	3600	1600	600	1200

What is the ratio of the expenses on food to that on house rent?

(a) 9 : 4 (b) 4 : 9
(c) 2 : 3 (d) 3 : 2

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (b) : In a certain month, woman expenses on food = ₹ 1600
And expense on house rent = ₹ 3600
The ratio of expenses on food and house rent

$$= \frac{1600}{3600} = \frac{400}{900} = \frac{4}{9}$$

Required ratio = 4 : 9

79. Study the given table and answer the question that follows-

Rate of Employment (in percentage) at Various Levels and Years				
Year	Primary Level	Seconda-ry Level	Higher Level	Total
1995	15	12	15	42
2000	20	18	20	58
2005	25	20	10	55
2010	30	25	15	70

Which of the following Stagements about the rate of employment figures provided in the table is true?

(a) Rate of employment at secondary level increased by 50% between 1995 and 2000
(b) Rate of employment at secondary level increased by 10% between 2000 and 2005
(c) Rate of employment at secondary level increased by 20% between 2005 and 2010
(d) Rate of employment at higher level increased by 25% between 1995 and 2000

RRB NTPC 23.07.2021 (Shift-I) Stage Ist

Ans. (a) : Rate of employment at secondary level increased between 1995 and 2000 $= \left(\frac{18-12}{12}\right)\times 100$
$= 50\%$

Rate of employment at secondary level increased between 2000 and 2005 $= \left(\frac{20-18}{18}\right)\times 100$
$= 11\frac{1}{9}\%$

Rate of employment at secondary level increased between 2005 and 2010 $= \left(\frac{25-20}{20}\right)\times 100 = 25\%$

Rate of employment at higher level increased between 1995 and 2000 $= \left(\frac{20-15}{15}\right)\times 100 = 33\frac{1}{3}\%$

Hence, option (a) is correct.

80. Study the given information in the table and answer the question that follows.
The following table shows the details of the number of people who booked a ticket and travelled from Punjab, during the years 2015-to 2018

Year	Punjab	
	Number of Tickets	Number of Passengers
2015	2400	2200
2016	2300	2000
2017	2600	2500
2018	2800	2460
Total	10100	9160

In which year was the number of people who travelled as a percentage of those who booked tickets, the minimum?
(a) 2017 (b) 2016
(c) 2018 (d) 2015

RRB NTPC 04.03.2021 (Shift-I) Stage Ist

Ans. (b) : According to the question,

During year 2015 $= \frac{2200}{2400}\times 100 = 91.66\%$

During year 2016 $= \frac{2000}{2300}\times 100 = 86.95\%$

During year 2017 $= \frac{2500}{2600}\times 100 = 96.15\%$

During year 2018 $= \frac{2450}{2800}\times 100 = 87.86\%$

So, it is clear that in year 2016 the number of people who travelled as a percentage of those who booked tickets is minimum.

81. The given table shows the number of students graduated from 4 different departments namely Mathematics, History, Urdu and English during 5 consecutive years.

Name of the Departments	Years				
	2014	2015	2016	2017	2018
Mathematics	250	150	275	255	310
History	80	60	55	85	75
Urdu	58	64	50	60	55
English	40	35	52	38	30

What is the ratio of the number of students who graduated from Department of Urdu in the year 2015 to the total number of students who graduated from Department of Urdu for all the years?
(a) 13 : 111 (b) 46 : 287
(c) 64 : 287 (d) 14 : 102

RRB NTPC 15.02.2021 (Shift-I) Stage Ist

Ans. (c) : No. of Urdu students in 2015 = 64
Total Urdu students in all years = 58+64+50+60+55
= 287
So, required ratio = 64 : 287

82. The given table presents the sales figures of Physics and Chemistry books in the years 2003, 2004, 2005 and 2006.

Years	2003	2004	2005	2006
Physics	300	425	475	515
Chemistry	450	550	590	700

In which year was the difference in the sale of the two subject books the least
(a) 2005 (b) 2006
(c) 2003 (d) 2004

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (a) : Sales difference in years of Physics and Chemistry

2003	2004	2005	2006
↓	↓	↓	↓
450	550	590	700
−300	425	475	515
150	125	115	185

Hence, the difference in sale of the two subject books least was in 2005.

83. According to the given table, what is the percentage of the total students who failed considering all the three classes i.e. 10th, 11th and 12th and in all five given subjects?

Class	Subjects	Pass % of Students	No. of Failed Students
10th	Maths	65	105
10th	Hindi	80	120
11th	English	40	360
12th	Psychology	75	100
12th	Biology	50	110

(a) 36.7 (b) 37.5
(c) 38.6 (d) 31.8

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (b) : From given table,
Total no. of students of class 10

$$= \frac{105}{35}\times 100 + \frac{120}{20}\times 100$$

$= 300 + 600 = 900$

Total no. of students in class 11 $= \frac{360}{60}\times 100 = 600$

Total no. of students in class 12 $= \frac{100}{25}\times 100 + \frac{110}{50}\times 100$

$= 400 + 220 = 620$

Total no. of students $= 900 + 600 + 620 = 2120$

Total number of students failed = 795

Required percentage $= \frac{795\times 100}{2120} = 37.5$

84. According to the given table, what is the ratio of total students who passed to total students who failed considering all the three classes i.e. 10th, 11th and 12th and all the five given subjects?

Class	Subjects	Pass % of Students	No. of Failed Students
10th	Maths	65	105
10th	Hindi	80	120
11th	English	40	360
12th	Psychology	75	100
12th	Biology	50	110

(a) 265 : 159 (b) 275 : 139
(c) 173 : 138 (d) 369 : 141

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (a) : From given table,

Pass students	:	Failed students
195		105
480		120
240		360
300		100
110		110
1325	:	795

Passed students : Failed students = 1325 : 795 = 265 : 159

85. The given table shows the number of electric bulbs sold in a shop during a week:

Day	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Number of bulbs sold	225	100	150	200	75	90

On which day was the daily sale closest to the average sale for the week?

(a) Wednesday (b) Friday
(c) Thursday (d) Saturday

RRB NTPC 05.01.2021 (Shift-I) Stage Ist

Ans. (a) : From the table,
Average sale of week

$$= \frac{225+100+150+200+75+90}{6}$$

$$= \frac{840}{6} = 140$$

So, the sale on wednesday is closest to the week's average sales.

86. If a pie chart is drawn based on the data given below, what will be the central angle for food?

No. of families	Item of expenditure
150	Education
400	Food
40	Rent
250	Electricity
160	Miscellaneous

(a) 150º (b) 208º
(c) 144º (d) 90º

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (c) : Total number of families = 150 + 400 + 40 + 250 + 160 = 1000
If we make pie chart, 1000 = 360º
Expenditure on food = 400

Hence, central angle for food $= \frac{360^\circ}{1000}\times 400 = 144^\circ$

87. The following table shows the marks obtained by two students, Raj and Rohit, in different subjects.

Subject	Raj	Maximum Marks	Rohit	Maximum Marks
Math	37	50	48	50
Physics	45	50	30	50
Chemistry	42	50	45	50
Biology	32	50	35	50

What is the difference between Rohit and Raj's percentage of aggregate marks?

(a) 5% (b) 4%
(c) 2% (d) 1%

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (d) : Total percentage marks obtained by Raj=

$$\frac{\text{Sum of marks}}{\text{Total marks}}\times 100 = \frac{37+45+42+32}{200}\times 100$$

$$= \frac{156}{2}\%$$

$= 78\%$

Total percentage marks obtained by Rohit

$$= \frac{48+30+45+35}{200}\times 100$$

$$= \frac{158}{2}$$

$= 79\%$

Required difference = 79 –78
= 1%

88. Details of expenses made by a company (in millions) under different heads of expenditure are given in the following table. Study the table and answer the question that follows.

Years	Head of Expenditure				
	Transport	Admin	Salary	Other	Taxes
2014	452	167	340	56	47
2015	569	174	398	62	56
2016	659	189	409	73	61
2017	706	193	456	77	63
2018	783	203	479	81	69

The total expenditure made on the payment of Admin in 2018 was approximately what percentage of the total expenditure made on all heads for that year ?

(a) 1257% (b) 1.257%
(c) 125.7% (d) 12.57%

RRB NTPC 02.03.2021 (Shift-I) Stage Ist

Ans. (d) : From the given table–
Total expenditure on Admin in the year 2018 = 203 million
Total expenditure on all heads in the year 2018
= 783+203+479+81+69
= 1615 million

$$\text{Required percentage} = \frac{203}{1615} \times 100 = 12.57\%$$

89. What is the total percentage (1 decimal point) of illiterate people in all 4 cities.....?

City	Population	Literate	Illiterate	% of literate
A	200	150	50	–
B	300	200	100	66.6
C	150	50	100	–
D	120	–	90	25

(a) 44.1 (b) 44.3
(c) 44.5 (d) 44.2

RRB RPF Constable – 25/01/2019 (Shift-I)

Ans. (d) : Total population of four cities = 200 + 300 + 150 + 120 = 770
Percentage of total illiterate people in the four cities

$$= (50 + 100 + 100 + 90) \times \frac{100}{770} = \frac{340 \times 100}{770}$$

$\boxed{x = 44.2\%}$ Almost/Approximate

Note (77-79): The bracket below shows the percentage details of the total expenditure of the company Zeta interactive service under various heads during 2003.

Basic infrastructure	**20**
Transportation	**12.5**
Advertisement	**15**
Tax	**10**
R & D	**5**
Salary	**20**
Interest on debt	**17.5**

90. What is the ratio of Zeta interactive services of total expenditure on infrastructure and transportation against total cost of interest on tax and loans.

(a) 5:4 (b) 8:7
(c) 9:7 (d) 11:13

RRB RPF Constable – 20/01/2019 (Shift-II)

Ans. (d) : Zeta interactive services of total expenditure on tax and interest on loans = 10 + 17.5 = 27.5%
Total expenditure on infrastructure and transportation = 20 + 12.5 = 32.5%
Intended ratio = 27.5 : 32.5 = 11 : 13

91. If the amount of interest on loans is Rs. 2.45 crores, then what is the total amount spend on advertising, taxes and R & D services?

(a) 7 crore (b) 5.4 crore
(c) 4.2 crore (d) 3 crore

RRB NTPC 29.04.2016 Shift : 2

Ans. (c) : From question,
The amount of interest on loan = 17.5% = 2.45 crores
And total expenditure on advertisement, tax and R & D
=(15+10+5)% = 30%
From the question-

$$\text{Required spent amount} = \frac{24500000}{17.5} \times 30$$
$$= 4.2 \text{ crore}$$

92. If the expenditure of Zeta interactive service is 2.10 crore on the advertisement, then what is the difference between taxes and transport?

(a) 1.25 crore (b) 95 lakhs
(c) 65 lakhs (d) 35 lakhs

RRB NTPC 29.04.2016 Shift : 2

Ans. (d) :
Difference between transport and taxes% = 12.5–10 = 2.5
Advertising expenditure = 15% ..... (Given)
As per the question,

$$\because 15\% = 2.1 \text{ crore} = 21000000$$
$$\therefore 1\% = \frac{21000000}{15}$$

$$\text{Required difference} = 2.5\% = \frac{21000000}{15} \times 2.5$$
$$= 35 \text{ lakhs}$$

93. CO_2 emissions in 3 years in the following municipality has given.

Year	CO_2 emission from house
2015	100
2016	110
2017	150

What is the percentage increase in CO_2 emission between 2016 and 2017?

(a) 63.63% (b) 36.36%
(c) 36.45% (d) 26.36%

RRB Group-D – 17/09/2018 (Shift-II)

Ans : (b) Increase in percentage of CO_2 emission between 2016 and 2017

$$= \frac{150-110}{110} \times 100 = \frac{40}{110} \times 100 = 36.36\%$$

94. The following table gives the details of 3 years of sales of the company.

	Sales in lakh (Area-1)	Sales in lakh (Area-2)
2014	7	3
2015	15	5
2016	18	7

What was the percentage difference of sales in the year 2014 and 2016?

(a) 1.5% increment (b) 1.5% increment
(c) 150% increment (d) 150% increment

RRB Group-D – 12/11/2018 (Shift-III)

Ans : (c) Required percentage difference

$$= \frac{(18+7)-(7+3)}{(7+3)} \times 100$$

$$= \frac{25-10}{10} \times 100 = \frac{15}{10} \times 100$$

= 150% increment

95. Uma is organizing a terrace party. She determines the total estimated expenditure according to the table given in the following five plants.

Estimate expenditure	% Expenditure
1	30
2	20
3	10
4	25
5	15

If she spends 850 on item 3, then what is the total expenditure on item 2 and 5.

(a) Rs. 1795 (b) Rs. 2975
(c) Rs. 1275 (d) Rs. 1175

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (b) : The total amount spent by Uma at item 3 is Rs. 850, which is 10% of the total amount

$\therefore$ Total amount $= \frac{850 \times 100}{10}$ = Rs. 8500

$\therefore$ Spent amount on item- 2 $= \frac{8500 \times 20}{100}$ = Rs. 1700

$\therefore$ Spent amount on item- 5 $= \frac{8500 \times 15}{100}$ = Rs. 1275

Total expenditure incurred by Uma on item-2 and item - 5 = 1700+1275 = Rs. 2975

96. Expense on various items of a company are shown below (in lakhs).

Year	Salary	Bonus	Tax	Interest on debt
year 1	200	10	70	20
year 2	200	10	70	22
year 3	450	10	120	20

What is the percentage of the total expenditure of year 1 of the total expenditure of year 3.

(a) 100% (b) 5%
(c) 0.5% (d) 50%

RRB Group-D – 19/09/2018 (Shift-II)

Ans. (d) : From the given table-

Total expenditure of year 1 = 200+10+70+20 = 300 lakh rupees

Total expenditure of year 3 = 450+10+120+20= 600 lakh rupees

$\therefore$ Intended percentage $= \frac{300}{600} \times 100 = 50\%$

97. For 3 years of a special brand of sugar in three Stages sales data are given in the table below. Data are in lakh rupees.

	Stage 1	Stage 2	Stage 3
Year 1	15	12	9
Year 2	12	14	8
Year 3	14	15	13

What is the percentage difference in sales for 1 year to 3 year.

(a) 18% (b) 16.67%
(c) 19.67% (d) 15.67%

RRB Group-D – 26/09/2018 (Shift-I)

Ans : (b) Total sales of year 1 = 15 + 12 + 9 = 36
Total sales of year 3 = 14 + 15 + 13 = 42
Difference = 6

Intended % $= \frac{6}{36} \times 100 = 16.67\%$

98. The operating cost of a company is given below.

	2016	2017
Debt interest	25%	25%
Salary	50%	55%
Tax	25%	20%

Total money spent on operations in 2016 is 120 lakhs and total money spent in 2017 is 150 lakhs. How much was the salary higher in 2017 than in 2016 ?

(a) Rs. 20 lakhs (b) Rs. 10 lakhs
(c) Rs. 22.5 lakhs (d) Rs. 5 lakhs

RRB Group-D – 28/09/2018 (Shift-II)

Ans. (c) : Expenditure on salaries in 2016 = $120 \times \frac{50}{100}$ = 60 lakhs rupees

Expenditure on salaries in 2017 = $150 \times \frac{55}{100}$ = 82.5 lakh rupees

Increase in salary in 2017 compared to 2016 = 82.5-60 = 22.5 lakh rupees

99. Based on the following table, in which months the number of production of screws is greater than the average number of production of screws in each months.

Months	The number of produced screws (In thousand)
January	200
February	300
March	250
April	250
May	230
June	270

(a) Only June (b) February and June
(c) January and February (d) May and June

RRB Group-D – 05/10/2018 (Shift-II)

Ans. (b) : Average number of production of screws

$$= \frac{200+300+250+250+230+270}{6}$$

$$= \frac{1500}{6} = 250$$

Hence, the months of production of screws above the average number of screw are February and June

100. The following table gives the average price per quarter of vegetables in 2 years. In which quarter the price difference was maximum?

	Price kg (Rs.) year 1	Price kg (Rs.) year 2
Qua-1	36	40
Qua-2	80	80
Qua-3	65	40
Qua-4	43	40

(a) quarter 4 (b) quarter 1
(c) quarter 2 (d) quarter 3

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (d) Difference in quarter 1 = 40 – 36 = 4
Difference in quarter 2 = 80 – 80 = 0
Difference in quarter 3 = 65 – 40 = 25
Difference in quarter 4 = 43–40 = 3
Hence, the difference of quarter 3 is the highest among the four quarters

101. According to the following table. Over a period of 2 years for how many months the prices of vegetables remain the same ?

Month	Price per kg (Rs.) year-1	Price per kg (Rs.) year-2
January	40	35
February	30	50
March	40	35
April	80	80
May	80	80
June	80	80
July	80	80
August	50	60
September	50	40
October	50	50
November	40	35
December	40	35

(a) 6 (b) 5
(c) 3 (d) 2

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (b) In a period of 2 years, the months in which the prices of vegetables were same-
April, May, June, July, October
So, the price of vegetables remain the same for five months

102. What is his average score in a game based on the following table in a football team scoring the following goals in six matches?

Play	Number of goals
Game 1	**2**
Game 2	**1**
Game 3	**0**
Game 4	**4**
Game 5	**3**
Game 6	**2**

(a) 4 (b) 3
(c) 1 (d) 2

RRB Group-D – 22/10/2018 (Shift-II)

Ans : (d) Number of games = 6
Total number of goals = 2 + 1 + 0 + 4 + 3 + 2 = 12
Average score in the game = 12/6 = 2

103. The monthly fees charged by a sports complex for various disciplines are as follows: Rs. 500 for gym, Rs. 1,500 for swimming pool and Rs. 2000 for tennis court. The list of consumers using these facilities is given below. How much does the gym earn from users who use it.

Facilities	Number of consumers
Gym	300
Swimming pool	200
Tennis court	100

(a) Rs. 1,50,000 (b) Rs. 15,000
(c) Rs. 25,000 (d) Rs. 50,000

RRB Group-D – 18/09/2018 (Shift-III)

Ans. (a) : Number of gym consumers = 300
Gym fee = Rs. 500
Per month earnings from gym =300× 500 = Rs.1,50,000

Note (91-93): Read the information given below and answer the questions given below.

The information of the number of sitting, answering and selected candidates from Delhi in competitive examination between 1997 and 2001 is given below.

Year	Sitting in examination	Passed	Selected
1997	**8000**	**850**	**94**
1998	**4800**	**500**	**48**
1999	**7500**	**640**	**82**
2000	**9500**	**850**	**90**
2001	**9000**	**800**	**70**

104. In which year was the minimum percentage of selected candidates among the candidates.

(a) 1998 (b) 2000
(c) 2001 (d) 1999

RRB NTPC 28.04.2016 Shift : 2

Ans.(c) Percentage of selected candidates in the year 1997

$$= \frac{94 \times 100}{8000} = 1.175\%$$

Percentage of selected candidates in the year 1998

$$= \frac{48 \times 100}{4800}$$

$$= 1\%$$

Percentage of selected candidates in the year 1999

$$= \frac{82 \times 100}{7500}$$

$$= 1.093\%$$

Percentage of selected candidates in the year 2000

$$= \frac{90 \times 100}{9500}$$

$$= 0.947\%$$

Percentage of selected candidates in the year 2001

$$= \frac{70 \times 100}{9000}$$

$$= 0.7778\%$$

So, the percentage of selected candidates in the year 2001 is minimum.

105. In which year the ratio of the number of selected candidates to the number of passed candidates was maximum.

(a) 1998 (b) 2000
(c) 2001 (d) 1999

RRB NTPC 28.04.2016 Shift : 2

Ans. (d) : From option,

$$\text{Ratio in year 1998} = \frac{48}{500} = 0.096$$

$$\text{Ratio in year 2000} = \frac{90}{850} = 0.1058$$

$$\text{Ratio in year 2001} = \frac{70}{800} = 0.0875$$

$$\text{Ratio in year 1999} = \frac{82}{640} = 0.128$$

Hence, the ratio of the number of selected candidates to the number of passed candidates in year 1999 is the maximum.

106. What is the average number of selected candidates in the given interval.

(a) 79 (b) 77
(c) 76 (d) 74

RRB NTPC 28.04.2016 Shift : 2

Ans. (b) : Average number of selected candidates

$$= \frac{94+48+82+90+70}{5} = \frac{384}{5} = 76.8 \approx 77$$

Note (94-95): The following table shows the population details based on poverty line and gender in 5 Stages M, N, O, P and Q.

Stage	Population of below poverty line %	The ratio of male (M) and female (F)	
		Below poverty line	Above poverty line
		M : F	M : F
M	40	7 : 6	8 : 7
N	30	3 : 2	6 : 5
O	26	1 : 1	4 : 3
P	17	1 : 2	4 : 5
Q	20	2 : 3	3 : 4

107. If the men population of Stage O above the poverty line is 1.7 million then what will be the total population of Stage O.

(a) 4.62 million (b) 11.44 million
(c) 5.63 million (d) 4.02 million

RRB NTPC 28.04.2016 Shift : 1

Ans. (d) : ∵ Male population of Stage O above the poverty line = 1.7 millions

$$\therefore \text{Female population} = \frac{3}{4} \times 1.7 = \frac{5.1}{4}$$

$$= 1.275 \text{ million}$$

Total population above the poverty line = 1.7 + 1.275

$$= 2.975$$

Population (%) above the poverty line Stage O=100– 26

$$= 74\ \%$$

$$\therefore \text{Total population of Stage O} = \frac{2.975 \times 100}{74}$$

$$= 4.02 \text{ million}$$

108. What will be the female population above the poverty line of Stage P if it is known that the total population of Stage P is 9 million.

(a) 4.32 million (b) 5.32 million
(c) 4.15 million (d) 6.32 million

RRB NTPC 28.04.2016 Shift : 1

Ans. (c) ∵ Total population of P Stages = 9 million

∴ Population of Stage P above the poverty line = 9 million's 83% $= 9 \times \frac{83}{100} = \frac{747}{100} = 7.47$ million

∵ Ratio of male to female in population of Stage P above the poverty line = 4:5

$$\therefore \text{Female population above poverty line} = \frac{5}{4+5} \times 7.47$$

$$= \frac{5}{9} \times 7.47 = \frac{37.35}{9} = 4.15 \text{ million}$$

Note (96) : The following table shows the record of a football team's performance in 7 tournaments played for 4 years.

Record of played tournaments	Won matches	Loose matches	The no. of total played matches
I	5	3	8
II	4	4	8
III	5	2	7
IV	6	3	9
V	4	2	6
VI	3	3	6
VII	2	4	6

109. In what percentage of the matches played the team won.

(a) 58% (b) 80%
(c) 75% (d) 52%

RRB NTPC 19.01.2017 Shift : 3

Ans. (a) : Total matches played = 50

Total matches won = 29

$$\text{Required \%} = \frac{29}{50} \times 100 = 58\%$$

Note (97- 99): Study the following tables and answer the questions based on it

The following tables gives the company's investment for a few years as a per year.

year	Expense of details				
	Salary	Fuel and Transport	Bonus	Interest on dept	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

110. The company's total expenditure on goods during the year 2001 is.

(a) Rs. 590 lakhs (b) Rs. 598 lakhs
(c) Rs. 597 lakhs (d) Rs. 597.08 lakhs

RRB NTPC 11.04.2016 Shift : 1

Ans. (d) : Total expenditure of the company on goods during the year 2001 = 336 + 133 + 3.68 + 36.4 + 88

= Rs. 597.08 lakhs

111. What is the ratio between the total expenditure on tax for all the years and the total bonus for all the years in order.

