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Inspiring Minds

REVISED EDITION

Verbal Reasoning
Logical & Analytical Reasoning
Non-Verbal Reasoning

How to Crack
TEST OF REASONING
In All Competitive Exams

Contains More Than 2000 Solved Questions

Jaikishan • Premkishan

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Test of **Reasoning** & How to Crack It

> Bad reasoning as well as good reasoning both are possible, and this fact is the foundation of the practical side of logic.

Skills in Reasoning are supposed to be the parameters of how analytical and discerning the mind of an individual is. It is seen that a person with high level of reasoning is quite successful and well adjusted to the surrounding environment, while a person with low reasoning capabilities is not so successful in life and mal-adjusted to the environment around. This is why the tests of reasoning have been devised to ascertain the suitability of a person for a job.

Test of reasoning is a method of measuring the mental capacities. It includes tests to solve problems and arrive at rational answers and solutions in a logical way.

Test of **Reasoning** *in* **Various Competitive Exams**

There is no specific syllabus of Test of Reasoning. The range, depth, pattern and format of questions varies from one exam to another. Also the proportion of test items of reasoning out of the total items of the test changes from one exam to another. In Management Aptitude Test(MAT), there are 40 items of reasoning out of the total of 200 items while in different Bank PO Exams almost 50 items are there from reasoning out of the total 200. A comparison chart is given here:

S.No.	Competitive Examination	Total Number of Questions	No. of Questions from Test of Reasoning (*Approx*)
1.	Bank Probationary Officers	200	50-70
2.	SSC Graduate Level	200	50
3.	MAT	200	40
4.	Hotel Management	200	50
5.	Inspector of Central Excise/IT	200	80
6.	Railway	200	20-30

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Section 1: **Verbal Reasoning**

A Verbal Reasoning Test is designed to test the ability to analyse the given information in words, and solve the problems using language-based reasoning framework. It aims at evaluating the ability to think correctly and constructively, rather than at simple fluency or vocabulary power. It also is a test of intelligence, provides an assessment of individual's ability to think logically and solve problems in shortest of time. Verbal reasoning tests use words, letters and numbers and require logical reasoning and a reasonable knowledge of English language words.

People generally assume that their verbal reasoning skills are relatively sharp because they engage in conversations and engage in at least some reading of newspapers and magazines regularly. The differentiation between someone with poor verbal reasoning and someone with excellent verbal reasoning skill lies in one's ability to read or listen critically, and to pick out some significant information. Significant information can include known facts, specific opinions, statistics, sources and the like.

This book How to Crack Test of Reasoning comprises of the following 18 chapters of Verbal reasoning

1. Coding–Decoding
2. Analogy
3. Classification
4. Alphabet Test
5. Word Formation
6. Sitting Arrangement
7. Direction Sense Test
8. Number, Ranking and Time Sequence Test
9. Puzzles
10. Number Series
11. Letter Series
12. Inserting Missing Character
13. Problems Based on Ages
14. Blood Relations
15. Clocks and Calendar
16. Mathematical Operation
17. Logical Order of Words
18. Clerical Aptitude

Section 2 : **Logical and Analytical Reasoning**

"Logical and Analytical thinking is not a magical process or a matter of genetic endowment, but a learned and cultivated mental prowess."

This book aims to make your logical and analytical reasoning abilities more sharp. We all have these skills, and we use these many times in our daily life without being aware of this fact.

All the competitive exam papers contain logical and mastering some tricks, and regular practice of various sub-topical questions could solve analytical test items in the reasoning section, and these.

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This book contains almost all the chapters related to logical and analytical reasoning with problem-solving strategies, and plenty of solved and unsolved questions.

Following chapters are covered in this book

1. Logical Venn Diagrams
2. Eligibility Test
3. Syllogism
4. Statement and Assumptions
5. Statement and Conclusions
6. Statement and Arguments
7. Statement and Course of Action
8. Verification of Truth of the Statement
9. Data Sufficiency
10. Input-Output

Section 3 : **Non-Verbal Reasoning**

Non-verbal Reasoning involves the ability to understand and analyse visual information and so problems using visual reasoning. For example, identifying relationships, similarities a differences between shapes and patterns, recognising visual sequences and relationships betwe objects, and remembering these. It enables candidates to analyze and solve complex proble without relying upon or being limited by language skills. As these tests don't require reading th can give insight into the abilities of those who have problems with reading and thinking verba those who may lack motivation, and those with specific learning difficulties. In this section you w get different chapters based on non- verbal problems asked in various competitive exams.

It comprise following chapters

1. Mirror Image
2. Water Image
3. Series
4. Analogy
5. Classification
6. Paper folding and Cutting
7. Grouping of Identical Figures
8. Formation of Figure
9. Counting Figure
10. Embedded Figure
11. Figure Completion
12. Figure Matrix
13. Cube and Dice

5 Tips *to* Crack the Test of Reasoning

1. Practice hard.
2. Solve previous years' questions of that exam to know the range, type and level of questions.
3. Exercise your memory so that all the important formula and methods are always in your consciousness.
4. Practice for speed with accuracy.
5. Develop alertness and poise.

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Verbal Reasoning

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1

Coding-Decoding

Coding is a system of signals. This is a method of transmitting information in the form of codes or signals without it being known by a third person.

The person who transmits the code or signal, is called the sender and the person who receives it, is called the receiver. Transmitted codes or signals are decoded on the other side by the receiver—this is known as decoding.

In questions on coding-decoding, a word (basic word) is coded in a particular way and the candidates are asked to code other word in the same way. The coding and decoding tests are set up to judge the candidate's ability to decipher the rule that has been followed to code a particular word/message and break the code to decipher the message.

Order of the English Alphabet

Forward order position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Backward order position	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Here, are some methods/techniques are given below to remember the positions of English alphabets in forward or backward order.

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1. By using EJOTY and CFILORUX formulae, we can easily remember the position letters of English alphabets.

3 6 9 12 15 18 21 24
C F I L O R U X

(sounds like a medicine name)

5 10 15 20 25
E J O T Y

(sounds like a girl's name Joti)

- Backward order position of a letter = 27 – Forward order position of letter

e.g., Backward order position of B = 27 – Forward order position of B = 27 – 2 = 25

Illustration 1. If CUP = 40, then KITE = ?

(a) 10 (b) 20 (c) 30 (d) 45

Solution *(d)* As, C U P ⇒ 3 + 21 + 16 = 40
3 21 16

Similarly, K I T E ⇒ 11 + 9 + 20 + 5 = 45
11 9 20 5

(using forward letter positions)

Illustration 2. What is the number place of from right side?

(a) 10 (b) 20
(c) 25 (d) 30

Solution *(b)* 27 – G = 27 – 7
= 20

(from le

2. By using V Q L G B and X U R O L I F C, we can easily remember the position letters of alphabet in reverse order.

V Q L G B and X U R O L I F C
5 10 15 20 25 3 6 9 12 15 18 21 24

Illustration 3. If BAG = 71, then VICE = ?

(a) 69 (b) 70 (c) 75 (d) 90

Solution *(a)* As, B A G ⇒ 25 + 26 + 20 = 71
25 26 20

Similarly, V I C E
5 18 24 22
= 5 + 18 + 24 + 22 = 69

(using backward letter position

3. If the sum of two letters is 27, then both letters are at opposite position of each othe Some pairs of opposite letters can be remembered as given below

D W (DEW)
4 + 23 = 27

B Y (BY)
2 + 25 = 27

C X (SIX)
3 + 24 = 27

G T (GT Road)
7 + 20 = 27

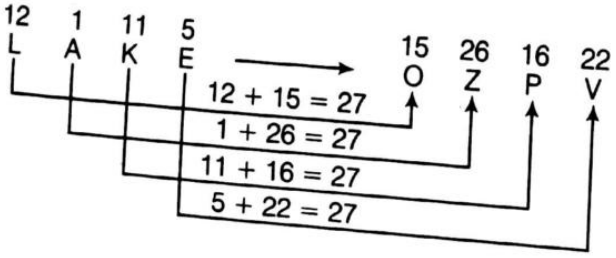
I R (Indian Railway)
9 + 18 = 27

M N (MAN)
13 + 14 = 27

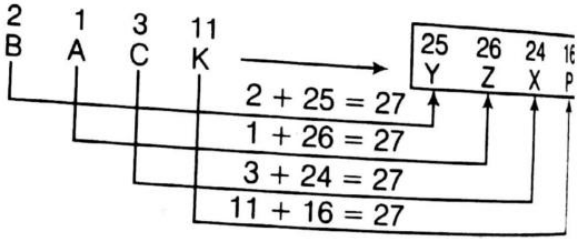
Illustration 4. In a certain code, LAKE is written as OZPV. How will BACK be in that same code?

(a) ZYXP (b) ZYPX
(c) YZXP (d) YZPX

Solution *(c)* As,



Similarly,



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Types of Questions

Following are the categories/types of questions which are generally asked in various competitive examinations.

Type 1 Letter Coding

In this type, we deal with questions, in which the letters of a word are replaced by certain other letters according to a specific pattern/rule to form a code. You are required to detect the coding pattern/rule and answer the question(s) that follow, based on that coding pattern/rule.

Illustration 5. In a certain code language, 'PICTURE' is written as 'QHDSVQF'. How would 'BROWSER' be written in that same code language?

(a) CQVVTDS (b) CQPVTDS
(c) CQPUTDS (d) CQVPPDS
(e) None of these

Solution (*b*) Clearly, the letters in the word PICTURE are moved alternately, one step forward and one step backward to obtain the letters of the code. Thus, we have

P $\xrightarrow{+1}$ Q
I $\xrightarrow{-1}$ H
C $\xrightarrow{+1}$ D
T $\xrightarrow{-1}$ S
U $\xrightarrow{+1}$ V
R $\xrightarrow{-1}$ Q
E $\xrightarrow{+1}$ F

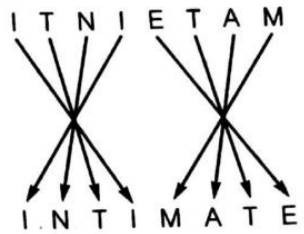
Similarly,

B $\xrightarrow{+1}$ C
R $\xrightarrow{-1}$ Q
O $\xrightarrow{+1}$ P
W $\xrightarrow{-1}$ V
S $\xrightarrow{+1}$ T
E $\xrightarrow{-1}$ D
R $\xrightarrow{+1}$ S

Illustration 6. In a certain code language, 'ITNIETAM' is code for 'INTIMATE', then which of the following words has the code for 'TREVNIETARBI'?

(a) INVRETIBRATE (b) INVERTIBARTE
(c) INVERTIBRETA (d) INVERTIBRATE
(e) INVERITBARTE

Solution (*d*) The letters of the first half and the next half of the code are separately reversed to obtain the word. Thus, we have



Similarly,

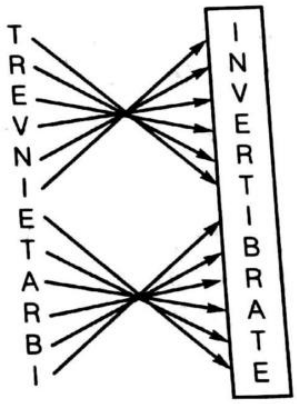


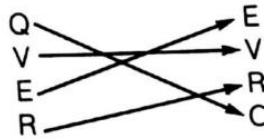
Illustration 7. In a certain code language, 'GIVE' is written as 'VIEG' and 'OVER' is written as 'EVRO'. How will 'DISK' be written in that same code?

(a) SIDK (b) KISD
(c) KDSI (d) SIKD
(e) None of these

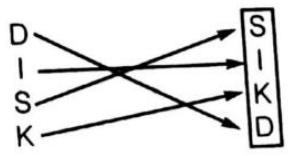
Solution (*d*) Here,



and



Similarly,



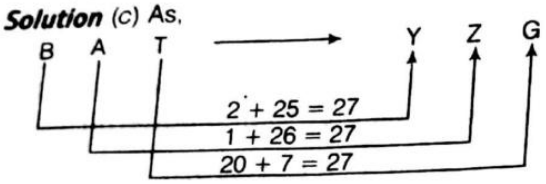
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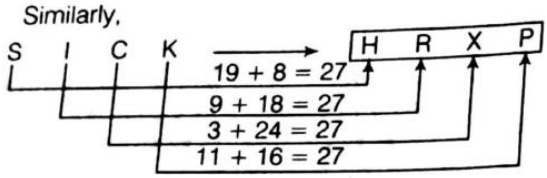
Illustration 8. In a certain code language, 'BAT' is written as 'YZG'. How will 'SICK' be written in that same code language?

(a) HRYV (b) HRZP (c) HRXP
(d) RHPX (e) None of these

Solution (c) As,



Similarly,



Important Points

- If more than one codes are given, then the requ... code can be derived from the question itself and you... not required to solve it mathematically. e.g., In a ce... code LOCATE is written as 981265 and SPARK as 47... the code for CASKET can be derived by common let... in LOCATE and SPARK.
- For a word in which a letter repeats at those s... pattern repeats for 2nd letter in the word itself. ... TASTE has code SZRSD, in this case, code for T is ... both cases. So, the coding pattern is -1 for T, then it ... be same for all the letters.

Note Each letter is coded by the letter of its opp... position.

Type 2 **Direct Letter Coding**

In direct letter coding system, the code letters occur in the same sequence as corresponding letters occur in the words. This is basically a direct substitution method.

Illustration 9. In a certain code language, 'STARK' is written as 'LBFMG' and 'MOBILE' is written as 'TNRSPJ'. How will 'BLAME' be written in that same code language?

(a) TSFRJ (b) RPFTJ (c) NJFTP
(d) TSFGJ (e) None of these

Solution (b) Using direct letter coding method,

S ⟶ L	and	M ⟶ T	
T ⟶ B		O ⟶ N	
A ⟶ F		B ⟶ R	
R ⟶ M		I ⟶ S	
K ⟶ G		L ⟶ P	
		E ⟶ J	

Similarly, from the direct codes

B ⟶	R
L ⟶	P
A ⟶	F
M ⟶	T
E ⟶	J

Illustration 10. In a certain coding sys... 'SHEEP' is written as 'GAXXR' and 'BLEA... 'HPXTN'. How can 'SLATE' be written in ... same coding system?

(a) GPTNX (b) GPTXN (c) GPXNT
(d) PTGXN (e) None of these

Solution (a) In both the words 'SHEEP' and 'BLEAT' letter E is common and code for E is substitute... Hence, using direct letter coding method, we h...

S ⟶	G	and	B ⟶ H
H ⟶	A		L ⟶ P
E ⟶	X		E ⟶ X
E ⟶	X		A ⟶ T
P ⟶	R		T ⟶ N

Similarly, using the direct codes

S ⟶	G
L ⟶	P
A ⟶	T
T ⟶	N
E ⟶	X

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Type 3 **Number/Symbol Coding**

In this type of questions, either numerical code values are assigned to a word or alphabetical code letters are assigned to the numbers.

Illustration 11. If 'WORK' is coded as '4-12-9-16', then how will you code 'WOMAN'?

(a) 4-12-14-26-13 (b) 4-26-14-13-12
(c) 23-12-26-14-13 (d) 23-15-13-1-14
(e) None of these

Solution (a) We have,

W ⟶ 4 Hence, W ⟶ 4
O ⟶ 12 O ⟶ 12
R ⟶ 9 M ⟶ 14
K ⟶ 16 A ⟶ 26
N ⟶ 13

Here, each letter is coded by the numerical obtained by subtracting its 'position value' in English alphabetical order, from 27, *e.g.*, W, O, M, A, N are at 23rd, 15th, 13th, 1st and 14th position in alphabetical order. So, their codes are (27–23), (27–15), (27–13), (27–1), (27–14), *i.e.*, 4, 12, 14, 26, 13, respectively *i.e.*, their backward order position.

Illustration 12. If 'RAJU' is coded as 11-12-13-14 and 'JUNK' is coded as 13-14-10-9, then how will you code 'RANK'?

(a) 9-10-11-12 (b) 10-11-12-9
(c) 11-12-10-9 (d) 12-11-10-9
(e) None of these

Solution (c) We have,

R ⟶ 11 and J ⟶ 13
A ⟶ 12 U ⟶ 14
J ⟶ 13 N ⟶ 10
U ⟶ 14 K ⟶ 9

Similarly, R ⟶ 11
A ⟶ 12
N ⟶ 10
K ⟶ 9

Here, each letter is assigned a specific value.

Directions (Illustrations 13-15) *Study the following letters and their corresponding digits codes following by certain conditions of coding and then answer the questions given below them by finding out which of the digit combinations given in (a), (b), (c) and (d) is the coded form of the letter-groups given in each question and mark your answer accordingly.*

Letters	P	N	A	J	I	R	E	B	U	K
Digits/Codes	5	3	9	1	4	6	2	7	0	8

Conditions

(i) If both the first and the last letters in the group are vowels, both should be coded as $.

(ii) If both the first and the last letters in the group are consonants, both should be coded as #.

Illustration 13. KUNAJB

(a) 803917 (b) 0391
(c) #0391# (d) #0391$
(e) None of these

Illustration 14. RBUKAE

(a) #70892 (b) 670892
(c) 670982 (d) 607892
(e) None of these

Illustration 15. EBNAPI

(a) 273954 (b) 7395
(c) #7395# (d) $7395#
(e) None of these

Solutions (Illustrations 13-15) We know that, in English alphabets A, E, I, O, U letters are vowels and remaining letters are consonants.

13. (c) From condition (ii),

K U N A J B
↓ ↓ ↓ ↓ ↓ ↓
0 3 9 1

14. (b) R B U K A E
↓ ↓ ↓ ↓ ↓ ↓
6 7 0 8 9 2

Note This question does not follow any condition.

15. (b) From condition (i),

E B N A P I
↓ ↓ ↓ ↓ ↓ ↓
$ 7 3 9 5 $

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Type 4 Deciphering Message Word Coding/Numeral Coding

In this type of questions to analyse such codes, any two messages bearing a common word/numeral are picked up. The common code word/numeral will represent that word/code. Proceeding similarly by picking up all possible combinations of two, the entire message can be decoded and the codes for every individual word/numeral can be found.

Illustration 16. In a certain code language, 'it pit sit' means 'I am boy', 'it nit sit' means 'I am girl', which of the following means 'girl'?

(a) it (b) pit (c) sit
(d) nit (e) None of these

Solution (d) We have,

it pit sit → I am boy
it nit sit → I am girl

Here, 'it' and 'sit' is common in both the messages and 'I' and 'am' is common in both codes. Hence, code for girl will be 'nit'.

Illustration 17. In a certain code language, '786' means 'study very hard', '958' means 'hard work pays' and '645' means 'study and work'. Which of the following is the code for 'very'?

(a) 8
(b) 6
(c) 7
(d) Cannot be determined
(e) None of the above

Solution (c) Given,

7 8 6 → study very hard ...(i)
9 5 8 → hard work pays ...(ii)
6 4 5 → study and work ...(iii)

In the first and second statements, the common code digit is '8' and the common word is 'hard'. So, '8' means 'hard'. In the first and third statements, the common code digit is '6' and the common word is 'study'. So, '6' means 'study'.

From Eqs. (i) and (ii), 8 ⟶ hard
From Eqs. (i) and (iii), 6 ⟶ study
Hence, very ⟶ 7

Type 5 Substitution Coding

In this type, some particular words are assigned with certain substituted names. Now, questions are formed based on that principles.

Illustration 18. If 'white' is called 'blue', 'blue' is called 'red', 'red' is called 'yellow', 'yellow' is called 'green', 'green' is called 'black', 'black' is called 'violet' and 'violet' is called 'orange', then what would be the colour of human blood?

(a) Red (b) Green
(c) Yellow (d) Violet
(e) Orange

Solution (c) We know that, the colour of the human blood is 'red' and given that 'red' is called 'yellow'. So, the colour of human blood will be 'yellow'.

Illustration 19. If 'Parrot' is known as 'Peacock', 'Peacock' is known as 'Swallow', 'Swallow' is known as 'Pigeon' and 'Pigeon' is known as 'Sparrow', then what would be the name of Indian National Bird?

(a) Parrot (b) Swallow
(c) Peacock (d) Pigeon
(e) Sparrow

Solution (b) We know that, Peacock is the Indian National Bird but here Peacock is known as Swallow. So, the answer is Swallow.

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Let us Practice

A. Base Level Exercise

1. In a certain code, SOBER is written as RNADQ. How LOTUS can be written in that code? **[SSC (Multitasking) 2013]**

(a) KNSTR (b) MPUWT
(c) KMSTR (d) LMRST

2. If 'MEAT' is written as 'TEAM', then 'BALE' is written as **[SSC (CGL) 2013]**

(a) ELAB (b) EABL
(c) EBLA (d) EALB

3. If 'WATER' is written as 'YCVGT', then what is written as 'HKTG'? **[SSC (CGL) 2013]**

(a) IRFE (b) FIRE
(c) REFI (d) ERIF

4. If the word 'TABLECLOTH' is coded as 'XEMRANRIXT', how can 'HOTEL' be coded? **[RRB (ASM) 2011]**

(a) RIXAT (b) TIXAR
(c) TAXIR (d) RAXIT

5. If ' CARING' is coded as 'EDVGKC' , and SHARES is coded as 'UKEPBO', how will CASKET be coded as in the same code? **[SSC (CPO) 2013]**

(a) EDXIBP (b) EDWIAP
(c) EDWPAI (d) EDWIBP

6. If DEMOCRATIC is written as EDMORCATCI, how CONTINUOUS will be written in the same code? **[CG PSC 2013]**

(a) OCTNNIOUSU
(b) OTCNINUOUS
(c) OCNTNIUOSU
(d) OTNCINUOSU
(e) CONNITUOSU

7. In a certain code, P is #, A is %, C is ϕand E is @. How is PEACE written in that code? **[IBPS (Clerk) 2012]**

(a) #@%@# (b) #@#ϕ@
(c) %#@ϕ% (d) #@%ϕ@
(e) None of these

8. In a certain code, 'BELIEF' is written as 'AFKKDH'. How would 'SELDOM' be written in that code?

(a) RDKCHL (b) RFKENM
(c) RFKFNO (d) TFKENP
(e) None of these

9. In a certain code language 'LIEUTENANT' is written as 1232212021411420, then how 'MANGO' can be written in that code language?

(a) 13114715 (b) 1311474
(c) 14141375 (d) 13114157

10. If 'DELHI' is coded as '73541' and 'CALCUTTA' as '82589662', how will 'CALICUT' be coded? **[MAT 2012]**

(a) 5279431 (b) 5978213
(c) 8251896 (d) 8543691

11. If in a certain code, 'DAUGHTER' is written as 'TERDAUGH', how will 'APTITUDE' be written in that code? **[SSC (Steno) 2012]**

(a) DEUAPTIT (b) UDEAPTIT
(c) DUEAPTIT (d) DAUEPTIT

12. In a certain code, 'TERMINAL' is written as 'NSFUMBOJ' and 'TOWERS' is written as 'XPUTSF'. How is 'MATE' written in that same code? **[IBPS (Clerk) 2012]**

(a) FUBN (b) UFNB
(c) BNFU (d) BNDS
(e) None of these

13. 165135 is to 'peace' as 1215225 is to **[IB (ACIO) 2013]**

(a) lead (b) love
(c) loop (d) aura

14. If PARK is coded as 5394, SHIRT is coded as 17698 adn PANDIT is coded as 532068, how would you code NISHAR in that code language?

(a) 266734 (b) 231954
(c) 201739 (d) 261739

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15. If 'SYNDICATE' is written as 'SYTENDCAI', then how can 'PSYCHOTIC' be written?
(a) PSYICTCOH (b) PSYCOHTCI
(c) PSICYOCTH (d) PSICYCOTH

16. In a certain code, 'REFRIGERATOR' is coded as 'ROTAREGIRFER'. Which words from the following would be coded as 'NOITINUMMA'?
(a) ANMOMIUTMI (b) AMNTOMUIIN
(c) AMMUNITION (d) NMMUNITIOA
(e) None of these

17. In a certain code, 'CERTAIN' is coded as 'XVIGZRM' 'SEQUENCE' is coded as 'HVJFVMXV'. How would 'REQUIRED' be coded? [SSC (CGL) 2012]
(a) FJIVWVIR (b) VJIFWTRV
(c) WVJRIFVI (d) IVJFRIVW

18. In a certain code, 'BUILDER' is written as JVCKSFE. How is 'SEALING' written in that same code? [RRB (TC/CC) 2009]
(a) BFTKHOJ (b) JOHKBT
(c) TFBKHOJ (d) BFTKJOH

19. In a coded language, BRINJAL is written as LAJNIRB. How will LADYFINGER be written in that code? [SSC (Multitasking) 2014]
(a) RNEGIFYDAL (b) RINEGIFYDAL
(c) REGNIFYDAL (d) RGENIFYDAL

20. In a certain code language, 'CURATIVE' is written as 'BSVDDUHS'. How 'STEAMING' is to be written in the same code language?
(a) BFUTFMHL (b) TUFBFMHL
(c) BFUTLHMF (d) BFUTHOJN
(e) None of these

21. If 'NEUROTIC' can be written as 'TICRONEU', then how can 'PSYCHOTIC' be written?
(a) TICOCHPSY (b) TICCHOPSY
(c) TICCOHPSY (d) TICHCOPSY

22. In a certain code language, 'COMPUTRONE' is written as 'PMOCTUENOR'. How is 'ADVANTAGES' written in that same code? [CMAT 2003]
(a) IDUJLAIC (b) UJIDLAIC
(c) UJIDICLA (d) IDUJICLA
(e) None of these

23. If 'GLOSSORY' is coded as '97533562' and 'GEOGRAPHY' = '915968402', then 'GEOLOGY' can be coded as
(a) 915692 (b) 9157592
(c) 9057592 (d) 9157591

24. If 'REASON' is coded as 5 and 'BELIEVED' as 7, what is the code number for 'GOVERNMENT'? [SSC (Multitasking) 2012]
(a) 10 (b) 6 (c) 9 (d) 8

25. In a certain code, 'MOUSE' is written as 'PRUQC'. How is 'SHIFT' written in that same code? [Vijaya Bank (Clerk) 2010]
(a) VKIRD (b) VKIDR (c) VJIDR
(d) VIKRD (e) None of these

26. In a certain code 'CALANDER' is written as 'CLANAEDR'. How is 'CIRCULAR' written in that code?
(a) ICCRLURA (b) CRIUCALR
(c) CRIUCLRA (d) CRIARLCU

27. In a certain code, 'CLOCK' is written as 'XOLXP'. How will 'LOTUS' be written in that same code?
(a) OGLFH (b) OLGFH
(c) LOGFH (d) OLGHF
(e) None of these

28. In a certain code, 'LATE' is written as 'VGZO'. How will 'SHINE' be written in that same code?
(a) VRMSH (b) VMSHR
(c) VMRSH (d) MVRSH
(e) None of these

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29. If LOFTY is coded as LPFUY, then DWARF will be written as [RBI (Grade 'B') 2011]

(a) DXASF (b) DXBSG (c) DXATF
(d) DWBSG (e) None of these

30. In a coding system, 'JUNE' is written as 'PQRS' and 'AUGUST' is written as 'WQFQMN'. How can 'GUEST' be written in the same coding language?

(a) FQTMN (b) FPSMN
(c) FQSMN (d) FQSNM
(e) None of these

31. If in a code language, 'PARENT' is written as 'BDFGJK' and 'CHILDREN' is written as 'MOXQUFGJ', then how is 'REPRINT' written in that same code?

(a) FGBFXJK (b) FGBUXJK
(c) FGBFXGD (d) BGFXJK

32. Some letters are given below in the first line and numbers are given below them in the second line. Numbers are the codes for the alphabets and *vice-versa*. Choose the correct number-code for the given set of alphabets.

C	W	E	A	Z	X	J	Y	K	L
3	9	5	7	4	8	1	0	2	6

J	W	X	C	L	Z

(a) 198364 (b) 198264
(c) 198354 (d) 197354

33. Some letters are given below in the first line and numbers are given below them in the second line. Numbers are the codes for the alphabets and *vice-versa*. Choose the correct letter-code for the given set of numbers.

E	M	K	B	Z	W	Q	U	D	J
5	9	1	6	4	8	2	0	7	3

4	2	9	7	5	3

(a) ZQMJDE (b) ZQMEDJ
(c) ZQMDEJ (d) ZQEDMJ

34. Some capital letters are given below in the first line and numbers are assigned to each of them in the second line. The numbers are the codes for the letters and *vice-versa*.

M	O	E	A	S	J	T	Z
3	5	7	6	2	9	4	0

Choose the correct number code for the given set of letters

EAST

(a) 7620 (b) 7623
(c) 7624 (d) 7625

35. If DISC is coded as 8749 and ACHE is coded as 3950, then HEAD is coded as

(a) 5038 (b) 5308
(c) 3508 (d) 3805

36. In a code language, 'PRINCE' is written as 'FLOWER' and 'PRINCESS' is written as 'FLOWERSS'. Which of the following word would be coded as 'SLOWER'?

(a) SRINCE (b) SIRNCE
(c) SRNICE (d) None of these

37. In a code language, 'ORGANISATION' is written as 'CBDWLQJWYQCL' and 'OPERATION' is written as 'CXFBWYQCL'. How would 'SEPARATION' be coded?

(a) EJXEBYQCL (b) JFQYWBCXQL
(c) JFXWBWYQCL (d) QCLYWBFXJE

Directions (Q. Nos. 38-41) *In a defence message,* GETAWAY, FIRE, BACK-WARDS, MOVE, SLOW *is coded as* BENCDCI, QHOE, PCTL-DCOXU, ZMWE, VFMD. *Based on this coding scheme, spot the codes of the following words*

38. OVER

(a) MWED (b) MWEO
(c) MWOE (d) MWZO

39. DEADLY

(a) XECXEI (b) XEEXCI
(c) XECXFI (d) XENXFI

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40. EDWARD

(b) OLPCOX
(d) OIPCOX

41. CSLAT

(b) BOLNC
(d) BOLQN

42. In a certain code, 'ZOOM' is written as 'POON' and 'ROAD' is written 'QOBE'. How would 'NOMP' be coded in that code language?

(b) QOHB
(d) MONZ

[illegible] is written as 'KWQKACJ', then how can 'SPRINKLE' be written? [SSC (CGL) 2013]

(b) QNPGLIJC
(d) URTKPMNG

44. In a certain code, 'STOVE' is written as 'FNBLK', then how will 'VOTES' be written in the same code? [SSC (CPO) 2003]

(b) LBNKF
(d) LNBKF

45. If 'MACHINE' is coded as 19-7-9-14-15-20-11, then how will you code 'DANGER' in the same code?

(b) 13-7-20-9-11-25
(d) 13-7-10-11-25

Directions (Q. Nos. 46-50) *Study the following information carefully and answer the given questions.* [IDBI Bank (PO) 2010]

In a certain code '318' means 'run very fast', '289' means 'to run away', '97' means 'to see' and '43' means 'very good'.

46. What is the code for 'see'?

(b) 7
(c) 4
(e) None of these

47. Which of the following represents, 'see good run away'?

(b) 7914
(c) 7319
(e) None of these

[illegible] the code for 'run'?

(b) 8
(c) 1
(e) None of these

49. Which of the following may represent 'good to see away'?

(a) 7485
(b) 3149
(c) 5439
(d) 2479
(e) None of these

50. What does '4' represent in this code?

(a) very
(b) fast
(c) run
(d) good
(e) None of these

51. If 'LINGER' is '123456' and 'FORCE' is '56789', then 'FIERCE' will be

(a) 345667
(b) 456678
(c) 345677
(d) 556789
(e) Cannot be determined

52. In a certain code 'PRISM' is written as 'OSHTL' and 'RUBLE' is written as 'QVAMD'. How will 'WHORL' be written in that code? [Allahabad Bank (PO) 201

(a) XIPSM
(b) VINSK
(c) UINSK
(d) XGPQM

53. If A = 1, ACE = 9, then ART = ? [SSC (10+2) 201

(a) 10
(b) 39
(c) 29
(d) 38

54. In a certain code, FLOWERS is written as EKNVDQR. How is SUPREME written in that code? [RRB (ASM) 201

(a) TQDROLD
(b) RTODQLD
(c) TQDDROL
(d) RTOQDLD

55. If A = 1, ACT = 24, then FAT = ? [SSC (10+2) 20

(a) 26
(b) 25
(c) 27
(d) 24

56. If B = 2, BAG = 10, then BOX = ? [SSC (10+2) 20

(a) 36
(b) 39
(c) 41
(d) 52

57. If each of the letters in the English alphabet is assigned and even numeric value by giving A=2, B = 4 and so o what would be the total value of t letters for the word 'Lady' whe similarly coded? [SSC (CGL) 201

(a) 74
(b) 72
(c) 84
(d) 82

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58. If in a certain code language 'DASHE' is '21845', then how would 'SHADE' be written in that same code language?
(a) 84125 (b) 84215
(c) 84152 (d) 84124

59. If 'ACNE' is coded as 1, 3, 14, 5, then 'BOIL' will be coded as
(a) 5, 31, 21, 25 (b) 2, 15, 9, 12
(c) 5, 29 19, 25 (d) 5, 29,19, 27

60. In a certain code language, 'DOME' is written as '8943' and 'MEAL' is written as '4321'. What group of letters can be formed for the code '38249'?
[SBI (Clerk) 2012]
(a) EOADM (b) MEDOA
(c) EMDAO (d) EDAMO
(e) None of these

61. If 'FLARE' is coded as 21, 15, 26, 9, 22, then how would 'BREIF' be coded in the same language?
(a) 25, 9, 22, 21, 18 (b) 5, 37, 11, 19, 13
(c) 13, 19, 11, 37, 5 (d) 25, 9, 22, 18, 21

62. If the word 'LEADER' is coded as 20-13-9-12-13-26, how would you write 'LIGHT'?
(a) 20-16-17-15-27 (b) 20-15-16-18-23
(c) 20-17-15-16-28 (d) 20-16-15-17-22

63. In a certain code language, 'SAFER' is written as '5@3#2' and 'RIDE' is written as '2©%#', how would 'FEDS' be written in that code? [RBI (Grade 'B') 2009]
(a) 3#©5 (b) 3@%5
(c) 3#%5 (d) 3#%2
(e) None of these

64. If in a certain code language, 'EAT' is written as '318' and 'CHAIR' is written as '24156', then how 'TEACHER' be written in that code language?
[Delhi Police (Constable) 2009]
(a) 8313426 (b) 8312436
(c) 8321436 (d) 8312346

65. If CAT = 12, then MAN =?
(a) 14 (b) 24 (c) 16 (d) 15
(e) None of these

B. Expert Level Exercise

Directions (Q. Nos. 1-5) *Study the following information carefully and answer the questions given below it.* [IBPS (Clerk) 2012]

Digits in the numbers are to be coded as follows

Digits	9	2	1	7	5	3	6	4	8
Codes	B	V	M	L	D	P	A	F	R

Conditions

(i) If the first as well as the last digits are even, both are to the coded by the code for the first digit.

(ii) If the first as well as the last digits are odd, both are to be coded by the code for the last digit.

1. 562183
(a) PAVMRP (b) DAVMRD
(c) PAVMRD (d) DAVMRP
(e) None of these

2. 627851
(a) PULRDM (b) AVLDRM
(c) AVLFDM (d) AVLRDM
(e) None of these

3. 812354
(a) RLVPDF (b) FMVPDF
(c) RMVPDR (d) None of these

4. 397416
(a) PBLFMP (b) ABLFMA
(c) PVLFMA (d) PBLFMA
(e) None of these

5. 734192
(a) DPFMBV (b) LPAMBV
(c) LPFMVB (d) LPFMBV
(e) None of these

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Directions (Q. Nos. 6-10) *In each of the questions given below is given a group of digits followed by four combinations of letters/symbols numbered (a), (b), (c) and (d). You have to find out which of the combinations correctly represents the group of the digits based on the coding system and the conditions given below. Mark the number of that combination as your answer. If none of the combinations correctly represent the group of digits, mark (e), i.e., 'None of these' as your answer.*

Digits	5	1	3	4	9	6	8	2	7
Letters/ Symbols	P	A	K	%	R	@	D	©	M

Conditions

(i) If the first digit is odd and the last digit is even, the codes for the first and last digits are to be reversed.

(ii) If the first and the last digits are even, both are to be coded as ★.

(iii) If the first and the last digits are odd, both are to be coded as $.

6. 215349

(a) RAPK%©
(b) ★APK%★
(c) $APK%$
(d) ©APK%R
(e) None of these

7. 671254

(a) @MA©P%
(b) $MA©P$
(c) ★MA©P★
(d) %MA©P©
(e) None of these

8. 813469

(a) RAK%@D
(b) DAK%@R
(c) DAP%@R
(d) ★AK%@★
(e) None of these

9. 794821

(a) MR%D©A
(b) AR%D©M
(c) M%RD©A
(d) $R%D©$
(e) None of these

10. 591426

(a) @RA%©P
(b) PRA%©@
(c) @AR%©P
(d) $RA%©★
(e) None of these

Directions (Q. Nos. 11-15) *Study the following information carefully to answer the given questions.* **[IBPS (Clerk) 2013]**

In a certain code

'very large risk associated' is written as 'nu ta ro gi',

'risk is very low' is written as 'gi se nu mi',

'is that also associated' is written as 'ta mi po fu',

'inherent risk also damaging' is written as 'fu nu di yu'.

(All the codes are two letter codes only)

11. Which of the following represents 'risk also large'?

(a) nu fu po
(b) nu gi ro
(c) ro po ta
(d) fu nu ro
(e) ro yu fu

12. What is the code for 'very'?

(a) ta
(b) fu
(c) ro
(d) nu
(e) gi

13. What is the code for 'associated'?

(a) mi
(b) ta
(c) ro
(d) gi
(e) nu

14. What does the code 'di' stand for?

(a) Either 'damaging' or 'inherent'
(b) inherent
(c) also
(d) low
(e) risk

15. Which of the following represents 'that is low'?

(a) po mi di
(b) se po mi
(c) ta mi po
(d) se po nu
(e) ta mi se

16. In a certain language, 'sun shines brightly' is written as 'ba lo sul', 'houses are brightly lit' as 'kado ula ari ba' and 'light comes from sun' as 'dopi kup lo mo'. What are the codewords for 'sun' and 'brightly'?

(a) ba, sul
(b) sul, lo
(c) lo, ba
(d) ba, lo

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17. In a certain code language, 'po ki top ma' means 'Usha is playing cards', 'kop j ki ma' means 'Asha is playing tennis', 'ki top sop ho' means 'they are playing foot-ball' and 'po sur kop' means' cards and tennis. Which word in that languages menas 'Asha'? [GRPSC 2013]

(a) ja (b) ma
(c) kop (d) top

18. In a certain language, 'me lo po' means 'anu weds vinay' and 'pe to lo' means 'vinay comes here', which word in that language means 'come'?

(a) pe (b) to (c) me
(d) po (e) pe or to

Directions (Q. Nos. 19-23) *In each question below, a group of digits/symbols is given, followed by four combinations of letters numbered (a), (b), (c) and (d). You have to find out which of the combinations (a), (b), (c) and (d) correctly represents the group of digits/symbols based on the following coding system and the conditions those follow and mark the number of that combination as your answer. If none of the four combinations correctly represents the group of digits/symbols, mark (e) i.e., 'None of these' as the answer.* [Vijaya Bank (Clerk) 2012]

Digits/ Symbols	5	9	@	©	3	8	1	$	%	4	2	6	★	7	δ	#
Letters/ Codes	B	E	P	A	K	D	F	H	Q	I	R	J	U	M	V	T

Conditions

(i) If the first unit in the group is an even digit and the last unit is a symbol, both these are to be coded as the code for the symbol.

(ii) If the first unit in the group is an odd digit and the last unit is an even digit their codes are to be interchanged.

(iii) If both the first and the last units in the group are symbols, both these are to be coded as 'X'.

19. @91$26

(a) JEFHRP (b) PEFHRP
(c) XEFHRX (d) PEFHRJ
(e) None of these

20. 387#©9

(a) KMDTAE (b) KDMATE
(c) EDMTAK (d) KDMTAE
(e) None of these

21. 4@312δ

(a) VPKFRV (b) VPKFRI
(c) XPKFRX (d) IPKFRV
(e) None of these

22. %4187★

(a) QIFDMU (b) UNIFDMQ
(c) XIFDMX (d) UIFDMU
(e) None of these

23. 9124δ6

(a) EFRIVJ (b) JFRIVE
(c) EFRIVE (d) XFRIVX
(e) None of these

24. In a certain code language, '123' means 'bright little boy', '145' means 'tall big boy' and '637' means 'beautiful little flower'. Which digit in that language means 'bright'?

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

25. In a certain code, '975' means 'throw away garbage', '528' means 'give away smoking' and '213' means 'smoking is harmful'. Which digit in that code means 'smoking'?

(a) 5 (b) 8
(c) 2 (d) 3

26. In a certain code, 'BASKET' is written as '5$3%#1' and 'TRIED' is written as '14★#2'. How is 'SKIRT' written in that code? [IBPS (PO) 2011]

(a) 3%★41 (b) 3★%41
(c) 3%#41 (d) 3#4%1
(e) None of these

27. In a certain code language, '3a, 2b, 7c' means 'truth is eternal', '7c, 9a, 8b, 3a' means 'enmity is not eternal' and '4d, 2b, 8b' means 'truth does not'. Which of the following means 'enmity' in that language?

(a) 3a (b) 7c
(c) 8b (d) 9a
(e) None of these

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28. If 'Lily' is called 'Lotus', 'Lotus' is called 'Rose', 'Rose' is called 'Sunflower' and 'Sunflower' is called 'Marigold', then which will be the national flower of India?

(a) Lily (b) Lotus (c) Rose
(d) Marigold (e) Sunflower

29. In a certain code, the following numbers are coded by assigning signs

1	2	3	4	5	6	7	8	9
<	+	=	□	↑	→	>	≠	-

which number can be decoded from the given symbols? [SSC (Constable) 2012]

→ ≠ > = <

(a) 63181 (b) 68731
(c) 62781 (d) 63118

30. On another planet, the local terminology for 'earth', 'water', 'light', 'air' and 'sky' are 'sky', 'light', 'air', 'water' and 'earth', respectively. If someone is thirsty there, what would he drink?

(a) Light (b) Air
(c) Sky (d) Water

31. If the animals which can walk are called 'swimmers', animals who crawl are called 'flying', those living in water are called 'snakes' and those which fly in the sky are called 'hunters', then what will a lizard be called?

(a) Swimmers (b) Snakes
(c) Flying (d) Hunters
(e) None of these

32. If 'bucket' is known as 'tub', 'tub' is known as 'glass', 'glass' is known as 'saucer', 'saucer' is known as 'spoon', then which utensil will be used for drinking water?

(a) Tub (b) Saucer (c) Glass
(d) Spoon (e) None of these

33. If 'orange' is called 'butter', 'butter' is called 'soap', 'soap' is called 'ink', 'ink' is called 'honey' and 'honey' is called 'orange', then which of the following will be used for washing clothes?

(a) Honey (b) Butter (c) Orange
(d) Soap (e) Ink

34. In a certain code, the following alphabets are coded in a certain way by assigning numbers as follows

A	D	I	L	M	N	O	R	W
1	2	3	4	5	6	7	8	9

Which word can be decoded from the following? [SSC (FCI) 2012]

163514 97842

(a) ANIMAL WORLD
(b) ANIMAL LESS WORLD
(c) WORLD OF ANIMALS
(d) ANIMALS WORLD

Directions (Q. Nos. 35-39) *Study the following information carefully and answer the following questions.* [SBI (PO) 2012]

In a certain code language.

'economics is not money' is written as 'ka la ho ga'

'demand and supply economics' is written as 'mo la pa ka'

'money makes only part' is written as 'zi la ne ki'

'demand makes supply economics' is written as 'mo ka ta'

35. What is the code for 'money' in the given code language?

(a) ga (b) mo
(c) pa (d) ta
(e) la

36. What is the code for 'supply' in the given code language?

(a) Only ta (b) Only mo
(c) Either pa or mo (d) Only pa
(e) Either mo or ta

37. What may be the possible code for 'demand only more' in the given code language?

(a) xi ne mo (b) mo zi ne
(c) ki ne mo (d) mo zi ki
(e) xi ka ta

38. What may be the possible code for 'work and money' in the given code language?

(a) pa ga la (b) pa la lu
(c) mo la pa (d) tu la ga
(e) pa la ne

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39. What is the code for 'makes' in the given code language ?

(a) mo (b) pa
(c) ne (d) zi
(e) ho

Direction (Q. No. 40) *According to certain codes*

(i) 'min fin bin gin' means 'trains are always late'.

(ii) 'gin din cin hin' means 'drivers were always punished'.

(iii) 'bin cin vin rin' means 'drivers stopped all trains'

(iv) 'din kin fin vin' means 'all passengers were late'.

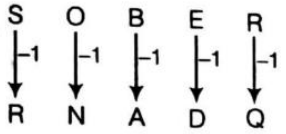
40. 'Drivers were late' would be written as

(a) min cin din
(b) cin din fin
(c) fin din gin
(d) gin hin min
(e) None of the above

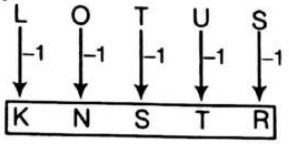
Answer *with* Explanations

A. Base Level Exercise

1. (*a*) As,



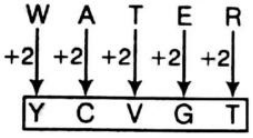
Similarly,



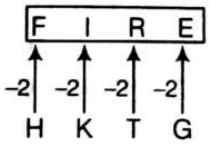
2. (*d*) MEAT → TEAM

Then, BALE will be written as EALB

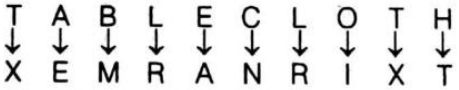
3. (*b*)



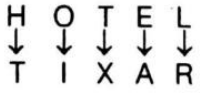
Now, word written for code HKTG is



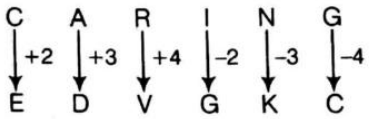
4. (*b*) As,



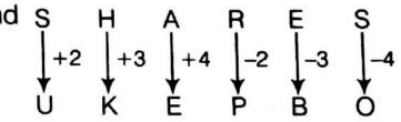
Similarly,



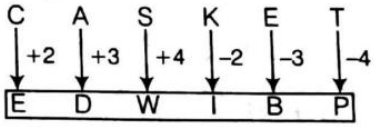
5. (*d*) As,



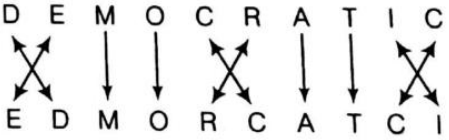
and



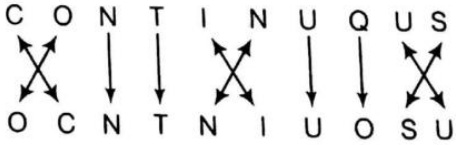
Similarly,



6. (*c*) As,

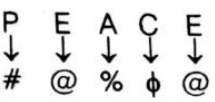


Similarly,



7. (*d*) If, 'P' means #, 'A' means %, 'C' means ϕ and 'E' means @.

Then,



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8. (*c*) As, B $\xrightarrow{-1}$ A Similarly, S $\xrightarrow{-1}$ R

E $\xrightarrow{+1}$ F E $\xrightarrow{+1}$ F

L $\xrightarrow{-1}$ K L $\xrightarrow{-1}$ K

I $\xrightarrow{+2}$ K D $\xrightarrow{+2}$ F

E $\xrightarrow{-1}$ D O $\xrightarrow{-1}$ N

F $\xrightarrow{+2}$ H M $\xrightarrow{+2}$ O

9. (*b*) In the given code language, each consonant is shown as it's place value. Further vowels have an another sequence

A → 1, E → 2, I → 3, O → 4, U → 5

∴ MANGO - 13 1 14 74

i.e., 1311474

10. (*c*) If D↓7 E↓3 L↓5 H↓4 I↓1

and C↓8 A↓2 L↓5 C↓8 U↓9 T↓6 T↓6 A↓2 Then,

C↓8 A↓2 L↓5 I↓1 C↓8 U↓9 T↓6

11. (*b*) As, 1 2 3 4 5 6 7 8 → 6 7 8 1 2 3 4 5

DAUGHTER → TERDAUGH

Similarly, APTITUDE → UDEAPTIT

12. (*c*) If, T E R M I N A L

N S F U M B O J

+1 +1 +1 +1 +1 +1 +1 +1

and T O W E R S

X P U T S F

+1 +1 +1 +1 +1 +1

Then, M A T E

B N F U

+1 +1 +1 +1

13. (*b*) p e a c e

16 5 1 3 5

Place in th alphabetical order

So, 1215225 is decoded as love.

14. (*d*) P A R K S H I R T

5 3 9 4 1 7 6 9 8

P A N D I T → 5 3 2 0 6 8

So, N I S H A R → 2 6 1 7 3 9

15. (*d*) As, S Y N D I C A T E

S Y T E N D C A I

Similarly,

P S Y C H O T I C

P S I C Y C O T H

16. (*c*) As, Similarly

REFRIGERATOR → ROTAREGIRFER

AMMUNITION → NOITINUMMA

Note All letters are coded in revese order.

17. (*d*) As, C E R T A I N

X V I G Z R M

and S E Q U E N C E

H V J F V M X V

Hence, R E Q U I R E D

I V J F R I V W

Note The letters given here are opposite letters to each other.

18. (*a*) As, Similarly,

B +1 J S +1 B

U → V E → F

I → C A → T

L −1 → K L −1 → K

D → S I → H

E → F N → O

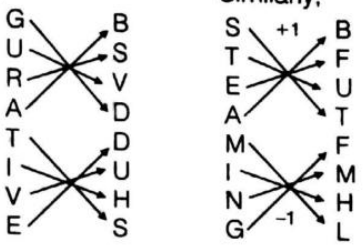
R +1 → E G +1 → J

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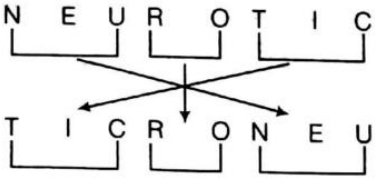
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19. (*c*) Letters of the word are written in reverse order.

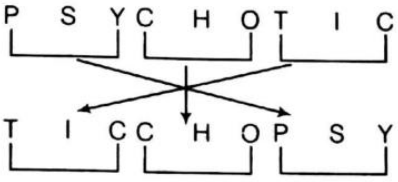
20. (*a*) As,



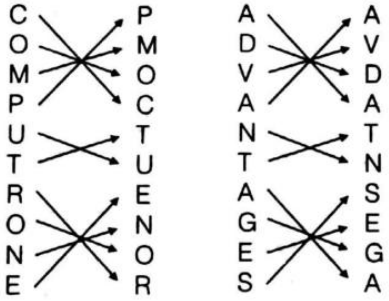
21. (*b*) As, N E U R O T I C



Similarly,



22. (*e*) As,



Similarly,

23. (*b*)

G	L	O	S	S	O	R	Y
9	7	5	3	3	5	6	2

G	E	O	G	R	A	P	H	Y
9	1	5	9	6	8	4	0	2

∴ GEOLOGY = 9157592

24. (*c*) Given, REASON = 5

BELIEVED = 7

Here, Number of letters −1

Now, GOVERNMENT = 9

∴ Number of letter = 10 − 1 = 9

25. (*b*) As, M $\xrightarrow{+3}$ P Similarly, S $\xrightarrow{+3}$ V

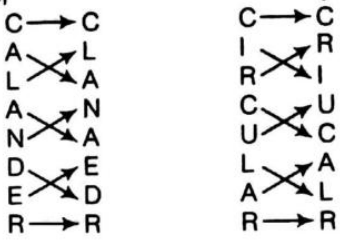
O $\xrightarrow{+3}$ R H $\xrightarrow{+3}$ K

U $\longrightarrow$ U I $\longrightarrow$ I

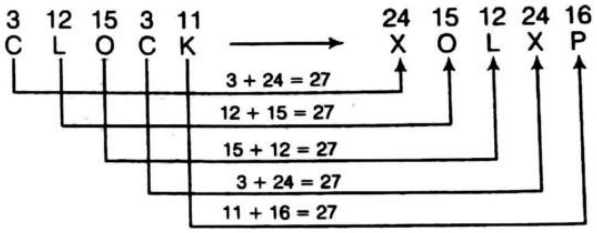
S $\xrightarrow{-2}$ Q F $\xrightarrow{-2}$ D

E $\xrightarrow{-2}$ C T $\xrightarrow{-2}$ R

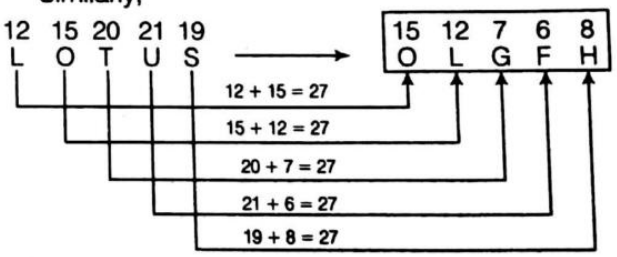
26. (*b*) As,



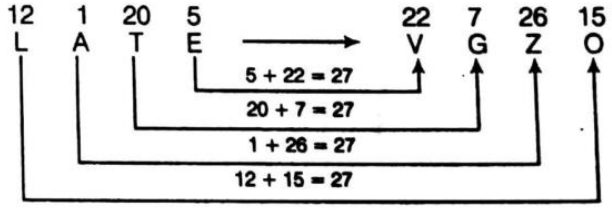
27. (*b*) As,



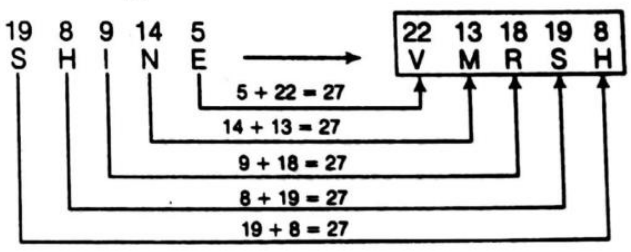
Similarly,



28. (*c*) As,
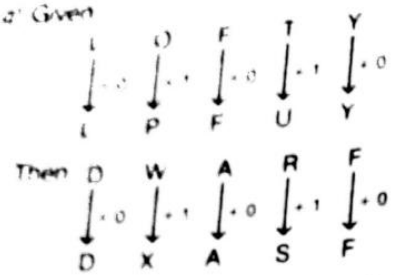


Similarly,



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29. (a) Given



Then D W A R F

30. (c) As, J ⟶ P and A ⟶ W Similarly, G ⟶ F

U ⟶ Q U ⟶ Q U ⟶ Q E ⟶ S

N ⟶ R G ⟶ F S ⟶ M S ⟶ M

E ⟶ S U ⟶ Q T ⟶ N T ⟶ N

S ⟶ M

T ⟶ N

31. (a) As, P ⟶ B and C ⟶ M

A ⟶ D H ⟶ O

R ⟶ F I ⟶ X

E ⟶ G L ⟶ Q

N ⟶ J D ⟶ U

T ⟶ K R ⟶ F

E ⟶ G N ⟶ J

Similarly, R ⟶ F

E ⟶ G

P ⟶ B

R ⟶ F

I ⟶ X

N ⟶ J

T ⟶ K

32. (a) J W X C L Z

1 9 8 3 6 4

33. (c) The correct letter code for the given set of number is Z Q M D E J.

34. (c) M O E A S J T Z

3 5 7 6 2 9 4 0 EAST = 7624

So, the correct number code for the given set of letters EAST is 7624.

35. (a)

Letters	D	I	S	C	A	H
Code	8	7	4	9	3	5

So, code of HEAD is 5038.

36. (a) As, P ⟶ F and P ⟶ F

R ⟶ L R ⟶ L

I ⟶ O I ⟶ O

N ⟶ W N ⟶ W

C ⟶ E C ⟶ E

E ⟶ R E ⟶ R

S ⟶ S S ⟶ S

S ⟶ S

Similarly, R ⟶ L

I ⟶ O

N ⟶ W

C ⟶ E

E ⟶ R

37. (c) As, O ⟶ C and O ⟶ C

R ⟶ B P ⟶ X

G ⟶ D E ⟶ F

A ⟶ W R ⟶ B

N ⟶ L A ⟶ W

I ⟶ Q T ⟶ Y

S ⟶ J I ⟶ Q

A ⟶ W O ⟶ C

T ⟶ Y N ⟶ L

I ⟶ Q

O ⟶ C

N ⟶ L

Similarly, S ⟶ J

E ⟶ F

P ⟶ X

A ⟶ W

R ⟶ B

A ⟶ W

T ⟶ Y

I ⟶ Q

O ⟶ C

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Solutions (Q. Nos. 38-41)

G ⟶ B
E ⟶ E
T ⟶ N
A ⟶ C
W ⟶ D
A ⟶ C
Y ⟶ I
B ⟶ P
A ⟶ C
C ⟶ T
K ⟶ L

F ⟶ Q
I ⟶ H
R ⟶ O
E ⟶ E

W ⟶ D
A ⟶ C
R ⟶ O
D ⟶ X
S ⟶ U
S ⟶ V
L ⟶ F
O ⟶ M
W ⟶ D

M ⟶ Z and
O ⟶ M
V ⟶ W
E ⟶ E

38. (*b*) O ⟶ M, V ⟶ W, E ⟶ E, R ⟶ O

39. (*c*) D ⟶ X, E ⟶ E, A ⟶ C, D ⟶ X, L ⟶ F, Y ⟶ I

40. (*b*) R ⟶ O, E ⟶ E, W ⟶ D, A ⟶ C, R ⟶ O, D ⟶ X

41. (*a*) G ⟶ B, R ⟶ O, E ⟶ E, A ⟶ C, T ⟶ N

42. (*d*) As, Z ⟶ P, O ⟶ O, O ⟶ O, M ⟶ N and R ⟶ Q, O ⟶ O, A ⟶ B, D ⟶ E

Similarly, N ⟶ M, O ⟶ O, M ⟶ N, P ⟶ Z

43. (*c*) As,

M	U	S	I	C	A	L
−2	+2	−2	+2	−2	+2	−2
K	W	Q	K	A	C	J

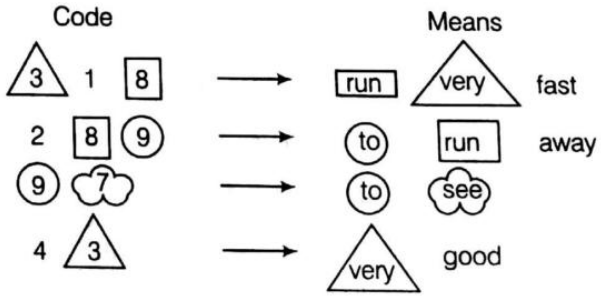
Similarly,

S	P	R	I	N	K	L	E
−2	+2	−2	+2	−2	+2	−2	+2
Q	R	P	K	L	M	J	G

44. (*b*) As, S ⟶ F, T ⟶ N, O ⟶ B, V ⟶ L, E ⟶ K
Similarly, V ⟶ L, O ⟶ B, T ⟶ N, E ⟶ K, S ⟶ F

45. (*c*) As, M $\xrightarrow{+6}$ 19, A $\xrightarrow{+6}$ 7, C $\xrightarrow{+6}$ 9, H $\xrightarrow{+6}$ 14, I $\xrightarrow{+6}$ 15, N $\xrightarrow{+6}$ 20
Similarly, D $\xrightarrow{+6}$ 10, A $\xrightarrow{+6}$ 7, N $\xrightarrow{+6}$ 20, G $\xrightarrow{+6}$ 13, E $\xrightarrow{+6}$ 11, R $\xrightarrow{+6}$ 24, E $\xrightarrow{+6}$ 11

Solutions (Q. Nos. 46-50)



46. (*b*) See ⟶ 7

47. (*a*) See Good Run Away ⟶ 8472

48. (*b*) Run ⟶ 8

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49. (*d*) Good to See away ⟶ 2479

50. (*d*) 4 ⟶ Good

51. (*e*) As, L ⟶ 1 and F ⟶ 5
I ⟶ 2 O ⟶ 6
N ⟶ 3 R ⟶ 7
G ⟶ 4 C ⟶ 8
E ⟶ 5 E ⟶ 9
R ⟶ 6

Similarly, F ⟶ 5
I ⟶ 2
E ⟶ 9/5
R ⟶ 6/7
C ⟶ 8
E ⟶ 9/5

Hence, cannot be determined.

52. (*b*) Given,

P	R	I	S	M
−1	+1	−1	+1	−1
O	S	H	T	L

and

R	U	B	L	E
−1	+1	−1	+1	−1
Q	V	A	M	D

Then,

W	H	O	R	L
−1	+1	−1	+1	−1
V	I	N	S	K

53. (*b*) As, A = 1 (place value)
and ACE = 1 + 3 + 5 (place value of ACE) = 9
Similarly, ART = 1 + 18 + 20 (place value of ART)
= 39

54. (*d*) Given,

F	L	O	W	E	R	S
−1	−1	−1	−1	−1	−1	−1
E	K	N	V	D	Q	R

Then,

S	U	P	R	E	M	E
−1	−1	−1	−1	−1	−1	−1
R	T	O	Q	D	L	D

55. (*c*) As, A = 1
ACT = 1 + 3 + 20 = 24
Similarly, FAT = 6 + 1 + 20 = 27

56. (*c*) As, B = 2
and BAG = 2 + 1 + 7 = 10
Similarly, BOX = 2 + 15 + 24 = 41

57. (*c*) LADY = 2(12 + 1 + 4 + 25)
= 2 × 42 = 84

58. (*a*) As, D ⟶ 2 Similarly, S ⟶ 8
A ⟶ 1 H ⟶ 4
S ⟶ 8 A ⟶ 1
H ⟶ 4 D ⟶ 2
E ⟶ 5 E ⟶ 5

59. (*b*) As, A ⟶ 1 Similarly, B ⟶ 2
C ⟶ 3 O ⟶ 15
N ⟶ 14 I ⟶ 9
E ⟶ 5 L ⟶ 12

60. (*d*) As,

D	O	M	E	and	M	E	A	L
↓	↓	↓	↓		↓	↓	↓	↓
8	9	4	3		4	3	2	1

Similarly,

3	8	2	4	9
↓	↓	↓	↓	↓
E	D	A	M	O

61. (*d*) As, F ⟶ 21 Similarly, B ⟶ 25
L ⟶ 15 R ⟶ 9
A ⟶ 26 E ⟶ 22
R ⟶ 9 I ⟶ 18
E ⟶ 22 F ⟶ 21

Note Each letter is coded in opposite alphabet sequence.

62. (*c*) As,

12	5	1	4	5	18
L	E	A	D	E	R
+8	+8	+8	+8	+8	+8
20	13	9	12	13	26

Similarly,

12	9	7	8	20
L	I	G	H	T
+8	+8	+8	+8	+8
20	17	15	16	28

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63. (*c*) As, S ⟶ 5, A ⟶ @, F ⟶ 3, E ⟶ #, R ⟶ 2 and R ⟶ 2, I ⟶ ©, D ⟶ %, E ⟶ #

Similarly, F ⟶ 3, E ⟶ #, D ⟶ %, S ⟶ 5

64. (*b*) As, E ⟶ 3, A ⟶ 1, T ⟶ 8, I ⟶ 5 and C ⟶ 2, H ⟶ 4, A ⟶ 1, R ⟶ 6

Similarly, T ⟶ 8, E ⟶ 3, A ⟶ 1, C ⟶ 2, H ⟶ 4, E ⟶ 3, R ⟶ 6

65. (*a*) As, $\overset{3}{C}\ \overset{1}{A}\ \overset{20}{T} = (3 + 1 + 20) \div 2$

$= 24 \div 2 = 12$

Similarly, $\overset{13}{M}\ \overset{1}{A}\ \overset{14}{N}$

$= (13 + 1 + 14) \div 2$

$= 28 \div 2 = 14$

B. Expert Level Exercise

1. (*a*) 5 6 2 1 8 3 → P A V M R P

[condition number (ii) follows]

2. (*d*) 6 2 7 8 5 1 → A V L R D M

[no condition follows]

3. (*c*) 8 1 2 3 5 4 → R M V P D R

[condition number (i) follows]

4. (*d*) 3 9 7 4 1 6 → P B L F M A

[no condition follows]

5. (*d*) 7 3 4 1 9 2 → L P F M B V

[no condition follows]

6. (*d*) 2 1 5 3 4 9 → © A P K % R

[none of the conditions is applicable]

7. (*c*) 6 7 1 2 5 4 → ☆ M A © P ☆

[condition (ii) is applicable]

8. (*b*) 8 1 3 4 6 9 → D A K % @ R

[none of the conditions is applicable]

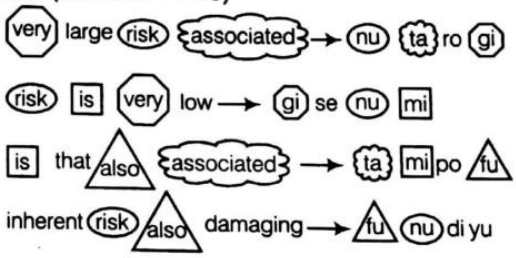
9. (*d*) 7 9 4 8 2 1 → $ R % D © $

[condition (iii) is applicable]

10. (*a*) 5 9 1 4 2 6 → @ R A % © P

[condition (i) is applicable]

Solutions (Q. Nos. 11-15)



11. (*d*) risk also large → nu fu ro

12. (*e*) very → gi

13. (*b*) associated → ta

14. (*a*) 'di' stands for either 'damaging' or 'inherent'.

15. (*b*) that is low → po mi se

16. (*c*) sun shines brightly ⟶ ba lo sul ...(i)

houses are brightly lit ⟶ kado ula ariba ...(ii)

light comes from sun ⟶ dopi kup lo mo ...(iii)

From Eqs. (i) and (ii), brightly ⟶ ba

From Eqs. (i) and (iii), sun ⟶ lo

Hence, sun ⟶ lo and brightly ⟶ ba

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17. (*a*) po ki top ma → Usha is playing cards
Kop ja ki ma → Asha is playing tennis
ki topsopno → they are playing football
posur kop → Cards and tennis
So, Asha → ja

18. (*e*) me lo po → anu weds vinay ...(i)
pe to lo → vinay comes here ...(ii)
From Eqs. (i) and (ii), lo → vinay
Hence, come is either as pe or to.

19. (*d*)

@	9	1	$	2	6
↓	↓	↓	↓	↓	↓
P	E	F	H	R	J

[no such condition is follow]

20. (*d*)

3	8	7	#	©	9
↓	↓	↓	↓	↓	↓
K	D	M	T	A	E

[no such condition is follow]

21. (*a*)

4	@	3	1	2	d
↓	↓	↓	↓	↓	↓
V	P	K	F	R	V

[(i) condition follow]

22. (*c*)

%	4	1	8	7	☆
↓	↓	↓	↓	↓	↓
X	I	F	D	M	X

[(iii) condition follows]

23. (*b*)

9	1	2	4	d	6
↓	↓	↓	↓	↓	↓
J	F	R	I	V	E

[(ii) condition follows]

24. (*b*) 1 2 3 → bright little boy ...(i)
1 4 5 → tall big boy ...(ii)
6 3 7 → beautiful little flower ...(iii)
From Eqs. (i) and (ii), 1 → boy
From Eqs. (i) and (iii), 3 → little
Hence, 2 → bright.

25. (*c*) 9 7 5 → throw away garbage ...(i)
5 2 8 → give away smoking ...(ii)
2 1 3 → smoking is harmful ...(iii)
From Eqs. (ii) and (iii), smoking → 2

26. (*a*) As,

B	A	S	K	E	T
↓	↓	↓	↓	↓	↓
5	$	3	%	#	1

and

T	R	I	E	D
↓	↓	↓	↓	↓
1	4	*	#	2

Similarly,

S	K	I	R	T
↓	↓	↓	↓	↓
3	%	*	4	1

27. (*d*) 3a 2b 7c → truth is eternal
7c 9a 8b 3a → enmity is not eternal ...(i)
4d 2b 8b → truth does not ...(ii)
From Eqs. (i) and (ii), 7c → is/eternal ...(iii)
From Eqs. (i) and (iii), 2b → truth
From Eqs. (ii) and (iii), 8b → hot
Hence, 9a → enmity

28. (*c*) We know that, national flower of India is Lotus and here Lotus is called Rose.

29. (*b*) According to given sign's table,

→	≠	>	=	<
↓	↓	↓	↓	↓
6	8	7	3	1

30. (*a*) Water quenches thirst and here water is called as light.

31. (*c*) Lizard → flying

32. (*b*) Glass is used for drinking water and here glass is called as saucer.

33. (*e*) Soap is used for washing clothes and here soap is called ink.

34. (*a*) According to given alphabets codes

1	6	3	5	1	4	9	7	8	4	2
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
A	N	I	M	A	L	W	O	R	L	D

Solutions (Q. Nos 35-39) *On the basis of given information*

economics is not money → ka la ho ga ...(i)
demand and supply economics → mo ta pa ka ...(ii)
money makes only part → zi la ne ki ...(iii)
demand makes supply economics
→ zi mo ka ta ...(iv)

35. (*c*) **36.** (*e*) **37.** (*a*) **38.** (*b*) **39.** (*d*)

40. (*b*) min fin bin gin → trains are always late ...(i)
gin din cin hin → drivers were always punished ...(ii)
bin cin vin rin → drivers stopped all trains ...(iii)
din kin fin vin → all passengers were late ...(iv)
From Eqs. (i) and (iv), fin → late
From Eqs. (ii) and (iii), cin → drivers
From Eqs. (ii) and (iv), din → were
Hence, drivers were late → cin din fin

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2

Analogy

Analogy means similarity or correspondence i.e., having similar features.

In questions based on analogy, a particular relationship is given and another similar relationship has to be identified from the alternatives provided. Questions based on analogy are set up to test a candidate's overall knowledge, power of reasoning and ability to think.

These types of questions cover every types of relationships that one can think. There are many ways of establishing a relationship like quantity and unit, worker and tools, cause and effect, word-synonym, word-antonym, country and capital, state and capital, country and currency, animal and the young ones (kid), male and female, animals and their resting places, games and places of playing, occupation their working place and their work.

Here, some relationships are given, which are useful for solving questions based on analogy

Country	Capital	Currency
Bangladesh	Dhaka	Taka
Iraq	Baghdad	Dinar
China	Beijing	Yuan
India	Delhi	Rupee
UK	London	Pound
Japan	Tokyo	Yen
USA	Washington DC	Dollar
Russia	Moscow	Rouble
Greece	Athens	Euro

Occupation	Working Place	Working
Lawyer	Court	Legal Practice
Servant	House	Service
Beautician	Parlour	Make up
Mechanic	Garage	Repairing
Waiter	Restaurant	Serving
Teacher	School	Teaching
Chef	Kitchen	Cooking
Sailor	Ship	Sailing

States of India	Capital
Sikkim	Gangtok
West Bengal	Kolkata
Goa	Panaji
Tamil Nadu	Chennai
Odisha	Bhubaneshwar
Bihar	Patna

Male	Female
Dog	Bitch
Horse	Mare
Bull	Cow
Cock	Hen
Son	Daughter
Brother	Sister

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Individual	Class
Frog	Amphibian
Rat	Rodent
Cup	Crockery
Snake	Reptile
Man	Mammal
Ostrich	Bird
Whale	Mammal
Pen	Stationery

Animal	Sound
Cock	Crow
Duck	Quack
Cat	Mew
Frog	Croak
Snake	Hiss
Owl	Hoot
Jackal	Howl
Donkey	Bray

Quantity	Unit
Power	Watt
Pressure	Pascal
Current	Ampere
Area	Hectare
Time	Second
Mass	Kilogram
Work	Joule
Volume	Litre
Force	Newton

Word	Synonym
Assign	Allot
Substitute	Replace
Abduct	Kidnap
Haughty	Proud
Dissipate	Squander
Brim	Edge
Dearth	Scarcity

Word	Antonym
Robust	Weak
Deep	Shallow
Chaos	Peace
Cruel	Kind
Gentle	Harsh
Kind	Cruel
Lethargy	Alertness
Mourn	Rejoice

Individual	Dwelling (Place)
Lion	Den
Spider	Web
Horse	Stable
Bird	Nest
King	Palace
Eskimo	Igloo

Instrument	Measurement
Sphygmomanometer	Blood pressure
Seismograph	Earthquake
Barometer	Pressure
Ammeter	Current
Odometer	Speed

Game	Place of Playing
Tennis	Court
Wrestling	Arena
Boxing	Ring
Race	Track
Badminton	Court

Occupation	Product
Farmer	Crop
Architect	Designs
Producer	Films
Teacher	Education
Tailor	Clothes

Animal	Young One
Dog	Puppy
Hen	Chick
Cat	Kitten
Cow	Calf
Bear	Cub

Types of Questions

Different types of questions based on analogy that are asked in various competitive exams, have been given below

Type 1 Direct/Simple Analogy

In this type of analogy, we deal with questions which have three components. Two have some relationship and you have to choose from the alternatives which has the same relationship with the third component.

Illustration 1. College is related to student in the same way as Hospital is related to ...

(a) Doctor (b) Nurse (c) Medicine (d) Patient

Solution (*d*) In the College, education is given to students, in the same way treatment given to Patient in Hospital.

Illustration 2. Major is related to Lieutenant in the same way as Squadron Leader is related to ...

(a) Group Captain (b) Flying Attendant

(c) Flying Officer (d) Pilot Officer

Solution (c) Major and Squadron Leader are equivalent ranks in the Army and the Air Force, respectively. Same as Lieutenant and Flying Officer are equivalent ranks in the Army and the Air force.

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Type 2 Completing the Analogous Pair

In this type of questions, two words are given. These words are related to each other in some way. Another word is also given. The candidate is required to find out the relationship between the first two words and choose the word from the given alternatives, which have the same relationship to the third word, as their is between the first two.

Illustration 3. Boat : Oar : : Bicycle : ?

(a) Pedal (b) Seat
(c) Road (d) Wheel

Solution (a) Second denotes that part of the first, on which the effort is applied to move it.

Illustration 4. Traveller : Journey : : Sailor : ?

(a) Water (b) Ship
(c) Voyage (d) Crew

Solution (c) Second is the name given to the process of travel of the first.

Type 3 Choosing the Analogous Pair

In this type of questions, a pair of words is given, followed by four pairs of words as alternatives. You are required to choose the pair in which the words bear the same relationship as beared by words given in questions.

Illustration 5. Apostate : Religion

(a) Teacher : Education
(b) Traitor : Country
(c) Potentate : Kingdom
(d) Jailor : Law

Solution (b) Apostate is one who renounces Religion. Similarly, Traitor is one who betrays his Country.

Illustration 6. Gland : Enzyme

(a) Muscle : Spasm
(b) Generator : Current
(c) Organ : Kidney
(d) Brain : Cortex

Solution (b) As, Gland produces the Enzyme. Similarly, Generator produces the Current.

Type 4 Choosing a Similar Word

In this type of questions, a group of three words is given, followed by four other words as alternatives. The candidate is required to choose the alternative, which is similar to the given group of words.

Illustration 7. Kolkata, Mumbai, Mangalore

(a) Delhi (b) Lucknow
(c) Cochin (d) Hyderabad

Solution (c) All are port cities of India.

Illustration 8. Bhilai, Durgapur, Bokaro

(a) Baroda (b) Chennai
(c) Chandigarh (d) Rourkela

Solution (d) All cities are famous for steel plants.

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Some other Types of Analogy

This types of analogies are explained as under

(i) Number Analogy

In this type of analogy, questions have two numbers/group of numbers bearing a relationship. There is also a third number/group of number which have the same relationship from the alternative. You are required to find that alternative.

Illustration 9. 2 : 8 : : 3 : ?

(a) 20 (b) 21
(c) 24 (d) 27

Solution (d) Second number is the cube of first number in the same way 27 is the cube of 3.
i.e., $2^3 = 8$
$3^3 = 27$

Illustration 10. 5 : 35 : : ?

(a) 7 : 77 (b) 9 : 45
(c) 11 : 45 (d) 3 : 28

Solution (a) The first number is multiplied by the next prime number to obtain the second number.
and $7 \times 11 = 77$
7 and 11 are prime numbers.
So, missing pair is 7 : 77.

(ii) Alphabet Analogy

In this type of analogy, first two groups of letters are related to each other in some way, you are required to find out this relationship and then choose a letter group of letters which is related in the same way, as first two letters / group of letters are related.

Illustration 11. MUMBAI : LTLAZH : : DELHI : ?

(a) CDKGG
(b) IHLED
(c) CDKGH
(d) BCKGH

Solution (c) Each letter of the first group is moved one step backward to obtain the corresponding letter of the second group.
So, DELHI → CDKGH

Note There can be another type of analogy containing both, Number Analogy and Alphabet Analogy i.e., Alphanumeric Analogy. The method of solving these type of question are similar as above.

Illustration 12. NEWS : 14,5,23,19 : : PAPER : ?

(a) 16,5,16,1,18 (b) 18,5,16,1,16
(c) 16,1,16,5,18 (d) 32,2,32,10,36

Solution (c) Each letter assigned its position from left.
So, PAPER → 16,1,16,5,18

Illustration 13. FILM : 10 : : HOTEL : ?

(a) 12 (b) 15 (c) 18 (d) 30

Solution (a) As, F I L M
↓ ↓ ↓ ↓
$6 + 9 + 12 + 13 = 40$
$40 \div 4 = 10$

Similarly, H O T E L
↓ ↓ ↓ ↓ ↓
$8 + 15 + 20 + 5 + 12 = 60$
$60 \div 5 = 12$

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Let us Practice

A. Base Level Exercise

1. 'Hare' is related to 'Burrow', in the same way 'Owl' is related to ...
(a) Hole (b) Hive
(c) Nest (d) Barn

2. 'Duma' is related to 'Russia', in the same way as 'Shora' is related to ...
(a) Malaysia (b) Afghanistan
(c) France (d) Germany

3. 'Konkani' is related to 'Goa', in the sam way as 'Dogri' is related to ...
(a) Madhya Pradesh (b) Odisha
(c) Jammu and Kashmir (d) Gujrat

4. 'Pitch' is related to 'Cricket', in the same way as 'Arena' is related to ...
(a) Tennis (b) Gymnastic
(c) Badminton (d) Wrestling

5. Choose the option that expresses the same relationship as the word Tobacco : Cancer, has
(a) Milk : Food
(b) Bud : Flower
(c) Soil : Erosion
(d) Mosquito : Malaria
(e) Honeybee : Wax

6. 'Cyclone' is related to 'Anti-cyclone', in the same way as 'Flood' is related to ... .
(a) Devastation (b) Havoc
(c) River (d) Drought

7. 'Doctor' is related to 'Patient', in the same way 'Lawyer' is related to ...
[UP B.Ed. 2008]
(a) Customer (b) Criminal
(c) Magistrate (d) Client

8. As 'Bald' is related to 'Blond', in the same way, 'Barren' is related to
[SSC (FCI) 2012]
(a) Vegetation (b) Farm
(c) Fertile (d) Inhibited

9. 'Atom' is related to 'Molecule', in the same way as 'Cell' is related to ...
[RRB (ASM) 2006]
(a) Matter (b) Nucleus
(c) Organism (d) Battery

10. 'Flower' is related to 'Petal', in the same way as 'Book' is related to ...
[LIC (AAO) 2005]
(a) Pages (b) Content
(c) Author (d) Library
(e) None of these

Directions (Q. Nos. 11-13) *In each of the following questions, there is certain relationship between two given words on one side of (::) and one word is given on another side of (::) while another word is to be selected from the given alternatives having the same relationship with the word, as the words of the given pair bear. Choose the correct alternative.*

11. Cougar : South America :: Okapi : ?
(a) India (b) Central Africa
(c) North America (d) Pakistan

12. Bow : Arrow :: Pistol: ?
(a) Bullet (b) Gun
(c) Shoot (d) Rifle

13. Cobbler : Leather :: Carpenter : ?
(a) Furniture (b) Wood
(c) Hammer (d) Chair

Directions (Q. Nos. 14-22) *In each of the following questions, two words are given to the left side of the sign (::) and one word and a question mark are given to the right side of the of sign (::), select one word from the given alternatives which bears the same relationship to the word given to the right side of sign (::) as that of the words given to the left side of the sign (::).*

14. House : Door :: Compound : ?
(a) Gate (b) Fence
(c) Foundation (d) Wall

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15. Hongkong : China :: Vatican : ? [SSC (Multitasking) 2013]
(a) France (b) Mexico
(c) Canada (d) Rome

16. Magazine : Editor :: Drama [SSC (Multitasking) 2014]
(a) Director (b) Player
(c) Manager (d) Actor

17. King : Throne :: Rider : ? [SSC (FCI) 2012]
(a) Chair (b) Horse
(c) Seat (d) Saddle

18. Video : Cassette :: Computer : ?
(a) Reels (b) Recordings
(c) Files (d) Floppy
(e) CPU

19. Plant : Seed :: ? : Bud
(a) Leaf (b) Twig
(c) Flower (d) Fruit

20. Pleasure : Sorrow :: Right : ? [SSC (Constable) 2011]
(a) Wrong (b) Wonderful
(c) Happy (d) Sure

21. Nightingale : Warble :: Frog : ? [IBPS (CWE) 2013]
(a) Yelp (b) Croak
(c) Cackle (d) Squeak
(e) None of these

22. Tanning : Leather :: Pyrotechnics : ?
(a) Bombs (b) Fireworks
(c) Wool (d) Machinery

Directions (Q. Nos. 23-26) *In the following questions, find the word which holds the same relation with the third word as there in between the first two words.*

23. MODERATE : INTENSIFY : NOMINAL : ?
(a) MEMORIAL (b) EXPENSIVE
(c) DISTANCE (d) CHAOS

24. Oxygen : Burn :: Carbon dioxide : ? [IBPS (Clerk) 2012]
(a) Isolate (b) Foam
(c) Extinguishes (d) Explode
(e) None of these

25. Smoke : Pollution :: War : ?
(a) Peace
(b) Victory
(c) Treaty
(d) Destruction

26. Dress : Tailor :: ? : Carpenter
(a) Wood (b) Furniture
(c) Leather (d) Cloth

Directions (Q. Nos. 27-33) *In each of the following questions, there is same relationship between the two terms of the left of (: :) and the same relationship holds between the two terms to its right. Also, in each question, one term to the right of (: :) is missing. This term is given as one of the alternatives, from the given alternatives below each question. Find out this term from the given alternatives.*

27. In the English alphabet, 'BDG' is to 'CFJ' in the same way as 'EGJ' is to? [IBPS (PO) 2011]
(a) FIL (b) FJM
(c) FIM (d) FIN
(e) None of these

28. BFG : EIJ :: RVW : ?
(a) UWY (b) UYZ
(c) SWX (d) QUV

29. AFHO : GBDJ :: CHFM : ? [SSC (FCI) 2012]
(a) GBIM (b) GBLD
(c) GPLD (d) IDBH

30. HCM : FAK :: SGD : ?
(a) QEB (b) QIB
(c) ESQ (d) GES

31. GREAT : 25 :: NUMBER : ? [SSC (FCI) 2012]
(a) 36 (b) 38
(c) 27 (d) 24

32. AHOP : CKSU :: BJMR : ? [SSC (CGL) 2013]
(a) EZUQ (b) DMQW
(c) DQKM (d) CJWN

33. AZCX : BYDW :: HQJO : ?
(a) GREP (b) IPKM
(c) IPKN (d) GRJP

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Directions (Q. Nos. 34-41) *In each of the following questions, there is a certain relationship between two given numbers on one side of (::) and one number is given on the other side of (: :) while another number is to be found from the given alternatives having the same relationship with this number as the numbers of the given pair. Choose the best alternatives.*

34. 1, 2, 4, 7 : 3, 4, 6, 9 :: ? : 2, 3, 5, 8 **[SSC (10+2) 2012]**

(a) 0, 1, 3, 6 (b) 2, 4, 5, 8
(c) 1, 3, 4, 7 (d) 3, 5, 6, 8

35. 63 : 21 :: 27 :?