(a) 9 : 40 (b) 25 : 13
(c) 451 : 17 (d) 1 : 25

RRB NTPC 11.04.2016 Shift : 1

Ans. (c) : Total expenditure on taxes for all years
= 83 + 108+74+88+98
= 451
Total bonus for all years = 3+2.52+3.84+3.68+3.96
= 17.00
∴ Intended ratio = 451 : 17

112. What is the percentage of expenditure on salary in the year 2001 on fuel and transport forms.

(a) 34.54% (b) 39.58%
(c) 33.57% (d) 37.58%

RRB NTPC 11.04.2016 Shift : 1

Ans. (b) : In year 2001,
Expense on fuel and transport = 133 lakhs
Expense on salary = 336 lakhs
∴ Intended percentage $= \frac{133}{336} \times 100$
= 39.58%

Note (100-102): The following table shows the number of MSD, VK, RD and SR fans in different areas of the city. Consider the following information and answer the following question based on it.

	Area 1	Area 2	Area 3	Area 4
VK	2500	1700	2300	5000
MSD	3000	3000	4000	3100
RD	1500	3500	4500	5200
SR	1500	4000	3500	2500

113. What is the difference between total number of fans of SR and MSD?

(a) 1500 (b) 1600
(c) 3000 (d) 3200

RRB NTPC 19.04.2016 Shift : 2

Ans. (b) : Total number of SR's fan-
= 1500 + 4000 + 3500 + 2500 = 11500
Total number of MSD's fan
= 3000 + 3000 + 4000 + 3100 = 13100
Required difference = 13100 – 11500
= 1600

114. Whose fans are largest?

(a) VK (b) MSD
(c) RD (d) SR

RRB NTPC 19.04.2016 Shift : 2

Ans. (c) : Number of VK's fan
= 2500 +1700+2300+5000 = 11500
Number of MSD's fan
= 3000 + 3000 + 4000 + 3100 = 13100
Number of RD's fan
= 1500 + 3500 + 4500 + 5200 = 14700
Number of SR's fan
= 1500 + 4000 + 3500 + 2500 = 11500
So, it is clear that maximum number of fan (14700) is of RD

115. What is difference between number of fans in area 2 as compared to area 3.

(a) Area 2 to 2200 fans more
(b) Area 2 to 2100 fans less
(c) Area 2 to 2100 fans more
(d) Area 2 to 2200 fans less

RRB NTPC 19.04.2016 Shift : 2

Ans. (b) : Number of fans of area- 2
= 1700 + 3000 + 3500 + 4000 = 12200
Number of fans of area-3 = 2300 + 4000 + 4500 + 3500
= 14300
Required difference = 14300–12200 = 2100
Hence, it is clear that in area-2 has minimum 2100 fans as compare to area-3

Instruction (103-105): Study the given data and answer the question that follow (In lakh hectares)

Stage	2011	2012	2013
Punjab	**220**	**256**	**264**
Haryana	**120**	**108**	**151**
Uttar Pradesh	**100**	**143**	**128**
Madhya Pradesh	**40**	**85**	**90**
Maharastra	**80**	**150**	**175**
Rajasthan	**30**	**26**	**24**

116. What was the percentage of increase in agriculture land in Punjab in 2013 compared to year 2011?

(a) 20 (b) 16.36
(c) 25.8 (d) 22.33

RRB NTPC 18.01.2017 Shift : 2

Ans. (a) : Required increased $= \frac{(264-220)\times 100}{220}$
$\Rightarrow \frac{44\times 100}{220} = 20\%$

117. What is the difference in the total agriculture area of lakh hectares of Maharastra and M.P. on a combined bares in all 3 years.

(a) 135 lakh hectares (b) 34 lakh hectares
(c) 190 lakh hectares (d) 174 lakh hectares

RRB NTPC 18.01.2017 Shift : 2

Ans. (c)
Difference in total agriculture area of Maharashtra and Madhya Pradesh
⇒ (80+150+175) – (40+85+90)
⇒ 405–215 = 190 lakh hectares

118. What was the maximum agriculture area in U.P. as compared to Rajasthan in the year 2012.

(a) 35 lakh hectares (b) 117 lakh hectares
(c) 113 lakh hectares (d) 58 lakh hectares

RRB NTPC 18.01.2017 Shift : 2

Ans : (b) Agriculture area of 2012 Uttar Pradesh
Agriculture area of 2012 Rajasthan
143–26 = 117 lakh hectares

Instruction (106-108): Take of the following table and answer the question based on it.

The marks scored by the students in various subject in an examination are given below.

Student	Subject			
	Physics (In 120)	Chemistry (In 120)	Biology (In 120)	Mathematics (In 100)
Anil	**95**	**53**	**61**	**70**
Binu	**105**	**84**	**42**	**80**
Chirag	**95**	**65**	**73**	**90**
Dhawan	**85**	**65**	**84**	**60**
Alza	**85**	**66**	**95**	**50**
Farah	**75**	**77**	**85**	**40**
George	**65**	**38**	**75**	**80**

119. How many students have scored more than 60% in the exam.

(a) 7 (b) 6
(c) 5 (d) 4

RRB NTPC 04.04.2016 Shift : 3

Ans. (b) :

Anil's percentage marks $= \frac{95+53+61+70}{120+120+120+100} \times 100$

$= \frac{279}{460} \times 100 = 60.65\%$

Similarly,

Binu's percentage marks

$= \frac{105+84+42+80}{460} \times 100$

$= \frac{311}{460} \times 100 = 67.60\%$

Chirag's percentage marks $= \frac{95+65+73+90}{460} \times 100$

$= \frac{323}{460} \times 100 = 70.21\%$

Dhawan's percentage marks

$= \frac{85+65+84+60}{460} \times 100 = \frac{294}{460} \times 100 = 63.91\%$

Alza's percentage marks

$= \frac{85+66+95+50}{460} \times 100 = \frac{296}{460} \times 100 = 64.34\%$

Farah's percentage marks

$= \frac{75+77+85+40}{460} \times 100 = \frac{277}{460} \times 100 = 60.21\%$

George's percentage marks

$= \frac{65+38+75+80}{460} \times 100 = \frac{258}{460} \times 100 = 56.08\%$

Hence the remaining 6 students except George have scored more than 60%

120. Who is first in class in terms of total percentage mark in the exam.

(a) Binu (b) Chirag
(c) Dhawan (d) Alja

RRB NTPC 04.04.2016 Shift : 3

Ans. (b) : The percentage of Chirag is the highest in the class (70.21%). See the explanation of the above question.

121. What is the average of more marks by Dhawan in all 4 subjects?

(a) 65.3 (b) 71.3
(c) 68.3 (d) 73.5

RRB NTPC 04.04.2016 Shift : 3

Ans. (d) : Dhawan's average score $= \frac{85+65+84+60}{4}$

$= \frac{294}{4} = 73.5$

122. The following table gives the details of the number of students in Class 10, section A and B, who had taken their midterm and final exams.

Result	Section A 10 'A'	Section B 10 'B'
Total number of students who failed in both the exams	**28**	**23**
Total number of students who failed in the midterm but passed in the final exam	**14**	**12**
Total number of students who passed in the midterm but failed in the final exam	**6**	**17**
Total Number of students who passed in both the exams	**64**	**55**

Based on the above data, what percentage of class 10 A students passed in the final examination.

(a) 69.64 (b) 69.70
(c) 69.69 (d) 69.54

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (a) Number of students passed in the final examination = 64+14=78

Total number of students = 14+28+6+64= 112

Percentage of passed students in the final examination of 10 A,

$= \frac{78}{112} \times 100 = 69.64$

123.

Stu / Sub	P	C	B	M
W	**70**	**90**	**50**	**85**
X	**55**	**80**	**95**	**60**
Y	**60**	**20**	**90**	**40**
Z	**90**	**80**	**40**	**65**

The given table represents the marks obtained by four students W, X, Y and Z in four subjects P, C, B and M, with the maximum marks in each subject being 100.

Based on the given data, the student who got the lowest percentage in P, C, M and B combined is:

(a) Y (b) Z
(c) X (d) W

RRB ALP & Tec. (31-08-18 Shift-I)

Ans : (a) According to the question total score of P, C, B, M = 400

Scored marks in P, C, B, M by W student

= 70+90+50+85=295

Percentage marks $= \frac{295}{400} \times 100$

= 73.75%

Scored marks in P, C, B, M by X student

= 55+80+95+60

= 290

Percentage marks $= \frac{290}{400} \times 100$

= 72.5%

Scored marks in P, C, B, M by Y student

= 60+20+90+40

= 210

Percentage marks $= \frac{210}{400} \times 100$

$= 52.5\%$

Scored marks in P, C, B, M by Z student

$= 90+80+40+65$

$= 275$

Percentage marks $= \frac{275}{400} \times 100$

$= 68.75\%$

So, it is clear that minimum percentage marks scored by Y

124. Based on the given table, the percentage salary increase per year during the period 2001-2006 was (round off to the nearest integer).

Year	Items of Expenditure			
	Salary	Food	Medicine	Tax
2001	Rs.1,500	Rs. 200	Rs. 500	Rs. 100
2002	Rs.2,600	Rs. 300	Rs. 600	Rs. 200
2003	Rs.3,200	Rs. 150	Rs. 700	Rs. 150
2004	Rs.4,100	Rs. 250	Rs. 650	Rs. 125
2005	Rs.5,000	Rs. 200	Rs. 800	Rs. 150
2006	Rs.5,200	Rs. 100	Rs. 750	Rs. 175

(a) 248 (b) 247
(c) 246 (d) 245

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (b) Salary in year 2001 = Rs.1500

Salary in year 2006 = Rs. 5200

Profit = 5200 – 1500 $\Rightarrow$ Rs. 3700

Percentage profit $\Rightarrow \frac{3700 \times 100}{1500}$

$\Rightarrow$ 246.67 or Almost 247 percentage

125. The ratio of salary : expenditure per year during period 2001 to 2006 is :

Year	Items of Expenditure			
	Salary	Food	Medicine	Tax
2001	Rs.1,500	Rs.200	Rs.500	Rs. 100
2002	Rs.2,600	Rs.300	Rs.600	Rs. 200
2003	Rs.3,200	Rs.150	Rs.700	Rs. 150
2004	Rs.4,100	Rs.250	Rs.650	Rs. 125
2005	Rs.5,000	Rs.200	Rs.800	Rs. 150
2006	Rs.5,200	Rs.100	Rs.750	Rs. 175

(a) 71/108 (b) 71/105
(c) 105/71 (d) 216/61

RRB ALP & Tec. (21-08-18 Shift-I)

Ans : (d) Total salary till 2001 to 2006 = 1500 + 2600 + 3200 + 4100 + 5000 + 5200 = 21600,

Similarly

Total expenditure till 2001 to 2006 =

2001 $\Rightarrow$ 200 + 500 + 100 = 800

2002 $\Rightarrow$ 300 + 600 + 200 = 1100

2003 $\Rightarrow$ 150 + 700 + 150 = 1000

2004 $\Rightarrow$ 250 + 650 + 125 = 1025

2005 $\Rightarrow$ 200 + 800 + 150 = 1150

2006 $\Rightarrow$ 100 + 750 + 175 = 1025

$\frac{\text{Salary}}{\text{Expenditure}} = \frac{21600}{6100} = 216 : 61$

126. The table gives the details of the number of students in Class 10 section A and B who had taken mid-term and final exams.

What is the passed percentage in at least one of the two exams for sections A (approximately of rounded)?

Result	Sec A	Sec B
Total number of students who failed in both exams	**28**	**23**
Total number of students who failed in mid-term but passed in finals	**14**	**12**
Total number of students who passed in mid-term but failed in finals	**6**	**17**
Total number of students who passed in both the exams	**64**	**55**

(a) 80 (b) 75
(c) 65 (d) 70

RRB ALP & Tec. (14-08-18 Shift-III)

Ans : (b) Total number of students in section 'A' = (Total passed students + Total failed students) = 28+14+6+64= 112

And total number of students passed in at least one examination = Number of students passed in one examination + Number of students passed in both examination = 14+6+64= 84

Hence the percentage of students passed in at least one examination in section 'A' $= \frac{84}{112} \times 100 = 75\ \%$

127.

City	Population	Literate	Illiterate	% of literates
A	200	150	50	–
B	–	200	100	66.6
C	150	50	100	–
D	120	–	90	25

Based on the given data, the total percentage of literates in the four cities together, round to one decimal, is _____.

(a) 55.9 (b) 55
(c) 55.7 (d) 55.8

RRB ALP & Tec. (10-08-18 Shift-III)

Ans : (d) Total population in city B =200+100 = 300

Educated population in city D = 120–90 = 30

Total population = 200+300+150+120= 770

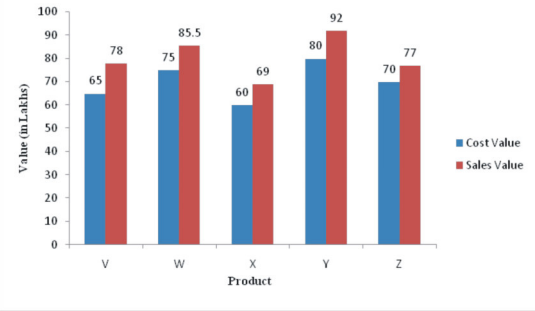
Total educated people = 150+200+50+30 = 430

Total percentage of educated $= \frac{430 \times 100}{770} = 55.84$

Type - 3

128. Study the given graph and answer the question that follows.

The graph shows the total cost and sales values (in lakhs) of five products manufactured by a company.



(Reference- Values (in lakhs), product Cost Value, Sales Value)

In which product did the company earn maximum profit ?

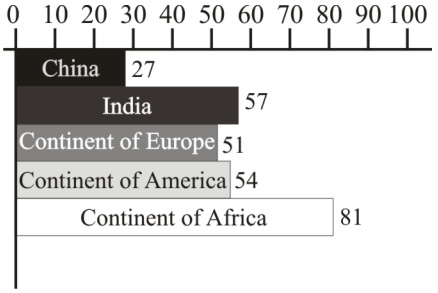
(a) Product W (b) Product X

(c) Product V (d) Product Z

RRB NTPC (Stage-2) 17/06/2022 (Shift-III)

Ans. (c) : In is clear from the above table
Product V has earned maximum profit-
7800000–6500000 = ₹1300000

129. The following graph represents the number distribution of all the directors in the film industry of country X by their birth origin.



What is the ratio of the number of directors form the continent of America to the total number of directors?

(a) 1 : 3 (b) 1 : 4

(c) 1 : 6 (d) 1 : 5

RRB NTPC (Stage-2) 12/06/2022 (Shift-II)

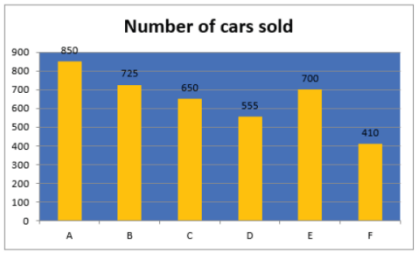
Ans. (d) : Number of directors born in continent of America : Total number of directors

= 54 : 270

= 1 : 5

130. The following chart shows the number of cars sold by a company through its six branches namely A, B, C, D, E and F.

Study the chart, and answer the question based on it.



Number of cars sold

In how many branches the sale of cars was more than the average sale of all the six branches together ?

(a) तीन (b) दो

(c) चार (d) पांच

RRB Group-D 18/08/2022 (Shift-II)

Ans. (c) : From the given chart
The average sale of all the six branches

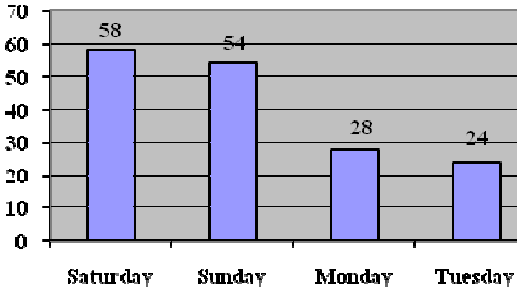
$$= \frac{850+725+650+555+700+410}{6}$$

$$= \frac{3890}{6}$$

= 648.33

In branch A, B, C and E the sale of cars was more than the average sale of all the six branches.

131. Study the following bar graph and answer the given question. The given bar graph shows the number of movie tickets sold in four days.



Reference : Number of movie tickets sold, Saturday, Sunday, Monday, Tuesday are days.

If the average number of tickets sold on Monday, Tuesday and wednesday was 31, the what was the number of tickets sold on wednesday ?

(a) 39 (b) 45

(c) 43 (d) 41

RRB GROUP-D – 30/09/2022 (Shift-I)

Ans. (d) : Let the number of tickets sold on Wednesday = x

According to the question,

$$\frac{28+24+x}{3} = 31$$

$$\Rightarrow x = 93-(28+24)$$

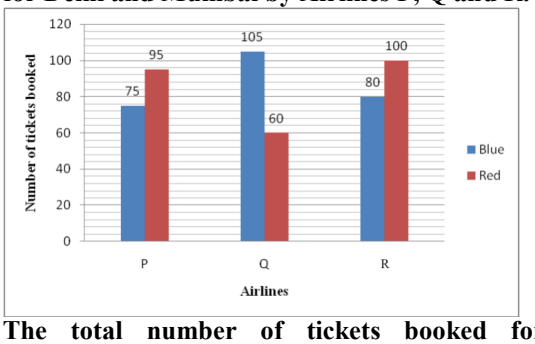
x = 93–52

x = 41

Hence the number of tickets sold on wednesday = 41

132. Study the given bar-graph and answer the question that follows.

The bar-depicts the number of tickers booked for Delhi and Mumbai by Airlines P, Q and R.



The total number of tickets booked for Mumbai by Airlines Q and R was what per cent more than the number of tickets booked for Delhi by Airline R ?

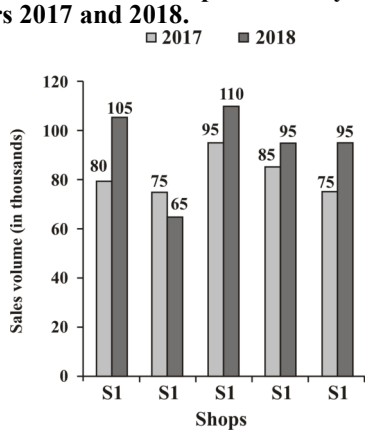
(a) 150% (b) 100%
(c) 200% (d) 50%

RRB Group-D 29-09-2022 (Shift-II)

Ans. (a) : According to the question,
Total number of tickets booked for Mumbai by Airlines Q and R = 60 + 100 = 160
Number of tickets booked for Delhi by Airline R = 80

$$\text{More percentage} = \frac{160-80}{80}\times 100$$
$$= 100\%$$

133. Study the graph and answer the question that follows. The following bar chart shows the sales volume of Philips bulbs (in thousand) from five different electric shops in a city during two years 2017 and 2018.



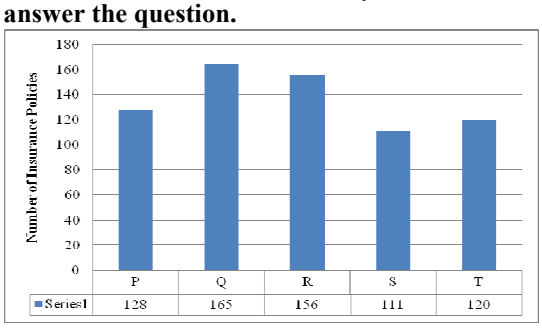
What is the average sales volume of Philips bulbs (in numbers) from all the shops for the year 2017?

(a) 83000 (b) 80000
(c) 81000 (d) 82000

RRB GROUP-D – 22/09/2022 (Shift-III)

Ans. (d) : The average sales volume of philips bulbs from all the shops $= \left(\frac{80+75+95+85+75}{5}\right)$ thousand
= 82 thousand
= 82000

134. The following chart shows the numbers of insurance policies sold by five salespersons named P, Q, R S and T. Study the chart and answer the question.



What is the percentage share of insurance policies sold by Q in the total insurance policies sold by all five salespersons?

(a) 25% (b) 28%
(c) 30% (d) 20%

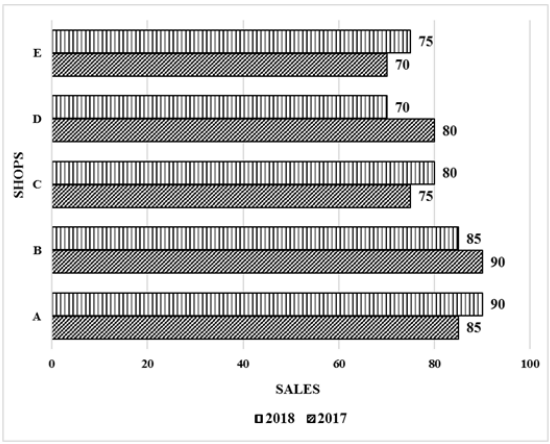
RRB GROUP-D – 17/08/2022 (Shift-II)

Ans. (a) : According to the question :
Total insurance policies sold by all live salespersion
= 128 + 165 + 136 + 111 + 120
= 660
Insurance policies sold by Q = 165

$$\text{Percentage} = \frac{Q}{P+Q+R+S+T}$$
$$= \frac{165}{660}\times 100 = 25\%$$

Hence, option 'a' is correct.

135. The given bar graph shows the sales of inverters of five different shops, A, B, C, D and E, in the years 2017 and 2018.



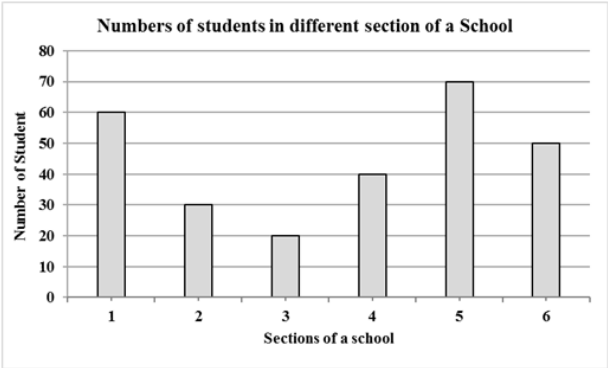
What is the ratio of the total sales of shop A for both the years to that of shop D for both the years?

(a) 5:3 (b) 6:5
(c) 1:3 (d) 7:6

RRB NTPC 02.02.2021 (Shift-I) Stage Ist

Ans. (d) : According to the question:–
Total sales of shop A in both the years = 90 + 85 = 175
Total sales of shop D in both the years = 70 + 80 = 150
Required ratio = 175:150 = 7:6

Direction - (116 - 119): Observe the bar graph showing the number of students in different sections of a school and answer the question.



136. The strength of which of the following two sections is in the ratio of 1 : 3 ?

(a) Sections 2 and 5 (b) Sections 3 and 1
(c) Sections 3 and 5 (d) Sections 2 and 6

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) : From options,
Ratio of number of students in section 2 and 5 = 30 : 70 = 3 : 7
Ratio of number of students in section 3 and 1 = 20 : 60 = 1 : 3
Ratio of number of students in section 3 and 5 = 20 : 70 = 2 : 7
Ratio of number of students in section 2 and 6 = 30 : 50 = 3 : 5
Hence, it is clear from above, option (b) is correct.