(a) 6 (b) 9 (c) 1 (d) 3

36. 12 : 30 :: 18 : ?

(a) 36 (b) 42
(c) 44 (d) 45

37. 25 : 625 :: 35 : ? **[SSC (CGL) 2012]**

(a) 1575 (b) 1205
(c) 875 (d) 635

38. 6524 : 6465 :: 9638 : ? **[Vijaya Bank (Clerk) 2011]**

(a) 9825 (b) 9736
(c) 9697 (d) 9579
(e) None of these

39. 100 : 121 :: 144 : ? **[SSC (Multitasking) 2014]**

(a) 160 (b) 93
(c) 169 (d) 426

40. 08 : 66 :: ? : 38 **[SSC (10+2) 2013]**

(a) 2 (b) 6 (c) 12 (d) 19

41. 583 : 488 :: 293 : ?

(a) 581 (b) 291
(c) 387 (d) 487

B. Expert Level Exercise

Directions (Q. Nos. 1-7) *The following questions consist of two words each that have certain relationship between each other, followed by four lettered pairs of words. Select the related pair that has the same relationship as the original pair of words.*

1. Surgeon : Scalpel **[MAT 2012]**

(a) Musician : Instrument
(b) Carpenter : Cabinet
(c) Sculptor : Chisel
(d) Baker : Oven

2. Horse : Hoof :: ? **[SSC (DEO & LDC) 2012]**

(a) Man : Foot
(b) Dog : Black
(c) Paise : Rupee
(d) Pen : Pencil

3. Which of the following has the same relationship as Sailor : Compass :: ? **[PNB (Clerk) 2011]**

(a) Student : Exam
(b) Doctor : Stethoscope
(c) Pen : Officer
(d) Painter : Artist
(e) Bricks : Plumber

4. Cells : Cytology :: ? **[RRB (ASM) 2009]**

(a) Worms : Ornithology
(b) Insects : Entomology
(c) Disecses : Physiology
(d) Tissues : Morphology

5. Chair : Wood :: ? **[SSC (10+2) 2013]**

(a) Book : Print (b) Mirror : Glass
(c) Plate : Food (d) Purse : Money

6. Nuts : Bolts **[CLAT 2013]**

(a) Nitty : Gritty (b) Bare : Feet
(c) Naked : Clothes (d) Hard : Soft

7. Book : Author **[CLAT 2013]**

(a) Rain : Flood
(b) Light : Switch
(c) Symphony : Composer
(d) Song : Music

Directions (Q. Nos. 8-11) *In each of the following questions choose that set of numbers from the four alternatives sets, that is similar to the given set.*

8. Given set : (7, 77, 140)

(a) (8, 80, 166 (b) (9, 88, 180)
(c) (8, 88, 160) (d) (10, 110, 300)

9. Given set : (32, 24, 8) **[SSC (CPO) 2005]**

(a) (26, 32, 42) (b) (34, 24, 14)
(c) (24, 16, 0) (d) (42, 34, 16)

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10. Given set : (8, 3, 2)

(a) (10, 6, 5) (b) (63, 8, 3)
(c) (95, 24, 5) (d) (168, 15, 4)

11. Given set : (56, 52, 36)

(a) (95, 90, 65) (b) (85, 80, 50)
(c) (60, 70, 90) (d) (45, 55, 65)

Directions (Q. Nos. 12-15) *In each of the following questions, choose that word which has the same relationship among the given three words.*

12. Bhopal, Panaji, Gandhinagar

(a) Amritsar (b) Allahabad
(c) Patna (d) Baroda

13. Yuan, Kyat, Lira

(a) Dirham (b) Turkey
(c) Madrid (d) Mass

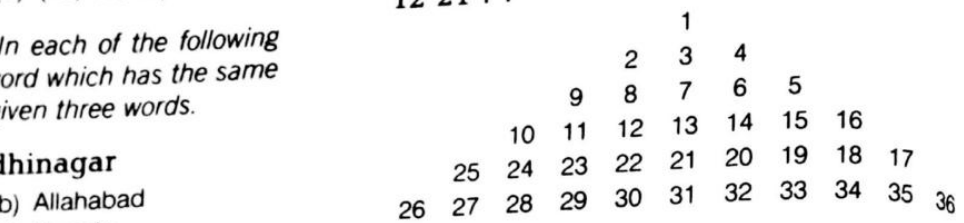
14. Yellow, Blue, Red

(a) Black (b) Orange
(c) White (d) Paint

15. Peat, Bituminous, Lignite

(a) Coke
(b) Granite
(c) Basalt
(d) Anthracite

16. In this pyramid if 11 22 31 : 12 21 32 :: 9 12 21 : ?



(a) 2 7 1 4
(b) 8 13 20
(c) 6 15 18
(d) 10 23 30

17. Peacock : India :: Bear : ?

(a) Australia (b) America
(c) Russia (d) England

Answer *with* Explanations

A. Base Level Exercise

1. (*d*) 'Burrow' is the dwelling place of 'Hare'. Similarly, 'Barn' is the dwelling place of 'Owl'.

2. (*b*) 'Russian' parliament is called 'Duma'. Similarly, 'Afghanistan's' parliament is called 'Shora'.

3. (*c*) 'Konkani' is the language of 'Goa'. Similarly, 'Dogri' is the language of 'Jammu and Kashmir'.

4. (*d*) 'Cricket' is played on 'Pitch'. Similarly, 'Wrestling' is done in 'Arena'.

5. (*d*) As, Tobacco is a cause of Cancer. Similarly, Mosquito is the cause of Malaria.

6. (*d*) The words in each pair represent opposite conditions.

7. (*d*) 'Doctor' deals with 'Patient'. Similarly, 'Lawyer' deals with 'Client'.

8. (*c*) As, 'Bald' is related to 'Blond' in the same way, 'Barren' is related to 'Fertile'.

9. (*c*) First constitutes the second. As combining 'Atom' we get 'Molecule' in the same way combining 'Cell' we get 'Organism'.

10. (*a*) 'Flower' is made of 'Petals'. Similarly, 'Book' is made of 'Pages'.

11. (*b*) As, Cougar is found in South America. Similarly, Okapi is found in Central Africa

12. (*a*) As, Arrow is released from Bow. Similarly, Bullet is released from Pistol.

13. (*b*) As, Cobbler uses Leather to make shoes. Similarly, Carpenter uses Wood to make furniture,

14. (*a*) As, Doors are for Entry in house. Similarly, Gates are for entry in compound.

15. (*d*) As, Hongkong is in China. Similarly, Vatican is in Rome.

16. (*a*) As, Editor is related to Magazine. Similarly, Director is related to Drama.

17. (*c*) As, King sits on the 'Throne'. In the same way 'Rider' sits on the Seat.

18. (*d*) Second is recording device and first is visual device.

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19. (*c*) As, grown form of seed is Plant. Similarly, grown form of Bud is Flower.

20. (*a*) 'Pleasure' is opposite of 'Sorrow' in the same way 'Right' is opposite of 'Wrong'.

21. (*b*) As, sound of Nightingale is Warble. Similarly, the sound of Frog is Croak.

22. (*b*) As, for finishing the 'Leather', Tanning. Method is used in the same way, 'Pyrotechnics' is used for 'fire works.'

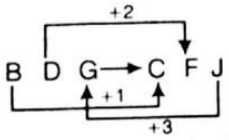
23. (*b*) MODERATE and INTENSIFY are antonyms and NOMINAL and EXPENSIVE are antonyms.

24. (*c*) The fire Burns due to presence of Oxygen and the fire Extinguishes due to Carbon dioxide.

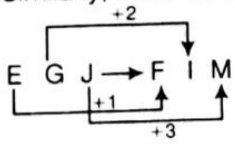
25. (*d*) Pollution is the result of Smoke. Similarly, Destruction is the result of War.

26. (*b*) As, Tailor makes Dress. Similarly, Carpenter makes Furniture.

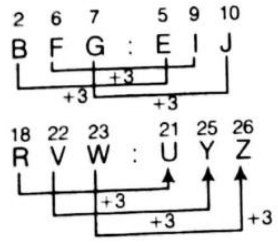
27. (*c*)



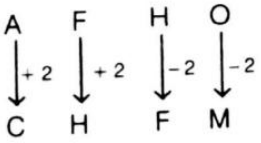
Similarly, code for EGJ is given as



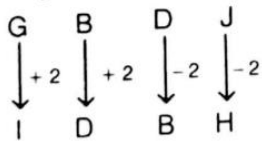
28. (*b*)



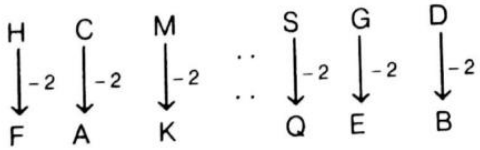
29. (*d*) As,



Similarly,



30. (*a*)



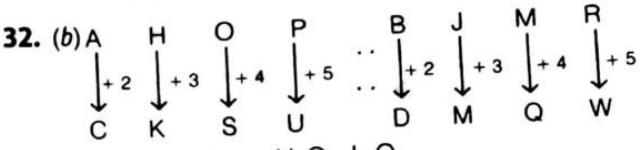
31. (*a*) In word GREAT, the number of alphabets = 5

$\therefore$ GREAT = $(5)^2 = 25$

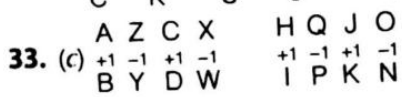
In the same way, in word NUMBER, the number of alphabets = 6

$\therefore$ NUMBER = $(6)^2 = 36$

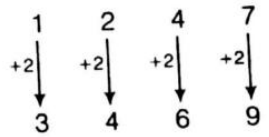
32. (*b*)



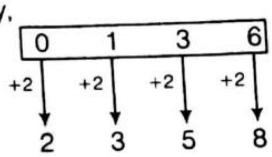
33. (*c*)



34. (*a*) As,



Similarly,



35. (*b*) $63 + 3 = 21$

$27 + 3 = 9$

36. (*b*) $12 : 30 :: 18 : 42$

$\times 2 + 6 \quad \times 2 + 6$

37. (*d*) As, 25 is common in both 25 and 625 and 6 is added.
Similarly, 35 is common in both 35 and 635 and 6 is added.

38. (*d*) $6524 - 59 = 6465$

$9638 - 59 = \boxed{9579}$

39. (*c*) $100 = 10^2 : 121 = 11^2$

$144 = 12^2 : 13^2 = 169$

40. (*b*) $(08)^2 + 2 = 66$

$(06)^2 + 2 = 38$

41. (*c*) As, $\left.\begin{matrix} 5+8+3=16 \\ 4+8+8=20 \end{matrix}\right] + 4$

Similarly,

$\left.\begin{matrix} 2+9+3=14 \\ 3+8+7=18 \end{matrix}\right] + 4$

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B. Expert Level Exercise

1. (c) Scalpel is used by Surgeon during operation, in the same way, Sculptor uses his Chisel for crating sculptures.

2. (a) The Hoofs of an animal such as a Horse are the hard lower parts of its feet. In the same way Foots are the lower parts of Man.

3. (b) 'Sailor' is judge the direction through 'Compass' same as 'Doctor' is judge the breathing and heart beats through 'Stethoscope'.

4. (b) 'Cytology' is the science of study of 'Cells'. In the same way 'Entomology' is the Science of study of 'Insects'.

5. (b) As, Chair is made of Wood. Similarly, Mirror is made of Glass.

6. (c) As, Nuts are covered with Bolts. Similarly, Naked is covered with Clothes.

7. (c) Book is written by Author. Similarly, Symphony is composed by Composer.

8. (c) As,

7 — 77 ; 7 — 140

7×11 7×20

Similarly,

8 — 88 ; 8 — 160

8×11 8×20

9. (c) Here, 32 — 24 — 8

-8 -16

Similarly, 24 — 16 — 0

-8 -16

10. (b) Here,

2^2-1

8 — 3 — 2

3^2-1

Similarly,

3^2-1

63 — 8 — 3

8^2-1

11. (a) Given, 56 — 52 — 36

-4 -4^2

Then, 95 — 90 — 65

-5 -5^2

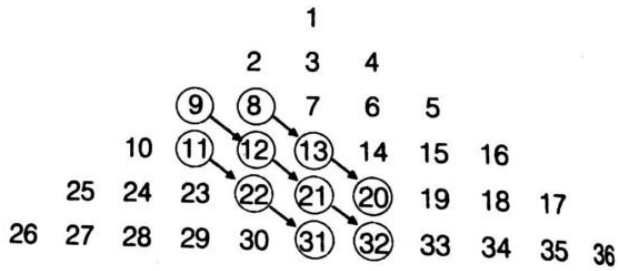
12. (c) All are the Capitals of Indian States.

13. (a) All are the currencies of different Countries.

14. (b) All are the colours of rainbow.

15. (d)

16. (b)



In this pyramid, you can see the pattern.
So, the correct option is 8, 13, 20

17. (c) As, Peacock is the National Bird of India. Similarly, Bear is the National Animal of Russia.

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3

Classification

Classification means 'to assort the items' of a given group on the basis of a certain common quality they possess and then spot the stranger or 'odd one out'.

These questions are based on words, letters and numerals. In these types of problems, we consider the defining quality of particular things. In these questions, four or five elements are given, out of which one does not belong to the group. You are required to find the 'odd one'.

Note There may be possibility of more than one logic to be applicable but we need to apply optimum and best logic of all possibilities.

There are several types of questions that can be asked on classification in different catagories. Some of the types are discussed below

Type 1 Choosing the Odd Word

In these type of problems, some words are given which belong to real world. They have some common features except the odd one. You are required to find the 'odd one out'.

Directions (Illustrations 1-3) *In each of the following questions, five words have been given out of which four are alike in some manner while the fifth one is different. Choose the odd one.*

1. (a) Pear (b) Apple (c) Litchi (d) Guava (e) Orange

Solution (e) Out of given fruits orange is citrus fruit. So, it is different from others.

2. (a) Deck (b) Quay (c) Stern (d) Bow (e) Mast

Solution (b) All except quay are parts of a ship.

3. (a) Tomato (b) Gourd (c) Brinjal (d) Cucumber (e) Potato

Solution (e) All the vegetables except potato grow above the ground level.

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Type 2 Choosing the Odd Pair of Words

In this type of classification, different pairs are classified on the basis of some common features/ properties like names, places, uses, situations, origin, etc.

Directions (Illustrations 4-6) *In each of the following questions, five/four pairs of words are given out of which words in four/three pairs bear a certain common relationship. Choose the pair in which the words are differently related.*

4. (a) Gold : Ornaments (b) Cloth : Garments
(c) Wood : Furniture (d) Leather : Footwear
(e) Earthen pots : Clay

Solution (e) Except pair (e), in all other pairs, the first is the raw material used to make the second.

5. (a) Broad : Wide (b) Light : Heavy
(c) Tiny : Small (d) Big : Large

Solution (b) Light is antonym of heavy. But in other pairs words are synonyms.

6. (a) Petrol : Car (b) Ink : Pen
(c) Garbage : Dustbin (d) Lead : Pencil

Solution (d) Except pair (d) in all other pairs first is required by the second for its functioning.

Type 3 Choosing the Odd Letter Group

In this type of problems, some groups of letters are given. One out of them is different and this is need to identify as the relevent Answer.

Directions (Illustrations 7-9) *Choose the group of letters which is different from others.*

7. (a) H (b) Q
(c) T (d) Z

Solution (b) All other letters except (b), occupy the even-numbered positions in the English alphabets.

8. (a) GE (b) MK
(c) WU (d) QN

Solution (d) Here,

G	E	M	K	W	U	Q	N
↑		↑		↑		↑	
F		L		V		P, O	

9. (a) DG2 (b) EK5 (c) JR6
(d) PY8 (e) RV3

Solution (c) Taking A = 1, B = 2, ..., Z = 26, then
DG2 = G – (D + 2) = 7 – (4 + 2) = 1
EK5 = K – (E + 5) = 11 – (5 + 5) = 1
JR6 = R – (J + 6) = 18 – (10 + 6) = 2
PY8 = Y – (P + 8) = 25 – (16 + 8) = 1
RV3 = V – (R + 3) = 22 – (18 + 3) = 1

Type 4 Choosing the Odd Number/Pair of Numbers

In this type of classification, certain numbers/pair of numbers are given, out of which except one, all have some common characteristics and hence are alike. The 'different one' is to be chosen as the answer.

Directions (Illustrations 10-14) *In each of the following questions, five/four numbers are given. Out of these, four/three are alike in a certain way but the fifth one is different. Choose the one which is different from the rest four/three.*

10. (a) 2 (b) 32
(c) 56 (d) 128

Solution (c) Each of the numbers except 56, can be expressed in terms of powers of 2.

11. (a) 57 (b) 87 (c) 131
(d) 133 (e) 143

Solution (c) Except 131, all other numbers are non-prime (composite) numbers.

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12. (a) 144 (b) 169 (c) 256
(d) 288 (e) 324

Solution (*d*) Except 288, all other numbers are square of natural numbers.

As, $12^2 = 144$
$13^2 = 169$
$16^2 = 256$
$18^2 = 324$

13. (a) 125 (b) 216 (c) 729
(d) 525 (e) 343

Solution (*d*) Except 525, all other numbers are cubes of natural numbers.

14. (a) 21 : 24 (b) 28 : 32 (c) 14 : 16
(d) 70 : 80 (e) 54 : 62

Solution (*e*) Here, $\frac{21}{24} = \frac{7}{8}$;

$\frac{28}{32} = \frac{7}{8}$; $\frac{14}{16} = \frac{7}{8}$;

$\frac{70}{80} = \frac{7}{8}$

and $\frac{54}{62} = \frac{27}{31}$

Except option (e) every ratio is equal *i.e.*, 7/8.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-30) *In the following questions, three/four out of the four/five alternatives are same in a certain way and so form a group. Find the odd one that does not belong to the group.*

1. (a) Unicorn (b) Rhino (c) Fox
(d) Antelope (e) Jackal

2. (a) Swimming (b) Sailling
(c) Diving (d) Driving
(e) Boating
[EPFO 2011]

3. (a) Blackmail (b) Smuggling
(c) Snobbery (d) Forgery
(e) Sabotage

4. (a) Gallon (b) Ton
(c) Quintal (d) Kilogram
[SSC (CPO) 2012]

5. (a) Zinc (b) Bronze
(c) Silver (d) Platinum
[SSC (CGL) 2013]

6. (a) Herd (b) Flight
(c) Hound (d) Swarm
[SSC (Steno) 2013]

7. (a) Ring (b) Tyre (c) Plate
(d) Bangle (e) Rubber tube
[SBI (Clerk) 2011]

8. (a) Huge (b) Tiny (c) Heavy
(d) Small (e) Big

9. (a) Cheese (b) Wine
(c) Milk (d) Curd

10. (a) Sky (b) Star (c) Planet
(d) Comet (e) Moon

11. (a) Rigveda (b) Yajurveda
(c) Atharveda (d) Ayurveda
(e) Samaveda

12. (a) Frequency polygon
(b) Rectangle
(c) Bar
(d) Pi
[SSC (Steno) 2013]

13. (a) Silicon (b) Platinum
(c) Arsenic (d) Antimony

14. (a) Carpenter (b) Goldsmith
(c) Blacksmith (d) Driver
[SSC (Constable) 2012]

15. (a) Misdeed (b) Corruption
(c) Failure (d) Offence
(e) Villainy

16. (a) Rain (b) Shower
(c) Sleet (d) Raisin

17. (a) Rickshaw (b) Taxi (c) Tanga
(d) Cart (e) Phaeton

18. (a) Brass (b) Gun metal
(c) Bronze (d) Germanium
[SSC (Steno) 2013]

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19. (a) Mountain (b) Valley
(c) Glacier (d) Sea-coast
(e) Ridge

20. (a) Graph (b) Chart (c) Model
(d) Drawing (e) Figure [IBPS (Clerk) 2012]

21. (a) Mountain (b) Hill
(c) Plateau (d) Plane
[SSC (10+2) 2013]

22. (a) Asia (b) Australia (c) America
(d) Africa (e) England

23. (a) Cello (b) Guitar
(c) Flute (d) Violin
[SSC (Multitasking) 2012]

24. (a) Sweetness (b) Elegant
(c) Bright (d) Beautiful
[SSC (Multitasking) 2012]

25. (a) Cholera (b) AIDS (c) Cancer
(d) Health (e) Jaundice [LIC (AAO) 2011]

26. (a) Chop (b) Slit
(c) Chirp (d) Slice

27. (a) Political Science (b) History
(c) Philosophy (d) Physics [SSC (CPO) 2013]

28. (a) Author (b) Novelist
(c) Poet (d) Publisher
[SSC (10+2) 2013]

29. (a) Barter (b) Purchase
(c) Sale (d) Borrow
[SSC (10+2) 2013]

30. (a) Scurvy (b) Rickets
(c) Night-blindness (d) Influenza
[SSC (CGL) 2013]

Directions (Q. Nos. 31-50) *In each of the following questions, some groups of letters are given, all of which, except one, share a common feature while one is different. Choose the odd one out.*

31. (a) A (b) E (c) I
(d) Z (e) U

32. (a) A (b) D (c) F
(d) K (e) T

33. (a) MORV (b) CEHL
(c) CENT (d) JLOS
[SSC (CGL) 2013]

34. (a) dcba (b) zyxw
(c) srpq (d) hgfe
[SSC (Multitasking) 2014]

35. (a) GMS (b) EKQ (c) JOU
(d) LRX (e) BHN

36. (a) PQXZ (b) BCQN (c) ABDF
(d) MNPR (e) GHJL
[Corporation Bank (PO) 2012]

37. (a) DACB (b) EBCD
(c) SPQR (d) XUVW

38. (a) MOR (b) GIL (c) SUX
(d) ACF (e) VXZ

39. (a) HKI (b) UXV (c) CFD
(d) MQN (e) GJH

40. (a) BdEg (b) PrSu (c) KmNp
(d) TwXz (e) HjKm

41. (a) CdaB (b) VwtU (c) LmjK
(d) RsqP (e) HifG

42. (a) FIJL (b) RUVX
(c) DGHJ (d) NPQS

43. (a) ABDG (b) CDFI (c) EFHK
(d) GHJK (e) HIKN
[IBPS (Clerk) 2011]

44. (a) ABYZ (b) CDWX
(c) EFUV (d) GHTV
[RRB (ASM) 2012]

45. (a) DFIMR (b) CEHLQ
(c) GILPU (d) HJMPT [SNAP 2012]

46. (a) HJN (b) JLP (c) PRU
(d) QSW (e) ACG
[PNB (Clerk) 2011]

47. (a) BDFH (b) MOQS
(c) SUWY (d) TVZE

48. (a) CDFE (b) JKLM (c) STVU
(d) WXZY (e) HIKJ [LIC (ADO) 2012]

49. (a) NKHE (b) MIDA
(c) KHEB (d) WTQN
[SSC (10+2) 2013]

50. (a) 3216 (b) 2338
(c) 3205 (d) 2015 [CDS 2011]

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Directions (Q. Nos. 51-64) *In each of the following questions, five/four numbers are given. Out of these four/three are alike in a certain way but one is different. Choose the one which is different from the rest four/three.*

51. (a) 9, 49 (b) 13, 121 (c) 10, 61 (d) 7, 25 **[SSC (CPO) 2013]**

52. (a) 14, 17, 23 (b) 19, 22, 28 (c) 17, 20, 26 (d) 21, 23, 30 **[SSC (Steno) 2013]**

53. (a) 4867 (b) 5555 (c) 6243 (d) 6655 **[RRB (Group 'D') 2011]**

54. (a) 272 (b) 210 (c) 240 (d) 304 **[SSC (CGL) 2013]**

55. (a) 46, 57 (b) 38, 49 (c) 41, 52 (d) 64, 73

56. (a) 144 (b) 169 (c) 196 (d) 210

57. (a) 72 (b) 45 (c) 81 (d) 28

58. (a) 527 (b) 639 (c) 246 (d) 356

59. (a) 17 (b) 44 (c) 29 (d) 13

60. (a) 729 (b) 123 (c) 423 (d) 621

61. (a) 24 (b) 60 (c) 124 (d) 210

62. (a) 25 (b) 9 (c) 16 (d) 18 **[SSC (Multitasking) 2013]**

63. (a) 120 (b) 168 (c) 290 (d) 380 (e) 728

64. (a) 15 (b) 63 (c) 143 (d) 195 (e) 267

B. Expert Level Exercise

Directions (Q. Nos. 1-15) *In each of the following questions, four/five pairs of words are given, out of these words one pair does not bear the common relationship which rest bear. You are required to find that odd pair.*

1. (a) Needle-Prick (b) Gun-Fire (c) Auger-Bore (d) Chisel-Carve **[SSC (LDC & DEO) 2012]**

2. (a) Lion-Roar (b) Snake-Hiss (c) Bees-Hum (d) Frog -Bleat (e) Dog-Bark **[IBPS (Clerk) 2011]**

3. (a) Dim : Bright
(b) Wrong : Right
(c) Shallow : Deep
(d) Genuine : Real
(e) Involvement : Indifference

4. (a) Oil : Lamp
(b) Water : Tap
(c) Oxygen : Life
(d) Power : Machine

5. (a) Circle : Arc
(b) Line : Dot
(c) Hexagon : Angle
(d) Square : Line **[SSC (10+2) 2013]**

6. (a) Captain-Team
(b) Boss-Gang
(c) Prime Minister-Cabinet
(d) Artist-Troupe **[RRB (Group 'D') 2012]**

7. (a) Hard-Soft (b) Pointed-Blunt (c) Sweet-Sour (d) Long-High (e) Day-Night **[LIC (ADO) 2012]**

8. (a) Ice cube : Cold
(b) Iron : Hard
(c) Marble : Smooth
(d) Purse : Money

9. (a) Petrol-Car
(b) Electricity-Television
(c) Ink-Pen
(d) Dust-Vacuum Cleaner
(e) Pen-Paper **[LIC (AAO) 2012]**

10. (a) Day : Night (b) Up : Down (c) Across : Along (d) Small : Large

11. (a) Flag : Flagship
(b) Court : Courtship
(c) War : Worship
(d) Friend : Friendship

12. (a) Tree : Stem
(b) Face : Eye
(c) Chair : Sofa
(d) Plant : Flower

13. (a) Light-Heavy (b) Crime-Blame (c) Short-Long (d) Man-Woman **[CDS 2011]**

14. (a) Principal : School
(b) Soldier : Barrack
(c) Artist : Troupe
(d) Singer : Chorus

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15. (a) Death : Disease
(b) Milk : Butter
(c) Grape : Wine
(d) Water : Oxygen

Directions (Q. Nos. 16-29) Choose the odd numeral pair/group in each of the following questions.

16. (a) 2-8 (b) 3-27 (c) 4-32
(d) 5-125 (e) 6-216 **[SBI (Clerk) 2012]**

17. (a) 80-9 (b) 64-8 (c) 36-6 (d) 49-7
[SSC (CPO) 2011]

18. (a) 11-121 (b) 12-144
(c) 13-169 (d) 14-186

19. (a) 1-1 (b) 2-8 (c) 3-27 (d) 4-32

20. (a) 42-4 (b) 36-6 (c) 32-2 (d) 15-5
[IB (Assistant executive) 2012]

21. (a) 8-11 (b) 1-4 (c) 7-10 (d) 3-5
[SSC (Multitasking) 2014]

22. (a) 8-15 (b) 25-36 (c) 49-64 (d) 81-100
[UP B.Ed. 2011]

23. (a) 547-563 (b) 71-55
(c) 517-523 (d) 248-231
[RRB (TC/CC) 2012]

24. (a) 12-24 (b) 14-28
(c) 23-46 (d) 36-70 **[SNAP 2011]**

25. (a) 5-21 (b) 29-45
(c) 48-68 (d) 71-87 **[SSC (10 + 2) 2013]**

26. (a) 5-2 (b) 19-16
(c) 27-23 (d) 31-28

27. (a) 2, 15, 13 (b) 7, 12, 4
(c) 4, 15, 11 (d) 6, 18, 12

28. (a) 20,16,18 (b) 14,11,13
(c) 18,14,16 (d) 16,12,14

29. (a) 0-3-8 (b) 9-12-16
(c) 17-20-24 (d) 51-54-58
[SSC (Steno) 2011]

30. Find out the set among the four sets which is like the given set.
(23 : 30 : 37) **[SSC (10 + 2) 2013]**
(a) (6 : 13 : 20) (b) (7 : 15 : 22)
(c) (21 : 28 : 34) (d) (12 : 19 : 25)

31. Find out the set among the four sets which is like the given set
(13 : 20 : 27) **[SSC (10 + 2) 2013]**
(a) (3 : 11 : 18) (b) (18 : 25 : 32)
(c) (18 : 27 : 72) (d) (7 : 14 : 28)

32. Find out the set among the four sets which is like the given set.
Given set is (6 : 12 : 18) **[SSC (10 + 2) 2013]**
(a) (4 : 8 : 14) (b) (10 : 20 : 26)
(c) (12 : 24 : 36) (d) (30 : 36 : 42)

Answer *with* Explanations

A. Base Level Exercise

1. (*a*) Except 'Unicorn', all others are real animals. But Unicorn is an imaginary animal.

2. (*d*) Except 'Driving', all activities are related to water but Driving is related to road.

3. (*c*) Except 'Snobbery', all other words are crimes.

4. (*a*) Only 'Gallon' is different because this is use for liquid measurement and rest are used for solid measurement.

5. (*d*) Platinum is different from all others because it is very costly and generally not used to make utensils except all other are used to make utensils.

6. (*c*) Except 'hound' all represent group.

7. (*c*) Except 'Plate', all things are hollow body.

8. (*c*) Except 'Heavy', all others are used to denote the size. But 'Heavy', denotes weight.

9. (*b*) Wine is alcohol while others got by animal.

10. (*a*) Except 'Sky', all others belong to the same class *i.e.*, celestial body.

11. (*d*) Ayurveda is the branch of medicine. All others are Vedas.

12. (*b*) Frequency polygon, Bar and Pi and different types of graphs while rectangle is a geometrical figure.

13. (*b*) Silicon, Arsenic and Antimony are semi-conductors while platinum is an element.

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14. (*d*) Except 'Driver', all three can made their specialisation but only 'Driver' serve his work.

15. (*c*) Except 'Failure', all others are illegal activities.

16. (*d*) Here, all options are related to rain or water except Raisin. The meaning of 'Raisin' is a partially dried grapes which is different from all others.

17. (*b*) 'Taxi' is auto-driven whereas other items are either man or animal driven.

18. (*d*) Brass , bronze and gun metal are alloys while germanium is an element.

19. (*c*) Except 'Glacier', all other are made of land. While Glacier is made of ice.

20. (*c*) Except 'Model', all are same because all are made on paper.

21. (*d*) Except 'Plane', all items have height.

22. (*e*) Except 'England', all others are continents.

23. (*c*) All are music instruments. Except flute, all have string to play the music but flute does not have.

24. (*a*) All except sweetness are related with beauty but sweetness is related with taste.

25. (*d*) Except 'Health', all other are different kinds of diseases.

26. (*c*) Except 'Chirp', all other are related to cutting.

So, the odd one is chirp which means sound of birds.

27. (*d*) Political Science, History and Philosophy are the subjects related with humanity while physics is a subject of science.

28. (*d*) Except the 'Publisher', all other are related to 'literature'.

29. (*d*) Except 'Borrow', all the options are the terms of business.

30. (*d*) Except 'Influenza', all other disease are caused by lack of any vitamins.

31. (*d*) Except 'Z', all others are vowels.

32. (*a*) Except 'A', all others are consonants.

33. (*c*) Except option (c), all options follow the pattern as

M O R V C E H L
+2 +3 +4 +2 +3 +4

C E N T J L O S
+2 +9 +6 +2 +3 +4

From above, it is clear that word CENT is different from all others.

34. (*c*) d c b a z y x w
−1 −1 −1 −1 −1 −1

s r P q h g f e
−1 −1 −1 −1 −1 −1

35. (*c*) In all other groups, first and third letters are equidistant from the middle letter as they appear in English alphabet.

36. (*b*) Except option 'b', all are same because all other Four options last two letters having only 1 letter gap.

37. (*a*) Option (a) shows different nature from the rest others as

$D \xrightarrow{-3} A \xrightarrow{+2} C \xrightarrow{-1} B$

$E \xrightarrow{-3} B \xrightarrow{+1} C \xrightarrow{+1} D$

$S \xrightarrow{-3} P \xrightarrow{+1} Q \xrightarrow{+1} R$

$X \xrightarrow{-3} U \xrightarrow{+1} V \xrightarrow{+1} W$

38. (*e*) In all other groups, there is a gap of two letters between second and third letters as they appear in English alphabet.

39. (*d*) In all other groups, there is a gap of one letter between second and third letters as they appear in English alphabet.

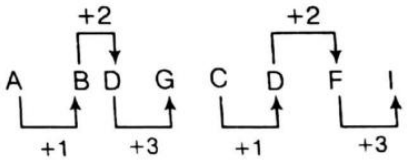
40. (*d*) In all other groups, there is a gap of one letter between first and second letters as they appear in English alphabet.

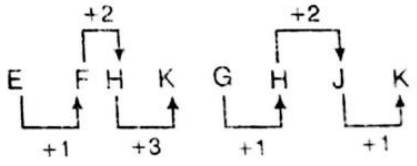
41. (*d*) In all other groups, third and fourth letters are consecutive alphabets.

42. (*d*) F I J L R U V X
+3 +1 +2 +3 +1 +2

D G H J N P Q S
+3 +1 +2 +2 +1 +2

43. (*d*)





Therefore, GHJK is different from the other thre

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44. (d) Except 4, all three are same because in those three options first and forth, and second and third are opposite letters.

45. (d) Except JUMPT, all three are same and having alphabets in increasing order.

46. (c) Except PRU, all other having same gap but PRU is not following the same rule.

47. (d) B D F H M O Q S

+2 +2 +2 +2 +2 +2

S U W Y T V Z E

+2 +2 +2 +2 +4 +5

Thus, TVZE is odd

48. (b) C D F E J K L M

+1 +2 −1 +1 +1 +1

S T V U W X Z Y

+1 +2 −1 +1 +2 −1

Clearly, JKLM is different from the other three.

49. (b) The pattern used for classification is placement of alphabets in the order (-3, -3 -3). Since, option (b) does not follow the pattern, it is odd in the group.

50. (d) $3216 \Rightarrow 3 + 2 + 6 - 1 \Rightarrow 10$

$2338 \Rightarrow 2 + 3 + 8 - 3 \Rightarrow 10$

$3205 \Rightarrow 3 + 2 + 5 - 0 \Rightarrow 10$

$2015 \Rightarrow 2 + 0 + 5 - 1 \Rightarrow 6$

Therefore, 2015 is different from the other three.

51. (c) $9 - 2 = 7 \rightarrow 7^2 = 49$

$13 - 2 = 11 \rightarrow 11^2 = 121$

$10 - 2 = 8 \rightarrow 8^2 = 64 \neq 61$

$7 - 2 = 5 \rightarrow 5^2 = 25$

52. (d) $14 + 3 = 17 \rightarrow 17 + 6 = 23$

$19 + 3 = 22 \rightarrow 22 + 6 = 28$

$17 + 3 = 20 \rightarrow 20 + 6 = 26$

$21 + 2 = 23 \rightarrow 23 + 7 = 30$

53. (d) $4867 \rightarrow 4 + 8 + 6 + 7 = 25$, which is divisible by 5.

$5555 \rightarrow 5 + 5 + 5 + 5 = 20$, which is divisible by 5.

$6243 \rightarrow 6 + 2 + 4 + 3 = 15$, which is divisible by 5.

$6655 \rightarrow 6 + 6 + 5 + 5 = 22$, which is divisible by 5

54. (c) ∵ $272 = 2 + 7 + 2 = 11$

$210 = 2 + 1 + 0 = 3$

$240 = 2 + 4 + 0 = 6$

$304 = 3 + 0 + 4 = 7$

The sum of digit of all number except 240 is prime number where as sum of number 2 digit is a non-prime. Hence, it is different from others.

55. (d) Except 64-73 all are having difference of 11.

56. (d) Except 210, all others are square of some numbers.

57. (d) Except 28, all others are multiples of 3.

58. (d) In all other numbers, the sum of the first two digits is equal to the third digit.

59. (b) Except 44, all are prime numbers.

60. (a) Only 729 is a perfect cube.

61. (c) Except 124, all other numbers are multiples of 4.

62. (d) All except 18 are square of natural number. $(5)^2 = 25$, $(3)^3 = 9$, $(4)^2 = 16$.

63. (d) Each of the numbers except 380, is either one less or one more than the squae of a certain number.

64. (e) Except 267, all other numbers are one less than the square of a certain number.

B. Expert Level Exercise

1. (a) Only this is not an instrument action pair.

2. (d) Frogs don't bleat, they croak.

3. (d) In all other pairs, the two words are antonyms to each other.

4. (b) In all other pairs, second requires the first to continue the corresponding function.

5. (c) Hexagon is not made from an angle.

6. (d) Artist is just a part of a troupe.

7. (d) Except 'Long-High', all options having opposite of second word.

8. (d) In all other pairs, second denotes characteristics of the first.

9. (d) Except 'Dust-Vaccum Cleaner', all second things are come in use with help of first.

10. (c) Day-Night, Up-Down and Small-Large word pairs denote the opposite relationship among them. But across and along are synonym.

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11. (*c*) War and Worship are not interrelated *i.e.*, irresavant.

12. (*c*) In all other pairs, second is a part of the first.

13. (*b*) Except 'Crime-Blame', all three options having opposite words.

14. (*a*) In all other pairs, second is a collective group of the first.

15. (*a*) In all other pairs, second is a product obtained from the first.

16. (*c*) Except '4-32', in all options second number having cube of first number.

17. (*a*) Except '80-9', in all options first number is square of second number.

18. (*d*) Except (d), in all other groups the second number is the square of the first number.

19. (*d*) Except (d), in all other groups the second number is the cube of the first number.

20. (*a*) Except option '(a)', in all options first number divide by second number.

21. (*d*) $8 + 3 = 11$ $\quad 1 + 3 = 4$
$7 + 3 = 10$ $\quad 3 + 3 = 6 \neq 5$

22. (*a*) Except 8-15, in all the options, both of th e numbers are the square of any natural number.

23. (*d*) Except option (d) difference of all other numbers are divisible by 2.

24. (*d*) Only 'option (d) second number is twice of first number.

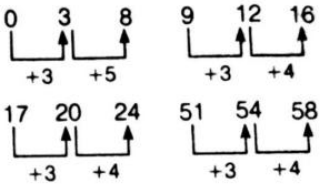
25. (*d*) $5 \xrightarrow{+16} 21$, $\quad 29 \xrightarrow{+16} 45$
$71 \xrightarrow{+16} 87$, $\quad 48 \xrightarrow{+20} 68$
So, '48-68' is different from other three.

26. (*c*) $5-2=3, 19-16=3, 27-23=4, 31-28=3$

27. (*b*) In all others, middle number is the sum of other two numbers.

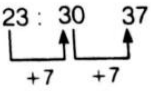
28. (*b*) Except '14,11,13', all remaining options having only even numbers.

29. (*a*)

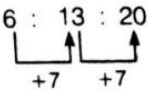


Hence, 0-3-8 is different from other three.

30. (*a*) As, $23 : 30 : 37 =$

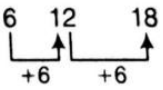


Similarly, $6 : 13 : 20 =$

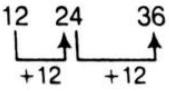


31. (*b*) As, $13 + 7 = 20 \rightarrow 20 + 7 = 27$
Similarly, $18 + 7 = 25 \rightarrow 25 + 7 = 32$

32. (*c*) As,



Similarly,



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4

Alphabet Test

'Alphabet test' is a test of the sequence of words in alphabetical order as they appear in the dictionary arranged in some other specific way.

This test requires the knowledge of English alphabets and way to use a dictionary. Questions based on alphabet test is based on orderly arrangement of different words or to detect a rule in which they are arranged. Some questions can be based on finding a letter or number following a particular rule in a alpha-numeric sequence.

Important Facts about Letters

1. Position number of letters in English alphabet

A	B	C	D	E	F	G	H	I	J	K	L	M
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
14	15	16	17	18	19	20	21	22	23	24	25	26

2. Position number of letters in English alphabet in reverse order

A	B	C	D	E	F	G	H	I	J	K	L	M
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
26	25	24	23	22	21	20	19	18	17	16	15	14

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
13	12	11	10	9	8	7	6	5	4	3	2	1

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3. We know A, E, I, O and U are vowels of English alphabet and remaining letters are consonants of English alphabet.
4. A → M (A to M) letters are called the first half of English alphabet.
5. N → Z (N to Z) letters are called the second half of English alphabet.
6. To the left means Z → A (Z to A)
7. To the right means A → Z (A to Z)
8. From A → Z (A to Z) letters are called left to right of English alphabet.
9. From Z → A (Z to A) letters are called right to left of English alphabet.
10. To remember the position of the opposite letter of English alphabet

A—Z	A to Z or Aaza	B—Y	By-By
C—X	CT Scan-X-RAY	D—W	Dew
E—V	Evening	F—U	First U (You)
G—T	GT Road	H—S	High School
I—R	Indian-Railway	J—Q	Jack-Queen
K—P	Kevin Peterson	L—O	Light ON
M—N	Man		

Types of Questions

There are four types of questions based on the alphabet test which are generally asked in various competitive examinations

Type 1 Arrangement According to Dictionary

Arranging words in alphabetical order implies 'to arrange them in the order as they appear in a dictionary'. For this arrangement, first we shall take the first letter of each word and then arrange the words in the order in which they appear in the English alphabet, then take the second letter and so on.

Illustration 1. If the following five words are arranged in alphabetical order, then which word will come in the middle?

(a) Electric (b) Elector
(c) Electrode (d) Electrode
(e) Electron

Solution (a) Arranging the words in alphabetical order we have Elect, Elector, Electric, Electrode, Electron.
Hence, Electric will come in the middle.

Illustration 2. Arrange the given words in alphabetical order and choose the one that comes at the second place.

(a) Bathing (b) Banking
(c) Backing (d) Banishing
(e) Barricading

Solution (d) Arranging the words in alphabetical order, we have Backing, Banishing, Banking, Barricading, Bathing
Hence, Banishing will come at the second place.

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Type 2 Alpha-Numeric Sequence

In this type of questions, a jumbled sequence of some letters, numbers and symbols are given. Sometimes only English alphabet from A to Z are given.

Directions (Illustrations 3-7) *Study the following arrangement carefully and answer the questions given below.*

F @ 3 9 H © A D I % 4 E ★ $ M K
2 U R P 5 W δ 8 1 T J V 7

Illustration 3. How many symbols are there in the above arrangement, which is preceded by a number and followed by a letter?

(a) None (b) One
(c) Two (d) Three
(e) More than three

Solution (a) No symbol is preceded by a number and followed by a letter.

Illustration 4. Four of the following five options are alike in a certain way, based on their positions, in the above arrangement and so form a group. Which is the one that does not belong to that group?

(a) D % © (b) 5 δ R
(c) T V 8 (d) A I H
(e) E % $

Solution (e) Except 'E % $', all follow same rule/pattern.

Illustration 5. If all the symbols from the above arrangement are dropped, which of the following will be the twelfth from the left end?

(a) 4 (b) K (c) 2 (d) U
(e) None of these

Solution (c) After droping all the symbols, the resultant arrangement will be

F 3 9 H A D I 4 E M K [2] U R P 5 W 8 1 T J V 7

So, twelfth from the left is 2.

Illustration 6. How many consonants are there in the given arrangement, which is preceded by a number and not followed by a letter?

(a) None
(b) One
(c) Two
(d) Three
(e) More than three

Solution (c) According to the question, in the given arrangement, two such consonants are there *viz.* 9 H © and 5 W δ which are preceded by a number and not followed by a letter.

Illustration 7. Which of the following is the tenth to the left of the sixth from the right end of the given arrangement?

(a) % (b) $
(c) K (d) P
(e) None of these

Solution (b) Required element = (6 + 10)
= 16 th from the right
= $

Type 3 Letter-Word Problems

In these type of problems, a word is given and candidates are required to answer question like — how many letters in the word is as far away from the beginning of the word as, it is from the begining of the English alphabet. Sometimes, a word is given and then they are asked how many letters remain same in its position, if they are arranged in alphabetical order. Sometimes, a word is given and they are asked, which vowel or a consonant going to follow it.

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Illustration 8. How many such pairs of letters are there in the word 'CHANNEL', which has as many letters between them in the word as in the English alphabet?

(a) None (b) One
(c) Two (d) Three
(e) More than three

Solution (c) C H A N N E L

So, such number of pairs are AC and LN.

Illustration 9. How many such letters are there in the word 'PMCLNOB' which remain same in its position, if they are arranged in an alphabetical order?

(a) None (b) One
(c) Two (d) Three
(e) More than three

Solution (c) P M C L N O B
B C L M N O P

So, such type of letters are N and O.

Illustration 10. If each vowel in the word 'GLADIOLUS' is substituted with the next letter of the English alphabetical series and each consonant is substituted with the letter preceding it. How many vowels are present in the new arrangement?

(a) None (b) One
(c) Two (d) Three
(e) None of these

Solution (a) G L A D I O L U S
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
F K B C J P K V R

So, no such vowel is present in the new arrangement.

Type 4 'Rule Detection

In these type of problems or questions, a certain rule is given in questions and candidates are asked to choose the correct alternative that follows this given rule.

Illustration 11. Find out the correct alternative in which numbers of letters skipped in between adjacent letters in the series, is two?

(a) LORTW (b) GJMPS (c) KNPSV (d) EHKLO

Solution (b) G J M P S
+3 +3 +3 +3

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-3) *In each of the following questions, five words are given. Which of them will come in the middle of all, if arranged alphabetically as in a dictionary?*

1. (a) Cruise (b) Crupper (c) Crusade
(d) Crude (e) Crumb

2. (a) Minisulate (b) Minimalis (c) Minority
(d) Miniature (e) Ministerial

3. (a) Sentinel (b) Sentimentally
(c) Sententious (d) Sentence
(e) Sentimentalize

4. Arrange the given words in the sequence in which they occur in the Dictionary and locate the last word. **[SSC (CPO) 2011]**

(a) Frankenstein (b) Frankincense
(c) Frankalmoign (d) Frauendienst

5. Which one of the following words will appear fourth in the English Dictionary? **[SSC (Steno) 2012]**

(a) Encradle (b) Encourage
(c) Encroach (d) Encounter

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6. Which will appear fourth in the English Dictionary? [SSC (FCI) 2012]

(a) Quick (b) Question
(c) Quality (d) Quit

Directions (Q. Nos. 7-11) *In each of the following questions, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence.*

7. (i) Bound (ii) Bonus
(iii) Bunch (iv) Board
(a) (i),(iv),(ii),(iii) (b) (ii),(iv),(iii),(i)
(c) (iv),(ii),(i),(iii) (d) (iv),(iii),(ii),(i)

8. (i) Aqueous (ii) Aquarium
(iii) Aquiline (iv) Aquatic
[SSC (10 + 2) 2013]
(a) (iv),(iii),(ii),(i) (b) (i),(ii),(iii),(iv)
(c) (ii),(iv),(i),(iii) (d) (iii),(i),(iv),(ii)

9. (i) Preposition (ii) Preparatively
(iii) Preposterous (iv) Preponderate
[SSC (CGL) 2011]
(a) (ii),(iv),(i),(iii) (b) (i),(ii),(iv),(iii)
(c) (iv),(ii),(iii),(i) (d) (iv),(ii),(i),(iii)

10. (i) Billian (ii) Bifurcate
(iii) Bilateral (iv) Bilirubin
[SSC (Multitasking) 2013]
(a) (ii),(i),(iii),(iv) (b) (iv),(iii),(ii),(i)
(c) (ii),(iii),(iv),(i) (d) (ii),(iii),(iv),(i)

11. (i) Ambitious (ii) Ambiguous
(iii) Ambiguity (iv) Animation
(v) Animals [SSC (CGL) 2013]
(a) (iii),(ii),(iv),(i),(v) (b) (iii),(ii),(v),(iv),(i)
(c) (iii),(ii),(i),(v),(iv) (d) (iii),(ii),(iv),(v),(i)

12. In dictionary, which word comes fourth in arrangement? [SSC (Multitasking) 2013]

(a) Propense (b) Prophet
(c) Prong (d) Propine

13. Arrange the following words as per order in the dictionary? [SSC (CPO) 2013]

(i) Divide (ii) Division
(iii) Devine (iv) Divest
(v) Direct
(a) (v),(iv),(iii),(i),(ii) (b) (v),(iv),(i),(iii), (ii)
(c) (i),(ii),(iii),(iv),(v) (d) (iii),(v),(iv),(i),(ii)

14. How many such pairs of letters are there in the word 'PREAMBLE', each of which has as many letters between them as in the English alphabet?

(a) None (b) One (c) Two
(d) Three (e) More than three

15. How many such pairs of letters are there in the word 'BRIGHTEN', each of which has as many letters between them as in the English alphabet?

(a) None (b) One (c) Two
(d) Three (e) More than three

16. How many such pairs of letters are there in the word 'JOURNEY' each of which has as many letters between them in the word (in both forward and backward directions) as they have between them in the English alphabetical order? [UCO Bank (Clerk) 2011]

(a) None (b) One (c) Two
(d) Three (e) More than three

17. How many such pairs of letters are there in the word 'STREAMING' each of which has as many letters between them in the word as in the English alphabet (in both forward and backward directions)? [IBPS (Clerk) 2011]

(a) None (b) One (c) Two
(d) Three (e) More than three

18. How many such pairs of letters are there in the word 'SUBSTANCE', each of which has as many letters between them in the word (in both forward and backward directions) as in the English alphabet? [IBPS (PO) 2011]

(a) None (b) One (c) Two
(d) Three (e) More than three

19. How many such pairs of letters are there in the word 'STONED', each of which has as many letters between them in the word (in both forward and backward directions) as they have between them in the English alphabetical series? [Punjab Grameen Bank (Clerk) 2011]

(a) None (b) Three (c) Two
(d) One (e) More than three

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20. How many such pairs of letters are there in word 'ENGLISH', each of which has as many letters between its two letters between them as in the English alphabet?

(a) None (b) One
(c) Two (d) Three
(e) More than three

21. How many such pairs of letters are there in the word 'FOREHAND', each of which have as many letters between them as they have in the English alphabet?

(a) None (b) One
(c) Two (d) Three
(e) More than three

22. The positions of how many alphabets will remain unchanged if each of the alphabets in the word 'FORGET' is arranged in alphabetical order from left to right? **[UBI (PO) 2011]**

(a) None (b) One (c) Two
(d) Three (e) More than three

23. Four of the following five are alike in a certain way based on the English alphabetical series and so form a group. Which is the one that does not belong to the group? **[Punjab Grameen Bank (Clerk) 2011]**

(a) BRQ (b) FUT (c) OXV
(d) CSR (e) JZY

24. In the following list of English alphabets, one alphabet has not been used. Identify the same. **[SSC (CGL) 2012]**

X N F A P S R W L T M D E X M G B C X
Q J L O P V R C Q J Z O H S G O D I P T
S M R A B E F G N U N E

(a) V (b) I (c) K (d) J

B. Expert Level Exercise

Directions (Q. Nos. 1-5) *Study the following arrangement of numbers, letters and symbols carefully and answer the questions given below.* **[IBPS (Clerk) 2011]**

R @ 2 9 T V A Y 5 © # J 1 P 8 Q $ E 3 ★ H
% 6 W 4 I δ U Z

1. Four of the following five are alike in a certain way based on their positions in the above arrangement, and so form a group. Which is the one that does not belong to that group?

(a) JP© (b) E★Q (c) WI%
(d) 9V@ (e) 1 # δ

2. Which of the following is the fifth to the right of the nineteenth element from the right end?

(a) P (b) V (c) W
(d) 8 (e) None of these

3. How many such number are there in the given arrangement, each of which is immediately preceded by a consonant and immediately followed by a symbol?

(a) One (b) Two (c) Three
(d) Four (e) More than four

4. If the positions of the last eighteen elements in the given arrangement are reversed, which of the following will be the seventeenth from the left end?

(a) E (b) P
(c) W (d) 6
(e) None of these

5. How many such vowels are there in the given arrangement, each of which is either immediately followed by a symbol or immediately preceded by a symbol?

(a) Four (b) One
(c) Two (d) Three
(e) None of these

Directions (Q. Nos. 6-8) *In each of the following questions, find out which of the letter-series follows the given rule.*

6. Number of letters skipped in reverse order in between adjacent letters in the series is constant.

(a) SQOLJ
(b) SPNLJ
(c) SPMJG
(d) WUTRQ

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7. Number of letters skipped in between adjacent letter decrease in order
(a) [illegible]
(b) GNSVA
(c) NSXCH
(d) AGMRV

8. Number of letters skipped in between the adjacent letters in the series is equal
(a) SUXADF
(b) RVZDHL
(c) HKNGSW
(d) RVZDFG

Directions (Q. Nos. 9-10) *Study the following arrangement of numbers, symbols and alphabets carefully and answer the questions that follow.* **[Allahabad Bank (Clerk) 2011]**

A ε 7 8 F $ I 9 G Ω 3 1 Δ D + U 2 @ 4 C

9. Which of the following is the 3rd to the left of 18th element from the left?
(a) 8 (b) $ (c) 1
(d) E (e) None of these

10. How many such symbols are there in the above arrangement each of which is immediately followed by a digit?
(a) Two (b) Three (c) One
(d) Zero (e) Four

Answer *with* Explanations

A. Base Level Exercise

1. (*e*) Alphabetical order is
Crude, Cruise, Crumb, Crupper, Crusade
So, word 'Crumb' will come in middle.

2. (*e*) Alphabetical order is
Miniature, Minimalis, Ministerial, Minisulate, Minority
So, word 'Ministerial' will come in middle.

3. (*b*) Alphabetical order is
Sentence, Sententious, Sentimentally, Sentimentialize, Sentinel
So, word 'Sentimentally' will come in middle.

4. (*d*) Alphabetical order is
Frankalmoign, Frankenstein, Frankincense, Frauendienst
So, the word 'Frauendienst' would be the last word.

5. (*c*) As per the Dictionary, the sequence of words is as follows
Encounter → Encourage → Encradle → Encroach

6. (*d*) The order of words according to the English dictionary is as follows
Quality, Question, Quick, Quit
So, Quit will appear fourth in English dictionary.

7. (*c*) Board → Bonus → Bound → Bunch
⇒ (iv), (ii), (i), (iii)

8. (*c*) As per order in the dictionary arrangement of the given words is
(ii) Aquarium → (iv) Aquatic → (i) Aqueous → (iii) Aquiline

9. (*a*) As per the dictionary order is Preparatively, Preponderate, Preposition, Preposterous
⇒ (ii), (iv), (i), (iii)

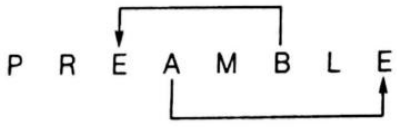
10. (*c*) Correct order will be
Bifurcate > Bilateral > Bilirubin > Billain
⇒ (ii), (iii), (iv), (i)

11. (*c*) As per in dictionary, the sequence is as follow
Ambiguity, Ambiguous, Ambitious, Animals, Animation
⇒ (iii), (ii), (i), (v), (iv)

12. (*d*) Proper arrangement of words is as follows
Prong > Propense > Prophet > Propine

13. (*d*) The correct order is as follow
Devine, Direct, Divest, Divide, Division
i.e., (iii), (v), (iv), (i), (ii)

14. (*c*)

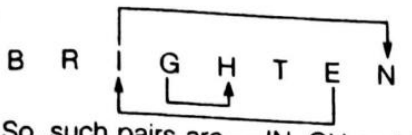


So, such pairs are—AE and BE

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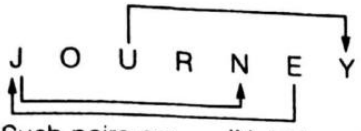
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15. (*d*)



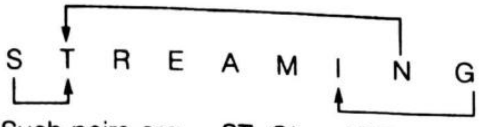
So, such pairs are — IN, GH and EI

16. (*d*)



Such pairs are — JN, UY and EJ.

17. (*d*)



Such pairs are — ST, GI and NT.

18. (*d*)



Such pairs are — ST, AC and SU.

19. (*b*) S T O N E D

Such paris are — ST, NO and DE.

B. Expert Level Exercise

1. (*e*) $J \xrightarrow{+2} P \xrightarrow{-4} ©$

$E \xrightarrow{+2} Q \xrightarrow{-4} ★$

$Q \xrightarrow{+2} I \xrightarrow{-4} \%$

$9 \xrightarrow{+2} V \xrightarrow{-4} @$

$1 \xrightarrow{-2} \# \xrightarrow{+16} \delta$

Hence, except option (e) all others are of the same group.

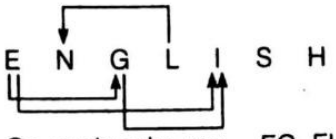
2. (*e*) Fifth to the right of the nineteenth element from the right end = Fourteenth element from the right end = Q

3. (*a*) Only one number 5, which is immediately preceded by a consonant and immediately followed by a symbol.

4. (*c*) After rearrangement, R @ 2 9 T V A Y 5 © # 2 U δ I 4 W 6 % H ★ 3 E $ Q 8 P 1 J

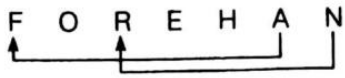
5. (*d*) Only three vowels E, I and U are in the arrangement immediately followed by a symbol or immediately preceded by a symbol.

20. (*e*)



So, such pairs are — EG, EI, GI and LN.

21. (*c*) F O R E H A N D



So, such pairs are — AF and NR

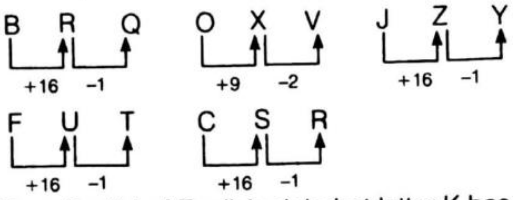
22. (*b*)

F O R G E T

Alphabetical Order → E F G O R T

So, after arranged the letters alphabetically 'T' is the only one letter which takes same place.

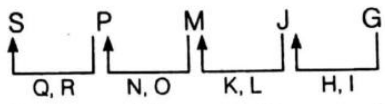
23. (*c*)



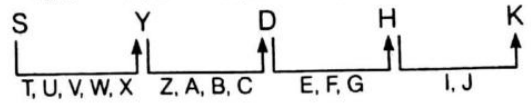
24. (*c*) From the list of English alphabet letter K has not been used.

(go through every given options)

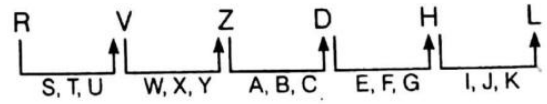
6. (*c*)



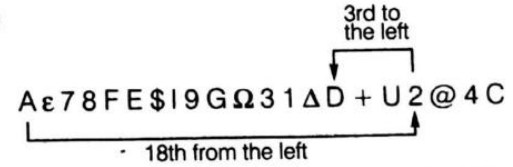
7. (*a*)



8. (*b*)



9. (*e*)



Hence, in the above arrangements 18th from the left is 2 and 3rd to the left of 2 is D.

10. (*b*) E 7, Ω 3, @ 4 ⇒ Three

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5

Word Formation

'Word formation' is advanced level alphabet test. This test is meant to test the ability of the candidate in word building process.

In word formation, a main word is given and we have to choose that word, which can or cannot be formed from the main word. Sometimes a set of English letters are given in a jumbled order and the candidates are asked to arrange them in a meaningful order. In some situations we are asked to choose particular letters from a word and arrange them to form a meaningful word.

In this chapter, we will deal with two types of questions

Type 1 Word Formation Using Letters from a Given Word

In this type, three subtypes of questions are asked generally.

First a word has been given, followed by four other words, one of which can or cannot be formed by using the main word.

Second a word has been given and candidates are asked to make new meaningful words using letters like 1st, 3rd, 5th, 8th, etc., of the given word.

Third a word has been given and candidates are asked to form as many meaningful English words as possible from the given word, using each letter only once in each word.

Directions (Illustrations 1-2) *In each of the following questions, a word has been given, followed by four other words, one of which cannot be formed by using the letters of the given word. Find that word.*

Illustration 1. CONSTRUCTION

(a) SUCTION (b) COINS (c) CAUTION (d) MOTION

Solution (c) CAUTION—All the letters except 'A' are present in the main word.

Hence, 'CAUTION' cannot be formed from the letters of the given word 'CONSTRUCTION'.

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Illustration 2. NATIONALISATION

(a) NOTATION (b) SALINATION
(c) INSTALLATION (d) SANITATION

Solution (c) INSTALLATION—All the letters except second 'L' are present in the main word.

Hence, 'INSTALLATION' cannot be formed from the letters of the given word 'NATIONALISATION'.

Directions (Illustrations 3-4) *In each of the following questions, a word has been given, followed by four other words, one of which can be formed by using the letters of the given word. Find that word.*

Illustration 3. MEASUREMENT

(a) ASSURE (b) MASTER
(c) SUMMIT (d) MANTLE

Solution (b) MASTER—All the letters of this word are present in the main word.

Hence, 'MASTER' can be formed from the letters of the given word 'MEASUREMENT'.

Illustration 4. COMPENSATION

(a) TINY (b) COPY
(c) MENTION (d) MOTIVE

Solution (c) MENTION—All the letters of this word are present in the main word.

Hence, 'MENTION' can be formed from the letters of the given word 'COMPENSATION'.

Illustration 5. If it is possible to make a meaningful word with the 1st, 4th, 7th and 11th letters from the word 'INTERPRETATION', which of the following will be the third letter of that word? If more than one such word can be made, given 'M' as the answer and if no such word can be formed, give 'X' as the answer.

(a) T (b) R
(c) M (d) X

Solution (c) Since, 1st, 4th, 7th and 11th letters are I, E, R and T, respectively.

Hence, two meaningful words RITE and TIRE can be formed.

Illustration 6. How many meaningful English words can be formed by using letters of the word 'ALEP'?

(a) One
(b) Two
(c) Three
(d) More than three

Solution (c) Such meaningful words are 'PEAL', 'LEAP', 'PALE'.

Type 2 Word Formation by Unscrambling Letters

In this type of questions, a set of English letters is given in a jumbled order. The candidate is required to arrange these letters to form a meaningful word.

Always try to place the letter according to the numbers provided in option that will provide you correct answer rather than doing it on the basis of your vocabulary knowledge.

Illustration 7. Select the combination of numbers, so that the letters arranged will form a meaningful word.

H N R C A B
1 2 3 4 5 6

(a) 2, 5, 3, 4, 1, 6 (b) 3, 5, 6, 4, 1, 2
(c) 4, 1, 5, 6, 2, 3 (d) 6, 3, 5, 2, 4, 1

Solution (d) Clearly, the given letters, when arranged in the order of '6, 3, 5, 2, 4, 1,' form the word 'BRANCH'.

Illustration 8. Rearrange the letters given below to form a meaningful word and select from the given alternatives, the word which is almost opposite in meaning to the word so formed.

A, R, T, Y, D

(a) Dirty (b) Quiet
(c) Quick (d) Queek

Solution (c) The word is 'Tardy' which means 'Sluggish', opposite of this word is 'Quick'.

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-8) *In each of the following questions, a word has been given, followed by four other words, one of which cannot be formed by using the letters from the given word. Find that word.*

1. REASONABLE
(a) BONES (b) BRAIN
(c) ARSON (d) NOBLE

2. COMMUNICATION [SSC (Multitasking) 2014]
(a) ACTION (b) UNION
(c) NATION (d) UNISON

3. SPECIFICATION [SSC (CGL) 2013]
(a) PACIFIC (b) FACTION
(c) FAINTING (d) TONIC

4. GENERALIZATION [SSC (CPO) 2013]
(a) NOTE (b) RATION
(c) LIZARD (d) GOAT

5. CONCEPTUALISATION [SSC (Multitasking) 2013]
(a) STATUS (b) POINTS
(c) NOISE (d) TOTAL

6. CONSTITUTIONAL [SSC (CGL) 2013]
(a) CONSULT (b) LOCATION
(c) TUTION (d) TALENT

7. COURAGEOUS [SSC (CGL) 2013]
(a) SECURE (b) ARGUE
(c) COURSE (d) GRACE

8. PORTFOLIO [SSC (Multitasking) 2014]
(a) RIFT (b) ROOF
(c) FORT (d) PORTICO

Directions (Q. Nos. 9-13) *In each of the following questions, a word has been given, followed by four other words. One of which can be formed by using the letters from the given word. Find that word.*

9. RECOMMENDATION [SSC (FCI) 2012]
(a) COMMUNICATE (b) REMINDER
(c) MEDICO (d) MEDIATES

10. PREPARATION [SSC (10+2) 2013]
(a) PAMPER (b) REPEAT
(c) PARTITION (d) PARROT

11. DICTIONARY
(a) NATION (b) ADDITION
(c) BINARY (d) DAIRY

12. IMMEDIATELY [LIC (ADO) 2012]
(a) DIALECT (b) LIMITED
(c) DIAMETER (d) DICTATE
(e) None of these

13. COMPANIONSHIP [SSC (10+2) 2013]
(a) OPEN (b) OPIUM
(c) OPINION (d) NATION

Directions (Q. Nos. 14-21) *Letters of the words given below have been jumbled up and you are required to construct the words. Each letter has been numbered and each word is followed by four options. Choose the option which gives the correct order of the letters as indicated by the numbers to form words.*

14. T P A F N F I L I
1 2 3 4 5 6 7 8 9
(a) 9, 8, 3, 2, 1, 7, 6, 5, 4
(b) 1, 2, 5, 6, 7, 8, 9, 3, 4
(c) 3, 4, 5, 6, 7, 8, 9, 1, 2
(d) 2, 8, 3, 9, 5,1, 7, 4, 6

15. A L I R E M C
1 2 3 4 5 6 7
(a) 6, 3, 4, 1, 7, 2, 5
(b) 6, 5, 1, 4, 7, 3, 2
(c) 7, 4, 5, 1, 6, 3, 2
(d) 7, 5, 4, 1, 6, 2, 3

16. GEDE MEN LC K N O W A T
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 [SSC (Multitasking) 2012]
(a) 14, 9, 10, 11, 12, 13, 8, 4, 3, 1, 2, 5, 6, 7, 15
(b) 2, 4, 6, 8, 10, 12, 14, 1, 3, 5 7, 9, 11, 13, 15
(c) 8, 7, 5, 4, 3, 2, 1, 6, 9, 10, 11, 13, 12, 14, 15
(d) 6, 7, 8, 9, 10, 1, 2, 3, 4, 5, 15, 14, 13, 12, 11

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17. V A R S T E
1 2 3 4 5 6
(a) 2, 3, 1, 6, 4, 5 (b) 3, 2, 4, 5, 6, 1
(c) 4, 5, 2, 3, 1, 6 (d) 6, 3, 4, 5, 2, 1

18. E M I H T R
1 2 3 4 5 6
(a) 1, 2, 3, 4, 5, 6 (b) 4, 1, 6, 2, 3, 5
(c) 5, 1, 6, 4, 3, 2 (d) 6, 1, 2, 3, 5, 4

19. X O M L C P E
1 2 3 4 5 6 7
(a) 3, 4, 7, 6, 1, 5, 2
(b) 4, 2, 3, 7, 1, 6, 5
(c) 5, 2, 3, 6, 4, 1, 7
(d) 5, 2, 3, 6, 4, 7, 1

20. E C O T I H T Y H O N P A
1 2 3 4 5 6 7 8 9 10 11 12 13
(a) 13, 7, 12 ,6, 11, 5, 10, 4, 9, 3, 8, 2, 1
(b) 13, 12, 11, 10, 1, 2, 3, 4, 5, 6, 7, 8, 9
(c) 10, 9, 8, 7, 6, 5, 4, 3, 2, 11, 12, 13, 1
(d) 9, 8, 12, 3, 7, 6, 1, 2, 13, 4, 5, 10, 11

21. R T A N U E
1 2 3 4 5 6
(a) 1, 3, 2, 6, 4, 5 (b) 3, 2, 4, 6, 1, 5
(c) 4, 3, 2, 5, 1, 6 (d) 4, 6, 5, 2, 3, 1

Directions (Q. Nos. 22-25) *In each of these questions, jumbled letters of a meaningful word are given. You are required to rearrange these letters and select from the given alternatives, the word which is almost similar in meaning to the rearranged word.* **[LIC (ADO) 2011]**

22. DAXEPN
(a) INCREASE (b) REDUCE
(c) STILL (d) DECREASE
(e) None of these

23. HRADTE
(a) DECREASE (b) LOSS
(c) REDUCTION (d) SCARCITY
(e) None of these

24. DNHBEI
(a) FRONT (b) SIDE
(c) BACK (d) LAST
(e) None of these

25. HNAGSRI
(a) DECORATE
(b) COMPOSE
(c) IMPRESS
(d) IMPOSE
(e) None of the above

B. Expert Level Exercise

1. If it is possible to make a meaningful word with the 2nd, the 6th, the 9th and the 12th letters of the word 'CONTRIBUTION', which of the following will be the last letter of that word? If more than one such word can be formed, give 'M' as the answer and if no such word can be formed, give 'X' as the answer. **[SSC (FCI) 2012]**
(a) T (b) O (c) M (d) X

2. If it is possible to make a meaningful word with the second, the fifth, the tenth and the twelfth letters of the word 'METROPOLITAN', which of the following will be the third letter of that word? If no such word can be made give X as the answer and if more than one such word can be made, give M as the answer. **[CSAT 2012]**
(a) N (b) Q (c) M (d) X

3. If it is possible to make only one meaningful word with the first, second, third and fifth letters of the word 'TECHNOLOGY', which of the following would be the third letter of that word? If no such word can be made, give 'X' as your answer and if more than one such word can be formed, give your answer as 'Y'. **[IBPS (Clerk) 2012]**
(a) C (b) T (c) N
(d) X (e) Y

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4. How many meaningful English words can be formed, starting with S, with the second, the fourth, the fifth and the eighth letters of the word PERISHED, using each letter only once in each word? (to be counted from left) **[IBPS (Clerk) 2011]**

(a) None (b) One
(c) Two (d) Three
(e) More than three

5. If it is possible to make a meaningful word with 1st, 5th, 6th and 11th letters of the word 'COURAGEOUSLY', which of the following will be third letter of that word?
If no such word can be made, give 'X' as your answer and if more than one such word can be made, give 'M' as the answer.

(a) O (b) A
(c) G (d) X
(e) M

6. How many meaningful English words can be formed with the third, the fifth, the seventh and the ninth letters of the word 'DOWNGRADED' once in each word? **[IBPS (Clerk) 2012]**

(a) None (b) One
(c) Two (d) Three
(e) More than three

7. How many meaningful English words can be made with the letters 'EPRO' using each letter only once in each word?

(a) None (b) One
(c) Two (d) Three
(e) More than three

8. How many meaningful English words can be made with the letters 'ERDU' using each letter only once in each word?

(a) None (b) One (c) Two
(d) Three (e) More than three

9. How many meaningful English words can be made with the letters 'NWTI' using each letter only once in each word? **[Allahabad Bank (Clerk) 2012]**

(a) One (b) Two (c) None
(d) Three (e) More than three

10. Select the letters that complete the first word and begin the second from the given alternatives.

PLAT (?) ATION **[SSC(Steno) 2013]**

(a) TENT (b) FORM
(c) TERR (d) EAU

11. How many meaningful English words can be made with the letters 'ALEP' using each letter only once in each word? **[SSC (10 + 2) 2012]**

(a) None (b) One (c) Two
(d) Three (e) More than three

12. What is the last letter of the word which is formed by rearranging the following letters?

C P A O E C K (a bird) **[EPFO 2011]**

(a) E (b) K (c) P
(d) C (e) None of these

13. The letters of the word 'NUMKIPP' are disorder. If they are arranged in proper order, the name of a vegetable is formed. What is the last letter of the word so formed? **[CDS 2011]**

(a) K (b) M (c) N (d) P

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Answer *with* Explanations

A. Base Level Exercise

1. (*b*) The word 'BRAIN' cannot be formed from 'REASONABLE' due to absence of letter i .

2. (*d*) UNISON cannot be formed letter 'S' is not in the given word.

3. (*c*) The word which cannot be formed form 'Specification' is 'Fainting' due to absence of the letter 'G' and only one 'N' is present in the given word.

4. (*c*) Using the letters of the given word, the word LIZARD cannot be made because D is not there in the given word.

5. (*a*) From the word 'CONCEPTUALISATION', the word which cannot be formed is STATUS as it contains only one 'S.'

6. (*d*) TALENT word cannot be formed using the letters of the given words because letter E is not present in the given word.

7. (*a*) The word 'Secure' cannot be formed from 'Courageous' because only one 'e' is present in the given word.

8. (*d*) 'PORTICO' word cannot be formed from 'PORTFOLIO' due to the absence of letter 'C'.

9. (*c*) From the given word, 'MEDICO' is the only word which can be formed.

10. (*d*) 'PARROT' can be formed from 'PREPARATION'.

11. (*d*) 'DAIRY' word can be formed from the word 'DICTIONARY'.

12. (*b*) 'LIMITED' is the only word which can be formed by using the letters of given word.

13. (*c*) 'OPINION' can be formed from 'COMPANIONSHIP'.

14. (*d*)

2	8	3	9	5	1	7	4	6
↓	↓	↓	↓	↓	↓	↓	↓	↓
P	L	A	I	N	T	I	F	F

15. (*a*) MIRACLE ⟷ (6, 3, 4, 1, 7, 2, 5)

16. (*a*)

14	9	10	11	12	13	8	4	3	1	2	5	6	7	15
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
A	C	K	N	O	W	L	E	D	G	E	M	E	N	T

17. (*c*) STARVE ⟷ (4, 5, 2, 3, 1, 6)

18. (*b*) HERMIT ⟷ (4, 1, 6, 2, 3, 5)

19. (*d*) Correct order of given letters is COMPLEX

(5), (2), (3), (6), (4),(7),(1)

20. (*d*)

9	8	12	3	7	6	1	2	13	4	5	10	11
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
H	Y	P	O	T	H	E	C	A	T	I	O	N

21. (*c*) NATURE ⟷ (4, 3, 2, 5, 1, 6)

22. (*a*) The same after meaning of the given is 'INCREASE' because after arrangement of given word is 'EXPAND'.

23. (*d*) The word is 'DEARTH' meaning 'SCARCITY'.

24. (*c*) Arrangement of word is 'BEHIND' and the similar word is 'BACK'.

25. (*a*) The word is 'GARNISH' meaning 'DECORATE'.

B. Expert Level Exercise

1. (*b*) From letters O, I, T, N, only one meaningful word 'INTO' can be formed and last letter of this word is O.

2. (*c*) The second, fifth, tenth and twelfth letters of the word METROPOLITAN are E, O, T and N, respectively. The words formed are NOTE and TONE.

3. (*c*) From letters T, E, C, N, only one meaningful word 'CENT' can be formed and third letter of this word is N.

4. (*b*) Second, fourth, fifth and eighth letters of the word PERISHED → E, I, S, D

∴ Meaningful English word → SIDE

5. (*d*) From letters C, A, G and L no meaningful word can be formed.

6. (*b*) D O [W] N [G] R [A] D [E] D

Only one meaningful English word WAGE can be formed by using the letters WGA and E.

7. (*c*) Two meaningful word 'ROPE' and 'REPO' can be formed by using letters from 'EPRO'.

8. (*b*) Only one meaningful word 'RUDE' can be formed by using letters from 'ERDU'.

9. (*a*) Only one meaningful English word can be formed with NWTI is TWIN.

10. (*b*) 'FORM' completes the first word as PLATFORM and begin the second.

11. (*d*) Only three words can be formed PEAL, PALE, LEAP.

12. (*b*) The name of the bird is PEACOCK and the last letter is K. (PEACOCK)

13. (*c*) The name of that vegetable would be 'PUMPKIN' and last letter of the word is N.

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6

Sitting Arrangement

Sitting arrangement is sequential arrangement of objects persons on basis of a predefined conditions.

In this chapter, we deal with the questions based on sitting arrangement. We are given few objects and then we are asked to arrange them based on the information provided. In other questions, we will also deal with arrangements in different shapes like square/pentagon/hexagon.

Types of Questions

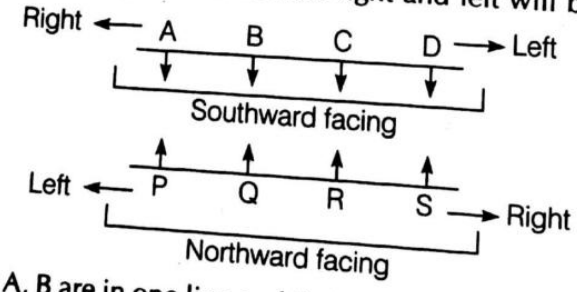
There are two types of questions which are generally asked in various competitive exams

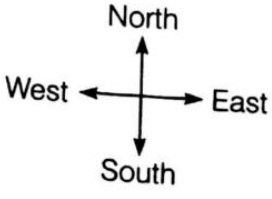
Type 1 Arrangement in a Line or Others

Here, we deal with questions, where arrangement is required to be done in a line or any others format in a straight line.

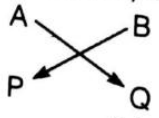
Before solving this type of questions, it is necessary to know the following facts

- When A, B, C and D facing at South direction and P, Q, R and S facing at North direction in a line, then positions at their right and left will be





- When A, B are in one line and P, Q in other, then diagonally opposite directions will be



A is diagonally opposite to Q.

B is diagonally opposite to P.

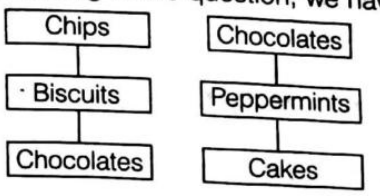
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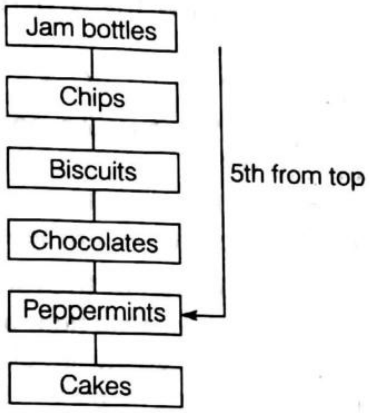
Illustration 1. In a shop, the items are arranged in a shelf consisting of six rows. Biscuits are kept above the tins of chocolates but below the rows of packets of chips, cakes are at the bottom and the bottles of peppermints are below the chocolates. The topmost row had the display of jam bottles, where exactly are the bottles of peppermints. Mention the place from the top.

(a) 2nd (b) 3rd (c) 4th (d) 5th

Solution (*d*) Jam bottles is at the top. Now, arranging them according to the question, we have



Finally,



Directions (Illustrations 2-5) *Study the following information carefully and answer the questions given below.*

Six friends A, B, C, D, E and F are sitting in a row facing towards North. C is sitting between A and E. D is not at the end. B is sitting at immediate right of E. F is not at the right end but D is sitting at 3rd left of E.

Illustration 2. How many persons are there to the right of D?

(a) One (b) Two (c) Three
(d) Four (e) None of these

Illustration 3. Which of the following is sitting to the left of D?

(a) F (b) C (c) E
(d) A (e) None of these

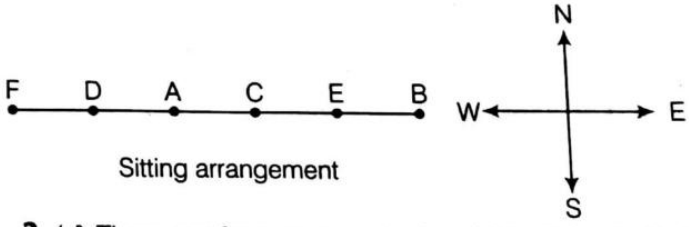
Illustration 4. Who is at the immediate left of C?

(a) A
(b) E
(c) Either E or A
(d) Cannot be determined
(e) None of the above

Illustration 5. Who is at the right end?

(a) A
(b) B
(c) E
(d) Cannot be determined
(e) None of the above

Solutions (Illustrations 2-5) *The given figure, shows the correct arrangement of six friends.*



Sitting arrangement

2. (*d*) There are four persons to the right of D—A, C, E and B.

3. (*a*) Clearly, F is sitting to the left of D.

4. (*a*) It is clear from the diagram that A is at the immediate left of C.

5. (*b*) It is clear from the diagram that B is at the right end.

Type 2 Arrangement Around a Circle / Square / Rectangle etc.

In such questions, we are given some clues regarding the arrangement. We have to apply these clues for sitting arrangement and using these informations, we have to find the solutions to questions associated with them. Here, we also deal with square/pentagon/hexagonal /arrangement in this section.

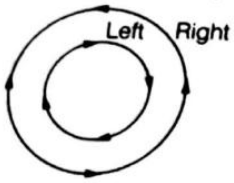
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Before solving type 2 questions, it is necessary to know the following facts.

- **For Circular Arrangement**

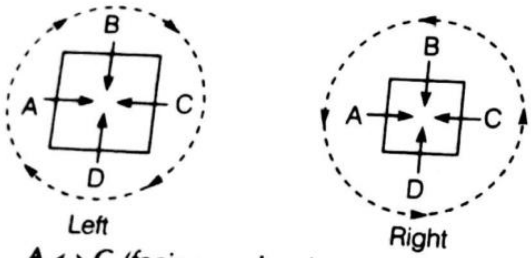
In this arrangement, suppose some persons are sitting around a circle and they facing the centre.



(i) Movement towards the left is also called **clockwise rotation.**

(ii) Movement towards the right is also called **anti-clockwise rotation.**

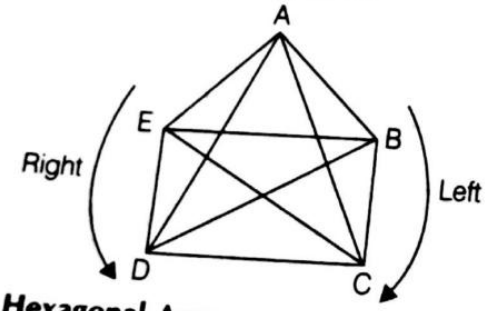
- **For Rectangular/Square Arrangement**



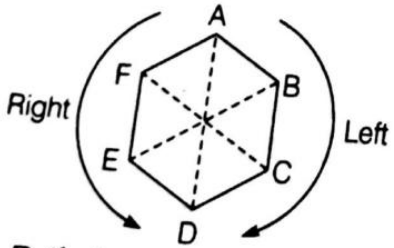
A ↔ C (facing each other)

B ↔ D (facing each other)

- **For Pentagonal Arrangement**



- **For Hexagonal Arrangement**



A ↔ D (facing each other)

B ↔ E (facing each other)

C ↔ F (facing each other)

Directions (Illustrations 6-10) *Read the following information carefully and answer the questions based on it.*

P, Q, R, S, T, U, V and W are eight friends. They are sitting around a round table and having coffee.

(i) P is sitting between U and V.
(ii) Q is sitting between W and T.
(iii) R is sitting to the third left of V.
(iv) W is sitting third right of S.

Illustration 6. What is the position of V with respect to S?
(a) Immediate left
(b) Immediate right
(c) Third to the left
(d) Fourth to the right

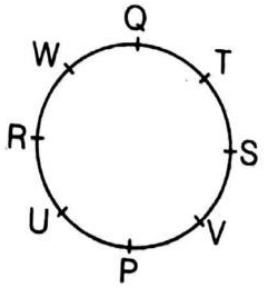
Illustration 7. How many persons are sitting between R and S?
(a) 2 (b) 3 (c) 4 (d) 5

Illustration 8. What is the position of T with respect to W?
(a) Immediate left (b) Immediate right
(c) Third to the left (d) Second to the left

Illustration 9. Which of the following is true?
(a) U is sitting immediate right of R
(b) U is sitting immediate left of P
(c) There is only one friend between W and T
(d) All of the above

Illustration 10. Which of the following is false?
(a) There are two friends between P and W
(b) There is no one between W and Q
(c) P is immediate right of V
(d) S is to the second left of Q

Solutions (Illustrations 6-10) Adjoining figure shows the correct sitting arrangement of all eight friends sitting around a round table.



6. (a) It is clear from the diagram that V is at immediate left of S.

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7. (*b*) Clearly, three members are sitting between R and S.
8. (*d*) Clearly, T is sitting to the second left of W.
9. (*d*) U is sitting immediately to the right of R. (true)
U is sitting immediately to the left of P. (true)
There is only Q between W and T. (true)
10. (c) There are two friends between P and W. (true)
There is no one between W and Q. (true)
P is immediately to the right of V. (false)
S is to the left of Q leaving one. (true)

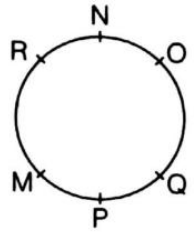
Direction (Illustration 11) *Read the following information carefully and answer the questions based on it.*

Six persons M, N, O, P, Q and R are playing cards sitting in a circle facing the centre. R is sitting between M and N and Q is sitting between O and P. P is sitting at immediate right of M.

Illustration 11. Who is sitting immediate left of O?

(a) R (b) M (c) Q (d) P (e) Cannot be determined

Solution Adjoining figure shows the correct arrangement of sitting of these six persons.



11. (c) Clearly, Q is sitting immediately at the left of O.

Let us Practice

A. Base Level Exercise

1. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle? **[IB (ACIO) 2013]**

(a) A (b) B
(c) C (d) D

2. A, B, C, D, E and F are sitting in a row. 'E' and 'F' are in the centre and 'A' and 'B' are at the ends. 'C' is sitting on the left of 'A'. Then who is sitting on the right of 'B'? **[SSC (Multitasking) 2014]**

(a) A (b) D
(c) E (d) F

Directions (Q. Nos. 3-5) *Read the following information carefully and answer the questions given below it.* **[SSC (Constable) 2012]**

A, B, C, D, E, F and G are playing cards sitting in a circle.

(i) F is 2nd to the right of G.
(ii) B is neighbour of F but not of E.
(iii) E is neighbour of C, Who is 4th to the right of G.
(iv) D is between E and A.

3. Who is fourth to the left of G?

(a) D
(b) E
(c) C
(d) Cannot be determined

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4. Who is the left of G?
(a) A (b) C
(c) B (d) None of these

5. Who are the neighbours of F?
(a) E and C (b) F and B
(c) A and B (d) C and B

Directions (Q. Nos. 6-9) *Read the information carefully and answer the questions based on it.*
[Vijaya Bank (Clerk) 2011]

Six persons are sitting in a circle. A is facing to B. B is to the right of E and left of C. C is to the left of D. F is to the right of A. Now, D exchanges his seat with F and E with B.

6. Who will be sitting to the left of D?
(a) B (b) F (c) E
(d) A (e) C

7. Who will be sitting to the left of C?
(a) E (b) F (c) A
(d) B (e) D

8. Who will be sitting opposite of A?
(a) E (b) F
(c) D (d) B
(e) C

9. Who will be sitting opposite to C?
(a) E (b) D (c) B
(d) A (e) F

10. *At a birthday party, 5 friends are sitting in a row. 'M' is to the left of 'O' and to the right of 'P'. 'S' is sitting to the right of 'T', but to the left of 'P'. Who is sitting in the middle?* **[SSC (10+2) 2013]**
(a) M (b) O
(c) P (d) S

11. *In a gathering seven members are sitting in a row. 'C' is sitting left to 'B' but on the right to 'D'. 'A' is sitting right to 'B'. 'F' is sitting right to 'E' but left to 'D'. 'H' is sitting left to 'E'. Find the person sitting in the middle.* **[SSC (10+2) 2013]**
(a) C (b) D
(c) E (d) F

12. Five friends P, Q, R, S and T are sitting in a row facing North. Here S is between T and Q and Q is to the immediate left of R. P is to the immediate left of T. Who is in the middle? **[SSC (Multitasking) 2014]**
(a) S (b) T
(c) Q (d) R

Directions (Q. Nos. 13-17) *Study the information carefully and answer the questions that follow.*

S, T, U, V, W, X, Y and Z are sitting around a circle area, with equal distance amongst each other but not necessarily in the same order.

Only two people face the centre and the rest face outide (*i.e.*, in a direction opposite to the centre).

Y sits second to left of W. S sits second to left of Y. Only one person sits between S and Z. T sits to immediate right of S. T is not an immediate neighbour of Y. V is not an immediate neighbour of Y.

Both the immediate neighbours of X face the centre.

13. Who is sitting to immediate right of Z?
(a) Y (b) V (c) T
(d) X (e) W

14. Which of the following is true regarding U as per the given sitting arrangement?
(a) X sits second to left of U
(b) Only three people sit between U and Y
(c) Z is one of the immediate neighbours of U
(d) U faces the centre
(e) S sits to immediate left of U

15. What is T's position with respect of Y?
(a) Second to the right
(b) Second to the left
(c) Fifth to the left
(d) Fourth to the right
(e) Third to the left

16. Which of the following groups represents the immediate neighbours of X?
(a) WY (b) VW (c) TZ
(d) VZ (e) SU

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17. Four of the following five are alike in a certain way based on the given seating arrangement and so form a group. Which is the one that does not belong to that group?

(a) Z (b) T (c) Y
(d) V (e) X

Directions (Q. Nos. 18-20) *Study the given information and answer the given questions.*

Six people—K, L, M, N, O and P live on six different floors of a building not necessarily in the same order. The lower most floor of the building is numbered 1, the one above that is numbered 2 and so on till the top most floor is numbered 6. L lives on an even numbered floor. L lives immediately below K's floor and immediately above M's floor. P lives immediately above N's floor. P lives on an even numbered floor. O does not live on floor number 4.

18. Four of the following five are alike in a certain way based on the given arrangement and hence form a group. Which of the following does not belong to that group?

(a) MN (b) OL (c) KM
(d) LP (e) PK

19. Who amongst the following lives on floor number 2?

(a) K (b) P (c) L
(d) M (e) O

20. On which floor does N live?

(a) 4 (b) 3 (c) 5
(d) 1 (e) 2

21. Five boys A, B, C , D and E are standing row, D is on the right of E. B is on the left of E, but on the right of A, B is on the left of C, who is standing on the extreme right. Who is standing in the middle?

[SSC (10+2) 2013]

(a) B (b) C (c) D (d) E

22. Six friends A, B, C, D, E and F are sitting in a row facing towards North. C is sitting between A and E, D is not at the end, B is sitting at immediate right of E, F is not at the right end, but D is sitting at 3rd left of E. Which of the following is sitting to the left of D?

(a) A (b) F (c) E (d) C

Directions (Q. Nos. 23-28) *Study the following information carefully and answer the given questions.* **[IBPS (PO) 2012]**

(i) A, B, C, D, E, F, G and H are sitting around a circle facing the centre but not necessarily in the same order.

(ii) B sits second to left of H's husband. No female is an immediate neighbour of B.

(iii) D's daughter sits second to right of F who is the sister of G. F is not an immediate neighbour of H's husband.

(iv) Only one person sits between A and F. A is the father of G. H's brother D, sits to the immediate left of H's mother. Only one person sits between H's mother and E.

(v) Only one person sits between H and G. G is the mother of C. G is not an immediate neighbour of E.

23. What is position of A with respect to his mother-in-law?

(a) Immediate left
(b) Third to the right
(c) Third to the left
(d) Second to the right
(e) Fourth to the left

24. Who amongst the following is D's daughter?

(a) B (b) C (c) E
(d) G (e) H

25. What is the position of A with respect to his grandchild?

(a) Immediate right
(b) Third to the right
(c) Third to the left
(d) Second to the left
(e) Fourth to the left

26. How many people sit between G and her uncle?

(a) One (b) Two (c) Three
(d) Four (e) More than four

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27. Four of the following five are alike in a certain way based on the given information and so form a group. Which is the one that does not belong to that group?

(a) F (b) C (c) E
(d) H (e) G

28. Which of the following is true with respect to the given sitting arrangement?

(a) C is the cousin of E
(b) H and H's husband are immediate neighbours of each other
(c) No female is an immediate neighbour of C
(d) H sits third to left of her daughter
(e) B is the mother of H

Directions (Q. Nos. 29-31) *These questions are based on the information given below.*

Six girls are sitting in a circle. Sonia is sitting opposite to Radhika. Poonam is sitting at right of Radhika but left of Deepti. Monika is sitting at left of Radhika. Kamini is sitting at right of Sonia and left of Monika. Now, Deepti and Kamini, Monika and Radhika mutually exchange their positions.

29. Who will be sitting opposite to Sonia?

(a) Radhika (b) Monika (c) Kamini
(d) Deepti (e) None of these

30. Who will be sitting at left of Kamini?

(a) Poonam (b) Deepti (c) Radhika
(d) Sonia (e) None of these

31. Who will be sitting at left of Deepti?

(a) Sonia (b) Monika
(c) Radhika (d) Poonam
(e) Cannot be determined

Directions (Q. Nos. 32-35) *These questions are based on the information given below.*

[IDBI Bank (Clerk) 2011]

Six persons P, Q, R, S, T and U are sitting in a circle facing one another front to front. P is sitting in front of Q. Q is sitting to the right of T and left of R. P is sitting to the left of U and right of S.

32. Who is sitting opposite to R?

(a) P (b) Q (c) S
(d) T (e) U

33. Who is sitting opposite to S?

(a) U
(b) T
(c) R
(d) Cannot be determined
(e) None of the above

34. Who is sitting between P and R?

(a) S (b) T (c) U
(d) Q (e) None of these

35. If the positions of P and R are interchanged, who will be sitting between S and U?

(a) P (b) R (c) Q
(d) T (e) Cannot be determined

B. Expert Level Exercise

Directions (Q. Nos. 1-2) *These questions are based on the information given below.*

A group of seven singers, facing the audience, are standing in a line on the stage as follows

(i) D is to the right of C.
(ii) F is standing beside G.
(iii) B is to the left of F.
(iv) E is to the left of A.
(v) C and B have one person between them.
(vi) A and D have one person between them.

1. Who is on the extreme right?

(a) D (b) F
(c) G (d) E
(e) None of these

2. If we start counting from the left, on which number is C?

(a) 1st (b) 2nd
(c) 3rd (d) 5th
(e) None of these

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Directions (Q. Nos. 3-4) *Read the following information carefully and answer the questions that follow.*

(i) Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U.
(ii) Q gets a North facing flat and is not next to S.
(iii) S and U get diagonally opposite flats.
(iv) R next to U, gets a South facing flat and T gets a North facing flat.

3. Whose flat is between Q and S?
(a) T (b) U
(c) R (d) P
(e) Data inadequate

4. The flats of which of the other pair than SU, is diagonally opposite to each other?
(a) PT (b) QP
(c) QR (d) TS
(e) None of these

Directions (Q. Nos. 5-10) *Study the following information to answer the given questions.*
[IBPS (PO) 2012]

Ten people are sitting in two parallel rows containing five people each, in such a way that there is an equal distance between adjacent persons. In row 1, P, Q, R, S and T are seated and all of them are facing South. In row 2, A, B, C, D and E are seated and all of them are facing North. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row. D sits third to the left of A. P faces immediate neighbour of D, R sits second to the right of P. Only one person sits between Q and S, B and E are immediate neighbours of each other. E does not face P and Q.

5. How many persons are seated between Q and T?
(a) None (b) One
(c) Two (d) Three
(e) Cannot be determined

6. Four of the following five are alike in a certain way and thus form a group. Which is the one that does not belong to that group?
(a) R (b) S (c) C
(d) T (e) A

7. Who amongst the following represent the people sitting exactly in the middle of the rows?
(a) P, E (b) S, D (c) S, A
(d) A, R (e) P, B

8. Which of the following is true regarding B?
(a) A and C are immediate neighbours of B
(b) B sits at one of the extreme ends of the line
(c) Q faces B
(d) T is an immediate neighbour of the person facing B
(e) D sits to the immediate left of B

9. Four of the following five are alike in a certain way and thus from a group. Which is the one that does not belong to that group?
(a) T-E (b) Q-C (c) S-B
(d) R-A (e) P-D

10. Who amongst the following faces S?
(a) A (b) B (c) C
(d) D (e) E

Directions (Q. Nos. 11-15) *Study the following information to answer the given questions.*
[SBI (Clerk) 2012]

(i) Eight persons E, F, G, H, I, J, K and L are seated around a square table-two on each side.
(ii) There are three lady members and they are not seated next to each other.
(iii) J is between L and F.
(iv) G is between I and F.
(v) H, a lady member, is second to the left of J.
(vi) F, a male member, is seated opposite to E, a lady member.
(vii) There is a lady member between F and I.

11. Who among the following are the three lady members?
(a) E, H and J (b) E, G and J
(c) G, H and J (d) H, E and G
(e) None of these

12. Which of the following is true about J?
(a) J is a male member
(b) J is a female member
(c) Sex of J cannot be determined
(d) Position of J cannot be determined
(e) All of the above

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13. Who among the following is seated between E and H?
(a) I (b) J (c) F
(d) K (e) None of these

14. Who among the following is to the immediate left of F?
(a) G (b) J (c) I
(d) K (e) None of these

15. How many persons are seated between K and F?
(a) One
(b) Two
(c) Three
(d) Cannot be determined
(e) None of the above

Directions (Q. Nos. 16-20) *Read the information given below to answer the questions.*

A, B, C, D, E, F, G and H want to have a dinner on a round table and they have worked out the following seating arrangements. [CLAT 2013]

(i) A will sit beside C (ii) H will sit beside A (iii) C will sit beside E
(iv) F will sit beside H (v) E will sit beside G (vi) D will sit beside F
(vii) G will sit beside B (viii) B will sit beside D

16. Which of the following is wrong?
(a) A will be to the immediate right of C
(b) D will be to the immediate left of B
(c) E will be to the immediate right of A
(d) F will be to the immediate left of D

17. Which of the following is correct?
(a) B will be to the immediate left of D
(b) H will be to the immediate right of A
(c) C will be to the immediate right of F
(d) B will be to the immediate left of H

18. A and F will become neighbours if
(a) B agrees to change her sitting position
(b) C agrees to change her sitting position
(c) G agrees to change her sitting position
(d) H agrees to change her sitting position

19. During sitting
(a) A will be directly facing C
(b) B will be directly facing C
(c) A will be directly facing B
(d) B will be directly facing D

20. H will be sitting between
(a) C and B (b) A and F
(c) D and G (d) E and G

Directions (Q. Nos. 21-25) *Study the following information and answer the questions given below.*

Eight people–S, R, N, L, M, T, O and P are sitting in a circle facing the centre. All eight belong to different professions–reporter, doctor, cricketer, teacher, accountant, shopkeeper, painter and supervisor. They are not necessarily seated in the mentioned order. M is sitting third to the left of O.
The doctor is to the immediate right of M and M is not reporter. R is sitting fourth to the right of P. Neither R nor P is an immediate neighbour of M. T is a teacher and is sitting third to the right of the doctor. The shopkeeper is sitting second to the left of the teacher. The painter is sitting second to the left of M. S is the cricketer, is sitting exactly between T and P. The accountant is sitting second to the right of the cricketer. N is sitting third to the left of T.

21. Who amongs the following is a reporter?
(a) O
(b) L
(c) N
(d) R
(e) None of the above

22. What is S's position with respect to R?
(a) Third to the right
(b) Second to the right
(c) Third to the left
(d) Second to the left
(e) Fourth to the right

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23. How many people are sitting between P and N when counted in an anti-clockwise direction from N?
(a) One (b) Two (c) Three
(d) Four (e) None of these

24. Four of the following five pairs are alike in a certain way based on their positions in the above arrangement and so form a group. Which of the following does not belong to the group?
(a) Teacher-Painter (b) Supervisor-Shopkeeper
(c) Cricketer-Reporter (d) Doctor-Accountant
(e) Shopkeeper-Doctor

25. Which one of the following statements is false according to the above mentioned arrangement?
(a) N is to the immediate right of the supervisor
(b) The cricketer is third to the right of the shopkeeper
(c) The doctor is sitting exactly between the supervisor and the accountant
(d) L is neither a teacher nor a supervisor
(e) There are only three people between S and N

26. A, P, R, X, S and Z six persons sitting in a row. S and Z are at the centre and A and P are at the ends. R is sitting on the left of A. Then, who is sitting on the right of P?
[SSC (CPO) 2003]
(a) A (b) S (c) X (d) Z

Directions (Q. Nos. 27-29) *Study the information carefully and answer the questions given below.*

(i) Eleven students A, B, C, D, E, F, G, H, I, J and K are sitting in a row of the class facing the teacher.
(ii) D, Who is to the immediate left of F, is second to the right of C.
(iii) A, who is second to the right of E, Who is at one of the ends.
(iv) J is the immediate neighbour of A and B and third to the left of G.
(v) H is to the immediate left of D and third to the right of I.

27. Who is sitting in the middle of the row?
(a) C (b) I (c) B
(d) G (e) None of these

28. Which of the following groups of friends is sitting to the right of G?
(a) IBJA (b) ICHDF
(c) CHDF (d) CHDE
(e) None of these

29. In the above sitting arrangement, which of the following statements is superfluous?
(a) Only (i)
(b) Only (ii)
(c) Only (iii)
(d) None is superfluous
(e) Cannot be determined

Directions (Q. Nos. 30-34) *Read the following informations and answer the questions given below.*

(i) A, B, C, D, E, F, G and H are sitting in a row facing North.
(ii) A is fourth to the right of E.
(iii) H is fourth to the left of D.
(iv) C and F, which are not at the ends, are neighbours of B and E, respectively.
(v) H is next to the left of A and A is the neighbour of B.

30. What is the position of F?
(a) Next to the right of E
(b) Next to the right of G
(c) Sixth to the right of D
(d) Between G and H
(e) None of the above

31. Which of the following statements is not true?
(a) G is the neighbour of H and F
(b) B is next to the right of A
(c) E is at left end
(d) D is next to the right of B
(e) None of the above

32. Who is/are the neighbour(s) of D?
(a) F alone
(b) C alone
(c) B and C
(d) Cannot be determined

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33. Which of the following statements is not true?
(a) H is second to the right of F
(b) E is fourth to the left of A
(c) D is fourth to the right of H
(d) A is third to the left of D
(e) All are true

34. Who are sitting at the ends?
(a) E and D
(b) F and D
(c) G and B
(d) Cannot be determined
(e) None of the above

Answer *with* Explanations

A. Base Level Exercise

1. (*a*) Data is arranged as

D B A E C
• • • • •

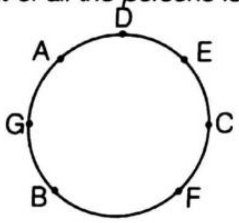
So, the house in the middle is A.

2. (*b*) According to the question, sitting arrangement is at follow

BD E/F F/E CA
•• • • ••

Clearly, D it sitting on the right of B.

Solutions (Q. Nos. 3-5) *From the given information, sitting arrangement of all the persons is as follow*

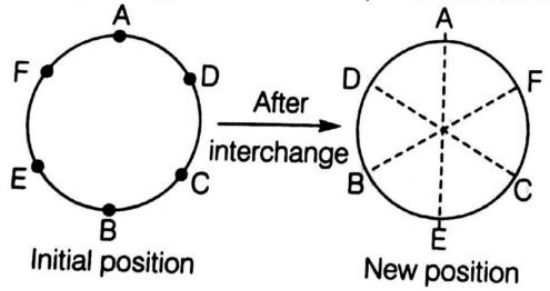


3. (*c*) Person C is fourth to the left of G.

4. (*a*) Person A is to the left of G.

5. (*d*) C and B are the neighbours of F.

Solutions (Q. Nos. 6-9) From the given information, sitting arrangement of all the persons is as follows



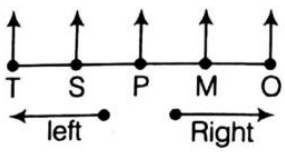
6. (*d*) It is clear from the figure that A is to the left of D.

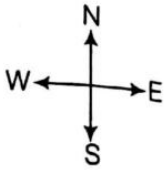
7. (*a*) E is sitting to the left of C.

8. (*a*) E is sitting opposite to A.

9. (*b*) D is sitting opposite to C.

10. (*c*)





So, P is sitting in the middle.

11. (*b*) According to the question,

arranging the seven members in a row,

H E F D C B A

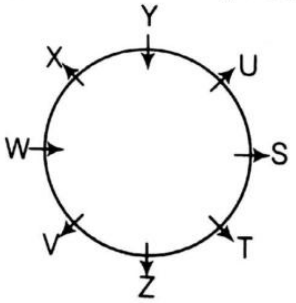
Hence, D is sitting in the middle.

12. (*a*) According to the questions, sitting arrangemer of all the five friends is as follow

P T S Q R
• • • • •

Hence, S is the middle.

Solutions (Q. Nos. 13-17) *From the given informatio sitting arrangement of all the persons is as follow*



13. (*b*)

14. (*a*)

15. (*e*)

16. (*a*)

17. (*c*)

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Solutions (Q. Nos. 18-20) *Arrangement of the floors to the six people is as follow*

6th	O
5th	K
4th	L
3rd	M
2nd	P
1st	N

18. (*e*) **19.** (*b*)

20. (*d*)

21. (*d*) The sequence of boys in a queue is

A → B → E → D → C

(left end) (right end)

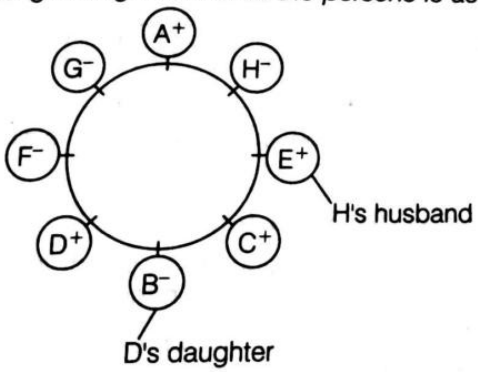
So, E is in the middle

22. (*b*) According to the question, arrangement of A, B, C, D, E and F is as follows

F D A C E B

Thus, F is sitting to the left of D.

Solutions (Q. Nos. 23-28) *From the given information, sitting arrangement of all the persons is as follow*



Note + = Male; − = Female

23. (*a*) Immediate left.

24. (*a*) B is the D's daughter.

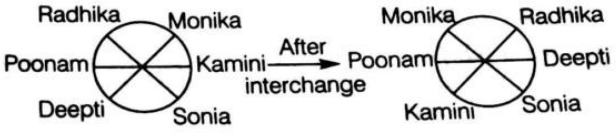
25. (*c*) Third to the left.

26. (*a*) One.

27. (*d*) Except H, all the persons have one male and female sitting at the left and right.

28. (*b*) H and H's husband are immediate neighbours of each other.

Solutions (Q. Nos. 29-31) *We have the order of sitting of girls as given in the figure*



29. (*b*) Monika will be at the opposite to Sonia.

30. (*a*) Poonam will be sitting just left of Kamini.

31. (*a*) Sonia will be sitting just left of Deepti.

Solutions (Q. Nos. 32-35) *Figure shows the exact positions in the sitting arrangement.*



32. (*e*) U is sitting opposite to R.

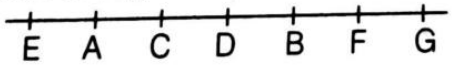
33. (*b*) T is sitting opposite to S.

34. (*a*) S is sitting between P and R.

35. (*b*) R will be sitting between S and U because the position of P and R has been changed.

B. Expert Level Exercise

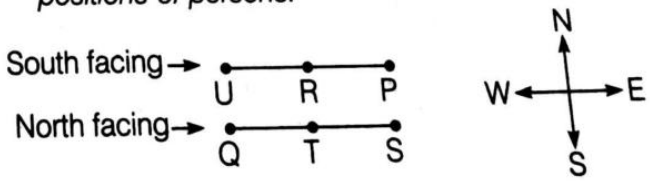
Solutions (Q. Nos. 1-2) *Given figure shows the correct positions of singers in the line.*



1. (*c*) It is clear from the diagram that singer G is at the extreme right of the line.

2. (*c*) It is clear from the diagram that C is the third from the left.

Solutions (Q. Nos. 3-4) *Given figure shows the correct positions of persons.*



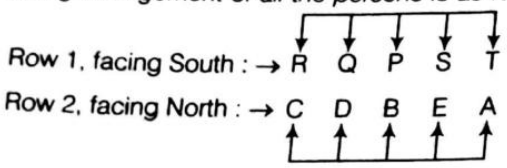
3. (*a*) Clearly, T's flat is between Q and S.

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4. (*b*) As given in statement (iii), S and U are diagonally opposite. Similarly, from the figures we can say P and Q are also diagonally opposite.

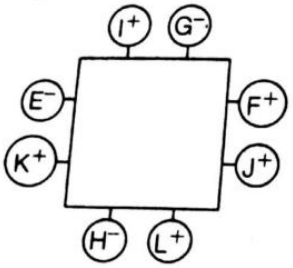
Solutions (Q. Nos. 5-10) *From the given information, sitting arrangement of all the persons is as follow*



5. (*c*) **6.** (*b*) **7.** (*e*)

8. (*e*) **9.** (*d*) **10.** (*e*)

Solutions (Q. Nos. 11-15) *From the given information, sitting arrangement of all the persons is as follow*



Note + = Male; − = Female

11. (*d*) It is clear from the figure that the three lady members are H, E and G.

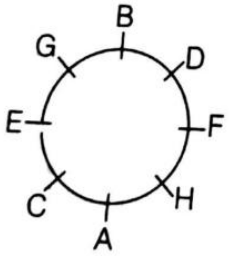
12. (*a*) It is clear that J is a male member.

13. (*d*) K is sitting between E and H.

14. (*b*) J is sitting immediately left to F.

15. (*c*) There are three persons seated between K and F on either side.

Solutions (Q. Nos. 16-20) *Information is arranged as follows*



16. (*c*) E is not to immediate right of A.

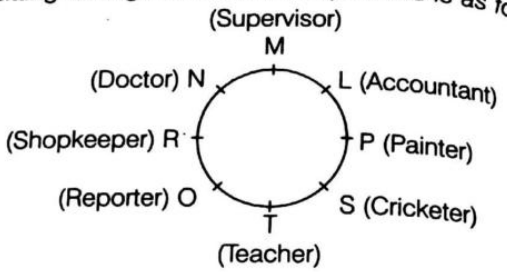
17. (*b*) H will be on immediate right of A.

18. (*d*) A and F will become neighbor on, if H agrees to change her sitting position.

19. (*c*) A will be directly facing B.

20. (*d*) H is sitting between A and F.

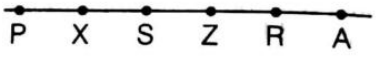
Solutions (Q. Nos. 21-25) *From the given information, sitting arrangement of all the persons is as follow*



21. (*a*) **22.** (*a*) **23.** (*d*)

24. (*e*) **25.** (*c*)

26. (*c*) Given figure shows the correct positions of six persons.



Hence, it is clear that X is on the right of P.

Solutions (Q. Nos. 27-29) *On the basis of the informations given in the question, we have the arrangement of standing as per the figure below*

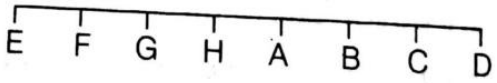


27. (*b*) It is clear from the figure drawn on the basis of the information that student I is sitting in the middle of the row.

28. (*c*) CHDF are sitting to the right of G.

29. (*d*) All the information is required to know the position of all students in the row.

Solutions (Q. Nos. 30-34) *The order of sitting of all the eight persons which satisfies all the conditions will be as in the figure.*



30. (*a*) It is clear from the above order that F is next to the right of E.

31. (*d*) Statement (d) is wrong because C is next to the right of B.

32. (*b*) Because D is to the extreme right hence, has only one neighbour C.

33. (*e*) All the statements are correct.

34. (*a*) E and D are sitting at the extreme ends.

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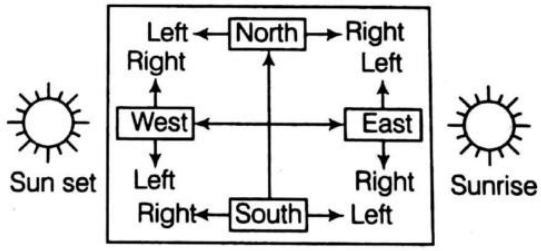
Direction Sense Test

Direction is a measurement of position of one thing with respect to another thing and displacement is the measurement of distance between the starting and the final point.

In this chapter, we deal with the questions in which a successive follow-up of directions is formulated and the candidate is required to ascertain the final direction or the distance between two points. This test is designed to judge the candidate's ability to trace and follow the logical path correctly and sense the direction correctly.

Main Directions

There are four main directions *viz.* East, West, North and South. Sunrises in the East. Just opposite of East is West and South is in the opposite to North.



Main Directions

Abbreviations for these directions are E (East), W (West), N (North) and S (South).

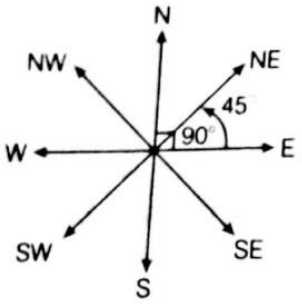
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Cardinal Directions

A direction between two main directions is called cardinal direction. Clearly, there are four cardinal directions.

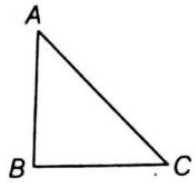
They are NE (North-East), NW (North-West), SE (South-East) and SW (South-West). Students are advised to use of diagram as given in question for the purpose of sensing directions.



Angle formed between two main directions is 90° and angle formed between a cardinal direction and main direction is 45°.

Shortest Distance

For finding shortest distance, it is necessary to know Pythagoras theorem.



AB = Perpendicular

BC = Base and AC = Hypotenuse

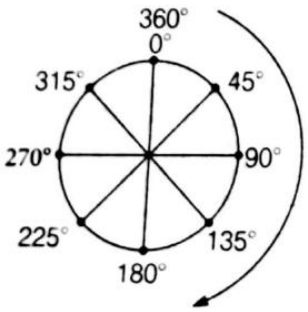
Hence, for shortest distance between A and C

i.e., $AC = \sqrt{AB^2 + BC^2}$

Angle of Movement

For solving questions based on angle of movement, it is necessary to know the rotations which are given below

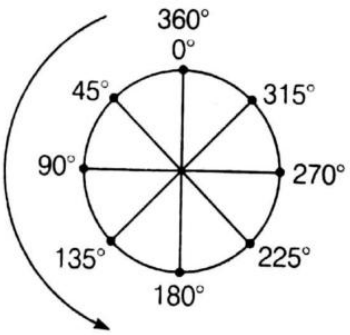
(i) Movement at the right direction is called the clockwise movement.



Clockwise

(ii) Movement towards the left is called anti-clockwise movement.

Anti-clockwise



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Types of Questions

There are three types of questions which are generally asked in various competitive examination

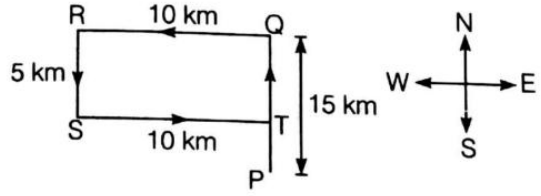
Type 1 Based on Final Direction

In this type of questions, we have to ascertain the final direction with respect to starting point or the directional relations between two points/persons/things are used in questions.

Illustration 1. From her house, Avantika went 15 km to the North. Then, she turned West and covered 10 km. Then, she turned South and covered 5 km. Finally turning to East, she covered 10 km. In which direction is she from her house?

(a) East (b) West
(c) North (d) South

Solution (c) Movements of Avantika are shown in the given figure.

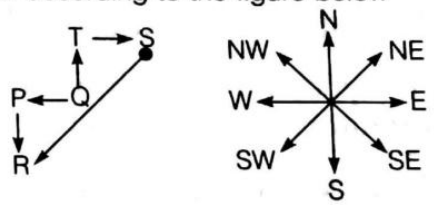


Clearly, Avantika's final position is T which is in the North of her house.

Illustration 2. Of the five villages P, Q, R, S and T situated close to each other, P is to the West of Q, R is to the South of P, T is to the North of Q and S is to the East of T. Then, in which direction R is with respect to S?

(a) North-West
(b) South-East
(c) South-West
(d) Data inadequate

Solution (c) Locations of the given villages can be shown according to the figure below



Clearly, R lies to the South-West of S.

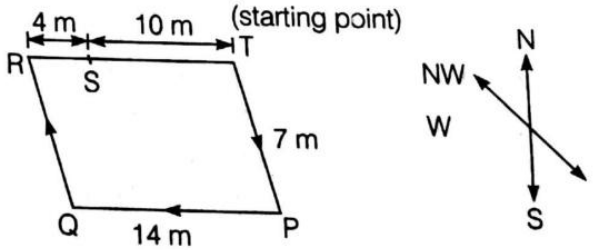
Type 2 Based on Displacement

In this type of questions, we deal with final distance between starting and final point or distance between two points/persons/things.

Illustration 3. Vinay moves towards South-East, a distance of 7 m, then he moves towards West and travels a distance of 14 m. From there, he moves towards North-West a distance of 7 m and finally he moves a distance of 4 m towards East and stands at point. How far is the starting point from where he is standing now?

(a) 3 m (b) 4 m
(c) 10 m (d) 11 m

Solution (c) All the movements of Vinay are shown in the figure below



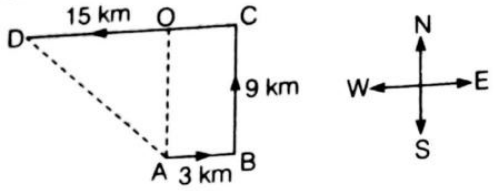
Vinay's distance from the starting point (T)
= (14 – 4) = 10 m

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Illustration 4. A person starts from a point A and travels 3 km eastwards to B and then turns left and travels thrice that distance to reach C.
He again turns left and travels five times the distance he covered between A and B and reaches his destination D. The shortest distance between the starting point and the destination is
(a) 12 km (b) 15 km (c) 16 km (d) 18 km

Solution (*b*) The movements of the person are as shown in the figure below



According to the question,

$BC = (3 \times 3) = 9$ km

$CD = (3 \times 5) = 15$ km

$OD = (15 - 3) = 12$ km

∴ Now, required distance,

$AD = \sqrt{OD^2 + OA^2}$

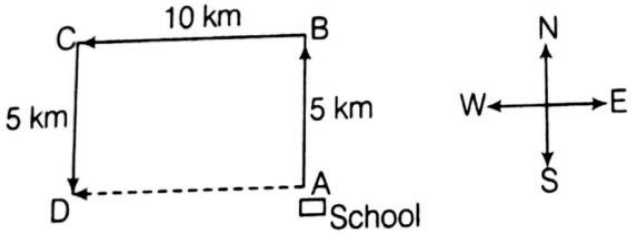
$AD = \sqrt{12^2 + 9^2} = \sqrt{144 + 81} = \sqrt{225}$ km = 15 km

Type 3 Based on Direction and Displacement

In this type of questions, we deal with the final distance and direction between starting and final point of any person/object/thing.

Illustration 5. Shyam goes to 5 km in the North from his school. Now, turning to the left, he goes to 10 km and again turn to left and goes to 5 km. How far he is from his school and which direction?
(a) 10 km, South from school (b) 10 km, North from school
(c) 10 km, West from school (d) 10 km, East from school

Solution (*c*) The movement of Shyam is as follow



Let point A is the starting point *i.e.*, school of Shyam.
Point D is the ending point.
From figure, AB = CD = 5 km
and AD = BC = 10 km
So, Shyam is 10 km far away from his school and in West direction from school.

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Let us Practice

A. Base Level Exercise

1. A man is facing West. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anti-clockwise direction. Which direction is he facing now?
[MAT 2013, RRB (TC/CC) 2005]

(a) South (b) North-West
(c) West (d) South-West

2. A direction pole was situated on the road crossing. Due to an accident, the pole turned in such a manner that the pointer which was showing East, started showing South. Sita, a traveller went to the wrong direction thinking it to be West. In what direction actually she was travelling?
[SSC (CGL) 2013]

(a) North (b) West
(c) East (d) South

3. A policeman left his police post and proceeded 4 km South on hearing a loud sound from point A. On reaching the place, he heard another sound and proceeded 4 km to his left to the point B. From B, he proceeded left to reach another place C, 4 km away. In which direction, he has to go to reach his police post?

(a) North (b) South
(c) East (d) West

4. A and B start walking in opposite directions. A covers 3 km and *B* covers 4 km. Then, A turns right and walks 4 km while B turns left and walks 3 km. How far is each from the starting point?
[SSC (Steno) 2013]

(a) 10 km (b) 8 km
(c) 5 km (d) 4 km

5. A watch reads 4 : 30. If the minute hand points East, in which direction will the hour hand point?

(a) South-East (b) North-East
(c) North (d) North-West

6. A man walks 6 km South, turns left and walks 4 km, again turns left and walks 5 km. Which direction is he facing now?
[SSC (Multitasking) 2014]

(a) South (b) North
(c) East (d) West

7. Ram cycled 10 km Southward from his home, turned right and cycled 6 km, turned right cycled 10 km, turned left and cycled 15 km. How many kilometres will he have cycled to reach straight home?
[SSC (CGL) 2013]

(a) 10 km (b) 21 km
(c) 16 km (d) 20 km

8. One day, Ravi left home and cycled 10 km Southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometres will he now have to cycle in a straight line to reach his home?
[MAT 2013]

(a) 10 km (b) 15 km
(c) 20 km (d) 25 km

9. A man travels 4 km due North, then travels 6 km due East and further travels 4 km due North. How far he is from the starting point?
[SSC (CGL) 2013]

(a) 6 km (b) 14 km
(c) 8 km (d) 10 km

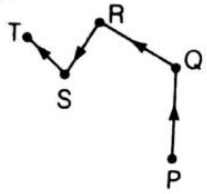
10. A professor left his college and proceeded towards North for 4 km, after seeing a signboard from point 'O'. On reaching the place, he saw an another signboard and proceed 4 km to his right to the point 'P', only to find that the signboard was on right of 'P'. From point 'P', he proceeded right to reach that place 4 km away. In which direction he has to go to reach that place from where he has left?
[MAT 2012]

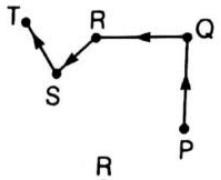
(a) East (b) West
(c) North (d) South

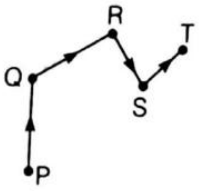
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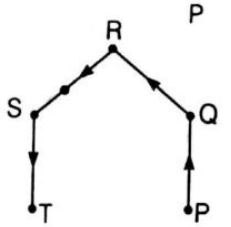
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11. Raju starts from a place P towards North and reaches place Q. From there, he turns towards North-West and reaches place R. He, then turns towards South-West and walks to a place S. From there, he turns towards North-West and finally reaches place T. Which of the following figures shows the movement of Raju?

(a) 

(b) 

(c) 

(d) 

12. One evening before sunset, two friends Raman and Arjun were talking to each other face to face. If Raman's shadow was exactly to his left side, which direction was Arjun facing? **[SSC (Steno) 2013]**

(a) West (b) East
(c) North (d) South

13. A villager went to meet his uncle in another village situated 5 km away in the North-East direction of his own village. From there, he came to meet his father-in-law living in a village situated 4 km in the South of his uncle's village. In what direction is he from initial position or starting point?

(a) North (b) East
(c) West (d) South

14. From his house, Dipak went 25 km to North. Then, he turned West and covered 15 km. Then, turned South and covered 10 km. Finally, turning to East, he covered 15 km. In which direction is he from his house? **[SSC (CPO) 2013]**

(a) North
(b) South
(c) West
(d) East

15. Gaurav walks 20 m towards North, then he turn left and walk 40 m. He again turns left and walk 20 m. Further he moves 20 m after turning to the right. How far is he from his original position? **[MAT 2012]**

(a) 20 m (b) 30 m
(c) 50 m (d) 60 m

16. Anamika who is facing South walks 20 m, then she turns to her right and walks 15 m, then she turns to her right and walks 16 m, again she turns to her right and walks 12 m. How far is she from her starting point ? **[CG PSC 2013]**

(a) 4 m (b) 16 m (c) 12 m
(d) 7 m (e) 5 m

17. Raj starts from his office facing West and walks 100 m straight, then takes a right turn and walks 100 m. Further, he takes a left turn and walks 50 m. In which direction is Raj now from the starting point? **[CDS 2012]**

(a) North-East (b) South-West
(c) North (d) North-West

18. Manoj starts from his house and moves towards North. After walking a distance of 4 km, he turns left. After walking a particular distance, he reaches Sunita's house. Sunita's house is at distance of 5 km from Manoj's house. Then, Manoj walked a total distance of **[EPFO 2011]**

(a) 1 km (b) 5 km (c) 7 km
(d) 3 km (e) None of these

19. A girl is facing North. She turns 180° in the anti-clockwise direction and then 225° in the clockwise direction. Which direction is she facing now? **[CG PSC 2013]**

(a) West (b) North-East
(c) South-West (d) East
(e) North-West

20. A man is performing yoga with his head down and legs up. His face is towards the West. In which direction, will his left hand be? **[RRB (ASM) 2004]**

(a) North (b) South
(c) East (d) West

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21. Starting from the point, Raju walked 12 m North, he turned right and walked 10 m, he again turned right and walked 12 m, then he turned left and walked 5 m. How far is he now and in which direction from the starting point?

(a) 27 m towards East (b) 5 m towards East
(c) 15 m towards East (d) None of these

22. A child was looking for his father. He went 90 m towards East before turning to his right. He then went 20 m before turning to his right again to look for his father at his uncle's place 30 m from this point. His father was not there. He then went 100 m to the North before meeting his father in a street. How far from the starting point did the son meet his father? **[MAT 2013]**

(a) 80 m (b) 100 m (c) 140 m (d) 200 m

23. I am facing South. I turn right and walk 20 m. Then, I turn right again and walk 10 m. Then, I turn left and walk 10 m and then turning right walk 20 m.Then, I turn right again and walk 60 m. In which direction am I from the starting point? **[RRB (GG) 2012]**

(a) South-East (b) North-West
(c) South-West (d) North-East

B. Expert Level Exercise

1. After starting from a point, A walks 3 km towards East, that turning to his left he moves 3 km. After this he again turns left and moves 3 km. In which direction is 'A' from his starting point? **[SSC (10+2) 2013]**

(a) North (b) East
(c) West (d) South

2. A man starts from his house and walks 10 km in South direction, then he turns right and goes 6 km, again he turns right and goes 10 km and finally turns right and goes 6 km. At what distance, is he from the starting point and in which direction?

(a) 2 km, North (b) 3 km, South
(c) At the starting point (d) 4 km, East
(e) None of these

24. Ram and Shyam start walking towards North and cover 20 m. Ram turns to his left and Shyam to his right. After sometime, Ram walks 10 m in the same direction in which he turned. On the other hand, Shyam walks only 7 m. Later, Ram turns towards his left and Shyam to his right. Both walk 25 m forward. How far is Ram from Shyam now? **[SSC (CGL) 2013]**

(a) 10 m
(b) 20 m
(c) 17 m
(d) 5 m

25. The houses of A and B face each other on a road going North-South, A's being on the western side. A comes out of his house, turns left, travels 5 km, turns right, travels 5 km to the front of D's house, B does exactly the same and reaches the front of C's house. In this context, which one of the following statements is correct? **[CSAT 2013]**

(a) C and D live on the same street
(b) C's house faces South
(c) The houses of C and D are less than 20 km apart
(d) None of the above

3. Rajnikanth left his home for office in car. He drove 15 km straight towards North and then turned Eastwards and covered 8 km. He then turned to left and covered 1 km. He again turned left and drove for 20 km and reached office. How far and in what direction is his office from the home? **[IB (ACIO) 2013]**

(a) 21 km West
(b) 15 km North-East
(c) 20 km North-West
(d) 26 km North-West

4. Ram goes 15 m North, then turns right and walks 20 m, then again turns right and walks 10 m, then again turns right and walks 20 m. How far is he from his original position? **[SSC (10+2) 2013]**

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

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5. Ram and Shyam start walking in opposite directions. Ram covers 6 km and Shyam 8 km. Then, Ram turns right and walks 8 km and Shyam turns left and walks 6 km. How far everyone is from their starting point? [SSC (CGL) 2012]

(a) 11 km (b) 8 km
(c) 9 km (d) 10 km

6. Sherley starting from a fixed point, goes 15m towards North and then after turning to his right, he goes 15 m. Then, he goes 10, 15 and 15 after turning to his left each time. How far is he from his starting point? [SSC (CGL) 2011]

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

7. Alok walked 30 m towards East and took a right turn and walked 40 m. He again took a right turn and walked 50 m. Towards which direction is he from his starting point? [MAT 2013]

(a) South (b) West
(c) South-West (d) South-East

8. One morning at 7 O'clock, Naresh started walking with his back towards the Sun. Then, he turned towards left, walked straight and then turned towards right and walked straight. Then, he again turned towards left. Now in which direction is he facing?

(a) North
(b) East
(c) West
(d) South

9. Anoop starts walking towards South. After walking 15 m, he turns towards North. After walking 20 m, he turns towards East and walks 10 m. He, then turns towards South and walks 5 m. How far is he from his original position and in which direction?

(a) 10 m, North
(b) 10 m, South
(c) 10 m, West
(d) 10 m, East

Directions (Q. Nos. 10-11) *Study the given information and answer the given questions.* [IBPS (Clerk) 2013]

Point A is 11 m North of point B.
Point C is 11 m East of point B.
Point D is 6 m North of point C.
Point E is 7 m West of point D.
Point F is 8 m North of point E.
Point G is 4 m West of point F.

10. How far is point F from point A?

(a) 43 m (b) 4 m (c) 3 m
(d) 7 m (e) 5 m

11. How far and in which direction is point G from point A?

(a) 3 m, North (b) 5 m, North
(c) 4 m, North (d) 4 m, South
(e) 3 m, South

12. From his house, Lokesh went 15 km to the North. Then, he turned West and covered 10 km. Then, he turned South and covered 5 km. Finally, turning to East, he covered 10km. In which direction is he from his house? [IBPS (Clerk) 2012]

(a) East (b) West (c) North
(d) South (e) None of these

13. A man walks 1 km towards East and then he turns to South and walks 5 km. Again he turns to East and walks 2 km, after this he turns to North and walks 9 km. How far is he from his starting point? [IBPS (Clerk) 2011]

(a) 3 km (b) 4 km (c) 5 km
(d) 7 km (e) None of these

14. A postman was returning to the post office which was in front of him to the North. When the post office was 100 m away from him, he turned to the left and moved 50 m to deliver the last letter at Shanti Villa. He, then moved in the same direction for 40 m, turned to his right and moved 100 m. How many metres was he away from the post office? [LIC (ADO) 2011]

(a) 50 (b) 90 (c) 150
(d) 100 (e) 120

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15. Village Chimur is 20 km to the North of village Rewa. village Rahate is 18 km to the East of village Rewa. village Angne is 12 km to the West of village Chimur. If Sanjay starts from village Rahate and goes to village Angne, in which direction he has to go from his starting point?

(a) North (b) North-West
(c) South (d) South-East

16. Rohit walked 25 m towards South. Then, he turned to his left and walked 20 m. He then turned to his left and walked 25 m. He again turned to his right and walked 15 m. At what distance is he from the starting point and in which direction? **[UP B.Ed. 2012]**

(a) 35 m, East (b) 35 m, North
(c) 40 m, East (d) 60 m, East

17. Ms A goes for her morning walk at 6 O'clock towards the sun for 2 km, then she turns to her right and walks 3 km. She again turns to her left and walks 2 km, finally she turns to her left to walk another 6 km. In which direction is she moving and at what distance from the last turn, is she standing?

(a) 6 km, East
(b) 9 km, East
(c) 6 km, North
(d) 9 km, North

18. Starting from a point 'S', Mahesh walked 25 m towards South. He turned to his left and walked 50 m. He then again turned to his left and walked 25 m. He again turned to his left and walked 60 m and reached a point 'T'. How far Mahesh is from point 'S' and in which direction?

(a) 10 m, West
(b) 25 m, North
(c) 10 m, East
(d) 25 m, West

Directions (Q. Nos. 19-20) *Study the information and answer the questions given below.*

On a playing ground, Dev, Kumar, Nilesh, Ankur and Pintu are standing as directed below facing the North.

(i) Kumar is 40 m to the right of Ankur.
(ii) Dev is 60 m to the South of Kumar.
(iii) Nilesh is 25 m to the West of Ankur.
(iv) Pintu is 90 m to the North of Dev.

19. If a boy walks from Nilesh, meets Ankur followed by Kumar, Dev and then Pintu, how many metres has he walked, if he has travelled the straight distance all through?

(a) 215 m (b) 155 m
(c) 245 m (d) 185 m

20. Who is at the North-East of the person, who is to the left of Kumar?

(a) Nilesh
(b) Ankur
(c) Pintu
(d) Either Nilesh or Dev

21. The door of Aditya's house faces the East. From the back side of his house, he walks straight 50 m, then turns to the right and walks 50 m again. Finally, he turns towards left and stop after walking 25 m. Now, Aditya is in which direction from the starting point? **[SBI (PO) 2011]**

(a) South-East (b) North-East
(c) South-West (d) North-West
(e) None of these

22. Lakshman went 15 km to the West from his house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left he covered 20 km. How far is he now from his house?

(a) 15 km (b) 20 km
(c) 25 km (d) 10 km

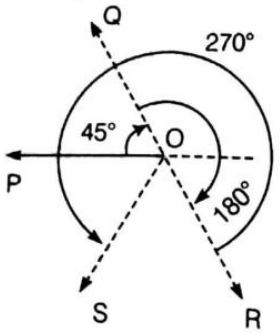
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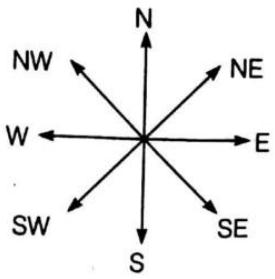
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Answer *with* Explanations

A. Base Level Exercise

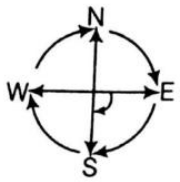
1. (*d*) The movement of man is shown in the figure below





From figure, finally, he is facing in the OS direction, which is South-West.

2. (*a*)

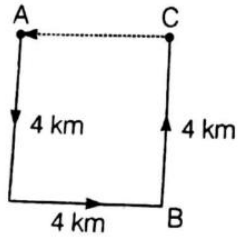


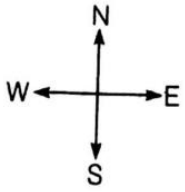
The, pointer which was showing last started showing South

After accident $E \to S$ $S \to W$
$W \to N$ $N \to E$

$\therefore$ Pointer turned 90° clockwise.

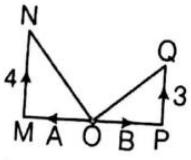
3. (*d*) The movement of policeman is shown in the figure below.

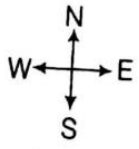




For reaching A (starting point) from C, policeman will have to move in the West direction.

4. (*c*)





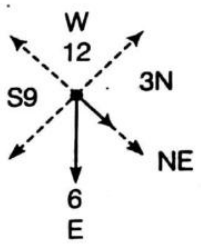
Let A and B started from point O. A towards west and B towards East and at last they reached N and Q. respectively.

$$ON = \sqrt{NM^2 + MO^2} = \sqrt{4^2 + 3^2}$$
$$= 5 \text{ km}$$

$\because$ $OQ = \sqrt{QP^2 + OP^2} = \sqrt{3^2 + 4^2} = \sqrt{25}$
$= 5$ km

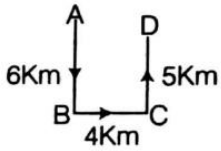
$\therefore$ $OQ = ON$

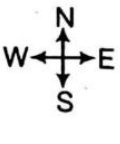
5. (*b*)



Hence, when the minute hand points to the East, hour hand points to the North-East direction.

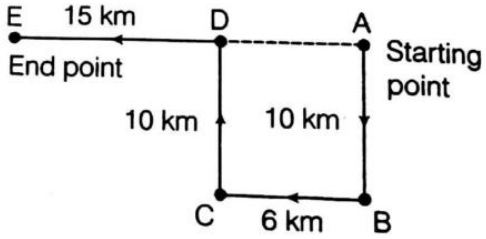
6. (*b*) Let the man starts from the point A and passing through





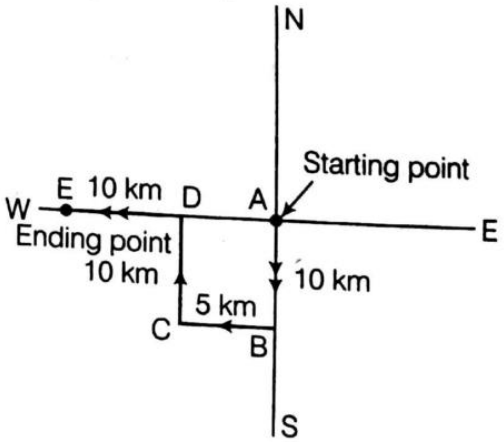
B and C, he reaches D. Clearly, he is now facing North.

7. (*b*) Figure is drawn as



Now, to go back home Ram has to cycle
$= (ED + DA) = (15 + 6) = 21$ km

8. (*b*)

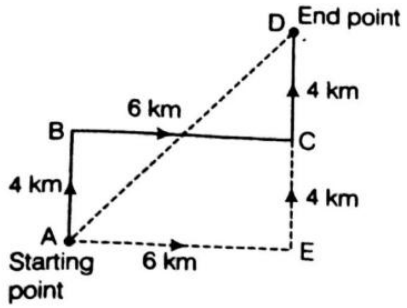


Now, distance Ravi have to cycle to reach home is (ED + DA) = (10 + 5) = 15 km

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9. (*d*)



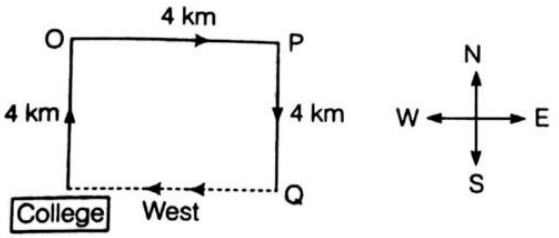
Distance between the starting point and end point is AD. (Pythagoras theorem in ΔADE)

Now, $AD^2 = AE^2 + DE^2$

$AD^2 = (6)^2 + (8)^2$

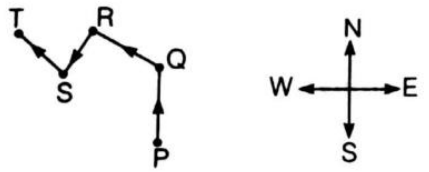
$\therefore \quad AD = \sqrt{36 + 64} = \sqrt{100} = 10$ km

10. (*b*) The movement figure of professor is as shown below



For reaching college from point Q professor will have to move in the West direction.

11. (*a*)



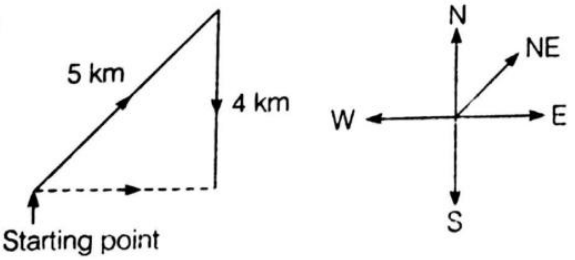
This situation is traced by option (a).

12. (*c*) According to the question,



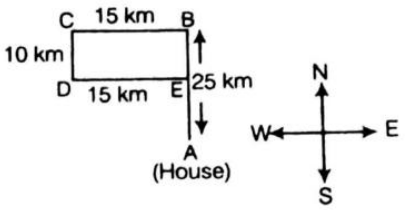
Hence, Arjun was facing North.

13. (*b*)



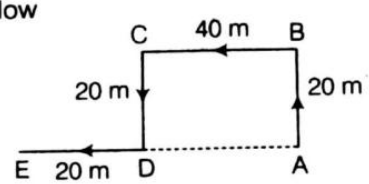
Hence. villager is in the East direction of his initial position.

14. (*a*)



Starting from the point A and passing through the points B, C and D, Deepak reaches the point E. Hence, he is in North direction from his house.

15. (*d*) The movements of Gaurav is shown in figure below



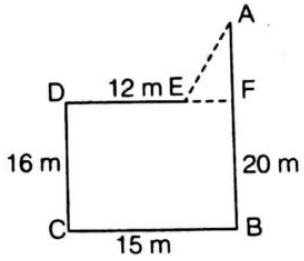
Clearly, Gaurav's distance from his initial position A = AE = (AD + DE)

$AD = BC = 40$ m

$\therefore \quad AE = 40 + 20$

$= 60$ m

16. (*e*)



$AE = \sqrt{(AF)^2 + (EF)^2}$

$= \sqrt{(4)^2 + (3)^2}$

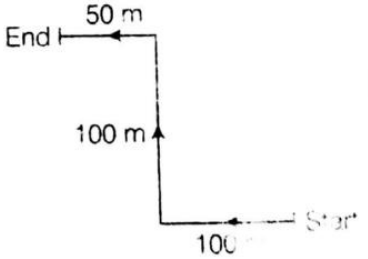
$= \sqrt{16 + 9}$

$= \sqrt{25}$

$AE = 5$ m

She is 5 m away from starting poi

17. (*d*)

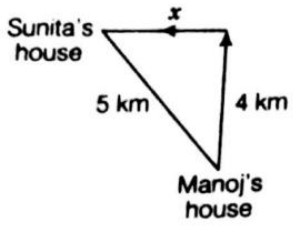


So, Raj is in North-West ... starting point.

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18. (c) It is clear from the figure that it is a right angle triangle.



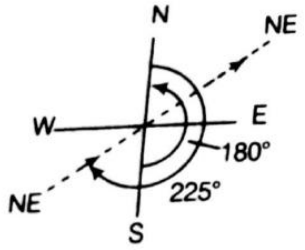
So, by Pythagoras theorem,

$4^2 + x^2 = 5^2$

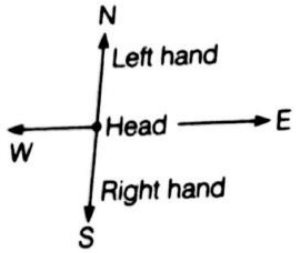
$\Rightarrow \quad x = 3$ km

Thus, Manoj travelled a distance of 7 km.

19. (b)

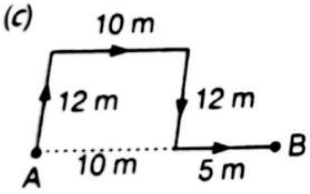


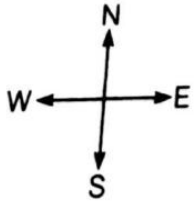
20. (a)



Hence, it is clear from above figure that the left hand points towards North.

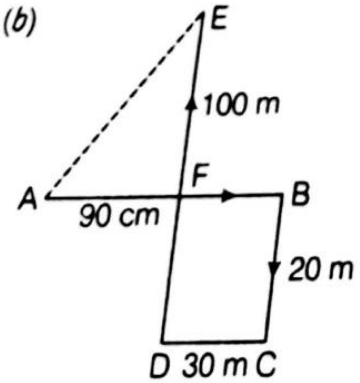
21. (c)

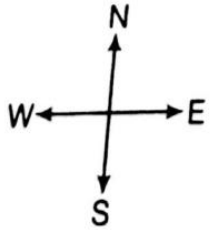




Finishing point B is at a distance of 15 m from starting point A and in the East direction.

22. (b)





AE is the distance from the starting point and the end point.

$\therefore \quad AF = AB - FB$

$= AB - DC \quad (\because FB = DC)$

$= 90 - 30 = 60$ m

$EF = ED - FD \quad (\because FD = BC)$

$= ED - BC$

$= 100 - 20$

$= 80$ m

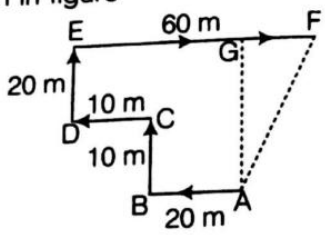
Now, $AE = \sqrt{(AF)^2 + (EF)^2}$

$= \sqrt{(60)^2 + (80)^2}$

$= \sqrt{3600 + 6400}$

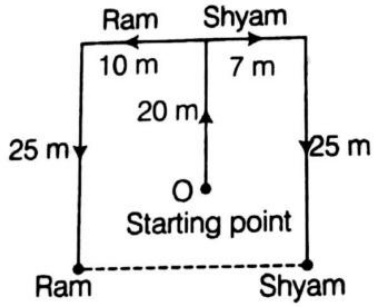
$= \sqrt{10000} = 100$ m

23. (d) The movement of the person from A to F, as shown in figure



Clearly, the final position is F which is to the North-East of the starting point A.

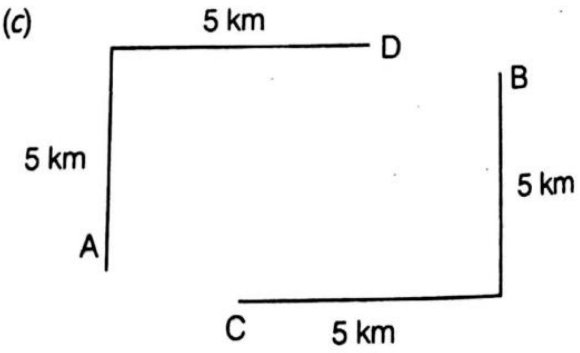
24. (c) Data is arranged as



$\therefore$ Distance between Ram and Shyam

$= (10 + 7) = 17$ m

25. (c)



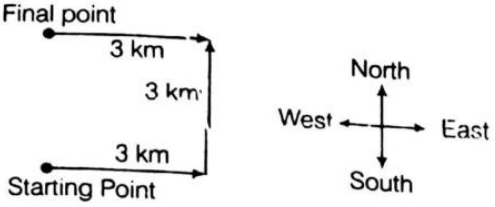
So, the houses of C and D are less than 20 k apart.

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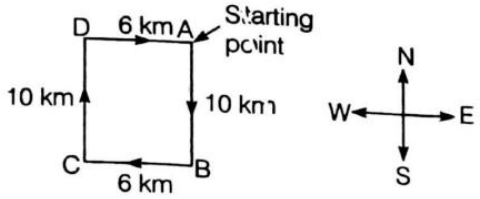
B. Expert Level Exercise

1. (*a*) Final point



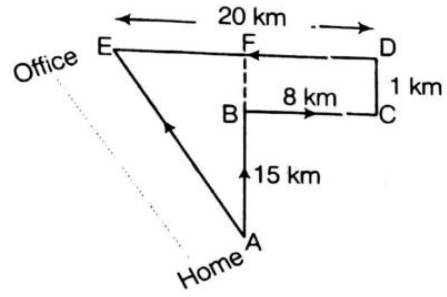
Thus, A is in North direction from his starting point.

2. (*c*)



From above figure, it is clear that the starting and final points of the man are same.

3. (*c*)



In ΔAFE,

$$AE = \sqrt{AF^2 + EF^2}$$

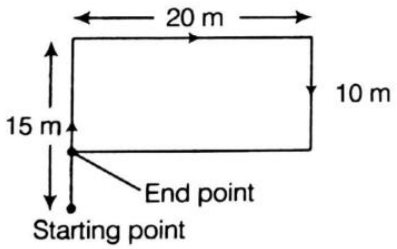
$$= \sqrt{(AB + BF)^2 + (ED - FD)^2}$$

$$= \sqrt{(16)^2 + (12)^2} = \sqrt{256 + 144}$$

$$= \sqrt{400} = 20 \text{ km}$$

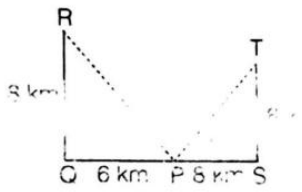
So, his office is 20 km North-West

4. (*a*)



Thus, Ram is at a distance of 5 m from his starting point.

5. (*d*)



From above figure, we can see that both are standing equal distance from starting point.

$\therefore$ Required distance $= \sqrt{(8)^2 + (6)^2}$

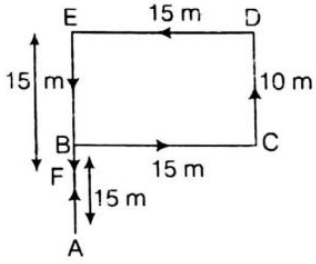
(by Pythagoras theorem)

$= \sqrt{64 + 36}$

$= \sqrt{100} = 10$ km

Hence, everyone is 10 km far from their starting point.

6. (*c*) From figure, A is the starting point and F is the ending point of Sherley.



$\because$ $AE = AB + BE$

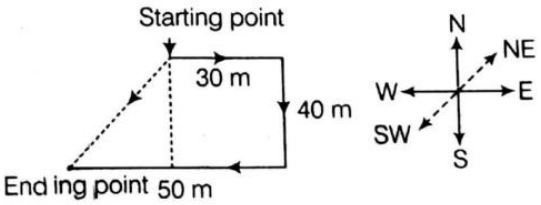
$= 15 + 10 = 25$ m ($\because$ BE = DC = 10)

Now, $AF = AE - EF = 25 - 15$

$= 10$ m

Hence, Sherley is 10 m far from his starting point.

7. (*c*) The movement of Alok is shown below

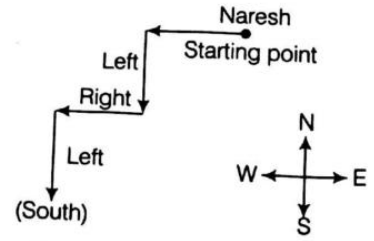


From figure, it is clear that he is in South-West direction from his starting point.

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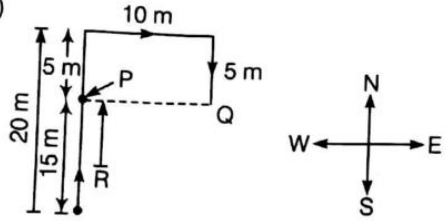
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8. (*d*) Naresh walk's as



So, Naresh's facing towards South.

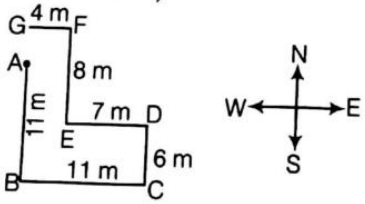
9. (*d*)



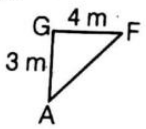
where, P → Starting point

Clearly, from figure point Q is at a distance of 10 m from point P and in the East direction.

Solutions (Q. Nos. 10-11)



10. (*e*) AG = BG – AB



$= (CD + EF) - (AB)$

$= (6 + 8) - 11 = 3$ m

and $GF = 4$ m

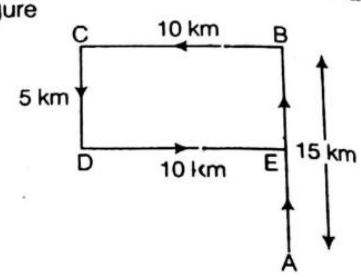
$\therefore \quad AF = \sqrt{AG^2 + GF^2}$

$= \sqrt{9 + 16} = 5$ m

11. (*a*) Point G is in the 'North' direction from point A.

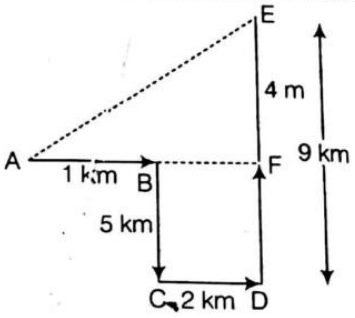
and $AG = 3$ m (from above solution)

12. (*c*) The movements of Lokesh are as shown figure



Clearly, his final postion E is to the North of house at A.

13. (*c*) The movements of the man are as shown



Clearly, DF = BC = 5 km

EF = (DE – DF) = (9 – 5) = 4 km,

BF = CD = 2 km

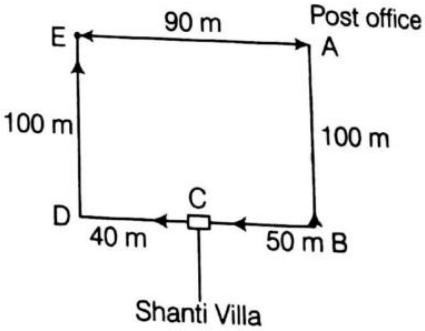
AF = AB + BF = AB + CD = (1 + 2) = 3km

∴ Man's distance from starting point A,

$AE = \sqrt{AF^2 + EF^2}$

$= \sqrt{3^2 + 4^2} = \sqrt{25} = 5$ km

14. (*b*)

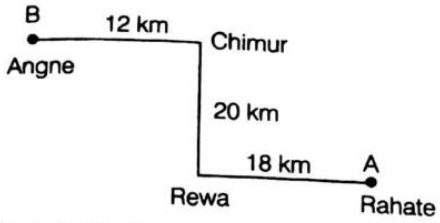


It is clear from above figure that postman was 90 m away from post office.

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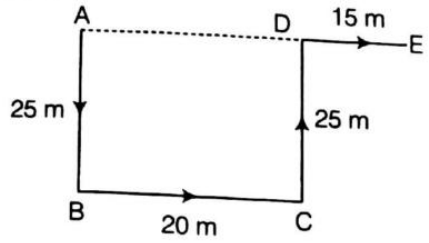
15. (*b*)



From figure, it is clear that A and B denote the starting and finishing points, respectively.

So, B is the North-West of point A.

16. (*a*) The movements of Rohit are shown in figure below



∴ Rohit's distance from starting point, AE

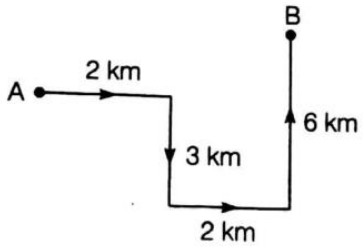
= AD + DE

= BC + DE

= 20 + 15

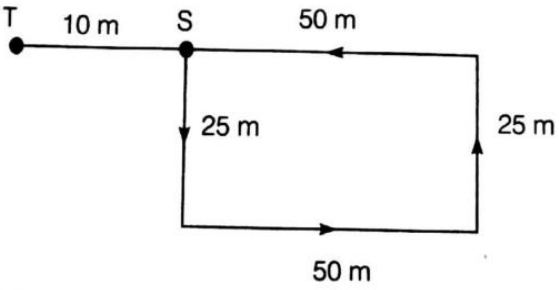
= 35 m East

17. (*c*)



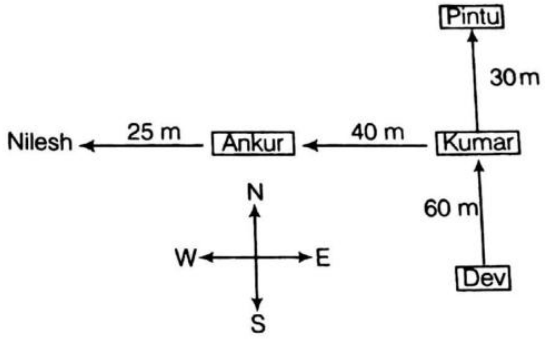
Final position of A is at a distance of 6 km towards North from her last turn.

18. (*a*)



Mahesh is at a distance of 10 m away and in West direction from his starting point S.

19. (*a*) Following the instructions as given in the question,

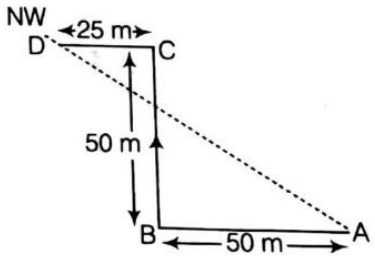


Total distance covered by the boy

= 25 + 40 + 60 + 90 = 215 m

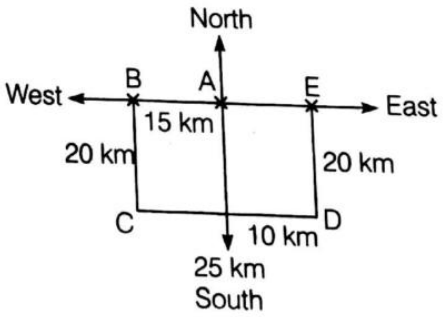
20. (*c*) From the above figure, it is very clear that the person to the left of Kumar is Ankur and Pintu is to the North-East of Ankur. Therefore, Pintu is the right answer.

21. (*d*) Since, Aditya's house face towards East and he walks from backside of his house, it means that he starts walking towards West which is shown as below



Clearly, Aditya's final position is D which is to the North-West of the starting point A.

22. (*d*) The movement of Lakshman is shown below



Points A and E show the starting and end positions respectively of Lakshman. It is clear that E is 10 km away from A.

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8 Number, Ranking and Time Sequence Test

Sequence and Ranking is based on arrangement of characters/persons/objects in a particular order based on some specific characteristics.

In this chapter, we deal with questions which are followed with a sequence of numbers, ranks and time. We have to find answers on the basis of given conditions. The importance of such type of questions cannot be defined as their presence in a test of reasoning is almost certain.

Types of Questions

In this section, we will deal with three types of questions based on number, ranking and time sequence test which are asked in various competitive exam.

Type 1 Number Test

In this type of questions a number a set of numbers or a series of digits is given and the candidate are asked to find out digits following certain given conditions.

Illustration 1. How many 5's are there in the following number sequence which are preceded by 7 and followed by 6?

7 5 5 9 4 5 7 6 4 5 9 8 7 5 6 7 6 4 3 2 5 6 7 8

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

Solution (a) Here, 7 5 5 9 4 5 7 6 4 5 9 8 7 [5] 6 7 6 4 3 2 5 6 7 8

Preceded by 7

and followed by 6

So, there is only one such 5.

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Illustration 2. How many even numbers are there in the following series of numbers, each of which is preceded by an odd number, but not followed by an even number?

5 3 4 8 9 7 1 6 5 3 2 9 8 7 3 5

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

Solution (*d*) 5 3 4 8 9 7 1 6 5 3 2 9 8 7 3 5

There are three such even numbers 6, 2 and 8 each of which is preceded by an odd number and not followed by an even number.

Directions (Illustrations 3-4) *Following questions are based on the five three-digit numbers given below.*

519 364 287 158 835

Illustration 3. If the positions of the first and the third digits within each number are interchanged, which of the following will be the third digit of the second lowest number?

(a) 9 (b) 5 (c) 7 (d) 8

Illustration 4. Which of the following is the difference between the second digit of the lowest and the highest of these numbers?

(a) 3 (b) 1 (c) 2 (d) 0

Solutions (Illustrations 3-4)

3. (*b*) According to the question, after the position of the first and third digits interchanged, new numbers are 519 ⇒ 915, 364 ⇒ 463, 287 ⇒ 782, 158 ⇒ 851, 835 ⇒ 538, so second lowest number = 538 and it is actually 835. Hence, third digit of the second lowest number = 5

4. (*c*) According to the question,
Highest number = 835
Lowest number = 158
Difference between the second digit of the lowest and the highest number = 5 – 3 = 2

Illustration 5. The positions of how many digits in the number 351462987 will remain unchanged after the digits are rearranged in ascending order within the number?

(a) None (b) One
(c) Two (d) Three

Solution (c) Given number 3 5 1 4 6 2 9 8 7
After rearrangement 1 2 3 4 5 6 7 8 9

Hence, there are two numbers, 4 and 8 remain unchanged after the rearrangement.

Illustration 6. The positions of the first and the sixth digit in the number 5109238674 are interchanged. Similarly, the positions of the second and the seventh digit are interchanged and so on. Which of the following will be the third digit from the right end after the rearrangement?

(a) 9 (b) 0
(c) 6 (d) 3

Solution (*b*) Given number = 5109238674
According to the condition given in question,
After interchanging the digits, new number
= 3867451092
Hence, third digit from the right end = 0

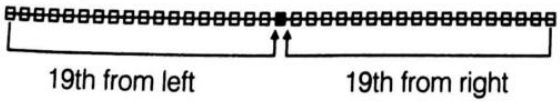
Type 2 **Ranking Test**

In this type of questions, generally, the ranks of a person both from the top or from the bottom or the total number of persons are to be found out based on condition given in question.

Illustration 7. In a class, boys stand in a single line. One of the boys is nineteenth in order from both the ends. How many boys are there in the class?

(a) 27 (b) 37
(c) 38 (d) 39

Solution (*b*)



Clearly, number of boys in the row
= (18 + 18 + 1) = 37

The question can be solved by formula also.

Total number of persons in a row or class = (Rank of a person from upper end or left end) + (Rank of that person from lower or right end) – 1 (because that particular place counts two times)

Total number of boys in the class = 19 + 19 – 1
= 37

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Illustration 8. Anu and Vinay are ranked seventh and eleventh respectively from the top in a class of 31 students. What will be their respective ranks from the bottom in the class?

(a) 20th and 24th (b) 24th and 20th
(c) 25th and 21st (d) None of these

Solution (c) Number of students after Anu in the class
$= (31 - 7) = 24$

Now, Anu's rank from bottom = 24 + 1 = 25

So, Anu is 25th from the bottom.

Number of students after Vinay in the class
$= (31 - 11) = 20$

Now, Vinay's rank from bottom = 20 + 1 = 21

So, Vinay is 21st from the bottom.

Note 1 will be added, if question is ask about another side and one side is already given.

This question can be solved by formula also.

Rank of a person from lower or right end = (Total number of persons in row) – (Rank of that person from upper or left end) + 1

Anu's rank from the bottom = 31 – 7 + 1 = 25
Vinay's rank from the bottom = 31 – 11 + 1
= 21

Illustration 9. In a class of 42 students Mahesh's rank is 16th from the bottom. What is his rank from the top?

(a) 25th
(b) 26th
(c) 24th
(d) 27th

Solution (d) Number of students ahead of Mahesh
$= 42 - 16 = 26$

Now, Mahesh's rank from top = 26 + 1 = 27

So, Mahesh's rank is 27th from the top.

This question can be solved by formula also.

Rank of a person from upper or left end = (Total number of persons in row) – (Rank of that person from lower or right end) + 1

Alternate :

∴ Mahesh's rank from the top = 42 – 16 + 1
= 27

Type 3 Time Sequence Test

This test is designed to test a candidate's ability in understanding 'time sequences.

To solve such type of problems a candidate must have a proper knowledge regarding calender clock.

Illustration 10. Sunita leaves her house at 20 min to seven in the morning, reaches Vineeta's house in 25 min, they finish their breakfast in another 15 min and leave for their office which takes another 35 min. At what time, did they leave Vineeta's house to reach their office?

(a) 7 : 40 am (b) 7 : 20 am
(c) 7 : 45 am (d) 8 : 15 am

Solution (b) Sunita leaves her house at 6 : 40 am.

She reaches Vineeta's house in 25 min, *i.e.*, 6 : 40 + 0 : 25 at 7 : 05 am. Both leave for office, 15 min after 7 : 05 am *i.e.*, 7 : 05 + 0 : 15 at 7 : 20 am.

Illustration 11. If every second Saturdays and all Sundays are holidays in a 30 days month beginning on Saturday, then how many working days are there in that month?

(a) 20 (b) 21
(c) 22 (d) 23

Solution (d) As the month begins on Saturday. So, 2nd, 9th, 16th, 23rd, 30th days are Sundays, while 8th and 22nd days are second Saturdays. Thus, there are 7 holidays in all.