137. Which of the sections given below has exactly double the number of students as compared one of the other sections?

(a) 3 (b) 4
(c) 5 (d) 2

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) : As per the graph,
Section with the lowest number of students is 3 in which the number of students is 20.
Number of students in section 3 = 20
Number of students in section 4 = 40
Hence, option (b) is correct.

138. What is the difference between the average number of students in the 3 most populated sections and the 3 least populated sections?

(a) 50 (b) 20
(c) 40 (d) 30

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (d) : Average of students in 3 highest populated sections – Average of students in 3 least populated sections.

$$= \frac{60+70+50}{3} - \frac{40+30+20}{3}$$
$$= 60 - 30$$
$$= 30$$

139. Which section has nearly the average number of students when compared with all the 6 sections of the graph?

(a) Section 2 and 3 (b) Section 4 and 6
(c) Section 1 and 3 (d) Section 4 and 5

RRB NTPC 13.01.2021 (Shift-II) Stage Ist

Ans. (b) : Average number of students in six sections

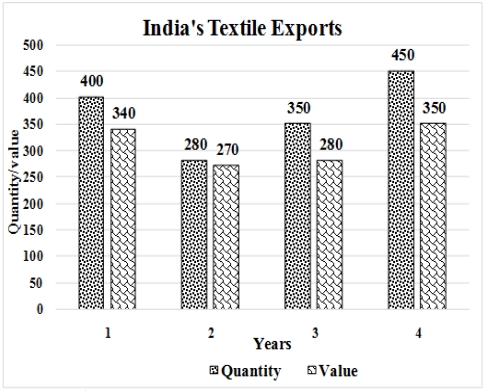
$$= \frac{60+30+20+40+70+50}{6}$$
$$= 45$$

Average of section 4 and 6.

$$= \frac{40+50}{2} = \frac{90}{2} = 45$$

Hence, the required sections are 4 and 6.

140. The following bar graph shows the quantity (in number of containers) and value (in Rupee crores) of India's textile exports for 4 years. Based on the graph answer the question given below.
quantity - value, India's textile export.
In which year the value per container was minimum?



(a) 2nd year (b) 1st year
(c) 3rd year (d) 4th year

RRB NTPC 11.03.2021 (Shift-I) Stage Ist

Ans. (d) : Value per container in 1st year $= \frac{340}{400} = ₹0.85$

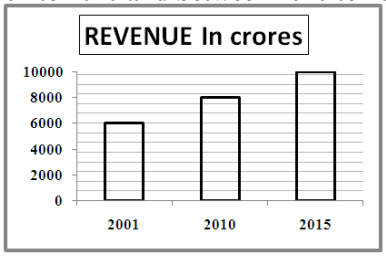
Value per container in 2nd year $= \frac{270}{280} = ₹0.96$

Value per container in 3rd year $= \frac{280}{350} = ₹0.80$

Value per container in 4th year $= \frac{350}{450} = ₹0.77$

Hence, it is clear that the value per container was minimum in 4th year.

141. The revenue earned by Company A in 2001 is ₹ 6,300 crore, that earned in 2010 is ₹ 8,100 crore and that earned in 2015 is ₹ 10,800 crore. What is the ratio of the increase in revenue between 2001 to 2010 and between 2010 to 2015?



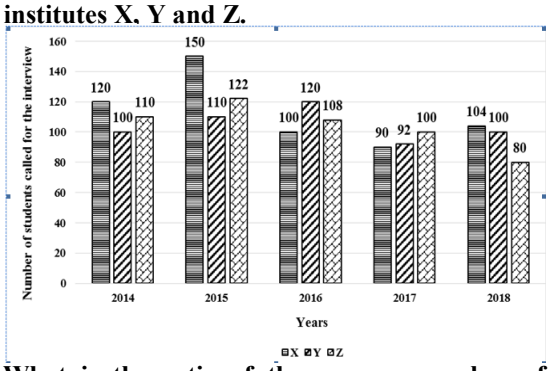
(a) 1 : 2 (b) 2 : 3
(c) 1 : 1 (d) 3 : 2

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : Given-
Revenue earned by the company in 2001 = ₹6,300 crore
Revenue earned by the company in 2010 = ₹8,100 crore
Revenue earned by the company in 2015 = ₹10,800 crore
Increase in revenue between 2001 and 2010 = ₹8100–₹6300 = ₹1800 crore
Increase in revenue between 2010 and 2015 = ₹10800–₹8100 = ₹2700 crore
Ratio of increase in revenue between 2001 to 2010 and 2010 to 2015 = $\frac{1800}{2700}$

$= \frac{2}{3} = 2 : 3$

142. Observe the bar graph below and answer the question. The bar graph shows the data for the years 2014 to 2018 of the number of students who were called for a job interview of a certain company. The interview was for the post of HR and the students were from three different institutes X, Y and Z.



What is the ratio of the average number of students called for the interview from the institute X during the period 2014 to 2016 to the average number of students from the institute Y called for the interview during the same period ?
(Reference = number of students called for the interview)
(a) 13 : 43 (b) 37 : 33
(c) 43 : 13 (d) 33 : 37

RRB NTPC 09.03.2021 (Shift-II) Stage Ist

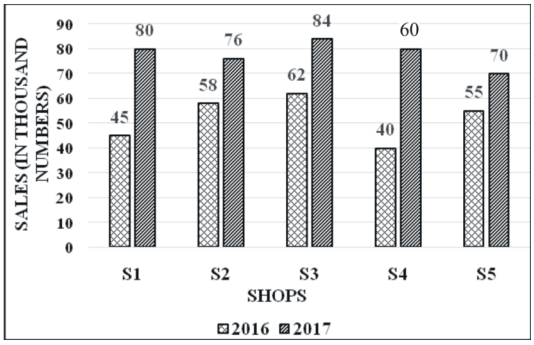
Ans. (b) : Average number of students called for interview from institute X during period 2014 to 2016 $= \frac{120+150+100}{3} = \frac{370}{3}$

Average number of students called for interview from institute Y during period 2014 to 2016 $= \frac{100+110+120}{3} = \frac{330}{3}$

Required ratio $= \frac{370}{3} : \frac{330}{3}$

$= 37 : 33$

143. The given graph shows the sales of hard drives (in thousand numbers) from five different shops S1, S2, S3, S4, S5 in the years 2016 and 2017



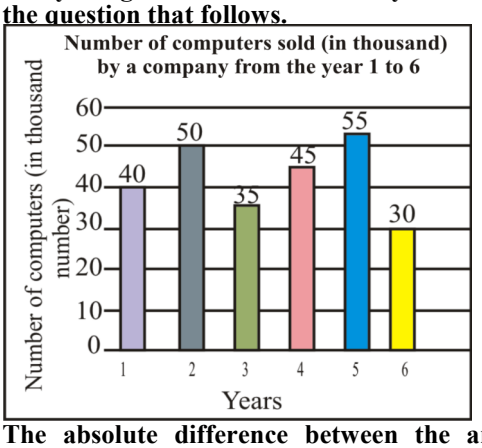
What is the ratio of total sales in all the shops in 2016 to that of the total sales in all the shops in 2017?
(a) 74 : 52 (b) 31 : 42
(c) 45 : 80 (d) 26 : 37

RRB NTPC 07.04.2021 (Shift-II) Stage Ist

Ans. (d) : Total sales of all the shops in 2016
= 45 + 58 + 62 + 40 + 55
= 260
Total sales of all the shops in 2017
= 80 + 76 + 84 + 60 + 70
= 370
So, required ratio = $\frac{260}{370}$

$= \frac{26}{37} = 26 : 37$

144. Study the given bar chart carefully and answer the question that follows.

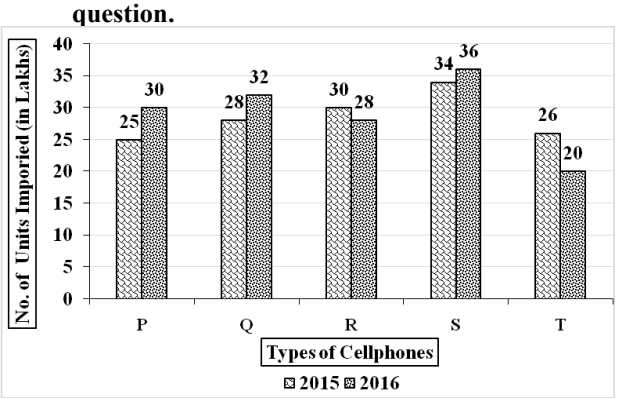


The absolute difference between the annual sales in year 4 and the average sales for all six years is the same as the absolute difference between the annual sales in another year and the average sales for all six years. Identify the year.
(a) Year 4 (b) Year 2
(c) Year 1 (d) Year 3

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (c) : Annual sales in year 4 = 45 thousand
Avg. sales of all 6 years.
$= \frac{40+50+35+45+55+30}{6} = \frac{255}{6} = 42.5$ thousand
Required difference = (45 – 42.5) thousand
= 2.5 thousand
Annual sales in year 1 = 40 thousand
Required difference = 42.5 – 40 = 2.5 thousand
Hence, intended year = year 1.

145. The bar graph given below shows the total number of different types of cell phones- P,Q Q, R, S and T (in lakhs numbers) imported by a company in the year 2015 and 2016, Study the graph carefully and answer the given question.



Which of the following types of cell phones from 2015 to 2016 has the minimum percentage change (increase or decrease) in the number of imported cell phones ?

(a) P (b) S
(c) R (d) Q

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (b) : Percentages change of cell-phones–

$P \to 30 - 25 \Rightarrow \frac{5}{25} \times 100 = 20\%$ (Increase)

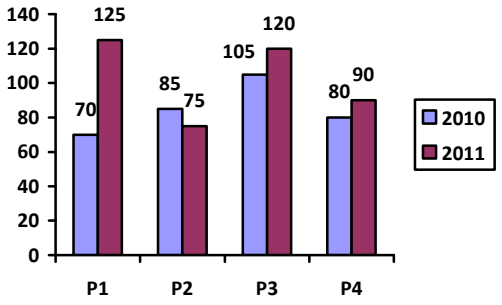
$S \to 34 - 36 \Rightarrow \frac{2}{34} \times 100 = 6\%$ (Approx) (Increase)

$R \to 30 - 28 \Rightarrow \frac{2}{30} \times 100 = 6\frac{2}{3}\%$ (Decrease)

$Q \to 28 - 32 \Rightarrow \frac{4}{28} \times 100 = 14\frac{2}{7}\%$ (Increase)

Hence, the minimum percentage change in the form of growth belongs to company S.

146. The graph given below shows the sales of books (in thousands) from four branches of ABC Publishing House during two consecutive years. What is the ratio of total sales of branch P2 for that of P4 for both years?

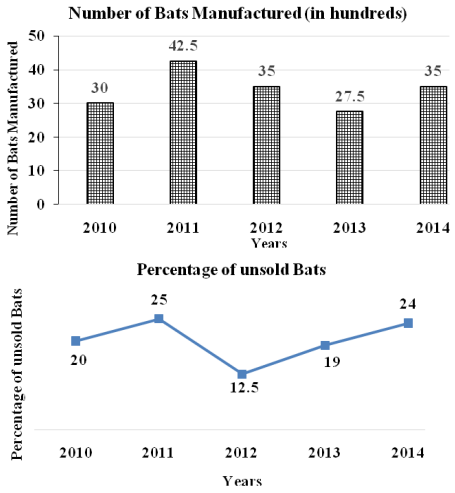


(a) 61 : 71
(b) 16 : 17
(c) 71 : 61
(d) 17 : 16

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : From the given graph,
Total sales of branch P_2 for both the years = 85 + 75 = 160
Total sales of branch P_4 for both the years = 80 + 90 = 170
Required ratio = 160 : 170
= 16 : 17

147. The given graph shows the number (in hundreds) of bats manufactured and the following line graph shows the percentage of unsold bats by a factory in Meerut over the period of 2010-2014



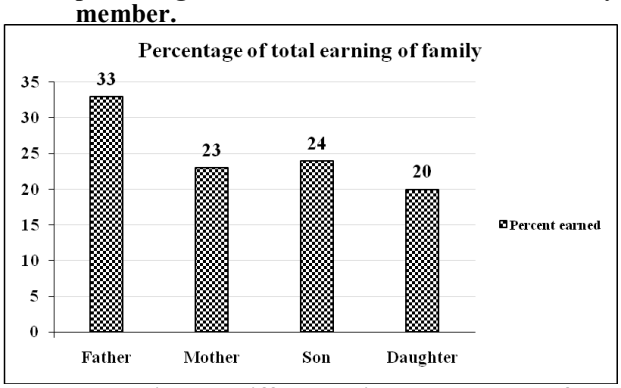
What is the difference between the number of bats sold in the year 2010 and year 2014?

(a) 240 (b) 260
(c) 500 (d) 200

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) : Difference between the number of bats sold in the year 2010 and year 2014
= 3000×80% ~ 3500×76%
= 2400 ~2660 = 2660 – 2400 = 260

148. Observe the bar graph and answer the question below.
The total annual earnings of a family of four members is ₹12 lakhs. The bar graph shows the percentage of contribution of each family member.



What is the difference in the salary of the highest and the lowest earning members?

(a) ₹15,600 (b) ₹11,60,000
(c) ₹1,560 (d) ₹1,56,000

RRB NTPC 04.01.2021 (Shift-II) Stage Ist

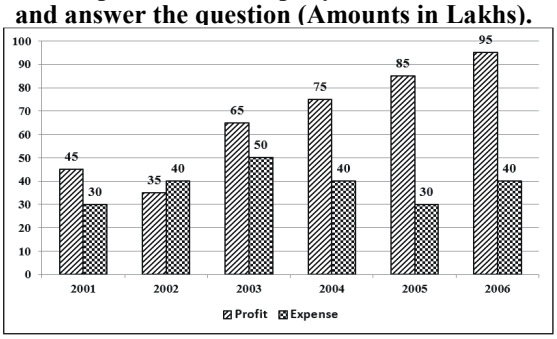
Ans. (d) : According to the given bar graph

Percentage of difference between highest income and lowest income.

$= (33 - 20)\% = 13\%$

$$\text{Required difference} = 1200000 \times \frac{13}{100} = ₹\ 1,56,000$$

149. Study the following graph showing the Profit and Expense of a Company from 2001 to 2006 and answer the question (Amounts in Lakhs).



For how many years was the profit more than the average profit of the given years

(a) 1 (b) 3

(c) 2 (d) 4

RRB NTPC 05.03.2021 (Shift-I) Stage Ist

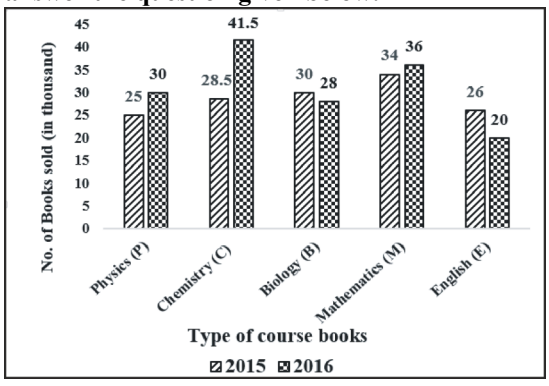
Ans. (b) : Average profit $= \dfrac{\text{Sum of profits in total years}}{\text{Total number of years}}$

$$= \frac{45+35+65+75+85+95}{6}$$

$$\text{Average profit} = \frac{400}{6} = 66.66 \text{ lakhs}$$

It is clear from the graph that the profit for three years (2004, 2005 and 2006) (75, 85, 96 lakhs respectively) is more than their average profit (66.66 lakhs).

150. The following bar graph shows the total number of course books for five subjects Physics, Chemistry, Biology, Mathematics and English (in thousands), sold by a printing company in 2015 and 2016. Based on the graph answer the question given below.



Find the percentage of the numbers of Mathematics books sold in 2015, to that of the number of English books sold in 2016.

(a) 100% (b) 170%

(c) 200% (d) 150%

RRB NTPC 03.03.2021 (Shift-I) Stage Ist

Ans. (b)

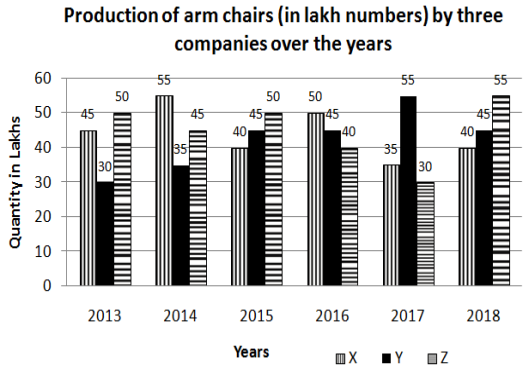
Number of Mathematics books sold in 2015 = 34

Number of English books sold in 2016 = 20

$$\text{Required percentage} = \frac{34}{20} \times 100 = 34 \times 5 = 170\%$$

151. Observe the given bar graph and answer the question.

The bar graph shows the production of arm chairs by three companies X, Y and Z for the years 2013 to 2018.



What is the ratio of the production of company Z in 2017 to that of company Y in 2014 ?

(a) 7 : 6 (b) 6 : 7

(c) 9 : 7 (d) 7 : 9

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (b) :

Production of arm chairs by company Z in year 2017 = 30 lakh

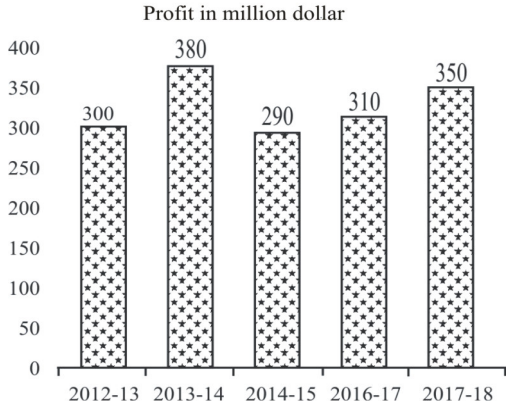
Production of arm chiars by company Y in year 2014 = 35 lakh

Thus, the ratio of the production of arm chairs of company Z in the year 2017 to that of company Y in the year $2014 = \dfrac{30}{35} = \dfrac{6}{7}$

Hence, required ratio = 6 : 7

152. Observe the given bar graph and answer the question.

The bar graph shows the profit made by a software company (in million $) from 2012 to 2018.



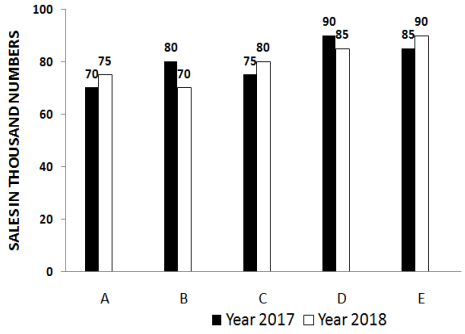
The profit made by the software company in 2013-2014 was approximately how many times that made in 2014-2015 ?

(a) 1.31 (b) 2.52
(c) 0.7 (d) 0.5

RRB NTPC 23.02.2021 (Shift-I) Stage Ist

Ans. (a) : Profit earned by software company in 2013 – 2014 = $380 million
Profit earned by the software company in 2014-2015 = $ 290 million
If profit earned by software company in 2013-2014 was x times of profit earned in 2014-2015.
Then,
$290 \times x = 380$
$x = \frac{380}{290} = 1.31$

153. The following bar graph shows the sales of bicycle (in thousand numbers) from five different shops A, B, C, D and E, in 2017 and 2018.



{Reference- SALES (IN THOUSAND NUMBERS) - बिक्री (in thousands), year}

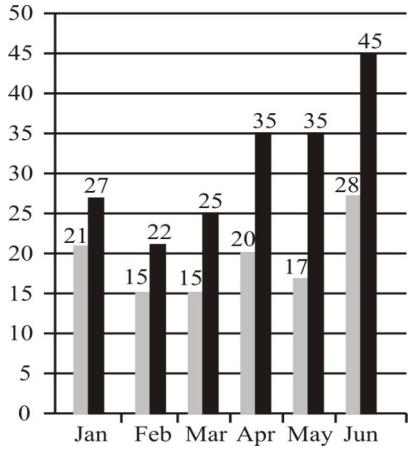
What is the ratio of the total sales of shop C for both the years to the total sales of shop E for both the years?

(a) 31 : 35 (b) 35 : 31
(c) 29 : 31 (d) 4 : 5

RRB NTPC 09.02.2021 (Shift-I) Stage Ist

Ans. (a) :
Total sales of shop C in both years = 75 + 80
= 155
Total sales of shop E in both years = 85 + 90
= 175
Ratio of sales of shop C and E = 155 : 175
= 31 : 35

154. The given graph X shows the bike registration in the city in 6 months and total vehicles (in thousand) in the year 2017.
Note : The first column in the chart shows the bike (brown) and the second one shows the total vehicle (black).
What is the number of registered vehicles in addition to the bike in the March 2017 based on the given data.



(a) 15000 (b) 10000
(c) 9000 (d) 11000

RRB RPF Constable – 19/01/2019 (Shift-I)

Ans : (b) ∵
Registered number of bikes in March 2017 = 15000
Total vehicles in March 2017 = 25000
Hence, the number of vehicles registered other than bikes.
= 25000–15000 = 10000

155. In the following graph, income from the laundry and dry cleaner chains of four different shop is given, its values are given in the form of Rupees.



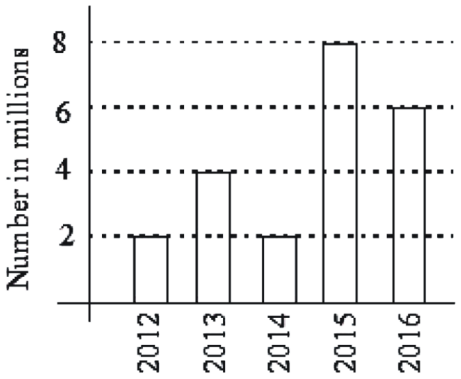
What is percentage difference between month 1 and month 4.

(a) less than 20% (b) more than 25%
(c) mote than 50% (d) less than 25%

RRB RPF SI – 12/01/2019 (Shift-III)

Ans : (a) Difference between month 1 and 4
= 25000-20000 = 5000
Required % difference $= \frac{5000}{25000} \times 100 = 20\%$
Hence, the income of month 4 are 20% less than the income of month 1.

156. The figure below report the number of vehicle locomotives manufactured by the company 'ABC' in last 5 years.



In which year were the largest number of locomotives manufactured?

(a) 2015 (b) 2014
(c) 2016 (d) 2012

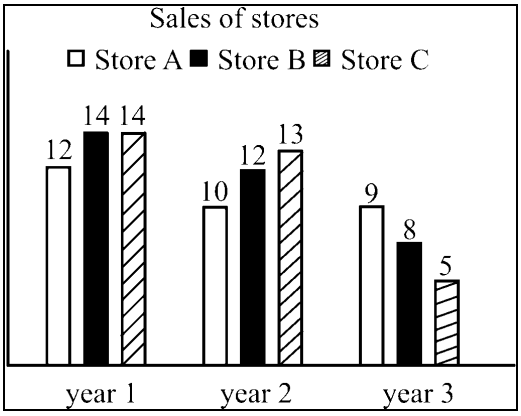
RRB Group-D – 19/09/2018 (Shift-II)

Ans. (a) : According to given graph-

year	Manufacture engines (Millions)
2012	2 Millions
2013	4 Millions
2014	2 Millions
2015	8 Millions
2016	6 Millions

Hence, it is clear from the table that the highest production of engines has been done (8 Millions) in the year 2015.

157.



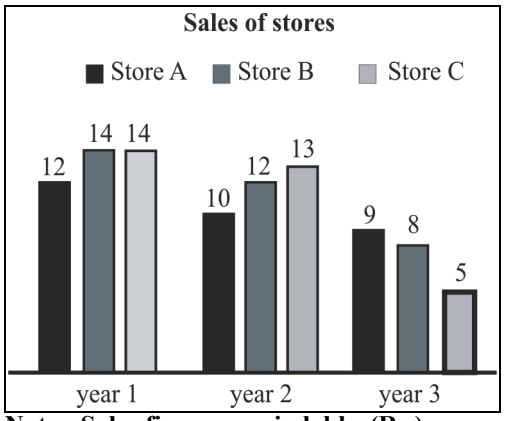
In which year sales of shop C is lower than other 2 years?

(a) year 3
(b) year 1
(c) Sales are same in 3 year
(d) year 2

RRB Group-D – 20/09/2018 (Shift-III)

Ans : (a) Sales of shop C in year 1 = 14
Sales of shop C in year 2 = 13
Sales of shop C in year 3 = 5
Hence, shop C's sales in year 3 were lower than that of other years:

158. According to the given chart, in which year sales of store B are more than 13 lakhs?



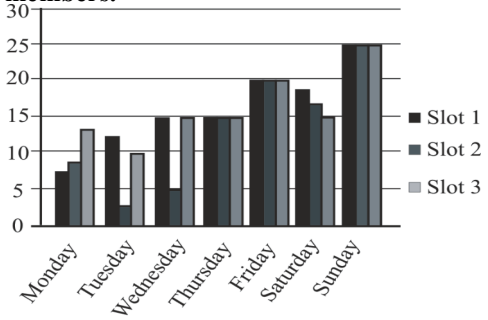
Note : Sales figures are in lakhs (Rs.)

(a) 2 year (b) 1 year and 2 year
(c) 1 year (d) 3 year

RRB Group-D – 23/09/2018 (Shift-I)

Ans : (c) After studying the given chart, it is found that the sales of store B in year 1 = 14 Lakhs
The sales of store B in year 2 = 12 Lakhs
And sales of store B in year 3 = 8 Lakhs
Hence, it is clear that the sales of store B in year 1 are more than 13 lakhs.

159. A private gym can accommodates up to 25 people in a time slot. Its user has three different times slots and the following chart shows the average visitors a week. What is the day when they cannot accommodates more members.

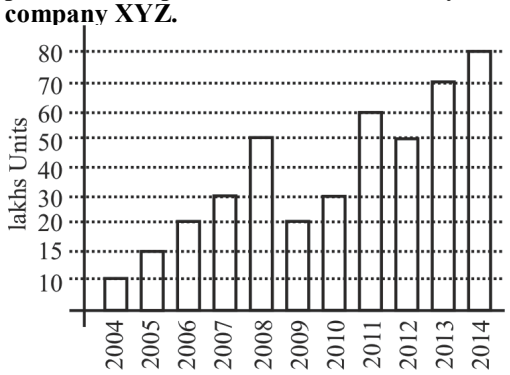


(a) Friday (b) Sunday
(c) Saturday (d) Thursday

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (b) According to the given chart, on Sunday the number of people in slot 1, slot 2, slot 3 = 25
So on Sunday they could not accommodate more members.

160. The graph below shows information on the personal computer sales over the 11 years by company XYZ.



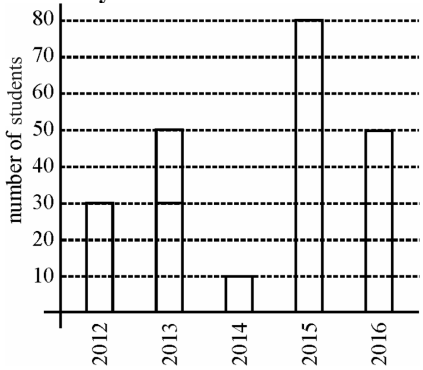
How many units of personal computer were sold by company XYZ in the year 2009. (in lakhs)

(a) 30 (b) 20
(c) 10 (d) 15

RRB Group-D – 10/10/2018 (Shift-II)

Ans : (b) The bar graph given above shows that the sales of private computers by the company XYZ in the year 2009 are 20 lakhs

161. The following bar graph gives information about the students who passed the institute ABC in the national level entrance examination in last 5 years.



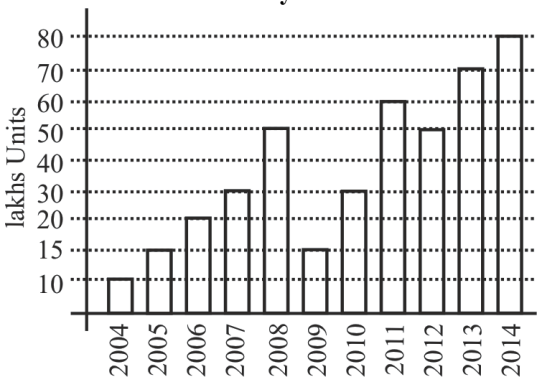
How many students passed from the institute in 2016?

(a) 40 (b) 50
(c) 30 (d) 60

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (b) It is clear from the given bar graph that the number of students passed from institute ABC in the year 2016 = 50

162. The following bar graph displays personal computer information sold by the company XYZ over the last 11 years.



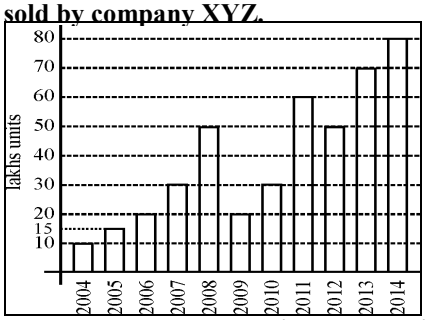
In which year was the lowest personal computer sold by the company XYZ.

(a) 2012 (b) 2014
(c) 2005 (d) 2004

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (d) In the given graph, 2004 graph is at the bottom of all other years. So, it is clear from this in 2004 personal computer sales were the lowest at 10 lakhs.

163. The following bar graph displays personal computer information sold by the computer sold by company XYZ.



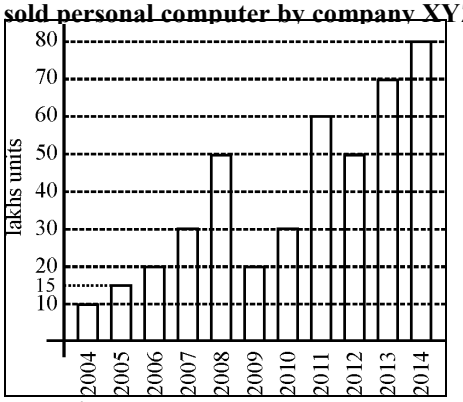
How many computers did XYZ sell in the year 2006?

(a) 10 (b) 15
(c) 20 (d) 30

RRB Group-D – 11/12/2018 (Shift-II)

Ans : (c) It is clear from the given bar graph that in the year 2006 the company XYZ sold 20 lakhs units of personal computers.

164. The following bar graph represent for 11 years, sold personal computer by company XYZ.



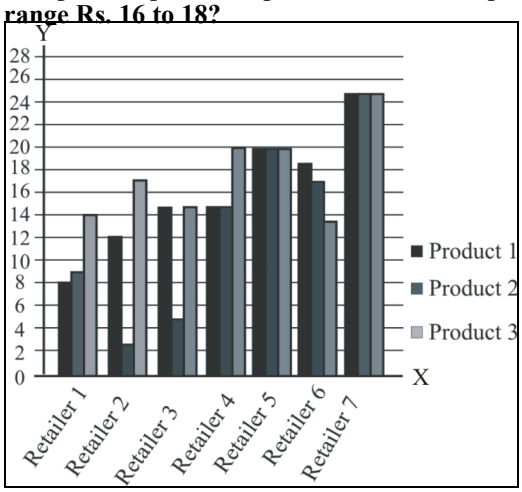
In which year were most computer sold by company XYZ. (in lakhs)

(a) 2014 (b) 2012
(c) 2013 (d) 2007

RRB Group-D – 22/10/2018 (Shift-III)

Ans : (a) Most personal computers (80 lakhs) have been sold by the company XYZ in the year 2014.

165. According to following chart, which retail salesperson provides product 2 in the price range Rs. 16 to 18?



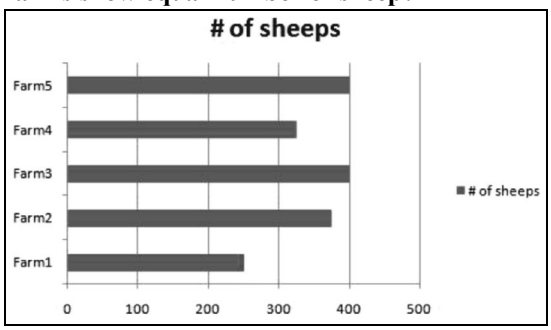
Note : Y axis indicates prize in rupees and X-axis represents the retailers.

(a) Retail Salesperson 1
(b) Retail Salesperson 6
(c) Retail Salesperson 7
(d) Retail Salesperson 2

RRB Group-D – 27/09/2018 (Shift-III)

Ans : (b) According to the chart, the price of Rs. 16 to Rs. 18 is available under the retailer 6

166. On the basis of graph given below which two farms show equal number of sheep?

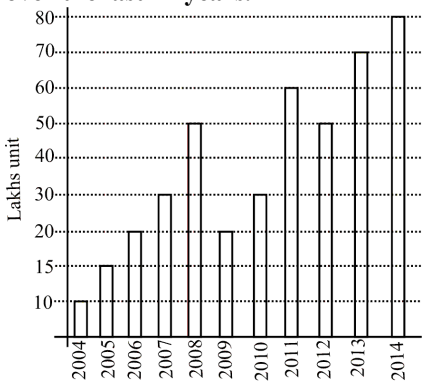


(a) Farm 3 and Farm 2
(b) Farm 3 and Farm 1
(c) Farm 4 and Farm 5
(d) Farm 3 and Farm 5

RRB Group-D – 10/10/2018 (Shift-I)

Ans : (d) The number of sheep in farm 5 and farm 3 in the given graph is same.

167. The following bar graph shows information on personal computers sold by the company 'XYZ' over the last 11 years.



Which year was the maximum sales during the year 2004 to 2010?

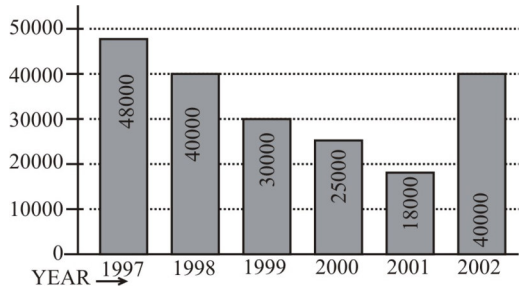
(a) 2010 (b) 2006
(c) 2008 (d) 2004

RRB Group-D – 24/10/2018 (Shift-III)

Ans. (c) : During the year 2004-10, the maximum sales were made in 2008, which was 50 lakh sales.

Note (148-150): Study this bar chart and answer the following question.

Following table shows the details of TV sets selling over the years.



168. What is the percentage increment of TV sets selling in years 2001 to 2002 ?

(a) 115% (b) 128%
(c) 122% (d) 118%

RRB NTPC 30.04.2016 Shift : 2

Ans. (c) : % increase in sales of TV sets from 2001 to 2002

$$= \frac{40000 - 18000}{18000} \times 100$$

$$= \frac{22000 \times 100}{18000} = 122.22\%$$

$\therefore$ % increase $\approx 122\%$

169. The sum of sales for TV sets held in the year 1999 and year 2001 is equal to the sales of which year?

(a) 1997 (b) 1993
(c) 2000 (d) 2002

RRB NTPC 30.04.2016 Shift : 2

Ans. (a) : The sum of sales of TV sets in the year 1999 and year 2001 = 30000 + 18,000 = 48000
Hence, 48000 sales of T.V. sets is equal to the sales of year 1997.

170. The rate of sales for TV sets has been minimum between which two years?

(a) 1998 and 1999
(b) 1999 and 2000
(c) 1997 and 1998
(d) 2001 and 2002

RRB NTPC 30.04.2016 Shift : 2

Ans. (b) : From options,
The difference of sales for TV sets between the year 1998 and 1999

40000 – 30000 = 10,000

The difference of sales for TV sets between the year 1999 and 2000

30000 – 25000 = 5,000

The difference of sales for TV sets between the year 1997 and 1998

48000 – 400000 = 8,000

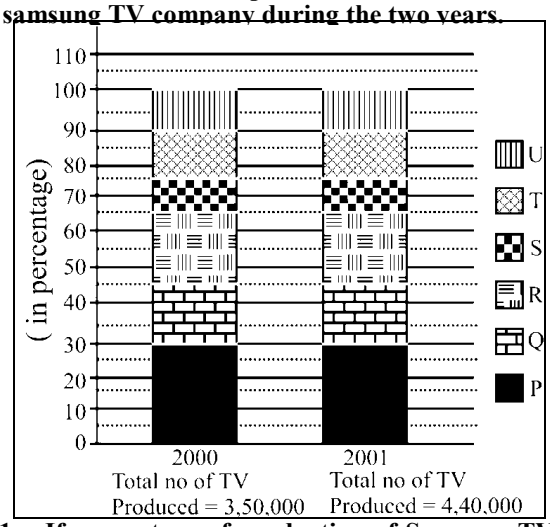
The difference of sales for TV sets between the year 2001 and 2002

40000 – 18000 = 22,000

Therefore, between year 1999 and 2000, the difference in sales of TV sets was minimum.

Note (151-153): Answer the following questions on the basis of given information.

The bar graph below shows the percentage of distribution of the total production of various models of samsung TV company during the two years.



171. If percentage of production of Samsung TV in 2001 was same as the year 2000, what would be the number of production of P type Samsung TV in 2001?

(a) 1,40,000 (b) 1,32,000
(c) 1,17,000 (d) 1,05,000

RRB NTPC 30.04.2016 Shift : 1

Ans. (b) : Number of production of P type Samsung TV in 2001

$$= 440000 \times \frac{30}{100}$$
$$= 132000$$

172. If the company had sold 85% of S type Samsung TV in each year, then how many S-type Samsung TV were not sold?

(a) 76,500 (b) 93,500
(c) 11,850 (d) 12,2500

RRB NTPC 30.04.2016 Shift : 1

Ans. (c) : Number of S type Samsung TV were not sold

$$= 350000 \times \frac{10}{100} \times \frac{(100-85)}{100} + \frac{440000 \times (100-85)}{100} \times \frac{10}{100}$$
$$= 35000 \times \frac{15}{100} + \frac{44000 \times 15}{100}$$
$$= 5250 + 6600$$
$$= 11850$$

173. What is the total number of Samsung TV manufactured in P, Q and T models in the year 2000?

(a) 2,45,0000 (b) 2,27,5000
(c) 2,10,000 (d) 1,92,5000

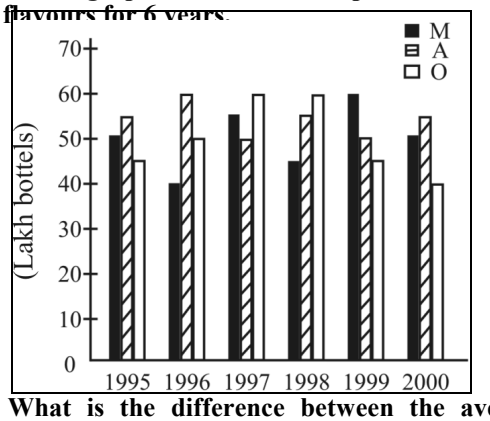
RRB NTPC 30.04.2016 Shift : 1

Ans. (c) : In year 2000, total number of manufactured Samsung TV of P(30%), Q (15%) and T(15%) models

$$= 350000 \times \frac{60}{100} = 210000$$

Note (154-156): Answer the following questions based on the information.

The Coca-Cola company makes drinks in three different flavour Mint (M), Apple (A) and Orange (O). The bar graph below shows the production of the three flavours for 6 years.



174. What is the difference between the average production of flavour mint in years 1995, 1996 and 1997 and the average production of flavour apples in the years 1998, 1999 and 2000.

(a) 5,000 bottles (b) 80,000 bottles
(c) 2,40,000 bottles (d) 5,00,000 bottles

RRB NTPC 29.04.2016 Shift : 3

Ans. (d) : Average production of flavour mint in year 1995, 1996 and 1997 $= \frac{50+40+55}{3} = \frac{145}{3}$ lakh bottles

Average production of flavour apple in year 1998, 1999 and 2000

$$= \frac{55+50+55}{3} = \frac{160}{3} \text{ lakh bottles}$$

$\therefore$ Intended difference $= \frac{160}{3} - \frac{145}{3} = 5$ lakh bottles
$= 5{,}00{,}000$ bottles

175. The annual average production of which flavour in the given period is maximum?

(a) Flavour mint (b) Flavour apple
(c) Flavour orange (d) Mint and apple

RRB NTPC 29.04.2016 Shift : 3

Ans. (b) : Total annual average production of flavour mint

$$= \frac{50+40+55+45+60+50}{6}$$
$$= \frac{300}{6} = 50 \text{ lakh bottles}$$

Total annual average production of flavour apple

$$= \frac{55+60+50+55+50+55}{6}$$
$$= \frac{325}{6} = 54.166 \text{ lakh bottles}$$

Total annual average production of flavour orange

$$= \frac{45+50+60+60+45+40}{6}$$
$$= \frac{300}{6} = 50 \text{ lakh bottles}$$

So, total annual average production of flavour apple is maximum

176. How much did the production of Orange flavour reduce in the year 2000 compared to in the year 1998 ?

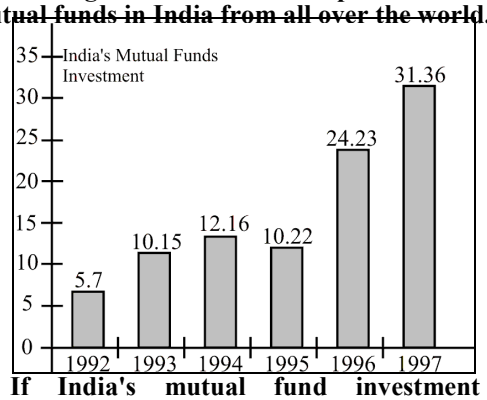
(a) 50% (b) 42%
(c) 33% (d) 25%

RRB NTPC 29.04.2016 Shift : 3

Ans. (c) : Intended loss $\% = \left(\frac{60-40}{60}\right)\times 100$
$= 33.33\% = 33\%$

Given the answer of the questions based on the following chart:

Following bar chart shows the polls of investment of mutual funds in India from all over the world.



177. If India's mutual fund investment was proportionately the same as that of the whole of the world mutual fund investment in 1992 and if mutual fund investment from these countries was 2 million euros in 1992, what was the amount of mutual fund investment from these countries in 1997.

(a) 11 (b) 0.72
(c) 11.28 (d) 11.5

RRB NTPC 27.04.2016 Shift : 1

Ans. (a) : Mutual fund investment ratio in 1992 and 1997 $= \frac{5.7}{31.66} = \frac{570}{3136} = \frac{285}{1568}$

Let mutual fund investment is 285x and 1568x million euro in year 1992 and 1997

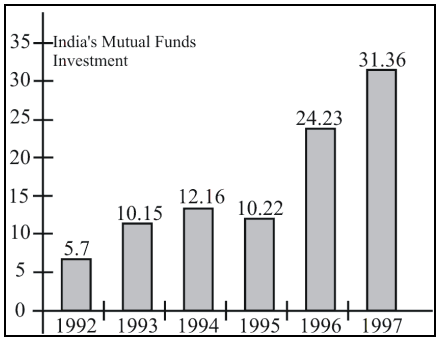
$\therefore$ 285x = 2 million euros

$$x = \frac{2}{285}$$

$\therefore$ Quantity of mutual fund investment from the country in 1997

$$= 1568 \times \frac{2}{285} = 11.003 \approx 11 \text{ million euros}$$

The following bar charts refers to the trend of mutual fund's investment in India from around the world.



178. What was the net gap between 1996 and 1997 in investment of mutual fund in India.

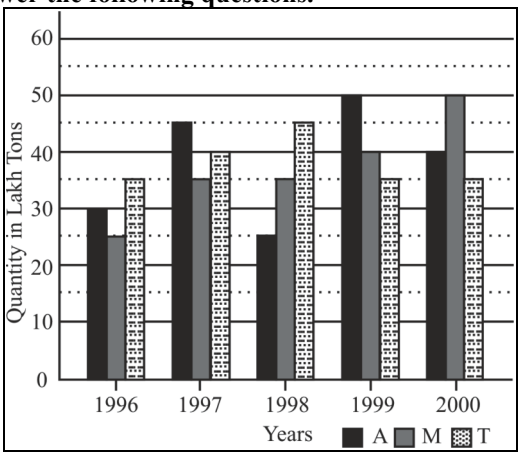
(a) 7.29 (b) 7.13
(c) 8.13 (d) 7.77

RRB NTPC 27.04.2016 Shift : 1

Ans. (b) : Difference in mutual fund's investment in India from year 1996 to 1997 = 31.36 – 24.23 = 7.13

Direction (159-161): The following bar diagram is given below in the last few years, three companies Amber paper mill, Mack paper mill and Tanveer paper mill, respectively shown from A, M, T

If the data produced by paper (in lakh tones) Answer the following questions.



179. Which company produces average in five years maximum ?

(a) Amber paper mill
(b) Mack paper mill
(c) Tanveer paper mill
(d) Both Amber paper mill and Tanveer paper mill

RRB NTPC 07.04.2016 Shift : 1

Ans. (d) : Average production of Amber paper mill

$$(A) = \frac{30+45+25+50+40}{5} = \frac{190}{5} = 38$$

Average production of Mack paper mill

$$= \frac{25+35+35+40+50}{5}$$

$$M = \frac{185}{5} = 37$$

Average production of Tanveer paper mill

$$= \frac{35+40+45+35+35}{5}$$

$$T = \frac{190}{5} = 38$$

Hence, the average production of Amber paper mill and Tanveer paper mill will be equal.

180. In which year the production of Tanveer paper mill was maximum from Mack paper mill.

(a) 1996 (b) 1997
(c) 1998 (d) 1999

RRB NTPC 07.04.2016 Shift : 1

Ans. (a) : Tanveer's production in 1996 = 35
Mack's is production in 1996 = 25

$$\text{Percentage} = \frac{35\times100}{25} = 140\%$$

Tanveer's production in 1997 = 40
Mack's production in 1997 = 35

$$\text{Percentage} = \frac{40\times100}{35} = 114.2\%$$

Tanveer's production in 1998 = 45
Mack's production in 1998 = 35

$$\text{Percentage} = \frac{45\times100}{35} = \frac{9\times100}{7} = 1.28\times100 = 128\%$$

So, in 1996 Tanveer's production percentage is maximum than Mack's production percentage

181. What is the ratio of average production of Amber paper mill and average production of a Mack paper mill from the time 1998-2000?