∴ Number of working days = 30 – 7 = 23

Important Facts

- A ordinary year has 365 days.
- A leap year has 366 days.
- A leap year is divisible by 4.
- A century to be a leap yeay it must be divisible by 400
- February in a leap year has 29 days.
- The last day of a year is always the same as the first day.

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Let us Practice

A. Base Level Exercise

1. How many '8' are followed by even number and preceded by an odd number? [SSC (Multitasking) 2013]

18438148328784856784186

(a) 3 (b) 4 (c) 9 (d) 5

2. What should come next in the following number series? [SSC (FCI) 2011]

4 5 3 2 1 5 4 5 3 2 1 4 4 5 3 2 1 3 4 5 3 2 1

(a) 1 (b) 4 (c) 2 (d) 5

3. What should come next in the following series of numbers?

2 2 3 2 3 4 2 3 4 5 2 3 4 5 6 2 3 4 5 6 7 2 3 4 5 6 7

(a) 2 (b) 3 (c) 4
(d) 7 (e) None of these

4. How many 9's are followed by and preceded by numbers divisible by 2? [EPFO 2011]

896535968349652697372941379417 34

984539761531957429685329574894 51

(a) 12 (b) 6 (c) 8
(d) 10 (e) 4

5. If two is subtracted from each odd digit and three is added to each even digit in the number 3675249. How many digits will appear twice in the new number thus formed? [SSC (Steno) 2012]

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

6. How many such 5s are there in the following number sequence, each of which is preceded by 3 or 4 but not followed by 8 or 9?

3 5 9 5 4 5 5 3 5 8 4 5 6 7 3 5 7 5 5 4 5 2 3 5 1 0

(a) Six (b) Three (c) Four
(d) Five (e) None of these

7. unita is the 11th from either end of a row of girls. How many girls are there in that row? [SSC (10 + 2) 2013]

(a) 19 (b) 20 (c) 21 (d) 22

8. In a row of boys, Rajan is 10th from the right and Suraj is 10th from the left. When Rajan and Suraj interchange their positions, Suraj will be 27th from the left. Which of the following will be Rajan's position from the right?

(a) 10th (b) 26th (c) 29th
(d) 25th (e) None of these

9. In a class of 45 students, a boy is ranked 20th. When two boys joined, his rank was dropped by one. What is his new rank from the end? [CSAT 2013]

(a) 25th (b) 26th
(c) 27th (d) 28th

10. Sohan ranks seventh from the top and twenty-sixth from the bottom in a class. How many students are there in the class? [SSC (10 + 2) 2013]

(a) 31 (b) 32 (c) 33 (d) 34

11. There are 25 boys in a horizontal row. Rahul was shifted by three places towards his right side and he occupies the middle position in the row. What was his original positon from the left end of the row ? [CG(PSC) 2013]

(a) 15th (b) 16th (c) 12th
(d) 10th (e) None of these

12. The positions of how many digits in the number 5314687 will remain unchanged after the digits are rearranged in ascending order within the number? [IBPS (PO) 2012]

(a) None (b) One (c) Two
(d) Three (e) More than three

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13. The positions of how many digits in the number 837912 will remain unchanged after the digits within the number are rearranged in descending order (from left to right)? **[IBPS (Clerk) 2012]**

(a) None (b) One (c) Two
(d) Three (e) More than three

14. There are twenty people working in an office. The first group of five works between 8 : 00 am to 2 : 00 pm. The second group of ten works between 10 : 00 am to 4 : 00 pm and the third group of five works between 12 noon to 6 pm. There are three computers in the office which all the employees frequently use. During which of the following hours the computers are likely to be used most? **[RRB (ASM) 2012]**

(a) 10 : 00 am-12 : 00 noon
(b) 12 noon-2 : 00 pm
(c) 1 : 00 pm-3 : 00 pm
(d) 2 : 00 pm-4 : 00 pm

15. In a row of girls, Veena is 12th from the start and 19th from the end. In another row of girls, Sunita is 14th from the start and 20th from the end. How many girls are there in both the rows together?

(a) 72 (b) 65 (c) 63 (d) 61

16. Consider five people A, B, C, D and E, each having different age. A is younger than only B. C is older than D. D is not the youngest. Who amongst the following are older than C? **[CDS 2012]**

(a) A and B (b) E, B and A
(c) A and E (d) E and B

17. How many digits position will remain same in the number 5231698, each of which is as far away from the beginning of the number as when the digits are rearranged in ascending order?

(a) None
(b) One
(c) Two
(d) Three
(e) More than three

18. How many digits position will remain same in the number 6315784, each of which has as many digits between them in the number as when the digits are rearranged in descending order?

(a) None (b) One (c) Two
(d) Three (e) More than three

19. How many digits position will remain same in the number 9431658, each of which has as many digits between them in the number as when the digits are rearranged in ascending order?

(a) None (b) One (c) Two
(d) Three (e) More than three

Directions (Q. Nos. 20-24) *Study the sets of numbers given below and answer the questions.*

972 682 189 298 751 **[LIC (ADO) 2012]**

20. If one is added to the lowest number and two is added to the highest number, what will be the difference between the second digit of the smallest number and third digit of the highest number?

(a) 5 (b) 7 (c) 9
(d) 8 (e) None of these

21. If in each number, first and the last digit are interchanged, which one of the following will be the third highest number?

(a) 972 (b) 682 (c) 189
(d) 298 (e) 751

22. If in each number, all the three digits are arranged in descending order, which of the following will be the third highest number?

(a) 972 (b) 682 (c) 189
(d) 298 (e) 751

23. If in each number, second and third digit are interchanged, what will be the sum of first digit of the smallest number and last digit of highest number?

(a) 7 (b) 6 (c) 9
(d) 8 (e) None of these

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24. If one is added to the smaller odd number and one is subtracted from the higher odd number, which of the following will be obtained, if the second digit of that odd higher number is subtracted from the second digit of that odd lower number thus formed?

(a) 6 (b) 5 (c) 4
(d) 3 (e) 2

B. Expert Level Exercise

1. Raja walks slower than Raghu and Raghu walks as fast as Guru and Krishna walks faster than Guru. Who walks the fastest? **[RBI (Grade 'B') 2011]**

(a) Raghu (b) Raja
(c) Krishna (d) Both Raghu and Guru
(e) None of these

2. If the 5th date of a month is Tuesday, what date will be 3 days after the 3rd Friday in the month? **[SSC (10+2) 2013]**

(a) 19 (b) 18 (c) 17 (d) 22

3. If 1st October is a Sunday, then 1st November will be

(a) Monday (b) Tuesday
(c) Wednesday (d) Thursday

4. In a queue, Mr X is fourteenth from the front and Mr Y is seventeenth from the end, while Mr Z is exactly in between Mr X and Mr Y. If Mr X is ahead of Mr Y and there are 48 persons in the queue, how many persons are there between Mr X and Mr Z? **[CSAT 2013]**

(a) 6 (b) 7 (c) 8 (d) 9

5. If in a clock, 12 is replaced by 1, 11 by 2, 10 by 3 and so on, then what will be the time in that clock corresponding to 'twenty minutes past three in the usual clock'? **[SBI (Clerk) 2012]**

(a) Twenty minutes past eleven
(b) Forty minutes past ten
(c) Forty minutes past eleven
(d) Twenty minutes past ten
(e) None of the above

25. If each of the digits in the number 92581473 are arranged in ascending order, what will be the difference between the digits, which are fourth from the right and third from the left in the new arrangement?

(a) One (b) Two (c) Three
(d) Four (e) None of these

6. Samant remembers that his brother's birthday is after 15th but before 18th of February, while his sister remembers that her brothers' birthday is after 16th but before 19th of February. On which date, of February, is Samant's brother's birthday?

(a) 16th (b) 18th
(c) 19th (d) 17th

7. Praveen correctly remembers that his father's birthday is after 21st May but before 27th May whereas his sister correctly remembers that their father's birthday is after 24th May but before 30th May. On which day in May was definitely their father's birthday? **[MAT 2012]**

(a) 25th (b) 24th
(c) 26th (d) 25th or 26th

8. Sangeeta remembers that her father's birthday was certainly after 8th but before 13th of December. Her sister Natasha remembers that their father's birthday was definitely after 9th but before 14th of December. On which date of December was their father's birthday?

(a) 10th (b) 11th
(c) 12th (d) Data inadequate

9. Sneha correctly remembers that her father's birthday is before 16th June but after 11th June whereas, her younger brother correctly remembers that their father's birthday is after 13th June but before 18th June and her elder brother

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birthday is on an even date. On what date, in June, is definitely their father's birthday? [Vijaya Bank (Clerk) 2010]

(a) Sixteenth (b) Twelfth
(c) Fourteenth (d) Data inadequate
(e) None of these

10. Five birds Crow, Pigeon, Little pigeon, Big crow and Eagle fly one after other from a tree branch. Big crow flew after Crow but is ahead of Eagle. Pigeon is between Crow and Big crow. Little pigeon is before Crow. Which bird is in the last? [SSC (Constable) 2012]

(a) Pigeon (b) Big crow
(c) Eagle (d) None of these

11. If it is possible to make only one such number with the first, the fourth and the sixth digits of the number 531697, which is the perfect square of a two-digit even number, which of the following will be the second digit of the two digit even number. If no such number can be made, give '@' as the answer and if more than one such numbers can be made, give '©' as the answer.

(a) 4 (b) 2 (c) 6
(d) @ (e) ©

12. In a group of five districts, Akbarpur is smaller than Fatehpur, Dhanbad is bigger than Palamu and Bara Banki is bigger than Fatehpur but not as big as Palamu. Which district is the biggest? [SSC (10+2) 2011]

(a) Akbarpur (b) Fatehpur
(c) Dhanbad (d) Palamu

13. In a class, Neha's rank is 21st from the top and 30th from the bottom. What is the total number of students in that class? [Allahabad Bank (PO) 2012]

(a) 48 (b) 49 (c) 50
(d) 51 (e) 52

14. The positions of the first and fifth digit in the number 53146872 are interchanged. Similarly, the positions of the second and the sixth digit are interchanged and so on. Which of the following will be fifth digit from the right end after the rearrangement?

(a) 2 (b) 4 (c) 6
(d) 1 (e) None of these

Directions (Q. Nos. 15-18) *Study the sets of numbers given below and answer the questions.*

489 541 654 953 783

15. If in each number, the first and the last digit are interchanged, which of the following will be the second highest number?

(a) 489 (b) 541 (c) 654
(d) 953 (e) 783

16. If in each number, all the three digits are arranged in ascending order, which of the following will be the lowest number?

(a) 489 (b) 541 (c) 654
(d) 953 (e) 783

17. If five is subtracted from each of the numbers, which of the following numbers will be the difference between the second digit of second highest number and the second digit of the highest number?

(a) 0 (b) 3 (c) 1
(d) 4 (e) 2

18. If in each number, the first and the second digit are interchanged, which will be the third highest number?

(a) 489
(b) 541
(c) 783
(d) 953
(e) 654

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Directions (Q. Nos. 19-20) *Study the following arrangement of numbers carefully and answer the questions that follow.*

[PNB (Clerk) 2012]

5 7 9 4 8 2 4 2 5 7 8 4 2
9 2 4 8 7 5 2 1 2 5 4 9 7

19. How many such digits are there in the above arrangement each of which is followed by a digit which has a greater value than the first digit?

(a) Eleven (b) Seven
(c) Eight (d) Nine
(e) None of these

20. How many such even digits are there in the above arrangement each of which is immediately preceded and also immediately followed by odd numbers?

(a) Three (b) Four (c) Five
(d) Six (e) None of these

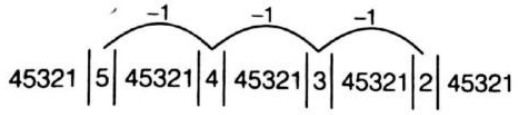
Answer *with* Explanations

A. Base Level Exercise

1. (*b*) 184381 4832878485 68784186

There are four such pairs which are followed by even number and preceded by odd number.

2. (*c*)



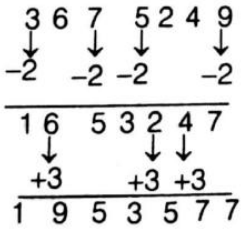
Hence, number 2 will be come in place of question mark.

3. (*e*) 2 /23 /234 /2345 /23456 /234567/234567 8

Hence, next number in the given series will be 8.

4. (*b*) In the given series, there are six 9's followed by and preceded by number divisible by 2.

5. (*b*) Subtract 2 from odd digits in given number and add 3 in even digits



So, answer will be 2 because in new number there are two digit of five and two digit of seven.

6. (*a*) There are six such 5's as shown below

3 5 9 5 4 5 5 3 5 8 4 5 6 7 3 5 7 5 5 4 5
2 3 5 1 0

7. (*c*) The total number of girls = 11 + 11 − 1
= 22 − 1 = 21

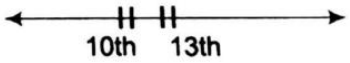
8. (*e*) Total number of boys = (10 + 27 − 1)
= 37 − 1 = 36

So, Rajan's position from the right
= (36 − 10) + 1 = 26 + 1 = 27

9. (*c*) When two boys joined the number of ranks in class reduces by one to go from 45 to 44. Since, the rank of the boy dropped by one it becomes 21th from 20th and it means that the boy who joined were in front of him and one behind him, so his rank is 21th among 47 student, then his rank from behind = 47− 21 + 1 = 27th

10. (*b*) Total student in the class
= 7 + 26 − 1 = 33 − 1 = 32

11. (*d*) When Rahul was shifted by three places towards his right side, then he occupies the middle position, *i.e.*, 13th position.



Thus, his original position from the left end of the row = 13 − 3 = 10th

12. (*c*)

5	3	1	4	6	8	7
1	3	4	5	6	7	8

Hence, two digits 3 and 6 will remain unchanged their positions.

13. (*b*) Given number — 8 3 7 9 1 2
Descending order — 9 8 7 3 2 1

Hence, only one number 7, digit position remain unchanged.

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14. (*b*)

Twenty people	Shifts
First Group of 5	8 am to 4 pm
Second Group of 10	10 am to 4 pm
Third Group of 5	12 noon to 6 pm

Here, timing 12 noon to 2 pm is commonly exist in all the shifts, so the computers are likely to be used most this time.

15. (*c*) In first row, Veena is 12th from starting and 19th from end.
Total number of girls $=(12+19-1)=30$
In second row, Sunita is 14th from starting and 20th from the end.
Then, total number of girls
$= (14 + 20 - 1) = 33$
$\therefore$ Total number of girls $= 30 + 33 = 63$

16. (*a*) Arrange the people according to their age,
$B > A > C > D > E$ ...(i)
From Eq. (i), we can say that A and B are older than C.

17. (*d*)

5	[2]	[3]	1	[6]	9	8
1	[2]	[3]	5	[6]	8	9

Hence, the position of three numbers 2, 3 and 6 will be remain same.

18. (*b*)

6	3	1	[5]	7	8	4
8	7	6	[5]	4	3	1

Hence, only number 5 digit position will be remain same.

19. (*b*)

9	4	3	1	[6]	5	8
1	3	4	5	[6]	8	9

Hence, only number 6 digits position will remain same.

20. (*a*) Given, 972, 682, 189, 298, 751
Make Changes +2 +1
Changed Series 974, 682, 190, 298, 751
$\therefore$ Difference $= 9 - 4 = 5$

21. (*b*) Changed Series →
279, 286, 981, 892, 157
[4] [3] [1] [2] [5]

22. (*a*) Series after in desending order
972, 862, 981, 982, 751
[3] [4] [2] [1] [5]

23. (*d*) After interchange
927, 628, 198, 289, 715
Sum
8

24. (*c*) Series 972, 682, 189, 298, 751
+1 −1
972, 682, 190, 298 750
Series changed difference $= 9 - 5 = 4$

25. (*b*) Ascending order 1 2 3 4 5 7 8 9
$\therefore$ Required difference $= 5 - 3 = 2$

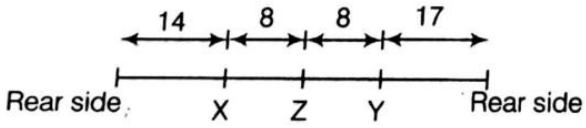
B. Expert Level Exercise

1. (*c*) Arrangement in descending order,
Krishna > Guru > Raghu > Raja
Hence, Krishna is the fastest from all of them.

2. (*a*) If the 5th day of the month is Tuesday. Then, first day of the month will be Friday. The third Friday will fall on 15th of the month. So, the date 3 days after 3rd Friday will be 19th.

3. (*c*) As 1st October is a Sunday. So, 29th October is also a Sunday. Now, 31st October is Tuesday. Hence, 1st November will be Wednesday.

4. (*c*) The arrangement can be drawn as



Position of Z will be after (14+8) = 22th place
Thus, Z is at 23rd.
There are 8 persons sitting between Mr X and Z.

5. (*e*)


Normal clock

Then,


Number change clock

So, the time will be 'Forty five minute past nine' There is no such option according to the answer.

6. (*d*)

According to	Birth Date
Samant	16, (17)
Sister	(17), 18

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Here, 17th is common to both.

Hence, confirm date is 17th February.

7. (*d*) According to Praveen — 22, 23, 24, (25), (26)

According to his sister — (25), (26), 27, 28, 29

So, Common date is 25 or 26.

8. (*d*)

According to	Birth Date
Sangeeta	9, (10), (11), (12)
Natasha	(10), (11), (12), (13)

Here, 10, 11 and 12 three dates are common. So, confirm date cannot be determined.

9. (*c*)

According to	Birth Date
Sneha	12, 13, (14), 15
Younger Brother	(14), 15, 16, 17
Elder Brother	..., (14), 16, ...

Hence, confirm date is fourteenth.

10. (*c*) Arranging all birds in descending order according to distance,

Little pigeon > Crow > Pigeon > Big crow > Eagle.

Hence, Eagle is in the last.

11. (*a*) 5 3 1 6 9 7

| | | |

Perfect square = 576

Square root = $\sqrt{576} = 24$

Hence, second digit = 4

12. (*c*) Dhanbad > Palamu > Bara Banki > Fatehpur > Akbarpur. Hence, Dhanbad district is biggest amongst them.

13. (*c*) Total number of students = Total of both side rank − 1 = 21 + 30 − 1 = 50

14. (*a*) Given number = 53146872

After interchanging the digits,

New number = 68725314

Hence, fifth digit from the right end = 2

15. (*c*) After interchanging the first and the last digit, numbers are 984, 145, 456, 359, 387

Hence, second highest number = 456 ⇒ 654

16. (*b*) Arranging all the digits in ascending order, we get

489, 145, 456, 359, 378

Hence, lowest number = 145 ⇒ 541

17. (*b*) 489 ⇒ 484, 541 ⇒ 536, 654 ⇒ 649,

953 ⇒ 948, 783 ⇒ 778

Hence, required difference = 7 − 4

= 3

18. (*d*) After interchanging first and second digit, numbers are

849, 451, 564, 593, 873.

Hence, third highest number = 593 ⇒ 953

19. (*e*) 5 7 9 4 8 2 5 7 8 4 2 9 2 4 8 7 5 2 1 2 5

4 9 7 ⇒ Thirteen

20. (*a*) 5 7 9 4 8 2 5 7 8 4 2 9 2 4 8 7 5 2 1 2 5

4 9 7 ⇒ Three

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9

Puzzles

Puzzles is a game or problem which tests the logical skill of a candidate, to put a required information together in a logical way, in order to arrive at correct solution of the puzzle.

In this chapter, we deal with questions put in the form of puzzles involving certain number of items, it may be persons or any object. You are required to analyse the given informations, condense it in a suitable form and answer the questions asked. The questions on puzzle test can based on classification, placing arrangement, comparison, sequential order, based on family etc. We have to deal with all types of problems (discussed earlier) in this book.

Types of Questions

Generally, there are three categories of questions based on puzzles

Type 1 Based on Classification

Certain items belonging to different groups or possessing different qualities are given alongwith some clues, with the help of which you are required to group and analyse the given items and answer the questions accordingly. It is advisable to solve classification based puzzle by making table and indicating the given information there. It saves time and make the analysis of information better.

Directions (Illustrations 1-3) *Read the following information carefully and answer the questions given below.*

Ravi and Kunal are good in Hockey and Volleyball. Sachin and Ravi are good in Hockey and Baseball. Gaurav and Kunal are good in Cricket and Volleyball. Sachin, Gaurav and Michael are good in Football and Baseball.

Illustration 1. Who is good in Hockey, Cricket and Volleyball?

(a) Sachin (b) Kunal (c) Ravi (d) Gaurav





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Illustration 2. Who is good in Baseball, Cricket, Volleyball and Football?

(a) Sachin (b) Kunal
(c) Gaurav (d) Ravi

Illustration 3. Who is good in Baseball, Volleyball and Hockey?

(a) Sachin (b) Kunal
(c) Ravi (d) Gaurav

Solutions (Illustrations 1-3) *All the given information can be summarised in the tabular form as given below*

	Hockey	Volleyball	Baseball	Cricket	Football
Ravi	✔	✔	✔	✘	✘
Kunal	✔	✔	✘	✔	✘
Sachin	✔	✘	✔	✘	✔
Gaurav	✘	✔	✔	✔	✔
Michael	✘	✘	✔	✘	✔

1. (*b*) Kunal is good in hockey, cricket and volleyball.
2. (*c*) Gaurav is good in baseball, cricket, volleyball and football.
3. (*c*) Ravi is good in baseball, volleyball and hockey.

Type 2 Based on Placing or Comparison

This type of questions are related to placing, arrangement and comparison. You are required to analyse all the given information, on ascending/descending sequence and then answer the questions accordingly. It is advisable to use the notation such as greater than (>), smaller than (<) and equal to (=) properly according to given condition/information, this gives the candidate analytical view to the puzzle and he/she is able to solve the problem quickly.

Directions (Illustrations 4-6) *Read the following information given below to answer these questions that follow.*

(i) Aarti is older than Sanya.
(ii) Muskan is elder than Aarti but younger than Kashish.
(iii) Kashish is elder than Sanya.
(iv) Sanya is younger than Muskan.
(v) Gargi is the eldest.

Illustration 4. Who is the youngest?

(a) Kashish (b) Aarti
(c) Muskan (d) Sanya

Illustration 5. Agewise, who is in the middle?

(a) Kashish
(b) Aarti
(c) Muskan
(d) Sanya

Illustration 6. Which of the given statement(s) is/are superfluous and can be dispensed with while answering the above questions?

(a) Either (i) or (ii)
(b) Only (iv)
(c) Either (i) or (iii)
(d) Both (iii) and (iv)

Solutions (Illustrations 4 - 6) According to the statements,

(i) Aarti > Sanya
(ii) Kashish > Muskan > Aarti
(iii) Kashish > Sanya
(iv) Sanya < Muskan

Clearly, Kashish > Muskan > Aarti > Sanya, but Gargi is the eldest of all.

Hence, Gargi > Kashish > Muskan > Aarti > Sanya

4. (*d*) Sanya is the youngest one.
5. (c) Agewise, Muskan is in the middle.
6. (*d*) Both the Statements (iii) and (iv) are superfluous.

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Type 3 Family Based Problems

Some clues are provided regarding relationship amongst different members of a family, together with their professions, qualities, colours, dresses and others. You have to analyse the whole information and then answer the given questions accordingly.

Directions (Illustrations 7-10) *Read the following informations carefully and answer the given questions.*

P, Q, R, S, T, V and W are the seven members of a family. There are three female members, each of them has a different profession—Lawyer, Chartered Accountant (CA), Engineer, Teacher, Doctor, Architect and Pharmacist. No lady is either Pharmacist or Chartered Accountant.

Each of them has a different monthly income. The Chartered Accountant earns the most. S, Engineer, earns less than V, the Doctor. R, the Teacher, earns more than P and less than S. W's wife earns the least. T is an unmarried lady Lawyer and she earns less than P and more than only Q. The Pharmacist's income is not the lowest.

Illustration 7. Who earns the least?

(a) P
(b) Q
(c) P or Q
(d) R
(e) None of the above

Illustration 8. What is P's profession?

(a) Pharmacist
(b) Lawyer
(c) Teacher
(d) Cannot be determined
(e) None of the above

Illustration 9. How many members earn less than the Doctor?

(a) 2 (b) 3 (c) 4
(d) 5 (e) None of these

Illustration 10. Which of the following represents the three female members of the family?

(a) PTQ (b) TRQ (c) VTQ
(d) VTR (e) Cannot be determined

Solutions (Illustrations 7-10) *All the given informations can be summarised in the following table*

Person	Profession	Sex
P	Pharmacist	M
Q	Architect	F
R	Teacher	M/F
S	Engineer	M/F
T	Lawyer	F
V	Doctor	M/F
W	Chartered Accountant	M

$Q \longrightarrow W$
Wife

In terms of income

$$Q < T < P < R < S < V < W$$

7. (b) Q earns the least.
8. (a) P is Pharmacist.
9. (d) V is Doctor and Q, T, P, R and S earnsless than V.
10. (e) The females are Q, T and one of R, S and V.

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-3) *Read the following information carefully to answer these questions.* **[MAT 2013]**

Madhu and Shobha are good in Dramatics and Computer Science. Anjali and Madhu are good in Computer Science and Physics. Anjali, Poonam and Nisha are good in Physics and History. Nisha and Anjali are good in Physics and Mathematics. Poonam and Shobha are good in History and Dramatics.

1. Who is good in Physics, History and Mathematics but not in Computer Science?

(a) Madhu (b) Poonam (c) Nisha (d) Anjali

2. Who is good in Physics, History and Dramatics?

(a) Poonam (b) Shobha (c) Madhu (d) Anjali

3. Who is good in History, Physics, Computer Science and Mathematics?

(a) Poonam (b) Nisha (c) Anjali (d) Madhu

Directions (Q. Nos. 4-6) *Read the following information carefully to answer these questions.*

There is a family of six members A, B, C, D, E and F. They are lawyer, doctor, teacher, salesman, engineer and accountant not necessarily in that order. There are two married couples in the family. D, the salesman, is married to the lady teacher. The doctor is married to the lawyer. F, the accountant, is the son of B and brother of E. C, the Lawyer, is the daughter-in-law of A. E is the unmarried engineer. A is the grandmother of F.

4. How is E related to F?

(a) Brother (b) Sister
(c) Cousin (d) None of these

5. What is the profession of B?

(a) Teacher
(b) Doctor
(c) Lawyer
(d) Cannot be determined

6. Which of the following is one of the couples?

(a) F and D
(b) D and B
(c) E and A
(d) None of these

Direction (Q. Nos. 7-9) *Answer the following questions based on the statements given below.*

(i) There are 3 poles on each side of the road.
(ii) These six poles are labelled A, B, C, D, E and F.
(iii) The poles are of different colours namely Golden, Silver, Metallic, Black, Bronze and White.
(iv) The poles are of different heights.
(v) E, the tallest pole, is exactly opposite to the Golden coloured pole.
(vi) The shortest pole is exactly opposite to the Metallic coloured pole.
(vii) F, the Black coloured pole, is located between A and D.
(viii) C, the Bronze coloured pole, is exactly opposite to A.
(ix) B, the Metallic coloured pole, is exactly opposite to F.
(x) A, the White coloured pole, is taller than C but shorter than D and B.

7. What is the colour of the pole diagonally opposite to the Bronze coloured pole?

(a) White (b) Silver
(c) Metallic (d) Golden

8. Which is the second tallest pole?

(a) A (b) D
(c) B (d) None of these

9. Which is the colour of the tallest pole?

(a) Golden
(b) Silver
(c) Bronze
(d) None of the above

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Directions (Q. Nos. 10-12) *Read the following passage carefully and answer the three items that follow.*

[CSAT 2013]

A tennis coach is trying to put together a team of four players for the forthcoming tournament. For this 7 players are available: males A, B and C and females W, X, Y and Z. All players have equal capability and atleast 2 males will be there in the team. For a team of four, all players must be able to play with each other. But, B cannot play with W, C cannnot play with Z and W cannot play with Y.

10. If Y is selected and B is rejected, the team will consist of which one of the following groups?

(a) A, C, W and Y (b) A, C, X and Y
(c) A, C, Y and Z (d) A, W, Y and Z

11. If B is selected and Y is rejected, the team will consist of which one of the following groups?

(a) A, B, C and W (b) A, B, C and Y
(c) A, B, C and X (d) A, W, Y and Z

12. If all the three males are selected, then how many combination of four member teams are possible?

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

Directions (Q. Nos. 13-17) *Study the given information and answer the given questions.*

[IBPS (Clerk)2013]

A, B, C, D, E, F and G are standing in a straight line facing North with equal distances between them, not necessarily in the same order.

Each one is pursuing a different profession—actor, reporter, doctor, engineer, lawyer, teacher and painter not necessarily in the same order.

G is fifth to the left of C. The reporter is third to the right of G. F is fifth to the right of A. E is second to the left of B. The engineer is second to the left of D. There are only three people between the engineer and the painter. The doctor is to the immediate left of the engineer. The lawyer is to the immediate right of the teacher.

13. What is A's profession?

(a) Painter (b) Doctor
(c) Teacher (d) Actor
(e) Engineer

14. Which of the following statements is true according to the given arrangement?

(a) F is the teacher
(b) F is third to the left of E
(c) The painter is to the immediate left of B
(d) The lawyer is standing in the exact middle of the arrangement
(e) None of the above

15. Who among the following is the actor?

(a) E (b) F (c) C
(d) B (e) A

16. What is D's position with respect to the painter?

(a) Third to the left
(b) Second to the right
(c) Fourth to the right
(d) Third to the right
(e) Second to the left

17. Four of the following five are alike in a certain way based on the given standing arrangement and so form a group. Which of the following does not belong to the group?

(a) AED (b) DFC (c) GDB
(d) EBF (e) BFC

Directions (Q. Nos. 18-19) *Examine carefully the following satements and answer the three items that follow.*

Out of four friends A, B, C and D, A and B play football and cricket, B and C play cricket and hockey, A and D play basketball and football, C and D play hockey and basketball

18. Who plays football, basketbal and hockey?

(a) D (b) C (c) B (d) A

19. Which game do B, C and D play?

(a) Basketball (b) Cricket
(c) hockey (d) Football

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Directions (Q. Nos. 20-22) *Read the following information carefully to answer these questions.*

Ramesh, Kailash, Avinash and Jagan are good friends studying in a school. Three of them stay away from the school and one stays nearer to it. Two study in class IV, one in class V and one in class VI. They study Hindi, Maths, Social Science and Science.

One of these four friends is good at all the four subjects while another is weak in all the four subjects. Ramesh stays away from the school and is good at Maths only while Kailash is weak in Maths only and stays close to the school. Neither of these two study in class V or VI. One who is good at all the subjects is studying in class V. Avinash is not studying in class VI.

20. Name the boy who is good at all the subjects

(a) Kailash (b) Jagan
(c) Avinash (d) Ramesh

21. Name the boy who is weak in all the subjects.

(a) Ramesh (b) Kailash (c) Jagan (d) Avinash

22. Which two boys are good at Mathematics?

(a) Jagan and Kailash (b) Kailash and Avinash
(c) Ramesh and Avinash (d) Ramesh and Jagan

Directions (Q. Nos. 23-27) *Read the following information given below to answer the questions.*

(i) Kareena's dieting schedule consists of having only one fruit on a given day of the week.
(ii) Dietician has prescribed banana, papaya, pomegranate, apple and grape from Sunday to Friday, one day being a fasting day. Kareena cannot eat any fruit on Saturday.
(iii) Pomegranate day is neither on the first day nor on the last day but earlier than the papaya day.
(iv) Apple day is on the immediate next day of papaya day.
(v) Banana day is on the immediate previous day of the fasting day.
(vi) Apple day and grape day must have a gap of two days between them.
(vii) Grape day is the day immediately following the fasting day.

23. Which of the following is the fasting day?

(a) Monday (b) Tuesday
(c) Wednesday (d) Thursday

24. Banana day and apple day have a gap of how many days between them?

(a) One (b) Two
(c) Three (d) Four

25. Which day is grape day?

(a) Monday (b) Tuesday
(c) Thursday (d) Sunday

26. Which day is pomegranate day?

(a) Sunday (b) Monday
(c) Tuesday (d) Wednesday

27. Which of the following is the correct statement?

(a) Apple day is after papaya day
(b) Banana day is on Wednesday
(c) Fasting day is on Tuesday
(d) Papaya day is earlier than banana day

Directions (Q. Nos. 28-32) *Study the following information carefully and answer the questions given below.* **[IBPS (Clerk) 2011]**

P, Q, R, S, T, V and W are seven friends. Each of them likes a particular fruit, viz. Apple, Banana, Pear, Guava, Orange, Mango and Watermelon and each of them has a favourite city, viz Mumbai, Pune, Delhi, Kolkata, Chennai, Hyderabad and Cochin.

The choices of fruit and favourite city of the seven friends are necessarily in the same order. Q likes Mango and his favourite city is Chennai. The one whose favourite city is Pune likes Watermelon. T's favourite city is Kolkata.

R likes Guava and his favourite city is not Mumbai. W's favourite city is Cochin and he does not like either Banana or Pear. The favourite city of the one who likes Orange is Hyderabad. T does not like Pear. P's favourite city is neither Pune nor Hyderabad. S does not like Watermelon.

28. Who likes Apple?

(a) W (b) T (c) V
(d) P (e) Data inadequate

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29. Which fruit does P like?
(a) Apple (b) Orange
(c) Pear (d) Watermelon
(e) None of these

30. Which is R's favourite city?
(a) Mumbai
(b) Pune
(c) Hyderabad
(d) Delhi
(e) None of the above

31. Which of the following combinations of Person–Fruit-City is incorrect?
(a) R–Guava–Kolkata
(b) V–Watermelon-Hyderabad
(c) T–Banana–Cochin
(d) S–Guava–Delhi
(e) All are incorrect

32. Which is V's favourite city?
(a) Hyderabad (b) Pune
(c) Mumbai (d) Data inadequate
(e) None of these

B. Expert Level Exercise

Direction (Q. Nos. 1-2) *Answer the questions on the basis of the information given below.*

The head of a newly formed Government desires to appoint five of the six elected ministers P, Q, R, S, T and U to portfolios of Foreign, Industry and Commerce, Agriculture, Rural Development and Human Resources. U does not wants any portfolio if S gets one of the five. R wants either Foreign or Human Resources or no portfolio. Q says that if S gets industry and Commerce or Rural Development, then she must get the other one. T insists on a portfolio if P gets one.

1. Which of the following is a valid assignment?
(a) P-Foreign, Q-Industry and Commerce, R-Agriculture, S-Rural Development, T-Human Resources
(b) R-Foreign, S-Industry and Commerce, P-Agriculture, Q-Rural Development, T-Human Resources
(c) P-Foreign, Q-Industry and Commerce, T-Agriculture, S-Rural Development, U-Human Resources
(d) Q-Foreign, U-Industry and Commerce, T-Agriculture, R-Rural Development, P-Human Resources

2. If P gets Foreign and R gets Human Resources, then which is not a valid assignment of Agriculture and Rural Development?
(a) S-Agriculture, Q-Rural Development
(b) U-Agriculture, Q-Rural Development
(c) Q-Agriculture, T-Rural Development
(d) Q-Agriculture, S-Rural Development

Directions (Q. Nos. 3-7) *Study the following information carefully and answer the following questions.*

A, B, C, D, E, G, and I are seven friends who study in three different standards namely 5th, 6th and 7th such that not less than two friends study in the same standard. Each friend also has a different favourite subject namely History, Civics, English, Marathi, Hindi, Maths and Economics, but not necessarily in the same order.

A likes Maths and studies in the 5th standard with only one other friend who likes Marathi. I studies with two other friends. Both the friends who study with I like languages (Here, languages include only Hindi, Marathi and English).

D studies in the 6th standard with only one person and does not like Civics. E studies with only one friend. The one who likes history does not study in 5th or 6th standard. E does not like languages. C does not like English, Hindi or Civics.

3. Which combination represents E's favourite subject and the standard in which he studies?
(a) Civics and 7th (b) Economics and 5th
(c) Civics and 6th (d) History and 7th
(e) Economics and 7th

4. Which of the following is I's favourite subject?
(a) History
(b) Civics
(c) Marathi
(d) Either English or Marathi
(e) Either English or Hindi

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5. Who amongst the following studies in the 7th standard?

(a) G (b) C (c) E
(d) D (e) Either D or B

6. Which of the following combinations is definitely correct?

(a) I and Hindi (b) G and English
(c) C and Marathi (d) B and Hindi
(e) E and Economics

7. Which of the following subjects does G like?

(a) Either Maths or Marathi
(b) Either Hindi or English
(c) Either Hindi or Civics
(d) Either Hindi or Marathi
(e) Either Civics or Economics

Directions (Q. Nos. 8-12) *Study the following information carefully and answer the questions given below.* **[SBI (PO) 2013]**

Eight people—E, F, G, H, J, K, L and M are sitting around a circular table facing the centre. Each of them is of a different profession — Chartered Accountant, Columnist, Doctor, Engineer, Financial Analyst, Lawyer, Professor and Scientist, but not necessarily in the same order. F is sitting second to the left of K. The Scientist is an immediate neighbour of K. There are only three people between the Scientist and E. Only one person sits between the Engineer and E. The Columnist is to the immediate right of the Engineer. M is second to the right of K. H is the Scientist. G and J are immediate neighbours of each other. Neither G nor J is an Engineer. The Financial Analyst is to the immediate left of F. The Lawyer is second to the right of the Columnist. The Professor is an immediate neighbour of the Engineer. G is second to the right of the Chartered Accountant.

8. Who is sitting second to the right of E?

(a) The Lawyer (b) G (c) The Engineer (d) F (e) K

9. Who amongst the following is the Professor?

(a) F (b) L (c) M (d) K (e) J

10. Four of the following five are alike in a certain way based on the given arrangement and hence from a group. Which of the following does not belong to that group?

(a) Chartered Accountant - H (b) M - Doctor (c) J-Engineer
(d) Financial Analyst-L (e) Lawyer - K

11. What is the position of L with respect to the Scientist?

(a) Third to the left (b) Second to the right
(c) Second to the left (d) Third to the right
(e) Immediate right

12. Which of the following statements is true according to the given arrangement?

(a) The Lawyer is second to the left of the Doctor
(b) E is an immediate neighbour of the Financial Analyst
(c) H sits exactly between F and the Financial Analyst
(d) Only four people sit between the Columnist and F
(e) All of the given statements are true

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Directions (Q. Nos. 13-15) *Study the following information carefully to answer the questions given below it.*

Seven professionals A, B, C, D, E, F and G are practicing their professions in different cities Chennai, Bengaluru, Hyderabad, Mumbai, Ahmedabad, Jaipur and Bhubaneshwar not necessarily in the same order. Each has a different profession Doctor, Engineer, Pharmacist, Lawyer, Counsellor, Professor and Artist not necessarily in the same order.

A is a Pharmacist and practises in Bhubanes hwar. D practises in Bengaluru but is not a Doctor or an Artist. The one who practises in Hyderabad is a Professor. G is a Counsellor and does not practise in Mumbai or Chennai. E is a Lawyer and practises in Ahmedabad. F practises in Chennai, but is not an Artist. C practises in Mumbai.

13. What is D's profession?

(a) Doctor (b) Professor (c) Engineer (d) Cannot be determined
(e) None of these

14. Which of the following combinations of profession and place is correct?

(a) Pharmacist—Jaipur (b) Engineer—Chennai
(c) Doctor—Bengaluru (d) Artist—Mumbai
(e) None of these

15. Who is the Doctor?

(a) D (b) B (c) C (d) B or C (e) None of these

Answer *with* Explanations

A. Base Level Exercise

Solutions (Q. Nos. 1-3) *Data is arranged as follows*

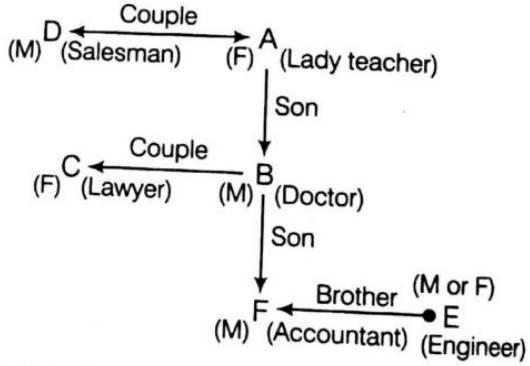
Madhu	—	Dramatics, Computer Science and Physics
Sobha	—	Dramatics, Computer Science and History
Anjali	—	Computer Science, Physics, History and Mathematics
Poonam	—	Physics, History and Dramatics
Nisha	—	Physics, History and Mathematics

1. (c) Nisha is good in Physics, History and Mathematics.

2. (a) Poonam is good in Physics, History and Dramatics.

3. (c) Anjali is good in given four subjects.

Solutions (Q. Nos. 4-6) *Following information is arranged as follows*



4. (d) As it is not clear that E is male or female, so we cannot conclude that E is brother or sister of F.

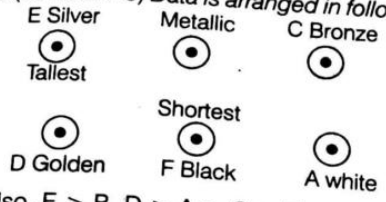
5. (b) The profession of B is Doctor.

6. (d) D, A and C, B are married couples.

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Solutions (Q. Nos. 7-9) *Data is arranged in following way*



Also, E > B, D > A > C > F

7. (*d*) As shown above, the colour of the pole diagonally opposite to the Bronze coloured pole is Golden.

8. (*d*) As comparison between B and D is not given so it can not determined who is second tallest.

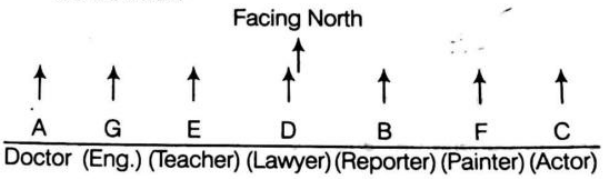
9. (*b*) Silver coloured pole is the tallest pole.

10. (*b*) Given that Y is selected. So option (a) is out. W cannot play with Y so option (d) is out. C cannot play with Z,Which means that option (c) is also out. Which means that the right answer is (b).

11. (*c*) Given that B is selected and Y is rejected which means that option (d) is out. Given that cannot play with W which means option (a) is out. Also C cannot play with Z which means option (b) is out. The right answer is thus (c).

12. (*b*) If all three males are selected then three of the team members are A, B and C. Now, W cannot be part of the team beacause she cannot play with B and Z cannot be selected because she cannot play with C. Hence, there can be only two combinations of four member teams, *i.e.*, ABCX and ABCY.

Solutions (Q. Nos. 13-17) *From the given information, standing arrangement and profession of the persons are as follow*



13. (*b*) A is a Doctor.

14. (*d*) The lawyer is standing in the exact middle of the arrangement.

15. (*c*) C is a Actor.

16. (*e*) Second to the left.

17. (*e*) BFC, does not follow the group.

Solutions (Q. Nos. 18-19)

	Foot Ball	Cricket	Hockey	Basketball
A	✔	✔		✔
B	✔	✔	✔	
C		✔	✔	✔
D	✔		✔	✔

18. (*a*) As, Shown in table, D plays football, hockey and basketball.

19. (*b*) B, C and D play Hockey.

20. (*c*) From the above table, Avinash is good in all the subjects.

21. (*c*) Jagan is weak in all the subjects.

22. (*c*) Ramesh and Avinash are good at Mathematics

Characteristics/ Friends	Stay away	Stay near	IV	V	VI	Subjects			
						Hindi	Maths	Social Science	Science
Ramesh	✔		✔				✔		
Kailash		✔	✔			✔		✔	✔
Avinash	✔			✔		✔	✔	✔	✔
Gagan	✔				✔				

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Solutions (Q. Nos. 23-27) *Following information is arranged as under*

Week days	Fruit
Sunday	Banana
Monday	Fast
Tuesday	Grapes
Wednesday	Pomegranate
Thrusday	Papaya
Friday	Apple
Saturday	No fruit day

23. (*a*) Monday is the fasting day.

24. (*d*) Banana day and apple day have 4 days gap.

25. (*b*) Tuesday is the grape day.

26. (*d*) Wednesday is the pomegranated day.

27. (*a*) Clearly Shown is table, Apple day is after papaya day.

B. Expert Level Exercise

1. (*b*) **2.** (*a*) S is not insisted to get agriculture.

Solutions (Q. Nos. 3-7) *Making table, on the basis of information given in the questions.*

Friends	Standard	Subject
A	V	Maths
B	VII	Hindi/English
C	V	Marathi
D	VI	Economics
E	VI	Civics
G	VII	Hindi/English
I	VII	History

3 (*c*) E's favourite subject is civics and he studies in 6th standard

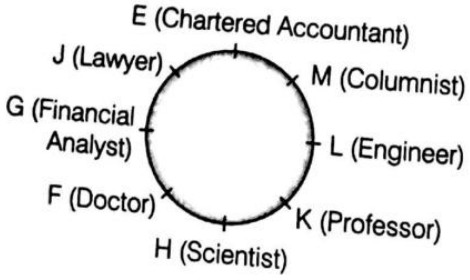
4. (*a*) History is the favourite subject of I.

5. (*a*) G, studies in 7th standard in the given options.

6. (*c*) C's favourite subject is Marathi.

7. (*b*) G likes either Hindi or English

Solutions (Q. Nos. 8-12)



Solutions (Q. Nos. 28-32)

Person	Favourite Fruit	Favourite City
P	Pear	Mumbai
Q	Mango	Chennai
R	Guava	Delhi
S	Orange	Hyderabad
T	Banana	Kolkata
V	Watermelon	Pune
W	Apple	Cochin

28. (*a*) W like Apple.

29. (*c*) P like Pear.

30. (*d*) R's favourite city is Delhi.

31. (*e*) All combinations are incorrect.

32. (*b*) V's favourite city is Pune.

8. (*b*) G is sitting second to the right of E.

9. (*d*) K is the professor.

10. (*c*) Except J-Engineer, in all other options, there are three persons between first and second person.

11. (*b*) The position of L with respect to the scientist is second to the right.

12. (*a*) Only Statement I is true.

Solutions (Q. Nos. 13-15)

Professionals	Profession	City
A	Pharmacist	Bhubaneshwar
B	Professor	Hyderabad
C	Artist	Mumbai
D	Engineer	Bengaluru
E	Lawyer	Ahmedabad
F	Doctor	Chennai
G	Counsellor	Jaipur

13. (*c*) D is an Engineer.

14. (*d*) Artist—Mumbai.

15. (*e*) F is the Doctor.

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10

Number Series

Number series is a sequential arrangement of number following a certain defined pattern.

In this chapter, we deal with the questions in which series of numbers, which are generally called the terms of the series is given. These terms follow a certain pattern throughout the series. Candidates are asked either to find a missing number or to find the one that does not follow the pattern of the series. A number series can be formed by using various characteristics of numbers and by using various type of calculations.

Types of Questions

There are mainly two types of questions which are asked in various competitive exams

Type 1 To Find a Missing Term

Here, we are given a sequence of numbers including one or more missing numbers. This series follows a pattern, keeping this pattern in mind, we will have to find the missing term.

Illustration 1. 1, 3, 5, 7, 9, ?

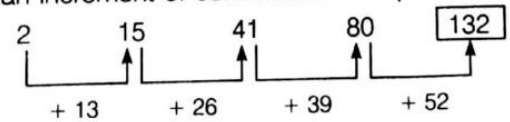
(a) 10 (b) 11 (c) 12 (d) 13

Solution (*b*) This series is a sequence of consecutive odd numbers hence, the missing term will be 11.

Illustration 2. 2, 15, 41, 80, ?

(a) 111 (b) 120 (c) 121 (d) 132

Solution (*d*) Here, there is an increment of consecutive multiples of 13 in consecutive terms.



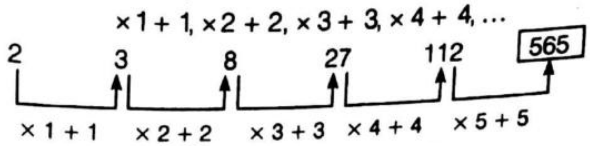
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Illustration 3. 2, 3, 8, 27, 112, ?

(a) 226 (b) 339
(c) 452 (d) 565

Solution (d) The pattern is

$\times 1 + 1, \times 2 + 2, \times 3 + 3, \times 4 + 4, \ldots$



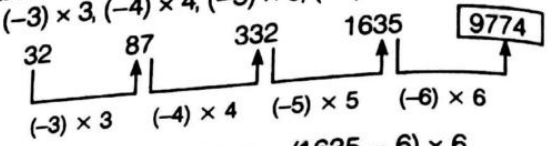
Hence, missing term $= 112 \times 5 + 5$
$= 560 + 5 = 565$

Illustration 4. 32, 87, 332, 1635, ?

(a) 9000 (b) 8775
(c) 9774 (d) 6549

Solution (c) The pattern is

$(-3) \times 3, (-4) \times 4, (-5) \times 5, (-6) \times 6, \ldots$



Hence, missing term $= (1635 - 6) \times 6$
$= 9774$

Type 2 To Find the Number that does not Follow the Pattern

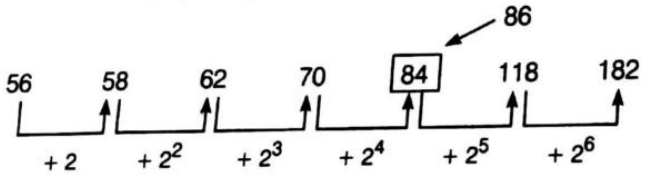
Here, we are given a sequence of number. Whole sequence except one number follow a certain rule. You have to find that number which does not follow the rule.

Illustration 5. 56, 58, 62, 70, 84, 118, 182

(a) 58 (b) 62
(c) 84 (d) 118

Solution (c) The pattern is

$+ 2, + 2^2, + 2^3, + 2^4, + 2^5, + 2^6$



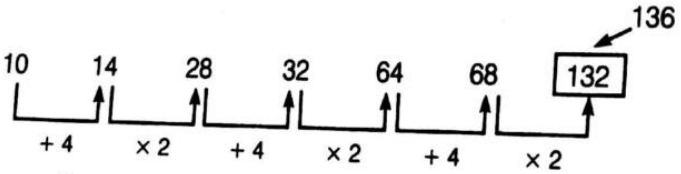
$\therefore$ Correct number $= 70 + 2^4$
$= 70 + 16 = 86$

Illustration 6. 10, 14, 28, 32, 64, 68, 132

(a) 28 (b) 32
(c) 64 (d) 132

Solution (d) The correct pattern is

$+ 4, \times 2, + 4, \times 2$

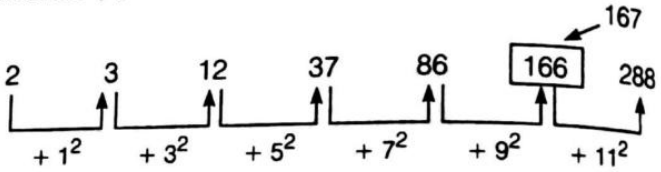


So, 132 is wrong and must be replaced by $68 \times 2 = 136$

Illustration 7. 2, 3, 12, 37, 86, 166, 288

(a) 2 (b) 3
(c) 166 (d) 86

Solution (c)



Series moves with the addition of squares of odd natural numbers, *i.e.*, 1, 9, 25, 49, 81, 121.

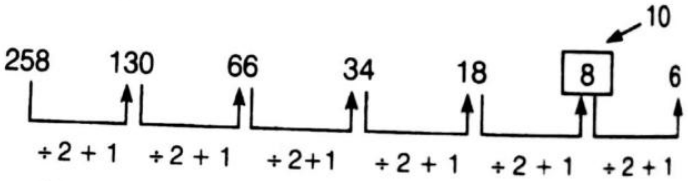
Hence, the number 166 should be replaced by number 167.

Illustration 8. 258, 130, 66, 34, 18, 8, 6

(a) 130 (b) 66
(c) 34 (d) 8

Solution (d) The correct pattern is

$\div 2 + 1, \div 2 + 1, \ldots$



Hence, number 8 is wrong and should be replaced by 10.

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Miscellaneous Patterns of the Series

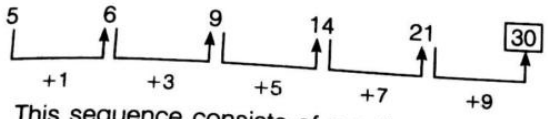
Some of the different series based on some particular patterns are discussed below

1. Based on addition/subtraction of consecutive odd /even numbers These questions have a pattern of addition or subtraction of even or odd numbers.

Illustration 9. 5, 6, 9, 14, 21, ?

(a) 26 (b) 28 (c) 30 (d) 34

Solution (c)

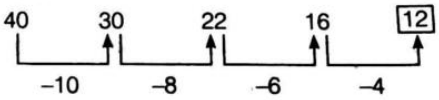


This sequence consists of a pattern of addition of consecutive odd numbers.

Illustration 10. 40, 30, 22, 16, ?

(a) 10 (b) 12 (c) 15 (d) 17

Solution (b)



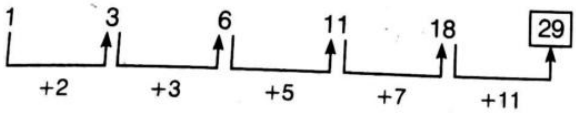
This sequence consists of a pattern of subtracting the even numbers, respectively.

2. Based on addition/subtraction of prime numbers These questions have a pattern of addition/subtraction of prime numbers.

Illustration 11. 1, 3, 6, 11, 18, ?

(a) 25 (b) 29 (c) 32 (d) 35

Solution (b)

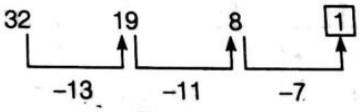


This sequence consists of a pattern of addition of prime numbers.

Illustration 12. 32, 19, 8, ?

(a) 12 (b) 3 (c) 1 (d) 5

Solution (c)



This sequence consists of a pattern of subtraction of prime numbers.

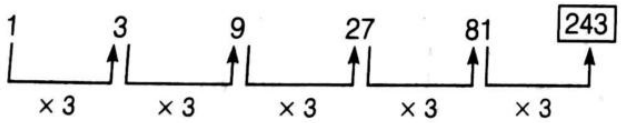
3. Based on multiplication or division These questions have a pattern based on multiplication and division.

Illustration 13. 1, 3, 9, 27, 81, ?

(a) 216 (b) 220

(c) 243 (d) 250

Solution (c)



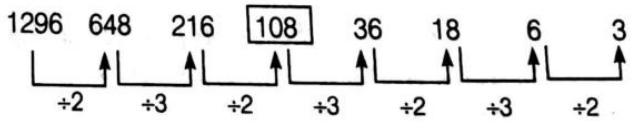
Next number of this series is multiplication of 3 with previous one.

Illustration 14. 1296, 648, 216, ?, 36, 18, 6, 3

(a) 112 (b) 108

(c) 106 (d) 110

Solution (b)



Here terms are divided by 2 and 3 alternately. So missing term is obtained as $\frac{216}{2} = 108$

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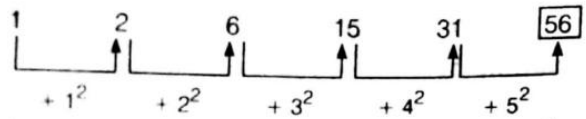
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4. Based on addition/subtraction of squares of natural numbers These questions consist of a pattern based on addition/subtraction of squares of natural numbers.

Illustration 15. 1, 2, 6, 15, 31, ?

(a) 56 (b) 64
(c) 60 (d) 58

Solution (a)

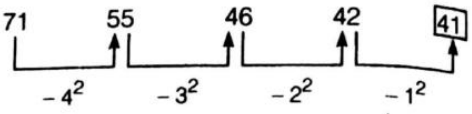


This sequence is based on addition of consecutive squares of natural numbers.

Illustration 16. 71, 55, 46, 42, ?

(a) 40 (b) 41 (c) 39 (d) 38

Solution (b)



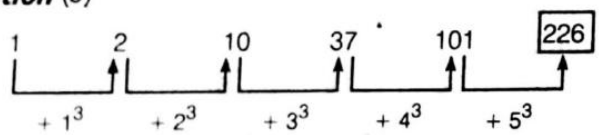
This sequence is based on subtraction of squares of natural numbers.

5. Based on addition/subtraction of cubes of natural numbers These questions consist of a sequence based on addition/ subtraction of cubes of natural numbers.

Illustration 17. 1, 2, 10, 37, 101, ?

(a) 402 (b) 206
(c) 226 (d) 320

Solution (c)

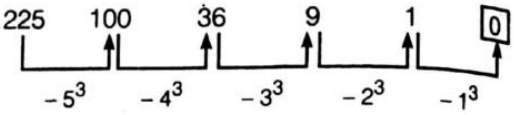


This sequence is based on addition of consecutive cubes of natural numbers.

Illustration 18. 225, 100, 36, 9 1 ?

(a) 7 (b) 6 (c) 0 (d) 1

Solution (c)



This sequence is based on subtraction of consecutive cubes of natural numbers.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-44) *In each of the following questions, a number series is given with one of the terms missing. Choose the correct alternative that will continue the same pattern and replace the question mark (?) in the given series.*

1. 21, 23, 27, 33, ?
(a) 37 (b) 41 (c) 43 (d) 49

2. 68, 67, 64, 59, ?
(a) 52 (b) 53 (c) 54 (d) 56

3. 0, 2, 6, 8, 16, 30, 54, ? **[MAT 2011]**
(a) 74 (b) 88
(c) 100 (d) 110

4. 4, ?, 144, 400, 900, 1764 **[SSC (Steno) 2012]**
(a) 25 (b) 36
(c) 49 (d) 100

5. 2, 10, 30, 68, ? **[SSC (Steno) 2012]**
(a) 125 (b) 130
(c) 128 (d) 135

6. 6, 11, 21, 36, 56, ?
(a) 42 (b) 51 (c) 81 (d) 91

7. 8, 14, 26, 44, 68, ?
(a) 71 (b) 78 (c) 84 (d) 98

8. 3, 9, 6, 36, 30, ? **[SSC (10+2) 2013]**
(a) 900 (b) 800
(c) 950 (d) 400

9. 36, 34, 30, 28, 24,? **[SSC (Steno) 2013]**
(a) 23 (b) 26 (c) 20 (d) 22

10. 97, 90, 76, 55, ?
(a) 28 (b) 27 (c) 26 (d) 25

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11. 1, 6, 15, ?, 45, 66, 91 [SSC (10+2) 2011]
(a) 25 (b) 26
(c) 27 (d) 28

12. 5, 11, 23, 47, 95, ?
(a) 190 (b) 191
(c) 161 (d) 169

13. 7, 12, 19, 28, 39, ?
(a) 52 (b) 50
(c) 51 (d) 48

14. 2, 6, 12, ?, 30 [SSC (Steno) 2011]
(a) 18 (b) 24
(c) 20 (d) 26

15. 24, 6, 18, 9, 36, 9, 24, ? [United Bank (Clerk) 2011]
(a) 24 (b) 12 (c) 8
(d) 6 (e) 26

16. 2, 1, 4, 3, 6, 5, 8, ?
(a) 9 (b) 10
(c) 7 (d) 8

17. 1, 4, 27, 256,
(a) 625 (b) 3125
(c) 3025 (d) 1225

18. 285, 253, 221, 189,?
(a) 122 (b) 153
(c) 157 (d) 151

19. 8, 3, 11, 14, 25, ?
(a) 50 (b) 39
(c) 29 (d) 11

20. 3, 8, 27, 112, ?, 3396
(a) 565 (b) 452
(c) 560 (d) 1530

21. 2, 9, 28, 65, ? [CDS 2012]
(a) 121 (b) 195
(c) 126 (d) 103

22. 31, 13, 45, 54, ?, 63
(a) 36 (b) 54
(c) 61 (d) 58

23. 8, 27, 64,?
(a) 216 (b) 224
(c) 64 (d) 125

24. 6, 9, 12, 15, 18, ? [SSC (Multitasking) 2013]
(a) 21 (b) 20
(c) 19 (d) 22

25. 107, 97, 82, 62, ?
(a) 52 (b) 42
(c) 47 (d) 37

26. 30, 68, 130, 222, ?, 520, 738 [SSC (FCI) 2012]
(a) 420 (b) 350
(c) 250 (d) 280

27. 2, 29, 38, 47, ? [SSC (CGL) 2014]
(a) 59 (b) 56
(c) 52 (d) 58

28. 17, 43, 81, 131, ?
(a) 375 (b) 468
(c) 300 (d) 193

29. 3.5, 7, 10.5, 14, ? [SSC (Multitasking) 2013]
(a) 15.5 (b) 16.5
(c) 18.5 (d) 17.5

30. 3, 128, 6, 64, 9, ?, 12, 16, 15, 8 [IB (ACIO) 2012]
(a) 32 (b) 12
(c) 108 (d) 72

31. 24, 60, 120, 210 ? [MAT 2013]
(a) 300 (b) 336
(c) 420 (d) 525

32. 462, 420, 380, ?, 306
(a) 322 (b) 332
(c) 342 (d) 352

33. 10, 33, 102, 309,?
(a) 1030 (b) 1050
(c) 928 (d) 930

34. 8, 16, 28, 44, ? [SSC (Multitasking) 2014]
(a) 62 (b) 64
(c) 66 (d) 60

35. 2, 8, 18, 32, 50, ? [SSC (10+2) 2013]
(a) 64 (b) 72
(c) 70 (d) 68

36. 1, 3, 7, 15, 31, ? [SSC (10+2) 2013]
(a) 37 (b) 36
(c) 73 (d) 63

37. 0, 3, 8, 15, 24, ?, 48 [SSC (Multitasking) 2014]
(a) 41
(b) 29
(c) 37
(d) 35

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38. 4, 11, 30, 67, 128 ? [SSC (10+2) 2013]
(a) 219 (b) 228
(c) 231 (d) 237

39. 5, 6, 9, 14, 21, ? [SSC (10+2) 2013]
(a) 28 (b) 30
(c) 31 (d) 29

40. 5, 16, 51, 158, ? [SSC (CGL) 2013]
(a) 1452 (b) 483
(c) 481 (d) 1454

41. 11, 29, 55, ?, 131 [SSC (CPO) 2013]
(a) 110 (b) 81
(c) 89 (d) 78

42. 198, 194, 185, 169, ? [SSC (CPO) 2013]
(a) 92 (b) 136
(c) 144 (d) 112

43. 0,1,1,2,3,5,8,13, 21, ? [CLAT 2013]
(a) 34 (b) 35
(c) 33 (d) 36

44. 17, 36, 74, 150, ?, 606 [CLAT 2013]
(a) 250 (b) 303
(c) 300 (d) 302

45. Find the missing number in the series 4, 18, ..., 100, 180, 294. [IB (ACIO) 2013]
(a) 32 (b) 36
(c) 48 (d) 40

B. Expert Level Exercise

Directions (Q. Nos. 1-30) *In each of the following questions, one of the terms in the number series is wrong. Find out the wrong term.*

1. 160, 118, 83, 65, 34, 20
(a) 83 (b) 118 (c) 34 (d) 65

2. 3, 10, 19, 30, 42, 58, 75
(a) 10 (b) 42 (c) 19 (d) 58

3. 2, 4, 16, 256, 65535
(a) 65535 (b) 256
(c) 4 (d) 16

4. 888, 454, 237, 128.5, 76.25, 47.125
(a) 76.25 (b) 454
(c) 128.5 (d) 237

5. 10, 14, 28, 32, 64, 68, 132 [CDS 2011]
(a) 28 (b) 32
(c) 64 (d) 132

Directions (Q. Nos. 46- 47) *In each of the following question, one of the terms in the number series is missing. Choose the correct alternative that will complete the series.*

46. 26, 37, 50, 65, 82, ?
(a) 93 (b) 98
(c) 105 (d) 101

47. 13 (168) 13, 14 (181) 13, 15 (?) 13
(a) 190 (b) 194
(c) 195 (d) 196

48. What should come next in the following series?
9 8 7 6 5 4 3 2 1 9 8 7 6 5 4 3 2 9 8 7 6 5 4 3 9 8 7 6 5 4 9 8 7
(a) 5 (b) 4 (c) 6
(d) 1 (e) None of these

49. What should come next in the following series?
1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 9 8 7 6 5 4 3 2 1 2 3
(a) 5
(b) 6
(c) 7
(d) 4
(e) None of the above

6. 146, 74, 40, 23, 19.5, 18.75
(a) 74 (b) 23 (c) 19.5
(d) 18.75 (e) 40

7. 3, 6, 10, 16, 21, 28
(a) 16 (b) 10
(c) 15 (d) 28

8. 2, 3, 5, 8, 12, 18, 23
(a) 13 (b) 15
(c) 16 (d) 18

9. 17, 23, 31, 41, 53, 69
(a) 23 (b) 31 (c) 41 (d) 69

10. 17, 19, 23, 25, 29, 37
(a) 23 (b) 37 (c) 29 (d) 25

11. 1788, 892, 444, 220, 112, 52, 24 [RBI (Grade B) 2011]
(a) 52 (b) 112 (c) 220
(d) 444 (e) None of these

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12. 3, 7, 13, 23, 31, 43
(a) 23 (b) 7 (c) 43 (d) 31

13. 17, 36, 53, 83, 92 [SSC (CGL) 2012]
(a) 92 (b) 53 (c) 68 (d) 83

14. 9, 16, 25, 36, 49, 61 [SSC (Steno) 2012]
(a) 16 (b) 9 (c) 49 (d) 61

15. 2, 8, 3, 27, 4, 64, 5, 225 [IB (ACIO) 2011]
(a) 27 (b) 8
(c) 225 (d) 64

16. 20, 40, 200, 400, 2000, 4000, 8000 [Andhra Bank (Clerk) 2011]
(a) 200 (b) 2000 (c) 8000
(d) 4000 (e) None of these

17. 9, 14, 19, 25, 32, 40 [EPFO 2012]
(a) 14 (b) 25 (c) 32
(d) 9 (e) 19

18. 11, 5, 20, 12, 40, 26, 74, 54
(a) 5 (b) 20
(c) 40 (d) 26

19. 125, 126, 124, 127, 123, 129
(a) 126 (b) 124
(c) 123 (d) 129

20. 2, 10, 50, 500, 1000
(a) 2 (b) 10
(c) 50 (d) 1000

21. 24, 27, 31, 33, 36
(a) 24 (b) 27 (c) 31 (d) 33

22. 1, 5, 5, 9, 7, 11, 11, 15, 12, 17
(a) 11 (b) 12
(c) 17 (d) 15

23. 8, 13, 21, 32, 47, 63, 83
(a) 13 (b) 32
(c) 47 (d) 63

24. 22, 37, 52, 67, 84, 97 [SSC (Multitasking) 2013]
(a) 52 (b) 84 (c) 97 (d) 67

25. 4, 31, 130, 349, 728, 1339
(a) 31 (b) 130
(c) 349 (d) 728

26. 1, 4, 8, 16, 31, 64, 127, 256 [UP B.Ed. 2011]
(a) 31 (b) 16
(c) 8 (d) None of these

27. 27, 26, 28, 25, 29, 24, 31
(a) 28 (b) 26 (c) 29 (d) 31

28. 2, 3, 6, 12, 24, 58
(a) 2 (b) 3 (c) 12 (d) 58

29. 33792, 8448, 2148, 528, 132, 33, 8.25
(a) 2148 (b) 528
(c) 8448 (d) 132

30. 2, 7, 24, 77, 236, 723, 2180
(a) 7 (b) 77
(c) 24 (d) 236

Directions (Q. Nos. 31-35) *Find the one that does not belong to the group.* [SSC (FCI) 2012]

31. 75, 79, 72, 80, 69, 83, 66
(a) 79 (b) 83 (c) 69 (d) 72

32. 1, 8, 27, 64, 127, 216
(a) 216 (b) 64
(c) 27 (d)127

33. 6, 12, 21, 32, 45, 60
(a) 6 (b) 12 (c) 21 (d) 32

34. 8, 27, 125, 343, 1331
(a) 8 (b) 343
(c) 1331 (d) None of these

35. 2, 3, 9, 27, 112, 565, 3396
(a) 565 (b) 9 (c) 112 (d) 27

Directions (Q. Nos. 36-39) *In each of the following question, one term in the number series is wrong. Find out the wrong term.* [IDBI Bank (PO) 2011]

36. 1, 2, 6, 24, 120, 620, 5040
(a) 5040 (b) 620 (c) 120
(d) 24 (e) None of these

37. 56, 72, 90, 110, 132, 150
(a) 72 (b) 90 (c) 110
(d) 150 (e) None of these

38. 1236, 2346, 3456, 4566, 5686
(a) 1236 (b) 3456 (c) 4566
(d) 5686 (e) None of these

39. 1, 5, 5, 9, 7, 11, 11, 15, 12, 17
(a) 11 (b) 12
(c) 17 (d) 15
(e) None of these

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Answer *with* Explanations

A. Base Level Exercise

1. (*b*) 21, 23, 27, 33, [41]; +2, +4, +6, +8

2. (*a*) 68, 67, 64, 59, [52]; −1, −3, −5, −7

3. (*c*) 2 + 6 ⇒ 8
2 + 6 + 8 ⇒ 16
6 + 8 + 16 ⇒ 30
8 + 16 + 30 ⇒ 54
16 + 30 + 54 ⇒ [100]

4. (*b*) 4, [36], 144, 400, 900, 1764
$(2)^2$, $(6)^2$, $(12)^2$, $(20)^2$, $(30)^2$, $(42)^2$
+4, +6, +8, +10, +12

5. (*b*) 2, 10, 30, 68, [130]
$(1)^3+1, (2)^3+2, (3)^3+3, (4)^3+4, (5)^3+5$

6. (*c*) 6, 11, 21, 36, 56, [81]; +5, +10, +15, +20, +25

7. (*d*) 8, 14, 26, 44, 68, [58]; +6, +12, +18, +24, +30

8. (*a*) 3, 9, 6, 36, 30, [900]; ×3, −3, ×6, −6, ×30

9. (*d*) 36, 34, 30, 28, 24, [22]; −2, −4, −2, −4, −2

10. (*b*) 97, 90, 76, 55, [27]; −7, −14, −21, −28

11. (*d*) 1, 6, 15, [28], 45, 66, 91; +5, +9, +13, +17, +21, +25
Hence, it is clear from above series that the missing term is 28.

12. (*b*) 5, 11, 23, 47, 95, [191]
+(1×6), +(2×6), +(4×6), +(8×6), +(16×6)

13. (*a*) 7, 12, 19, 28, 39, [52]; +5, +7, +9, +11, +13

14. (*c*) The pattern of the series is
2, 6, 12, [20], 30; +4, +6, +8, +10; +2, +2, +2

15. (*b*) The pattern of the series is
24, 6, 18, 9, 36, 9, 24, [12]; ×4, ×2, ×4, ×2

16. (*c*) 2, 1, 4, 3, 6, 5, 8, [7]; +2, +2, +2, +2, +2, +2

17. (*b*) Series is as follows
$(1)^1 = 1$
$(2)^2 = 4$
$(3)^3 = 27$
$(4)^4 = 256$
$(5)^5 = 3125$

18. (*c*) 285, 253, 221, 189, 157; −32, −32, −32, −32

19. (*b*) 8 + 3 = 11
3 + 11 = 14
11 + 14 = 25
14 + 25 = [39]

20. (*a*) 3, 8, 27, 112, [565], 3396; (×2)+2, (×3)+3, (×4)+4, (×5)+5, (×6)+6

21. (*c*) 2, 9, 28, 65, [126]
$(1)^3+1$, $(2)^3+1$, $(3)^3+1$, $(4)^3+1$, $(5)^3+1$

22. (*a*) 31, 13, 45, 54, 36, 63
Interchange, Interchange, Interchange

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23. (*d*) 8 27 64 125

(2^3) (3^3) (4^3) (5^3)

24. (*a*) 6 9 12 15 18 [21]

+3 +3 +3 +3 +3

25. (*d*) 107 97 82 62 [37]

−10 −15 −20 −25

26. (*b*) 30 68 130 222 [350] 520 738

+38 +62 +92 +128 +170 +218

+24 +30 +36 +42 +48

+6 +6 +6 +6

27. (*b*) 2 29 38 47 [56]

+1 +1 +1

−1 −1 −1

So, the correct alternative is 56.

28. (*d*) 17 43 81 131 [193]

+26 +38 +50 +62

+12 +12 +12

29. (*d*) 3.5 7 10.5 14 [17.5]

+3.5 +3.5 +3.5 +3.5

30. (*a*) 3 128 6 64 9 [32] 12 16 15 8

+3 +3 +3 +3

Then, × 2 × 2 × 2 × 2

31. (*b*) 24 60 120 210 [336]

+36 +60 +90 +126

24 30 36

32. (*c*) 462 420 380 [342] 306

−42 −40 −38 −36

33. (*d*) 10 33 102 309 [930]

×3+3 ×3+3 ×3+3 ×3+3

34. (*b*) 8 16 28 44 [64]

+8 +12 +16 +20

+4 +4 +4

35. (*b*) 2 8 18 32 50 [72]

+6 +10 +14 +18 +22

+4 +4 +4 +4

36. (*d*) 1 3 7 15 31 [63]

×2+1 ×2+1 ×2+1 ×2+1 ×2+1

37. (*d*) $1^2 - 1 = 0$

$2^2 - 1 = 3$

$3^2 - 1 = 8$

$4^2 - 1 = 15$

$5^2 - 1 = 24$

$6^2 - 1 = [35]$

$7^2 - 1 = 28$

38. (*a*) 4 11 30 67 128 [219]

+7 +19 +37 +61 +91

+12 +18 +24 +30

+6 +6 +6

39. (*b*) 5 6 9 14 21 [30]

+1 +3 +5 +7 +9

40. (*c*) The sequence of the series is as follows

$5 \times 3 + 1 = 16$

$16 \times 3 + 3 = 51$

$51 \times 3 + 5 = 158$

$158 \times 3 + 7 = [481]$

41. (*c*) $3^2 + 2 = 11$

$5^2 + 4 = 29$

$7^2 + 6 = 55$

$9^2 + 8 = [89]$

$11^2 + 10 = 131$

42. (*c*) 198 194 185 169 [144]

-2^2 -3^2 -4^2 -5^2

43. (*a*) The number is the addition of previous two number

So, $0 + 1 = 1$,

$1 + 1 = 2$,

$2 + 3 = 5$,

$5 + 8 = 13$,

$13 + 21 = [34]$

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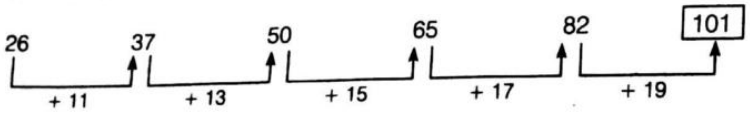
44. (*d*) Series is $\times 2 + 2$, $\times 2 + 2$,...

So, next term is $= 150 \times 2 + 2 = 302$

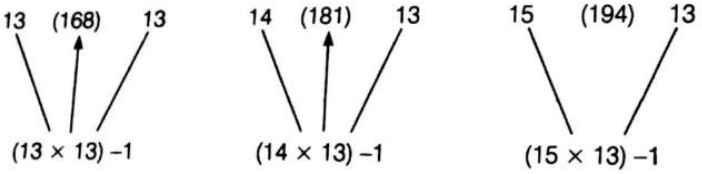
45. (*c*)

4	18	48
↓	↓	↓
$2^2 \times 1$	$3^2 \times 2$	$4^2 \times 3$
100	180	294
↓	↓	↓
$5^2 \times 4$	$6^2 \times 5$	$7^2 \times 6$

46. (*d*)



47. (*b*)



Hence, missing term $= 15 \times 13 - 1 = 195 - 1 = 194$

48. (*c*) 9 8 7 6 5 4 3 2 1

9 8 7 6 5 4 3 2

9 8 7 6 5 4 3

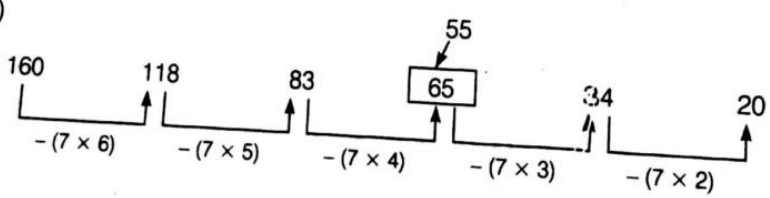
9 8 7 6 5 4

9 8 7 [6]

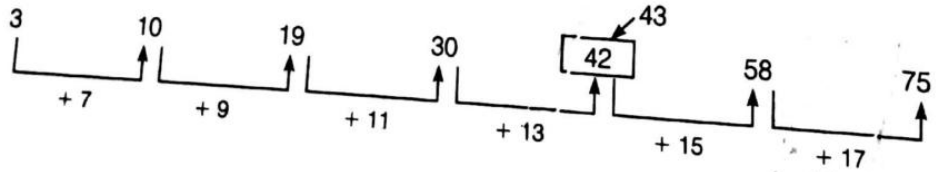
49. (*d*) 1 2 3 4 5 6 7 8 | 9 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 | 9 8 7 6 5 4 3 2 | 1 2 3 [4]

B. Expert Level Exercise

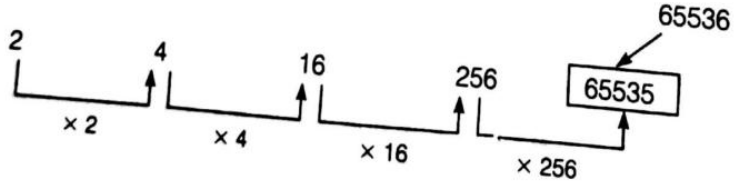
1. (*d*)



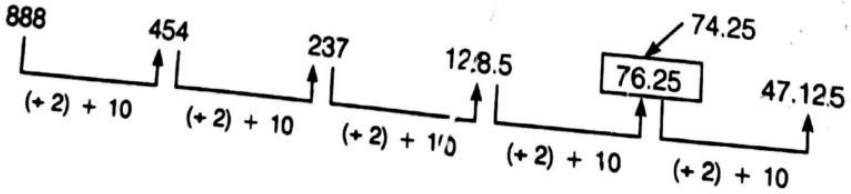
2. (*b*)



3. (*a*)



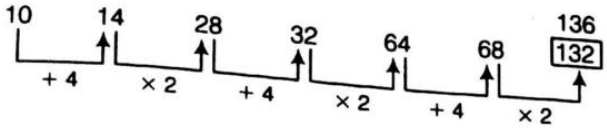
4. (*a*)



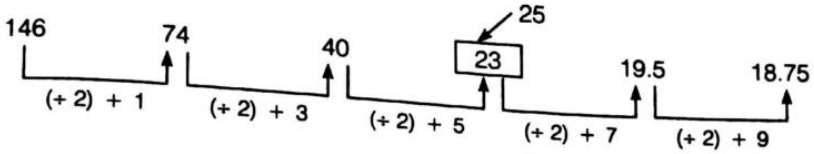
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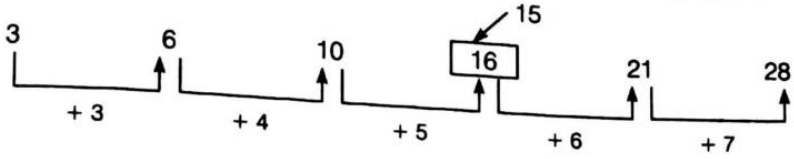
5. (*d*)



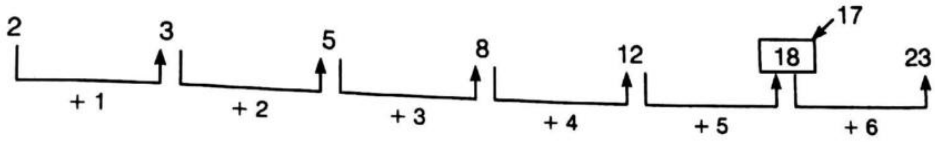
6. (*b*)



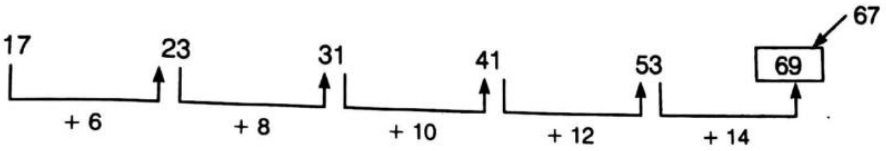
7. (*a*)



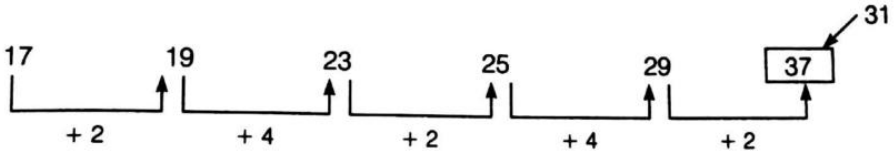
8. (*d*)



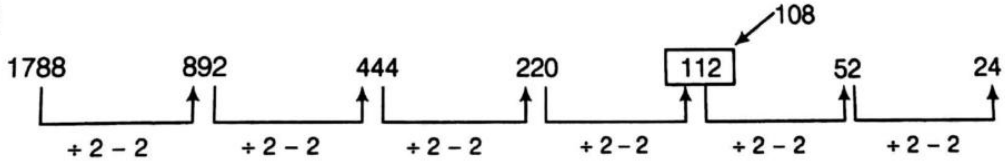
9. (*d*)



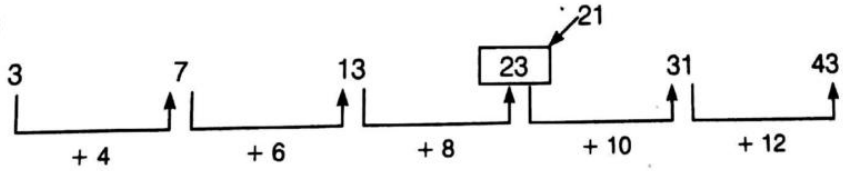
10. (*b*)



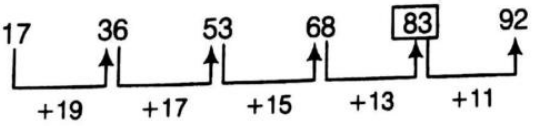
11. (*b*)



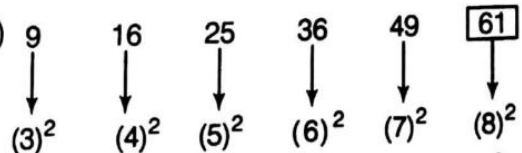
12. (*a*)



13. (*d*)



14. (*d*)

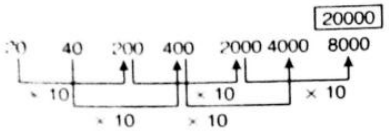


15. (*c*) The pattern of the series is $2^3 = 8, 3^3 = 27, 4^3 = 64, 5^3 = 125$

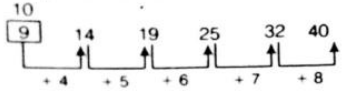
Hence, 125 will come in place of 225.

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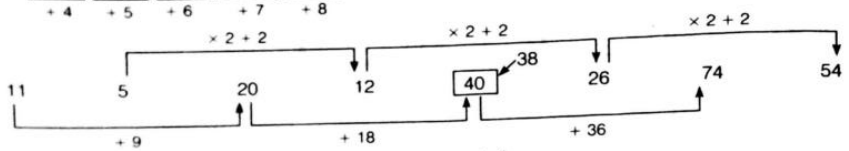
16. (c)



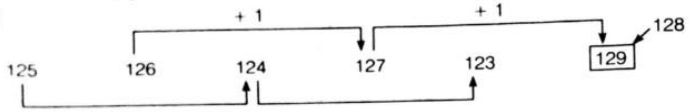
17. (d) The pattern of the series is



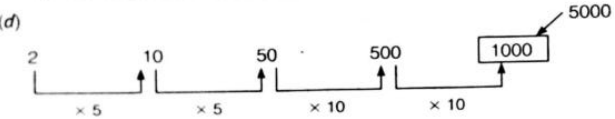
18. (c)



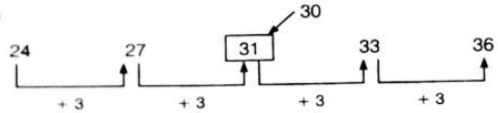
19. (d)



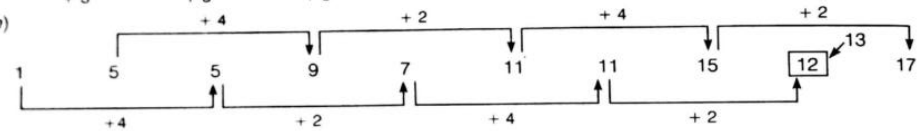
20. (d)



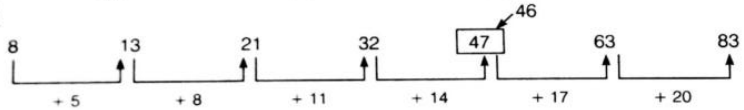
21. (c)



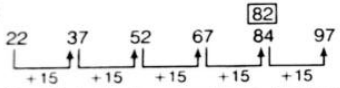
22. (b)



23. (c)



24. (b)



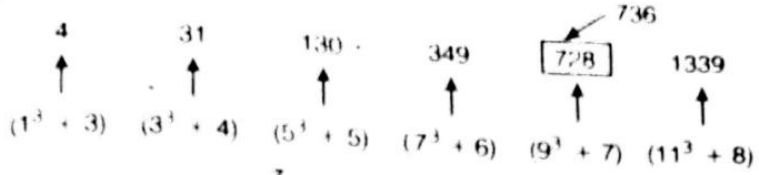
So, 84 is the incorrect term, it should be 82.

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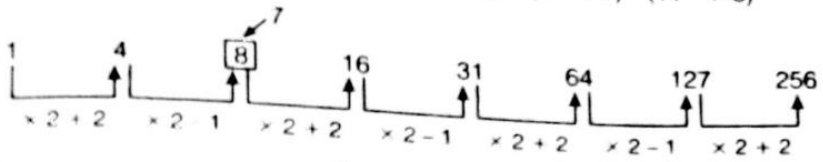
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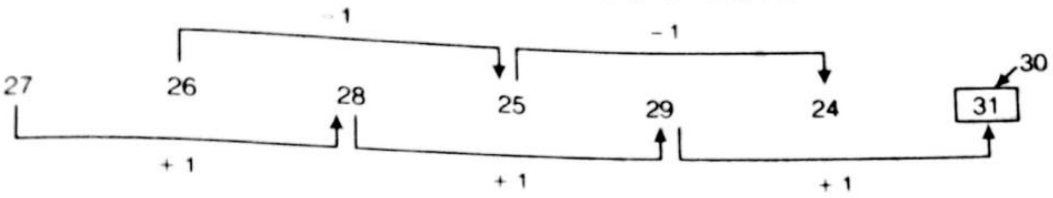
25. (d)



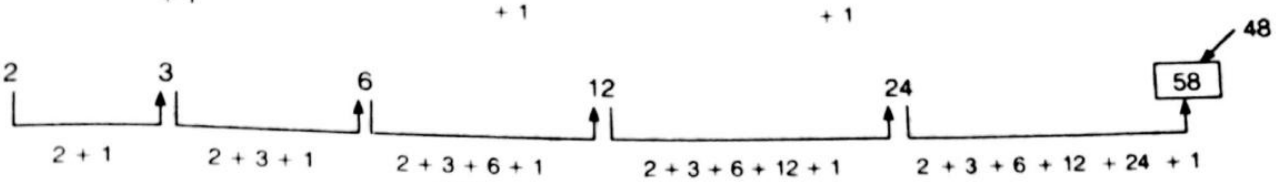
26. (c)



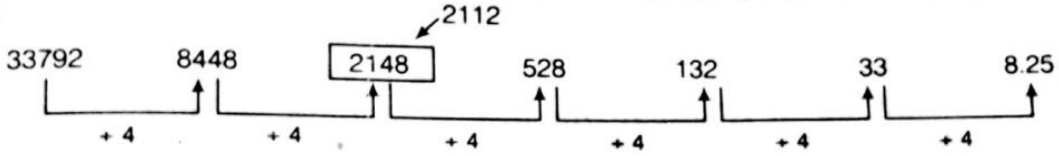
27. (d)



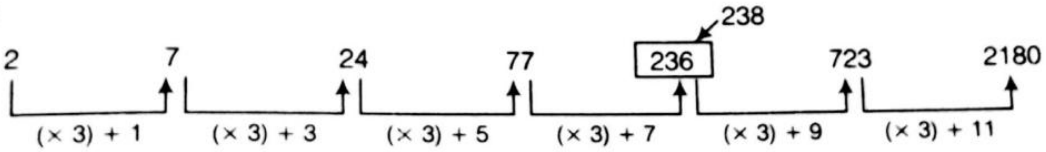
28. (d)



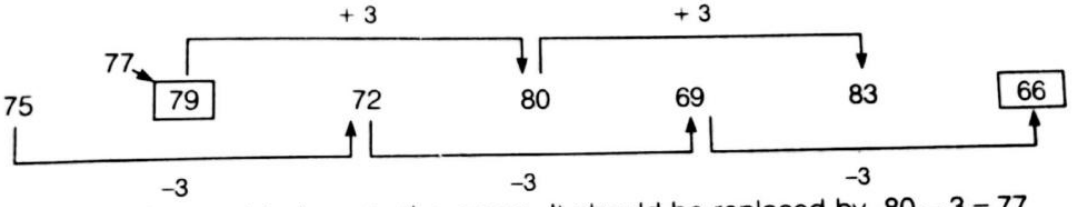
29. (a)



30. (d)

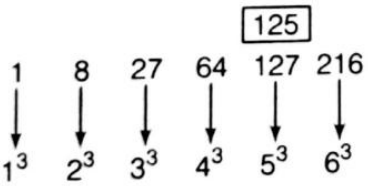


31. (a)



Thus, 79 does not belong to the group. It should be replaced by, 80 − 3 = 77

32. (d)

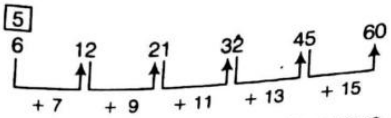


Thus, 127 does not belong to the group. It should be replaced by $5^3 = 125$.

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33. (*a*) [5]



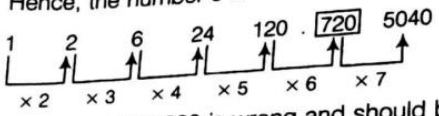
Thus, 6 does not belong to the group.
Here, difference between the number is in odd digit.

34. (*d*) The numbers are cubes of prime numbers *i.e.*, $2^3, 3^3, 5^3, 7^3, 11^3$. Clearly, none is wrong.

35. (*b*) Series follows the pattern $2 \times 1 + 1 = 3$, $3 \times 2 + 2 = 8$, $8 \times 3 + 3 = 27$, $27 \times 4 + 4 = 112$ and so on.

Hence, the number 9 should be replaced by 8.

36. (*b*)



Hence, number 620 is wrong and should be replaced by 720.

37. (*d*) The numbers are 7×8, 8×9, 9×10, 10×11, 11×12, 12×13.

So, 150 is wrong and must be replaced by (12×13) *i.e.*, 156.

38. (*d*) The first digits of the numbers form the series 1, 2, 3, 4, 5; the second digits form the series 2, 3, 4, 5, 6; third digits form the series 3, 4, 5, 6, 7; while the last digit in each of the numbers is 6.

So, 5686 is wrong and must be replaced by 5676.

39. (*b*) The given sequence is a combination of two series

I. 1, 5, 7, 11, 12 II. 5, 9, 11, 15, 17

The pattern in both I and II is +4, +2, +4, +2.

So, 12 is wrong and must be replaced by $(11 + 2)$ *i.e.*, 13.

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11

Letter Series

Letter series is a logical arrangement of English alphabets arranged in specified pattern.

In this chapter, a series of single pairs or groups of letters or combinations of letters are given. Each pair or single element is called the term. The terms of the series form a certain pattern based on the position of the letters in the English alphabets. You are required to identify this pattern and find the missing or wrong term in the given series which will satisfy the pattern.

Types of Questions

There are mainly two types of questions asked from letter series in various competitive exams. They are as follows

Type 1 Alphabet Series

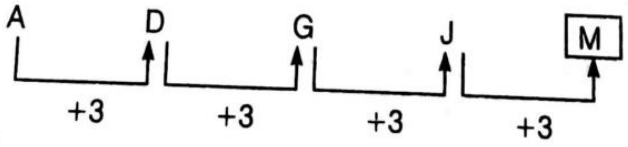
In this type, the terms of the series form a particular pattern as based on the position of the letters in the English alphabets.

Illustration 1. Find the next term in the series.

A, D, G, J, ?

(a) K (b) L (c) M (d) N

Solution (c) Each next term of the series is next third letter of the alphabets (according to position).



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Illustration 2. Find the next two terms of the given series.

Z, S, W, O, T, K, Q, G, ?, ?

(a) N, C (b) N, D (c) O, C (d) O, D

Solution (a) The given sequence is a combination of two series.

I. Z, W, T, Q, ? and II. S, O, K, G, ?

Now,

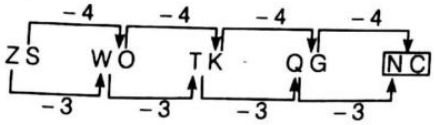


Illustration 3. Find the missing term in the given sequence.

RUA, UBG, XIL, APP, DWS, ?

(a) PIT (b) GBM (c) GDU (d) PQL

Solution (c) The given sequence is a combination of three series.

I. R, U, X, A, D, ?

II. U, B, I, P, W, ?

III. A, G, L, P, S, ?

Now,

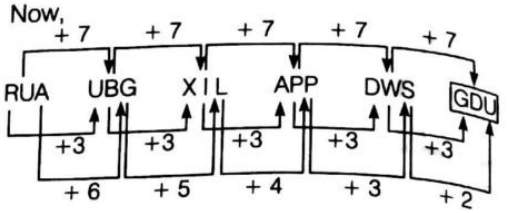


Illustration 4. Find the missing term in the given sequence.

AB, DEF, HIJK, ?, STUVWX

(a) LMNO

(b) LMNOP

(c) MNOPQ

(d) QRSTU

Solution (c) The number of letters in the terms of the given series increases by one at each step. The first letter of each term is two steps ahead of the last letter of the preceding term. However, each term consists of consecutive letter in order. So, missing term will be MNOPQ.

Type 2 Continuous Pattern Series

In this type a series of small/capital letters are given which follow a particular pattern. However, some letters are missing from the series. In some of the questions involving alphabetical series, a set of letters is given four or five times with blank spaces or question mark in between. The series follows a specific pattern and you are required to find the letter which should come in place of the blank space or question mark.

Directions (Illustrations 5-6) *These questions are based on the letter series. In each of these series, some of the letters are missing. Select the correct alternatives.*

Illustration 5. abca_bcaab_ca_bbc_a

(a) ccaa (b) bbaa (c) abac (d) abba

Solution (c) The pattern of the series is

abc / a<u>a</u>bc / aab<u>b</u>c / a<u>a</u>bbc<u>c</u> / a ⇒ abac

In each subsequent block, one new letter is introduced to form a series aa ... bb ... cc ...

Illustration 6. _cb_ca_bacb_ca_bac_d

(a) addddb (b) addbbb

(c) bddddb (d) bbbddd

Solution (a) The pattern of the series is

<u>a</u>cb<u>d</u> / ca<u>d</u>b / acb<u>d</u> / ca<u>d</u>b / ac<u>b</u>d ⇒ addddb

The sequence is made of repetition of two blocks 'acbd' and 'cadb' alternatively.

Tip

In continuous pattern series, firstly, count the total given letters and blanks and secondly, find out the how many multiple of numbers are exist in the series like as an above example, there are 20 places which having letters and blanks so 20 could be the multiple of

$= 4 \times 5 \quad = 5 \times 4 \quad = 10 \times 2 = 2 \times 10$

Here, we prefer 20 as 4 × 5 because series are divide in 5 part and <u>abcd</u> is exists in each pair as acbd/cadb/acbd/cadb/acbd

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-41) *In each of the following questions, various terms of an alphabet series are given with one or more terms missing as shown by (?). Choose the missing terms out of the given alternatives.*

1. A, C, F, J, ?
(a) K (b) O (c) M (d) N

2. A, Z, D, Y, G, X, ?, ?
(a) W, J (b) J, W (c) W, K (d) K, W

3. B, I, P, ?, D **[Punjab Grameen Bank (Clerk) 2011]**
(a) U (b) W (c) S
(d) R (e) None of these

4. E, J, ?, T, Y, D **[SBI (Associates) 2012]**
(a) B (b) O (c) F
(d) J (e) None of these

5. A, C, F, J, ?, ?
(a) L, P (b) M, O (c) O, U (d) R, V

6. A, D, E, H, I, L, ?, ?
(a) M, P (b) M, N (c) M, O (d) M, Q

7. C, F, I, L, O, ? **[Bank of Maharashtra (Clerk) 2011]**
(a) R (b) S (c) T
(d) U (e) None of these

8. D, H, L, P, T, ? **[Bank of Maharashtra (Clerk) 2011]**
(a) Z (b) A (c) B
(d) X (e) None of these

9. A I B J C K ? **[SSC (Multitasking) 2014]**
(a) EM (b) EL (c) DL (d) DM

10. W, T, P, M, I, F, B, ?, ? **[SSC (CPO) 2012]**
(a) Z, V (b) X, U (c) Y, U (d) Y, V

11. X, Q, K, F, ?
(a) E (b) B (c) C (d) D

12. W, T, Q, N
(a) J (b) K (c) L (d) M

13. A, Z, B, Y, C, X, ?, ? **[SSC (10+2) 2011]**
(a) E, V (b) W, D (c) D, W (d) Y, V

14. A, P, C, Q, E, R, G, ?, ? **[RRB (ASM) 2012]**
(a) S, I (b) H, I (c) I, S (d) T, J

15. NZ, OY, PX, QW, RV, ? **[SSC (Multitasking) 2013]**
(a) FS (b) SU (c) UF (d) TU

16. AC, FH, K__, PR, UW **[SSC (Multitasking) 2013]**
(a) L (b) J (c) M (d) N

17. AZ, BY, CX, ?
(a) EW (b) EU (c) GH (d) DW

18. DF, GI, KM, NQ, RT, ? **[MAT 2013]**
(a) UW (b) YZ (c) XZ (d) UX

19. KDY, FJW, HIU, JHS, ? **[SSC (10+2) 2013]**
(a) LFQ (b) LGQ (c) KGR (d) KFR

20. AC, EG, IK, MO, ? **[IBPS (Clerk) 2011]**
(a) PR (b) QS (c) QR
(d) PS (e) None of these

21. AC, FH, KM, PR, ? **[SSC (Multitasking) 2014]**
(a) UX (b) TV (c) UW (d) VW

22. DF, GJ, KM, NQ, RT, ? **[SSC (CGL) 2012]**
(a) UX (b) UW (c) YZ (d) XZ

23. IKMO, TVXZ, ?, LMNO **[SSC (Steno) 2012]**
(a) ABCD (b) CEGH (c) EGIK (d) GIKN

24. YVP, WTN, URL, ? **[SSC (10+2) 2013]**
(a) VSP (b) SRJ (c) SPJ (d) TQL

25. OAC, PBD, QCE, RDF, ? **[MAT 2013]**
(a) SGH (b) SHI (c) SEG (d) SIJ

26. AMV, BNW, COX, ?, EQZ
(a) DMO (b) DPY (c) DYP (d) DLZ

27. AFI, JOR, MRU, ? **[SSC (CGL) 2013]**
(a) GJN (b) HMP (c) PMO (d) RJL

28. FLU, GMV, HNW, IOX, ? **[Allahabad Bank (Clerk) 2011]**
(a) JYP (b) WYP (c) WPY
(d) JPY (e) None of these

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29. BMW, DNV, FOU, ?
(a) GHO (b) GPS (c) HPS (d) HPT

30. BCD, BDC, CBD, ?, EQZ
(a) CDB (b) CCD (c) CDE (d) DCB

31. CIG, FLJ, IOM, ? **[SSC (FCI) 2012]**
(a) LRP (b) JLG (c) PSU (d) QUB

32. BFG, HLM, NRS, ? **[SSC (FCI) 2012]**
(a) TWX (b) RVW (c) TYZ (d) TXY

33. AZY, EXW, IVU, ? **[SSC (10+2) 2011]**
(a) MTS (b) MQR (c) NRQ (d) LST

34. DKM, FJP, HIS, JHV, ? **[SSC (CPO) 2013]**
(a) LGY (b) HGY (c) IGZ (d) IGY

35. bc, cde, de, efg, fg, ? **[SSC (CGL) 2013]**
(a) ghi (b) fgh (c) hij (d) ijk

36. OTE, PUF, QVG, RWH, ?
(a) SYJ (b) TXI (c) SXJ (d) SXI

37. CEG, IKM, OQS, ?
(a) VXZ (b) TVX (c) TUV (d) UWY

38. CFL, EIK, GLJ, IOI, ?
(a) KRH (b) KRJ
(c) JRU (d) KOV

39. BXF, DVI, FTL, HRO, ?
(a) IOL (b) KPM (c) KPL (d) JPR

40. BEAG, DGCI, FIKE, ? **[SSC (CGL) 201**
(a) HMIE (b) HKGM (c) HGKJ (d) HKLJ

41. ABCD, BCDA, CDAB, ?, ABCD **[SSC (FCI) 201**
(a) DADC (b) DABC (c) DBAC (d) DACB

42. What should come next in the following letter series?
A B C D P Q R S A B C D E P Q R S T A B C D E F P Q R S T
(a) A (b) V (c) U
(d) W (e) None of these

43. What should come next in the following letter series?
P Q P Q R P Q R S P Q R S T P Q R S T U P Q R S T U V P Q R S T
(a) S (b) U (c) Q
(d) R (e) None of these

44. What should come next in the following letter series?
A B C D E F Z Y X W V U A B C D E Z Y X W V U A B C D Z Y X W V
(a) U (b) A (c) B
(d) Z (e) None of these

B. Expert Level Exercise

Directions (Q. Nos. 1-10) *These questions are based on the letter series. In each of these series, some letters are missing. Select the correct alternative.*

1. ab_d_ _ b_dm_ _x_ _
(a) xmaxabda (b) xmaxabdm
(c) mxaxabdm (d) mxaxbadm

2. mc_m_a_ca_ca_c_mc **[SSC (10+2) 2013]**
(a) acmmma (b) camcam
(c) aaacmm (d) acmmc

3. b_ab_ b_aab_b **[SSSC (CGL) 2013]**
(a) abbb (b) abba (c) baaa (d) aaba

4. _bcab_cabc_abca _b **[SSC (CGL) 2013]**
(a) abca (b) aabc (c) bbca (d) abac

5. _ _r_ttp_ _s__tp_ _ _s_ _ _
(a) pqrssqtpqrtp (b) pqstrsqptrst
(c) pqsqrsqrrtpq (d) None of these

6. pqr_ _rs _ rs _ _s_q _ **[SSC (FCI) 201**
(a) spqpprr (b) pqrrppq
(c) sqppqpr (d) sqprrqr

7. bc_bca_ cab_ ab_a_ca **[SSC (10+2) 201**
(a) abcab (b) cabac (c) abccb (d) cabca

8. _ bb_c_bg_b_g **[SSC (10+2) 201**
(a) cbgbc (b) cgbcb (c) cgbcc (d) gbcbb

9. a_c_ba_ca_cb **[SSC (10+2) 201**
(a) abcc (b) acba (c) bcaa (d) bcba

10. _OPQ, N_PQ, NO_Q, NOP_ **[SSC (Steno) 201**
(a) ONQP (b) NOQP (c) NOPQ (d) PQNO

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Directions (Q. Nos. 11-20) *In each of the following questions, a letter series is given. Some of the letters of the series are missing. These missing letters are given in same order as one of the four alternatives below the series. Find out the correct alternatives.*

11. l_n_mllm_n_l
(a) mnmn (b) mnnm (c) mnmm (d) nmmn

12. _bbm_amb_m_a_bb
(a) mbabm (b) abmab (c) mabam (d) ambbm

13. a_n_b_ _ncb_ _ncb
(a) bcabab (b) bacbab (c) abcbcb (d) abbcc

14. _aa_ba_bb_ab_aab
(a) babab (b) aaabb (c) bbaab (d) bbbaa

15. cc_ccbc_accbcc_c_b_
(a) acacc (b) abacc (c) ababc (d) aabcc

16. _stt_tt_tts_
(a) tsst (b) sstt (c) ttst (d) tsts

17. ac_ga_eg_ce_
(a) dbag (b) ecag (c) deag (d) ebdg

18. ac_bacc_a_cba_cb
(a) cbcc (b) cbbc (c) caac (d) bbcb

19. nc_ln_clncc_nc_l_ccl
(a) cclcc (b) ccncc (c) clclc (d) cclcn

20. _c_ca_ab_bc_
(a) abcac (b) babca (c) ccabb (d) acbba

irections (Q. Nos. 21-30) *In each of the following letter series, some of the letters are missing, which are given in the same order as one of the alternatives below it. Choose the correct alternatives.*

1. _cb_ca_bacb_ca_bac_d
(a) addddb (b) addbbb (c) bddddb (d) bbbddd

2. c_bba_cab_ac_ab_ac
(a) bcacb (b) babcc (c) abcbc (d) acbcb

23. a_bc_a_bcda_ccd_bcd_
(a) abddbd (b) acbdbb (c) adbbad (d) adbcad

24. _c_bd_cbcda_a_db_a
(a) bdbcba (b) daabbc (c) cdbbca (d) adabcd

25. a_bc_c_abb_bca_
(a) abbba (b) accba (c) cccbc (d) cbbac

26. _A'B_B' AA'_ BB'_A **[SSC (FCI) 2012]**
(a) A'BAB' (b) A'B'AB (c) ABAB (d) AB'A'B

27. _zy_zxy_yxzx_zyx_xy **[SSC (Steno) 2011]**
(a) yxzyz (b) zxyzy (c) yzxyx (d) xyzzy

28. a_ba_c_aad_aa_ea **[SSC (CGL) 2012]**
(a) babbb (b) babbd (c) babbc (d) bacde

29. aa_aabb_b_aa_aabb_bb **[UP B.Ed. 2011]**
(a) bbbaa (b) bbbba (c) aabbb (d) babba

30. ab_y abc_xw abcdev_ **[SBI (PO) 2011]**
(a) z, d, u (b) d, x, u (c) c, d, u
(d) z, y, w (e) None of these

Directions (Q. Nos. 31-35) *In each of the following questions, a letter series is given. Some of the letters of the series are missing. These missing letters are given in the same order as one of the four alternatives below the series. Find out the correct alternatives.*

31. H_JH_IJHHI_HH_JH
(a) IHJI (b) HIHI (c) IHIJ (d) HJHJ

32. ZYX_W_YZZ_XWWXY_
(a) WXYZ (b) WYXZ (c) WXZY (d) XYZW

33. ZX_TR_NLJ_FD_
(a) VPHB (b) VRHB (c) UPJB (d) VPJB

34. ac_cab_baca_aaa_aba **[SSC (CPO) 2011]**
(a) aabc (b) aacb (c) babb (d) bcbb

35. _b_baaabb_a_ _bb_ a_ **[RRB (ASM) 2012]**
(a) abbaaba (b) ababbaa
(c) babaaba (d) baabaab

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Answer *with* Explanations

A. Base Level Exercise

1. (b) A C F J [O]
+2 +3 +4 +5

2. (b) A Z D Y G X [J] [W]
−1 −1 −1
+3 +3 +3

3. (b) B I P [W] D
+7 +7 +7 +7

4. (b) E J [O] T Y D
+5 +5 +5 +5 +5

5. (c) A C F J [O] [U]
+2 +3 +4 +5 +6

6. (a) A D E H I L [M] [P]
+3 +1 +3 +1 +3 +1 +3

7. (a) C F I L O [R]
+3 +3 +3 +3 +3

8. (d) D H L P T [X]
+4 +4 +4 +4 +4

9. (c) A I B J C K [D] [L]
+1 +1 +1 +1 +1 +1

10. (c) W T P M I F B [Y] [U]
−3 −4 −3 −4 −3 −4 −3 −4

11. (b) X Q K F [B]
−7 −6 −5 −4

12. (b) W T Q N [K]
−3 −3 −3 −3

13. (c) A Z B Y C X [D] [W]
−1 −1 −1
+1 +1 +1

14. (a) A P C Q E R G [S] [I]
+1 +1 +1
+2 +2 +2 +2

15. (b) NZ OY PX QW RV [SU]
−1 −1 −1 −1 −1
+1 +1 +1 +1 +1

16. (c) A C F H K [M] P R U W
+2 +3 +2 +3 +2 +3 +2 +3 +2

17. (d) A Z B Y C X [DW]
−1 −1 −1
+1 +1 +1

18. (d) DF GJ KM NQ RT [UX]
+4 +3 +4 +3 +4
+3 +4 +3 +4 +3

19. (b)
D (4) +2 F (6) +2 H (8) +2 J (10) +2 [L (12)]
K (11) −1 J (10) −1 I (9) −1 H (8) −1 [G (7)]
Y (25) −2 W (23) −2 U (21) −2 S (19) −2 [Q (17)]

20. (b)
A +4 E +4 I +4 M +4 [Q]
C +4 G +4 K +4 O +4 [S]

21. (c) A C F H K M P R [U W]
+2 +3 +2 +3 +2 +3 +2 +3 +2

22. (a) DF GJ KM NQ RT [UX]
+3 +4 +3 +4 +3
+4 +3 +4 +3 +4

23. (a)
I K M O
+2 +2 +2

T V X Z
+2 +2 +2

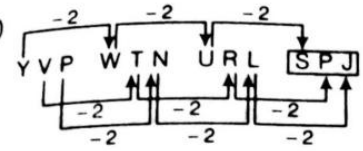
A B C D
+1 +1 +1

L M N O
+1 +1 +1

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24. (c)



25. (c) O A C P B D Q C E R D F S E G

26. (b) A M V B N W C O X D P Y E Q Z

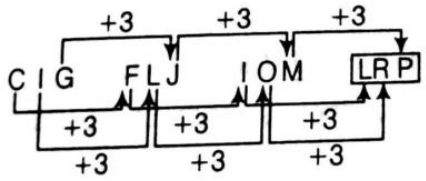
27. (b) A F I J O R M R U H M P

28. (d) FLU GMV HNW IOX JPY

29. (d) B M W D N V F O U H P T

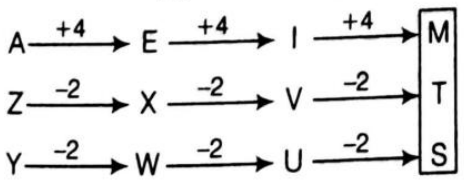
30. (a) B C D C B D D C B B D C C D B

31. (a)

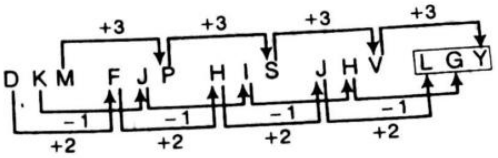


32. (d) B F G H L M N R S T X Y

33. (a)

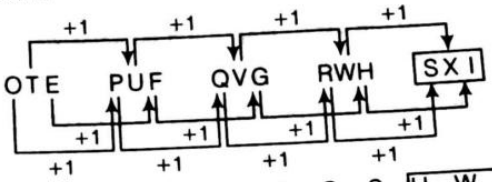


34. (a)



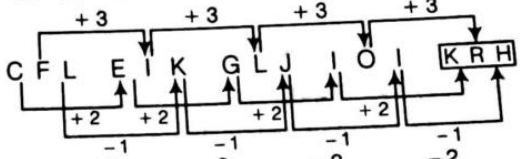
35. (a) bc, cde, de, efg, fg, ghi
In this series, last letter of a term is started to new term and next two letter is included in the term.

36. (d)

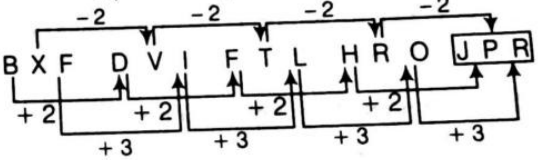


37. (d) C E G I K M O Q S U W Y
+2 +2 +2 +2 +2 +2 +2 +2 +2 +2

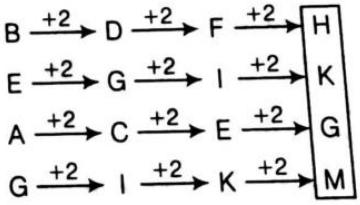
38. (a)



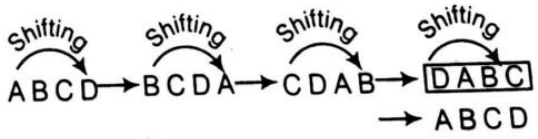
39. (d)



40. (b)



41. (b)



42. (c) ABCD/PQRS/ABCDE/PQRST/ABCDEF/PQRST/U

43. (b) PQ/PQR/PQRS/PQRST/PQRSTU/PQRSTUV/PQRST U

44. (a) ABCDEF/ZYXWVU/ABCDE/ZYXWVU/ABCD/ZYXWV U

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B. Expert Level Exercise

1. (*b*) Here, repeated block is 'abxdm'.

Now, abxdmabxdmabxdm

2. (*a*) m c a/ m c a/ m c a/ m c a/m c a/ mc

3. (*d*) ba/ab/ab/ba/ab/ab

4. (*a*) abc/abb/cab/cca/bca/ab

5. (*c*) The last letter of each previous block is moved to the beginning of the successive block.

Now, pqrst/tpqrs/stpqr/rstpq

6. (*c*) Set 'sqppqpr' completes the given letter series.

pqrs/qrsp/rspq/spqr

7. (*c*) In the series, the pattern abc is repeated. Hence, the series is

bc/abc/abc/abc/abc/abc/a = abccb

8. (*b*) cbbg/cbbg/cbbg ⇒ cgbcb

9. (*d*) By option (d),

abc/cba/bca/acb ⇒ bcba

10. (*c*) N O P Q, N O P Q, N O P Q, N O P Q ⇒ NOPQ

11. (*b*) lmn/nml/lmn/nml ⇒ mnnm

The sequence is repeate of alternative two blocks lmn and nml.

12. (*c*) mbb/maa/mbb/maa/mbb ⇒ mabam

The sequence is repeate of alternative two blocks mbb and maa.

3. (*a*) abncb/abncb/abncb ⇒ bcabab

The pattern is abncb.

(*c*) The pattern is baab. Now,

baab/baab/baab/baab ⇒ bbaab

(*a*) cca/ccb/cca/ccb/cca/ccb/c ⇒ acacc

The sequence is made of two blocks cca and ccb alternately.

) tst/tst/tst/tst ⇒ tsst

The sequence is made of repetition of block tst.

17. (*b*) aceg/aceg/aceg ⇒ ecag

The series is made of repetition of block aceg.

18. (*a*) accb/accb/accb/accb ⇒ cbcc

The series is made of repetition of block accb.

19. (*d*) nccl/nccl/nccl/nccl/nccl ⇒ cclcn

The series is made of repetition of block nccl.

20. (*b*) bca/cab/abc/bca ⇒ babca

21. (*a*) acbd/cadb/acbd/cadb/acbd ⇒ addddb

The sequence is made of repetition of two block acbd, cadb alternatively.

22. (*d*) cab/bac/cab/bac/cab/bac ⇒ acbcb

The sequence is made of repetition of two blocks cab and bac alternatively.

23. (*c*) aabcd/abbcd/abccd/abcdd ⇒ adbbad

24. (*d*) acdb/dacb/cdab/acdb/da ⇒ adabcd

25. (*b*) aabcc/ccabb/bbcaa ⇒ accba

26. (*c*) AA'B/ BB'A/A'AB/ B'BA ⇒ ABAB

27. (*a*) From option (a),

yzy/xzx/yzy/xzx/yzy/xzx/y ⇒ yxzyz

28. (*d*) abba/acca/adda/aeea

Hence, set bacde come in gap, respectively.

29. (*c*) aaaaa/bbabb/aabaa/bbbbb

Hence, set aabbb come in gap respectively.

30. (*a*) abzy/abcdxw/abcdevu ⇒ zdu

31. (*a*) HIJH/HIJH/HIJH/HIJH ⇒ IHJI

The sequence is made of repetition of block HIJH.

32. (*a*) ZYXWWXYZ/ZYXWWXYZ ⇒ WXYZ

33. (*a*) ZXVTRPNLJHFDB ⇒ VPHB

The sequence is made of (–2) letters, respectively.

34. (*a*) aca/cab/aba/cab/aaa/cab/a ⇒ aabc

35. (*a*) abb/baa/abb/baa/abb/baa ⇒ abbaaba

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12 Inserting the Missing Character

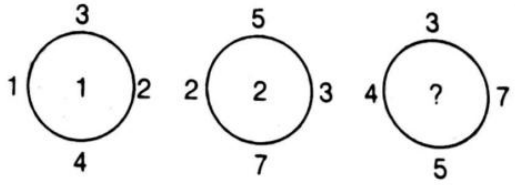
Inserting the missing character is based on diagrammatic arrangement of letters/numbers in which a missing term is asked to be calculated.

In this chapter, we deal with questions which have a pictorially represented sequence of number or letters or both. All follow a definite pattern. The candidate is required to find this pattern and accordingly find the missing character in the figure. These figure could be circle, triangle, matrices or any new shaped figures having character at its places.

Examples given below will give you a better idea about the types of questions asked in exams.

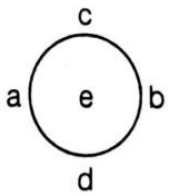
Directions (Illustrations 1-6) *Find the missing number in the following figures.*

Illustration 1.



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

Solution (c) Clearly, pattern associated with given question is



$e = (b - a) \times (d - c)$

= Difference between left and right numbers × Difference between bottom and top numbers

So, missing number = $(5 - 3) \times (7 - 4)$

$= 2 \times 3 = 6$

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Illustration 2.

?	13	49
9	17	69
13	11	59

(a) 9 (b) 5 (c) 10 (d) 21

Solution (*b*) Number in third column
= 2 × Number in first column
+ 3 × Number in second column

So, $(2 \times 9) + (17 \times 3) = 69$

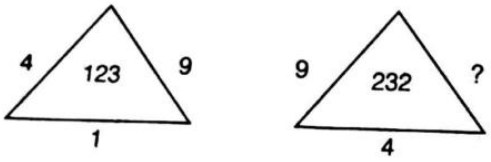
and $(13 \times 2) + (11 \times 3) = 59$

Hence, $(? \times 2) + (13 \times 3) = 49$

$\Rightarrow \quad ? \times 2 = 49 - 39 = 10$

$\therefore \quad ? = \frac{10}{2} = 5$

Illustration 3.



(a) 2 (b) 6 (c) 4 (d) 16

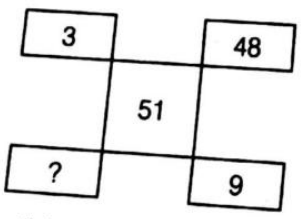
Solution (*c*) Clearly, the numbers along the sides of triangles are the squares of digits of numbers at the centre.

As, 123 → $1^2 = 1$, $2^2 = 4$, $3^2 = 9$

Similarly, 232 → $2^2 = 4$, $3^2 = 9$, $2^2 = 4$

Hence, $? = 4$

Illustration 4.



(a) 25 (b) 20 (c) 32 (d) 42

Solution (*d*) Clearly, middle number is sum of upper two numbers.

As, $3 + 48 = 51$

Similarly, $? + 9 = 51 \Rightarrow ? = 51 - 9 = 42$

Illustration 5.

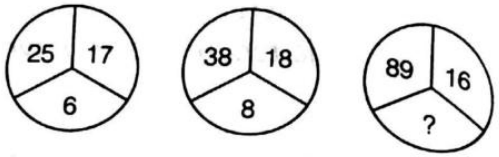
C_{18}	B_{21}
D_{15}	A_{24}
?	H_3
F_9	G_6

(a) E_{31} (b) E_{12} (c) F_{12} (d) H_8

Solution (*b*) Alphabet appears in anti-clockwise direction and the numerals are the multiples of 3 appear in clockwise direction.

Hence, the missing character = E_{12}

Illustration 6.



(a) 13 (b) 15 (c) 17 (d) 19

Solution (*b*) Sum of the two numbers in the upper part is seven times the number in the lower part.

$(25 + 17) \div 7 = 6 \Rightarrow (38 + 18) \div 7 = 8$

So, missing term $= (89 + 16) \div 7 = 105 \div 7 = 15$

Illustration 7. Numbers are required in the place of '?' in the following equation

$$3^{(?)} + \sqrt{?} - (2)^2 = 10$$

(a) 2, 4 (b) 5, 81
(c) 4, 16 (d) 2, 25

Solution (*d*) Clearly, $3^? + \sqrt{?} = 10 + 2^2 = 10 + 4 = 14$

This equation is valid for 2, 25 as

$$3^2 + \sqrt{25} = 9 + 5 = 14$$

Illustration 8. Which one of the given options fits correctly in the blank space so that the pattern is maintained?

3	4	5
25 2	49 3	? 3

(a) 49 (b) 64
(c) 81 (d) 100

Solution (*b*) Pattern followed by all sets

$\begin{matrix} a \\ b \ c \end{matrix} \Rightarrow \quad (a + c)^2 = b$

As, $(3 + 2)^2 = 25$ and $(4 + 3)^2 = 49$

So, missing number $= (5 + 3)^2 = 8^2 = 64$

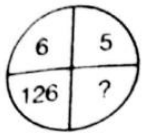
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Let us Practice

Directions (Q. Nos. 1-15) *Find the missing character in each of the following.*

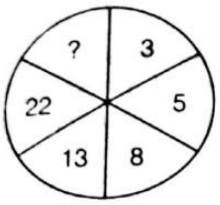
1.



[SSC (CGL) 2011]

(a) 127 (b) 31
(c) 217 (d) 238

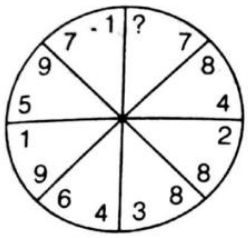
2.



[MAT 2011]

(a) 1 (b) 26 (c) 39 (d) 45

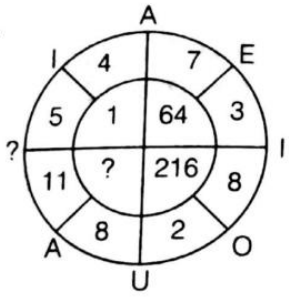
3.



[SSC (CGL) 2012]

(a) 6 (b) 2 (c) 3 (d) 4

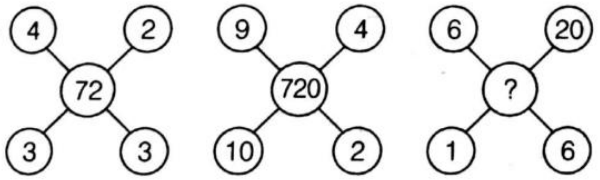
4.



[IGNOU 2012]

(a) U and 28 (b) I and 26
(c) E and 27 (d) A and 25

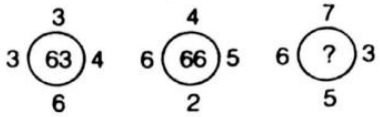
5.



[SSC (CPO) 2011]

(a) 72 (b) 720
(c) 7200 (d) 38

6.



[CAT 2011]

(a) 57 (b) 53
(c) 39 (d) 108

7.

6	15	20
8	4	5
3	5	20
51	65	?

[SSC (CGL) 2013]

(a) 12 (b) 56 (c) 120 (d) 51

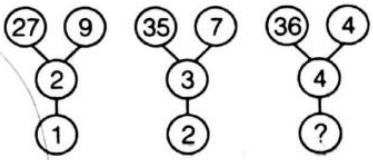
8.

16	25	9
36	64	81
10	13	?

[SSC (CGL) 2013]

(a) 14 (b) 11 (c) 12 (d) 13

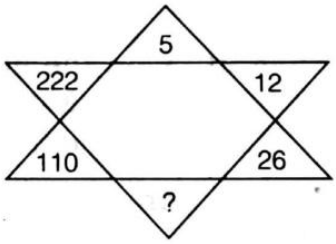
9.



[SSC (Multitasking) 2013]

(a) 3 (b) 4 (c) 5 (d) 6

10.



[SSC (Multitasking) 2013]

(a) 54 (b) 51 (c) 48 (d) 44

11.

8	10	17
11	?	10
16	11	8

[SSC (Steno) 2013]

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

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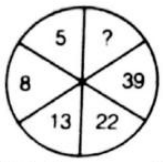
12.

11	12	13
14	15	16
2	3	4
39	57	?

[SSC (Steno) 2013]

(a) 87 (b) 75 (c) 85 (d) 77

13.



[SSC (CPO) 2013]

(a) 66 (b) 72 (c) 61 (d) 78

14.

4	3	2
6	9	10
9	27	?

[SSC (CGL) 2013]

(a) 30 (b) 20 (c) 50 (d) 54

15.

96	100	132
6	4	6
5	7	3
21	32	?

[SSC (10 + 2) 2013]

(a) 25 (b) 30 (c) 32 (d) 20

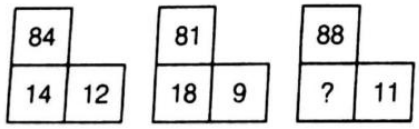
16. Consider the following matrix

3	370	7
2	224	6
1	730	X

What is the number at 'X' in the above matrix? [CSAT 2013]

(a) 5 (b) 8 (c) 9 (d) 11

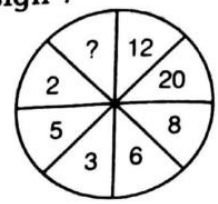
17. Examine the following three figures in which the numbers follow a specific pattern



The missing number (?) in the third figure above is [CSAT 2013]

(a) 7 (b) 16 (c) 21 (d) 28

18. In the given figure, numbers have b arranged in a certain pattern. Which the following will replace the quest mark (?) sign ? [CG PSC 2



(a) 24 (b) 6
(c) 18 (d) 10

Directions (Q. Nos. 19-27) *Numbers in follow questions have been arranged according to identical pattern. Find out the missing numbe*

19.

92	70	48
64	53	42
52	45	?

[SSC (Multitasking) 20

(a) 36 (b) 40 (c) 38 (d) 42

20.

2	9	11	7
8	5	13	–3
7	?	10	–4
6	4	10	?

[SSC (CGL) 20

(a) 3 and (–2) (b) (–3) and (–2)
(c) 3 and 2 (d) (–3) and 2

21.

17	8	5	5
13	7	5	4
6	12	6	3
10	6	4	?

[IB (ACIO) 20

(a) 4 (b) 5 (c) 6 (d) 7

22.

81	36	25
49	100	36
9		

[SSC (10 + 2) 201

(a) 107 (b) 77 (c) 27 (d) 50

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23. 2 24 48
3 9 27
4 ? 40

[SSC (10+2) 2013]

(a) 10 (b) 16
(c) 12 (d) 32

24. 3 5 8 7
4 6 4 6
5/58 2/58 2/62 3/?

[SSC (CGL) 2013]

(a) 126
(b) 122
(c) 128
(d) 124

25. 24 25 50
24 20 10
4 9 3
12 5 ?

[SSC (10+2) 2013]

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

26. 63 7 9
30 5 6
20 4 ?

[SSC (10+2) 2013]

(a) 8 (b) 3
(c) 5 (d) 2

27. 4 10 16
6 12 18
8 ? 20

[SSC (Steno) 2013]

(a) 18
(b) 10
(c) 12
(d) 14

28. The number of students in Art class is increasing month after month as follows

Month	Jan	Feb	Mar	Apr	May	June
Number of students	1	2	4	7	11	?

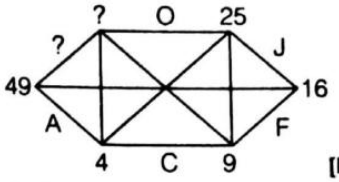
Find the number of students in June.

[RRB (ASM) 2011]

(a) 13
(b) 14
(c) 15
(d) 16

Directions (Q. Nos. 29-35) *Find out the missing numbers.*

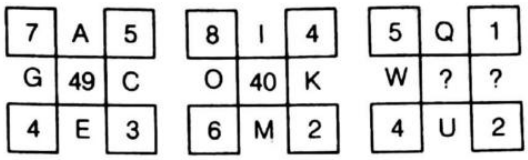
29.



[Hotel Management 2011]

(a) Y and 40 (b) U and 36
(c) W and 64 (d) X and 81

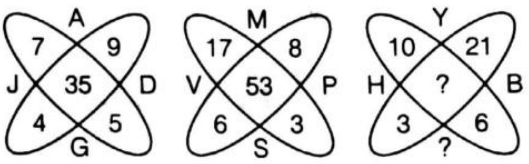
30.



[MAT 2012]

(a) V and 9 (b) T and 3
(c) S and 6 (d) Y and 5

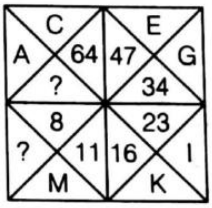
31.



[MAT 2012]

(a) F and 75 (b) E and 65
(c) D and 60 (d) C and 58

32.



[MAT 2012]

(a) J and 80 (b) O and 83
(c) N and 74 (d) P and 85

33.

1	3	7
2	4	4
4	5	9
3	2	3
50	70	?

[SSC (CPO) 2011]

(a) 23 (b) 115
(c) 118 (d) 220

34.

D	M	V
F	P	Z
H	S	?

[CG PSC 2013]

(a) D (b) C (c) I
(d) G (e) K

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35.

DL	10	14	ER
RX	23	18	SM
KM	?	?	PV

[MAT 2011]

(a) 18, 34
(b) 14, 21
(c) 56, 84
(d) 12, 18

36. Which of the given options fits correctly in the blank space to exhibit the similar pattern shown by the three sets below?

4 3 2
36 2 100 7 ? 5

(a) 71 (b) 49
(c) 64 (d) 81

37. Which of the given options fits correctly in the blank space to exhibit the similar pattern of the three sets below?

7 9 11
9 4 4 7 ? 7

(a) 12 (b) 16 (c) 18 (d) 25

Directions (Q. Nos. 38-39) *Find out the missing term*

38. $\begin{matrix}8\\3\ \boxed{15}\ S\\9\end{matrix}$ $\begin{matrix}14\\6\ \boxed{18}\ D\\3\end{matrix}$ $\begin{matrix}5\\?\ \boxed{8}\ K\\6\end{matrix}$

(a) 9 (b) 3 (c) 6 (d) 2

39. $\begin{matrix}5 & 45\\ & \boxed{5}\\40 & 25\end{matrix}$ $\begin{matrix}8 & 22\\ & \boxed{5}\\16 & 48\end{matrix}$

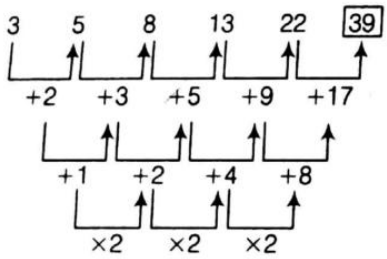
(a) 5 (b) 6 (c) 12 (d) 9

Answer *with* Explanations

1. (c) As $5 \rightarrow 126 = 5^3 + 1 = 126$

$6 \rightarrow ? = 6^3 + 1 = \boxed{217}$

2. (c)



3. (a) Since, sum of left and right side number is equal to sum of opposite side of left and right side number.

$\therefore \quad 1 + ? = 4 + 3$

$? = 7 - 1 = 6 \Rightarrow ? = 6$

Hence, 6 will come in place of question mark in circle.

4. (c) Starting from letter A in vowel sequence in clockwise direction

A, E, I, O, U, A, $\boxed{E}$ (outer side)

In inner side, (right half part)

$(7 - 3)^3 = 64$ and $(8 - 2)^3 = 216$

In inner side, (left half part)

$(5 - 4)^3 = 1$ and $(11 - 8)^3 = \boxed{27}$

Hence, ? = E and 27

5. (b) $4 \times 2 \times 3 \times 3 = 72$

$9 \times 4 \times 10 \times 2 = 720$

$6 \times 20 \times 1 \times 6 = \boxed{720}$

6. (d) $(3 + 4) \times (3 + 6) = 7 \times 9 = 63$

$(4 + 2) \times (6 + 5) = 6 \times 11 = 66$

$(6 + 3) \times (7 + 5) = 9 \times 12 = \boxed{108}$

7. (c)

⑥	15	20
8	4	5
3	5	20
51	65	?

The above can be solved as

$6 \times 8 + 3 = 51$

$15 \times 4 + 5 = 65$

Similarly, $20 \times 5 + 20 = ?$

$? = 120$

8. (c) $\because \quad \sqrt{16} + \sqrt{36} = 10$

$\Rightarrow \quad 4 + 6 = 10$

$\Rightarrow \quad 10 = 10$

Also, $\sqrt{25} + \sqrt{64} = 13$

$\Rightarrow \quad 5 + 8 = 13$

$\Rightarrow \quad 13 = 13$

$\therefore \quad \sqrt{9} + \sqrt{81} = ?$

$\Rightarrow \quad 3 + 9 = ?$

$\Rightarrow \quad ? = 12$

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9. (c)

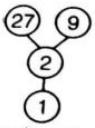
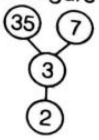


Figure is solved as,

$27 \div 9 - 2 = 1$

$3 - 2 = 1 \Rightarrow 1 = 1$

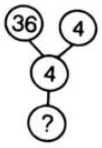
Similarly, second figure



$\Rightarrow \quad 35 \div 7 - 3 = 2$

$5 - 3 = 2 \Rightarrow 2 = 2$

Then,



$\Rightarrow \quad 36 \div 4 - 4 = ?$

$9 - 4 = ? \Rightarrow ? = 5$

Hence, the correct option is (c).

10. (a) Pattern given in figure is as follows

$5 \times 2 + 2 = 12$

$12 \times 2 + 2 = 26$

$26 \times 2 + 2 = 54$

$54 \times 2 + 2 = 110$

So, the missing number is 54.

11. (a) Sum of all the numbers in a row or column is always 35.

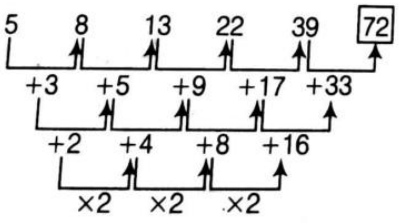
Therefore, required number will be 14.

12. (d) As, $11 + 14 \times 2 = 11 + 28 = 39$

and $12 + 15 \times 3 = 12 + 45 = 57$

Similarly, $13 + 16 \times 4 = 13 + 64 = 77$

13. (b)



14. (c) As, $4 \times \frac{3}{2} = 6,\ 6 \times \frac{3}{2} = 9$

and $3 \times 3 = 9,\ 9 \times 3 = 27$

Same as, $2 \times 5 = 10,\ 10 \times 5 = 50$

Hence, number 50 will be come in place of question mark.

15. (a) As, $96 \div 6 = 16$ and $16 + 5 = 21$

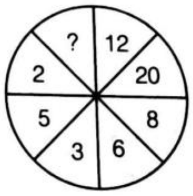
and $100 \div 4 = 25$ and $25 + 7 = 32$

Similarly, $132 \div 6 = 22$ and $22 + 3 = 25$

16. (c) The sum of the digits of the number in the middle column equals the sum of the numbers in the column to its left and right. So, in the first row we have $3 + 7 + 0 = 10 = 3 + 7$. In the second row we have $2 + 2 + 4 = 2 + 6$. Thus, in the third row the total of the left and right columns must be equal to $7 + 3 + 0 = 10$. Which means that the number in the right column must be equal to $10 - 1 = 9$.

17. (b) In the first two figures the number at the top is divided by the number at the right and is then doubled *e.g.*, in the first figure, $\frac{84}{12} = 7$ and $2 \times 7 = 14$. In the second figure $\frac{81}{9} = 9$ and $2 \times 9 = 18$. In the third figure $\frac{88}{11} = 8$. And the missing number will be $2 \times 8 = 16$.

18. (a) As, $2 \times 4 = 8$



$5 \times 4 = 20, \quad 3 \times 4 = 12$

Similarly, $6 \times 4 = 24$

19. (c) As, $92 + 64 + 52 = 208$ $\xrightarrow{-40}$

and $70 + 53 + 45 = 168$ $\xrightarrow{-40}$

Similarly, $48 + 42 + \boxed{38} = 128$

20. (a) $2 + 9 = 11$

$9 - 2 = 7$

Also, $8 + 5 = 13$

$5 - 8 = -3$

Now, $7 + ? = 10$

$? = 10 - 7 = 3$

Also, $4 - 6 = ?$

$? = -2$

So, the correct option is (a).

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21. (*a*)

17	8	5	5
13	7	5	4
6	12	6	3
10	6	4	?

Here, in row 1 $= \frac{17+8}{5} = 5$

In row 2 $= \frac{13+7}{5} = 4$

In row 3 $= \frac{6+12}{6} = 3$

In row 4 $= \frac{10+6}{4} = ?$

$? = 4$

22. (*b*) As, $81 + 49 + 9 = 139$

$36 + 100 + 64 = 200$

Similarly, $25 + 36 + 16 = 77$

23. (*a*) As, $2 \times 24 = 48$

$3 \times 9 = 27$

Similarly, $4 \times \boxed{10} = 40$

24. (*d*) As, $(3 \times 4 \times 5) - 2 = 60 - 2 = 58$

and $(5 \times 6 \times 2) - 2 = 60 - 2 = 58$

and $(8 \times 4 \times 2) - 2 = 64 - 2 = 62$

Similarly, $(7 \times 6 \times 3) - 2 = 126 - 2 = 124$

Hence, number 124 will be come in place of question mark.

25. (*c*) As, $(24 + 24) \div 12 = 4$

and $(25 + 20) \div 5 = 9$

Similarly, $(50 + 10) + ? = 3$

$60 \div ? = 3$

$? = \frac{60}{3} = 20$

26. (*c*) As, $7 \times 9 = 63$

and $5 \times 6 = 30$

Similarly, $4 \times ? = 20$

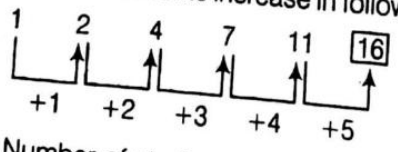
$? = \frac{20}{4} = 5$

27. (*d*) As, $4 + 2 = \rightarrow 6 + 2 = 8$

and $16 + 2 = 18 \rightarrow 18 + 2 = 20$

Similarly, $10 + 2 = 12 \rightarrow 12 + 2 = 14$

28. (*d*) Number of students increase in following order



∴ Number of students in June = 16

29. (*b*) Starting from letter A in anti-clockwise direction

$A \xrightarrow{+2} C \xrightarrow{+3} F \xrightarrow{+4} J \xrightarrow{+5} O \xrightarrow{+6} U$

Starting from number 4 in anti-clockwise direction

$2^2 = 4, 3^2 = 9, 4^2 = 16, 5^2 = 25, 6^2 = 36$

Hence, ? = U and 36

30. (*c*) In first figure → starting from letter A in clockwise direction

$A \xrightarrow{+2} C \xrightarrow{+2} E \xrightarrow{+2} G$

and $(7^2 + 5^2) - (4^2 + 3^2)$

$= (49 + 25) - (16 + 9) = 49$ (middle number)

In second figure → starting from letter I in clockwise direction

$I \xrightarrow{+2} K \xrightarrow{+2} M \xrightarrow{+2} O$

and $(8^2 + 4^2) - (6^2 + 2^2)$

$= (64 + 16) - (36 + 4) = 40$ (middle number)

In third figure → starting from letter Q in clockwise direction

$Q \xrightarrow{+2} S \xrightarrow{+2} U \xrightarrow{+2} W$

and $(5^2 + 1^2) - (4^2 + 2^2)$

$= (25 + 1) - (16 + 4) = \boxed{6}$

Hence, ? = S and 6

31. (*b*) In first figure → starting from letter A in clockwise direction

$A \xrightarrow{+3} D \xrightarrow{+3} G \xrightarrow{+3} J$

and $(7 + 9) \times 2 + \sqrt{4 + 5} = 35$ (middle number)

In second figure → starting from letter M in clockwise direction

$M \xrightarrow{+3} P \xrightarrow{+3} S \xrightarrow{+3} V$

and $(17 + 8) \times 2 + \sqrt{6 + 3} = 53$

(middle number)

In third figure → starting from letter Y in clockwise direction

$Y \xrightarrow{+3} B \xrightarrow{+3} \boxed{E} \xrightarrow{+3} H$

and $(10 + 21) \times 2 + \sqrt{3 + 6} = \boxed{65}$

(middle number)

Hence, ? = E and 65

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32. (*b*) Starting from letter A in clockwise direction

$$A \xrightarrow{+2} C \xrightarrow{+2} E \xrightarrow{+2} G \xrightarrow{+2} I \xrightarrow{+2} K \xrightarrow{+2} M \xrightarrow{+2} \boxed{O}$$

Starting from number 8 in anti-clockwise direction (prime number sequence)

$$8 \xrightarrow{+3} 11 \xrightarrow{+5} 16 \xrightarrow{+7} 23 \xrightarrow{+11} 34 \xrightarrow{+13} 47 \xrightarrow{+17} 64 \xrightarrow{+19} \boxed{83}$$

Hence, ? = O and 83

33. (*b*) As, $1 + 2 + 4 + 3 = 10 \times 5 = 50$

and $3 + 4 + 5 + 2 = 14 \times 5 = 70$

Similarly, $7 + 4 + 9 + 3 = 23 \times 5 = 115$

34. (*a*) As, $D \xrightarrow{+2} F \xrightarrow{+2} H$

$M \xrightarrow{+3} P \xrightarrow{+3} S$

Similarly, $V \xrightarrow{+4} Z \xrightarrow{+4} \boxed{D}$

35. (*b*) As, D L

$$4 + 12 = \frac{16}{2} = 8 + 2 = 10$$

It means, place number of letter will be added and divided by 2, after divided it plus 2.

Similarly,

K M

$$11 + 13 = \frac{24}{2} = 12 + 2 = \boxed{14}$$

P V

$$16 + 22 = \frac{38}{2} = 19 + 2 = \boxed{21}$$

36. (*b*) We have, $(4 + 2)^2 = 36$,

and $(3 + 7)^2 = 100$

So, missing number $= (5 + 2)^2 = 49$

37. (*b*) We have, $(7 - 4)^2 = 9, (9 - 7)^2 = 4$

So, missing number $= (11 - 7)^2 = 4^2 = 16$

38. (*d*) Position of 'S' in English alphabetical order = 19

Position of 'D' in English alphabetical order = 4

Position of 'K' in English alphabetical order = 11

Now, in first figure

$$(8 \times 9) - 15 = 3 \times 19 \text{ (S)}$$

$$72 - 15 = 57$$

$$57 = 52$$

Again, in second figure

$$(14 \times 3) - 18 = 6 \times 4 \text{(D)}$$

$$42 - 18 = 24$$

$$24 = 24$$

Similarly, for third figure

$$= (5 \times 6) - 8$$

$$= ? \times 11 \text{(K)}$$

$$= 30 - 8 = ? \times 11$$

$$22 = ? \times 11$$

$$? = \frac{22}{11} = 2$$

39. (*b*) From first figure

$$\frac{25}{5} = 45 - 40 = 5$$

$$5 = 5 = 5$$

Similarly, for second figure

$$\frac{48}{8} = 22 - 16 = ?$$

$$6 = 6 = ?$$

$$\therefore \quad ? = 6$$

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13

Problems Based on Ages

Time passed since birth is known as 'Age'. Hence, age clarifies the exact date or year of birth.

In this chapter, we deal with questions which clarify the age of one person or number of persons. We also deal with concepts of relative age, *i.e.*, age of two persons like father-son, mother-daughter, pair of persons. To solve this type of questions, we are given some concepts regarding their ages and ages could be ask in the form of 'some years after' and 'some years before'.

Basic Concept of Age

1. Before the Year

If we have to find the age of a person before n yr, then we will have to subtract n yr from his present age. *e.g.*, Present age of Shalu is 24 yr. What was her age before 7 yr?

Solution Shalu's age before 7 yr $= (24 - 7) = 17$ yr

2. After the Year

If we have to find the age of a person after n yr, then we will have to add n yr to present age. *e.g.*, Present age of Anu is 22 yr. What will be her age after 5 yr?

Solution Anu's age after 5 yr $= (22 + 5) = 27$ yr

3. Ratio of Ages

If present age of A and B is x yr and y yr, respectively.

Then, ratio of their ages n yr hence $= \dfrac{x + n}{y + n}$

Ratio of their ages n yr before $= \dfrac{x - n}{y - n}$

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Illustration 1. The age of Rakhi is twelve times that of her daughter Anubha. If age of Anubha is 3 yr, then what is the age of Rakhi?

(a) 20 yr (b) 24 yr
(c) 30 yr (d) 36 yr

Solution (*d*) Let age of Anubha $= x$ yr
Then, age of Rakhi $= 12x$ yr
$\therefore$ Age of Rakhi $= 12 \times 3 = 36$ yr

Illustration 2. If the present ages of Nandu and Shobit are 20 yr and 24 yr respectively, then find the ratio between the age of Nandu (before 4 yr) and Shobhit (after 4 yr).

(a) 5 : 9 (b) 4 : 7
(c) 2 : 3 (d) 5 : 6

Solution (*b*) $\dfrac{\text{Age of Nandu} - 4}{\text{Age of Shobhit} + 4} = \dfrac{20-4}{24+4} = \dfrac{16}{28} = 4:7$

Illustration 3. The age of the father 4 yr ago was 8 times the age of his son. At present, the father's age is 4 times that of his son. Find the present age of son.

(a) 9 yr (b) 7 yr
(c) 14 yr (d) 18 yr

Solution (*b*) Let present age of son $= x$ yr
Then, present age of father $= 4x$ yr
Now, age of father 4 yr ago $= (4x - 4)$ yr
Age of son 4 yr ago $= (x - 4)$ yr
According to the question,

$$(4x - 4) = 8(x - 4)$$
$$\Rightarrow \quad 4x - 4 = 8x - 32$$
$$\Rightarrow \quad 4x = 32 - 4 = 28$$
$$\therefore \quad x = \frac{28}{4} = 7$$

Hence, the present age of son is 7 yr.

Illustration 4. At present, the ratio between the ages of Arun and Deepak is 4 : 3. After 6 yr, Arun's age will be 26 yr. What is the age of Deepak at present?

(a) 12 yr (b) 15 yr
(c) $19\frac{1}{2}$ yr (d) 25 yr

Solution (*b*) Let the present ages of Arun and Deepak be $4x$ yr and $3x$ yr, respectively.
Then, $4x + 6 = 26$
$\Rightarrow \quad 4x = 20$
$\Rightarrow \quad x = 5$
$\therefore$ Deepak's present age $= 3x = 3 \times 5 = 15$ yr

Illustration 5. Present ages of Anupam and Raju are in the ratio of 5 : 4, respectively. 3 yr hence, the ratio of their ages will become 11 : 9, respectively. What is Raju's present age?

(a) 24 yr
(b) 27 yr
(c) 40 yr
(d) Data inadequate

Solution (*a*) Let the present ages of Anupam and Raju be $5x$ yr and $4x$ yr, respectively.
After 3 yr, age of Anupam $= (5x + 3)$ yr
After 3 yr, age of Raju $= (4x + 3)$ yr
According to the question,

$$\frac{5x + 3}{4x + 3} = \frac{11}{9}$$
$$\Rightarrow \quad 45x + 27 = 44x + 33$$
$$\therefore \quad x = 33 - 27 = 6$$

So, present age of Raju $= 4 \times 6 = 24$ yr

Illustration 6. A person was asked to state his age. His reply was, 'Take my age three year hence multiply it by 3 and then subtract three times my age 3 yr ago and you will know how old-I am.' What was the age of the person?

(a) 18 yr (b) 20 yr
(c) 24 yr (d) 32 yr

Solution (*a*) Let the present age of the person $= x$ yr
According to the question,

$$3(x + 3) - 3(x - 3) = x$$
$$\Rightarrow \quad 3x + 9 - 3x + 9 = x$$
$$\therefore \quad x = 18 \text{ yr}$$

So, the person is 18 yr old.

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Let us Practice

1. The age of father is thrice of his son. If the sum of their ages is 48 yr. What is the age of father?

(a) 30 yr (b) 32 yr
(c) 36 yr (d) 40 yr

2. Nikhil is 8 yr younger than his brother Rohan. How old will Rohan be when he is twice as old as Nikhil? **[SSC (10+2) 2013]**

(a) 4 (b) 6
(c) 8 (d) 16

3. The age of Arvind's father is 4 times his son's age. If 5 yr ago, father's age was 7 times of the age of his son at that time, then what is Arvind's father's present age?

(a) 84 yr (b) 70 yr
(c) 40 yr (d) 35 yr

4. Rahim and his uncle differ in their ages by 30 yr. After 7 yr, if the sum of their ages is 66, what will be the age of the uncle? **[SSC (10+2) 2013]**

(a) 51 yr (b) 49 yr
(c) 39 yr (d) 41 yr

5. Five yr ago, the average age of P and Q was 15 yr. Now, average age of P, Q and R is 20 yr. What would be the age of R after 10 yr? **[SSC (CGL) 2012]**

(a) 35 yr (b) 40 yr
(c) 30 yr (d) 50 yr

6. A person's present age is two-fifth of the age of his mother. After 8 yr, he will be one-half of the age of his mother. How old is the mother at present? **[SSC (10+2) 2012]**

(a) 32 yr (b) 36 yr
(c) 40 yr (d) 48 yr

7. Devendra is older by 4 yr to Rajendra. After 16 yr, Devendra will be thrice his present age and Rajendra will be five times, of his present age. How old would Rajendra be after 16 yr? **[SSC (FCI) 2012]**

(a) 30 yr (b) 25 yr
(c) 24 yr (d) 20 yr

8. Tarun's age is the cube of a whole number. It was square of another whole number 2 yr ago. How long he must wait before his age is again the cube of a whole number? **[SSC (Steno) 2012]**

(a) 2 yr (b) 10 yr
(c) 37 yr (d) 39 yr

9. Rajan is younger than his father by 20 yr. 5 yr ago his father was 3 times elder than him. Find the present age of his father. **[SSC (10+2) 2013]**

(a) 25 yr (b) 30 yr
(c) 35 yr (d) 36 yr

10. It was Shriram's and Sreedevi's 12th Wedding Anniversary. Shriram said, "When we got married, Sreedevi was 3/4th of my age, but now she is 5/ 6 of my age". What actually are their present ages? **[SSC (CGL) 2012]**

(a) Shriram 38, Sreedevi 32
(b) Shriram 36, Sreedevi 30
(c) Shriram 30, Sreedevi 24
(d) Shriram 40, Sreedevi 34

11. A father's age is one more than 5 times of his son's age. After 3 yr, the father's age would be 2 less than four times the son's age. Find the present age of the father. **[SSC (CPO) 2011]**

(a) 30 yr (b) 40 yr
(c) 31 yr (d) 29 yr

12. The ratio between the present ages of A and B is 5 : 3 respectively. The ratio between A's age 4 yr ago and B's age 4 yr hence is 1 : 1. What is the ratio between A's age 4 yr hence and B's age 4 yr ago?

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

13. The average age of 19 boys in a class is 21 yr. If the teacher's age is included, the average increases to 22 yr. What is the teacher's age? **[SSC (CPO) 2012]**

(a) 39 yr (b) 41 yr
(c) 40 yr (d) 44 yr

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14. The sum of the ages of 5 children born at the intervals of 3 yr each is 50 yr. What is the age of the youngest child?
(a) 4 yr (b) 8 yr
(c) 10 yr (d) None of these

15. The ratio of A's and B's ages is 3 : 2. The product of their ages is 216 yr. Then, the sum of their present ages is
(a) 18 yr (b) 30 yr
(c) 36 yr (d) 32 yr

16. The ratio of the father's age to the son's age is 4 : 1. The product of their ages is 196. The ratio of their ages after 5 yr will be
(a) 3 : 1 (b) 10 : 3
(c) 11 : 4 (d) 33 : 12

17. The ages of Ram and Mohan differs by 16 yr. 6 yr ago, Mohan's age was thrice as that of Ram's. Find the sum of their ages.
(a) 30 yr (b) 27 yr
(c) 44 yr (d) 25 yr

18. Present age of Vinay is 8 yr less than Anu's present age. If 3 yr ago Anu's age was x, which of the following represents Vinay's present age?
(a) $(x + 3)$ yr
(b) $(x - 5)$ yr
(c) $(x - 3 + 8)$ yr
(d) $(x + 3 + 8)$ yr

19. The ratio of Raju and Prateek's age is 3 : 5 and sum of their ages is 80 yr. The ratio of their ages after 10 yr will be
(a) 2 : 3 (b) 1 : 2
(c) 3 : 2 (d) 3 : 5

20. The sum of the ages of father and a son presently is 70 yr. After 10 yr, the son's age is exactly half that of the father. What are their ages now? **[SSC (LDC) 2011]**
(a) 45 yr, 25 yr (b) 50 yr, 20 yr
(c) 47 yr, 23 yr (d) 50 yr, 25 yr

21. The ratio of the age of a father to that of his son is 5 : 2. If the product of their ages is 1000, then the father's age (in yr) after 10 yr will be **[SSC (10 + 2) 2011]**
(a) 50 (b) 60
(c) 80 (d) 100

22. Two yr ago, a mother was 4 times as old as her son. 6 yr from now her age will become more than double her son's age by 10 yr. What is the present ratio of their ages? **[SSC (10 + 2) 2012]**
(a) 2 : 1 (c) 38 : 11
(c) 19 : 7 (d) 3 : 1

23. Ranu is 48 yr old. Robin is 6 yr junior to Ranu and 14 yr senior to Rohit. Ranu has two children-Neetu and Vinu. Youngest sister of Rohit is Krishna and she is 15 yr junior to him. What is the age of Krishna?
(a) 13 yr (b) 15 yr
(c) 14 yr (d) 12 yr

Answer *with* Explanations

1. (c) Let age of son $= x$ yr
Then, the age of father $= 3x$ yr
Now, $3x + x = 48$
$\Rightarrow \quad 4x = 48$
$\Rightarrow \quad x = 12$
$\therefore$ Age of father $= 3 \times 12 = 36$ yr

2. (d) Let age of Nikhil $= x$ yr
Then, age of Rohan $= (x + 8)$ yr
According to the question,
$x + 8 = 2x$
$\Rightarrow \quad x = 8$
$\therefore$ Age of Rohan $= 8 + 8 = 16$ yr

3. (c) Let age of Arvind $= x$ yr
Then, age of Arvind's father $= 4x$ yr
According to the question,
$(4x - 5) = 7(x - 5) \Rightarrow 4x - 5 = 7x - 35$
$\Rightarrow \quad 3x = 30 \Rightarrow x = 10$ yr
$\therefore$ Arvind's father's present age
$= 4 \times 10 = 40$ yr

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4. (*d*) Let age of Rahim = x yr
and age of Rahim's uncle = y yr
According to the question,
$$y - x = 30 \quad ...(i)$$
Now, after 7 yr
$$(x + 7) + (y + 7) = 66$$
$$\Rightarrow \quad x + y + 14 = 66$$
$$\Rightarrow \quad x + y = 52 \quad ...(ii)$$
On adding Eqs. (i) and (ii), we get
$$2y = 82 \Rightarrow y = 41 \text{ yr}$$
So, the age of Rahim's uncle = 41 yr

5. (*c*) According to the question,
$$\left(\frac{P+Q}{2}\right) - 5 = 15 \Rightarrow \frac{P+Q}{2} = 20$$
$$\Rightarrow \quad P + Q = 40 \quad ...(i)$$
and $$\frac{P+Q+R}{3} = 20$$
$$P + Q + R = 60$$
From Eqs. (i) and (ii),
$$R = 20 \text{ yr}$$
$\therefore$ Age of R after 10 yr from now = 20 + 10
= 30 yr

6. (*c*) Let person's mother present age = x
$\therefore$ Person's present age = $\frac{2}{5}x$ yr
According to the question, After 8 yr,
$$\frac{1}{2}(x + 8) = \left(\frac{2x}{5} + 8\right)$$
$$\Rightarrow \quad \frac{x+8}{2} = \frac{2x+40}{5}$$
$$\Rightarrow \quad 5x + 40 = 4x + 80 \Rightarrow x = 40 \text{ yr}$$
$\therefore$ Present age of person's mother = 40 yr

7. (*d*) Suppose Rajendra's age = x yr
and Devendra's age = $(x + 4)$ yr
Then, $(x + 4) + 16 = 3(x + 4)$
$$\Rightarrow \quad x + 20 = 3x + 12$$
$$\Rightarrow \quad 2x = 8 \Rightarrow x = 4 \text{ yr}$$
$\therefore$ Rajendra's age after 16 yr = $x + 16$
= 4 + 16 = 20 yr

8. (*c*) Let present age of Tarun = 27 yr
$\therefore$ Age of Tarun, 2 yr back = 27 – 2 = 25 yr
So, the cube of 4, next number to 3 is 64.
$\therefore$ Required answer = 64 – 27 = 37 yr

9. (*c*) Let age of Rajan = x yr
and age of his father = y yr
According to the question,
$$x + 20 = y \quad ...(i)$$
Now, 5 yr ago
$$3(x - 5) = (y - 5)$$
$$\Rightarrow \quad 3x - 15 = y - 5$$
$$\Rightarrow \quad 3x - y = 10 \quad ...(ii)$$
On putting the value of y from Eq. (i) in Eq. (ii), we get
$$2x = 30$$
$$\Rightarrow \quad x = 15 \text{ yr}$$
On putting the value of x in Eq. (i), we get
$$y = 35 \text{ yr}$$
So, the age of Rajan's father = 35 yr

10. (*b*) Let present age of Shriram = x yr
and present age of Sreedevi = y yr
It was the 12th wedding anniversary of them. Then, according to the question, their age of twelve year back, $\frac{3}{4}(x - 12) = y - 12$
$$\Rightarrow \quad \frac{3x}{4} - 9 = y - 12$$
$$\Rightarrow \quad \frac{3x}{4} - y = -3$$
$$\Rightarrow \quad 3x - 4y = -12 \quad ...(i)$$
Now, their present age,
$$\frac{5x}{6} = y \Rightarrow 5x = 6y$$
$$\Rightarrow \quad 5x - 6y = 0 \quad ...(ii)$$
On solving Eqs. (i) and (ii), we get
$$x = 36, y = 30$$
Hence, present age of Shriram = 36 yr
and present age of Sreedevi = 30 yr

11. (*c*) Let present age of son = x yr
Then, present age of father = $(5x + 1)$ yr
According to the question,
$$\Rightarrow \quad 4(x + 3) - 2 = (5x + 1) + 3$$
$$\Rightarrow \quad 12 - 2 - 4 = 5x - 4x$$
$$\Rightarrow \quad x = 6 \text{ yr}$$
$\therefore$ Present age of father = $5x + 1$
= 5 × 6 + 1 = 31 yr

12. (*c*) Let the present ages of A and B be $5x$ yr and $3x$ yr, respectively.
Now, $$\frac{5x - 4}{3x + 4} = \frac{1}{1}$$
$$\Rightarrow \quad 5x - 4 = 3x + 4$$
$$\Rightarrow \quad 2x = 8$$
$$\Rightarrow \quad x = 4 \text{ yr}$$
$\therefore$ Required ratio = $\frac{(5 \times 4 + 4)}{(3 \times 4 - 4)} = \frac{24}{8} = 3:1$

13. (*b*) The average age of 19 boys = 21 yr
when teacher comes in the class, then age becomes 19 boys +1 teacher = 22 yr
$\therefore$ Age of teacher = Old average + New average
= 21 + 20 = 41 yr

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14. (*a*) Let the ages of the children be x, $(x + 3)$, $(x + 6)$, $(x + 9)$ and $(x + 12)$ yr, respectively.
Then, $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 50$
$\Rightarrow \quad 5x + 30 = 50$
$\Rightarrow \quad 5x = 20 \Rightarrow x = 4$ yr

15. (*b*) Let the present ages of A's and B's be $3x$ yr and $2x$ yr, respectively.
Now, $3x \times 2x = 216$
$\Rightarrow \quad 6x^2 = 216$
$\Rightarrow \quad x^2 = \frac{216}{6} = 36 \Rightarrow x = 6$ yr
$\therefore$ Sum of their presentages
$= (3x + 2x) = 5x = 5 \times 6 = 30$ yr

16. (*c*) Let the ages of father and son be $4x$ yr and x yr, respectively.
Now, $4x \times x = 196$
$\Rightarrow \quad 4x^2 = 196$
$\Rightarrow \quad x^2 = 49 \Rightarrow x = 7$ yr
$\therefore$ Required ratio $= \frac{(4 \times 7 + 5)}{(7 + 5)}$
$= \frac{33}{12} = \frac{11}{4} = 11 : 4$

17. (*c*) Let the ages of Ram and Mohan be x yr and $(16 + x)$ yr, respectively.
Now, $(16 + x - 6) = 3(x - 6)$
$\Rightarrow \quad x + 10 = 3x - 18$
$\Rightarrow \quad 2x = 28 \Rightarrow x = 14$ yr
$\therefore$ Required sum $= 14 + (16 + 14)$
$= 14 + 30 = 44$ yr

18. (*b*) Anu's present age $(x + 3)$ yr, then present age of Vinay $= (x + 3 - 8) = (x - 5)$ yr

19. (*a*) Let the ages of Raju and Prateek be $3x$ yr and $5x$ yr, respectively.
Then, $3x + 5x = 80$
$\Rightarrow \quad 8x = 80 \Rightarrow x = 10$
$\therefore$ Required ratio $= \frac{(3 \times 10 + 10)}{(5 \times 10 + 10)} = \frac{40}{60} = 2 : 3$

20. (*b*) Let present age of son $= x$ yr
Then, present age of father $= y$ yr
According to the question,
$x + y = 70$ ...(i)
Also, after 10 yr,
$\Rightarrow \quad 2(x + 10) = y + 10$
$\Rightarrow \quad 2x + 20 = y + 10$
$2x - y = -10$ ...(ii)
From Eqs. (i) and (ii),
$x = 20$ yr and $y = 50$ yr

21. (*b*) Let the father's age $= 5x$ yr
and his son's age $= 2x$ yr.
$\therefore$ Product of their age $= 5x \times 2x = 1000$
$\Rightarrow \quad 10x^2 = 1000$
$\Rightarrow \quad x^2 = \frac{1000}{10}$
$\Rightarrow \quad x = 10$
$\therefore$ Father's age $= 5x = 50$ yr
and son's age $= 2x = 20$ yr
After 10 yr, father's age $= 50 + 10$
$= 60$ yr

22. (*b*) Let present age of son $= x$ yr
and present age of mother $= y$ yr
According to the question,
$4(x - 2) = y - 2$
$\Rightarrow \quad 4x - 8 = y - 2$
$\Rightarrow \quad 4x - y = 6$ ...(i)
Also, after 6 yr from now,
$2(x + 6) + 10 = y + 6$
$\Rightarrow \quad 2x + 12 + 10 = y + 6$
$\Rightarrow \quad 2x - y = -16$ ...(ii)
From Eqs. (i) and (ii),
$x = 11$
and $y = 4 \times 11 - 6 = 38$
$\therefore$ Required ratio $= 38 : 11$

23. (*a*) $\because$ Ranu's age $= 48$ yr
$\therefore$ Robin's age $= 48 - 6 = 42$ yr
Rohit's age $= 42 - 14 = 28$ yr
and Krishna's age $= 28 - 15 = 13$ yr

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14

Blood Relations

Blood relation is defined as when a person is related to another by birth rather than by marriage.

The questions which are asked in this chapter are related to 'Blood Relations' You should have adequate knowledge of 'blood relations' in order to solve these questions. The relations may be divided into two main categories. Relations on the mother's side are called **maternal** while that on father's side are called **paternal**.