(a) 1 : 1 (b) 15 : 17
(c) 23 : 25 (d) 27 : 29

RRB NTPC 07.04.2016 Shift : 1

Ans. (c) : Average production of Amber paper mill from (1998- 2000)

$$= \frac{25+50+40}{3} = \frac{115}{3}$$

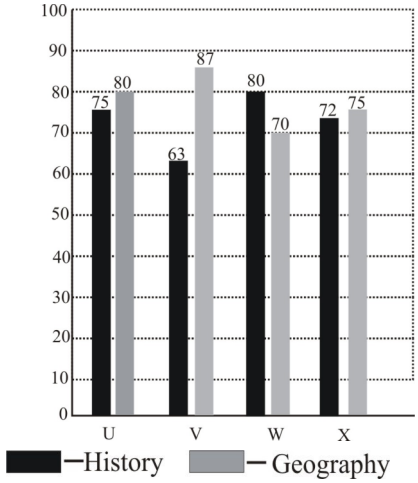
Average production of Mack paper mill from (1998 - 2000)

$$= \frac{35+40+50}{3} = \frac{125}{3}$$

$$\text{Intended ratio} = \frac{115}{3} : \frac{125}{3} = 23:25$$

Note (162-164):

The bar chart represents percentage marks scored by four students U, V, W and X in History and Geography. Consider the bar chart and answer the questions based on it.



182. What is the percentage difference in the total marks obtained in Geography and History?

(a) 7.58% (b) 7%
(c) 4.13% (d) 5.5%

RRB NTPC 03.04.2016 Shift : 2

Ans. (d) : Scored total marks in Geography
= 80+87+70+75 =312
Scored total marks in History
=75+63+80+72= 290
Intended difference %

$$= \left(\frac{312}{4}\right)\% - \left(\frac{290}{4}\right)\% = \frac{22}{4}\% = 5.5\%$$

183. What is the average percentage marks obtained in History by all students?

(a) 78% (b) 75%
(c) 72.5% (d) 70%

RRB NTPC 03.04.2016 Shift : 2

Ans. (c) : Scored average percentage marks in History by all students

$$= \left(\frac{75+63+80+72}{4}\right) = \frac{290}{4}\% = 72.5\%$$

184. Who scored the highest percentage in both the subjects combined?

(a) Both V and W (b) V
(c) W (d) U

RRB NTPC 03.04.2016 Shift : 2

Ans. (d) :
Got percentage marks in History and Geography by U

$$= \frac{(75+80)}{2}\%$$

$$= \frac{155}{2}\% = 77.5\%$$

Got percentage marks in History and Geography by V

$$= \left(\frac{63+87}{2}\right)\% = \frac{150}{2}\% = 75\%$$

Got percentage marks in History and Geography by W

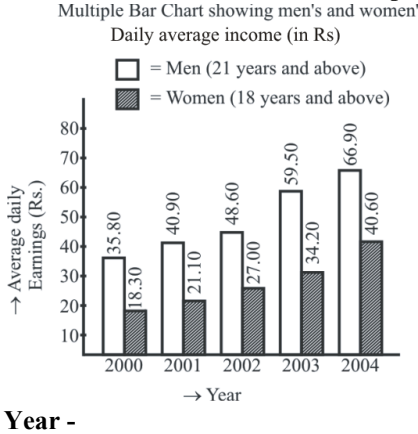
$$= \left(\frac{80+70}{2}\right)\% = 75\%$$

Got percentage marks in History and Geography by X

$$= \left(\frac{72+75}{2}\right)\% = 73.5\%$$

So, percentage marks of U are maximum in both subjects.

185. The given chart shows the daily average income of men and women in company X.



Year -
Daily average income -

Men (21 years and above) -
Women (18 years and above)-
Based on the depicted data, in which year was the percentage increase in the daily average income of men maximum over the preceding year ?

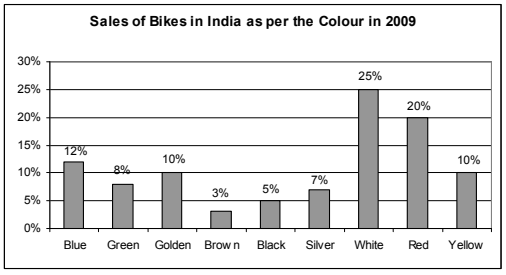
(a) 2003 (b) 2001
(c) 2002 (d) 2004

RRB ALP & Tec. (30-08-18 Shift-I)

Ans : (a)
Daily average income in year 2000 = ₹ 35.80
increase in daily average income in year 2001 =40.90 – 35.80 = ₹ 5.10
Increase in 2002 = 48.60 – 40.90 = ₹ 7.7
Increase in 2003 = 59.50 – 48.60 = ₹ 10.9 (maximum)
Increase in 2004 = 66.90 – 59.50 = ₹ 7.4
Hence, it is clear that is the year 2003, the increase in the daily average income of men was maximum.

$$\text{Increase percentage} = \frac{10.9 \times 100}{48.60} = 22.43\%$$

186. If the total number of bikes sold in 2009 was 50000, then by what number was the sales of white bikes less than that of yellow and red bikes put together?



Sales of bikes by color in India in 2009, blue, green, golden, brown, black, silver, white red and yellow.

(a) 5,000 (b) 2,500
(c) 10,000 (d) 3,000

RRB ALP & Tec. (20-08-18 Shift-I)

Ans : (b) Number of yellow colour bikes

$$= 50000 \times \frac{10}{100} = 5000$$

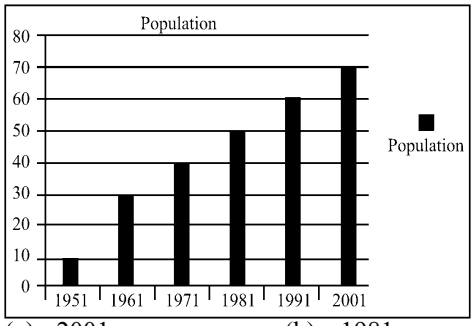
$$\text{Number of red colour bikes} = 50000 \times \frac{20}{100} = 10000$$

Sales of yellow and red colour bikes = 10000 + 5000
= 15000

$$\text{Number of white colour (sale) bikes} = 50000 \times \frac{25}{100}$$

= 12500
Intended difference
= 15000 – 12500 = 2500

187. The percentage increase in the population is highest as compared to that of the previous year in the year :



(a) 2001 (b) 1981
(c) 1971 (d) 1961

RRB ALP & Tec. (17-08-18 Shift-II)

Ans : (d) From options,
Population increase in year 2001

$$= \frac{70-60}{60} \times 100$$

$$= \frac{10}{60} \times 100$$

$$= \frac{100}{6} = 16.66\%$$

Population increase in year 1981 $= \frac{50-40}{40} \times 100$

$$= \frac{10}{40} \times 100$$

$$= \frac{100}{4} = 25\%$$

Population increase in year 1961 $= \frac{30-10}{10} \times 100$

$$= \frac{20}{10} \times 100$$

$$= 200\%$$

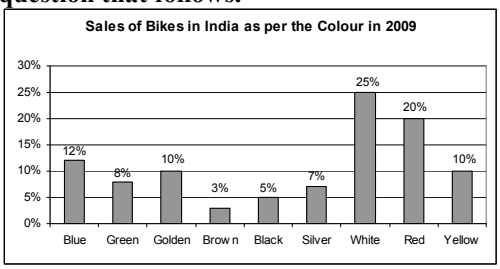
Population increase in year 1971 $= \frac{40-30}{30} \times 100$

$$= \frac{10}{30} \times 100 = \frac{100}{3}$$

$$= 33.33\%$$

So, percentage increase is maximum compare to previous year in year 1961

188. Study the following graph and answer the question that follows.



If the total number of bikes sold in 2009 was 10000 how many more yellow bikes were sold than green ones?

(a) 200 (b) 2000
(c) 1000 (d) 800

RRB ALP & Tec. (10-08-18 Shift-II)

Ans : (a) Total sales = 10000

$$\text{Sales of green colour's bikes} = 10000 \times \frac{8}{100}$$
$$= 800$$

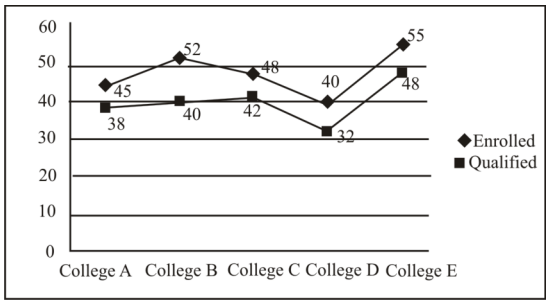
$$\text{Sales of yellow colour's bikes} = 10000 \times \frac{10}{100}$$
$$= 1000$$

Intended difference = 1000 – 800 = 200

Type - 4

189. The following graph represents the number of students enrolled and the number of qualified in five colleges during a particular year.

What is the ratio of enrolled to quallified students across all colleges.



(a) 13:3 (b) 6:7
(c) 6:5 (d) 3:7

RRB NTPC (Stage-2) 16/06/2022 (Shift-III)

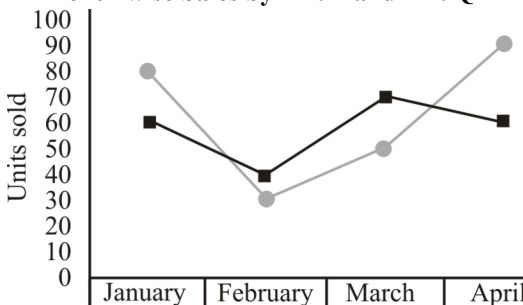
Ans. (c) : Total number of Enrolled Students
= 45+52+48+40+55+ = 240

Total number of qualified students = 38+40+42+32+48 = 200

Required Ratio = 240 : 200
6 : 5

190. The graph and the table below show the units sold by two salesmen. Mr. P and Mr. Q, in 4 months from January to April. Study the graph and the table and answer the question.

Month wise Sales by Mr. P and Mr. Q



	January	February	March	April
P	80	30	50	90
Q	60	40	70	60

What is the respective ratio of the total units sold by Mr. P and Mr. Q during the 4 months?

(a) 25 : 23 (b) 24 : 23
(c) 25 : 27 (d) 23 : 21

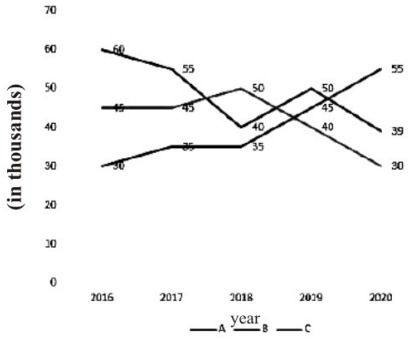
RRB Group-D 18/08/2022 (Shift-I)

Asn. (a) : Units sold by Mr. P during the 4 months from January to April = 80 + 30 + 50 + 90
= 250

Units sold by Mr. Q during the 4 months from January to April
= 60 + 40 + 70 + 60
= 230

Hence the ratio of the total units sold by Mr. P and Mr. Q = 250 : 230 = 25 : 23

191. The following line graph shows the production of laptops by three different companies, namely A, B, C during certain years. Study the line graph and answer the given question.



During which year, the percentage of production of company C was minimum with respect to the production of company A ?

(a) 2017 (b) 2012
(c) 2016 (d) 2014

RRB Group-D 30/08/2022 (Shift-II)

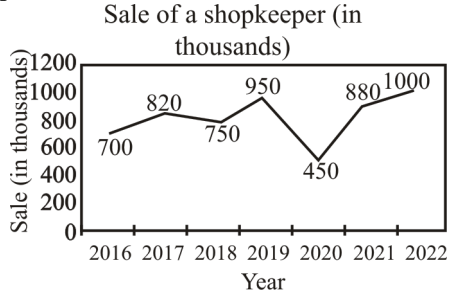
Ans. (c) : The percentage of production of company C to the production of company A in the year 2017

$$= \frac{35}{55} \times 100$$
$$= 63.63\%$$

The percentage of production of company C to the production of company A in the year 2016 $= \frac{30}{60} \times 100$
$= 50\%$

Hence it is clear that the percentage of production of company C to the production of company A during the year 2016 was minimum.

192. The given line graph shows the sale of a shopkeeper (in thousands) from the year 2016 to 2022. Study the graph and answer the question that follows:



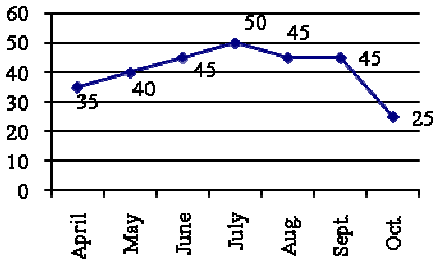
The sale in 2020 is what percentage of sale in 2021?

(a) 51.13 % (b) 73.08 %
(c) 61.73 % (d) 59.31 %

RRB GROUP-D – 29/09/2022 (Shift-III)

Ans. (a) : Percentage of sales in year 2020 to sales in year 2021 $= \frac{450}{880} \times 100$
$= 51.13\%$

193. The following graph shows the expenditure of a family over different months. Study the graph and answer the question.

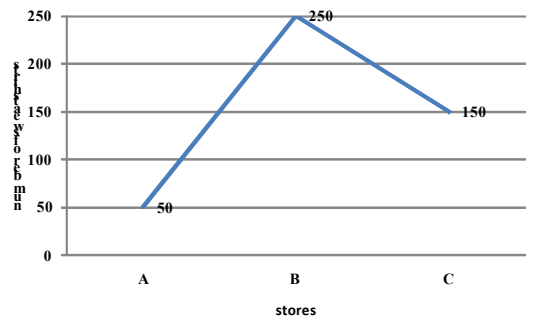


What is the approximate average of the total expenditure in April, May, June, August, September and October (in thousands)?
(a) 16 (b) 39
(c) 26 (d) 84

RRB GROUP-D – 11/10/2022 (Shift-I)

Ans. (b) :
$\text{Average} = \frac{\text{April} + \text{May} + \text{June} + \text{August} + \text{September} + \text{October}}{6}$
$= \frac{35 + 40 + 45 + 45 + 45 + 25}{6}$
$= \frac{235}{6}$
$= 39.16 \approx 39$ (approx)

194. Study the given line graph and answer the following question.
The given line graph depicts the number of sweatshirts in stores A, B and C

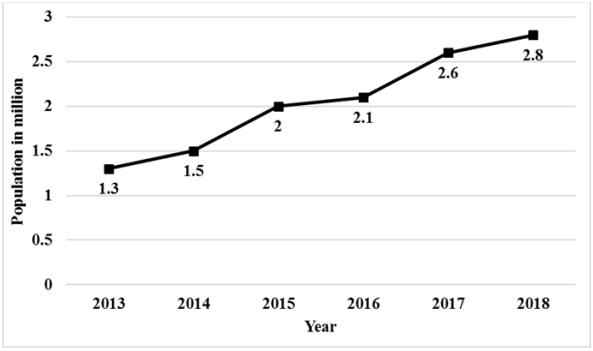


Out of the number of sweatshirts in stores A and B, 20% and 40%, respectively were sold. What is the total number of sweatshirts sold by stores A and B?
(a) 130 (b) 120
(c) 90 (d) 110

RRB Group-D 28-09-2022 (Shift-II)

Ans. (d) : The number of sweatshirts in store A = 50
And the number of sweatshirts in store B = 250
The total number of sweatshirts sold by stores A and B
$= 50 \times \frac{20}{100} + 250 \times \frac{40}{100}$
$= 10 + 100$
$= 110$

195. The following line graph shows the population (in million) of Istanbul over 6 years (From 2013 to 2018). Answer the given question based on the line graph.
What is the approximate percentage increase in the population of Istanbul from 2013 to 2018?

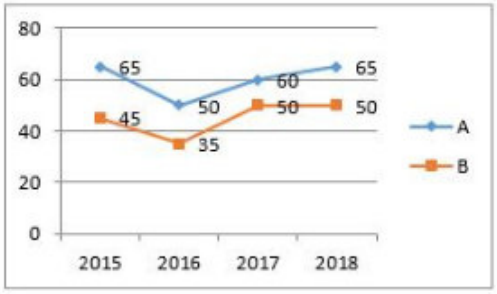


(a) 118% (b) 130%
(c) 115% (d) 120%

RRB NTPC 08.02.2021 (Shift-II) Stage Ist

Ans. (c) : Population of Istanbul in the year 2013 = 1.3 million
Population of Istanbul in the year 2018 = 2.8 million
Required percentage increase
$= \frac{2 \cdot 8 - 1 \cdot 3}{1 \cdot 3} \times 100$
$= \frac{1 \cdot 5}{1 \cdot 3} \times 100$
$= 115 \cdot 38\ \%$
$\approx 115\%$

196. The given graph shows the percentage of profit gained by two corporate bodies A and B from the year 2015 to 2018.
If the expenditure of A was ₹60 lakhs, then how much was the revenue (in ₹) of A in 2018?



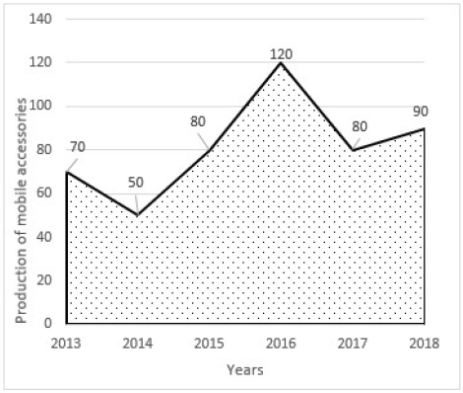
(a) 50 lakh (b) 100 lakh
(c) 99 lakh (d) 65 lakh

RRB NTPC 29.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the given graph -
A's expenditure in 2018 = ₹60 lakh
A's profit in 2018 = 65%

$$\text{A's income} = \frac{6000000 \times 165}{100}$$
$$= ₹9900000$$
$$= ₹99 \text{ lakh}$$

197. The following chart shows the production of mobile accessories (in lakh units) by a company Z over 6 years (from 2013 to 2018). Answer the given quesiton based on the chart.
Find the percentage decrease in the production of mobile accessories from the years 2016 to 2018.



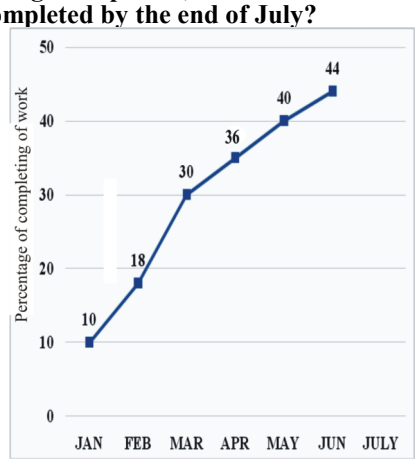
(a) 50% (b) 40%
(c) 25% (d) 20%

RRB NTPC 08.04.2021 (Shift-I) Stage Ist

Ans. (c) : The production of mobile accessories in the year 2016 is 120.
The production of mobile accessories in the year 2018 is 90.
Decrease = 120 – 90 = 30

$$\text{Required decrease \%} = \frac{30}{120} \times 100 = 25\ \%$$

198. The following graph shows the month wise cumulative progress in the constructions of a dam. If the progress in July is equal to that of the highest progress recorded in any month in the given period, how much work will be completed by the end of July?

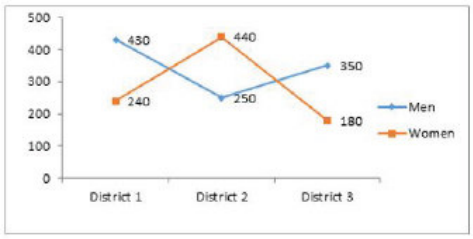


(a) 54% (b) 52%
(c) 56% (d) 50%

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) : Work progress in January = 10%
Work progress in February = (18−10) = 8%
Work progress in March = (30−18) = 12%
Work progress in April = (36−30) = 6%
Work progress in May = (40−36) = 4%
Work progress in June = (44−40) = 4%
∵ The highest work progress recorded in March.
∴ Work will be done by the end of July = (44+12) = 56%

199. Study the graph and answer the question that follows.
The graph provides the details regarding the number of men and women in three districts.



Based on the numbers given above, If the men were equally distributed from District 1 to District 2 and 3 in a way that the male to female ratio in District 1 becomes 1 : 1, what will be the revised male to female ratio for Districts 2 and 3 together ?

(a) 62 : 79 (b) 27 : 20
(c) 20 : 27 (d) 79 : 62

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

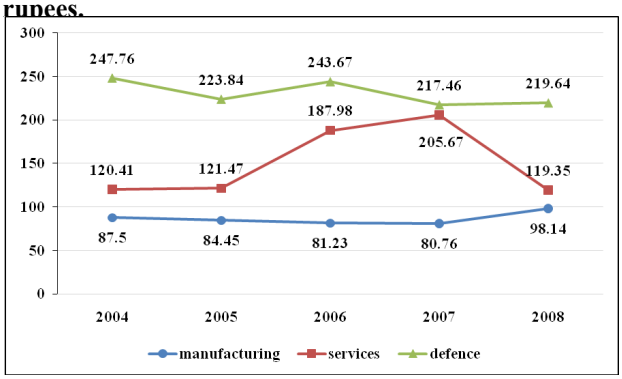
Ans. (d) : Number of male and females in all three districts–

District-1	**District–2**	**District–3**
Male -430	Male-250	Male-350
Female-240	Female-440	Female-180

On distributing Men equally from District 1 to District 2 and 3 in a way that the ratio of male to female in District 1 becomes 1 : 1.

$$\text{Number of males in District 2} = 250 + \frac{190}{2}$$
$$= 250 + 95 = 345$$
$$\text{Number of males in District 3} = 350 + \frac{190}{2}$$
$$= 350 + 95 = 445$$
$$\text{Required ratio} = (345 + 445) : (440 + 180)$$
$$= 790 : 620 = 79 : 62$$

Direction (174–177) : This Chart shows the investment in 3 sectors - manufacturing, services and defence– in five different years. All values are in lakh rupees.



200. Which year has highest investment in all three sectors together?

(a) 2006 (b) 2005
(c) 2004 (d) 2007

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (a) : Investment in all sectors in the year 2004
= 87.5 + 120.41 + 247.76 = ₹ 455.67 lakhs
Investment in all sectors in the year 2005
= 84.45 + 121.47 + 223.84 = ₹ 429.76 lakhs
Investment in all sectors in the year 2006
= 81.23 + 187.98 + 243.67 = ₹ 512.88 lakhs
Investment in all sectors in the year 2007
= 80.76 + 205.67 + 217.46 = ₹ 503.89 lakhs
So, in the year 2006 has the highest investment in all three sector.

201. Find the difference in lakhs between the investment in the defence and manufacturing sectors in all years together.

(a) ₹721.28 (b) ₹620.29
(c) ₹720.29 (d) ₹820.27

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (c) : Investment in defence sector in all the years
=247.76+223.84+243.67+217.46+219.64
= ₹1152.37 lakh
Investment in manufacturing in all the years
= 87.5+84.45+81.23+80.76+98.14
= ₹ 432.08 lakh
Required difference = 1152.37 – 432.08 = ₹ 720.29 lakh

202. In which year the investment in services sector is closest to the average investment in services sector over a period of 5 years.

(a) 2007 (b) 2004
(c) 2008 (d) 2006

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (b) : Average of five years in services sector

$$= \frac{120.41+121.47+187.98+205.67+119.35}{5}$$

$$= \frac{754.88}{5} = ₹150.97 \text{ lakh}$$

Investment in service sector in 2004 = ₹ 120.41 lakh
It is clear from the above graph that the investment in the services sector in the year 2004 is approximately closest the average investment in the services sector during the period of 5 years.

203. In which years was the percentage share of investment in the defence sector the lowest as compared to all three sectors for that years.

(a) 2006 (b) 2007
(c) 2008 (d) 2005

RRB NTPC 29.01.2021 (Shift-I) Stage Ist

Ans. (b) : From option (a)
Required share percentage of investment in defence sector in 2006.

$$= \frac{243.67}{512.88} \times 100 = 47.51\%$$

From option (b)
Required share percentage of investment in defence sector in 2007.

$$= \frac{217.47}{503.89} \times 100 = 43.15\%$$

From option (c)
Required share percentage of investment in defence sector in 2008.

$$= \frac{219.64}{437.13} \times 100 = 50.24\%$$

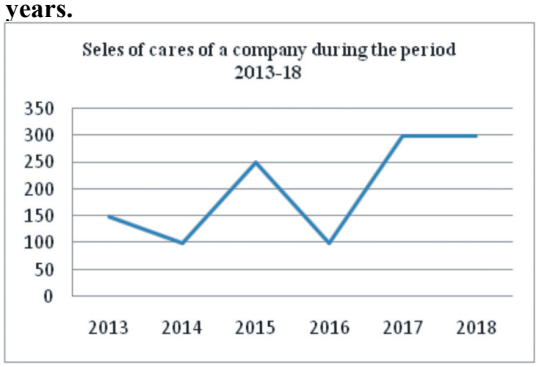
From option (d)
Required share % of investment in defence sector in 2005

$$= \frac{223.84}{(84.45+121.47+223.84)} \times 100$$

$$= \frac{2238400}{42976} = 52.08\%$$

Hence, the percentage share of investment is lowest in 2007.

204. From the given diagram, determine the difference between the total number of cars sold in the first three years and in the last three years.



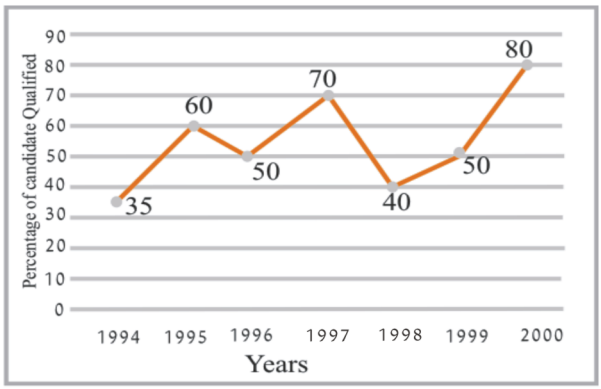
(a) 700 (b) 150
(c) 1200 (d) 200

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) : Total number of cars sold in first three years
= 150 + 100 + 250
= 500
Total number of cars sold in last three years
= 100 + 300 + 300
= 700
Required difference = 700 – 500
= 200

Direction (179-181) Study the given line graph and answer the question that follows.

The line graph shows the percentage of candidates qualified in different years from 1994 to 2000.



205. If the number of candidates qualified in 1994 was 35490, then total number of candidates in that year was

(a) 101440 (b) 101400

(c) 111400 (d) 111440

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (b) : Number of qualified candidates in 1994 = 35% of total candidates = 35490

Hence, total number of candidates $= \frac{35490}{35} \times 100$

$= 101400$ students

206. The total number of candidates qualified in 1997 and 1999 together was 53590 and the number of candidates appeared in 1999 was 43060. Candidates qualified in 1997 are what percentage (approximately) of the candidates qualified in 1999?

(a) 149% (b) 160%

(c) 155% (d) 120%

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : Number of candidates who appeared in the examination in 1999 = 43060

So the number of candidates passed in the year 1999 = $43060 \times \frac{50}{100} = 21530$ Students

Then the number of candidates passed in 1997 = 53590 – 21530 = 32060 Students

Required percentage $= \frac{32060}{21530} \times 100 = 149\%$

207. Which of the following Stagements about the line graph cannot be inferred?

(a) The number of candidates qualifying 1996 is the same as the number of candidates qualifying in 1999

(b) The highest percentage of candidates qualified in the year 2000

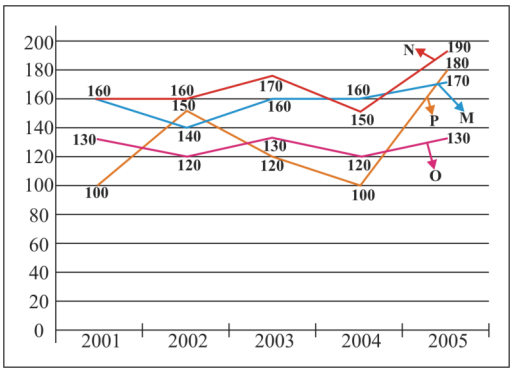
(c) The lowest percentage of candidates qualified in the year 1994

(d) The percentage of candidates qualifying has risen in 4 periods and fallen in 2 periods between 1994 and 2000

RRB NTPC 08.03.2021 (Shift-II) Stage Ist

Ans. (a) : The Stagement given in option (a) cannot be inferred from the given line graph.

Direction (182-185) The given graph shows rainfall in centimetres in the cities M, N, O and P from 2001 to 2005. Study the graph and answer the question.



208. Which city has recorded maximum rainfall on an average?

(a) M (b) P

(c) O (d) N

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (d) : The average of maximum rainfall in the city between 2001 to 2005.

$$M = \frac{160+140+160+160+170}{5} = 158$$

$$N = \frac{160+160+170+150+190}{5} = 166$$

$$O = \frac{130+120+130+120+130}{5} = 126$$

$$P = \frac{100+150+120+100+180}{5} = 130$$

So, city N has recorded maximum rainfall on an average.

209. For the given period, which two cities are closest to each other in terms of average annual rainfall.

(a) N and O (b) O and P

(c) M and N (d) M and P

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : $M = \frac{160+140+160+160+170}{5} = 158$

$$N = \frac{160+160+170+150+190}{5} = 166$$

$$O = \frac{130+120+130+120+130}{5} = 126$$

$$P = \frac{100+150+120+100+180}{5} = 130$$

Thus, the average annual rainfall between cities O and P was approximately equal.

210. Which city has the widest range of rainfall over 5 years?

(a) N (b) P

(c) O (d) M

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (b) : The maximum range of rainfall during 5 years is as follows.

Range of city M- 170 – 160 = 10

Range of city N- 190 – 150 = 40

Range of city O - 130 – 120 = 10

Range of city P - 180 – 100 = 80

Hence, city P has the highest rainfall range.

211. Which year reocrded highest total rainfall across all the cities?

(a) 2005 (b) 2001

(c) 2003 (d) 2004

RRB NTPC 17.01.2021 (Shift-I) Stage Ist

Ans. (a) :

Total rainfall in 2001 - 160+160+130+100 = 550

Total rainfall in 2002 - 160+150+140+120 = 570

Total rainfall in 2003 - 170+160+130+120 = 580

Total rainfall in 2004 - 160+150+120+100 = 530

Total rainfall in 2005 - 190+180+170+130 = 670

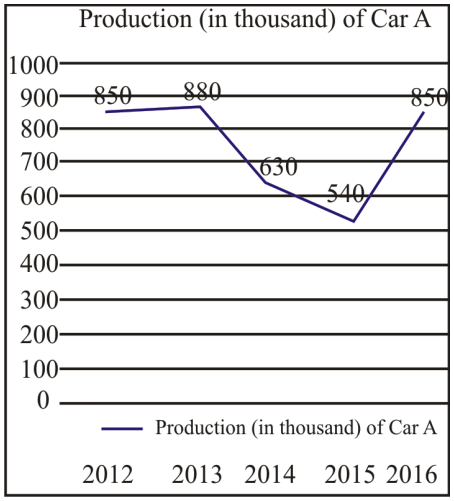
So in the year 2005 recorded the highest rainfall across all the cities.

212. The table below shows the ratio of manufacturing of Car A to the manufacturing of Car B by the same company from 2012-2016.

The Line Graph shows the manufacturing (in thousands) of Car A, from 2012-2016.

What is the ratio of number of Car B manufactured in 2012 to the number of Car A manufactured in 2014?

Year	Production Ratio of A to B
2012	17:16
2013	8:7
2014	9:10
2015	18:19
2016	7:6



Reference-

production ratio

production of car A

(a) 79 : 61 (b) 79 : 63

(c) 80 : 61 (d) 80 : 63

RRB NTPC 07.01.2021 (Shift-II) Stage Ist

Ans. (d) : Let production of Car A in 2012 = 17x

and production of car B in 2012 = 16x

By line graph-

$17x = 850$

$x = 50$

And production of Car B in 2012 = 16x

$= 16 \times 50$

$= 800$

Again, Let production of Car A in 2014 = 9y

And production of Car B = 10y

By line graph-

$9y = 630$

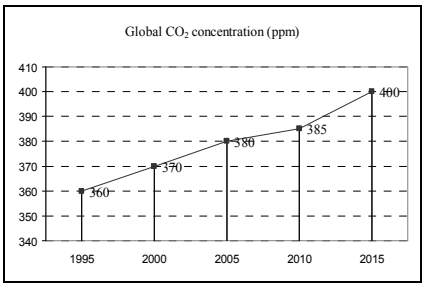
$y = 70$

$\therefore$ Production of Car A in 2014 = $70 \times 9 = 630$

Required Ratio = $\frac{800}{630}$

= 80 : 63

213. Based on the given graph, what percentage change in CO_2 concentration from year 2005 to 2015.



(a) 3.00% (b) 4.26%

(c) 5.00% (d) 5.26%

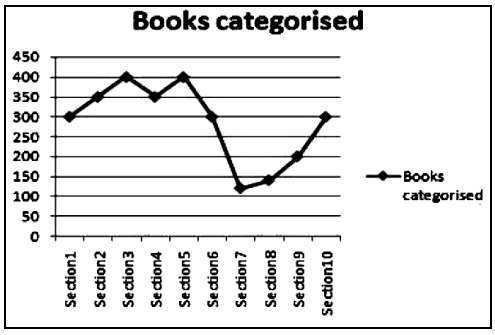
RRB RPF Constable – 24/01/2019 (Shift-III)

Ans. (d) : CO_2 concentration change from year 2005 to 2015 = 400 – 380 = 20

Percentage increase in CO_2 concentration

$$= \frac{20}{380} \times 100 = 5.26\%$$

214. A library has 10 different sections and the librarians verifies books for 20 days. Which section has the lowest number of books?



(a) Section 7

(b) Section 5

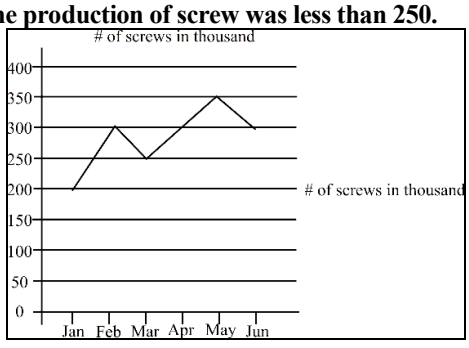
(c) Section 8

(d) Section 9

RRB Group-D – 18/09/2018 (Shift-II)

Ans. (a) : From the given graph it is clear that minimum books (125) is in section 7

215. According to the following chart in which month the production of screw was less than 250.



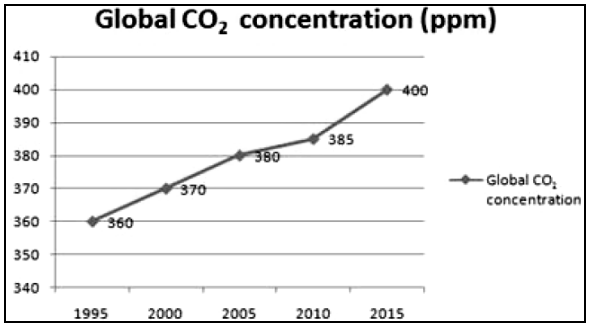
(a) May (b) June

(c) February (d) January

RRB Paramedical Exam – 21/07/2018 (Shift-II)

Ans : (d) It is clear from the chart 200 screws manufactured in January month which is less than 250 screws.

216. Based on the given graph, what percentage of a change in humidity of CO_2 from year 1995 to 2015 year ?



(a) 11.26%

(b) 11.31%

(c) 11.00%

(d) 11.11%

RRB Group-D – 26/09/2018 (Shift-II)

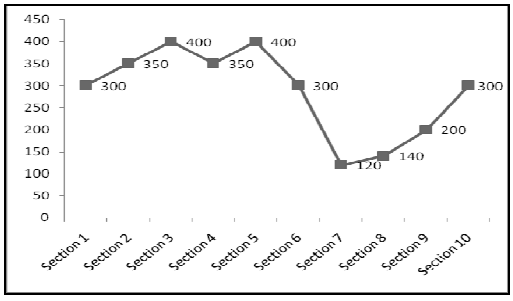
Ans. (d) : From the graph,

Percentage change in the concentration of CO_2 from 1995 to 2015

$$= \frac{400-360}{360} \times 100 = \frac{40}{360} \times 100 = 11.11\%$$

So the concentration of CO_2 change is 11.11%

217. Based on the graph below, which section contains more than 360 books?



(a) only section 3

(b) section 4 and section 5

(c) section 3 and section 5

(d) section 5 and section 6

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (c) According to the graph in section 3 and section 5 is 400 and 400 books respectively which are more than number of 360 books in the given section.

28.

Miscellaneous

1. In a group of students, the number of girls is three-fourth of the number of boys. If two-third of the number of girls and one-half of the number of boys like mango juice, then what fraction of the total number of girls and boys like mango juice?

(a) $\frac{1}{7}$ (b) $\frac{4}{7}$

(c) $\frac{2}{7}$ (d) $\frac{3}{7}$

RRB NTPC (Stage-II) 17/06/2022 (Shift-III)

Ans. (b) : Let the number of boys = 8

the number of girls = $8\times\frac{3}{4}=6$

According to the question,

Number of girls like mange juice = $6\times\frac{2}{3}=4$

Number of boyslike mango juice = $8\times\frac{1}{2}=4$

Required fraction = $\frac{4+4}{8+6}=\frac{8}{14}=\frac{4}{7}$

2. A hundred rupee note measures 15 cm × 8 cm and a bundle of 125 such notes is 2 cm thick. Find the value of the hundred-rupee notes that can be contained in a box of size 48 cm × 36 cm × 30 cm. If the bundles are tightly packed in it without any empty space.

(a) ₹ 30 Lakhs (b) ₹ 33 Lakhs

(c) ₹ 36 Lakhs (d) ₹ 27 Lakhs

RRB NTPC (Stage-II) 14/06/2022 (Shift-I)

Ans. (d) : Given,

Measures of ₹100 note = 15 cm × 8 cm.

Thickness of 125 notes = 2 cm.

Measures of box = 48 cm × 36 cm × 30 cm.

$\therefore$ Total number of bundles of 125 notes = $\frac{48\times36\times30}{15\times8\times2}$

$= 216$

Number of notes in 216 bundles $= 216\times125$

$= 27000$

Hence, Total value of ₹100 notes = 27000 × 100

= ₹2700000

or 27 Lakhs

3. The total expenditure of Krishna in a year is ₹4,20,000. If his salary per month is ₹45,000, then find his average savings per month.

(a) ₹12,000 (b) ₹14,000

(c) ₹16,000 (d) ₹10,000

RRB Group-D 08/09/2022 (Shift-I)

Ans. (d) : According to the question,

Total expenditure of Krishna in 1 year = ₹4,20,000

Salary of Krishna per month = ₹45,000

Total salary of Krishna in 1 year = 45,000 × 12

= ₹5,40,000

Total saving in 1 year = 5,40,000 – 4,20,000 = 1,20,000

Average saving of Krishna per month

$=\frac{1,20,000}{12}=$ ₹10,000

4. A dealer buys apples at ₹50, ₹40 and ₹30 per kilogram. He mixes them in the ratio 2 : 4 : 9 respectively, by weight and sells at a profit of 30%. At what approximate price per kilogram does he sell the apples?

(a) ₹45.9/kg (b) ₹23.5/kg

(c) ₹10.8/kg (d) ₹75/kg

RRB Group-D 01/09/2022 (Shift-III)

Ans. (a) : By mixing apples in the ratio 2 : 4 : 9 at the rate of ₹ 50, ₹ 40 and ₹ 30 per kg respectively, the cost of (2 + 4 + 9) kg mixture.

$= 50\times2+40\times4+30\times9$

Cost price of 1 kg mixture $=\frac{100+160+270}{15}$

$=\frac{530}{15}$

Selling price of 1 kg apples if sold the mixture at 30% profit $=\frac{530}{15}\times\frac{(100+30)}{100}=45.93/\text{ kg}$

5. Mohit's salary is ₹ 15,000 per month. He spends ₹ 5,000 on house rent, ₹ 2,000 on bills and rest of the amount is his monthly savings. Find his savings in a year, if in the month of his birthday he spent his complete monthly saving for birthday celebration.

(a) ₹ 88,000 (b) ₹ 8,000

(c) ₹ 17,000 (d) ₹ 96,000

RRB Group-D 18/08/2022 (Shift-III)

Ans. (a) : According to the question,

Mohit's salary = ₹15000/month

Amount spent by him = 5000 + 2000

= ₹ 7000

Mohit's total salary in 1 year = 15000 × 12

= ₹ 180000

Amount spent by Mohit in 1 year = 7000 × 12 + 8000

= 84000 + 8000

= ₹ 92000

Total saving of mohit in 1 year = 1,80,000 – 92,000

= ₹ 88000

6. During a school tour one among the group of 15 students was elected as the group leader. If there are total 11 such groups, how many students are going for the tour ?

(a) 165 (b) 176
(c) 174 (d) 154

RRB Group-D 09/09/2022 (Shift-II)

Ans. (a) : Number of students in one group = 15
Total number of students in 11 groups = 15 × 11 = 165
Hence the total number of students who went on tour is 165.

7. A vessel is one-fourth full of water. After adding 10 cups of water to it, the vessel gets three-fourth. Find the capacity of the vessel in cups.

(a) 25 (b) 20
(c) 22 (d) 27

RRB Group-D 30/08/2022 (Shift-III)

Ans. (b) : Let the vessel filled by pouring x cups of water.
According to the question,

$$\Rightarrow \frac{3x}{4} - \frac{1x}{4} = 10$$

$$\Rightarrow \frac{2x}{4} = 10$$

$$\Rightarrow \frac{x}{2} = 10$$

$$x = 20$$

Hence, the capacity of the vessel in measure of cups will be 20.

8. If the degree of polynomial $9x^5y^2z^r$ is 15, then r = ?

(a) 7 (b) 6
(c) 8 (d) 9

RRB NTPC 19.01.2021 (Shift-I) Stage Ist

Ans. (c) : Degree of polynomial $9x^5y^2z^r$ is 15.

$$\therefore \quad 5 + 2 + r = 15$$

$$r = 8$$

Hence, value of r = 8.

9. A beautician's income includes her salary and the tips she gets for her services. During a particular week, if her tips were $\frac{5}{4}$ her salary, then what fraction of her income came from the tips?

(a) $\frac{4}{5}$ (b) $\frac{9}{5}$
(c) $\frac{5}{9}$ (d) $\frac{4}{9}$

RRB NTPC 01.02.2021 (Shift-I) Stage Ist

Ans. (c) : Let the salary of beautician's = ₹x

And income received in tips = $₹\frac{5}{4}x$

Total income = $₹\frac{9x}{4}$

Fraction of her income came from the tips $= \frac{5x}{4} \times \frac{4}{9x} = \frac{5}{9}$

Hence, $\frac{5}{9}$ of the income was received in tips.

10. If $a \oplus b = a - b + \frac{1}{\sqrt{ab}} + \sqrt{\left(\frac{a}{b}\right)}$, then $0.9 \oplus 0.1$ = ?

(a) $\frac{30}{214}$ (b) $\frac{212}{30}$
(c) $\frac{30}{212}$ (d) $\frac{214}{30}$

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$$a \oplus b = a - b + \frac{1}{\sqrt{ab}} + \sqrt{\frac{a}{b}}$$

$$\therefore 0{\cdot}9 \oplus 0{\cdot}1 = 0{\cdot}9 - 0{\cdot}1 + \frac{1}{\sqrt{0{\cdot}9 \times 0{\cdot}1}} + \sqrt{\frac{0{\cdot}9}{0{\cdot}1}}$$

$$= 0{\cdot}8 + \frac{1}{\sqrt{0{\cdot}09}} + \sqrt{9}$$

$$= 0{\cdot}8 + \frac{1}{0{\cdot}3} + 3$$

$$= 3{\cdot}8 + \frac{1}{0{\cdot}3} \quad = 3{\cdot}8 + \frac{10}{3}$$

$$= \frac{11{\cdot}4 + 10}{3} = \frac{21{\cdot}4}{3} = \frac{214}{30}$$

11. A pillar is divided into three parts. The first part is $\frac{1}{4}$ of the whole, second part is $\frac{4}{8}$ of the first, and the third is 10 m. The length of the pillar is:

(a) 18 m (b) 16 m
(c) 20 m (d) 22 m

RRB NTPC 01.03.2021 (Shift-I) Stage Ist

Ans. (b) : Let total length of pillar is 32x meters

Hence, length of first part = $32x \times \frac{1}{4} = 8x$

Length of second part = $8x \times \frac{4}{8} = 4x$

Length of third part = $32x - (8x + 4x) = 20x$

According to the question,

$$10 = 20x$$

$$x = \frac{1}{2}$$

Hence, length of pillar = 32x

$$= 32 \times \frac{1}{2} = 16 \text{ meters.}$$

12. What are the values of x in the following equation?

$3^{2x+1} - 3^x = 3^{x+3} - 3^2$

(a) 4, –2 (b) 4, –1
(c) 2, –1 (d) 3, –1

RRB NTPC 08.04.2021 (Shift-II) Stage Ist

Ans. (c) : From question,

$$3^{2x+1} - 3^x = 3^{x+3} - 3^2$$

$$3^{2x} \cdot 3 - 3^x = 3^x \cdot 3^3 - 3^2 \qquad \{a^x \cdot a^y = a^{x+y}\}$$

$$3^{2x}.\ 3 - 3^x - 3^x.3^3 + 3^2 = 0$$

$$3^x\,(3.3^x - 1) - 3^2\,(3.3^x - 1) = 0$$

$(3^x - 3^2)(3.3^x - 1) = 0$

$\because (3^x - 3^2) = 0$

$3^x = 3^2$

$\boxed{x = 2}$

$\because 3^{x+1} - 1 = 0$

$3^{x+1} = 3^0 \quad \{x^\circ = 1\}$

$x + 1 = 0$

$\boxed{x = -1}$

13. A 1.5 kg cake is divided equally among 10 boys. How much cake will each boy get?

(a) 10 g (b) 1500 g

(c) 15 g (d) 150 g

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (d) : According to the question,

$$1.5 \text{ kg cake} = \frac{1.5}{10}\text{kg} = \frac{15}{100}\text{kg} = \frac{3}{20}\text{kg}$$

$$\frac{3}{20} \times 1000 \Rightarrow 150\,\text{g}$$

14. A train started with 450 passengers. At the first stop, 1/9 of them got down and 20 new passengers got in. At the second stop, 1/6 of the passengers then existing got down and 19 new passengers boarded. With how many passengers did the train arrive at the third stop?