Types of Relations

Relations from Paternal Side		Relations from Maternal Side	
Relation	**Relation Name**	**Relation**	**Relation Name**
Father's father	Grandfather	Mother's father	Maternal grandfather
Father's mother	Grandmother	Mother's mother	Maternal grandmother
Father's brother	Uncle	Mother's brother	Maternal uncle
Father's sister	Aunt	Mother's sister	Aunt
Children of uncle or aunt	Cousin	Children of maternal uncle or Aunt	Cousin
Wife of uncle	Aunt	Wife of maternal uncle	Maternal aunt
Husband of aunt	Uncle	Husband of maternal aunt	Uncle



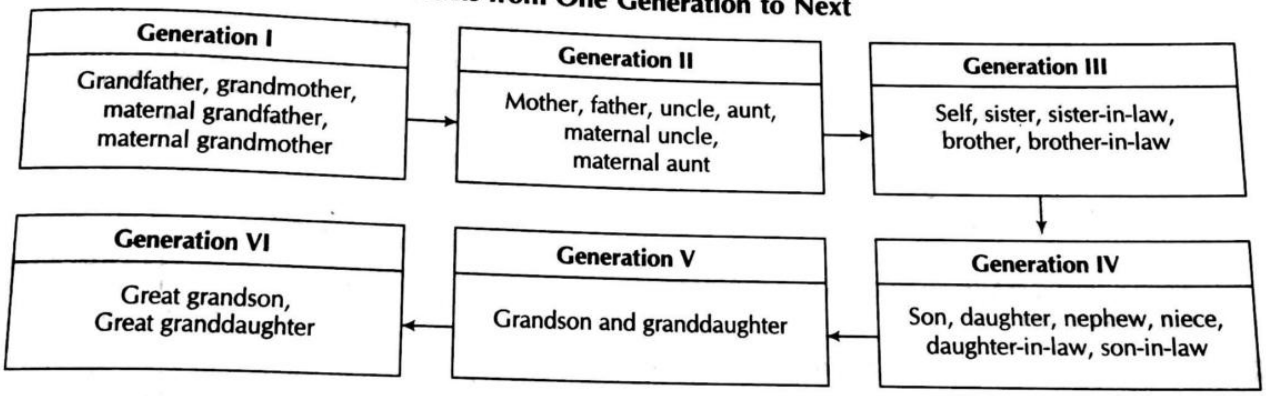
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Other Relations

Relation	Relation Name	Relation	Relation Name
Grandfather's or Grandmother's son	Father or Uncle	Daughter's husband	Son-in-law
Grandfather's or Grandmother's only son	Father	Husband's or wife's brother	Brother-in-law
Grandfather's or Grandmother's daughter	Aunt	Brother's son	Nephew
Mother's or father's son	Brother	Brother's daughter	Niece
Mother's or father's daughter	Sister	Sister's husband	Brother-in-law
Son's wife	Daughter-in-law	Brother's wife	Sister-in-law
Husband's or wife's sister	Sister-in-law	Grandson's or Granddaughter's daughter or son	Great granddaughter or son

Relations from One Generation to Next



Types of Questions

There are three types of questions based on blood relations which are generally asked in various competitive examinations.

Type 1 Deciphering from Jumbled-up Descriptions

A round about description is given in the form of certain small relationships and you are required to analyse the whole chain of relations and **decipher** the direct relationship between the person concerned.

Illustration 1. Introducing a man, a woman said, "His wife is the only daughter of my father". How is that man related to the woman?

(a) Husband (b) Brother
(c) Father-in-law (d) Maternal uncle

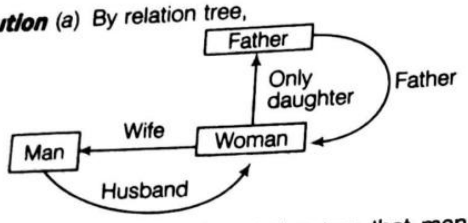
Logical Meaning of Arrows

- A is brother of B denoted by, $A \xrightarrow{\text{Brother}} B$
- B is brother of A denoted by, $A \xleftarrow{\text{Brother}} B$
- A is brother of B denoted by, $A \rightleftharpoons B$
- A and B are sisters denoted by, $A \rightleftharpoons B$

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Solution (a) By relation tree,

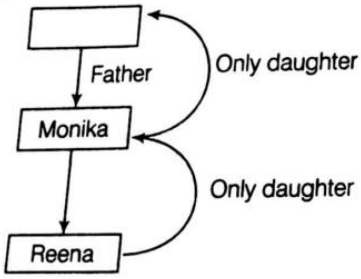


As it is clear from the relation tree that man and woman have a husband-wife relationship.

Illustration 2. Introducing Reena, Monika said, "She is the only daughter of my father's only daughter". How is Monika related to Reena?

(a) Aunt (b) Niece (c) Cousin (d) Mother

Solution (d) We can summarise the information in family tree.

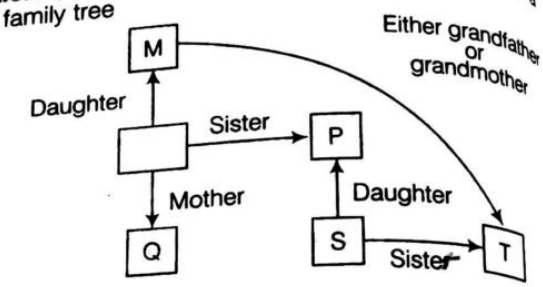


Hence, Reena is Monika's daughter, *i.e.*, Monika is Reena's mother.

Illustration 3. Q's mother is the sister of P and daughter of M. S is the daughter of P and sister of T. How is M related to T?

(a) Grandmother
(b) Father
(c) Grandfather
(d) Grandfather or Grandmother

Solution (d) We can summarise the information in a family tree

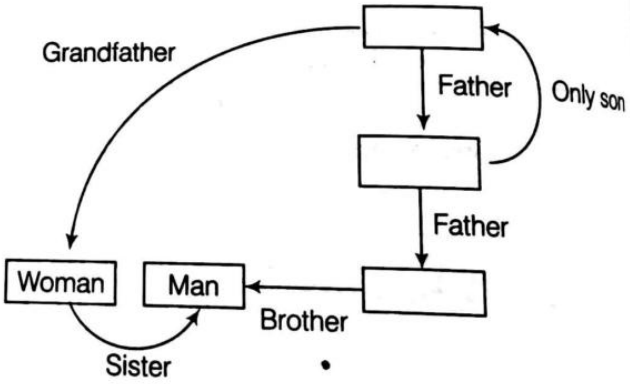


Hence, M is either Grandfather or the Grandmother of T.

Illustration 4. Pointing to a man in a photograph, a woman said, "His brother's father is the only son of my grandfather". How is the woman related to the man in the photograph?

(a) Mother (b) Aunt
(c) Sister (d) Daughter

Solution (c) We can summarise the information in a family tree



Hence, woman is sister of that man.

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Type 2 **Relation Puzzles**

Here, we are given mutual blood relations of more than two persons. You are required to analyse the information and then answer the given questions.

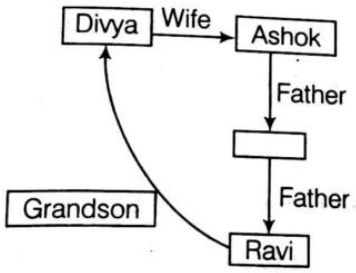
Directions (Illustrations 5-6) *Read the following information carefully and answer the questions given below.*

Ravi is son of Aman's father's sister. Sahil is son of Divya, who is the mother of Gaurav and grandmother of Aman. Ashok is the father of Tanya and grandfather of Ravi. Divya is wife of Ashok.

Illustration 5. How is Ravi related to Divya?

(a) Nephew
(b) Grandson
(c) Son
(d) Data inadequate

Solution (b)

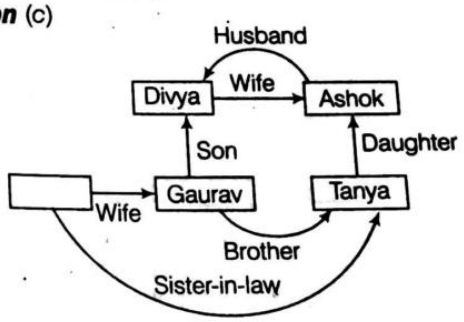


Hence, Ravi is the grandson of Divya.

Illustration 6. How is Gaurav's wife related to Tanya?

(a) Niece
(b) Sister
(c) Sister-in-law
(d) Data inadequate

Solution (c)



Hence, Gaurav's wife is Tanya's sister-in-law.

Type 3 **Coded Relations**

Here, relations are not given directly but we have given some codes. First, we have to use these codes, then extract important information and finally answer the questions asked.

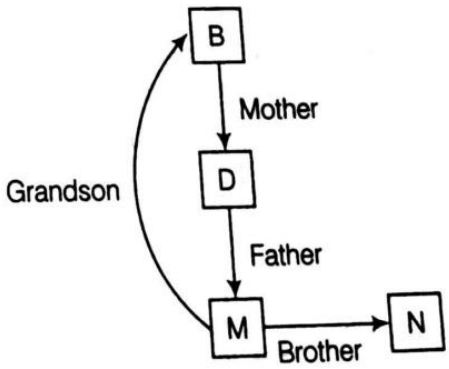
Directions (Illustrations 7-9) *Following questions are based on the information given below.*

(i) 'P × Q' means 'P is father of Q'.
(ii) 'P – Q' means 'P is sister of Q'.
(iii) 'P + Q' means 'P is mother of Q'.
(iv) 'P ÷ Q' means 'P is brother of Q'.

Illustration 7. In the expression B + D × M ÷ N, how is M related to B?

(a) Granddaughter
(b) Son
(c) Grandson
(d) Granddaughter or Grandson
(e) None of the above

Solution (c) B + D × M ÷ N



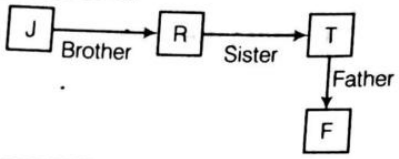
So, M is grandson of B.

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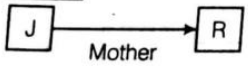
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Illustration 8. Which of the following represents 'J is son of F'?
(a) $J \div R - T \times F$
(b) $J \div R - T \times F$
(c) $J \div M - N \times F$
(d) Cannot be determined
(e) None of the above

Solution (e)
(a) $J \div R - T \times F$

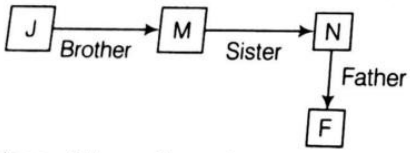


(b) $J + R - T \times F$



So, initially it is proved J is female since J is the mother of R. So, J cannot be son of F, because to be a son J must be male.

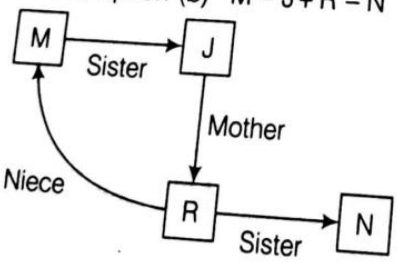
(c) $J \div M - N \times F$



None of the options shows that J is son of F.

Illustration 9. Which of the following represents 'R is niece of M'?
(a) $M \div K \times T - R$
(b) $M - J + R - N$
(c) $R - M \times T \div W$
(d) Cannot be determined
(e) None of the above

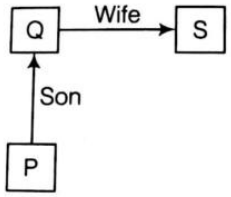
Solution (b) Option (a) does not clarify the gender of R. Hence, it is not possible.
Now, option (b) $M - J + R - N$

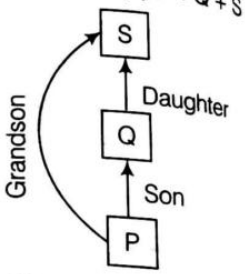


Directions (Illustrations 10-14) *Read the following informations carefully and answer the questions which follow.*
(i) 'A – B' means 'A is father of B'.
(ii) 'A + B' means 'A is daughter of B'.
(iii) 'A ÷ B' means 'A is son of B'.
(iv) 'A × B' means 'A is wife of B'.

Illustration 10. Which of the following means P is grandson of S?
(a) $P + Q - S$
(b) $P \div Q \times S$
(c) $P \div Q + S$
(d) $P \times Q \div S$
(e) None of these

Solution (c) P is the grandson. So, P is a male. But options (a) and (d) shows P is female.
Now, option (b) $P \div Q \times S$, option (c) $P \div Q + S$

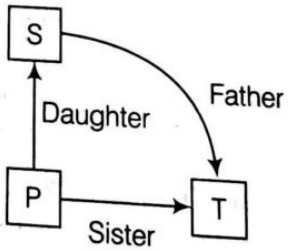




Hence, P is grandson of S.

Illustration 11. How is P related to T in the expression 'P + S – T'?
(a) Sister
(b) Wife
(c) Son
(d) Daughter
(e) None of these

Solution (a) P + S – T



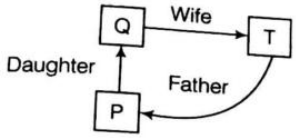
Hence, P is sister of T.

Illustration 12. In the expression 'P + Q × T', how is T related to P?
(a) Mother
(b) Father
(c) Son
(d) Brother
(e) None of these

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Solution (b) P + Q × T



Hence, T is father of P.

Illustration 13. Which of the following means T is wife of P?

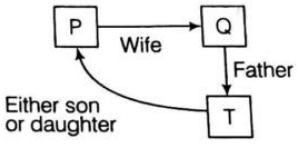
(a) P × S ÷ T (b) P ÷ S × T
(c) P − S ÷ T (d) P + T ÷ S
(e) None of these

Solution (e) As T is wife of P. So, T should be female. In options (a) and (c), gender of T cannot be determined.
Options (b) and (d) show T is male. Hence, these options are superfluous.

Illustration 14. In the expression 'P × Q − T', how is T related to P?

(a) Daughter
(b) Sister
(c) Mother
(d) Cannot be determined
(e) None of the above

Solution (d) P × Q − T



Hence, answer cannot be determined. Because here, gender of T cannot be determined.

Let us Practice

A. Base Level Exercise

1. Pointing to a man on the stage, Rita said, "He is the brother of the daughter of the wife of my husband." How is the man on the stage related to Rita? **[MAT 2013]**

(a) Son (b) Husband
(c) Cousin (d) Nephew

2. Pointing towards a boy Veena said, "He is the son of only son of my grandfather." How is that boy related to Veena? **[SSC (Multitasking) 2014]**

(a) Uncle (b) Brother
(c) Cousin (d) Nephew

3. Ramesh is the brother of Amit. Sushma is the sister of Satish. Amit is the son of Sushma. How is Ramesh related to Sushma? **[SSC (FCI) 2012]**

(a) Father (b) Brother
(c) Son (d) Nephew

4. A woman introduces a man as the son of the brother of her mother. How is the man related to the woman? **[MAT 2013]**

(a) Nephew (b) Son
(c) Cousin (d) Uncle

5. Pointing to a woman in the photograph, Rajesh said, "The only daughter of her grandfather is my wife". How is Rajesh related to that woman? **[CLAT 2013]**

(a) Uncle
(b) Father
(c) Maternal Uncle
(d) Brother

6. Pointing towards a girl, Anurag says, "This girl is the daughter of the only child of my father". What is the relation of Anurag's wife with the girl? **[CG PSC 2013]**

(a) Sister
(b) Aunt
(c) Daughter
(d) Mother
(e) None of these

7. D is B's Father. B is C's sister-in-law and A's daughter. How is A related to D? **[SSC (CPO) 2013]**

(a) Wife (b) Mother
(c) Father (d) Husband

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8. Pointing to a gentleman, Deepak said, "His only brother is the father of my daughter's father." How is the gentleman related to Deepak?

(a) Grandfather (b) Father
(c) Brother-in-law (d) Uncle
(e) None of these

9. Looking at a photograph, a person said, "I have no brother or sister but that man's father is my father's son". At whose photograph was the person looking at? [SSC (10+2) 2011]

(a) His son's (b) His nephew's
(c) His father's (d) His own

10. Raghu and Babu are twins. Babu's sister is Reema. Reema's husband is Rajan. Raghu's mother is Lakshmi. Lakshmi's husband is Rajesh. How is Rajesh related to Rajan? [SSC (10+2) 2012]

(a) Uncle (b) Son-in-law
(c) Father-in-law (d) Cousin

11. If Neena says, "Anita's father Raman is the only son of my father-in-law, Mahipal", then how is Bindu, who is the sister of Anita, related to Mahipal? [MAT 2013]

(a) Niece (b) Daughter
(c) Wife (d) Granddaughter

12. Moni is daughter of Sheela. Sheela is wife of my wife's brother. How Moni is related to my wife ? [CLAT 2013]

(a) Cousin (b) Niece
(c) Sister (d) Sister-in-law

13. B is the father of Q. B has only two children. Q is the brother of R. R is the daughter of P. A is the granddaughter of P. S is the father of A. How is S related to Q? [IDBI Bank (PO) 2011]

(a) Son (b) Son-in-law
(c) Brother (d) Brother-in-law
(e) None of these

14. Annu is daughter of my mother's brother Abahi. Pari is granddaughter of my mother. Pari should call Annu as [CLAT 2013]

(a) maternal Aunt (b) sister
(c) cousin (d) niece

15. A's mother is sister of B and daughter of C. D is the daughter of B and sister of E. How is C related to E? [IB (ACIO) 2013]

(a) Sister
(b) Mother
(c) Father
(d) Grandmother or Grandfather

16. A man said to a woman, "The only son of your brother, is the brother of my wife." How is that woman related to the wife of that man? [SSC (10+2) 2013]

(a) Aunt
(b) Sister
(c) Mother
(d) Grandmother

17. A woman going with a boy is asked by another woman about the relationship between them. The woman replied, "My maternal uncle and the uncle of his maternal uncle is the same." How is the lady related to that boy?

(a) Grandmother and grandson
(b) Mother and son
(c) Aunt and nephew
(d) Cannot be determined
(e) None of the above

18. In a family of five persons, Dinesh is Jairam's son and Gopal's brother while Meeta is Gopal's mother and Jayanti's daughter. If there are no step brothers or half brothers in the family, which of the following statements is true? [IB (ACIO) 2012]

(a) Jayanti is Dinesh's mother
(b) Meeta is Dinesh's mother
(c) Jayanti is Jairam's grandmother
(d) All of the above

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19. A man showed a boy next to him and said, "He is the son of my wife's sister-in-law but I am the only child of my parents". How is my son related to him? [SSC (CGL) 2013]

(a) Cousin (b) Brother
(c) Uncle (d) Nephew

20. Pointing to a lady Simon said, "She is the daughter of the only sister of my father". How is lady related to Simon? [SSC (10 + 2) 2013]

(a) Mother (b) Aunt
(c) Sister (d) Cousin sister

21. Introducing Asha to guests, Bhaskar said, "Her father is the only son of my father." How is Asha related to Bhaskar? [SSC (Multitasking) 2013]

(a) Niece (b) Granddaughter
(c) Mother (d) Daughter

22. Deepak said to Nitin, "That boy playing with the football is the younger of the two brothers of the daughter of my father's wife". How is the boy playing football related to Deepak? [CLAT 2013]

(a) Son (b) Brother
(c) Cousin (d) Brother-in-law

23. Sunil is the son of Kesav. Simran, Kesav's sister, has a son Maruti and daughter Sita. Prem is the maternal uncle of Maruti. How is Sunil related to Maruti? [SSC (CGL) 2013]

(a) Cousin (b) Uncle
(c) Brother (d) Nephew

24. Pointing, towards a photograph, Ram said, "She is the mother of my brother's son's wife's sister". How is the lady in the photograph related to Ram's brother? [SSC (CPO) 2012]

(a) Sister (b) Daughter-in-law
(c) Daughter (d) None of these

25. If A is brother of B. C is father of D. E is mother of B. A and D are brothers. Then, what is the relationship between E and C? [RRB (TC/CC) 2004]

(a) Sister (b) Sister-in-law
(c) Niece (d) Wife

26. Pointing to a lady in a photograph, a lady tells Pramod, "I am the only daughter of this lady and her son is your maternal uncle." How is the lady related to Pramod's father? [MAT 2005]

(a) Sister-in-law
(b) Wife
(c) Either (a) or (b)
(d) None of the above

27. Let A and B are sisters. C is brother of A. D is brother of E. If E is daughter of B, then who is aunt of D? [UP B.Ed. 2006]

(a) E (b) C
(c) A (d) B

28. K is brother of X. Z is son of X. P who is daughter of K is married to N. G and X are sisters to each other. What is the relation between G and Z? [SSC (CGL) 2006]

(a) Sister
(b) Aunt
(c) Mother
(d) Mother-in-law

29. A man said to a lady, "Your mother's husband's sister is my aunt". How is the lady related to the man? [UP (B.Ed.) 2008]

(a) Daughter
(b) Granddaughter
(c) Mother
(d) Sister

30. C is the mother of A and B. If D is the husband of B, then what is C to D? [SSC (10 + 2) 2013]

(a) Mother
(b) Aunt
(c) Mother-in-law
(d) Sister

31. Given that,

I. A is the brother of B
II. C is the father of A.
III D is the brother of E.
IV. E is the daughter of B.

Then, the uncle of D is [CSAT 2013]

(a) A (b) B
(c) C (d) E

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32. Pointing to a photo of a girl, Rohit said, "She does not have any sister or daughter but her mother is the only daughter of my mother." What is the relation between the girl and Rohit?
[RRB (ASM) 2006]
(a) Daughter
(b) Sister
(c) Niece
(d) Daughter-in-law

33. Markandey is Rajiv's mother's father. Markandey has three brothers. One of them has grandson Abhi. Rajan is son of Abhi. Rajan is related to Rajiv as
(a) brother
(b) nephew
(c) cousin
(d) uncle

B. Expert Level Exercise

Directions (Q. Nos. 1-2) *Read the following information carefully and answer the questions which follow.*

(i) '$P \times Q$' means 'Q is mother of P'.
(ii) '$P + Q$' means 'P is brother of Q'.
(iii) '$P - Q$' means 'P is sister of Q'.
(iv) '$P \div Q$' means 'Q is father of P'.

1. Which of the following definitely means 'R is grandson of K'?
(a) $R \times T \div K$
(b) $M + R \times T \div K$
(c) $M - R \times T \div K$
(d) Cannot be determined
(e) None of the above

2. Which of the following statements is redundant to answer the above question?
(a) None
(b) Only (i)
(c) Only (ii)
(d) Only (iii)
(e) Only (iv)

Directions (Q. Nos. 3-4) *Read the following information carefully and answer the questions which follow.*

(i) '$P \times Q$' means 'P is brother of Q'.
(ii) '$P - Q$' means 'P is mother of Q'.
(iii) '$P + Q$' means 'P is father of Q'.
(iv) '$P \div Q$' means 'P is sister of Q'.

3. Which of the following means 'M is niece of N'?
(a) $M \times R - N$
(b) $N \div J + M \div D$
(c) $N \div J + M$
(d) $N \times J - M$
(e) None of the above

4. Which of the following means 'B is the grandfather of F'?
(a) $B + J - F$
(b) $B - J + F$
(c) $B \times T - F$
(d) $B + T + F$
(e) None of these

5. T, S and R are three brothers. T's son Q is married to K and they have one child Rahul blessed to them. M the son of S is married to H and this couple is blessed with a daughter Madhvi. R has a daughter N who is married to P. This couple has one daughter Karuna born to them. How is Madhvi related toS ?
[MAT 2013]
(a) Daughter
(b) Niece
(c) Granddaughter
(d) None of these

6. There are six members in family. A is the father of D, E is the grandfather of D. B is the daughter-in-law of C. F is th uncle of D. What is the relationship of C with F?
[MAT 2013]
(a) Sister
(b) Mother-in-Law
(c) Nephew
(d) Data inadequate

Directions (Q. Nos. 7-9) *Read the following information carefully to answer these questions.*

A family consists of six members P, Q, R, X, Y and Z. Q is the son of R but R is not the mother of Q. P and R are a married couple. Y is the brother of R. X is the daughter of P. Z is the brother of P.

7. Who is the brother-in-law of R?
(a) P
(b) Z
(c) Y
(d) X

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8. How many female members are there in the family?

(a) One (b) Two
(c) Three (d) Four

9. Which of these is a pair of brothers?

(a) P and X (b) P and Z
(c) Q and X (d) R and Y

10. In a family there are seven persons, comprising two married couples, T is the son of M and the grandson of K. M is a widower. M and R are brothers and W is the daughter-in-law of J, who is the mother of R and the grandmother of 'D'. How is D related to M? **[MAT 2013]**

(a) Son (b) Son-in-law
(c) Nephew (d) Brother

11. A, Q, Y, Z are different persons. Z is the father of Q. A is the daughter of Y and Y is the son of Z. If P is the son of Y and B is the brother of P, then **[CG (PSC) 2012]**

(a) B and Y are brothers
(b) A is the sister of B
(c) Z is the uncle of B
(d) Q and Y are brothers

Directions (Q. Nos. 12-16) *Study the following information carefully to answer these questions.* **[Delhi Police (constable) 2009]**

(i) 'P ★ Q' means 'P is father of Q'.
(ii) 'P # Q' means 'P is sister of Q'.
(iii) 'P + Q' means 'P is brother of Q'.
(iv) 'P – Q' means 'P is mother of Q'.
(v) 'P/Q' means 'P is son of Q'.
(vi) 'P = Q' means 'P is daughter of Q'.

12. If Z ★ X – Y is given, then which of the following is true?

(a) Z is maternal uncle of Y
(b) Z is grandfather of Y
(c) X is nephew of Z
(d) Z is grandmother of Y

13. Which of the following means 'Z has two children'?

(a) Z + Y + X (b) Z ★ Y # X
(c) Z # Y – X (d) Z + X/Y

14. Which of the following means 'X is the grandfather of Y'?

(a) X ★ Z ★ Y (b) Y ★ Z/X
(c) Z # X = Y (d) X + Y/Z

15. Which of the following means 'X is the grandfather of Z'?

(a) X ★ Y ★ Z (b) Z # X – Y
(c) Y – Z = X (d) X – Y – Z

16. Which of the following means 'Y is the mother of X and Z'?

(a) X + Y – Z (b) Y – X/Z
(c) Y – X + Z (d) Y + X ★ Z

17. If 'P$Q' means 'P is father of Q', 'P#Q' means 'P is mother of Q', 'P★Q' means 'P is sister of Q', then how is D related to N in N#A$B★D? **[SBI (PO) 2000]**

(a) Nephew
(b) Grandson
(c) Grand daughter
(d) Data inadequate
(e) None of the above

Directions (Q. Nos. 18-22) *Read the following information carefully and answer the following questions.* **[SBI (PO) 2013]**

If 'A + B' means 'A is the father of B'.
If 'A × B' means 'A is the sister of B'.
If 'A $ B' means 'A is the wife of B'.
If 'A % B' means 'A is the mother of B'.
If 'A ÷ B' means 'A is the son of B'.

18. What should come in place of the question mark, to establish that J is the brother of T in the expression?

J ÷ P % H ? T % L

(a) × (b) ÷
(c) $ (d) Either ÷ or X
(e) Either + or ÷

19. Which among the given expressions indicate that M is the daughter of D?

(a) L % R $ D + T × M
(b) L + R $ D + M × T
(c) L % R % D + T ÷ M
(d) D + L $ R + M × T
(e) L $ D ÷ R % M ÷ T

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20. Which among the following options is true, if the expression 'I + T % J × L ÷ K' is definitely true?

(a) L is the daughter of T
(b) K is the son-in-law of I
(c) I is the grandmother of L
(d) T is the father of J
(e) J is the brother of L

21. Which among the following expressions is true, if Y is the son of X is definitely false?

(a) W % L × T × Y ÷ X
(b) W + L × T × Y ÷ X
(c) X + L × T × Y ÷ W
(d) W $ X + L + Y + T
(e) W % X + T × Y ÷ L

22. What should come in place of the question mark, to establish that T is the sister-in-law of Q in the expression?

R % T × P ? Q + V

(a) ÷ (b) % (c) × (d) $ (e) Either $ or ×

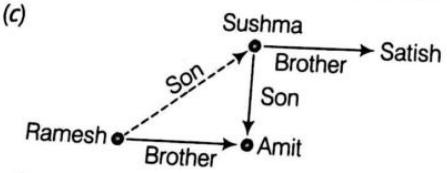
Answer *with* Explanations

A. Base Level Exercise

1. *(a)* Brother of daughter means son. Wife of my husband means herself. So, the man is son of Rita.

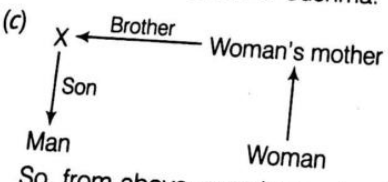
2. *(b)* The only son of Veena's grandfather is her father and the son of her father is her brother.

3. *(c)*



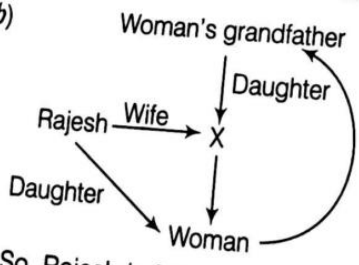
So, Ramesh is son of Sushma.

4. *(c)*



So, from above, man is cousin of woman.

5. *(b)*

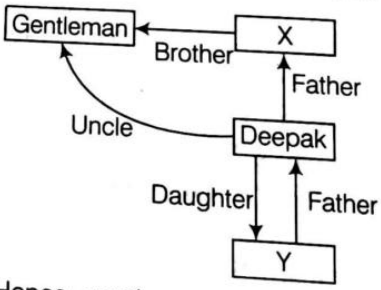


So, Rajesh is father of that woman.

6. *(d)* The daughter of only child of Anurag's father will be daughter of Anurag. Thus, Anurag's wife will be the mother of this girl.

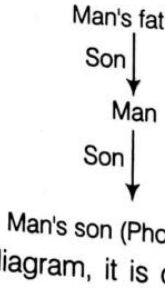
7. *(a)* According to the question, D is the father of B and B is the daughter of A. Thus. A is wife of D.

8. *(d)*



Hence, gentleman is Deepak's uncle.

9. *(a)*



By diagram, it is clear that the photo is of his son.

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'I + T % J × L ÷ K' is definite

of X is definitely false?

at T is the sister-in-law o

child of Anurag's father w
g. Thus, Anurag's wife w
girl.

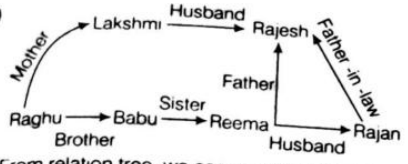
tion, D is the father of E
A. Thus. A is wife of D

X
Father
oak
Father

ak's uncle.

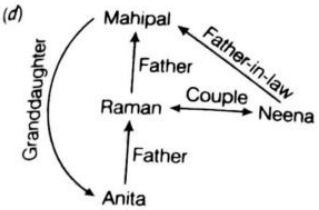
e photo is of his

10. (c)



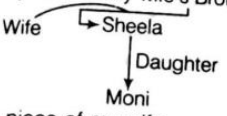
From relation tree, we can say that Rajesh is the father-in-law of Rajan.

11. (d)



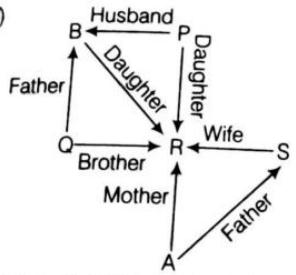
So, Anita is granddaughter of Mahipal.

12. (b) Myself → My wife → My wife's Brother



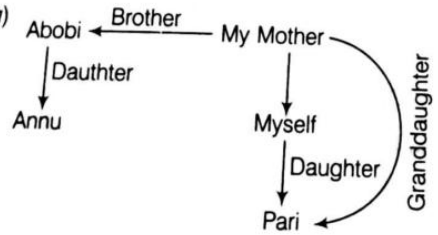
So, Moni is niece of my wife.

13. (d)



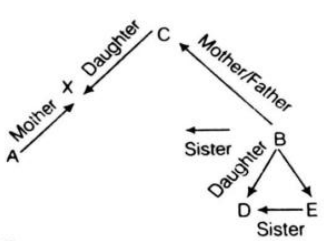
Hence, S is the brother-in-law of Q.

14. (a)



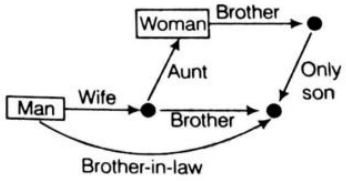
So, Pari should call Annu her maternal Aunt.

15. (d)



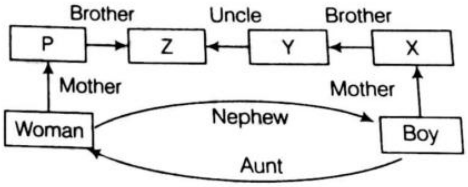
From, the above family tree it can be concluded that C is either grandmother or grandfather of E.

16. (a)



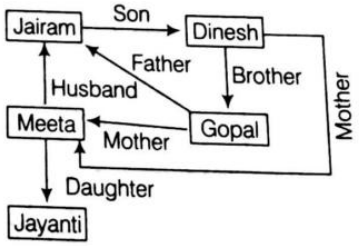
So, that woman is Aunt to the wife of that man.

17. (c)



Hence, their relationship is Aunt-Nephew.

18. (b) For making the relation tree



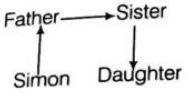
From above relation tree and given information, we can say that Meeta is Dinesh's mother.

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19. (*a*) Son of sister-in-law of the man means that boy is the son of his brother-in-law and the son of the man is cousin to that boy.

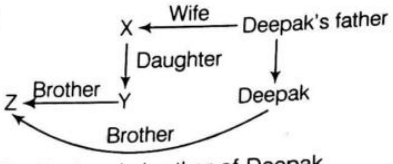
20. (*d*)



Thus, the lady is the cousin sister of Simon.

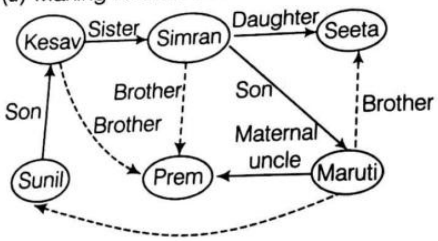
21. (*d*) Only son of Bhaskar's father is himself. Therefore, Asha's father is Bhaskar. Hence, Asha is the daughter of Bhaskar.

22. (*b*)



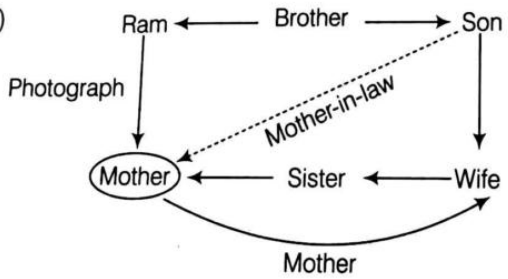
So, the boy is brother of Deepak.

23. (*a*) Making relation tree from the given information.



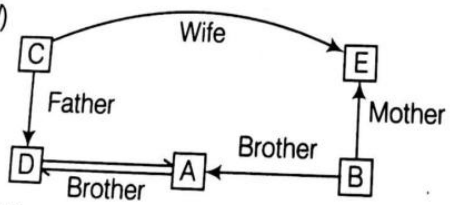
From above relation tree it is clear that Kesav is Prem's brother *i.e.*, maternal uncle of Maruti. So, Sunil is the cousin of Maruti.

24. (*d*)



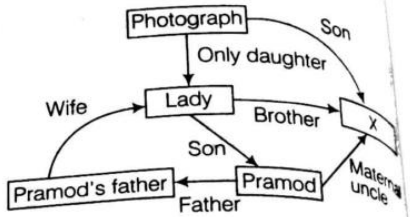
Hence, from the above diagram, it is clear that the lady in the photograph is mother-in-law of Ram's brother's son.

25. (*d*)



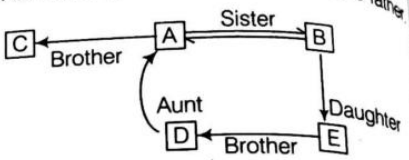
Hence, E is the wife of C.

26. (*b*)



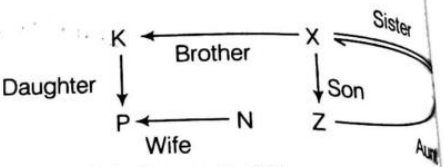
Hence, lady is the wife of Pramod's father.

27. (*c*)



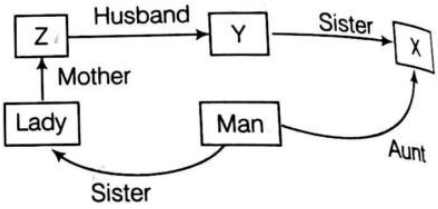
Hence, A is the aunt of D.

28. (*b*)



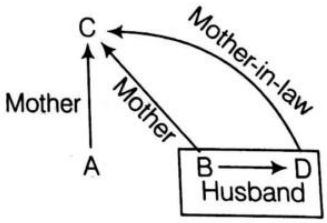
Hence, G is the aunt of Z.

29. (*d*)



Hence, lady is the sister of man.

30. (*c*)



So, the C is mother-in-law of D.

31. (*a*) From Statements III and IV,

B is either mother or father of D.

Hence, B's brother will be uncle of D.

Hence, by Statement I, A is the uncle of D.

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hotograph
Only daughter
Son
Lady
Brother
X
Son
Pramod
Maternal uncle
ather
wife of Pramod's father.

Sister
B
Daughter
Brother
E
of D.

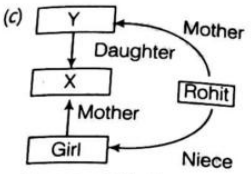
X
Sister
Son
Z
Aunt

Sister
X
Aunt

an.

f D.
cle of D.

32. (c)



Hence, girl is the niece of Rohit.

B. Expert Level Exercise

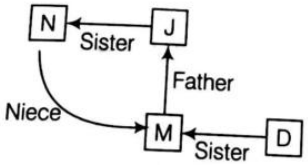
1. (e) In each options, R × T means 'R is mother of T'. Means R is female. So, none of these represents R is grandson of K.

N ÷ J + M ÷ D

2. (a) None is redundant. Each option clarify the gender of R.

3. (b) M is niece of N. So, M is female. Here option (a) is redundant. Also, gender of M cannot be determined using options (c) and (d). Now,

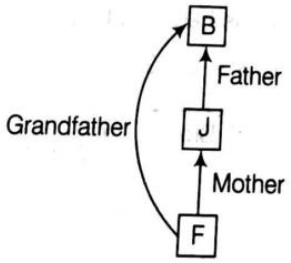
N ÷ J + M ÷ D



4. (a) B is grandfather of F. So, B should be male. Hence, options (b) and (d) are redundant. Now,

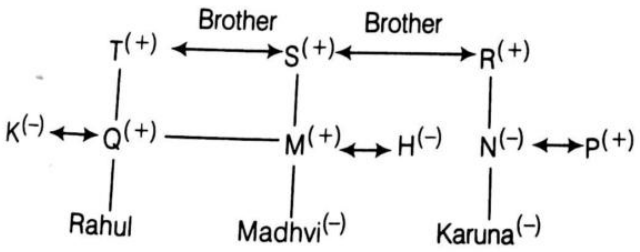
By taking option (a).

(a) B + J – F

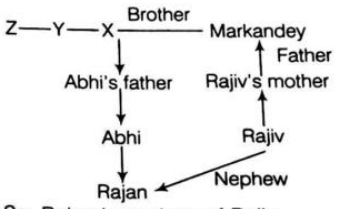


Hence, option (a) is true.

5. (c)



33. (b)



So, Rajan is nephew of Rajiv.

(+) → Male member

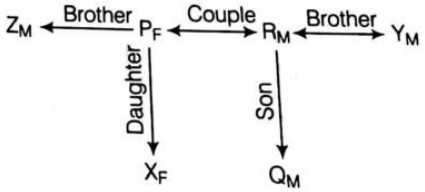
(–) → Female member

⟷ → Couples

From the above generation tree, we see that Madhvi is the granddaughter of S.

6. (d) Cannot be determine, since the relation of B and C is not given with other family member. Hence, data is inadequate.

Solutions (Q. Nos. 7-9) *From the information given data is arranged as*

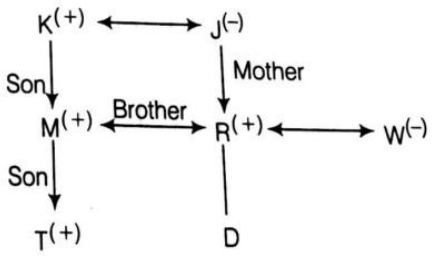


7. (b) Z is brother-in law of R.

8. (b) X and P are females.

9. (d) R and Y is the pair of brothers.

10. (c)



(+) → Male member

(–) → Female member

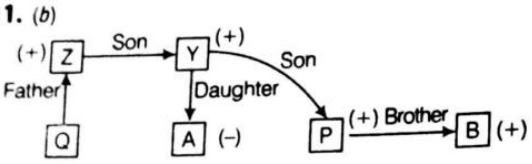
⟷ → Married couples

From the above generation, we see that M is uncle of D or D is nephew of M.

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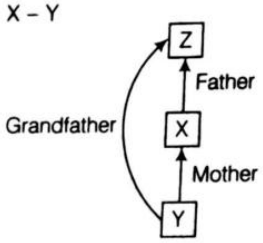
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11. (*b*)



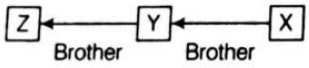
From above diagram, it is clear that A is sister of B.

12. (*b*) Z ★ X – Y

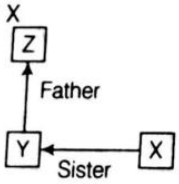


Hence, option (b) is true.

13. (*b*) (a) Z + Y + X

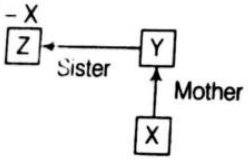


(b) Z ★ Y # X

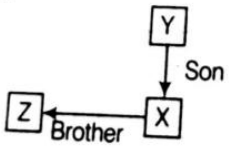


Clearly, Z has two children *x* and *y*.

(c) Z # Y – X

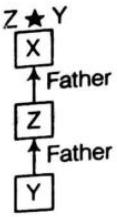


(d) Z + X/Y



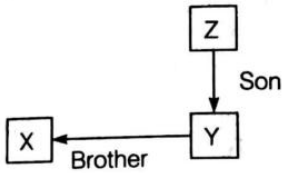
14. (*a*) Option (b) is harsh as gender of X cannot be determined. Also, option (c) is harsh as gender of X is female here.

Now, (a) X ★ Z ★ Y



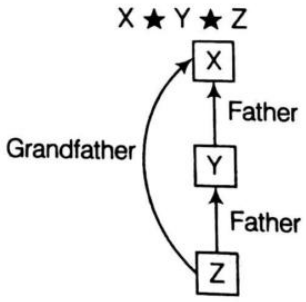
Hence, X is grandfather of Y

(d) X + Y/Z



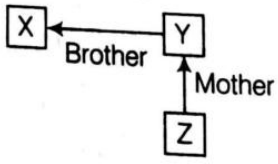
15. (*a*) Option (c) is harsh as gender of X cannot be determined. Also, option (b) and option (d) are harsh as, here gender of X is female but it should be male.

Now,



16. (*c*) Option (d) is harsh as here Y is male.

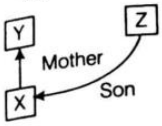
Now, (a) X + Y – Z



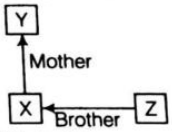
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(b) Y – X/Z

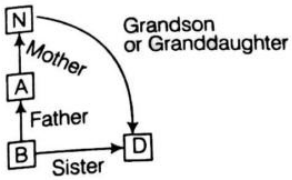


(c) Y – X + Z



Hence, Y is mother of X and Z.

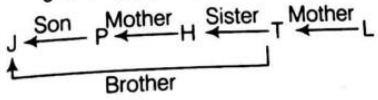
17. (*d*) N # A $ B ★ D



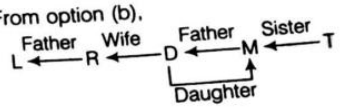
Hence, D is the grandson or granddaughter of N.

18. (*a*) From option (a),

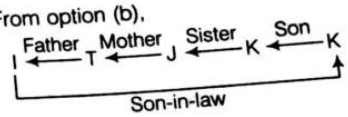
J ÷ P % H × T % L



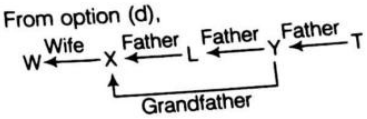
19. (*b*) From option (b),



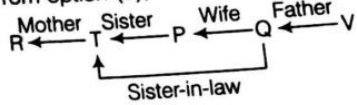
20. (*b*) From option (b),



21. (*d*) From option (d),



22. (*d*) From option (d),



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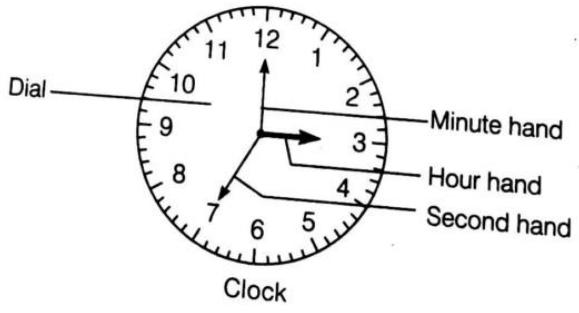
Clock *and* Calendar

Clock and calender are the basic instruments that are being used to measu time in different units.

Clock

A clock is a circular/square shaped instrument used to view/measure time in hours, minutes and seconds.

Measurement of time is an important aspect of our daily life. It helps us to prepare our schedule and work in an orderly manner. There are, mainly, four important parts of a clock—Dial, Hour hand, Minute hand and Second hand.



Clock

The Dial

The dial of a clock is circular one, whose circumference is divided into 12 parts (12 equal big divisions) labelled as 1, 2, 3, 4, ... and 12. The space between every pair of two numbers is divided in 5 equal small divisions.

Thus, the dial is divided into 60 small divisions. The clock has two hands. One is longer (minute hand) and another is shorter (hour hand).

Minute hand The longer hand of the clock is known as minute hand. The minute hand moves from one small division to the next small division in 1 min.

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The minute hand goes once round the dial in 1 h. Thus, the minute hand covers 60 small divisions in 1 h.

60 min = An hour
30 min = Half an hour
15 min = Quarter of an hour

Hour hand The shorter hand of the clock is known as hour hand. The hour hand moves from one number to the next number in 1 h. The hour hand takes 12 h to complete one round. Also, it takes 2 full rounds of the clock in a day. Its movement is also in a clockwise direction.

1 day = 24 h

Second hand We may come across some clocks or watches which have three hands. The third hand which is very thin and is called the second hand.

The second's hand makes full round in 1 min and the time in which it moves between two successive small divisions is called 1sec.

Thus,

60 s = 1 min

Use of AM and PM

... time is 12 O'clock. It may be in the noon or ... that

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The use of 24 h clock time is very useful. The time is expressed by four digits. The first two digits on the left denote hours while the right two digits denote minutes. The day starts at 12 midnight and is written as 0000 h. Hence, the time in this clock type of is expressed as 12 O'clock midnight is written as 2400 h or 0000 h.

3 : 00 am is written as 0300 h.
11 : 00 am is written as 1100 h.
2 : 00 pm is written as 1400 h.

Fast and slow If a watch or a clock indicates 6:15, when the correct time is 6, it is said to be 15 min fast. On the other hand, if it indicates 5:45, when the correct time is 6, it is said to be 15 min slow.

Important Points

- In 60 min, the minute hand gains 55 min on the hour hand.
- In every hour, both the hands coincide once.
- The hands are in the same straight line when they are coincident or opposite to each other.
- When the two hands are at right angles (90°) they are 15 min space apart.
- When the hands are in opposite directions, they are 30 min space apart.
- Angle traced by hour hand in 12 h = 360°
- Angle traced by minute hand in 60 min = 360°
- Both hands of a clock occurs at right angle twice in one hour, 22 times in 12 h and 44 times in 24 h.
- Both hands of a clock occurs in a straight line or are opposite once in one hour, 11 times in 12 h and 22 times in 24 h.

Illustration 1. At what angle the hands of a clock are inclined at 15 min past 5?

(a) $72\frac{1}{2}^\circ$

(b) $67\frac{1}{2}^\circ$

(c) $58\frac{1}{2}^\circ$

(d) 64°

Solution (b) At 15 min past 5, the minute hand is at 3 and hour and slightly ahead of 5.

Now, angle through which hour hand shifts in 15 min $= \left(15 \times \frac{1}{2}\right)^\circ$

$= 7\frac{1}{2}^\circ$

$\therefore$ Angle at 15 min past 5 $= \left(60 + 7\frac{1}{2}\right)^\circ$

$= 67\frac{1}{2}^\circ$

Illustration 2. A clock is set right at 8 am. The clock gains 10 min in 24 h. What will be the right time when the clock indicates 1pm on the follllowing day?

(a) 11 : 40 pm (b) 12 : 48 pm
(c) 12 pm (d) 10 pm

Solution (b) Time from 8 am of a particular day to 1 pm on the following day = 29 h

Now the clock gains 10 min in 24 h, it means that 24 h 10 min of this clock is equal to 24 h of the correct clock.

$\frac{145}{6}$ h of this clock = 24 h of the correct clock.

29 h of this clock $= \frac{24}{145} \times 6 \times 29 = 28$ h, 48 min of correct clock

29 h of this clock = 28 h 48 min of the correct clock.

It means that the clock in question is 12 min faster than the correct clock. Therefore, when clock indicates 1pm the correct time will be 48 min past 12.

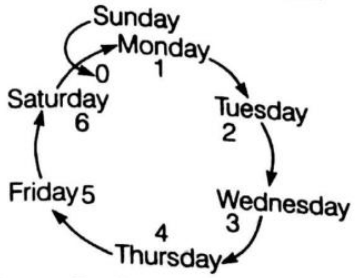
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Calendar

The record of all the days of the year is given in the calendar. It shows the months, weeks and days in the year.

Week days There are seven days in a week. A week starts with Monday and ends at Sunday. After which again comes Monday. The same cycle goes on and on.



Months of the year We know that, there are 12 months in a year. The months of the year with the number of days in that month are given below

Name of the months	Number of days	Name of the months	Number of days
1. January	31	7. July	31
2. February	28 or 29	8. August	31
3. March	31	9. September	30
4. April	30	10. October	31
5. May	31	11. November	30
6. June	30	12. December	31

February of an ordinary year has 28 days. There are 365 days in an ordinary year.

Thus, 1 ordinary year = 365 days = 52 weeks and 1 day. February of a leap year has 29 days, so, there are 366 days in a leap year. Thus, 1 leap year = 366 days = 52 weeks and 2 days. A leap year comes after every 4 yr.

Century A block of 100 yr is called a century. A century has, thus a total of 100 yr. Thus, each one of the years 1100, 1800, 2000, 2100 is a century.

Leap year The year other than a century divisible by 4 as well as by 400 is called a leap year.

Thus, each one of the years 1600, 1996, 2000, 2004, 2008 is a leap year and none of the years 1867, 1993, 1997, 1999, 2001, 2003, 2007 is a leap year.

Ordinary year The year which is not a leap year is called an ordinary year.Thus, each one of the years 1781, 1891, 1995, 1999, 2013 is an ordinary year.

Important Points

- A leap year has 52 weeks and 2 days.
- An ordinary year has 52 weeks and 1 day.
- A year has 52 full weeks.
- **Odd Days** In a given period, the number of days more than the complete weeks are called odd days. Also, when total number of days divided by 7 remainder called odd days.
  1 ordinary year = 365 days = (52 weeks + 1 day)
- 1 leap year = 366 days = (52 weeks + 2 days) 100 yr = 76 ordinary years + 24 leap years = $(76 \times 1 + 24 \times 2)$ odd days = 124 odd days = (17 weeks + 5 days) = 5 odd days
  Number of odd days in 100 yr = 5
  Number of odd days in 200 yr = $(5 \times 2) = 10 = (7 + 3)$ = 3 odd days
- The first day of century cannot be wednesday, Friday and Sunday
- The last day of century can not be Tuesday and Saturday.

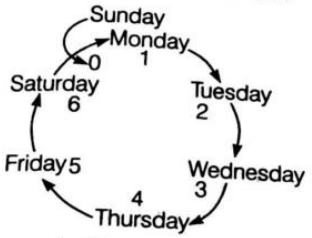
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Important Points

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  Number of odd days in 100 yr = 5
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- The first day of century cannot be wednesday, Friday and Sunday
- The last day of century can not be Tuesday and Saturday.

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Day of the week

related to odd days

- The first day of century cannot be Wednesday, Friday and Sunday
- The last day century cannot be Tuesday and Saturday.

Number of days	0	1	2	3	4	5	6
Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Illustration 3. What was the day on 26th Jan 1950, when Ist Republic Day of India was celebrated?

(a) Monday (b) Tuesday
(c) Thursday (d) Friday

Solution (c) 26th Jan, 1950 means
(1949 yr and 26 days)
1600 yr have 0 odd day,
300 yr have 1 odd day
49 yr have (12 leap year and 37 ordinary years)
$\Rightarrow (12 \times 366 + 37 \times 365)$
$\Rightarrow$ days – (4392 + 13505) days
$\Rightarrow$ (17897) days = 2556 weeks + 5 days
So,. 49 ys have 5 odd days
and 26 days have 5 odd days.
Total number of odd days = 0 + 1 + 5 + 5
= 11 days
Hence, the day on 26th Jan, 1950 was Thursday.

Illustration 4. If the day after tomorrow is a Sunday, what was it day before yesterday?

(a) Wednesday (b) Thursday
(c) Friday (d) Saturday

Solution (a) Today → Friday. So, the yesterday day before → Wednesday.

Let us Practice

. Base Level Exercise

1. What will be the angle between hour hand and minute hand, if clock shows 8:30 pm? [SSC (CPO) 2011]

(a) 90° (b) 75° (c) 60° (d) 85°

2. Reaching the place of meeting on Tuesday 15 min before 8:30 h, Anuj found himself half an hour earlier than the man who was 40 min late. What was the scheduled time of the meeting?

(a) 8:00 h (b) 8:05 h
(c) 8:15 h (d) 8:45 h

3. A clock buzzes 1 time at 1 O'clock, 2 times at 2 O'clock, 3 times at 3 O'clock and so on. What will be the total number of buzzes in a day?

(a) 150 (b) 156
(c) 100 (d) None of these

4. How many times are the hands of a clock is at right angle in a day?

(a) 22 (b) 24
(c) 44 (d) 48

5. How many times do the hands of a clock coincide in a day?

(a) 24 (b) 22
(c) 21 (d) 20

6. How many times do the hands of a clock points towards each other in a day?

(a) 24 (b) 20
(c) 12 (d) 22

7. If today is Thursday, what will be the day on 363 days?

(a) Sunday (b) Saturday
(c) Thursday (d) None of these

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8. Today is Monday. After 61 days, it will be
(a) Wednesday (b) Saturday
(c) Tuesday (d) Thursday

9. Which of the following is not a leap year?
(a) 707 (b) 800
(c) 1200 (d) 2000

10. Today is Wednesday, what will be the day after 84 days?
(a) Monday
(b) Tuesday
(c) Wednesday
(d) Sunday

11. Today is Thursday. The day after 59 days will be
(a) Sunday
(b) Monday
(c) Tuesday
(d) Wednesday

12. The last day of a century cannot be either
I. Tuesday II. Thursday
III. Saturday IV. Sunday [MAT 2013]
(a) I and II
(b) I and IV
(c) I, II and III
(d) I,III and IV

B. Expert Level Exercise

1. Mrs Susheela celebrated her wedding anniversary on Tuesday, 30th September, 1997. When will she celebrate her next wedding anniversary on the same day?
(a) 30th September, 2003
(b) 30th September, 2004
(c) 30th September, 2002
(d) 30th October, 2003

2. If Republic day was celebrated in 1996 on Friday, on which day in 2000 Independence was celebrated? [SSC (CGL) 2012]
(a) Tuesday
(b) Monday
(c) Sunday
(d) Saturday

13. The day before the day before yesterday is three days after Saturday. What day is it today? [IB (ACIO) 2013]
(a) Tuesday (b) Wednesday
(c) Thursday (d) Friday

14. If January 1 is a Friday, what is the first day of the month of March in a leap year? [CG PSC 2013]
(a) Tuesday (b) Wednesday
(c) Thursday (d) Friday

15. In a month of 31 days, third Thursday falls on 16th. What will be the last day of the month? [SSC (10 + 2) 2013]
(a) 5th Friday (b) 4th Saturday
(c) 5th Wednesday (d) 5th Thursday
(e) None of these

16. A bus for Delhi leaves every 30 minutes from a bus stand. An enquiry clerk told a passenger that the bus had already left 10 min ago and next bus will leave at 9 : 35 am. At what time did the enquiry clerk give this information to the passenger?
(a) 9 : 10 am (b) 8 : 55 am
(c) 9 : 08 am (d) 9 : 15 am

3. If 18th February, 1997 falls on Tuesday, then what will be the day on 18th February, 1999?
(a) Monday
(b) Tuesday
(c) Thursday
(d) Friday

4. I was born on August 11. Mohan is younger to me by 11 days. This year's independence day falls on Monday. The day on which Mohan's birthday will fall this year will be
(a) Monday
(b) Tuesday
(c) Sunday
(d) Thursday

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5. At what time, (in minutes) between 3 O' clock and 4 O'clock, both the needles will coincide with each other?

(a) $5\frac{1''}{11}$ (b) $12\frac{4''}{11}$

(c) $13\frac{4''}{11}$ (d) $16\frac{4''}{11}$

6. At what time between 5:30 and 6 O'clock, will the hands of a clock be at right angle?

(a) $43\frac{3}{11}$ min past 5

(b) $43\frac{7}{11}$ min past 5

(c) 40 min past 5

(d) 45 min past 5

7. A clock is set right at 5 am. The clock loss 16 min in 24 h. What will be the right time when the clock indicates 10 pm on the third day?

(a) 11 15 pm (b) 11 : 00 pm

(c) 12 00 pm (d) 12 : 30 pm

8. The Republic day of India was celebrated on Friday in year 2008. On which day, it will be celebrated in 2012?

(a) Tuesday (b) Wednesday

(c) Thursday (d) Friday

9. Last Saturday was on the 20th of the month. If Tuesday is 3 days ahead, what day of the week is today?

(a) Sunday (b) Saturday

(c) Friday (d) Thursday

10. If 8th February, 2005 was a Tuesday, what was the day the 8th February, 2004?

(a) Tuesday (b) Monday

(c) Sunday (d) Wednesday

11. What was the day the 2nd July, 1984?

(a) Wednesday (b) Tuesday

(c) Monday (d) Thursday

12. The year next to 1990 will have the same calendar as that of the year 1990.

(a) 1995 (b) 1997

(c) 1996 (d) 1992

13. If 27 March, 1995 was a Monday, th what day of the week was 1Novemb 1994? [MAT 20

(a) Sunday (b) Monday

(c) Tuesday (d) Wednesday

14. If the Republic Day of India in 1980, fal on Saturday, X was born on March 1980 and Y 's birthday fell on [IB (ACIO) 20

(a) Thursday (b) Friday

(c) Wednesday (d) None of these

15. If it was Saturday on December 17, 189 what will be the day on December 2 1901? [RPSC 20

(a) Friday (b) Saturday

(c) Sunday (d) Monday

16. At what time between 5 and 6, are th hands of a clock coincides?

(a) 22 min past 5 (b) 30 min past 5

(c) $22\frac{8}{11}$ min past 5 (d) $27\frac{3}{11}$ min past 5

17. At what time between 9 and 10 O'clock will the hands of a watch be together?

(a) 45 min past 9 (b) 50 min past 9

(c) $49\frac{1}{11}$ min past 9 (d) $48\frac{2}{11}$ min past 9

18. At what time between 4 and 5 O'clock will the hands of a watch point in opposite directions?

(a) 45 min past 4

(b) 40 min past 4

(c) $50\frac{4}{11}$ min past 4

(d) $54\frac{6}{11}$ min past 4

19. Find at what time between 8 and 9 O'clock will the hands of a clock be in the same straight line but not together.

(a) $10\frac{10}{11}$ min past 8

(b) $50\frac{10}{11}$ min past 8

(c) $10\frac{12}{11}$ min past 8

(d) 10 min past 8

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Answer *with* Explanations

A. Base Level Exercise

1. (*b*)



$$\text{Angle} = \frac{360 \times 2.5}{12} = 75°$$

2. (*b*) Anuj reached the place of meeting at 8 : 15 h, he reached 30 min earlier than the man who was 40 min late, *i.e.*, he reached 10 min late. Hence, the scheduled time of the meeting was 8 : 05 h.

3. (*b*) Number of buzzes in a day

$$= \frac{12(12+1)}{2} \times 2 = 156$$

4. (*c*) In 12 h, they are at right angles, 22 times.
So, in 24 h, they are at right angles, 44 times.

5. (*b*) From the properties of the clock, we know that hands of a clock coincide once in every hour but between 11 O'clock and 1 O'clock, they coincide only once. Therefore, the hands of a clock coincide 11 times in every 12 h.
Hence, they will coincide $(11 \times 2) = 22$ times in 24 h.
89 h of this clock = 90 h of the correct clock
Therefore, it is clear that in 89 h this clock loses 1 h and hence, the correct time is 11:00 pm when this clock shows 10:00 pm.

6. (*d*) The hands of a clock point towards each other 11 times in every 12 h (because between 5 and 7, they point towards each other only once at 6 O'clock).
Therefore, in a day, the hands points 22 times in all, towards each other.

7. (*d*) Here, $\frac{363}{7}$ = 51 weeks + 6 days

8. (*b*) Each day of the week is repeated after 7 days.
So, after 63 days, it will be Monday.
After 61 days, it will be Saturday.

9. (*a*) The century divisible by 400 is a leap year. The year 707 is not a leap year.

10. (*c*) Everyday of the weeks is repeated after 7 days.
Hence, it will be Wednesday after 84 days.

11. (*a*) Everyday of the week is repeated after 7 days.
Hence, after 56 days, it would be Thursday again and after 59 days, it would be Sunday.

12. (*c*) The last day of century cannot be either Tuesday, Thursday or Saturday.

13. (*d*) Three days after Saturday is Tuesday and Tuesday is a day befor a day before yesterday
So, yesterday is Thursday.
Hence, today is Friday.

14. (*a*) Total number of days from January 1 to March 1
= 31 + 29 + 1
= 61 days
(February in leap years = 29 days) = 61 + 7
= 8 weeks and 5 odd days
So, the fifth day from Friday = Tuesday

15. (*a*) Friday will fall on 3,10, 17, 24, 31
So, it will be 5th Friday on 31st

16. (*d*) Next bus will leave at 9 : 35 am. So, last bus left at (9 : 35 – 0 : 30) = 9 : 05 am
So, enquiry clerk gave the information to the passenger at = (9 : 05 + 0 : 10)
= 9 : 15 am

B. Expert Level Exercise

1. (*a*) Total number of odd days
30 September, 1997-98 = 1
30 September, 1998-99 = 1
30 September, 1999-2000 = 2
30 September, 2000-01 = 1
30 September, 2001-02 = 1
30 September, 2002-03 = $\frac{1}{7}$
∴ Tuesday + 7 = Tuesday
So, the next Tuesday will come on the Mrs Susheela's wedding anniversary in 30th September, 2003

2. (*a*) 26 January, 1996 to 15 August, 2000 days were
= 1663
1663 having odd day = 4
∴ In the year 2000, Independence day
= Friday + 4 = Tuesday

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3. (*c*) 18th February, 1997 is Tuesday. So, 17th February, 1998 will also be Tuesday.
Again 16th February, 1999 will also be Tuesday.
Hence, 18th February, 1999 will be Thursday.

4. (*a*) Mohan was born on 31st July, August 15 falls on Monday.

5. (*d*) At 3 O'clock, the minute hand is 15 min away from the hour hand. To coincide, it must gain 15 min as 55 min are gained in 60 min.

15 min are gained in $\left(\frac{60}{55} \times 15\right)$ min $= 16\frac{4}{11}$ min

Hence, the hands are coincide at $16\frac{4}{11}$ min past 3.

6. (*b*)



Fig. (i) Fig. (ii) Fig. (iii)

At 5, both the hands are 25 min apart and to be at right angle both the hands have to be 15 min apart as shown in Fig. (ii) and Fig. (iii). Since, we have to take the position of clock between 5:30 and 6 O'clock, therefore the positions of hands of clock as above Fig. (iii) is our answer.

Now, it is clear from Fig. (i) and Fig. (iii) that minute hand needs to travel (25 + 15) = 40 min space in order to form a right angle with the hour hand. 55 min space is gained in 60 min. Therefore, 40 min spaces will be gained in $\left(\frac{60}{55} \times 40\right)$ min or $43\frac{7}{11}$ min. Therefore, the hands are at right angle at $43\frac{7}{11}$ min past 5.

7. (*b*) Time from 5 am of a particular day to 10 pm on the 4th day is 89 h. Now, the clock loses 16 min in 24 h or in other words, we can say that 23 h 44 min of this clock is equal to 24 h of the correct clock. or $\left(23 + \frac{44}{60}\right)$

$\Rightarrow \frac{356}{15}$ h of this clock = 24 h of the correct clock

$\therefore$ 89 h of this clock

$= \left(\frac{24 \times 15}{356} \times 89\right)$ h of correct clock

= 90 h of the correct clock

8. (*b*) 26th January (Republic day) 2008
→ Friday
Clearly, it will be on Wednesday in 2012.

9. (*c*) Last Saturday → 20th
Today

0	0	0	0	0
↑				↑
Friday				Tuesday

So, it will be Friday.

10. (*c*) The year 2004 is a leap year. It has 2 odd days The day on 8th February, 2004 is 2 days before the day on 8th February, 2005.
Hence, this day is Sunday.

11. (*c*) 2nd July, 1984 means (1983 years 6 months and 2 days) 1900 years have 1 odd day 83 years have 20 leap years and 63 ordinary years
= (40 + 63) odd days
= 103
= 5 odd days
6 months and 2 days

Jan	Feb	Mar	Apr	May	June	July
31	29	31	30	31	30	2

= 184 days = 2 odd days
Total number of days = (1 + 5 + 2)
= 8 odd days
= 1 odd day
Hence, it was Monday on 2nd July, 1984.

12. (*c*) The year 1990 has 365 days, *i.e.*, 1 odd day, year 1991 has 365 days, v 1 odd day, year 1992 has 366 days, *i.e.*, 2 odd days. Likewise year 1993, 1994, 1995 have 1 odd day each. The sum of odd days, so calculated from years 1990-95 = (1 + 1 + 2 + 1 + 1 + 1)
= 7 odd days
= 0 odd day
Hence, the year 1996 will have the same calendar as that of the year 1990.

13. (*c*) Here, 27th March 1995 was Monday. Now for calculating total number of odd days. First, we calculate total number of days till 1 November 1994

$\therefore$ Number of days in March 1995 = 27
Number of days in February 1995 = 28
Number of days in January 1995 = 31
Number of days in December 1994 = 31
Number of days in November 1994 = 29
146

$\therefore$ Number of odd days $= \frac{146}{7} = 20\frac{6}{7}$
So, 6 odd days.
$\therefore$ On November 1, 1994 = Monday – 6
= Tuesday

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14. (a) Required day in 1980 i.e., January 26, 1980 Saturday

Number of odd days till March 3, 1980

January February March

29 3 → 37 odd day

or $\frac{37}{7}$ = 2 odd day

March 3 is Monday and Y is 4 day older to X. So, his birthday must be four days ahead of X i.e., on Thursday

15. (b) Total number of odd days from December 17, 1899 to December 22, 1901

$14 + 365 + 356 = 735$

or, $\frac{735}{7} = 105$

= 0 odd days

It was saturday on December 17, 1899.

So, it will be saturday on December 22, 1901.

16. (d)



From the figure, we find that minute hand is 25 min spaces apart from hour hand. In order to coincide, it has to gain 25 min spaces. Now, 55 min are gained by minute hand in 60 min. 25 min will be gained in

$$\frac{60}{55} \times 25 = 27\frac{3}{11} \text{ min}$$

So, the hands will coincide at $27\frac{3}{11}$ min past 5.

17. (c) Both the hands are 15 min space part at 9 O'clock. To be together between 9 and 10, minute hand has to gain 45 min.



Now, minute hand gains 55 min in 60 min.

It will gain 45 min in $\frac{60}{55} \times 45 = 49\frac{1}{11}$ min.

Therefore, the hands are together at $49\frac{1}{11}$ min past 9.

18. (d)



Fig. (i)



Fig. (ii)

At 4 O clock, the hands are 20 min apart from each other and for having in the opposite direction they needs to be 30 min apart.

From Fig. (i) and Fig. (ii), it is clear that minute hand has to travel

(20 + 30) min space in order to be in opposite direction of each other

Now, 55 min space is gained in 60 min.

Therefore, 50 min space will be gained in

$$\left(\frac{60}{55} \times 50\right) \text{ min or } 54\frac{6}{11} \text{ min.}$$

Hence, the hands of the clock will be in opposite direction at $54\frac{6}{11}$ min past 4.

19. (a)



Fig. (i)



Fig. (ii)

Fig. (i) shows the positions of the hands of the clock and it is clear that they are 20 min apart. To be in the straight line, they have to be 30 min apart. So, the minute hand will have to move 10 min space in order to be 30 min apart from hour hand. 55 min are gained in 60 min.

10 min will be gained in

$$\frac{60}{55} \times 10 = \frac{12}{11} \times 10 \text{ min}$$

Therefore, the hands will be at right angle but not together at $10\frac{10}{11}$ min past 8.

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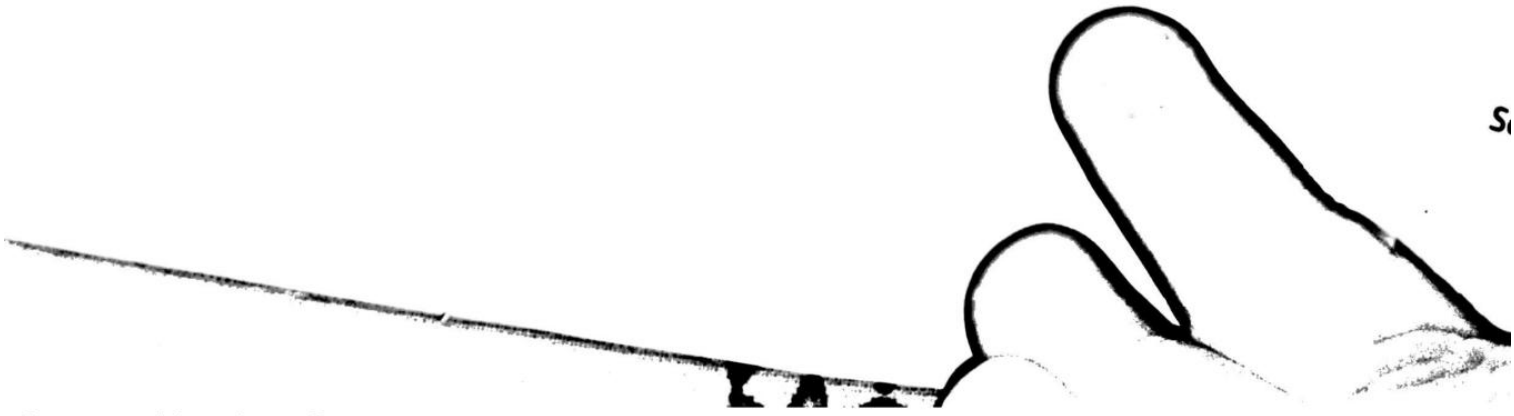
16 Mathematical Operations *and* Symbol Notations

Mathematical operation are basically the simplification of an expression containing mathematical symbols.

First, we should know some mathematical operations. They are addition (+), subtraction (–), multiplication (×), division (÷) signs like greater than (>), less than (<) and equal to (=) etc. This test is formulated to test candidate's skill in mathematical operations. The questions involving these operations are set using artificial symbols. You are required to substitute the real signs and solve the questions accordingly.

To solve such questions we need to follow the VBODMAS rule for simplification of mathematical operation.

Rule	VBODMAS
Viniculum	— or bar
Brackets	( )
Of	×
Division	÷
Multiplication	×
Addition	+
Subtraction	–



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Types of Questions

There are three types of questions based on mathematical operations are usually asked in competitive examinations

Type 1 Problem Solving by Substitution

In this type of questions, you have substitutes for various mathematical symbols or numerals followed by a question involving calculation of an expression or choosing the correct/incorrect equation.

Illustration 1. If '+' means '–', '×' means '÷', '÷' means '+' and '–' means '×', then which of the following will be the value of expression?

$7 \times 3.5 \div 2 - 4 + 5$

(a) 4 (b) 5
(c) 11 (d) None of these

Solution (*b*) Using the proper notations in the given expression, we have

$= 7 \times 3.5 \div 2 - 4 + 5$
$= 7 \div 3.5 + 2 \times 4 - 5$
$= 2 + 2 \times 4 - 5$
$= 2 + 8 - 5$
$= 10 - 5 = 5$

Illustration 2. If '×' means '+', '+' means '÷', '–' means '×' and '÷' means '–', then

$6 \times 4 - 5 + 2 \div 1 = ?$

(a) 10 (b) 11 (c) 12 (d) 15

Solution (*d*) Replacing the proper signs in the given expression, we have

$= 6 \times 4 - 5 + 2 \div 1$
$= 6 + 4 \times 5 \div 2 - 1$
$= 6 + 4 \times 2.5 - 1$
$= 6 + 10 - 1$
$= 16 - 1 = 15$

Illustration 3. If P denotes '×', T denotes '–', M denotes '+' and B denotes '÷', then

12 P 6 M 15 T 16 B 4 = ?

(a) 70 (b) 83
(c) 75 (d) 110

Solution (*b*) 12 P 6 M 15 T 16 B 4
$= 12 \times 6 + 15 - 16 \div 4$
$= 12 \times 6 + 15 - 4$
$= 72 + 15 - 4$
$= 87 - 4 = 83$

Type 2 Interchanging the Signs and Numbers

In this type of questions, certain signs or numbers interchange between each other. The

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Illustration 6. If $5 \times 4 = 15$, $7 \times 8 = 49$ and $6 \times 5 = 24$, then 8×4 is equal to

(a) 24 (b) 26
(c) 28 (d) 30

Solution (a) As $5 \times 4 = 5 \times (4 - 1) = 5 \times 3 = 15$
$7 \times 8 = 7 \times (8 - 1) = 7 \times 7 = 49$
and $6 \times 5 = 6 \times (5 - 1) = 6 \times 4 = 24$
Similarly, $8 \times 4 = 8 \times (4 - 1) = 8 \times 3 = 24$

Illustration 7. If $64 \times 52 = 48 \times 56 = 23$ and $74 \times 35 = 19$, then $84 \times 37 = ?$

(a) 32 (b) 28 (c) 22 (d) 20

Solution (c) As, $64 \times 52 \Rightarrow (6 + 4) + (5 + 2) = 17$
$48 \times 56 \Rightarrow (4 + 8) + (5 + 6) = 23$
and $74 \times 35 \Rightarrow (7 + 4) + (3 + 5) = 19$
Similarly, $84 \times 37 \Rightarrow (8 + 4) + (3 + 7) = 22$

Type 3 Deriving the Appropriate Conclusion

In this type of questions, certain relationship between different sets of elements is given (in terms of 'less than', 'greater than', or 'equal to'), using either the real symbols or substituted symbols. The candidate is required to quickly read the given statements and then choose which of the conclusions is/are definitely true.

Directions (Illustrations 8-10) *In the following questions, the symbols δ, @, ©, % and ★ are used with the meaning as indicated below.*

'P © Q' means 'P is not smaller than Q'.

'P % Q' means 'P is neither smaller than nor equal to Q'.

'P ★ Q' means 'P is neither greater than nor equal to Q'.

'P δ Q' means 'P is not greater than Q'.

'P @ Q' means 'P is neither greater than nor smaller than Q'.

Now, in each of the following questions assuming the given statements to be true, find which of the four Conclusions I, II, III and IV given below them is/are definitely true, give your answer accordingly.

8. Statements D δ T, T @ R, R © M, M % K

Conclusions I. R @ D
II. R % D
III. K ★ T
IV. M δ T

(a) Only either I or II is true
(b) III and IV are true
(c) Either I or II and III are true
(d) Either I or II and IV are true
(e) Either I or II and III and IV are true

9. Statements J @ F, F δ N, N % H, H © G

Conclusions I. G ★ N
II. N © J
III. F ★ J
IV. J δ G

(a) I and II are true
(b) I, II and III are true
(c) I, III and IV are true
(d) All I, II, III and IV are true
(e) None of the above

10. Statements R ★ K, K % D, D @ V, V δ M

Conclusions I. R ★ D
II. V ★ R
III. D @ M
IV. M % D

(a) None is true
(b) Only III is true
(c) Only IV is true
(d) Either III or IV is true
(e) Either III or IV and II are true

Solutions (Illustrations 8-10) Finally, © ⇒ ≥
% ⇒ >
★ ⇒ <
δ ⇒ ≤
@ ⇒ =

8. (e)

9. (a)

A. Ba

1. If a 1

2. I s c

3. S r a

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8. (e) Here, $D \delta T \Rightarrow D \leq T$
$T @ R \Rightarrow T = R$
$R © M \Rightarrow R \leq M$
$M \% K \Rightarrow M > K$
So, $D \leq T = R \geq M > K$
Now, $R @ D \Rightarrow R = D$
$R \% D \Rightarrow R > D$ (may be)
$K \bigstar T \Rightarrow K < T$ (may be)
$M \delta T \Rightarrow M \leq T$ (true)
(true)
From first two statements only one can be true.
Hence, either I or II and III and IV are true.

9. (a) Here, $J @ F \Rightarrow J = F$
$F \delta N \Rightarrow F \leq N$
$N \% H \Rightarrow N > H$
$H © G \Rightarrow H \geq G$
So, $J = F \leq N > H \geq G$
Now, $G \bigstar N \Rightarrow G < N$ (true)
$N © J \Rightarrow N \geq J$ (true)
$F \bigstar J \Rightarrow F < J$ (false)
$J \delta G \Rightarrow J \leq G$ (false)
Hence, I and II are true.

10. (d) Here, $R \bigstar K \Rightarrow R < K$
$K \% D \Rightarrow K > D$
$D @ V \Rightarrow D = V$
$V \delta M \Rightarrow V \leq M$
So, $R < K > D = V \leq M$
Now, $R \bigstar D \Rightarrow R < D$ (false)
$V \bigstar R \Rightarrow V < R$ (false)
$D @ M \Rightarrow D = M$ (may be)
$M \% D \Rightarrow M > D$ (may be)
Hence, either III or IV is true.

Let us Practice

A. Base Level Exercise

1. If '+' mean '–', '–' means '×', '×' means '÷' and '÷' means '+', then the value of $16 \times 2 \div 25 + 7 - 4$ is [CG PSC 2013]
(a) 104
(b) 5
(c) 22
(d) 4
(e) 0

2. If '–' stands for '÷', '+' stands for '×', '÷' stands for '–' and '×' stands for '+', find out which one is correct? [SSC (10+2) 2011]
(a) $49 + 7 - 3 \times 5 \div 8 = 20$
(b) $49 - 7 + 3 \div 5 \times 8 = 24$
(c) $49 \times 7 + 3 \div 5 - 8 = 16$
(d) $49 \div 7 \times 3 + 5 - 8 = 26$

3. Select the correct combination of mathematical signs to replace '*' signs and to balance the following equation.
$6 * 4 * 12 * 12$ [SSC (Multitasking) 2014]
(a) ÷, –, =
(b) +, –, ÷
(c) =, –, ÷
(d) ×, –, =

4. If '×' stands for '+', '<' for '–', '+' for '÷', '>' for '×', '–' for '=', '÷' for '>' and '=' for '<', then state which of the following is true?
(a) $3 \times 4 > 2 - 9 + 3 < 3$
(b) $5 \times 3 < 7 \div 8 + 4 \times 1$
(c) $5 > 2 + 2 = 10 < 4 \times 8$
(d) $3 \times 2 < 4 \div 16 > 2 + 4$

5. If '–' stands for '÷', '+' stands for '–', '÷' stands for '×', '×' stands for '+', then which one of the following equation is correct? [SSC (CGL) 2011]
(a) $70 - 2 + 4 \div 5 \times 6 = 44$
(b) $70 - 2 + 4 \div 5 \times 6 = 21$
(c) $70 - 2 + 4 \div 5 \times 6 = 341$
(d) $70 - 2 + 4 \div 5 \times 6 = 96$

6. Which of the following sets of operation with the usual notations replacing the stars in the order given makes the statements valid? [SSC (Steno) 2013]
$\sqrt{100} * \sqrt{16} * \sqrt{225} * \sqrt{1}$
(a) ×, =, +
(b) +, =, –
(c) +, =, ×
(d) –, ×, =

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7. If 'P' means '+', 'Q' means '×', 'R' means '÷' and 'S' means '–', then

44 Q 9 R 12 S 6 Q 4 P 16 = ? [SSC (CGL) 2013]

(a) 36 (b) 124
(c) 25 (d) 112

8. Which of the following interchange of signs would make the given equation correct?

$5 + 3 \times 8 - 12 \div 4 = 3$ [SSC (CGL) 2013]

(a) + and ÷ (b) + and –
(c) – and ÷ (d) + and ×

9. If '+' means '÷', '–' means '+', '×' means '–' and '÷' means '×', then what is the value of 24 ÷ 12 – 18 + 9?

(a) –25 (b) 0.72
(c) 15.30 (d) 290

10. If P denotes '÷', Q denotes '×', R denotes '+' and S denotes '–', then

18 Q 12 P 4 R 5 S 6 = ? [SSC (CGL) 2012]

(a) 95 (b) 53 (c) 51 (d) 57

11. If '–' stands for 'addition', '÷' for 'multiplication', '×' for 'subtraction', and '+' for 'division', then which of the following is correct? [SSC (CPO) 2013]

(a) 25 × 12 – 14 ÷ 4 + 6 = 16
(b) 25 – 12 + 14 ÷ 2 × 4 = 15
(c) 25 – 15 + 5 ÷ 4 × 16 = 21
(d) 25 + 11 – 4 ÷ 10 × 6 = 20

12. If A for '+', M for '×', D for '÷', G for '>', L for '<', then which of the following will be logically correct? [SSC (FCI) 2012]

(a) 4A 5D 3G 6A 2M 3
(b) 4A 5M 4L 6D 2A 8
(c) 4D 2A 4G 6D 2A 4
(d) 4A 3M 2L 4D 2M 6

13. If the mathematical signs interchange from – to +, + to ÷, × to – and ÷ to ×, then find out the correct answer of the given equation [SSC (CPO) 2013]

$6 \div 8 + 2 \times 5 - 8 = ?$

(a) 27 (b) 18 (c) 32 (d) 28

14. If +, –, ×, ÷, =, > and < are represented as δ, •, γ, η, ω, β and α respectively, then which of the following is correct? [SSC (CPO) 2013]

(a) 3γ6η2δ8•4ω5 (b) 3η6γ2δ8•4β5
(c) 3γ6•2δ8η4α5 (d) 3δ6•2γ8η4ω5

15. Select the correct combination of mathematical signs to replace '*' signs and to balance the given equation. [SSC (10+2) 2013]

24 * 34 * 2 * 5 * 12

(a) + ÷ × = (b) = ÷ + –
(c) = ÷ – + (d) + ÷ = ×

16. Find the correct group of signs to solve the equation.

24 * 16 * 8 * 32 [SSC (CGL) 2013]

(a) ÷ – = (b) – + =
(c) × ÷ = (d) + – =

17. If 'R' means '÷', 'Q' means '×', 'P' means '+', then 1 8 R 9 P 2 Q 8 = ?

(a) 18 (b) 16 (c) 28 (d) 30

18. If '+' means '–', '–' means '×', '÷' means '+' and '×' means '÷', then

$10 \times 5 \div 3 - 2 + 3 = ?$ [SSC (10+2) 2013]

(a) 5 (b) $\frac{53}{3}$
(c) 21 (d) 36

19. If Q means '+', J means '×', T means '–' and K means '÷', then

3 0 K 2 Q 3 J 6 T 5 = ?