(a) 420 (b) 369

(c) 400 (d) 394

RRB NTPC 09.01.2021 (Shift-II) Stage Ist

Ans. (b) : Number of passengers after first stop

$$= 450 - \left[450 \times \frac{1}{9}\right] + 20$$

$$= 450 - [50] + 20$$

$$= 400 + 20$$

$$= 420$$

Number of passengers after second stop

$$= 420 - \left[420 \times \frac{1}{6}\right] + 19$$

$$= 420 - 70 + 19$$

$$= 350 + 19 = 369$$

15. If a vessel gets filled by 15 glasses of milk where capacity of each glass is 1.5 L, How many glasses are required to fill the same vessel if the capacity of each glass is 0.5 L?

(a) 55 (b) 40

(c) 50 (d) 45

RRB NTPC 31.01.2021 (Shift-II) Stage Ist

Ans. (d) : Capacity of glass = 1.5 L

Capacity of vessel = $1.5 \times 15 = 22.5$

If the capacity of glass is 0.5 L, then the glass required to full the vessel $= \frac{22.5}{0.5} = 45$

16. A mango kept in a basket doubles in every one minute. If the basket gets completely filled by mangoes in 30 min then in how many minutes half of the basket was filled?

(a) 29 (b) 15

(c) 27 (d) 28

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (a) : According to the question, in every 1 minute the number of mangoes in the basket doubles and the basket is filled completely in 30 minutes.

So, 1 minute before 30 minutes, the basket must have been half basket = 30 – 1 = 29 minutes.

17. There is a carpet of length $20\frac{5}{2}$ m. How many small pieces of carpet, each of length $4\frac{1}{2}$ m, can be cut out of it?

(a) 8 (b) 7

(c) 9 (d) 5

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (d) : Total length of carpet $= 20\frac{5}{2} = \frac{45}{2}$ meters

Length of $4\frac{1}{2}$ m carpet $= \frac{9}{2}$ meters

Required pieces $= \frac{45/2}{9/2} = 5$ pieces.

18. A class has 48 students, on a specific day, only $\frac{3}{8}$ of the students were present; the number of absentees on the same day would be:

(a) 28 (b) 38

(c) 30 (d) 18

RRB NTPC 04.01.2021 (Shift-I) Stage Ist

Ans. (c) : Total number of students in the class = 48 ---- (Given)

Number of present students = $\frac{3}{8}$ of total students

Number of absent students = $1 - \frac{3}{8} = \frac{5}{8}$ of total students

Total number of absent students $= 48 \times \frac{5}{8}$

= 30 students

19. 1200 apples were distributed among a group of boys. Each boy got thrice time of the apples as the number of boys in that group. The number of boys in the group was.

(a) 15 (b) 20

(c) 25 (d) 40

RRB NTPC 03.02.2021 (Shift-I) Stage Ist

Ans. (b) : Let the no. of boys in group = x

No. of apple got by each boy = 3x

Total no. of apples = $x \times 3x = 1200$

$3x^2 = 1200$

$x^2 = 400$

$x = 20$

No. of boys (x) = 20

20. If P = 2 + 0.2 ÷ (0.2 × 2) – 1 × 2, Q = 2 – 0.2 ÷ (0.2 × 2) – $\frac{1}{2}$ × 2, then $\frac{P}{Q}$ is the equal to:

(a) 0.5 (b) 1.0

(c) 1.5 (d) –0.5

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (b) : From question,

$P = 2 + 0.2 \div (0.2\times2) - 1\times2,$

$Q = 2 - 0.2 \div (0.2\times2) - \frac{1}{2}\times2$

$P = 2 + 0.2\times\frac{1}{0.4} - 2, \qquad Q = 2 - 0.2\times\frac{1}{0.4} - 1$

$P = 0.5 \qquad\qquad Q = 0.5$

$\therefore \frac{P}{Q} = \frac{0.5}{0.5} = 1$

21. If $P = 0.3 \times 0.3 + 0.03 \times 0.03 - 0.6 \times 0.03$ and $Q = 0.54$, then $\frac{P}{Q}$ is equal to:

(a) 0.45 (b) 4.5
(c) 0.135 (d) 4.05

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c) : $P = 0.3\times0.3 + 0.03\times0.03 - 0.6\times0.03$

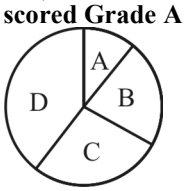
$P = 0.09 + 0.0009 - 0.018$

$P = 0.0729$

$Q = 0.54$

$\therefore \frac{P}{Q} = \frac{0.0729}{0.54} = \frac{729}{5400} = 0.135$

22. Of the 360 students who sat for class X Board exams, 10% students scored A Grade, 20% students scored B Grade, 30% students scored C Grade and 40% scored D Grade. From the given pie chart, find the total number of students who scored Grade A and Grade B.



(a) 108 (b) 72
(c) 144 (d) 36

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (a) : Total number of students = 360

100% = 360

1%=3.6

Total number of students who scored Grade A and Grade B = 30%

1% = 3.6

30% = 108

23. If $x = a \sin t$, $y = b \tan t$, then $\frac{a^2}{x^2} - \frac{b^2}{y^2}$ is:

(a) 1 (b) 2
(c) 0 (d) –1

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (a) : $x = a\sin t$

$y = b\tan t$

$\frac{a^2}{x^2} - \frac{b^2}{y^2}$

$= \frac{a^2}{a^2\sin^2 t} - \frac{b^2}{b^2\tan^2 t} = \frac{1}{\sin^2 t} - \frac{\cos^2 t}{\sin^2 t}$

$= \frac{1-\cos^2 t}{\sin^2 t} = \frac{\sin^2 t}{\sin^2 t} = 1$

24. The length of the longest pole, that could be placed in a room of dimensions 10 m, 8 m and 6 m, is:

(a) 18 m (b) 15 m
(c) $10 \times \sqrt{2}$ m (d) 14 m

RRB NTPC 28.12.2020 (Shift-II) Stage Ist

Ans. (c) : The length of the longest pole

$= \sqrt{10^2 + 8^2 + 6^2}$

$= \sqrt{200}$

$= 10\sqrt{2}$m

25. A map of a city is drawn on a scale of 1 : 50000. The distance between two cities A and B on this map is 12 cm. What will be the actual distance between the two cities?

(a) 9 km (b) 6 km
(c) 12 km (d) 15 km

RRB NTPC 19.01.2021 (Shift-II) Stage Ist

Ans. (b) : Representative fraction method is also called numerical measurement method like $\frac{1}{50000}$ means that one part of the map is equal to 50000 part of the surface, so if the distance b/w the two cities on the map 12 cm then actual distance b/w the two cities = 12×50000 = 600000 cm or 6 km.

26. Two-fifth of Narendra's salary is equal to Amit's salary and seven-ninth of Amit's salary is equal to Arun's salary. If the sum of the salaries is ₹770, what are the respective salaries of Narendra, Amit and Arun (in ₹)?

(a) 450, 140, 180 (b) 450, 180, 140
(c) 180, 450, 140 (d) 180, 140, 450

RRB NTPC 03.02.2021 (Shift-II) Stage Ist

Ans. (b) : According to the question,

Narendra's salary $\times \frac{2}{5}$ = Amit's salary

$\frac{\text{Narendra's salary}}{\text{Amit's salary}} = \frac{5}{2}$

And Amit's salary $\times \frac{7}{9}$ = Arun's salary

$\frac{\text{Amit's salary}}{\text{Arun's salary}} = \frac{9}{7}$

Narendra : Amit: Arun

5 : 2

9 : 7

45 : 18 : 14

The sum of their salaries = 770

(45 + 18 + 14) units ⟶ ₹ 770

77 units ⟶ ₹ 770

1 unit ⟶ ₹ 10

Narendra's salary = 45 × 10 = ₹ 450

Amit's salary = 18 × 10 = ₹ 180

Arun's salary = 14 × 10 = ₹ 140

Hence, the salaries of Narendra, Amit and Arun are 450, 180 and 140 respectively.

27. The earth takes 24 h to rotate about its own axis. Through what angle will it turn in 5 h and 24 min?

(a) 80° (b) 79°
(c) 81° (d) 82°

RRB NTPC 09.02.2021 (Shift-II) Stage Ist

Ans. (c) : ∵ Earth make 360º angle in one rotation

∴ 24 hours $\longrightarrow$ 360º

1 h $\longrightarrow \frac{360}{24} = \frac{90}{6} = 15^\circ$

5 hours 24 min $\rightarrow 15^\circ \times \left(5 + \frac{24}{60}\right)$

$= 15^\circ \times \frac{27}{5} = 81^\circ$

28. Sonal was given some money to take care of her travel expenses during a 16-day sales drive. However, she had to increase her stay by another 8 day, and as a result her average daily travel allowance went down by Rs 80. How much was sanctioned to her in the beginning?

(a) ₹3,760 (b) ₹3,750
(c) ₹3,820 (d) ₹3,840

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (d) : Let daily travel expenses = ₹x

According to the question-

$16 \times x = 24 \times (x - 80)$

$16x = 24x - 1920$

$x = 240$

Expenses during the 16 day sales compaign.

$= 16 \times 240$

= ₹3840

29. There is a 6-storey building with 20 room on each floor. Some toxic material is concealed in the building. Three groups of officers start the search operation simultaneously. The first group searches the 1st and 2nd floors. The second group handles the 3rd and 4th floors. The third group takes over the 5th and 6th floors. If it takes 1 minute to reach any nearest floor and 1 minute to search each room, how much time will be taken to complete the entire search operation?

(a) 126 min (b) 46 min
(c) 40 min (d) 61 min

RRB NTPC 16.01.2021 (Shift-I) Stage Ist

Ans. (b) : There is six storey building, with 20 rooms in each floor.

∴ The number of rooms = 20 × 6 = 120

It takes one minute to search each room and one minute to go to each floor. 3 teams start search operation together, So = 40 + 1 + 2 + 3

= 46 minutes

30. A map of a city is drawn on a scale 1:150000. The distance between two cities A and B on this map is 6 cm. What will be the actual distance between the two cities?

(a) 15 km (b) 12 km
(c) 9 km (d) 6 km

RRB NTPC 20.01.2021 (Shift-I) Stage Ist

Ans. (c) : As per question,

1 : 150000

6 cm = 900000 cm

∴ Actual distance = $\frac{900000}{100 \times 1000} = 9\text{km}$

31. If $11 = \frac{11x}{1-x}$, then the value of $(2x)^2$ is:

(a) 3 (b) 2
(c) 4 (d) 1

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (d) : Given,

$11 = \frac{11x}{1-x}$

$\Rightarrow$ 11 (1 – x) = 11x $\Rightarrow$ 11 – 11x = 11x

22x = 11

$x = \frac{11}{22} = \frac{1}{2}$

$\therefore (2x)^2 = \left(2 \times \frac{1}{2}\right)^2 = (1)^2 = 1$

32. If a, b, c, d and e are the digits of a number beginning from the left, then the number is:

(a) 100a+10b+10c+d+e
(b) $10^4a+10^3b+10^2c+10d+e$
(c) edcba
(d) 1000a+100b+10c+1d+e

RRB NTPC 04.02.2021 (Shift-I) Stage Ist

Ans. (b) :

∵ a, b, c, d and e are in order from left to right

So, 10000a + 1000b + 100c + 10d + e

$= (10)^4a + 10^3b + 10^2c + 10d + e$

33. A group of 463 persons were asked to vote for their favourite season out of four seasons (rain, summer, spring and winter). The rainy season got 130 votes, while the summer season got 100 votes. Winter season got 53 more votes than the summer season. Spring season got 80 votes. Which of the following seasons was liked by most people?

(a) Spring season
(b) Summer season
(c) Winter season
(d) Rainy season

RRB NTPC 29.12.2020 (Shift-II) Stage Ist

Ans. (c) : Total number of votes = 463

Rainy season got votes = 130

Summer season got votes = 100

Winter season got votes = Summer season got votes+53

= 100 + 53 = 153

Spring season got votes = 463 – (130+100+153) = 80

Hence, it is clear that, 'winter season' was liked by most of the people.

34. Sunila had $9\frac{1}{4}$kg of flour to make bread with. If the recipe says that she needs $1\frac{1}{8}$kg to make one loaf of bread, how many loaf can she make? Estimate to the nearest whole number.

(a) 8 (b) 7
(c) 9 (d) 10

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (a) :

$$\text{Number of loaves} = \frac{9-\frac{1}{4}}{1-\frac{1}{8}} = \frac{\frac{37}{4}}{\frac{9}{8}}$$

$$\frac{37\times 8}{4\times 9} = \frac{74}{9} = 8.22$$

Hence, number of loaves = 8

35. In a game Rajesh lost 1/3 of his money in the first round of the game, in the second round he losses 3/5 of his remaining money and in the third round he lost 4/7 of the rest. He is left with what part of the original sum of money.

(a) $\frac{4}{15}$ (b) $\frac{4}{45}$

(c) $\frac{2}{5}$ (d) $\frac{4}{35}$

RRB NTPC 30.12.2020 (Shift-I) Stage Ist

Ans. (d) : L.C.M. of 3, 5, 7 = 105 (which is original part)

According to the question–

Amount lost in the first round $= \frac{1}{3}$ part of the total amount $= 105\times\frac{1}{3} = 35$

Remaining amount after the first round = 105 – 35 = 70

Amount lost in the second round $= \frac{3}{5}$ part of the remaining amount $= 70\times\frac{3}{5} = 42$

Remaining amount after the second round = 70–42 = 28

Amount lost in the third round $= \frac{4}{7}$ part of the remaining amount $= 28\times\frac{4}{7} = 16$

Remaining amount after the third round =28 – 16 = 12

Hence, remaining share of original amount $= \frac{12}{105} = \frac{4}{35}$

36. A drum of water is 3/4 full. When 9 litres of water is drawn from it, it is 1/2 full. What is the capacity of the drum?

(a) 20 litre (b) 36 litre

(c) 28 litre (d) 37 litre

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the capacity of drum = x litre

$$\frac{3x}{4} - 9 = \frac{x}{2}$$

$$\frac{3x-2x}{4} = 9$$

x = 36 litre

37. A student takes 1.5 hours from home to school at a speed of 5 km/h. By what percent should he increase his speed to reduce the time by 20% and cover the same distance from school to home?

(a) 20 % (b) 25 %

(c) 16 % (d) 15 %

RRB NTPC 08.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the speed increased by 'v' km/h.

From $v_1t_1 = v_2t_2$

$5\times 1.5 = (5+v)\times 1.2$ $\left(\because 1.5\times\frac{80}{100} = 1.2h\right)$

$25 = 20 + 4v$

$v = \frac{5}{4}$ km/h (increment)

Hence, the required percentage increment $= \frac{\frac{5}{4}}{5}\times 100$

$= \frac{5}{20}\times 100$

$= 25\%$

38. If $f(x) = \frac{x+1}{x-1}$ find the value of f(f(f(2)))

(a) 2 (b) 1

(c) -1 (d) 3

RRB NTPC 12.01.2021 (Shift-II) Stage Ist

Ans. (d) : $f(x) = \frac{x+1}{x-1}$

$f(2) = \frac{2+1}{2-1} = \frac{3}{1} = 3$

$f(f(2)) = \frac{3+1}{3-1} = \frac{4}{2} = 2$

$f(f(f(2))) = \frac{2+1}{2-1} = 3$

39. A laptop costs ₹27000. You will have to pay 15% extra to purchase an extended warranty of 2 years. What will be the final cost of the laptop if 6% GST must be paid on the whole amount ?

(a) ₹32,913 (b) ₹31,050

(c) ₹31,293 (d) ₹32,670

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) : Laptop final price (with 6% GST)

$= 27000\times\frac{115}{100}\times\frac{106}{100}$

$= ₹\ 32913$

40. If the speeds of a train in 10 successive hours are a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10} then the average speed of the train is:

(a) Geometric mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}.

(b) Harmonic mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}.

(c) Arithmetic mean of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}.

(d) Median of a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9 and a_{10}.

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (c) : Average speed of train = $\frac{\text{Total distance}}{\text{Total time}}$

$= \frac{a_1 + a_2 + a_3 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 + a_{10}}{10}$

So, it is clear that the average speed of the train is equal to the arithmetic mean of a_1, a_2, a_3, a_4 .....a_{10}.

41. If x% of y = y% of z, then:

(a) x = z (b) x = 3z

(c) x = 2z (d) x = 4z

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (a) : From question,

x % of y = y% of z

$\Rightarrow \frac{x}{100} \times y = \frac{y}{100} \times z$

$\Rightarrow x = z$

42. The number 1.112123123412345.....is a/an:

(a) Integer (b) Natural number

(c) National number (d) Irrational number

RRB NTPC 13.01.2021 (Shift-I) Stage Ist

Ans. (d) : The number 1.112123123412345 ..... is an irrational number.

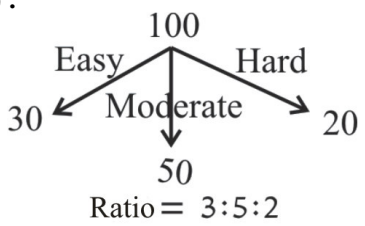
43. There are 100 questions in which each right answer has 1 mark credit. Out of 100 questions 30, 50 and 20 questions are easy, medium and difficult respectively. The questions paper covers five abilities with an equal number of questions and similar distribution of difficulty levels for each ability. Sachin has excellent knowledge in three abilities but in the other two abilities he can solve only easy questions. If the evaluator deducts 0.33 marks for each wrong answer and Sachin attempts all questions which of the following would be his expected score?

(a) 62.60 (b) 62.49

(c) 62.67 (d) 62.98

RRB NTPC 16.01.2021 (Shift-II) Stage Ist

Ans. (c) :



According to the question,

Section	Easy	Moderate	Hard
20	6	10	4
20	6	10	4
20	6	10	4
20	6	10	4
20	6	10	4

Total question solved by Sachin in three sections = (6 + 10 + 4) ×3 = 60

Again, the rest easy questions = 6 + 6 = 12

Total number of question solved by Sachin = 60 + 12 = 72

Questions with wrong answer = 10 × 2 + 4 × 2 = 28

Expected score = $72 - \frac{28}{3} = 62.67$

44. If Reeta types the numbers from 2 to 222, both inclusive, then how many times will she have to press the buttons on the number pad?

(a) 555 (b) 558

(c) 557 (d) 556

RRB NTPC 17.01.2021 (Shift-II) Stage Ist

Ans. (c) : According to the question,

No. of buttons on the number pad pressed from 2 to 9 = 8

No. of buttons on number pad pressed from 10 to 99

= 90×2

=180

Again, no. of buttons on number pad pressed from 100 to 222

= 123 × 3

= 369

Hence, total no. of buttons pressed on the number pad

= 8 + 180 + 369

= 557

45. Of the residents of a housing society, $\frac{13}{18}$ own a cars and 48/65 of the car owners have purchased covered parking space. If 136 of the residents parked the car in the open, how many residents were there in the society.

(a) 900 (b) 720

(c) 630 (d) 650

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (b) : Let the total number of residents in the society = x

Number of people who have a car = $x \times \frac{13}{18}$

Number of people who purchased covered parking space = $\frac{13x}{18} \times \frac{48}{65} = \frac{8x}{15}$

According to the question,

$\frac{13x}{18} - \frac{8x}{15} = 136$

$\frac{65x - 48x}{90} = 136$

$\frac{17x}{90} = 136$

$x = \frac{136 \times 90}{17} = \frac{12240}{17} = 720$

46. Parvez leaves his office every day at 6 pm and reaches home at 7.30 pm. One day he left his office at 6 pm but he covered one fourth the distance at 4/5 of his usual speed if Parvez was able to reach home on time then at what time did he cover the remaining part of the journey at his usual speed?

(a) $\frac{16}{15}$ (b) $\frac{10}{9}$

(c) $\frac{12}{11}$ (d) $\frac{6}{5}$

RRB NTPC 31.01.2021 (Shift-I) Stage Ist

Ans. (c) : Let distance between office and Parvez's home is d km and his usual speed be v km/h.
According to the question,

$$\frac{d}{v} = 1\frac{1}{2} \text{ hours}$$

$$\frac{d}{v} = 3/2 \text{ hours} \quad \text{_____(i)}$$

Again, let Parvez covers the remaining part of the journey at x times of usual speed.

$$\frac{(d/4)}{(4v/5)} + \frac{(3d/4)}{x.v} = 3/2 \text{ _____(ii)}$$

From eq^{n} (i) & (ii),

$$\frac{(d/4)}{(4v/5)} + \frac{(3d/4)}{x.v} = \frac{d}{v}$$

$$\Rightarrow \frac{5}{16} + \frac{3}{4x} = 1$$

$$\Rightarrow \frac{3}{4x} = 1 - \frac{5}{16} \text{ or } \frac{3}{4x} = \frac{11}{16}$$

$$\frac{3}{x} = \frac{11}{4}$$

$$\frac{1}{x} = \frac{11}{12}$$

$$x = \frac{12}{11}$$

47. If $a^2 + b^2 + c^2 + d^2 = 1$, what will be the maximum value of the product abcd?

(a) 16 (b) 64

(c) $\frac{1}{64}$ (d) $\frac{1}{16}$

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : $a^2 + b^2 + c^2 + d^2 = 1$

For maximum value, $a = b = c = d$

Then, $4a^2 = 1 \Rightarrow a^2 = \frac{1}{4}$ or $a = \frac{1}{2}$

$\therefore \quad (abcd)_{max} = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{16}$

48. Rakesh donates blood twice in 3 years each time 330ml. How many litres of blood will he donate in 6 years.

(a) 1.36 L (b) 1.30 L

(c) 1.32 L (d) 1.34 L

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (c) : Blood donates twice in 3 years.
Then the blood donates in 6 years $(2 \times 2) = 4$ times.
Total blood donates in 6 years = 4× 330 = 1320 ml

$$= \frac{1320}{1000} \text{ L} = 1.32 \text{ L}$$

49. Angle 54° is equivalent to (in radians):

(a) $\frac{9\pi}{10}$ (b) $\frac{7\pi}{10}$

(c) $\frac{\pi}{10}$ (d) $\frac{3\pi}{10}$

RRB NTPC 04.02.2021 (Shift-II) Stage Ist

Ans. (d) : From question,

π radian $= 180°$

$$1° = \frac{\pi}{180} \text{ radian}$$

$$54° = 54° \frac{\pi}{180°} = \frac{3\pi}{10}$$

50. John, Sarah, Tom and Joane bought 3 pizzas of the same size in all. John eat 2/4 of a pizza. Sarah, Tom and Joane eat 3/4 of a pizza each. How much pizza was left?