(a) 18 (b) 28
(c) 31 (d) 103

20. If P denotes '÷', Q denotes '×', R denotes '+' and S denotes '–', then

1 8 Q 1 2 P 4 R 5 S 6

(a) 53 (b) 59 (c) 63 (d) 65

21. Select the correct combination of mathematical signs to replace * signs and to balance the given equation.

15 * 24 * 3 * 6 * 17 [SSC (CGL) 2013]

(a) + ÷ – = (b) + × = ÷
(c) – × = + (d) – ÷ + =

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Directions (Q. Nos. 22-25) *If the given interchanges are made in signs and numbers, which one of the four equations would be correct?*

22. Given interchanges signs '+' and '–'; numbers '5' and '8'
(a) 82 – 35 + 55 = 2 (b) 82 – 35 + 55 = 102
(c) 85 – 38 + 85 = 132 (d) 52 – 35 + 55 = 72

23. Given interchanges signs '+' and '×'; numbers '3' and '7'
(a) 23 + 17 × 73 = 1241 (b) 37 + 73 × 12 = 112
(c) 23 × 17 + 37 = 428 (d) 23 + 17 × 73 = 388

24. Given interchanges signs '×' and '÷'; numbers '4' and '9'
(a) 94 × 7 ÷ 47 = 324
(b) 94 × 7 ÷ 97 = 329
(c) 49 × 7 ÷ 49 = 7
(d) 47 × 9 ÷ 94 = 18

25. Given interchanges signs '–' and '÷'; numbers '2' and '6'
(a) 32 – 12 ÷ 6 = 30
(b) 36 ÷ 12 – 2 = 1
(c) 32 – 16 ÷ 6 = 1
(d) 36 – 12 ÷ 2 = 30

26. Select the correct combination of mathematical signs to replace • signs and to balance the following equation
8 • 8 • 1 • 7 = 8 **[SSC (Multitasking) 2014]**
(a) × ÷ + (b) + ÷ ×
(c) ÷ × + (d) + × ÷

Directions (Q. Nos. 27-34) *Correct the following equations by interchanging the two signs.*

27. 3 – 9 × 27 + 9 ÷ 3 = 3
(a) + and – (b) × and +
(c) × and ÷ (d) – and ÷
(e) × and –

28. 4 × 2 + 6 ÷ 2 – 12 = 2
(a) ÷ and ×
(b) + and –
(c) × and +
(d) ÷ and –
(e) × and –

29. 5 × 15 ÷ 7 – 20 + 4 = 77
(a) – and + (b) × and ÷
(c) + and ÷ (d) + and ×
(e) – and ÷

30. 16 – 21 ÷ 7 × 6 + 3 = 31
(a) – and + (b) + and ×
(c) ÷ and + (d) ÷ and ×
(e) – and ×

31. 15 ÷ 9 × 3 – 74 + 2 = 5
(a) + and – (b) ÷ and ×
(c) + and + (d) – and ÷
(e) None of these

32. 51 ÷ 3 × 12 – 6 + 3 = 201
(a) + and + (b) – and +
(c) × and + (d) – and ×
(e) None of these

33. 16 + 4 ÷ 2 – 21 × 7 = 21
(a) + and – (b) + and ×
(c) – and ÷ (d) × and ÷
(e) None of these

34. $3^2 \times 2^2 \div (6^2 - 9) + 1^2 = 33$
(a) – and ÷ (b) + and ×
(c) × and ÷ (d) + and –

Directions (Q. Nos. 35-37) *In the following questions, which one of the four interchanges in signs and numbers would make the given equation correct?*

35. 4 × 6 – 2 = 14
(a) × to ÷, 2 and 4
(b) – to +, 2 and 6
(c) × to +, 4 and 8
(d) – to ÷, 2 and 6

36. (6 ÷ 2) × 3 = 0
(a) × to –, 2 and 6 (b) ÷ and ×, 2 and 3
(c) × to –, 2 and 3 (d) ÷ and ×, 2 and 6

37. (3 ÷ 4) + 2 = 2
(a) + and ÷, 2 and 4
(b) + and –, 3 and 4
(c) + and ÷, 2 and 3
(d) None of the above

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38. If $2^3 + 4 = 2$, $4^4 + 8 = 32$, then what will be the value of $6^2 + 4$?
(a) 9 (b) 10
(c) 8 (d) 12

39. If $4 \star 2 @ 3 = 6$, $18 \star 6 @ 4 = 12$, then what will be the value of $24 \star 3 @ 7$?
(a) 21 (b) 27
(c) 72 (d) 56

40. If $2 \,\&\, 6 \,\%\, 7 = 33$, $4 \,\&\, 6 \,\%\, 8 = 54$, then what will be the value of $6 \,\%\, 8 \,\&\, 9$?
(a) 95 (b) 77
(c) 99 (d) None of these

41. If '+' denotes ÷, '–' denotes ×, '×' denotes – and '÷' denotes +, then
$35 + 7 - 5 + 5 \times 6 = ?$
(a) 36 (b) 24
(c) 20 (d) 14

42. If $6 \star 5 = 31$, $7 \star 8 = 57$, $3 \star 4 = 13$, then $9 \star 10 = ?$
(a) 90 (b) 91
(c) 81 (d) 19

B. Expert Level Exercise

Directions (Q. Nos. 1-5) *In these questions, relationship between different elements is shown in the statements. These statements are followed by two conclusions.* **[BOI (PO) 2011]**

Give answer
(a) only Conclusion I follows
(b) only Conclusion II follows
(c) either Conclusion I or II follows
(d) neither Conclusion I nor II follows
(e) both Conclusions I and II follow

1. Statements $A = B \geq C < D = E \leq F$
Conclusions I. $F > B$
II. $B \geq D$

2. Statements $P > M > Q$, $Q > Z > N$
Conclusions I. $M \geq Z$
II. $N < P$

3. Statements $X > Y$, $Y \geq Z$, $Z = V$, $V < W$
Conclusions I. $Y = V$
II. $Y > V$

43. If 879 = 8, 625 = 1 and 586 = 9, then 785 = ?
(a) 6 (b) 7 (c) 8 (d) 9

44. If given, 12 (169) 5, 4 (20) 2 and 1 (26) 5 then 7 (?) 3
(a) 78 (b) 68 (c) 58 (d) 36

45. Select the correct combination of mathematical signs to replace * signs and to balance the given equation.
$5 * 6 * 5 * 8 * 14$ **[SSC (10+2) 2013]**
(a) + − × = (b) × ÷ + = (c) ÷ × = − (d) + × − ÷

46. If '–' mean '×', '×' means '+', '+' means '÷' and '÷' means '–', then
$40 \times 12 + 3 - 6 \div 60 = ?$
(a) 44 (b) 16 (c) 7.95 (d) 4

47. If '+' means '÷', '×' means '+', '–' means '×' and '÷' means '–', then which of the following equation is correct?
[SSC (Multitasking) 2013]
(a) $36 + 6 \times 3 + 2 = 20$ (b) $36 + 6 - 3 \times 2 = 20$
(c) $36 \times 6 + 3 - 2 < 20$ (d) $36 \times 6 + 3 \times 2 > 20$

4. Statements
$D > B$, $C > K$, $K \leq N$, $B < C$, $N < B$
Conclusions I. $D > N$ II. $C \geq K$

5. Statements
$B < C$, $D > B$, $C > K$, $K \leq N$, $N < B$
Conclusions I. $C > N$ II. $B > K$

Directions (Q. Nos. 6-10) *In these questions, relationships between different elements is shown in the statement. The statement is followed by two conclusions. Study the conclusions based on the given statement and select the appropriate answer.* **[IBPS (Clerk) 2013]**

6. Statement $K > I \geq T \geq E$; $O < R < K$
Conclusion I. $R < E$
II. $O < T$
(a) Neither Conclusion I nor II follows
(b) Both Conclusions I and II follow
(c) Only Conclusion II follows
(d) Either Conclusion I or II follows
(e) Only Conclusion I follows

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7. Statement
$C < L < O = U = D \geq S > Y$
Conclusions I. $O > Y$
II. $C < D$
(a) Neither Conclusion I nor II follows
(b) Both Conclusions I and II follow
(c) Only Conclusion I follows
(d) Only Conclusion II follows
(e) Either Conclusion I or II follows

8. Statement $K \geq L > M \geq N$
Conclusions I. $N \leq K$
II. $N < K$
(a) Both Conclusions I and II follow
(b) Neither Conclusion I nor II follows
(c) Either Conclusion I or II follows
(d) Only Conclusion I follows
(e) Only Conclusion II follows

9. Statement $Z \geq Y = W \leq X$
Conclusions I. $W < Z$
II. $W = Z$
(a) Only Conclusion II follows
(b) Only Conclusion I follows
(c) Neither Conclusion I nor II follows
(d) Either Conclusion I or II follows
(e) Both Conclusions I and II follow

'P # Q' means 'P is neither smaller than nor equal to Q'.

'P % Q' means 'P is not greater than Q'.

'P @ Q' means 'P is neither greater than nor smaller than Q'.

Now, in each of the following questions assuming the given statements to be true, find which of the four Conclusions I, II, III and IV given below them is/are definitely true and given your answer accordingly.

11. Statements R # J, J $ D, D @ K, K % T
Conclusions I. T # D
II. T @ D
III. R # K
IV. J $ T
(a) Either I or II is true
(b) Only III is true
(c) III and IV are true
(d) Either I or II and III are true
(e) None of the above

12. Statements T % R, R $ M, M @ D, D © H
Conclusions I. D % R

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14. Statements F # H, H @ M, M © E, E $ J
Conclusions I. J © M
II. E # H
III. M © F
IV. F # E
(a) I and II are true
(b) II and III are true
(c) I, II and III are true
(d) II, III and IV are true
(e) None of the above

15. Statements D % A, A @ B, B © K, K % M
Conclusions I. B $ D
II. K #A
III. M # B
IV. A © M
(a) I, II and IV are true
(b) I, II and III are true
(c) II, III and IV are true
(d) I, III and IV are true
(e) All are true

Directions (Q. Nos. 16-20) *In the following questions, the symbols δ, $, ★, @ and © are used with the meanings as indicated below.*

'P $ Q' means 'P is neither equal to nor greater than Q'.

'P © Q' means 'P is neither equal to nor smaller than Q'.

'P δ Q' means 'P is neither greater than nor smaller to Q'.

'P @ Q' means 'P is not smaller than Q'.

'P H Q' means 'P is not greater than Q'.

In each question, three statements showing relationship, have been given, which are followed by three Conclusions I, II and III. Assuming that the given statements to be true, find out which conclusion(s) is/are definitely true.

16. Statements M @ D, D δ K, K © R
Conclusions I. R $ M
II. K δ M
III. K $ M
(a) Only I is true
(b) Only II is true
(c) Only III is true
(d) Either II or III and I are true
(e) Either II or III is true

17. Statements F ★ T, T $ N, N @ R
Conclusions I. R $ T
II. N © F
III. F $ R
(a) None is true
(b) Only I is true
(c) Only II is true
(d) Only III is true
(e) II and III are true

18. Statements B © N, N @ R, F ★ R
Conclusions I. B © R
II. F ★ N
III. R $ B
(a) I and II are true
(b) I and III are true
(c) II and III are true
(d) I, II and III are true
(e) None of the above

19. Statements D $ M, M ★ B, B δ J
Conclusions I. J © D
II. B @ D
III. J @ M
(a) I and II are true
(b) I and III are true
(c) II and III are true
(d) I, II and III are true
(e) None of the above

20. Statements W δ K, K © F, F $ M
Conclusions I. M © K
II. W @ F
III. F @ W
(a) Only I is true
(b) Only II is true
(c) Only III is true
(d) II and III are true
(e) None of the above

Directions (Q. Nos. 21-25) *Read each statement carefully and answer the following questions.* **[SBI (PO) 2013]**

21. Which of the following expressions will be true, if the expression

R > O = A > S < T is definitely true?

(a) O > T
(b) S < R
(c) T > A
(d) S = 0
(e) T < R

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22. Which of the following symbols should replace the question mark (?) in the given expression in order to make the expressions 'P > A' as well as 'T < L' definitely true?

$$P > L\ ?\ A \geq N = T$$

(a) ≤ (b) >
(c) < (d) ≥
(e) Either ≤ or <

23. Which of the following symbols should be placed in the blank spaces respectively (in the same order from left to right) in order to complete the given expression in such a manner that makes the expressions 'B > N' as well as 'D ≤ L' definitely true?

$$B\ \_\_\ L\ \_\_\ O\ \_\_\ N\ \_\_\ D$$

(a) =, =, ≥, ≥ (b) >, ≥, =, >
(c) >, <, =, ≤ (d) >, =, =, ≥
(e) >, =, ≥, >

24. Which of the following should be placed in the blank spaces respectively (in the same order from left to right) in order to complete the given expression in such a manner that makes the expression definitely false?

$$\_\_\_\_ \leq \_\_\_\_ < \_\_\_\_ > \_\_\_\_$$

(a) L, N, P, A (b) L, A, P, N
(c) A, L, P, N (d) N, A, P, L
(e) P, N, A, L

25. Which of the following symbols should be placed in the blank spaces respectively (in the same order from left to right) in order to complete the given expression in such a manner that makes the expression 'F > N' and 'U > D' definitely false?

$$F\ \_\_\ O\ \_\_\ U\ \_\_\ N\ \_\_\ D$$

(a) <, <, >, = (b) <, =, =, >
(c) <, =, =, < (d) ≥, =, =, ≥
(e) >, >, =, <

Answer *with* Explanations

A. Base Level Exercise

1. (b) $16 \times 2 \div 25 + 7 - 4$

$= 16 \div 2 + 25 - 7 \times 4$

$= 8 + 25 - 28$

$= 25 - 20 = 5$

2. (b) From option (b),

$49 - 7 + 3 \div 5 \times 8 = 24$

Change the sign, as per the question,

$49 \div 7 \times 3 - 5 + 8 = 24$

$\Rightarrow \quad 7 \times 3 - 5 + 8 = 24$

$\Rightarrow \quad 21 - 5 + 8 = 24$

$\therefore \quad 24 = 24$

3. (d) $6 * 4 * 12 * 12$

From option (d),

$6 \times 4 - 12 = 12$

$\Rightarrow \quad 12 = 12$

4. (c) Using the proper symbols in (c), we get

$5 \times 2 \div 2 < 10 - 4 + 8$

$\Rightarrow \quad 5 \times 1 < 18 - 4 \Rightarrow 5 < 14$

which is true.

5. (b) '–' ⇒ ÷
'+' ⇒ '–'
÷ ⇒ 'x'
'x' ⇒ '+'

$\therefore \quad 70 \div 2 - 4 \times 5 + 6 = 21$ (by BODMAS rule)

$\Rightarrow \quad 35 - 20 + 6 = 21$

$\Rightarrow \quad 15 + 6 = 21$

$\Rightarrow \quad 21 = 21$

6. (b) $\sqrt{100} + \sqrt{16} = \sqrt{225} - \sqrt{1}$

$10 + 4 = 15 - 1$

$\Rightarrow \quad 14 = 14$

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7. (c) $44 \times 9 \div 12 \quad 6 \times 4 + 16 = ?$

$\Rightarrow 44 \times 9 \times \frac{1}{12} \quad 24 + 16 = ?$

$\Rightarrow \quad 33 \quad 24 + 16 = ?$

$\Rightarrow \quad 49 - 24 = ?$

$? = 25$

8. (c) For changing – and +,

$5 + 3 \times 8 - 12 + 4 = 3$

Now, after changing the sign

$5 + 3 \times 8 \div 12 - 4 = 3$

$5 + \frac{3 \times 8}{12} - 4 = 3$

$5 + 2 - 4 = 3$

$3 = 3$

9. (d) Using the proper symbols, we have

$24 \div 12 - 8 + 9$

$= 24 \times 12 + 18 \div 9$

$= 288 + 2 = 290$

10. (b) Given, 18 Q 12 P 4 R 5 S 6

After changing the letters in to signs as per given in the question, we have

$18 \times 12 \div 4 + 5 - 6$

$\Rightarrow \quad 18 \times \frac{12}{4} + 5 - 6$ (by BODMAS rule)

$\Rightarrow \quad 18 \times 3 + 5 - 6$

$\Rightarrow \quad 54 + 5 - 6$

$\therefore \quad 59 - 6 = 53$

11. (c) On changing sign,

$25 + 15 \div 5 \times 4 - 16 = 21$

$\Rightarrow \quad 25 + 3 \times 4 - 16 = 21$

$\Rightarrow \quad 25 + 12 - 16 = 21$

$\Rightarrow \quad 37 - 16 = 21$

$\therefore \quad 21 = 21$

12. (d) From option (d),

4 A 3 M 2 L 4 D 2 M 6

$4 + 3 \times 2 < 4 \div 2 \times 6$

$10 < 12$

13. (a) $6 \div 8 + 2 \times 5 - 8$

$= 6 \times 8 \div 2 - 5 + 8$

$= 6 \times 4 - 5 + 8$

$= 24 - 5 + 8 = 32 - 5 = 27$

14. (d) Given, $3\delta 6 \bullet 2\gamma 8\eta 4\omega 5$

Then, placing of signs

$3 + 6 - 2 \times 8 \div 4 = 5$

$9 - 2 \times 2 = 5$

$5 = 5$

15. (c) $24 = 34 \div 2 - 5 + 12$

$24 = 17 - 5 + 12$

$24 = 29 - 5$

$24 = 24$

16. (d) Given equation is

$24 * 16 * 8 * 32$

Taking the sign of option (b),

$\Rightarrow \quad 24 + 16 - 8 = 32$

$\Rightarrow \quad 40 - 8 = 32 \quad \Rightarrow 32 = 32$

Hence, correct group of sign is option (b)

17. (a) Using the correct symbols, we have

1 8 R 9 P 2 Q 8

$= 18 \div 9 + 2 \times 8$

$= 2 + 2 \times 8 = 2 + 16 = 18$

18. (a) $? = 10 \times 5 \div 3 - 2 + 3$

$= 10 \div 5 + 3 \times 2 - 3$ (by interchanging)

$= 2 + 3 \times 2 - 3$

$= 2 + 6 - 3 = 8 - 3 = 5$

19. (b) Using the correct symbols, we have

3 0 K 2 Q 3 J 6 T 5

$= 30 \div 2 + 3 \times 6 - 5$

$= 15 + 18 - 5 = 33 - 5 = 28$

20. (a) Using the correct symbols, we have

1 8 Q 1 2 P 4 R 5 S 6

$= 18 \times 12 \div 4 + 5 - 6$

$= 18 \times 3 + 5 - 6$

$= 54 + 5 - 6 = 59 - 6 = 53$

21. (a) Given equation → 15 * 24 * 3 * 6 * 17

From option (a), substitute the signs

$15 + 24 \div 3 - 6 = 17$

$\Rightarrow \quad 15 + \frac{24}{3} - 6 = 17$

$\Rightarrow \quad 15 + 8 - 6 = 17$

$\Rightarrow \quad 23 - 6 = 17$

$\therefore \quad 17 = 17$

22. (a) (a) $52 + 38 - 88 = 2$

(b) $52 + 38 - 88 \neq 102$

(c) $58 + 35 - 58 \neq 132$

(d) $82 + 38 - 88 \neq 72$

23. (d) (a) $27 \times 13 + 37 \neq 1241$

(b) $73 \times 37 + 12 \neq 112$

(c) $27 + 13 \times 73 \neq 428$

(d) $27 \times 13 + 37 = 388$

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24. (b) (a) $49 \div 7 \times 97 \neq 324$
(b) $49 \div 7 \times 47 = 329$
(c) $94 \div 7 \times 94 \neq 7$
(d) $97 \div 4 \times 49 \neq 18$

25. (c) (a) $36 \div 16 - 2 \neq 30$
(b) $32 - 16 \div 6 \neq 1$
(c) $36 \div 12 - 2 = 1$
(d) $32 \div 16 - 6 \neq 30$

26. (c) From option (c),

$$8 * 8 * 1 * 7 = 8$$
$$\Rightarrow \quad 8 \div 8 \times 1 + 7 = 8$$
$$\therefore \quad 8 = 8$$

27. (e) If we interchange '×' and '−', the equation changes into

$$3 \times 9 - 27 + 9 \div 3 = 27 - 27 + 3 = 3$$

28. (a) If we interchange signs '÷' and '×', then equation changes into

$$4 \div 2 + 6 \times 2 - 12 = 2 + 12 - 12 = 2$$

29. (c) If we interchange signs '+' and '÷', then the equation changes into

$$5 \times 15 + 7 - 20 \div 4 = 5 \times 15 + 7 - 5 = 77$$

30. (b) If we interchange of signs '+' and '×', then the equation changes into

$$16 - 21 \div 7 + 6 \times 3 = 16 - 3 + 18 = 31$$

31. (c) If we interchange signs '+' and '÷', then the equation changes into

$$15 + 9 \times 3 - 74 \div 2 = 15 + 27 - 37 = 5$$

32. (e) None of the interchange is applicable in the equation to produce number 201.

33. (d) If we interchange the signs '×' and '÷', the equation becomes

$$16 + 4 \times 2 - 21 \div 7 = 16 + 8 - 3$$
$$= 21$$

34. (a) If we interchange symbols '−' and '÷', the equation becomes

$$9 \times 4 - (36 \div 9) + 1$$
$$= 9 \times 4 - \frac{36}{9} + 1$$
$$= 36 - 4 + 1$$
$$= 33$$

35. (b) On interchanging '−' to '+' and 2 to 6

$$4 \times 2 + 6 = 14$$
$$\Rightarrow \quad 8 + 6 = 14$$
$$\Rightarrow \quad 14 = 14$$

36. (c) On interchanging signs '×' to '−' and 2 to 3

$$(6 \div 3) - 2 = 0$$
$$\Rightarrow \quad 2 - 2 = 0$$
$$\Rightarrow \quad 0 = 0$$

37. (c) On interchanging signs '+' to '÷' and 2 to 3

$$(2 + 4) \div 3 = 2$$
$$\Rightarrow \quad 6 \div 3 = 2 \Rightarrow 2 = 2$$

38. (a) $(2)^3 \div 4 = 2, (4)^4 \div 8 = 32$
Therefore, $(6)^2 \div 4 = 9$

39. (d) Here, sign ★ implies division and sign @ implies multiplication

$$4 \div 2 \times 3 = 6,$$
$$18 \div 6 \times 4 = 12$$
Therefore, $24 \div 3 \times 7 = 56$

40. (a) Here sign '&' does not convey any meaning and sign '%' signifies '+'

$$26 + 7 = 33, 46 + 8 = 54$$
Therefore, $6 + 89 = 95$

41. (b) According to the question,

$$35 \div 7 \times 5 + 5 - 6 = ?$$
$$\Rightarrow \quad 5 \times 5 + 5 - 6 = ?$$
$$\Rightarrow \quad 25 + 5 - 6 = \boxed{?}$$
$$\Rightarrow \quad 30 - 6 = 24$$

42. (b) As, $6 \bigstar 5 = 6 \times 5 + 1 = 31$
$7 \bigstar 8 = 7 \times 8 + 1 = 57$
and $3 \bigstar 4 = 3 \times 4 + 1 = 13$
Similarly, $9 \bigstar 10 = 9 \times 10 + 1 = 91$

43. (a) $879 \Rightarrow (7 + 9) - 8 = 8$
$625 \Rightarrow (2 + 5) - 6 = 1$
and $586 \Rightarrow (8 + 6) - 5 = 9$
Similarly, $785 \Rightarrow (8 + 5) - 7 = 6$

44. (c) As, $12^2 + 5^2 \Rightarrow 144 + 25 = 169$
$4^2 + 2^2 \Rightarrow 16 + 4 = 20$
and $1^2 + 5^2 \Rightarrow 1 + 25 = 26$
Similarly,
$7^2 + 3^2 = 49 + 9 = 58$

45. (b) $5 * 6 * 5 * 8 * 14$
From option (b),

$$5 \times 6 \div 5 + 8 = 14$$
$$\Rightarrow \quad \frac{5 \times 6}{5} + 8 = 14$$
$$\Rightarrow \quad 6 + 8 = 14$$
$$\therefore \quad 14 = 14$$

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46. (*d*) $40 \times 12 + 3 - 6 \div 60$

According to the question, putting the real values of signs,

$40 + 12 \div 3 \times 6 - 60 = 40 + 4 \times 6 - 60$

$= 40 + 24 - 60 = 64 - 60 = 4$

B. Expert Level Exercise

1. (*d*) **Conclusions** I. $F > B$ (×)

II. $B \geq D$ (×)

2. (*b*) **Conclusions** I. $M \geq Z$ (×)

II. $N < P$ (✓)

3. (*c*) **Conclusions** I. $Y = V$ Either I or II

II. $Y > V$

Because if I must be true, then II must be wrong. And if II must be true, then I must be wrong.

4. (*a*) **Conclusions** I. $D > N$ (✓)

II. $C \geq K$ (×)

5. (*e*) **Conclusions** I. $C > N$ (✓)

II. $B > N$ (✓)

6. (*a*) $K > I \geq T \geq E$; $O < R < K$

$\Rightarrow O < R < K > I \geq T \geq E$

Conclusions I. $R < E$ (×)

II. $O < T$ (×)

Thus, neither Conclusion I nor Conclusion II follows.

7. (*b*) $C < L < O = U = D \geq S > Y$

Conclusions I. $O > Y$ (✓)

II. $C < D$ (✓)

Thus, both Conclusions I and II follow.

8. (*e*) $K \geq L > M \geq N$

Conclusions I. $N \leq K$ (×)

II. $N < K$ (✓)

Thus, only Conclusion II follows.

9. (*d*) $Z \geq Y = W \leq X$

Conclusions I. $W < Z$ (✓)

OR

II. $W = Z$ (✓)

Thus, either Conclusion I or II follows.

47. (*b*) $36 + 6 - 3 \times 2 = 20$

After changing, $36 \div 6 \times 3 + 2 = 20$

$\Rightarrow 6 \times 3 + 2 = 20$

$\Rightarrow 18 + 2 = 20$

$\Rightarrow 20 = 20$

10. (*d*) $B > A > S < I > C > L > Y$

Conclusions I. $B > L$

II. $A > Y$

Thus, neither Conclusion I nor II follows.

11. (*d*) **Statements** $R \# J \Rightarrow R > J$

$J \$ D \Rightarrow J \geq D$

$D @ K \Rightarrow D = K$

$K \% T \Rightarrow K \leq T$

i.e., $R > J \geq D = K \leq T$

Conclusions I. $T \# D \Rightarrow T > D$ (may be)

II. $T @ D \Rightarrow T = D$ (may be)

III. $R \# K \Rightarrow R > K$ (✓)

IV. $J \$ T \Rightarrow J \geq T$ (×)

Hence, either conclusion I or II and III are definitely true.

12. (*a*) **Statements** $T \% R \Rightarrow T \leq R$

$R \$ M \Rightarrow R \geq M$

$M @ D \Rightarrow M = D$

$D © H \Rightarrow D < H$

i.e., $T \leq R \geq M = D < H$

Conclusions I. $D \% R \Rightarrow D \leq R$ (✓)

II. $H \# R \Rightarrow H > R$ (×)

III. $T © M \Rightarrow T < M$ (×)

IV. $T \% D \Rightarrow T \leq D$ (×)

Hence conclusion I is definitely true.

13. (*c*) **Statements**

$M @ B \Rightarrow M = B$

$B \# N \Rightarrow B > N$

$N \$ R \Rightarrow N \geq R$

$R © K \Rightarrow R < K$

i.e., $M = B > N \geq R < K$

Conclusions I. $K \# B \Rightarrow K > B$ (×)

II. $R © B \Rightarrow R < B$ (✓)

III. $M \$ R \Rightarrow M \geq R$ (×)

IV. $N © M \Rightarrow N < M$ (✓)

Hence, II and IV are definitely true.

14. (*b*) Stat

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14. (*b*) **Statements** $F \# H \Rightarrow F > H$
$H @ M \Rightarrow H = M$
$M © E \Rightarrow M < E$
$E \$ J \Rightarrow E \geq J$
i.e., $F > H = M < E \geq J$
Conclusions I. $J © M \Rightarrow J < M$ (×)
II. $E \# H \Rightarrow E > H$ (✓)
III. $M © F \Rightarrow M < F$ (✓)
IV. $F \# E \Rightarrow F > E$ (×)
Hence, II and III are definitely true.

15. (*e*) **Statements** $D \% A \Rightarrow D \leq A$
$A @ B \Rightarrow A = B$
$B © K \Rightarrow B < K$
$K \% M \Rightarrow K \leq M$
i.e., $D \leq A = B < K \leq M$
Conclusions I. $B \$ D \Rightarrow B \geq D$ (✓)
II. $K \# A \Rightarrow K > A$ (✓)
III. $M \# B \Rightarrow M > B$ (✓)
IV. $A © M \Rightarrow A < M$ (✓)
Hence, all Conclusions I, II, III and IV are definitely true.

Solutions (Q. Nos. 16-20)
$P \$ Q \rightarrow P < Q$
$P © Q \rightarrow P > Q$
$P \delta Q \rightarrow P = Q$
$P @ Q \rightarrow P \geq Q$
$P \bigstar Q \rightarrow P \leq Q$

16. (*d*) **Statements** $M @ D \Rightarrow M \geq K$,
$D \delta K \Rightarrow D = K$, $K © R \Rightarrow K > R$
So, $M \geq K = D > R$
Conclusions I. $R \$ M \Rightarrow R < M$ (true)
II. $K \delta M \Rightarrow K = M$ (may be)
III. $K \$ M \Rightarrow K < M$ (may be)
So, from the given statements either II or III and I are true.

17. (*c*) **Statements** $F \bigstar T \Rightarrow F \leq T$,
$T \$ N \Rightarrow T < N$, $N @ R \Rightarrow N \geq R$
So, $F \leq T < N \geq R$
Conclusions I. $R \$ T \Rightarrow R < T$ (false)
II. $N © F \Rightarrow N > F$ (true)
III. $F \$ R \Rightarrow F < R$ (false)
So, only Conclusion II is true from the given statements.

18. (*d*) **Statements** $B © N \Rightarrow B > N$,
$N @ R \Rightarrow N \geq R$, $F H R \Rightarrow F \leq R$
So, $B > N \geq R \geq F$
Conclusions I. $B © R \Rightarrow B > R$ (true)
II. $F H N \Rightarrow F \leq N$ (true)
III. $R \$ B \Rightarrow R < B$ (true)
So, all I, II and III are true from the given statements.

19. (*b*) **Statements** $D \$ M \Rightarrow D < M$,
$M H B \Rightarrow M \leq B$, $B \delta J \Rightarrow B = J$
So, $D < M \leq B = J$
Conclusions I. $J © D \Rightarrow J > D$ (true)
II. $B @ D \Rightarrow B \geq D$ (false)
III. $J @ M \Rightarrow J \geq M$ (true)
So, Conclusions I and III are true from the given statements.

20. (*e*) **Statements** $W \delta K \Rightarrow W = K$,
$K © F \Rightarrow K > F$, $F \$ M \Rightarrow F < M$
So, $W = K > F < M$
Conclusions I. $M © K \Rightarrow M > K$ (false)
II. $W @ F \Rightarrow W \geq F$ (false)
III. $F @ W \Rightarrow F \geq W$ (false)
So, no conclusion is true from the given statements.

21. (*b*)
22. (*b*)
23. (*d*)
24. (*e*)
25. (*c*)

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17

Logical Order of Words

Logical order of words is basically the arrangement of words according to a certain order which can be according to their size, occurrence, dictionary etc.

As the name implies, in this type of problems, a sequence is formed with a certain number of words given in such a way that a particular arrangement of the words gives a logical step-by-step completion of the process or the activity described.

To understand the method of arranging the given words in a logical order we should study the given examples.

Illustration 1. Arrange the following words in a logical and meaningful order.

(i) Travel (ii) Destination (iii) Payment

(iv) Berth/Seat number (v) Reservation

(vi) Availability of Berth/Seat for reservation

(a) (vi), (ii), (v), (iv), (iii), (i) (b) (v), (iii), (iv), (i), (vi), (ii)

(c) (ii), (vi), (iii), (v), (iv), (i) (d) (i), (ii), (v), (iv), (iii), (vi)

Solution (c) From the above words, it is clear that in order to perform a journey, first, a destination is to be identified, secondly availability of berth/seat is ascertained, followed payment for reservation. As a result, berth is allotted and travelling is completed.

Illustration 2. Arrange the following words in a logical and meaningful order.

(i) Country (ii) Furniture (iii) Forest

(iv) Wood (v) Trees

(a) (i), (iii), (v), (iv), (ii) (b) (i), (iv), (iii), (ii), (v)

(c) (ii), (iv), (iii), (i), (v) (d) (v), (ii), (iii), (i), (iv)

Solution (a) From the above words, it is deduced that a country contains forests, a forest has trees, trees give wood that is used to make furniture.

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos.1-16) *In each of the following questions, arrange the words in a meaningful, logical order and then select the appropriate sequence from the alternatives given below for each of the groups of words.*

1. (i) House (ii) Street
(iii) Room (iv) Town
(v) District
[SSC (Steno) 2011]
(a) (iii), (ii), (i), (iv), (v) (b) (iii), (i), (iv), (ii), (v)
(c) (iii), (i), (ii), (iv), (v) (d) (iii), (i), (ii), (v), (iv)

2. (i) Mother (ii) Child
(iii) Milk (iv) Cry
(v) Smile
(a) (i), (v), (ii), (iv), (iii) (b) (ii), (iv), (i), (iii), (v)
(c) (ii), (iv), (iii), (i), (v) (d) (iii), (ii), (i), (v), (iv)

3. (i) Birth (ii) Death
(iii) Funeral (iv) Marriage
(v) Education
(a) (iv), (v), (iii), (i), (ii) (b) (ii), (iii), (iv), (v), (i)
(c) (i), (v), (iv), (ii), (iii) (d) (i), (iii), (iv), (v), (ii)

4. (i) Curd (ii) Grass
(iii) Butter (iv) Milk
(v) Cow
(a) (v), (ii), (iv), (i), (iii) (b) (v), (ii), (iii), (iv), (i)
(c) (iv), (ii), (v), (iii), (i) (d) (ii), (v), (iv), (iii),(i)

5. (i) District (ii) Village
(iii) State (iv) Block
(a) (ii), (i), (iv), (iii) (b) (ii), (iii), (iv), (i)
(c) (ii), (iv), (i), (iii) (d) (iii), (ii), (i), (iv)

6. (i) Destination (ii) Booking
(iii) Boarding (iv) Travel
(v) Planning
(a) (i), (ii), (iii), (iv), (v) (b) (iii), (iv), (v), (i), (ii)
(c) (iv), (iii), (i), (ii), (v) (d) (v), (ii), (iii), (iv), (i)

7. (i) Weekly (ii) Daily
(iii) Monthly (iv) Fortnightly

8. (i) Shoulder (ii) Wrist
(iii) Elbow (iv) Palm
(v) Finger
(a) (v), (iv), (ii), (iii), (i) (b) (iii), (iv), (v), (ii), (i)
(c) (iii), (i), (iv), (ii), (v) (d) (ii), (iv), (v), (iii), (i)

9. (i) Plant (ii) Fruit
(iii) Seed (iv) Flower
[SSC (10+2) 2013]
(a) (iii), (ii), (iv), (i) (b) (iii), (i), (ii), (iv)
(c) (iii), (i), (iv), (ii) (d) (iii), (ii), (i), (iv)

10. (i) Country (ii) District
(iii) State (iv) Village
(v) Continent
[SSC (CPO) 2013]
(a) (v),(iv),(iii),(ii),(i) (b) (i),(iii),(ii), (v), (iv)
(c) (iv),(ii),(iii),(i),(v) (d) (ii),(i),(iii),(v),(iv)

11. (i) South America (ii) Africa
(iii) Europe (iv) Australia
(v) North America
(a) (ii), (i), (v), (iii), (iv) (b) (ii), (v), (i), (iii), (iv)
(c) (ii), (v), (i), (iv), (iii) (d) (ii), (i), (v), (iv), (iii)

12. (i) Farmer (ii) Seed
(iii) Food (iv) Cultivation
[SSC (10+2) 2013]
(a) (i), (ii), (iv), (iii) (b) (ii), (i), (iii), (iv)
(c) (iv), (ii), (iii), (i) (d) (iii), (i), (iv), (ii)

13. (i) Table (ii) Tree
(iii) Wood (iv) Seed
(v) Plant
(a) (iv), (v), (iii), (ii), (i) (b) (iv), (v), (ii), (iii), (i)
(c) (i), (iii), (ii), (iv), (v) (d) (i), (ii), (iii), (iv), (v)

14. (i) Vegetable (ii) Market

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15. (i) Honey (ii) Flower
(iii) Honey Bee (iv) Wax [SSC (DEO) 2011]
(a) (i), (iii), (iv), (ii) (b) (ii), (i), (iv), (iii)
(c) (ii), (iii), (i), (iv) (d) (iv), (iii), (ii), (i)

16. (i) Weaving (ii) Cotton
(iii) Cloth (iv) Thread [SSC (Multitasking) 2014]
(a) (ii), (iv), (i), (iii) (b) (ii), (iv), (iii), (i)
(c) (iv), (ii), (i), (iii) (d) (iii), (i), (iv), (ii)

Directions (Q. Nos. 17-20) *In the following questions, arrange the given words as per order in the dictionary.* [SSC (10 + 2) 2012]

17. (i) Zephyr (ii) Zodiac
(iii) Zoonomy (iv) Zenith
(v) Zig-zag
(a) (ii), (iv), (iii), (v), (i) (b) (iv), (ii), (i), (iii), (v)
(c) (iv), (i), (v), (ii), (iii) (d) (v), (iii), (ii), (iv), (i)

18. (i) Chemistry (ii) Chamber
(iii) Cheap (iv) Cheerful
(a) (ii), (i), (iii), (iv) (b) (iii), (iv), (ii), (i)
(c) (ii), (iv), (iii), (i) (d) (ii), (iii), (iv), (i)

19. (i) Genuine (ii) Genesis
(iii) Gender (iv) Gentle
(v) General
(a) (iv), (v), (iii), (ii), (i)
(b) (i), (v), (iv), (iii), (ii)
(c) (iii), (v), (ii), (iv), (i)
(d) (ii), (v), (iii), (i), (iv)

20. (i) Billian (ii) Bifurcate
(iii) Bilateral (iv) Bilirubin [SSC (Multitasking) 2013]
(a) (ii), (i), (iii), (iv)
(b) (iv), (iii), (ii), (i)
(c) (ii), (iii), (iv), (i)
(d) (ii), (iii), (i), (iv)

B. Expert Level Exercise

Directions (Q. Nos. 1-15) *Which one of the given responses would be a meaningful order of the following words in ascending order?*

1. (i) Lung (ii) Nostrils
(iii) Windpipe (iv) Blood
(a) (i), (ii), (iii), (iv) [SSC (Steno) 2011]
(c) (i), (iii), (iv), (ii) (b) (ii), (iii), (i), (iv)
(d) (iv), (iii), (ii), (i)

2. (i) Site (ii) Plan
(iii) Rent (iv) Money
(v) Building
(a) (iv), (i), (ii), (v), (iii) (b) (iii), (iv), (ii), (v), (i)
(c) (ii), (iii), (v), (i), (iv) (d) (i), (ii), (iii), (v), (iv)

3. (i) Poverty (ii) Population
(iii) Death (iv) Unemployment
(v) Disease
(a) (iii), (iv), (ii), (v), (i) (b) (ii), (iv), (i), (v), (iii)
(c) (ii), (iii), (iv), (v), (i) (d) (i), (ii), (iii), (iv), (v)

4. (i) Index (ii) Contents
(iii) Title (iv) Chapters
(v) Introduction
(a) (iii), (ii), (v), (i), (iv) (b) (ii), (iii), (iv), (v), (i)
(c) (v), (i), (iv), (ii), (iii) (d) (iii), (ii), (v), (iv), (i)

5. (i) Caste
(ii) Family
(iii) Newly married couple
(iv) Clan
(v) Species
(a) (ii), (iii), (i), (iv), (v) (b) (iii), (ii), (i), (iv), (v)
(c) (iii), (iv), (v), (i), (ii) (d) (iv), (v), (iii), (ii), (i)

6. (i) Andhra Pradesh
(ii) Universe
(iii) Tirupati
(iv) World
(v) India
(a) (i), (v), (iii), (ii), (iv) (b) (ii), (i), (iii), (v), (iv)
(c) (iii), (i), (v), (iv), (ii) (d) (v), (iv), (ii), (i), (iv)

7. (i) Consultation (ii) Illness
(iii) Doctor (iv) Treatment
(v) Recovery
(a) (ii), (iii), (i), (iv), (v)
(b) (ii), (iii), (iv), (i), (v)
(c) (iv), (iii), (i), (ii), (v)
(d) (v), (i), (iv), (iii), (ii)

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8. (i) Windows (ii) Walls
(iii) Floor (iv) Foundation
(v) Roof (vi) Room
(a) (iv), (v), (iii), (ii), (i), (vi)
(b) (iv), (iii), (v), (vi), (ii), (i)
(c) (iv), (ii), (i), (v), (iii), (vi)
(d) (iv), (i), (v), (vi), (ii), (iii)

9. (i) Frog (ii) Eagle
(iii) Grasshopper (iv) Snake
(v) Grass
(a) (v), (iii), (iv), (ii), (i) (b) (v), (iii), (i), (iv), (ii)
(c) (iii), (iv), (ii), (v), (i) (d) (i), (iii), (v), (ii), (iv)

10. (i) Diagnosis (ii) Doctor
(iii) Sick (iv) Treatment
(v) Recovery
(a) (i), (ii), (iii), (iv), (v) (b) (iii), (ii), (i), (iv), (v)
(c) (ii), (i), (iii), (iv), (v) (d) (iv), (v), (i), (iii), (ii)

11. (i) Collector
(ii) Governor
(iii) Chief Secretary
(iv) President
(v) Clerk
(a) (i), (ii), (iii), (iv), (v)
(b) (v), (i), (iii), (ii), (iv)
(c) (v), (i), (iii), (iv), (ii)
(d) (v), (i), (iv), (iii), (ii)

12. (i) Twilight (ii) Dawn
(iii) Noon (iv) Night
[SSC (10 + 2) 2013]
(a) (ii), (i), (iii), (iv) (b) (ii), (iii), (i), (iv)
(c) (i), (ii), (iii), (iv) (d) (i), (iii), (ii), (iv)

13. (i) Sending (ii) Encoding
(iii) Receiving (iv) Decoding
[SSC (10 + 2) 2013]
(a) (ii), (iv), (iii), (i)
(b) (iv), (ii), (i), (iii)
(c) (i), (ii), (iii), (iv)
(d) (ii), (i), (iii), (iv)

14. (i) Pupa (ii) Larva
(iii) Moth (iv) Eggs [SSC (CGL) 2013]
(a) (iv), (ii), (i), (iii)
(b) (iv), (i), (ii), (iii)
(c) (iv), (iii), (ii), (i)
(d) (iv), (iii), (i), (ii)

15. (i) Compose (ii) Appreciation
(iii) Money (iv) Think
(v) Sing
(a) (i), (iv), (ii), (v), (iii)
(b) (iv), (i), (v), (ii), (iii)
(c) (ii), (iv), (iii), (v), (i)
(d) (v), (iv), (ii), (i), (iii)
(e) (iii), (ii), (iv), (i), (v)

Answer *with* Explanations

A Base Level Exercise

1. (c) Room → House → Street → Town → District

2. (b) Child → Cry → Mother → Milk → Smile

3. (c) Birth → Education → Marriage → Death → Funeral

4. (a) Cow → Grass → Milk → Curd → Butter

5. (c) Village → Block → District → State

6. (d) Planning → Booking → Boarding → Travel → Destination

7. (b) Meaningful order of the words in ascending order is as follows
Daily → Weekly → Fortnightly → Monthly → Bimonthly
⇒ (ii), (i), (iv), (iii), (v)

8. (a) Meaningful order of the words in ascending order is as follow
Finger → Palm → Wrist → Elbow → Shoulder
⇒ (v), (iv), (ii), (iii), (i)

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9. (c) Seed (iii) → Plant (i) → Flower (iv) → Fruit (ii)

10. (c) The meaningful order is as follow

Village, District, State, Country, Continent *i.e.*, (iv), (ii), (iii), (i), (v)

11. (b) The continents arranged in ascending order of area is Africa > North America > South America > Europe > Australia

So, the correct order is (ii), (v), (i), (iii), (iv)

12. (a) Meaningful order of the given words is Farmer, Seed, Cultivation, Food *i.e.*, (i), (ii), (iv), (iii)

13. (b) Seed → Plant → Tree → Wood → Table

14. (b) Market → Vegetable → Cutting → Cooking → Food

B. Expert Level Exercise

1. (b) Nostrils → Windpipe → Lung → Blood

2. (a) Money → Site → Plan → Building → Rent

3. (b) Population → Unemployment → Poverty → Disease → Death

4. (b) Content → Title → Chapters → Introduction → Index

5. (b) Newly married couple → Family → Caste → Clan → Species

6. (c) Tirupati → Andhra Pradesh → India → World → Universe

7. (a) Illness → Doctor → Consultation → Treatment → Recovery

8. (c) Foundations → Walls → Windows → Roof → Floor → Room

9. (b) Grass → Grasshopper → Frog → Snake → Eagle

15. (c) Flower → Honey bee → Honey → Wax

16. (a) Meaningful order of the words is Cotton, Thread, Weaving, Cloth *i.e.*, (ii), (iv), (i), (iii).

17. (c) Arrangement as per in dictionary order
Zenith → Zephyr → Zig-zag → Zodiac → Zoonomy

18. (d) Arrangement as per in dictionary order
Chamber → Cheap → Cheerful → Chemistry

19. (c) Arrange as per in dictionary order
Gender → General → Genesis → Gentle → Genuine

20. (c) Arrange as per in dictionary order
Bifurcate → Bilateral → Bilirubin → Billian

10. (b) Sick → Doctor → Diagnosis → Treatment → Recovery

11. (b) Meaningful order of the words in ascending order is as follows Clerk → Collector → Chief Secretary → Governor → President
i.e., (v), (i), (iii), (ii), (iv)

12. (b) Meaningful order of the given responses is (ii). Dawn → (iii) Noon → (i) Twilight → (iv) Night
i.e., (ii), (iii), (i), (iv)

13. (d) Logical arrangement of words is Encoding → Sending → Receiving → Decoding
i.e., (ii), (i), (iii), (iv)

14. (a) The meaningful order of term is Eggs → Larva → Pupa → Moth (life cycle of butterfly)

15. (b) Meaningful order of the given words is as follow
Think → Compose → Sing → Appreciation → Money

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18

Clerical Aptitude

Clerical Aptitude is basically designed to test the comparing and cross-checking capabilities of a candidate.

These types of questions are mainly asked in Bank Clerk exams. Students usually, taking this chapter to be easy and less important, commit mistakes while solving problems based on this chapter. This chapter or the questions from this chapter are framed to test a candidate's 'Meticulousness', his eyes for details, in solving a given problem.

Types of Questions

There are two types of questions which are asked generally in competitive exams from this chapter

Type 1 Questions Based on Address

In this type of questions, we have to deal with questions, which are based on 'address'. Here, one correct address is given, followed four of alternatives. You have to choose from the alternatives, the one which is similar to the correct one. If none matches, the answer is none.

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Directions (Illustrations 1-5) *Below each question, a combination of name and address is given in the first unnumbered column, at the left followed by four such combinations, one each under the columns (a), (b), (c) and (d). You have to find out the combination which is exactly the same as the combination in the first unnumbered column. The number of that column which contains that correct combination is the answer. If all the combinations are different, the answer is (e).*

	(a)	(b)	(c)	(d)	(e)
1. Kousambia Rao Ulhas Village Sarambaug-02	Kousambia Rao Ulhas Village Sarasbaug-02	Kousombia Rao Ulhas Village Sarambaug-02	Kousambia Rao Ulhas Village Sarambaug-20	Kousambia Rao Ulhas Village Sarambaug-02	None
2. RV Suthwale DSP (Vigi) II, Wing IV, 15/36	VR Suthwale DSP (Vigi) II, Wing IV, 15/36	RV Suthawale DSP (Vigi) II, Wing IV, 15/36	RV Suthwale DPS (Vigi) II, Wing IV, 15/36	RV Suthwale DSP (Vigi) II Wing VI, 15/36	None
3. Jestina's Salon Surayiya Park 12-Samtangar	Jestina's Saloon Surayiya Park 12-Samtangar	Jestina's Salon Surayiya Park 21-Samtanagar	Jestina's Salon Surayaiya Park 12-Samtangar	Jestina's Salon Surayiya Park 12-Samtanagar	None
4. Shivshankar Singh 41/B, Firdos Galli Ph-4651783	Shivshankar Singh 41/B, Firdos Galli Pin-4652783	Shivshankar Singh 41/D, Firdos Galli Ph-4651783	Shivshankar Singh 41/B, Firdos Galli Ph-4651783	Shivshankar Singh 41/B, Firdos Galli Ph-4651383	None
5. Chandrasen PS Akashganga Apts Sundarnagar-16	Chandrasen PS Akashganga Atps Sundarnagar-16	Chandrasen PS Akashganga Apts Sundarnagar-16	Chandrasen PS Akashganga Apts Sundernagar-16	Chandrusen PS Akashganta Apts Sundarnagar-16	None

Solutions (Q. Nos. 1-5)

1. (d) On close observation, we find the address given in alternative (d) is similar to the unnumbered column.
2. (e) On close observation, we find the address given is not similar to the unnumbered column.
3. (e) On close observation, we find the address given is not similar to the unnumbered column.
4. (c) On close observation, we find the address given in alternative (c) is similar to the unnumbered column.
5. (b) On close observation, we find the address given in alternative (b) is similar to the unnumbered column.

Type 2 **Questions Based on Issues**

In this type of questions, we deal with questions which are regarding with different issues viz. politics, social, sports, science and health and others.

Directions (Illustrations 6-10) *The news item in each of the questions given below is to be classified into one of the following five areas.*

(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

6. Bombay Juniors beat the Kolkata Juniors in the Ranji Trophy.

(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

7. Dowry deaths are still a cause of worry for the parents of young girls.

(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

8. A research suggests, 'Tea fights cancer'.

(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

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9. The 'Party supporters' say that they have lost faith in their leaders.
(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

10. The Super Star says, his divorce has brought him luck.
(a) Politics (b) Social Issues (c) Sports
(d) Science and Health (e) Miscellaneous

Solutions (Q. Nos. 6-10)

6. (c) This issue is related to Sports.

7. (b) It is a Social Issue.

8. (d) It deals with Science and Health.

9. (a) Party and supporter both the words are related to Politics.

10. (e) It can be classified under Miscellaneous.

Let us Practice

Directions (Q. Nos. 1-7) *In each of the question given below, a combination of Name and Address is given in the first unnumbered column at the left followed by four such combinations one each under the column (a), (b), (c) and (d). You have to find out the combination which is exactly the same as the combination in the first unnumbered column. The number of that column which contains that combination is the answer. If all the combinations are different the answer is (e).*

		(a)	(b)	(c)	(d)	(e)
1.	Uma Narayan Q No 4/632 'D' Jodhpur-24	Una Narayan Q No 4/632 'D' Jodhpur-24	Uma Narayan Q No 14/632 'D' Jodhpur-24	Uma Narayan Q No 4/632 'B' Jodhpur-24	Uma Narayan Q No 4/632 'D' Jodhpur-24	None
2.	Suman Rastogi 46, Kothi Bagan, Panipat-2 Tel. 6895386	Susan Rastogi 46, Kothi Bagan, Panipat-2 Tel. 6895386	Suman Rastogi 64, Kothi Bagan Panipat-2 Tel. 6895386	Suman Rastogi 46, Kothi Bagan, Panipat-2 Tel. 6895386	Suman Rastogi 46, Hathi Bagan, Panipat-2 Tel. 6895386	None
3.	Kavita Parekh 731 D/936, MIG Viramgam.-14	Kavita Parekh 713 D/936, MIG Viramgam.-14	Kavita Parekh 731 D/963, MIG Viramgam.-14	Kavita Parekh 731 D/936, MIG Viramgam.-14	Kavita Parekh 731 D/936, LIG Viramgam.-14	None
4.	Fatima K. Ahmad 4, Chuna Factory Bijnor-13	Fatima K. Ahmad 4, Chana Fatory Bijnor-13	Fatima Ahmad 4, Chuna Factory Bijnor-13	Fatima K. Ahmad 4, Chuna Factory Bijnor-13	Fatima K. Ahmad 4, Chuna Factory Bijnor-31	None
5.	M/s Raghava Phoolgali-N Phn : 2062258	M/s Raghava Phulgali-N Phn : 2062258	M/s Raghava Phoolgali-N Phn : 2662258	Mr/s Raghav Phoolgali-N Phn : 2062258	M/s Raghava Phoolgali-N Phn : 2062258	None
6.	Ramvati Gusain H.No. 19, Jamvaal Garhwal-15	Ramvati Gusain Qr.No. 19, Jamvaal Garhwal-15	Ramvati Gusain H.No. 19, Jamvaal Garhwal-15	Ramvati Gusain H.No. 19, Jamvaal Gadval-15	Ramvati Gusian H.No. 19, Jamvaal Garhwal-51	None
7.	Seema Yadav 96, Lodhi Mahal Patna-17	Seema Yadav 96, Lodhi Mahal Patna-17	Seema Yadav 46, Lodhi Mahal Patna-17	Seema Yadav 96, Lodhi Mahal Patna-71	Seema Yadav 69, Lodhi Mahal Patna-17	None

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Directions (Q. Nos. 8-16) *The news in each questions given below is to be classified into one of the following five areas.*

(a) Politics
(b) Social Issues
(c) Sports
(d) Science and Health
(e) Miscellaneous

8. Classical music stimulates the hippocampus and increases long term memory.

9. Indians top the list of highest paid sports persons in 2009.

10. Government to announce measures to curb inflation shortly.

11. State sponsored study reveals that there is a rise in percentage of girls attending primary school.

12. Foreign Banks set record in placement offers in management institutes in 2009.

13. The most common reason for a pace maker is a heart beat that shows to an unhealthy rate.

14. Narendra Modi is not the first Chief Minister to ascend to the seat of the head of government of India.

15. Extra time goals from Arjen Robben and Thomas muller handed Bayeru Munich the German Cup Final.

16. Every child between the age of 6 to 14 years has the right to free and Compulsory education.

Directions (Q. Nos. 17-21) *The news items in each of the question given below is to be classified into one of the following five areas.*

(a) Social Issues
(b) Environmental Issues
(c) Sports
(d) Politics
(e) Science and Health

17. New Delhi, the Capital of India is the most polluted city in the world when it comes to air quality.

18. President dissolved the 15th Lok sabha with immediate effect after the election.

19. Thousands of fishes and aquatic birds were found dead after the oil spill from the cargo ship.

20. Parliament was adjourned due to several instances of abusive behaviour by the members.

21. Women of the village ransacked all the liquor shops to deal with domestic violence due to alcoholism.

Answer *with* Explanations

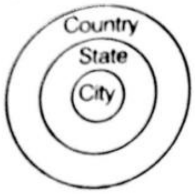
1. (d) **2.** (c) **3.** (c)
4. (c) **5.** (d)
6. (b)
7. (a)
8. (d) It is a Science and Health Issue.
9. (c) It is a Sports Issue.
10. (e) It is an Economic Issue.
11. (b) It is a Social Issue.
12. (e) It is a Miscellaneous Issue.
13. (d) It is a Science and Health issue
14. (a) It is a Political Issue.
15. (c) It is a Sports Issue.
16. (b) It is a Social Issue.
17. (b) It is an Environmental Issue.
18. (d) It is an Political Issue.
19. (b) It is an Environmental Issue.
20. (d) It is a Political Issue.
21. (a) It is a Social Issue.

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Illustration 2. Country, City, State

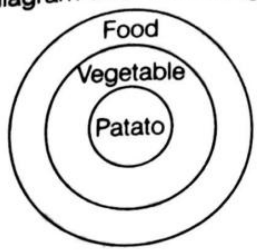
Solution Venn diagram would be as follows



A city lies within a state which in turn lies within a country

Illustration 3. Food, Patato, Vegetable

Solution Venn diagram would be as follows



As, patato is a vegetable and vegetable are considered as food that we eat.

Type 2 Universal Negative

If the items evidently belong to three different groups, *i.e.*, they are not correlated with each other in any way, called universal negative.

Illustration 4. Intelligence, Anxiety, Strength

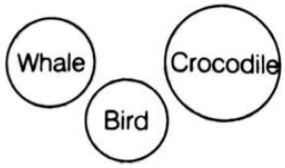
Solution



Anxiety, intelligence and strength are entirely different from each other.

Illustration 5. Whale, Crocodile, Bird

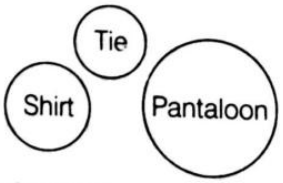
Solution



They all belong to different categories.

Illustration 6. Tie, Shirt, Panta loon

Solution



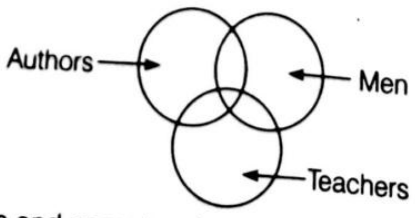
Tie, shirt and pantaloon are separate items, entirely different from each other.

Type 3 Particular Affirmative or Negative

In this type, two or more entities are correlated and statements arise like some first entity belongs to second entity.

Illustration 7. Teachers, Authors, Men

Solution



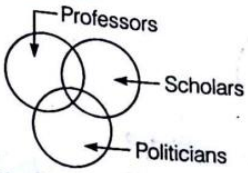
Here, some teachers may be authors and some teachers may be Men. Also, some authors may be men. So, the given items are partly related to each other.

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Illustration 8. Professor, Scholar, Politician

Solution



Here, some professors may be scholars and some scholars may be politicians. Also, some professors may be politicians. So, the given items are partly related to each other.

Type 4 Miscellaneous

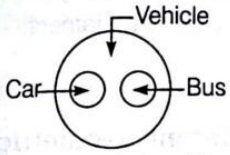
In this type, we deal with the questions which belong to at least two different types as discussed earlier.

Different types of cases that can be studied under this type are as follows

Case I If two separate groups of items are completely unrelated to each other but they are all completely included in the third group, then the relationships can be diagrammatically shown as

Illustration 9. Vehicle, Car, Bus

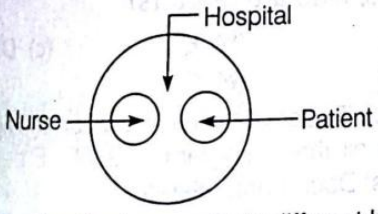
Solution



Bus and car are entirely different but both are vehicles.

Illustration 10. Hospital, Nurse, Patient

Solution

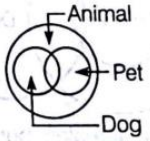


Nurse and patient are entirely different but both are parts of hospital.

Case II When two groups of items have some common relationship and both of them are completely included in the third group, the relationships are shown by two smaller intersecting circles in a third large circle.

Illustration 11. Animal, Dog, Pet

Solution

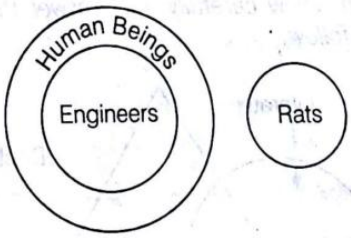


Some dogs are pets and some pets are dogs but all dogs and pets are animals.

Case III If one item belongs completely to the class of second while, third item is entirely different from the two, then they may be represented by the following diagram.

Illustration 12. Engineers, Human Beings, Rats

Solution



We know all engineers are human beings but rats are entirely different to both of these.

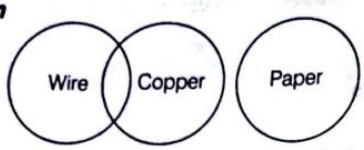
Case IV If one group of items is partly included in the second group of items and the third group is completely unrelated to these two groups, their relationship is diagrammatically shown as

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Illustration 13. Wire, Copper, Paper

Solution

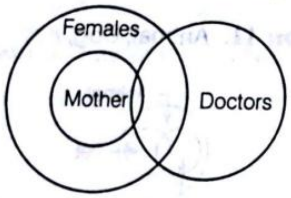


Some wires are made of copper but paper is entirely different.

Case V If one item belongs to the class of second and the third item is partly related to these two, they are represented as shown

Illustration 14. Females, Mothers, Doctors

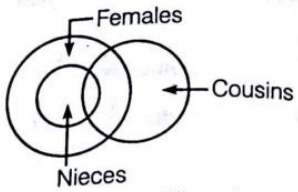
Solution



All mothers are females but some females and some mothers can be doctors. So, the circles representing doctors would intersect both of the two concentric circles.

Illustration 15. Females, Nieces, Cousins

Solution

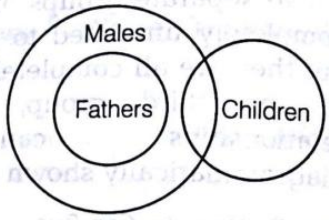


All nieces are females while only some cousins can be nieces and females both.

Case VI If one item belongs to the class of second and the third item is partly related to the second, they are represented as shown

Illustration 16. Males, Fathers, Children

Solution



All fathers are males. This would be represented by two concentric circles but some males are children but children cannot be fathers.

Geometrical Figures Venn Diagrams

In this type, we formed the Venn diagrams by using different geometrical figures. Till now, we have used only circles to represent different relationship. Here, we will use different geometrical figures to show different relationship.

Directions (Illustrations 17-18) *Study the figure given below carefully and answer the questions that follow.*

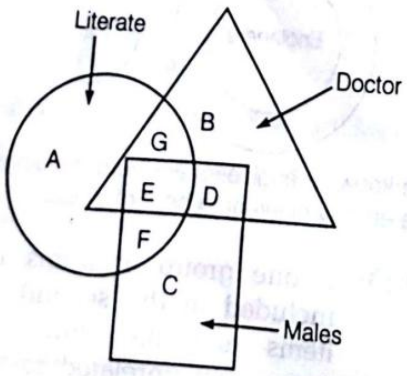


Illustration 17. Which part shows Literate Males, who are Doctors?

(a) G (b) E (c) D
(d) F (e) C

Solution (*b*) To depict the required part the figure should show all three diagrams, *i.e.*, E. E belongs to all Males, Doctor and Literate.

Illustration 18. Which part shows Males, who are neither Doctor nor Literate?

(a) A (b) B (c) C
(d) D (e) None of these

Solution (c) To depict the required part, the figure should show only Males, *i.e.*, C. C belongs to only Males.

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Directions (Illustrations 19-21) *Study the following diagram to answer these questions.*

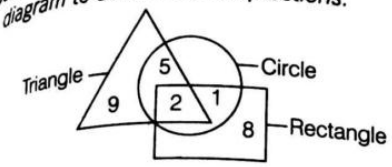


Illustration 19. Find out the number, that lies inside all the figures.

(a) 2 (b) 5 (c) 9
(d) No such number is there

Solution (a) Such number should be showing all three figures, ie, circle, rectangle and triangle. There is only one number *viz*. 2 which shows to all three figures.

Illustration 20. What are the numbers that lie inside any two figures?

(a) 2, 1
(b) 5, 1
(c) 5, 9
(d) 9, 1

Solution (b) Such numbers are 5 and 1.

Illustration 21. Find out the number, that lies only inside the triangle.

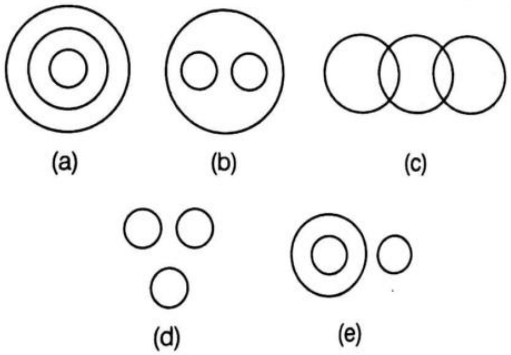
(a) 1
(b) 2
(c) 5
(d) 9

Solution (d) Such number should show only triangle not circle and rectangle, such number is 9.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-15) *Each of the questions given below, contains three elements. These three elements may or may not have some link. Each group of the elements may fit into one of the diagrams at (a), (b), (c), (d) and (e). You have to indicate the groups of elements, in each of the questions that will fit into any of the following diagrams. You will have to select that diagram from the set of following diagrams.*

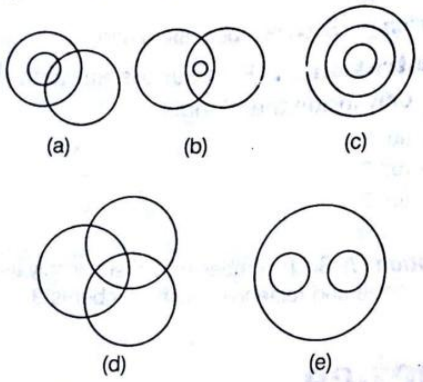


1. Week, Day, Year
2. Mammals, Cows, Crows
3. House, Bedroom, Bathroom
4. Metal, Iron, Chlorine
5. Words with no vowel, word with one vowel, words with two vowels
6. Homosapiens, Woman, Mother
7. Living beings, Men, Rodents
8. Iron, Lead, Nitrogen
9. Cabinet, Minister, Home Minister
10. Grains, Wheat, Maize
11. School, Classroom, Blackboard
12. Planets, Earth, Sun
13. Room, Wall, Window
14. Honesty, Intelligence, Aptitude
15. Fruits, Plums, Tomatoes

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Directions (Q. Nos. 16-20) *Each question given below, has three items having certain relationship among them. The same relationship is expressed by sets of circles, each circle representing one item irrespective of its size. Match the items with right set of circles.*



16. Rivers, Canals, Perennial source of water

17. Rings, Ornaments, Diamond rings

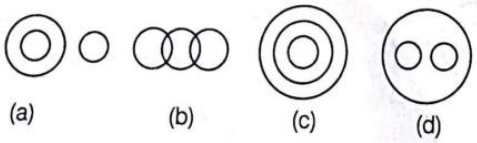
18. Women, Married persons, Wives who work

19. Computer skills, Graduates, Employed

20. Students, First divisioners, Third divisoners

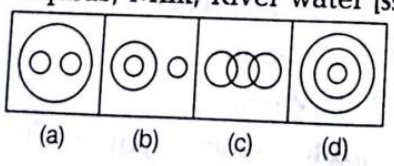
21. Identify the diagram that best represents the relationship among classes given below

Mammal, Dog and Bat [SSC (10+2) 2013]



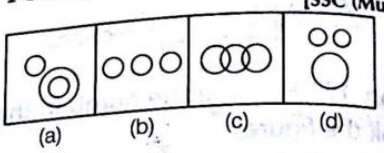
22. Identify the diagram that best represents the relationship among the classes given below

Liquids, Milk, River water [SSC (10+2) 2013]

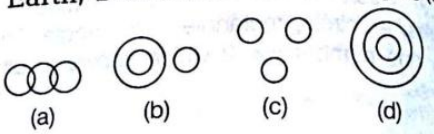


23. Identify the diagram that best represents the relationship among the classes given below

Police, Theif , Criminal [SSC (Multitasking) 2014]



24. Which one of the following diagrams best depicts the relationship among Earth, Sea and Sun? [SSC (CGL) 2013]

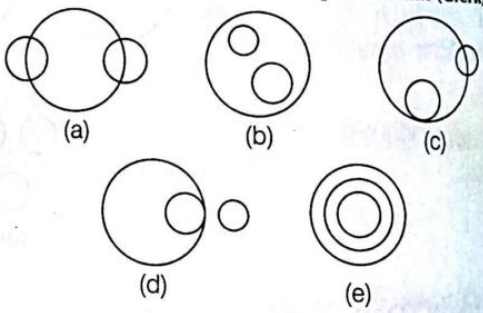


25. Identify the diagram that best represents the relationship among the classes given below

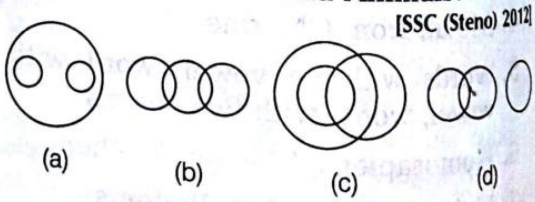
Tea, Coffee, Drink [SSC (10+2) 2013]



26. Which of the following figures represents the relation between Currency, Rupee and Dollar? [UCO Bank (Clerk) 2011]



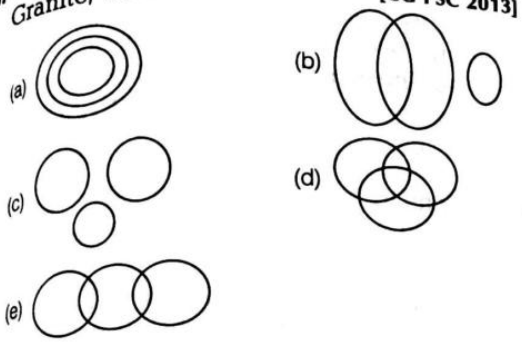
27. Which one of the following diagram best depicts the relationship among Elephants, Wolves and Animals? [SSC (Steno) 2012]



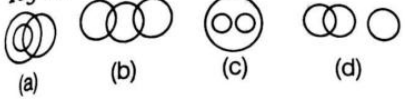
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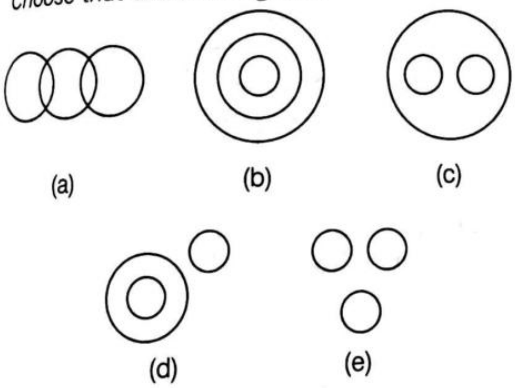
28. Which of the following represents Granite, Tree and Water [CG PSC 2013]



29. Which of the following diagram correctly represents the relationship amongst Tiger, Elephant, Animal?



Directions (Q. Nos. 30-32) *In each of these questions, three words are related in some way or other. The relationship among the words in the question can be best represented by one of the five diagram (a), (b), (c), (d) and (e) given below. Choose that correct diagram.*

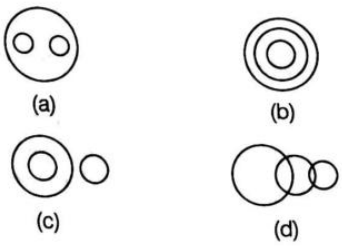


30. Goat, Carnivores, Lion

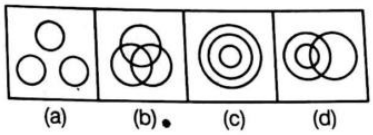
31. Truck, Ship, Goods

32. Mountain, Earth, Moon

33. Which one of the following figure represents the relationship among Politicians, Contractors and Candles? [SSC (FCI) 2012]

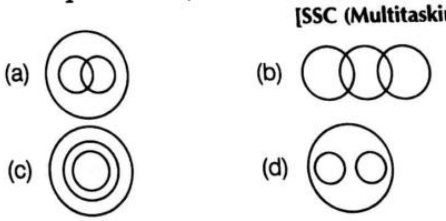


34. Which one of the following diagrams represents the correct relationship among Teacher, Educated, Employed? [SSC (Steno) 2013]

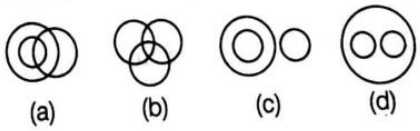


35. Identify the diagram that best represents the relationship among classes given below.

Sportsmen, Cricketers, Batsman [SSC (Multitasking) 2014]



36. Which figure will best represent the relationship amongst the three classes Doctor, Teacher, Women? [SSC (CPO) 2013]



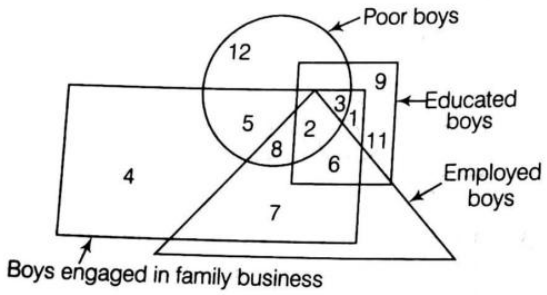
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B. Expert Level Exercise

Directions (Q. Nos. 1-5) *Read the following information carefully and answer the questions based on them.*

The circle represents poor boys, the square represents educated boys, the triangle represents the boys who are employed somewhere and the rectangle represents those who help in the family business. Each section of the diagram is numbered. Now answer the questions given below on the basis of this diagram.



1. Which number represents those poor boys who help in family business but are not educated or employed elsewhere?

(a) 2 (b) 3 (c) 4
(d) 5 (e) 7

2. Which number represents the group of educated poor boys who are employed some-where but do not help in family business?

(a) 12 (b) 3 (c) 11
(d) 2 (e) None of these

3. Which section does number 3 represent?

(a) Uneducated poor boys who do not help in family business
(b) Educated poor boys employed in service
(c) Uneducated boys who help in family business
(d) Educated poor boys who help in family business
(e) None of the above

4. Which number represents that section of poor boys who are neither educated nor are in any employment or have any family business?

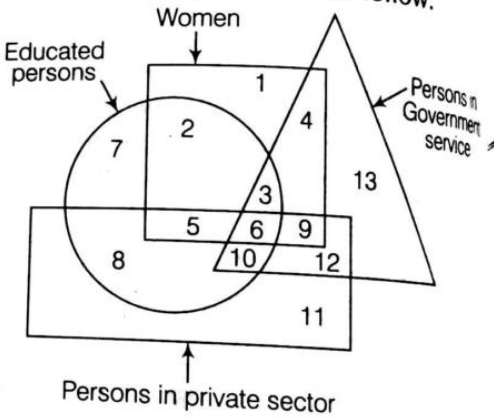
(a) 4 (b) 5
(d) 11 (e) 12 (c) 1

5. Boys who are neither educated nor pro... but have employment as well as a famil... business are represented by the number?

(a) 8 (b) 7 (c) 4
(d) 6 (e) 5

Directions (Q. Nos. 6-8) *Read the following informatio... carefully and answer the questions based o... them.*

In the Venn diagram given below, the square represents Women, the triangle represents Persons who are in Government serivces, the circle represents Educated persons and the rectangle represents Persons working in private sectors. Each section of the diagram is numbered. Your task is to study the diagram and answer the questions that follow.



6. Which number represents educated women, who are in Government jobs?

(a) 2 (b) 3 (c) 6
(d) 4 (e) None of these

7. Which number represents the uneducated women, who have government jobs as well as jobs in private sectors?

(a) 6 (b) 4 (c) 12
(d) 9 (e) None of these

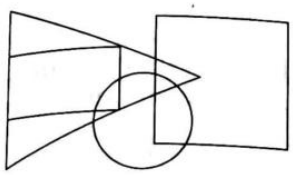
8. Number 10 represents?

(a) Educated women in private job
(b) Uneducated men in Government job
(c) Educated men working in private sector
(d) Educated men having private as well as Government job
(e) None of the above

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Directions (Q Nos. 9-10) *The followng figure represents a group of persons. The triangle represents Educated person, the ractangle represents the Administrative persons, the square represents the Businessman and circle Income tax payers.* **[CG PSC 2013]**



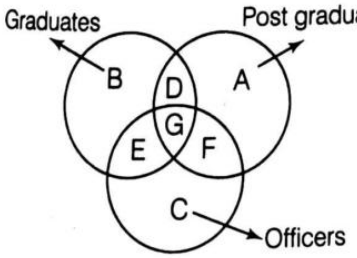
9. From the above figure, it can be concluded that

(a) all Businessmen pay Income tax
(b) some Administrative person are Income tax payers
(c) all Income tax payers are Educated
(d) Educated person which are not in Administrative service do not pay Income tax
(e) all Businessmen are Educated

10. According to the given figure, it can be inferred that

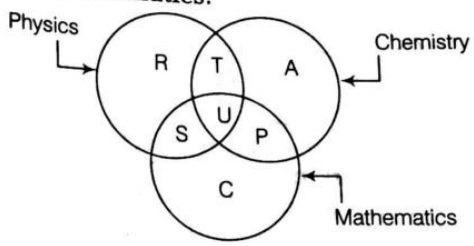
(a) none of the Income tax payer is Educated
(b) all the Administrative persons are Income tax payers
(c) none of the Income tax payer is Administrative person
(d) some of the persons who are neither Businessman nor Income tax payer are Educated person
(e) None of the above

11. Given below are three figures represent Graduates, Post graduates, Ofiicers. Which part represents all the Officers who are Graduates and Post graduates? **[SSC (Multitasking) 2013]**



(a) G (b) D (c) B (d) c

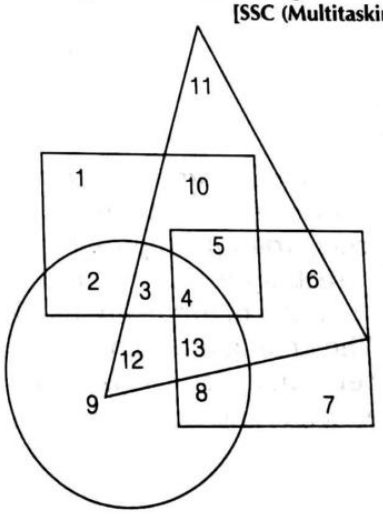
12. The diagram below represents the students who study Physics, Chemistry and Mathematics.



Study the diagram and identify the region which represents students who study both Physics and Chemistry but not Mathematics. **[SSC (FCI) 2012]**

(a) T + S + U + P
(b) C
(c) R + T + A + U + P + S
(d) T

13. In the following diagram, Police Officer represents Circle, Corrupt represents Triangle, Poet represents Square, Married represents Rectangle **[SSC (Multitasking) 2013]**



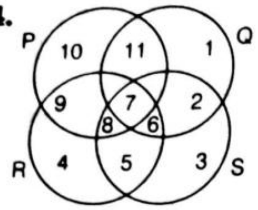
The area representing unmarried Police Officer who are not Corrupt but are Poets is **[SSC (Multitasking) 2013]**

(a) 8
(b) 9
(c) 2
(d) 4

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14.



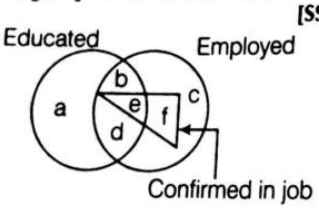
In the above figure, circle P represents Hardworking people, circle Q represents Intelligent people, circle R represents Truthful people and circle S represents Honest people, which region represents the people who are Intelligent, Honest and Truthful but not Hardworking?

[CSAT 2013]

(a) 6 (b) 7
(c) 8 (d) 11

15. Read the figure and find the region representing persons who are Educated and Employed but not Confirmed.

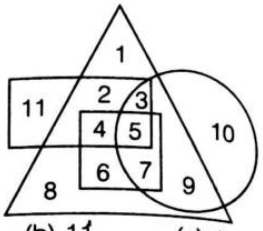
[SSC (CGL) 2013]



(a) ac (b) abc
(c) bd (d) adc

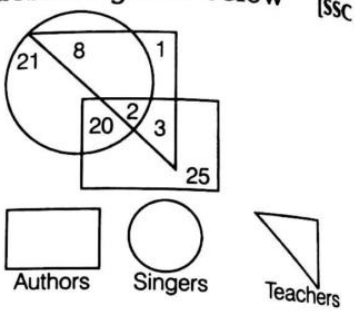
16. In the given diagram, circle represents Professionals, square represents Dancers, triangle represents Musicians and rectangle Europeans. Different region in the diagram are numbered 1 to 11. Who among the following is neither a Dancer nor a Musician but is Professional and not a European?

[SSS (CGL) 2013]



(a) 8 (b) 11 (c) 1 (d) 10

17. Study the following figure and answer the question given below [SSC (CPO) 2

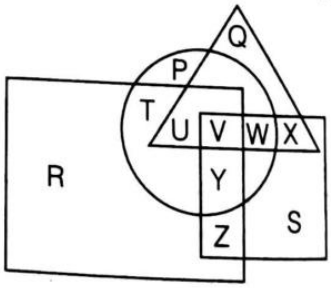


How many Teachers are neither Authors nor Singers?

(a) 1 (b) 8 (c) 2 (d) 3

18. In the given figure, circle represents persons having car, triangle represents persons having motorcycle, square represents persons having autorickshaw and rectangle represents persons having cycle. Find the region, where persons having car, motorcyle, cycle but not autorickshaw.

[SSC (CGL) 20



(a) X (b) U (c) V (d) W

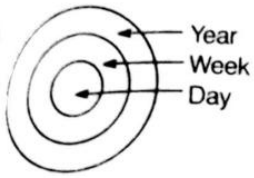
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Answer with Explanations

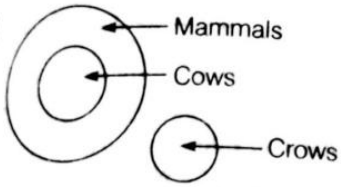
Base Level Exercise

1. (c)



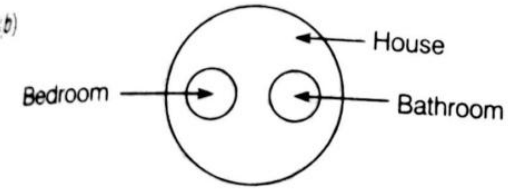
Year consists of weeks, week consists of days.