(a) $\frac{1}{4}$ of a pizza (b) $\frac{1}{2}$ of a pizza

(c) 1 pizza (d) $\frac{3}{4}$ of a pizza

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (a) : Suppose a pizza has 4 parts.
Total parts of 3 pizzas = 4×3 = 12

John	Sarah	Tom	Joane	[Eaten Parts]
2 parts	3 parts	3 parts	3 parts	

Remaining parts = 12– (2 + 3 + 3 + 3) = 1

Remaining parts of 3 pizzas = $\frac{1}{12} \times 3 = \frac{1}{4}$ of a pizza

51. If 2/5 of the number of girl students attending a school function is equal to 3/5 of the number of boys attending the function. What fraction of the total students attending the function will be 2/5 of the number of girl students attending the function?

(a) $\frac{5}{6}$ (b) $\frac{2}{3}$

(c) $\frac{1}{5}$ (d) $\frac{6}{25}$

RRB NTPC 05.02.2021 (Shift-I) Stage Ist

Ans. (d) : Let, number of boys in function = x
And number of girls in function = y
According to the question,

$$y \times \frac{2}{5} = x \times \frac{3}{5} \Rightarrow x : y = 2 : 3$$

Required fraction = $\frac{y \times 2/5}{(x+y)} = \frac{3 \times 2/5}{5} = \frac{6}{25}$

52. In a swimming pool measuring 90 m × 40 m, 150 men take a dip. If the average displacement of water by a man is 8 m^3, then what will be the rise in the water level of the pool?

(a) 20 cm (b) 25 cm

(c) 33.33 cm (d) 30 cm

RRB NTPC 10.02.2021 (Shift-II) Stage Ist

Ans. (c) : Side of small cuboid = 8 m^3
Side of a bigger cuboid = 150 × 8 m^3
Number of cuboids in a big cuboid = *l*bh
150 × 8 m^3 = 90 m × 40 m × h

$$h = \frac{1}{3} \text{m}$$

$$h = \frac{100}{3} \text{cm}$$

$$\boxed{h = 33.33 \text{ cm}}$$

53. Sundari, Kasu and Joyti each took two tests. The ratio of marks obtained to total marks for each of their two tests is given below;

Sundari - $\frac{24}{60}$ and $\frac{32}{40}$

Kasu - $\frac{35}{70}$ and $\frac{54}{60}$

Joyti - $\frac{27}{90}$ and $\frac{45}{50}$

Who among them registered the maximum progress?

(a) Both Sundari and Kasu
(b) Only Sundari
(c) Only Joyti
(d) Only Kasu

RRB NTPC 17.02.2021 (Shift-II) Stage Ist

Ans. (c) : Progress of Sundari $= 80 - 40 = 40\%$
Progress of Kashi $= 90 - 50 = 40\%$
Progress of Jyoti $= 90 - 30 = 60\%$
Hence, it is clear that Jyoti registered the maximum progress.

54. Read the given information and Stagements carefully and decide which option is correct with respect to the Stagements.
If a circle has a radius (r), area (A) and circumference (C), then:
Stagements:
(1) $A : C^2 = 1 : 4\pi$
(2) $A : C = r : 2$

(a) Both Stagement 1 and 2 are true.
(b) Only Stagement 2 is true.
(c) Both Stagement 1 and 2 are false.
(d) Only Stagement 1 is true.

RRB NTPC 27.02.2021 (Shift-I) Stage Ist

Ans. (a) : Area of a circle of radius r,

$$\text{Area } (A) = \pi r^2$$
$$\text{Perimeter } (C) = 2\pi r$$

From Stagement-1 $= A : C^2 = \pi r^2 : (2\pi r)^2$

$$A : C^2 = \pi r^2 : 4\pi^2 r^2$$
$$A : C^2 = 1 : 4\pi$$

From Stagement-2 $= A : C = \pi r^2 : 2\pi r$

$$A : C = r : 2$$

Hence, it is clear that Stagement (1) and Stagement (2) both are true.

55. Karuna reads $\frac{1}{4}$ th of a book in one hour. What fraction of the book will she be able to read in 2h 15 min?

(a) $\frac{1}{9}$ (b) $\frac{1}{8}$
(c) $\frac{9}{16}$ (d) 9

RRB NTPC 03.03.2021 (Shift-II) Stage Ist

Ans. (c) :

$\because$ 2 hours 15 minutes $= 2h + \frac{15}{60}$ hours

$$= \left(2 + \frac{1}{4}\right) \text{hours}$$
$$= 9/4 \text{ hours}$$

Read parts in 1 hours $= \frac{1}{4}$

$\therefore$ Read parts in $\frac{9}{4}$ hours $= \frac{1}{4} \times \frac{9}{4}$

$$= \frac{9}{16}$$

56. If the angle of a sector in a pie diagram is 135º, then it is equivalent to _____ of the pie diagram.

(a) $\frac{3}{4}$ (b) $\frac{3}{8}$
(c) $\frac{1}{8}$ (d) $\frac{1}{4}$

RRB NTPC 05.03.2021 (Shift-II) Stage Ist

Ans. (b) :
$\because$ The measure of the angle about the center of the circle is $360º \Rightarrow$ 1 part

$\therefore$ Angle of the segment $= 135º \Rightarrow \frac{1}{360º} \times 135º = \frac{3}{8}$ part

57. If $2^x = 4^{y+1}$ and $3^y = 3^{x-9}$, then the respective values of x and y will be

(a) (7, 16) (b) (-16, 7)
(c) (16, 7) (d) (16, 7)

RRB NTPC 13.03.2021 (Shift-II) Stage Ist

Ans. (c) : Given,
$2^x = 4^{y+1}$ and $3^y = 3^{x-9}$
$2^x = 2^{2(y+1)}$
On comparing exponent
$x = 2y+2$ — (I)
And $3^y = 3^{x-9}$
$y = x-9$ — (II)
On putting the value of 'y' in eq^n (i)
$x = 2x-18+2$
$x = 16$
On putting the value of 'x' in eq^n (ii)
$y = 16 - 9$
$y = 7$
Hence, value of x and y will be 16, 7 respectively.

58. What would be the highest value of X in the given equation?
5Y6 + 6X7 + 3Z8 = 1511

(a) 6 (b) 5
(c) 7 (d) 9

RRB NTPC 15.03.2021 (Shift-I) Stage Ist

Ans. (d) Equation = 5Y6 + 6X7 + 3Z8 = 1511

```
 5Y6
 6X7
+3Z8
------
 1511
```

(14) (21)

($\because$ Y+X+Z = 9, Maximum value of X = 9
So, the value of Y and Z will be 0)

59. A series of the set up in different regions is sold for as shown in the following table-

	Sale in Lakh
Region 1	3
Region 2	5
Region 3	8
Region 4	12

Comparison region 3 to region 4 is

(a) 25% more sale (b) 50% more sale
(c) 25% less sale (d) 20% more sale

RRB Group-D – 23/10/2018 (Shift-I)

Ans. (b) : From table,

$$\text{Intended increase \%} = \frac{12-8}{8}\times 100 = \frac{4}{8}\times 100 = 50\%$$

= 50% more sale

60. The following table describes the 4 years of sales (in lakh) to the company.

	Sale in Lakh
year 1	35
year 2	80
year 3	90
year 4	100

What percentage difference in sale from year 2 to year 4.

(a) 25% decrease (b) 25% increase
(c) 20% increase (d) 20% decrease

RRB Group-D – 23/10/2018 (Shift-II)

Ans. (b) : From table,

$$\text{Intended increase \%} = \frac{100-80}{80}\times 100$$

$$= \frac{20}{80}\times 100$$

= 25% increase

61. The salary of Q is 4/5 of salary of P which is Rs. 85,000 per month. Salary of R is 3/4 of Q. What is the per month salary of R.

(a) Rs. 68,000 (b) Rs. 61,000
(c) Rs. 51,000 (d) Rs. 45,000

RRB NTPC 05.04.2016 Shift : 2

Ans : (c) Salary of P = Rs. 85000

$$\text{Salary of Q} = 85000\times\frac{4}{5} = \text{Rs. } 68000$$

$$\text{Salary of R} = \text{Salary of Q}\times\frac{3}{4} = 68000\times\frac{3}{4}$$

= Rs. 51000 per month

62. 250 grams of sweet has 20 grams of Cashew and 30 grams of Almonds. How many grams of this sweet will be 350 grams of Cashew and Almonds respectively.

(a) 28 and 42 (b) 21 and 28
(c) 40 and 60 (d) 25 and 45

RRB NTPC 19.01.2017 Shift : 2

Ans :(a) % of Cashew in 250 grems sweet

$$= \frac{20}{250}\times 100 = 8\%$$

$$\text{\% of Almond in 250 grams sweet} = \frac{30}{250}\times 100 = 12\%$$

According to the question,

Quantity of Cashew in 350 grams sweet

$$= 350\times\frac{8}{100} = 28 \text{ grams}$$

Quantity of Almond in 350 grams sweet

$$= 350\times\frac{12}{100} = 42 \text{ grams}$$

63. John won a lottery in which the government deducted 35% of the tax and gave 7/8 part to john and remaining to the ticket seller. If the ticket seller received Rs. 22,343.75. What was the amount of lottery?

(a) 2,23.437 (b) 275,000
(c) 264,384 (d) 178,750

RRB NTPC 28.04.2016 Shift : 1

Ans : (b) Assuming lottery amount = x Rs.

$$\text{Governments tax} = \frac{x\times 35}{100} = \frac{35x}{100}$$

$$\text{Remain amount} = x - \frac{35x}{100} = \frac{65x}{100}$$

$$\text{Share of John} = \frac{65x}{100}\times\frac{7}{8} = \frac{91x}{160}$$

$$\text{Remain amount} = \frac{65x}{100} - \frac{91x}{160} = \frac{520x-455x}{800} = \frac{65x}{800}$$

$$\because \quad \frac{65x}{800} = 22343.75$$

$$x = \frac{22343.75\times 800}{65} = 275000$$

64. Various bronds of chips are available in a kiosk 70% of the sales of the store come from selling potatoes, 30% of sales are other chips and wafers. The average sales of the store in each quarter is Rs. 12,00,000. What is their estimated average monthly sales of potato chips?

(a) Rs. 5,00,000 (b) Rs. 2,50,000
(c) Rs. 3,00,000 (d) Rs. 2,80,000

RRB Group-D – 24/09/2018 (Shift-I)

Ans : (d) Let sales of stores = Rs. x

$$\text{Sales potato chips} = \frac{x\times 70}{100} = \frac{7x}{10}$$

$$\text{Sales of other chips and wafers} = \frac{x\times 30}{100} = \frac{3x}{10}$$

According to the question,

Sales of potato chips : Sales of other chips and wafers

$$= \frac{7x}{10} : \frac{3x}{10} = 7:3$$

$\because$ Store's average sale in every quarter = Rs. 12, 00,000

$$\therefore \text{ Store's average sale in every month} = \frac{12,00,000}{3}$$

= Rs. 400000

Estimated average monthly sales of potato chips

$$= \frac{400000\times 7}{(7+3)} = \frac{400000\times 7}{10}$$

= 40000 × 7 = Rs. 2,80,000

65. Which of these deals will be the best in terms of percentage profits

(a) Cost price = 60, Profit = Rs. 32
(b) Cost price = 80, Profit = Rs. 44
(c) Cost price = 50 , Profit = Rs. 26
(d) Cost price = 70, Profit = Rs. 40

RRB NTPC 18.01.2017 Shift : 3

Ans : (d) From the option-

(a) $P\% = \frac{32 \times 100}{60} = 53.33\%$

(b) $P\% = \frac{44 \times 100}{80} = 55\%$

(c) $P\% = \frac{26 \times 100}{50} = 52\%$

(d) $P\% = \frac{40 \times 100}{70} = \boxed{57.14\%}$

So, option (d) will be the best deal.

66. Ravi had Rs. 713.39 in his bank account he deposited some amount in his account and then withdraw the amount for 5 shirt. Cost of each shirt worth Rs. 123.79. If total balance in his account is Rs. 545.19. So, how much amount did he deposit.

(a) Rs. 460.70 (b) Rs. 450.75
(c) Rs. 448 (d) Rs. 459.50

RRB Group-D – 03/10/2018 (Shift-III)

Ans : (b) Amount in Ravi's bank account = Rs. 713.39
Withdraw money to buy five shirts
= Rs. 123.79 × 5
= Rs. 618.95
Suppose deposited amount by Ravi = Rs. x
Balance = Rs. 545.19
According to the question-
713.39 + x – 618.95 = 545.19
x + 94.44 = 545.19
x = 545.19 – 94.44
x = ₹ 450.75
So, Ravi deposited Rs. 450.75

67. If you want to increase the size of a cubic box, for this you increase its dimensions by half more than that of original size. Which of the following Stagement is true regarding the volume of the newly formed box after the box size has been increased?

(a) It is 337.5% of the volume of the original box.
(b) It is 112.5% of the volume of the original box.
(c) It is 450% of the volume of the original box.
(d) It is 150% of the volume of the original box.

RRB Group-D – 11/10/2018 (Shift-II)

Ans : (a) Suppose, cubic box dimension = a
According to the question-
Increased size = 1.5a
Volume of cubic box = a^3
And volume of cubic box with 1.5a dimensions = $(1.5a)^3$
$= 3.375a^3$
After the box size increase, 3.375 will be volume of the original box or (3.375 × 100)%
= 337.5%

68. Emma makes arrangements for a Kitty party she divides the total expected expenditure into five broad segment. The distribution has been given here.

Expense Segment	expense %
1	25
2	20
3	15
4	30
5	10

If she spends Rs. 3000 on segment 3. So what will be her total expenditure for segment 2 and segment 5.

(a) Rs. 2, 000 (b) Rs. 6, 000
(c) Rs. 3, 000 (d) Rs. 1, 000

RRB Group-D – 11/10/2018 (Shift-III)

Ans : (b) From table,
Spend percentage at segment 3 = 15
Given 15% = 3000
And spend percentage of segment 2 and 5 = 20 + 10 = 30%
$\because$ 15% = 3000

$1\% = \frac{3000}{15}$

$30\% = \frac{3000 \times 30}{15} = 6000$

So, 30% = Rs. 6000

69. A rich man divided his property among five sons. But later he withdraw his share of the youngest son and divided it into other sons, if the eldest son would now have 93.75m^2 land. How much land did the rich actually own.

(a) 375 m^2 (b) 395 m^2
(c) 315 m^2 (d) 275 m^2

RRB Group-D – 15/10/2018 (Shift-I)

Ans : (a) Considered the total wealth of rich man= x m^2

$\Rightarrow$ Each son got share $= \frac{x}{5}$ part

$\Rightarrow$ The share of the youngest son is shared by every four sons and the elder son gets the share $= \frac{x}{5} + \frac{x}{20}$

According to the question,

$\Rightarrow \frac{x}{5} + \frac{x}{20} = 93.75$

$\Rightarrow 4x + x = 93.75 \times 20$

$\Rightarrow 5x = 1875$

$\Rightarrow x = 375$

$\Rightarrow x = 375$ m^2

So, the total wealth of the rich man was 375 m^2

70. 216 cards are distributed between A and B. First the cards are distributed between A and B respectively in 5:4 the ratio. After some times CARDS are recollected and distributed between A and B respectively in the ratio 11:13. How many card received from A to the second time than before?

(a) 3 less (b) 3 more
(c) 21 more (d) 21 less

RRB Group-D – 25/09/2018 (Shift-III)

Ans. (d) : Ratio of the card distributed between A and B,

A : B = 5 : 4

Card received by A $= \frac{5}{9} \times 216 = 120$

Card received by B $= \frac{4}{9} \times 216 = 96$

Ratio of the distribution of recollected cards

A : B = 11 : 13

Again card received by A $= \frac{11}{24} \times 216 = 99$

Again card received by B $= \frac{13}{24} \times 216 = 117$

$\therefore$ Card received by A as compared to second time

= 120 – 99

= 21 less

71. A grasshopper of 63 grams can be eaten by three ants separately in 3, 4 and 6 days respectively if they eat the grasshopper together, find their share (in gram) till they finish it.

(a) 28, 21, 14 (b) 30, 21, 12
(c) 31, 20, 12 (d) 31, 21, 15

RRB Group-D – 27/11/2018 (Shift-III)

Ans. (a) Time = 3 : 4 : 6

Therefore, part $= \frac{1}{3} : \frac{1}{4} : \frac{1}{6} = 4 : 3 : 2$

Suppose that their share is 4x, 3x and 2x

4x + 3x + 2x = 63

9x = 63

x = 7

$\therefore$ Shares of three = 28, 21, 14

72. Jane won the lottery and get 1/3 of the prize money she makes a donation of Rs. 6000 which is 1/6th part. The total amount of lottery is:

(a) 36000 (b) 18000
(c) 54000 (d) 108000

RRB NTPC 03.04.2016 Shift : 2

Ans : (d) Let the price of the lottery = Rs. x

From the question-

$$\left(\frac{x}{3}\right) \times \frac{1}{6} = 6000$$

$$\frac{x}{18} = 6000$$

x = Rs. 108000

73. Rani and Malika have a total of Rs. 227, Rani and Tamali have Rs. 273, while the Tamali and Malika have total Rs. 280 what is the amount of money Malika has?

(a) ₹ 113 (b) ₹ 123
(c) ₹ 127 (d) ₹ 117

RRB Group-D – 30/10/2018 (Shift-II)

Ans : (d) Malika + Rani = 227 -----(I)

Rani + Tamali = 273 -----(II)

Tamali + Malika = 280 -----(III)

On adding equation I, II, and III,

2 (Malika + Rani + Tamali) = 227 +273 +280

Malika + Rani + Tamali $= \frac{780}{2}$ =390-----(IV)

On putting the value of eq^{n}. II in eq^{n}. IV,

Malika + 273 = 390

Malika = 390 - 273 = Rs. 117

74. In a college of 420 students, each students reads 5 subject and 60 students read each subjects then what is the total number of subjects that was read.

(a) Approximately 35 (b) Approximately 25
(c) At least 50 (d) At most 30

RRB Group-D – 24/10/2018 (Shift-I)

Ans : (a) From question,

No. of total students in college = 420

No. of subjects studies by 60 students $= \frac{420}{60} = 7$

$\because$ Each students studies 5 subjects

$\therefore$ Total no. of subjects studied = 7 × 5 = 35

75. In group of boys, 22 like sweets, 10 like puff and 10 like cakes. Three of them like all three from the items, at least two items are liked by 7. How many of them like only one item?

(a) 38 (b) 24
(c) 25 (d) 35

RRB Group-D – 30/10/2018 (Shift-III)

Ans. (c) : No. of peoples who like only one item

= 22+10+10-3-2× 7 = 42-17 = 25

76. A man has a few small boxes to pack in the parcel. If he pack 3, 4, 5 or 6 boxes in the parcel, then he left 1 box. If he pack 7 parcel then there is no one left, what can be the number of packing boxes?

(a) 405 (b) 309
(c) 400 (d) 301

RRB Group-D – 30/10/2018 (Shift-I)

Ans : (d) From question,
LCM of (3, 4, 5, 6) = 60
$\therefore$ Number = 60x + 1
for, x = 5
60 × 5 + 1 = 301
Number of packing box
Hence, 301 is divisible by 7.

77. How many millimeters in 10 km?
(a) 10^{10} (b) 10^{9}
(c) 10^{8} (d) 10^{7}

RRB NTPC 31.03.2016 Shift : 2

Ans : (d) 1 km = 1000 m
= 1000 × 1000 mm (1 m = 1000 mm)
= 10^{6} mm
$\therefore$ 10 km = 10 × 10^{6} = 10^{7} mm

78. What will be the next set of numbers in given series.
(2, 3), (3, 5), (5, 7), (7, 11), (11, 13), _____
(a) (13, 15) (b) (15, 17)
(c) (13, 17) (d) (13, 19)

RRB NTPC 17.01.2017 Shift-1

Ans : (c) The above series is a set of prime numbers
(2,3), (3,5), (5,7), (7,11), (11,13), (13,17)
Therefore, the next set of the series is (13, 17)

79. Read the following and answer the question based on it. Puspa wanted to buy three shirts. He came to know of the following offers.
1. Super sale take 2 shirts at a price of Rs. 749 per shirt and get 30% off on the next shirt.
2. Hot sale : Take 2 shirts at a price of Rs. 799 per shirt and get a discount of 40% on the next shirt.
3. Mega sale : Take 2 shirts of Rs. 1999 and get 1 shirt free.
4. Big sale : Take 2 shirts at the cost of Rs. 999 per shirt and get a discount of 90% on the next shirt.

In the content of price which offer is best which Puspa should choose.
(a) big sale (b) mega sale
(c) super sale (d) hot sale

RRB NTPC 26.04.2016 Shift : 1

Ans : (b) From question,
(1) Cost of 3 shirts according to the super sale
$= 749 + 749 + \left(749 \times \frac{70}{100}\right)$ = Rs. 2022.3
(2) Cost of 3 shirts according to the hot sale
$= 799 + 799 + \left(799 \times \frac{60}{100}\right)$ = Rs. 2077.4
(3) Cost of 3 shirts according to mega sale
= 1999 + 0 = Rs. 1999
(4) Cost of 3 shirts according to big sale =
$= 999 + 999 + \frac{999 \times 10}{100}$ = Rs. 2097.9
Therefore, the best offer is at mega sale which Puspa should choose.

80. A monkey is climb on a 12 m long tree. If he climbs 2 m in first second and in next second he slip 1 m. He repeated this activity again and again. In which second he climbs on the top of tree.
(a) 20 th (b) 21 st
(c) 22 nd (d) 24 th

RRB NTPC 29.04.2016 Shift : 3

Ans. (b) $\because$ The monkey climbs 2 m in first second but next second he slips 1 m. So, he climbs only one meter in 2 seconds.
$\therefore$ He will climb 10 meters in 20 seconds
and in 21 second he will be able to climb 12 m means he will reach at the top.

81. A man climbs a 24 meters high palm tree. He climbs 4 metres in the first second and slips 2 metres in the next second. This process is repeated again and again until he does not reaches the top. In which second he will at the top?
(a) 20 th (b) 21 th
(c) 22 th (d) 24 th

RRB NTPC 30.04.2016 Shift : 1

Ans : (b) In 2 seconds the distance climbed at the palm tree = 2 m
Distance climbed at the palm tree in 20 second = 20 m
21st second means the distance climbed at the palm tree in the last = 20 + 4 = 24 m
Therefore in 21st second he reaches at the top of 24m palm tree.

82. Consider the given question and decide which of the following Stagements is/are sufficient to answer the question.
Is X – 5 even
X is a real number.
Stagement:
1. X – 15 belongs to integer
2. X – 10 is an odd integer
(a) Stagement 1 alone is sufficient while Stagement 2 alone is insufficient
(b) Stagement 2 alone is sufficient while Stagement 1 alone is insufficient
(c) Both Stagements 1 and 2 are sufficient
(d) Neither Stagement 1 nor 2 is sufficient

RRB ALP & Tec. (09-08-18 Shift-I)

Ans : (b) Let x = 11
From Stagement (2),
11 – 10 = 1 (Odd Integer)
so 11 – 5 = 6 [Even number and 6 is a real no. along with even no.]
So, Stagement 2 is sufficient for answer the question.
So, option (b) is correct.