2. (c)



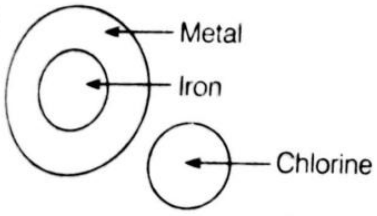
Cows are mammals but crows are entirely different, *i.e.*, birds.

3. (b)



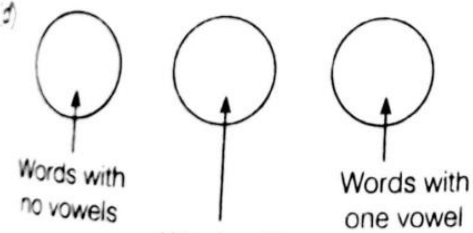
Bedroom and bathroom both are parts of a house but they are entirely different.

4. (e)



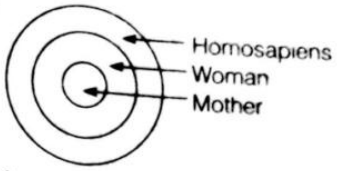
Iron is a metal but chlorine is a liquid non-metal, so it is totally different.

5. (c)



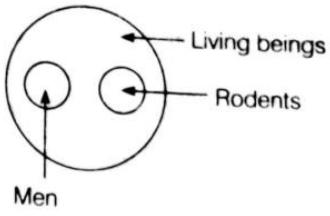
All are different in nature.

6. (a)



A mother is woman and a woman is homosapiens.

7. (b)



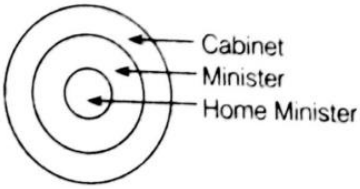
Men and rodents are different entities but both are living beings.

8. (d)



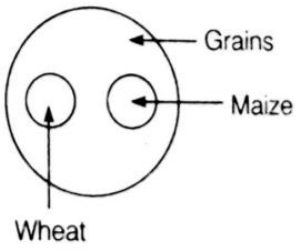
All are different entities.

9. (a)



Home minister is a minister and minister belongs to cabinet.

10. (b)

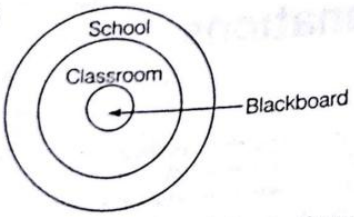


Maize and wheat both are different entities but both are grains.

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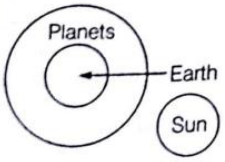
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11. (a)



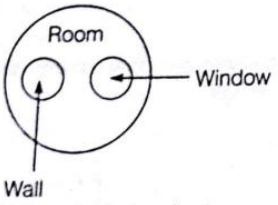
Blackboard is found in a classroom and classroom is found in a school.

12. (e)



Earth is a planet but Sun is not, it is a star.

13. (b)



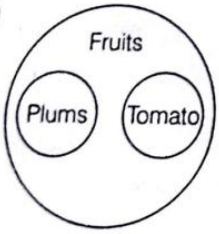
Wall and window both are entirely different but both are parts of a room.

14. (d)



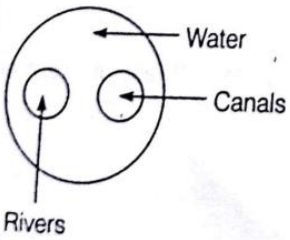
All are different entities.

15. (b)



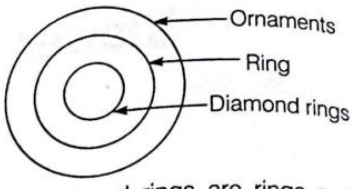
Plums is a part of fruit and tomato is a fruit.

16. (e)



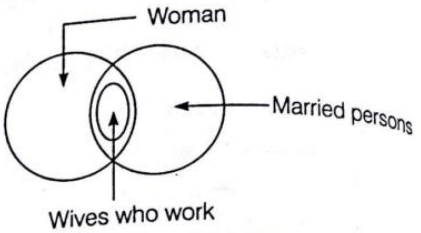
Rivers and canals are perennial source of water.

17. (c)



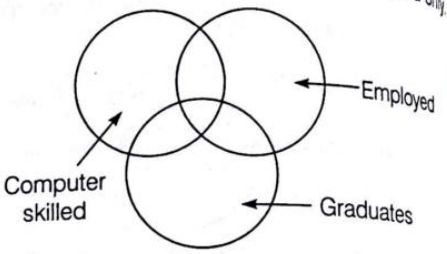
All diamond rings are rings and all rings are ornaments.

18. (b)



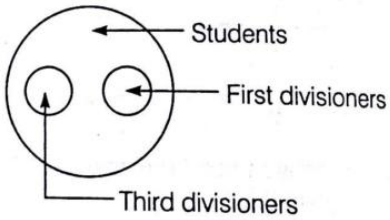
Note Wives means woman and married only.

19. (d)



Some graduates are employed and have computer skills. And some employed are graduates and have computer skills.

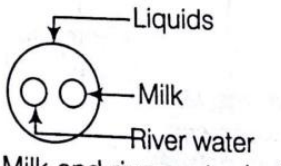
20. (e)



Some students are first divisioners and some are third divisioners.

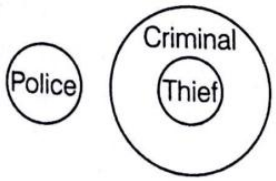
21. (a) Dogs are mammal but bats are different.

22. (a)



Milk and river water both are liquids.

23. (a)



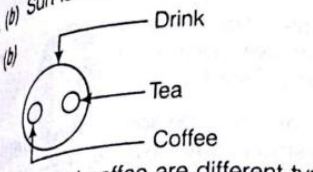
Thiefs are criminal but police is different.

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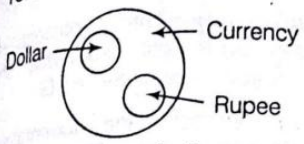
24. (b) Sun is outside and sea is inside of the Earth.

25. (b)



Tea and coffee are different types of drink.

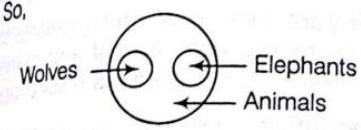
26. (b)



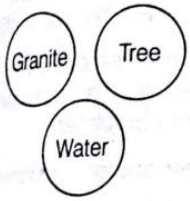
Dollar and rupee both are currency.

27. (a) Wolves and elephants both are animals but both are of different category.

So,

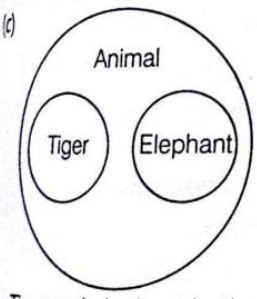


28. (b)



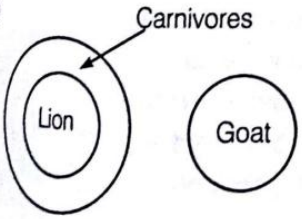
All are different entities.

29. (c)



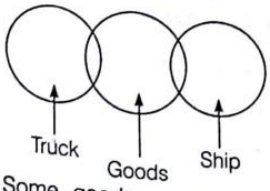
Tiger and elephant both are different but belong to animal class.

30. (d)



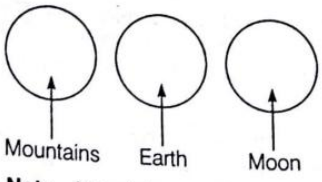
Lion is carnivores but goat is not.

31. (a)



Some goods are transported by ships and some are by truck.

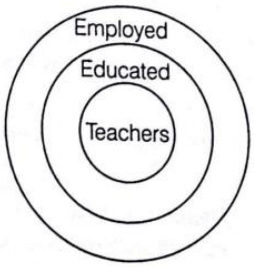
32. (e)



Note Mountains are there on moon also.

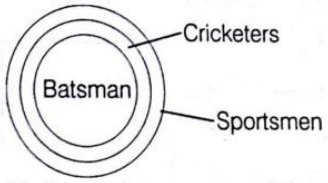
33. (c) Figure (c) represents the relationship among politicians, contractors and candles.

34. (c)



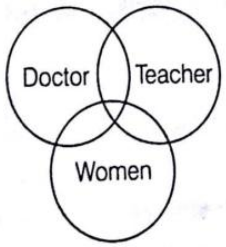
All the teachers are educated and employed

35. (c)



All the batsman are cricketers and all the cricketers are sportsmen.

36. (b)



Some women may be doctor and teacher both. And some doctors are women and teachers both.

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B. **Expert Level Exercise**

1. (*d*) Number 5 represents those poor boys who are helping in family business but are not educated or employed.

2. (*e*) That number should occupy the space which is common to the figures—circle, square and triangle only.

3. (*d*) That number should occupy the space common to circle, square and rectangle, 3 is that number which represents educated poor boys who help in family business.

4. (*e*) Number 12 lies on that portion of the circle, which is not common to any other figure.

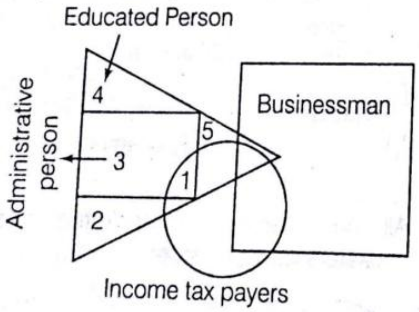
5. (*b*) That number should occupy the space which is common to triangle and rectangle only. 7 is that number which represents employed boys engaged in family business.

6. (*b*) That number should occupy the space common to circle, square and triangle. 3 is that number.

7. (*d*) That number should occupy the space which is common to square, triangle and rectangle. 9 is that number.

8. (*d*) Number 10 represents educated men having private jobs as well as government jobs.

Solutions (Q Nos. 9-10)



9. (*b*) From the figure, it is clear that ... administrative person are income tax ... and part 1 shows it.

10. (*d*) Some of the persons who are ... businessman nor Income tax payers ... educated person and parts 2,3, 4 and 5 show...

11. (*a*) The figure representing officers, who ... graduates and post graduates should ... covered by all three circle *i.e.*, G.

12. (*d*) Region T represents the students who st... both Physics and Chemistry but ... Mathematics.

13. (*a*) The area represents the unmarried po... officers who are not corrupt but poet is 8.

14. (*a*) We want a region which represents the pe... who are Intelligent, honest and truthful but ... hardworking. So, there are 6 such people.

15. (*c*) Region bd represents the persons who ... educated and employed but not confirmed.

16. (*d*) Region number 10 represents the people wh... neither a dancer nor a musician but ... professional and not European.

17. (*a*) 1 Teacher is neither author nor singer.

18. (*b*) U. represents the region, where persons hav... car, motorcycle, cycle but not autorickshaw.

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20 Eligibility Test

Eligibility test is a process of checking a candidates qualifications to fulfil the criteria for a job/promotion etc.

In the questions of this chapter, you are given a set of necessary qualifications required for certain vacancies in job/promotion/facility, along with the bio-data of few candidates who have applied for the same posts. You are required to match personal data of a person with the eligibility requirements of the job/promotion/facility.

Systematic analysis of facts and figures reduces the chances of inaccuracy and ensures speedy decision making. The idea behind inclusion of these questions in the competition is to test the candidate's ability to use data for decision making.

Following examples will illustrate the type of these questions, we may come across.

Directions (Illustrations 1-5) *Study the following information carefully and answer the questions given below.*

Following are some conditions for short-listing candidates for the interview for management trainees in an organisation.

The Candidate must

(i) not less than 21 yr and more than 28 yr as on 1st Nov, 2010.
(ii) have secured atleast 60% marks in graduation.
(iii) have secured atleast 65% marks in the preliminary selection examinations.
(iv) have secured atleast 55% marks in the final selection examinations.
(v) be ready to join work immediately after the interview.

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In case of a candidate, who fulfils all other criteria except

(a) at (iv) but has secured more than 72% marks in preliminary selection examination, his/her case is to be referred to Deputy General Manager.

(b) at (ii) but has secured atleast 65% marks in post-graduation, his/her is to be referred to General Manager.

In each of the questions given below. You have to study the information provided with reference to the conditions given above and decide whether the candidate is to be called for an interview or some other course of action is to be taken.

You are not to assume anything other than the information provided to you in each questions. All these cases are given to you as on 1st Nov, 2010.

Now, read the information provided in each question and decide the courses of actions with regard to each candidate.

Give answer

(a) if the candidate is to be called for an interview
(b) if the case is to be referred to General Manager
(c) if the candidate will not be called for an interview
(d) if the data provided are not sufficient to take a decision
(e) if the case is to be referred to Deputy General Manager

Illustration 1. Neelam Srivastava has secured 75% marks in the preliminary selection examination. She was 22 yr old as on 5th Dec, 2006. She has secured 65% and 60% marks in the final selection examination and in graduation, respectively. She is ready to join immediately after the interview.

Illustration 2. John D'costa has secured 54% marks in the final selection examination. He has secured 75% marks each in graduation and preliminary examination. He is ready to join work immediately after the interview. He was 22 yr old as on 4th Aug, 2007.

Illustration 3. Subhash Malhotra was 26 yr old as on 9th Sep, 2008. He has secured 75% marks each in graduation and preliminary selection examination. He is ready to join work immediately after the interview.

Illustration 4. Rahul Biswas was born on 21st Jan, 1983. He is ready to join work immediately after the interview. He has secured 70% marks in all the graduation, preliminary and final selection examination.

Illustration 5. Sudha Nagpal has secured 75% and 65% marks in the graduation and preliminary selection examination. She is ready to join immediately after the interview. She stood 3rd in the final selection examination. She was born on 2nd July, 1987.

Solutions (Illustrations 1-5) *All the informations can be summarised as given in the table*

Name	Conditions fulfilled						
	(i)	(ii)	B	(iii)	(iv)	B	(v)
Neelam	✓	✓	—	✓	✓		
John D'costa	✓	✓	—	✓	—	—	✓
Subhash	×	✓	—	✓	✓	✓	✓
Rahul	✓	✓	—	✓	✓	—	✓
Sudha	✓	✓	—	✓	×	—	✓

1. (a) Neelam Srivastava satisfies all the conditions. Therefore, she may be called for the interview.

2. (e) John D'costa satisfied all the conditions except (iv). So, his case is to be referred to the Deputy General Manager.

3. (c) Subhash Malhotra does not satisfy condition I. Hence, he should not be called for the interview.

4. (a) Rahul Biswas satisfies all the conditions. Hence, he should be called for the interview.

5. (d) Sudha Nagpal, final selection marks are not mentioned in the given question. So, data provided is not sufficient to take a decision.

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Let us Practice

Directions (Q. Nos. 1-5) *Study the following information carefully and answer the questions given below.* **[IBPS (Clerk) 2011]**

Following are the conditions for selecting Accounts Officer in an organisation.

The Candidate must

(i) be atleast 21 yr and not more than 26 yr as on 01.11.2011.

(ii) be a commerce graduate (B.Com) with atleast 55% aggregate marks.

(iii) have work experience of atleast 2 yr in the accounts department of an organisation.

(iv) have secured atleast 50% marks in the selection process.

In the case of a candidate who fulfils all the conditions except

(a) at (i) above but atleast 21 yr old and not more than 28 yr old and has work experience of 5 yr as Accounts Assistant in an organisation, his her case is to be referred in GM-Accounts.

(b) at (ii) above, but has secured atleast 50% aggregate marks in graduation and has secured atleast 55% marks in the selection process, his/her case is to the referred to VP-Accounts.

In each question below, details of one candidate are provided. You have to take one of the following courses of actions based on the conditions given above and the information provided in each question and mark the number of that course of action as your answer. You are not to assume anything other than the information provided in each question. All these case are given to you as on 01.11.2011.

Give answer

(a) if the case is to be referred to GM-Accounts
(b) if the case is to be referred to VP-Accounts
(c) if the candidate is to be selected
(d) if the candidate is not to be selected
(e) if the data provided are inadequate to take a decision

Now, read the information provided in each question and mark your asnwer accordingly.

1. Umesh Choksi was born on 25th November , 1989. He has secured 60% aggregate marks in B. Com. and 65% marks in the selection process. He has been working in the Accounts Department of an organisation for the past 3 yr.

2. Pratibha kale was born on 6th June, 1988. She has secured 60% aggregate marks in B.Com. and 49% marks in the selection process. She has been working in th Accounts Department of an organisation for the past 3 yr.

3. Arun Patil has secured 55% aggregate marks in graduation. He has been working for past 4 yr in the Accounts Department of an organisation. He has secured 50% marks in the selection process. He was born on 12th July, 1988.

4. Parbha Dixit was born on 18th April, 1985. She has been working as Accounts Assistant in an organisation for the past 5 yr. She has secured 60% aggregate marks in B.Com. and 55% marks in the selection process.

5. Amul Verma has secured 50% aggregate marks in B.Com. and 60% marks in the selection process. He has been working in the Accounts Department of an organisation for past 4 yr. He was born on 2nd January, 1987.

Directions (Q. Nos. 6-15) *Study the following information carefully to answer these questions.*

Following are the conditions stipulated by XYZ Co. for recrutment of Trainees Engineers.

The Candidate must

(i) be an engineering graduate with atleast 60% marks.

(ii) be not less than 21 yr and not more than 25 yr of age as on 01.05.2010.

(iii) have passed the selection test with atleast 55% marks.

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(iv) be willing to pay a deposit of ₹ 50000 to be refunded on completion of training.

However, if a candidate fulfils all the above mentioned criteria except

(a) at (i) but has appeared to the last semester examination and has obtained an aggregate of minimum 65% marks in first seven semesters his/her case may be referred to VP of the company.

(b) at (iv) but is willing to pay an amount atleast ₹ 25000 and has obtained atleast 70% marks in engineering degree; his case may be referred to the General Manager of the company.

In each of the following questions, details of a candidate are given as regards his/her candidature. You have to read the information provided and decide his/her status based on the conditions given above and the information provided. You are not to assume anything other than the information provided in each of the following questions. All these cases are given to you as on 01.05.2010.

Give answer

(a) if the candidate is to be selected
(b) if the case is to be referred to General Manager
(c) if the case is to be refered to the VP
(d) if the data provided is not adequate to take a decision
(e) if the candidate is not to be selected

6. Sachin who has just completed 23 yr age passed out degree in Civil Engineering with 70% marks. He has cleared the selection test with 61% marks. He is willing to pay the amount of ₹ 25000 only will not be able to pay ₹ 50000.

7. Anjali is an IT Engineer passed out in 2003 with 52% marks. After getting the engineering degree, she has done MBA with specialisation in finance. She has cleared the selection test with 60% marks. She can pay the deposit of ₹ 50000. Her date of birth is 15th Sep, 1986.

8. Mohan Rao is an Electronics Engineer and passed out in 2008 with 66% marks. He has passed the selection test with 59% marks and is willing to pay the required amount of deposit.

9. K. Shiv Kumar is a student of Mechanical Engineering and has appeared for the last semester examination. Results of the last semester examinations are expected in June 2010. He is expecting to score 65% marks in the last semester as his aggregate percentage of the first seven semesters is 67%. He has passed the selection test with 60% marks and has no problem in paying the amount of ₹ 50000 as deposit. He is 22 yr old at present.

10. Rajeev Andhare has appeared for the last semester of Engineering degree examination and is hoping to score atleast 70% marks. His aggregate score upto first seven semesters is 72%. He has just completed 21 yr of age. He has scored 63% marks in the selection test and is ready to pay an amount of ₹ 50000 as deposit.

11. Nachiket is an engineering graduate with 75% marks at degree level. His date of birth is 16.04.1986. He has obtained 66% marks in the selection test and is ready to pay 50% of the required amount of deposit at the time of selection and the remaining amount subsequently.

12. Nikita has passed out Chemical Engineering degree in June 2009 with 74% marks. She appeared for the selection test which she cleared with 72% marks. Her date of birth is 26.08.1987. She is not in a position to pay ₹ 50000 but will arrange to pay ₹ 30000 as deposit.

13. Vinod has passed Computer Engineering degree examination with 68% marks in 2009 at the age of 22 yr and is working with a private engineering firm since, last six months. He has cleared the selection test with 63% marks. He will manage to pay ₹ 50000 as deposit.

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14. Aniket has appeared for the last semester examination of Mechanical Engineering and the results are awaited. He secured first class in each of the first seven semesters. He has recently completed 22 yr of age. He has not problem in paying the required amount of ₹ 50000 as deposit. He has passed the selection test with 58% marks.

15. Shashank Joshi is an Electrical Engineer, passed out his degree exam in 2007 at the age of 21 yr. He obtained 66% marks at the degree examination and 56% marks in the selection test. He can pay the amount of ₹ 50000 as deposit.

Directions (Q. Nos. 16-25) *Study the following information carefully and answer the questions given below.* **[IDBI Bank (PO) 2011]**

Following are the conditions for selecting Manager Accounts in an organisation.

The candidate must

(i) be atleast 25 yr and not more than 35 yr as on 01.01.2010.

(ii) be a graduate in Commerce with atleast 55% marks.

(iii) be a post graduate in Commerce with atleast 60% marks.

(iv) have post qualification work experience of atleast 6 yr in the Accounts Department of an organisation.

(v) have secured atleast 45% marks in the personal interview.

In the case of a candidate who satisfies all the conditions except

(a) at (iii) above, but is a MBA-Finance with atleast 65% marks, the case is to be referred to GM-Accounts.

(b) at (iv) above, but is a CA/ICWA and has work experience of atleast 1 yr in an organisation, the case is to be referred to Executive Director.

In each question below, details of one candidate are provided. You have to take one of the following courses of actions based on the information provided and the conditions and subconditions and mark the number of that course of action as your answer. You are not to assume anything other than the information provided in each question. All these cases are given to you as on 01.01.2010.

Give answer

(a) if the case is to be referred to Executive Director
(b) if the case is to be referred to GM-Accounts
(c) if the data provided are not adequate to take a decision
(d) if the candidate is to be selected
(e) if the candidate is not to be selected

16. Prashant Mishra has secured 60% in B. Com. and 65% marks in M.Com. He has been working in the Accounts Department of an organisation for the past 7 yr after completing his M.Com. He has secured 50% marks in personal interview. His date of birth is 15.09.1984.

17. Samir Malhotra was born on 25th July 1982. He has been working in the Accounts Department of an organisation for the past 6 yr after obtaining his M.Com. degree with 58% marks. He has secured 70% marks in B.Com. and 60% marks in personal interview.

18. Sudha Agarwal was born on 5th January, 1978. She has been working in the Accounts Department of an organisation for the past 7 yr after obtaining her MBA in Finance with 70% marks. She has secured 68% marks in B.Com. and 52% marks in personal interview.

19. Arun Ramnathan has secured 62% marks in M.Com. and 58% marks in B.Com. He has been working in an organisation for the past 6 yr after completing his M.Com. He has secured 46% marks in the personal interview. His date of birth is 20th May, 1981.

20. Mohan Das was born on 8th February, 1980. He has been working for the past 2 yr in an organisation after completing his CA. He has secured 60% marks in both B.Com. and M.Com. He has secured 50% marks in personal interview.

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21. Atul Ghosh has secured 65% marks in B.Com. and 65% marks in M.Com. He has been working for the past 8 yr in the Accounts Department of an organisation after completing his M.Com. He was born on 12th march, 1981.

22. Seema Jaiswal was born on 19th January, 1978. She has secured 62% marks in both B.Com. and M.Com.

She has been working in the Accounts Department of an organisation for the past 6 yr after completing her M.Com. She has secured 48% marks in personal interview.

23. Navin Gosh has secured 68% marks in B.Com. and 57% marks in M.Com. He has been working in the Accounts Department of an organisation for the past 7 yr after completing his M.Com. He has secured 47% marks in the personal interview.

24. Kapil Sonawane was born on 4th November, 1976. He has been working for the past 1 yr in an organisation after completing his ICWA. He has secured 65% marks in both B.Com. and M.Com. He has secured 60% marks in personal interview.

25. Sonam Khanna was born on 28th December, 1979. She has secured 62% marks in M.Com. She has been working for the past 8 yr in the Accounts Department of an organisation after completing her MBA- Finance with 75% marks. She has secured 54% marks in B.Com. She has secured 60% marks in personal interview.

Directions (Q.Nos. 26-30) *Study the following information carefully and answer the questions given below.* **[IBPS (PO) 2012]**

Following are the conditions for selecting Manager-HR in an organisation.

The Candidate must

(ii) be atleast 30 yr and not more than 35 yr as on 01.03.2012.

(ii) have secured atleast 60% marks in graduation in any discipline.

(iii) have secured atleast 65% marks in the post-graduate degree/diploma in personnel Management/HR.

(iv) have post qualification work experience of atleast 5 yr in the Personnel/HR Department of an organisation.

(v) have secured atleast 50% marks in the selection process.

In the case of a candidate who satisfies all the above conditions except

(a) at (ii) above, but has secured atleast 55% marks in wegraduation in any discipline and atleast 70% marks in post-graduate degree/diploma in Personnel Management/ HR. The case is to be referred to GM-HR.

(b) at (iv) above, but has post qualification work experience of atleast 4 yr out of which atleast 2 yr as Deputy Manager-HR, the case is to be referred to President-HR.

In each question given below, are given details of one candidate. You have to take one of the following courses of actions based on the information provided and the conditions and subconditions given above and mark the number of that course of action as your answer.

You are not to assume anything other than the information provided in each question. All these cases are given to you as on 01.03.2012.

Give answer

(a) if the candidate is not to be selected

(b) if the data provided are not adequate to take a decision

(c) if the case is to be referred to President-HR

(d) if the case is to be referred to GM-HR

(e) if the candidate is to be selected

26. Rita Bhatt was born on July 25, 1978. She has secured 62% marks in graduation and 65% marks in post-graduate diploma in Management. She has been working for the past 6 yr in the personnel Department of an organisation after completing her post graduation. She has secured 55% marks in the selection process.

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27. Ashok pradhan was born on August 8, 1980. He has been working in the Personnel Department of an organisation for the past 4 yr after completing his post-graduate degree in Personnel Management with 67% marks. Out of his entire experience, he has been working for the past 2 yr as Deputy Manager-HR. He has secured 62% marks in graduation and 58% marks in the selection process.

28. Alok Verma was born on March 4, 1976. He has been working in the Personnel Department of an organisation for the past 6 yr after completing his post-graduate diploma in Personnel Management with 66% marks.

He has secured 57% marks in the selection process and 63% marks in graduation.

29. Swapan Ghosh has been working in the Personnel Department of an organisation for the past 5 yr after completing his post graduate degree in HR with 72% marks. He has secured 56% marks in graduation. He was born on May 12, 1977. He has secured 58% marks in the selection process.

30. Seema Behl has been working in the personnel Department of an organisation for the past 7 yr after completing her post-graduate diploma in Personnel Management with 70% marks. She was born on July 5, 1979. She has secured 65% marks in graduation and 50% marks in the selection process.

Answer *with* Explanations

1. (c) Umesh Choksi
   (i) Age (on 01.11.2011)-21 yr 11 months and 2 days
   (ii) Marks in graduation (B.Com.)-60%
   (iii) Experience in Account Department-3 yr
   (iv) Marks in selection process-65%
   So, Umesh Choksi is to be selected.

2. (d) Pratibha Kale
   (i) Age (on 01.11.2011)-23 yr 4 months and 25 days
   (ii) Marks in graduation (B.Com.)-60%
   (iii) Experience in Account Department-3 yr
   (iv) Marks in selection process-49%
   So, Pratibha Kale is not to be selected.

3. (c) Arun Patil
   (i) Age (on 01.11.2011)-23 yr 3 months and 19 days
   (ii) Marks in graduation (B.Com.)-55%
   (iii) Experience in Account Department-4 yr
   (iv) Marks in selection process-50%
   So, Arun Patil is to be selected.

4. (a) Prabha Dixit
   (i) Age (on 01.11.2011)-26 yr 6 months and 13 days
   (ii) Marks in graduation (B.Com.)-60%
   (iii) Experience in Account Department-5 yr
   (iv) Marks in Selection Process-55%
   So, the case is to be referred to GM-Accounts.

5. (b) Amul Verma
   (i) Age (on 01.11.2011)-24 yr 9 months and 29 days
   (ii) Marks in graduation (B.Com.)-50%
   (iii) Experience in Account Department-4 yr
   (iv) Marks in Selection Process-60%
   So, in case is to be referred to GM-Account.

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Solutions (Q. Nos. 6-15) *All the informations can be summarised as in the given table*

Name	Conditions fulfilled					
	(i)	A	(ii)	(iii)	(iv)	B
Sachin	✓	—	✓	✓	—	✓
Anjali	×	—	✓	✓	✓	—
Mohan Rao	✓	—	—	✓	✓	—
K. Shiv Kumar	×	✓	✓	✓	✓	—
Rajeev Andhare	×	✓	✓	✓	✓	—
Nachiket	✓	—	✓	✓	—	✓
Nikita	✓	—	✓	✓	×	✓
Vinod	✓	—	✓	✓	✓	—
Aniket	×	—	✓	✓	✓	—
Shashank Joshi	✓	—	✓	✓	✓	—

6. (*b*) His case will be referred to the General Manager of the company.

7. (*e*) Anjali fulfils all the criteria except (i). Hence, she is not to be selected.

8. (*d*) The data provided is not adequate to take a decision.

9. (*c*) His case may be referred to the VP of the company.

10. (*c*) According to condition A, his case may be referred to the VP of the company.

11. (*b*) According to B, her case is to be referred to the General Manager of the company.

12. (*b*) According to condition B, her case is to be referred to the General Manager of the company.

13. (*a*) Vinod fulfils all the criteria. Hence, he is to be selected.

14. (*d*) Data provided is not adequate to make a decision as percentage of marks are not specified.

15. (*a*) Shashank Joshi fulfils all the criteria. Hence, he is to be selected.

Solutions (Q. Nos. 16-25) *All the informations can be summarised as in the given table*

Name	I	II	III	IV	V	VI	VII
	Age 25-35 yr on 1-1-10	Graduate in Comm. 55 < %	PG Comm 60%	Work Exp 6 yr	Interview 45%	MBA-F in 65%	CA/ICWA+ 1 yr
Prashant Mishra	✓	✓	✓	✓	✓	—	—
Samir Malhotra	✓	✓	×	✓	✓	—	—
Sudha Agarwal	✓	✓	—	✓	✓	✓	—
Arun	✓	✓	✓	(?)	✓	—	—
Ramonathan	✓	✓	✓	(b)	✓	—	✓
Mohan Das	✓	✓	✓	(b)	—	—	—
Atul Ghosh	✓	✓	✓	✓	—	—	—
Seema Jiswal	✓	✓	×	✓	✓	—	—
Navin Ghosh	✓	✓	✓	(b)	✓	—	✓
Kapil Sonawane	✓	✓	✓	✓	✓	✓	—
Sonam Khanna	✓	(a)	✓	✓	✓	✓	—

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16. (d) **17.** (e) **18.** (b) **19.** (d) **20.** (a) **21.** (c) **22.** (d) **23.** (e) **24.** (a) **25.** (b)

Solutions (Q. Nos. 26-30)

Candidate	Condition						
	(i)	(ii)	(a)	iii	(iv)	(b)	v
Rita Bhatt	✓	✓	—	✓	✓	—	✓
Ashok Pradhan	✓	✓	—	✓	×	✓	✓
Alok Verma	×	✓	—	✓	✓	—	✓
Swapan Ghosh	✓	×	✓	✓	✓	—	✓
Seema Behl	✓	✓	✓	✓	✓	—	✓

26. (e) Rita Bhatt fulfils all the conditions.
Hence, she is to be selected.

27. (c) Ashok Pradhan does not satisfy the condition (iv) but he satisfies condition (b).
Hence, his case is to be referred to President-HR.

28. (a) Alok Verma does not satisfy condition (i).
Hence, he is not to be selected.

29. (d) Swapan Ghosh does not satisfy condition (ii) but he satisfies condition (a).
Hence, his case is to be referred to GM-HR.

30. (e) Seema Behl fulfils all the conditions.
Hence, she is to be selected.

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21

Syllogism

Syllogism is defined as the Science of thought expressed in the form of language.

It is an important chapter of logical reasoning and hence, a working knowledge of its rules is expected from a candidate. In this chapter, questions are based on some statements and their conclusions. We are not supposed to apply extra information except for the information given in statements, while drawing the conclusion.

Proposition

Proposition is a statement that asserts that either a part of or the whole of one set of objects. The set identified by the subject term in the sentence expressing that statement either is included in, or is excluded out from the subject.

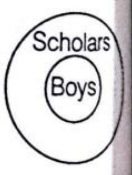
Classifications of Proposition

Proposition can be classified as

1. **Universal Affirmative Proposition** (A)

It distributes only the subject, opposite of universal affirmative proposition does not exist.

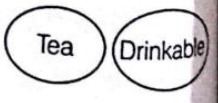
e.g., All boys are scholars.



Given example belongs to universal affirmative but its opposite, *i.e.*, all scholors are boys is not true.

2. **Universal Negative Proposition** (E)

It distributes both subject and predicate, *e.g.,* no tea is drinkable.



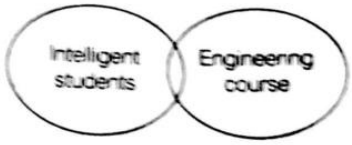
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Particular Affirmative Proposition (I)

It distributes neither the subject nor the predicate.

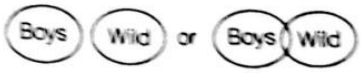
e.g., Some intelligent students are pursuing engineering course. opposite of this proposition is also possible. As some students who are pursuing engineering course are intelligent students.



Particular Negative Proposition (O)

It distributes only the predicate.

e.g., Some boys are not wild.



Special cases If two conclusions belong to any of the given combination (in table) they will be referred to as special case. In this case, the answer will be followed by either ..... or .....

Combination	Description
E + I	Universal negative + particular affirmative
I + O	Particular affirmative + Particular negative
A + E	Universal affirmative + Universal negative

Types of Questions

There are two types of questions which are generally asked in different competitions

Type 1 Two-Premise Arguments

This is the simplest type of problems on syllogism and we proceed, as discussed in the above cases, to arrive at logically valid conclusions.

Directions (Illustrations 1-3) *Two statements are given in each of the following questions, followed by two conclusions numbered I and II. You have to take the given two statements to be true even, if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two disregarding known facts.*

Give answer

a. if only Conclusion I follows
b. if only Conclusion II follows
c. if either Conclusion I or II follows
d. if neither I nor II follows
e. if both Conclusions I and II follow

Illustration 1. Statements

Some note books are books.

All books are papers.

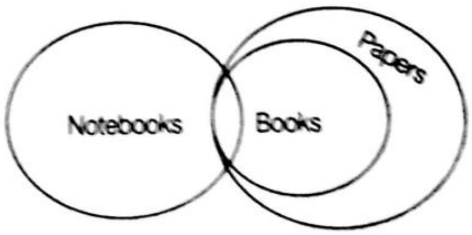
Conclusions

I. Some notebooks are papers.

II. No paper is notebook.

Solution (c) This is a special case (E+I) as a combination of universal negative and particular affirmative.

Alternatively



Hence, either some notebooks are papers or no paper is notebook.

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Illustration 2. Statements

All huts are mansions.

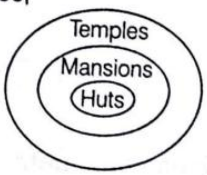
All mansions are temples.

Conclusions

I. Some temples are huts.

II. Some temples are mansions.

Solution (e) This shows the case of universal affirmative proposition. So,



Clearly, some temples are huts as well as some temples are mansions. So, both conclusions follow.

Illustration 3. Statements

All pens are pencils.

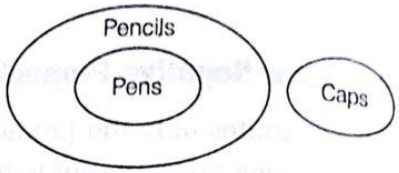
No pencil is cap.

Conclusions

I. All caps are pencils.

II. Some caps are pencils.

Solution (d)



Clearly, neither Conclusion I nor II follows.

Type 2 More than Two Premises Arguments

These types of questions are based on more than two statements and more than two conclusions.

Directions (Illustrations 4-5) *Three statements are given in each of the following questions, followed by three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements, disregarding commonly known facts.*

Illustration 4. Statements

Some eye drops are ear drops.

All eye drops are liquids.

Some liquids are drinkable.

Conclusions

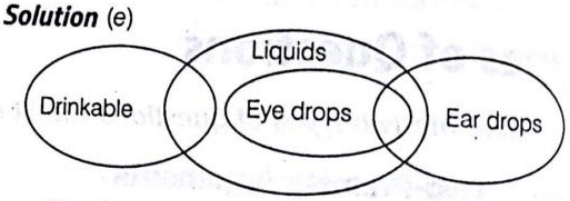
I. Some eye drops are drinkable.

II. Some ear drops are drinkable.

III. All liquids are eye drops.

(a) I and II follow
(b) II and III follow
(c) Only III follows
(d) All follow
(e) None follows

Solution (e)



Clearly, none of the given conclusions follows.

Illustration 5. Statements

Nail polish is a cosmetic.

No cosmetic is powder.

Some powders are medicine.

Conclusions

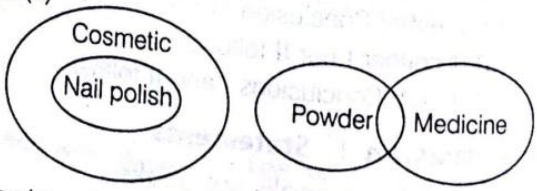
I. Some powders are cosmetics.

II. Some medicines are nail polishes.

III. Some cosmetics are nail polishes.

(a) Only I follows
(b) Only II follows
(c) Only III follows
(d) II and III follow
(e) None follows

Solution (c)



Clearly, only some cosmetics are nail polishes.

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Let us Practice

Base Level Exercise

Directions (Q. Nos. 1-4) *Two statements are given in each of the following questions, followed by two conclusions numbered I and II. You have to take the given two statements to be true even, if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements, disregarding the known facts.*

Give answer

a) if only Conclusion I follows
b) if only Conclusion II follows
c) if either Conclusion I or II follows
d) if neither Conclusion I nor II follows
e) if both Conclusions I and II follow

1. Statements

I. All fish are tortoise.
II. No tortoise is a crocodile.

Conclusions

I. No crocodile is a fish.
II. No fish is a crocodile.

2. Statements

I. All trucks fly.
II. Some scooters fly.

Conclusions

I. All trucks are scooters.
II. Some scooters do not fly.

3. Statements

I. All leaders are good team workers.
II. All good team workers are good orators.

Conclusions

I. Some good team workers are leaders.
II. All good orators are leaders.

4. Statements

I. Some papers are pens.
II. Angle is a paper.

Conclusion

I. Angle is not a pen.
II. Angle is a pen.

Directions (Q. Nos. 5-13) *Two statements are given in each of the following questions, followed by two Conclusions I and II. You have to take the two statements to be true even, if they seems to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusion logically follows the given two statement, disregarding the known facts.*

Give answer

(a) if only Conclusion I follows
(b) if only Conclusion II follows
(c) if both Conclusions I and II follow
(d) if none of the conclusion follows

5. Statements

I. Latha is a beautiful and intelligent girl.
II. She is very good. **[SSC (FCI) 2012]**

Conclusions

I. All beautiful girls are intelligent.
II. Beauty and intelligence are the essential factors of goodness.

6. Statements

I. All writers are lawyers.
II. All readers are lawyers. **[SSC (FCI) 2012]**

Conclusions

I. Some lawyers are readers.
II. Some readers are writers.

7. Statements

I. All players are doctors.
II. Some doctors are actors. **[SSC (Steno) 2012]**

Conclusions

I. Some doctors are players as well as actors.
II. All actors are doctors.

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8. Statements
I. All skaters are good swimmers.
II. All good swimmers are runners.
[SSC (CGL) 2012]

Conclusions
I. Some runners are skaters.
II. Some skaters are good swimmers.

9. Statements
I. Some buses are four wheelers.
II. All four wheelers are vans.
[SSC (10+2) 2012]

Conclusions
I. Some vans are buses.
II. Some buses are vans.

10. Statements
I. Some chairs are made up of wood.
II. Some tables are made up of wood.
[SSC (10+2) 2013]

Conclusions
I. All wooden things are either chairs of tables.
II. Some chairs are tables.

11. Statements
I. All crows are birds.
II. All peacocks are crows.
[SSC (Multitasking) 2014]

Conclusions
I. All peacocks are birds.
II. All birds are peacocks.

12. Statements
I. Some keys are locks, some locks are numbers.
II. All numbers are letters, all letters are words.
[SSC (CGL) 2013]

Conclusions
I. Some words are numbers.
II. Some locks are letters.

13. Statements
I. Some scales are pencils.
II. Some erasers are pencils.
[SSC (Multitasking) 2014]

Conclusions
I. Some pencils are erasers.
II. Some pencils are scales.

Directions (Q. Nos. 14-18) *In each of the questions below, two/three statements are given followed by conclusions/group of conclusions numbered I and II. You have to assume all the statements to be true even if they seem to be at variance from the commonly known facts and then decide which of the given two conclusions logically follows from the information given in the statements.*
[SBI (PO) 2013]

Give answer
(a) if only Conclusion I follows
(b) if only Conclusion II follows
(c) if either I or II follows
(d) if neither I nor II follows
(e) if both I and II follow

Statements (Q. Nos. 14-15)
Some squares are circles.
No circle is a triangle.
No line is a square.

14. Conclusions
I. All squares can never be triangles.
II. Some lines are circles.

15. Conclusions
I. No triangle is a square.
II. No lines is a circle.

Statements (Q. Nos. 16-17)
All Songs are poems.
All poems are rhymes.
No rhyme is a paragraph.

16. Conclusions
I. No song is a paragraph.
II. No poem is a paragraph.

17. Conclusions
I. All rhymes are poems.
II. All songs are rhymes.

18. Statements Some dews are drops.
All drops are stones.

Conclusion
I. Atleast some dews are stones.
II. Atleast some stones are drops.

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Expert Level Exercise

Directions (Q. Nos. 1- 6) *Two/three/four statements are given in each of the following questions, followed by three/four conclusions numbered I, II, III and IV. You have to take the given statements to be true even, if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.*

1. Statements Some towers are windows.
All windows are houses.
Some houses are temples.

Conclusions
I. Some towers are temples.
II. Some houses are towers.
III. Some temples are windows.
(a) Only I follows (b) Only II follows
(c) Only III follows (d) I and II follow
(e) None of these

2. Statements Some walls are doors.
Some doors are coats.
Some coats are chairs.

Conclusions
I. Some chairs are doors.
II. Some coats are walls.
III. No chair is door.
(a) Only II follows
(b) Only III follows
(c) Only either I or III follows
(d) Only I follows
(e) None of the above

3. Statements
All dogs are rats.
All rats are crows.
All crows are parrots.

Conclusions
I. All dogs are parrots.
II. Some parrots are dogs.
III. Some crows are dogs.
IV. All rats are dogs. **[SSC (DEO & LDC) 2011]**
(a) I and II follow
(b) I, II and III follow
(c) Either II or IV follows
(d) Either I or II or III follows

4. Statements All rings are fingers.
Some ears are fingers.
All ears are necklaces.

Conclusions
I. Some necklaces are fingers.
II. Some necklaces are rings.
(a) None follows
(b) Only I follows
(c) Only II follows
(d) Both I and II follow
(e) None of the above

5. Statements
I. Some years are decades.
II. All centuries are decades. **[SSC (CGL) 2013]**

Conclusions
I. Some centuries are years.
II. Some decades are years.
III. No century is a year.
(a) Conclusions I and II follow
(b) Conclusions I and III follow
(c) Either I or III and II follows
(d) Conclusion II follows

6. Statements
I. All philosophers are fools.
II. All fools are illiterate. **[SSC (CPO) 2013]**

Conclusions
I. All philosophers are illiterate.
II. All illiterates are philosopher.
III. All illiterates are fools.
IV. Some illiterates would be philosopher.
(a) Only IV follows
(b) I and IV follow
(c) Only II follows
(d) III and IV follow

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Directions (Q. Nos. 7 - 11) *In each question below are given two statements numbered I and II. You have to take the two given statements as true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follow from the given statements, disregarding commonly known facts.* **[CLAT 2013]**

7. I. All vegetables have gravy.
II. All lunch has vegetable.
(a) All lunch has gravy
(b) All gravy has lunch
(c) Both (a) and (b)
(d) None of the above

8. I. Karan Johar is a good director.
II. Directors are intelligent.
(a) All intelligent are directors
(b) Karan Johar is intelligent
(c) Both (a) and (b)
(d) None of the above

9. I. Some blues are green.
II. Pink is green.
(a) Some blue are pink
(b) Some green are pink
(c) Either (a) or (b) follows
(d) Some pinks are blues

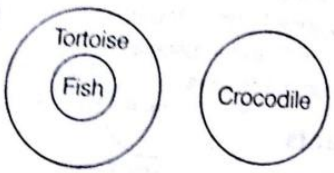
10. I. All boys are tall.
II. All Punjabi are tall.
(a) All boys are Punjabi
(b) Some boys are Punjabi
(c) Both of the above
(d) None of the above

11. I. All girls go to the college.
II. Rina does not go to the college.
(a) Rina is not a girl
(b) Going to college is not essential to be a girl
(c) Rina is a girl
(d) None of the above

Answer *with* Explanations

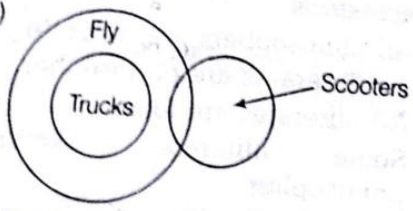
A. Base Level Exercise

1. (*a*)



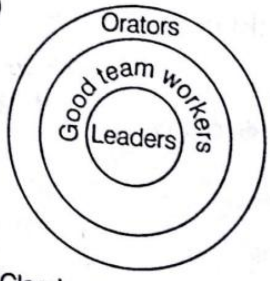
Clearly, no crocodile is fish and no fish is a crocodile.

2. (*b*)



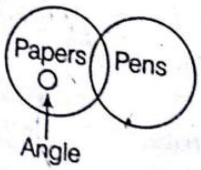
Clearly, some scooters do not fly.

3. (*a*)



Clearly, some good team workers are leaders.

4. (*c*)



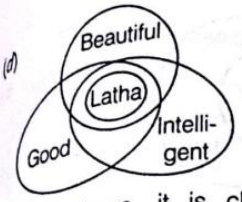
This is a special case. So, either Conclusion I or II follows.

5. (*d*)
6. (*a*)
7. (*d*)
8. (*c*)
9. (*c*)
10. (*d*)

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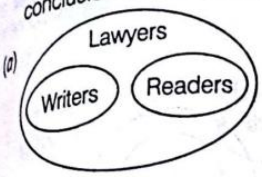
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5. (d)



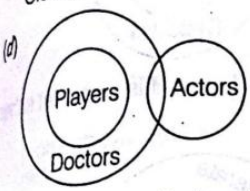
Form above, it is clear that none of the conclusion follows.

6. (a)



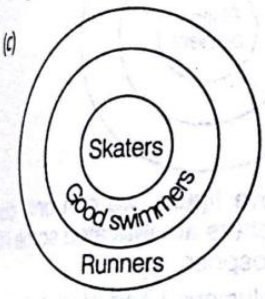
Clearly, some lawyers are readers

7. (d)



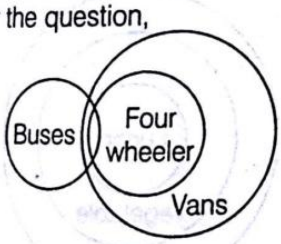
From above, it is clear that none of the conclusion follows.

8. (c)



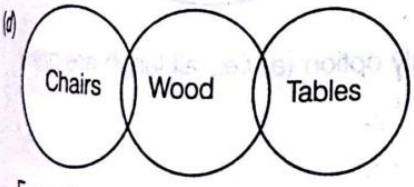
Hence, both Conclusions I and II follow.

9. (c) As per the question,



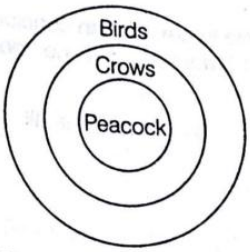
Hence, both Conclusions I and II follow.

10. (d)



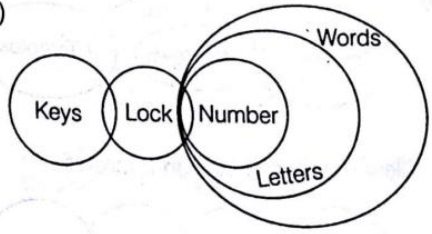
From the above figure we cannot conclude that all wooden things are either chairs or tables and some chairs are tables. So none follows.

11. (a)



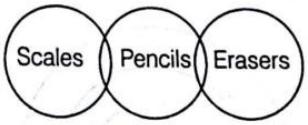
From the above figure, it is clear that all peacocks are birds but all birds are not crows. Thus, only Conclusion I follows.

12. (c)



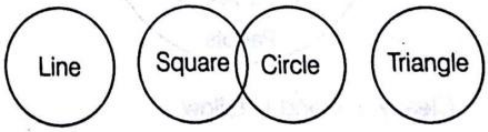
From the above diagram, Some words are numbers and some locks are letters.
So, Conclusions I and II follow.

13. (c)



From the above figure, some pencils are erasers and some pencils are scales.

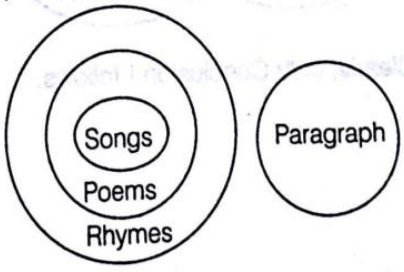
Solutions (Q. Nos. 14-15)



14. (a) From the figure we only can conclude that all squares can never be triangles.

15. (e) From the above figure, no triangle is a square and no line is a circles.

Solutions (Q. Nos. 16-17)



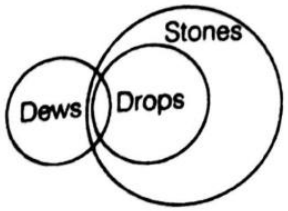
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16. (*e*) From the above figure, we can conclude that no song is a paragraph and no poem is a paragraph.

17. (*b*) All rhymes are not poem but all songs are rhymes.

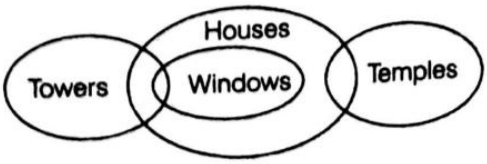
18. (*e*)



From the above figure, It is clear that atleast some dews are stones and at least some stones are drops.

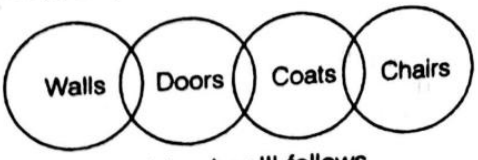
B. Expert Level Exercise

1. (*b*)



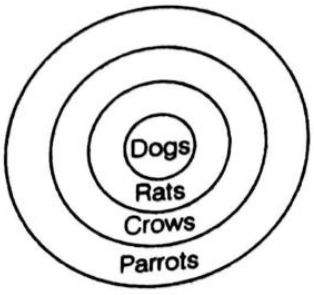
Clearly, only Conclusion II follows.

2. (*c*)



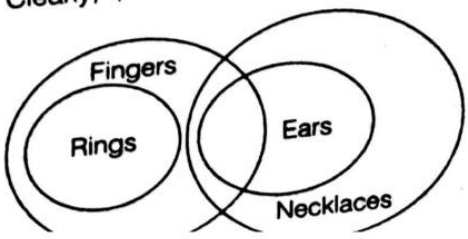
Clearly, only either I or III follows.

3. (*b*)

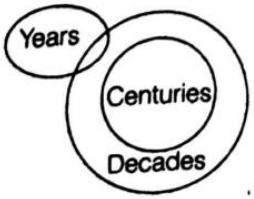


Clearly, I, II and III follow.

4. (*b*)



5. (*c*)



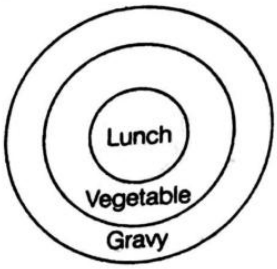
From the above figure, it is clear that either I or II and II follows.

6. (*b*)



From the above figure, we can only conclude that all philosphers are illiterated some illiterates would be philospher.
So, only Conclusions I and IV follow.

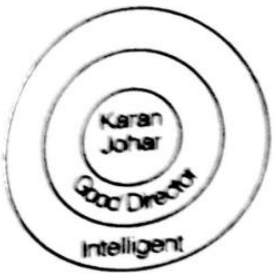
7. (*a*)



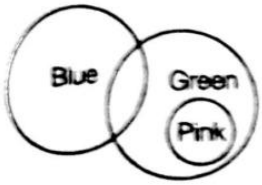
Only option (a) *i.e.*, all lunch are gravy.

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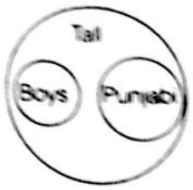


As, directors are intelligent and Karan Johar is good director, so Karan Johar is intelligent.



From above figure some green are definately pink.

10. (d)



From above figure we cannot conclude the relation of boys and Punjabi.

11. (d)



As, all girls go to college and Rina does not go to college. So, Rina is not a girl.

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22

Statement *and* Assumptions

Assumption is the hidden part of an argument which a person assumes before stating some fact or statement.

In many examinations, we come across questions where candidate is asked to identify an assumption. An assumption is 'something supposed or taken for granted.' In this type of questions, a statement is followed by two or more assumptions. The candidate is required to assess the given statement and decide, which of the given assumptions is implicit in the statement.

Types of Questions

There are mainly two types of questions which are generally asked in various competitive examinations

Type 1 One Statement and Two Assumptions

In this type of questions, a statement is given, followed by two assumptions. You are required to assess the given statement and then decide which of the given assumptions is implicit in the statement.

Directions (Illustrations 1-3) *One statement given each question mentioned below, followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.*

Give answer

(a) if only Assumption I is implicit
(b) if only Assumption II is implicit
(c) if either I or II is implicit
(d) if neither I nor II is implicit
(e) if both I and II are implicit

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Illustration 1. Statement Imprisonment for 27 yr made Nelson Mandela, the President.

Assumptions

I. Only who will be imprisoned for 27 yr will become the President.

II. To become the President, imprisonment is a qualification.

Solution (d) Nelson Mandela elected as the President on the appeal of people as he struggled for the freedom of Africa and he was dedicated to the nation. Here, statement does not clarify any of the assumptions.

Illustration 2. Statement The cotton crop continues to be poor even after the introduction of improved variety of cotton seeds.

Assumptions

I. The yield of cotton was expected to increase after introduction of improved variety of seeds.

II. The yield of cotton was inadequate before the introduction of new variety of seeds.

Solution (a) Improved variety of cotton seeds has been used in anticipation of good crop. So, Assumption I is implicit. As, Assumption I is implicit Assumption II cannot be implicit.

Illustration 3. Statement All existing inequalities can be reduced, if not completely eradicated, by action of governments or by revolutionary change of governments.

Assumptions

I. Inequality is a man-made phenomenon.

II. No person would voluntarily part with what he possessions.

Solution (a) It is clear that inequality can be reduced by man's actions. It must be a man-made phenomenon. But the eradication of inequality does not necessarily mean forcing anybody to part with what he possess.

Type 2 One Statement and More than Two Assumptions

This type of question also consists of similar type of questions as in type 1, with the difference that three assumptions are given and the candidate is required to choose that group which is implicit in context of the given statement.

Direction (Illustration 4) *A statement is given, followed by several assumptions. Read the statement carefully and decide which of the assumptions are implicit in the statement.*

Illustration 4. Statement "We do not want you to see our product in newspaper, visit our shop to get a full view."

—An advertisement

Assumptions

I. People generally decide to purchase any product after seeing the same in the advertisement.

II. Uncommon appeal may attract customers.

III. People may come to see the product.

(a) Both I and III are implicit
(b) Both I and II are implicit
(c) Both II and III are implicit
(d) All are implicit
(e) None is implicit

Solution (c) It can be inferred from the statement that people also like to see a product before buying. So, I is not implicit. Also, the statement is just an attempt to arouse the people to come and see the shop. So, both II and III are implicit.

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-20) *A statement is given in each of the following questions, followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.*

Give answer

(a) if only Assumption I is implicit
(b) if only Assumption II is implicit
(c) if either I or II is implicit
(d) if neither I nor II is implicit
(e) if both I and II are implicit

1. Statement "We need to appoint more teachers"—Principal informs the school staff.

Assumptions

I. Teachers are available.

II. Present teachers are not good.

2. Statement Those who are appearing for this examination for the first time, should be helped in filling up the forms."—An instruction to the invigilating staff.

Assumptions

I. The form is somewhat complicated.

II. Candidates can appear more than once for this examination.

3. Statement Be humble even after gaining victory.

Assumptions

I. Many people are humble after gaining victory.

II. Generally, people are not humble.

4. Statement It is dangerous to lean out of a moving train.

Assumptions

I. All those who lean out of a train take the risk of being hurt.

II. Generally, people don't like to get hurt.

5. Statement "Buy pure and natural honey of company X"—An advertisement in a newspaper says.

Assumptions

I. Artificial honey can be prepared.

II. People don't mind paying more for pure and natural honey.

6. Statement "Buy pure and natural honey of company X"—An advertisement in a newspaper says.

Assumptions

I. No other company supplies pure and natural honey.

II. People read advertisement.

7. Statement The target of a fiscal deficit of 5% of GDP could not be met because of major short fall in revenue collection.

Assumptions

I. Shortfall in revenue collection leads to an increase in fiscal deficit.

II. Shortfall in revenue collection leads to a decrease in fiscal deficit.

8. Statement The impact of economic sanctions on economy, that is already so weak, could be devastating.

Assumptions

I. Economic sanctions impact only a weak economy.

II. The impact of economic sanctions varies from economy to economy.

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9. Statement Rich people are more prone to have heart attacks. [SSC (10+2) 2012]

Assumptions

I. Most of the deaths among rich people are due to heart attacks.

II. Poor people do not have heart attacks.

10. Statement Postal rates have been increased to meet the deficit.

Assumptions

I. The present rates are very low.

II. If the rates are not increased, the deficit can not be met.

11. Statement If degrees are delinked from the jobs, boys will think thrice before joining college.

Assumptions

I. Students join college education for getting jobs.

II. A degree is of no use for getting a job.

12. Statement The next meeting of the board of the institute will be held after one year.

Assumptions

I. The institute will continue to function after one year.

II. The board will be dissolved after one year.

13. Statement A sentence in the letter to the candidates called for written examination— "You will have to bear your expenses on travel, etc."

Assumptions

I. If not clarified, all the candidates may claim reimbursement of expenses.

II. Many organisations reimburse expenses on travel to candidates called for written examination.

14. Statement "The function will start at 3 pm." You are requested to take your seats before 3 pm.

Assumptions

I. If an invitee is not on his seat before 3 pm, the function will not start.

II. Function will start as scheduled.

15. Statement A warning in a train compartment—"To stop the train pull the chain. Penalty for improper use is ₹ 500."

Assumptions

I. Some people misuse the chain.

II. On certain occassions, people may want to stop a moving train.

16. Statement The number of people living below poverty line urban areas has increased since last year. [UBI (PO) 2011]

Assumptions

I. People living in rural areas are not below the poverty line.

II. A similar survey was conducted last year.

17. Statement Travelling by trains rather than cabs is more convenient and economical in Paris.

Assumptions

I. Paris is an expensive city.

II. Train services are reasonably good in Paris.

18. Statement A government advertisement in public interest. For a child's better mental health, admit him/her to a school only after five years of age.

Assumptions

I. A child cannot learn before he / she turns five.

II. Some schools admit children, who are below the age of five years.

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19. **Statement** Although he has done MBA from a reputed institute he refuses to be in school as a person from college X

Assumptions

I. Students from college X are known for their sincerity.

II. Students should do MBA through correspondence if want to become rich.

20. **Statement** Corrective facility provided by organisation helps employees report to work on time.

Assumptions

I. The corrective facility which is provided by the organisation always reaches on time.

II. It is not possible to report to work on time unless corrective facility is provided by the organisation.

Directions In this question each of the question below a statement is followed by two assumptions numbered I and II. Consider the statement and the assumptions and decide which of the assumptions is implicit in the statement.

(PNB (MT) 2011)

Give answer

1) If only Assumption I is implicit
2) If only Assumption II is implicit
3) If only Assumption I is implicit
4) If either Assumption I or II is implicit
5) If both the Assumptions I and II are implicit

21. **Statement** An advertisement in the newspaper – Learn a foreign language course to get a high paying job'.

Assumptions

I. All those who learn foreign language get highly paid jobs.

II. Only a foreign language can get someone a high paying job.

22. **Statement** The school environment for students should be made "free from fear, trauma and anxiety" to make the right to education a grand national movement.

Assumptions

I. The Right to Education Movement is desirable for the betterment of society.

II. Children feel a lot of anxiety and stress at school.

23. **Statement** Give adequate job related training to the employees before assigning them full fledged work.

Assumptions

I. Training helps in boosting the performance of employees.

II. Employees have no skill sets before training is provided to them.

24. **Statement** Take a ferry or a boat instead of a bus to reach the Kravi Islands faster.

Assumptions

I. The islands being in remote location are not easily accessible.

II. Ferries and boats are available to travel to Kravi Islands.

25. **Statement** The government has decided to run all commercial vehicles on biofuels in order to save the depleting fossil fuel reserves.

Assumptions

I. It is possible to switch over from fossil fuel to biofuels for vehicles.

II. Sufficient amount of biofuel can be produced in the country to run all commercial vehicles.

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Expert Level Exercise

Directions (Q. Nos. 1-6) A statement is given for each of the question mentioned below, followed by three assumptions numbered I, II and III. An assumption is something supposed or taken or granted.

You have to consider the statement and the following assumptions and decide which of the assumption is implicit in the statement, then decide which of the answers (a), (b), (c), (d) and (e) is a correct answer and indicate it on your answer sheet.

1. **Statement** Training must be given to all the employees for increasing productivity and profitability.

Assumptions

I. Training is an essential component of productivity.

II. Employees cannot function effectively without proper training.

III. Profitability and productivity are supplimentary to each other.

(a) Only I is implicit
(b) Only II is implicit
(c) Only III is implicit
(d) Both I and II are implicit
(e) Both I and III are implicit

2. **Statement** The telephone company informed the subscribers through a publication that those who do not pay their bills by due date will be charged penalty for every defaulting day.

Assumptions

I. Majority of the people may pay their bills by the due date to avoid penalty.

II. The money collected as penalty may offset the losses due to delayed payment.

III. People generally pay, do not need to reminders. [RBI Grade 'B' 2006]

(a) Only I is implicit
(b) Both I and II are implicit
(c) Both II and III are implicit
(d) Only III is implicit
(e) None of the above

3. **Statement** "There is very heavy traffic on the road between 5 to 7 pm. We need to have flyover in this area."—A planning engineer said in a meeting.

Assumptions

I. Heavy traffic is sought to be maintained.

II. Previous planning engineers did not do much about heavy traffic.

III. A flyover is likely to solve the problem of heavy traffic

(a) Only II is implicit
(b) Only III is implicit
(c) Both I and II are implicit
(d) Both II and III are implicit
(e) Both I and III are implicit

4. **Statement** "Use Riya cold cream for fair complexion" An advertimement.

Assumptions

I. People like to use cream for fair complexion.

II. People are easily fooled.

III. People respond to advertisements. [NMAT 2005]

(a) Only I is implicit
(b) Both I and II are implicit
(c) Only II is implicit
(d) Both I and III are implicit
(e) None of the above

5. **Statement** "God! if my intentions have been pure and if my efforts sincere, I pray that, by your majestic grace, I emerge successful women!" A woman in a church.

Assumptions

I. God helps only who pray to him.

II. God helps only those whose intentions are pure.

III. Prayers do help people. [SSC (CGL) 2008]

(a) Both I and II are implicit
(b) Both II and III are implicit
(c) Only II is implicit
(d) Only III is implicit
(e) All are implicit

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6. Statement "If you desire to enjoy the best holiday to Europe, join our exclusive EURO package." An advertisement of a travel agency in an Indian newspaper.

Assumptions

I. Many Indians travel to European countries to spend their holidays.

II. There are other travel agencies in India which organise holiday tours to Europe.

III. Many people may still travel to Europe through other travel agencies.

[SSC (CPO) 2008]

(a) All are implicit
(b) Both I and II are implicit
(c) Only I is implicit
(d) Both I and III are implicit
(e) None is implicit

7. *Read the following information carefully and answer the given question.*

[SBI (PO) 2013]

'Pets are not allowed in the park premises' A notice put up the park entrance by the authority that is responsible for maintenance of the park.

Which of the following can be an assumption according to the given information? (an assumption is something that is supposed or taken for granted)

(a) Atleast some people who visit the park have pets.
(b) This is the only park which does not allow pets
(c) People who ignored this notice were fined
(d) There are more than one entrances to the park
(e) Many people have now stopped visiting the park

Answer *with* Explanations

A. Base Level Exercise

1. (a) It is clear from the statement that more teachers are needed, teachers are available but it is not clear that present teachers are good or not.

2. (e) It is given in statement that students appearing for this examination for the first time, should be helped. So, it is clear that candidates can re-apply for this exam. Students are helped as form is somewhat complicated. Hence, both Assumptions I and II are implicit.

3. (d) Statement is an advice. So, it is clear this advice is given, as many people are not humble after being Victorians. Also, it cannot be said that generally people are humble.

4. (a) Instruction in the statement is based on the assumption that those who lean out of a train are in the risk of being hurt. It is not inferred from the statement that people don't like to get hurt. Hence, only I is implicit.

5. (a) Assumption II does not follow the statement but Assumption I is implicit as it is assumed that artificial honey can be prepared.

6. (b) It is an advertisement, every company recommends itself but it cannot be said that no other company supplies the same.
So, clearly advertisements are given for reading.

7. (a) It is clear from the statement which is based on the assumption that short fall in revenue collection leads to an increase in fiscal deficit. So, only Assumption I is implicit.

8. (b) It is assumed in the light of statement that impact of economic sanctions varies from economy to economy. Only Assumption II is implicit.

9. (d) According to statement none of the assumption follows.

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10. (d) It is not clear from the statement that present rates are very low. Also, it cannot be said that increasing the rates is the only way to meet the deficit. Hence, neither I nor II is implicit.

11. (a) Getting a job is the aim of every student. Students join college education for getting jobs. Today a degree is the base for getting a job.

12. (a) As meeting will be held after one year it clarifies that institute will remain in operation after one year. If Assumption I is true so, Assumption II is not possible.

13. (e) Both the Assumptions I and II are implicit as some of instructions have been given in writing to prevent change of claim of reimbursement for travelling expenses. Also, expenses are paid by other organisations.

14. (b) Clearly, the function will start as per the scheduled. Hence, only Assumption II is implicit.

15. (e) Clearly, penalty will be imposed for improper use, so it is clear some people misuse the chain. Hence, both the Assumptions I and II are implicit.

16. (b) Assumption II follows, cause of people living in rural areas are not below the poverty line.

17. (b) Assumption, 'trains services are reasonably good in Paris. The only assumption according to statement.

18. (b) According to statement, the assumption, "some schools admit children who are below five years of age" is implicit.

19. (a) 'Student from college X are know for their smartness' which is exist in option 'a'.

20. (d) Assumptions I and II are not implicit.

21. (d) Both assumptions are not true as per the statement, so they are not implicit.

22. (e) Both assumptions are implicit.

23. (a) Only the Assumption I is implicit as training will help the employee to get more knowledge about the work and hence performance will enhance

24. (c) In statement, it is clearly stated that ferry or boat can save time to reach to the island.
So, statement II is implicit.

25. (e) Both statements are implicit as government decision of swathing fuel supports both the assumptions

Expert Level Exercise

1. (d) Training is related to the efficiency and effectiveness of an employee. Hence, both the Assumptions I and II are implicit.

2. (b) Assumptions I and II are implicit as penalty is a type of punishment. To avoid penalty people will start paying bill on time and money collected may offset the losses gained due to delayed payment.

3. (b) Assumption I is just opposite of truth.
II is not implicit by the engineer's statement no hint of previous planning is given.

4. (d) Assumption I is implicit, II is not implicit. As it is vague. III is implicit as advertisements are given with the hope that people would come into know the qualities of the product and buy it.

5. (d) The woman asks God to help her, if her intentions have been pure. But this does not imply that God would not have helped her if her intentions were not pure. Hence, only Assumption III is implicit.

6. (b) This advertisement is given as people travel to Europe There are other agencies also (clear from word 'our agency'). But III does not clarify that after this advertisement people may go to other agencies

7. (a) It is clear from the statement that some people who visit the park have pets.
So, statement given in option (a) is correct assumption.

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23

Statement *and* Conclusions

'Conclusion' means 'a fact that can truly be inferred from the contents of a given sentence or passage'. It requires a systematic approach to draw inference from the statement

A passage is given which is usually from a part of report or an economic essay or any other similar thought provoking subjects. The conclusions drawn may directly follow from the passage, can be inferred from the passage, can be inferred with the help of some key words.

If an action is being undertaken and if such an action is always taken with a particular type of motive, then such a motive must exist. The use of word 'only' makes the conclusion weak. We are required to analyse the given statements, understand their direct/indirect implications and then decide which of the given conclusion follows logically.

Types of Questions

There are two types of questions based on statement and conclusion which are generally asked in various competitive examinations.

Type 1 One Statement and Two Conclusions

In this type of questions, we have one statement and two conclusions. We have to analyse which of the conclusions support the statement.

Directions (Illustrations 1-5) *In each of the following questions, a statement is given followed by two conclusions numbered I and II.*

Give answer

(a) if only Conclusion I follows
(b) if only Conclusion II follows
(c) if either Conclusion I or II follows
(d) if neither Conclusion I nor II follows
(e) if both Conclusions I and II follow

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Illustration 1. Statement These apples are too expensive to be bad.

Conclusions

I. When apples are in short supply, the prices go up.

II. The higher the selling price, the superior is the quality of the commodity.

Solution (b) Clearly, 'Too expensive to be bad' means that it cannot be bad because it is expensive. But Conclusion I, short supply favours rising of price is irrelevant to the statement.

Illustration 2. Statement Cases of bride burning for dowry are not uncommon.

Conclusions

I. Inspite of anti-dowry laws, the ill practice continues.

II. The punishment inflicted on the party concerned is not sufficient.

Solution (a) These cases are not uncommon as inspite of anti-dowry laws, the ill practice continues.

Illustration 3. Statement This world is neither good nor bad. Every one makes his world in his way.

Conclusions

I. Some people like this world very much.

II. Some people hate this world very much.

Solution (e) According to statement, both the conclusions are true as everyone makes his world in his own way.

Illustration 4. Statement Only good men die on time.

Conclusions

I. No good people live till being old.

II. Every person who live till being old is bad.

Solution (d) Both conclusions have the same meaning. Means bad person live till they are old. But according to statement, only good men die in time *viz.* they live being old. Hence, neither I nor II follows.

Type 2 One Statement and Three/Four Conclusions

In this type of questions, we deal with questions, which have one statement and three/four conclusions. We have to analyse which of the conclusions supports the statement.

Illustration 5. Statement All the students in my class are bright. Manish is not bright.

Conclusions

I. Some students are not bright.

II. Manish must work hard.

III. Non-bright ones are not students.

IV. Manish is not a student of my class.

Solution (d) As Manish is not bright. So, it is clear that he does not belong to my class. As, all bright students belong to my class.

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Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-4) *In each of the following questions, a statement is followed by two Conclusions I and II.*

Give answer

(a) if only Conclusion I follows
(b) if only Conclusion II follows
(c) if either Conclusion I or II follows
(d) if neither Conclusion I nor II follows
(e) if both Conclusions I and II follow

1. Statement Smoking is one of the human weaknesses, which tends to test the willpower of the smoker to the edge.

Conclusions

I. It is very difficult for the smokers to give up smoking even if they want to.
II. Human beings have other weaknesses as well.

2. Statement All the TV sets manufactured in India, 'Solar' brand has the largest sale. [SSC (FCI) 2012]

Conclusions

I. Volume of sales of all brands of TV sets manufactured is known.
II. The production of no other TV set is as large as that of 'Solar'.

3. Statement No country is absolutely self dependent these days.

Conclusions

I. It is impossible to grow and produce all that a country needs.
II. Country's men in general have become lazy.

4. Statement The nation X faced the increased international opposition due to its decision to go on with eight nuclear explosions.

Conclusions

I. The citizens of the nation have favoured the decision.
II. Some powerful nations don't want others to become powerful.

Directions (Q. Nos. 5-15) *The questions given below have a statement followed by two conclusions I and II. Consider the statement and the following conclusions. Decide which of the conclusions follows from the statement.*

Give answer

(a) if Conclusion I follows
(b) if Conclusion II follows
(c) if neither Conclusion I nor II follows
(d) if both Conclusions I and II follow

5. Statement

According to a recent report, a glass of wine daily for women with breast cancer could boost the success rate of treatment. [MAT 2012]

Conclusions

I. Women taking a glass of wine daily will never suffer from breast cancer.
II. A glass of wine will cure the women suffering from breast cancer.

6. Statement

National integration is necessary because there are diversities in India. [MAT 2012]

Conclusions

I. India is a country of people with diverse cultures, different languages and different social and economic setups.
II. Ours is a disintegrated nation.

7. Statement

A Brahmin priest is expected to be able to recite atleast one of the Vedas. [MAT 2012]

Conclusions

I. Any person who can recite the Vedas is a Brahmin.
II. Reciting the Vedas is a Brahmin's obligation.

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8. **Statement** Sick people need medicine. [SSC (CGL) 2013]

Conclusions

I. Healthy people do not need medicine.

II. People keep medicine in their home.

9. **Statement** The best way to escape from a problem is to solve it. [MAT 2013]

Conclusions

I. Your life will be dull, if you don't face a problem.

II. To escape from problems, you should always have some solutions with you.

10. **Statement** India's economy is dependent mainly on forests. [MAT 2013]

Conclusions

I. Trees should be preserved to improve the Indian economy.

II. India wants only maintenance of forests to improve economic conditions.

11. **Statement** This world is neither good nor evil, each man manufactures a world for himself. [MAT 2013]

Conclusions

I. Some people find this world quite good.

II. Some people find this world quite bad.

12. **Statement** Company X has a record in making cameras with quality and modernisation to ensure that you do not lose even a single shot despite bad weather.

Conclusions

I. No other company has any recognition in camera industry.

II. Any common man can take good photographs using camera X.

13. **Statement** I know nothing except the fact of my ignorance... [MAT 2013]

Conclusions

I. Writer 's knowledge is very poor.

II. The world of knowledge is too vast to be explored by a single person.

14. **Statement** Quality has a price tag. India is allocating lots of funds to education. [MAT 2013]

Conclusions

I. Quality of education in India would improve soon.

II. Funding alone can enhance quality of education.

15. **Statements** The increasing population of our nation will lead to depletion of many essential resources. [SSC (CPO) 2013]

Conclusions

I. Population of our nation can be controlled.

II. The nation will not be able to provide a decent living to its citizens.

Directions (Q. Nos. 16-30) *In each of the following questions, a statement is given followed by two conclusions numbered I and II.* [CAT 2011]

Give answer

(a) if only Conclusion I follows
(b) if only Conclusion II follows
(c) if either Conclusion I or II follows
(d) If neither Conclusion I nor II follows
(e) if both Conclusions I and II follow

16. **Statement** The Government will review the present policy of the diesel price in view of further spurt in the international oil prices.

Conclusions

I. The Government will increase the price of the diesel after the imminent spurt in the international oil prices.

II. The Government will not increase the price of diesel to maintain the proper balance between expenditure and growth rate.

17. **Statement** The Prime Minister emphatically stated that this government will make every possible effort for the upliftment of poor farmers and farmhands.

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Conclusions

I. Except poor farmers and farmhands, all others have got benefits of fruits of development.

II. No serious efforts have been made in the past for upliftment of farmers.

18. Statement People, who speak too much against corruption are those who had taken it themselves.

Conclusions

I. It is easier for those to speak who have done it.

II. People have double standards.

19. Statement Parents are prepared to pay any price for an elite education to their children. [MAT 2013]

Conclusions

I. All parents these days are very well off.

II. Parents have an obsessive passion for a perfect development of their children through good schooling.

20. Statement Interview panel may select a student who is neither possessing the abilities of desired level nor any value and assumptions.

Conclusions

I. Inclusion of experts in interview panel does not ensure that the selection will be made properly.

II. Interview procedure for admission has some limitations.

21. Statement He emphasised the need to replace the present training programme by other methods which will bring out the real merit of the managers.

Conclusions

I. It is important to bring out the real merit of the managers.

II. The present training programme does not bring out the real merit of the managers.

22. Statement The greatest need in India today is not for sophisticated gadgets but for programmes which will provide employment to a large number of people.

Conclusions

I. There is an adequate number of sophisticated gadgets in India.

II. Emphasis is being laid on procuring sophisticated gadgets.

23. Statement Company X has marked its product; "Go ahead and purchase it, if price and quality are your considerations."

Conclusions

I. The product must be good in quality.

II. The price of the product must be reasonable.

24. Statement In case of the outstanding candidates, the condition of previous experience of social work may be waived by the Admission Committee for MA (social work).

Conclusions

I. Some of the students for MA (social work) will have previous experience of social work.

II. Some of the students for MA (social work) will not have previous experience of social work.

25. Statement It is almost impossible to survive and prosper in this world without sacrificing Ethics and Morality.

Conclusions

I. World appreciates some concepts but may not uphold it.

II. Concept of Ethics and Morality are not practicable in life.

26. Statement Any student, who does not behave properly while in the school, brings bad name to himself and also to the school.

Conclusions

I. Such students should be removed from the school.

II. He should be rectified during his stay in the school.

27. Statement While presenting a stage show recently, the famous actor declared that he has a practice of either taking full payment or none for his stage shows.

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32. Statements

I Education is a process of lighting.

II Mind requires light to enlighten the core of cognitive aspect. [SSC (10 + 2) 2013]

Conclusions

I Education is a light which removes the darkness of mind.

II Education is a static process for mind.

a) Only Conclusion I follows

b) Only Conclusion II follows

c) Both Conclusions I and II follow

d) Neither Conclusion I nor II follows

33. Statements

I For protection of Indian museums Central Government is responsible.

II Victoria Memorial Hall is national property. [SSC (10 + 2) 2013]

Conclusions

I Indian museum is national property.

II Historical property of nation is protected by the Central Government.

a) Only Conclusion I follows

b) Only Conclusion II follows

c) Both Conclusions I and II follow

d) None of the conclusions follows

34. Statements

I Leaders are human beings.

II All human beings need rest.

Conclusions

I All human beings are not leaders.

II Leaders need rest.

a) Both Conclusions I and II follow

b) Neither Conclusion I nor II follows

c) Only Conclusion I follows

d) Only Conclusion II follows

35. Statements

I The constitution assures the fundamental rights.

II Parliament has right to amend the constitution. [SSC (10 + 2) 2013]

Conclusions

I Parliament included fundamental rights in the constitution.

II Parliament did not assure the fundamental rights.

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(a) Only Conclusion I follows
(b) Only Conclusion II follows
(c) Both Conclusions I and II follow
(d) None of the above

36. Which of the conclusions can be drawn from the given statements? [SSC (CGL) 2013]

B. Expert Level Exercise

Directions (Q. Nos. 1-3) *Each question given below consists of a statements, followed by three or four conclusions numbered (a), (b), (c) and (d). You have to decide which of the conclusions is/are true from the given statements. Read the statement and answer the correct conclusion below.*

1. Statement All guilty politicians were arrested. Kishan and Chander were among those arrested.

Conclusions
(a) All politicians are guilty
(b) All arrested people are politicians
(c) Kishan and Chander were not politicians
(d) Kishan and Chander were guilty

2. Statement Many business offices located in building having two to eight floors. If a building has more than three floors, it has a lift.

Conclusions
(a) All floors may be reached by lifts
(b) Only floors above the third floors have lifts
(c) Seventh floor have no lifts
(d) Second floor have lifts

3. Statement Ministers arrived at the public functions in their cars.

Conclusions
(a) All ministers are rich
(b) Ministers have cars
(c) Ministers come to the public functions
(d) Both (b) and (c) follow as minister have cars and come to public functions

4. Consider the following statements
I. All machines consume energy.
II. Electricity provides energy.
III. Electricity operated machines are cheap to maintain.

Statements All the students in my class are intelligent. Kaushik is not intelligent.
(a) Some students are not intelligent
(b) Non-intelligent are not students
(c) Kaushik is not a student of my class
(d) All other than Kaushik are intelligent

4. Electrically operated machines do not cause pollution. [CSAT 2013]

Which one of the following inferences can be drawn from the above statements?
(a) All machines are run by electric energy
(b) There is no form of energy other than electricity
(c) Most machines are operated on electric energy
(d) Electrically operated machine are preferable to use

5. Examine the following statement
I. None but the rich can afford air-travel.
II. Some of those who travel by air become sick.
III. Some of those who become sick require treatment. [CSAT 2013]

Which one of the following conclusions can be drawn from the above statements?
(a) All the rich persons travel by air
(b) Those who travel by air become sick
(c) All the rich persons become sick
(d) All those who travel by air are rich

6. Consider the following three statements
I. Only students can participate in the race.
II. Some participants in the race are girls.
III. All girl participants in the race are invited for coaching. [CSAT 2013]
(a) All participants
(a) in the race are invited forcoaching
(b) All students are invited for coaching
(c) All participants in the race are students
(d) None of the above

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Direction (Q. No. 7) *Read the given statment and choose the answer from given options.*

Statement: All scientists working in America are talented, some are Indian.

Conclusions

I. None of the Indian scientists is talented.

II. Some talented Indian scientists have migrated.

III. All talented scientists are in America.

IV. Some Indian scientists are talented.

[SSC (10 + 2) 2012]

(a) Only Conclusion I follows
(b) Only Conclusion II follows
(c) Only Conclusion III follows
(d) Conclusions II and IV follow

Answer *with* Explanations

Base Level Exercise

1. (b) Clearly, people have many weaknesses, smoking is one of them. But it is not true that if a person desires to give up smoking he is not able to do it. Hence, only II is true.

2. (a) 'Of all the TV sets manufactured in India, 'Solar' brand has the largest sale', it can be said only when volume of sales of all brands of TV sets manufactured is known. Thus, Conclusion I follows. Nothing can be said about Conclusion II as we don't have any information about the production of different brands of TV.

3. (a) The second conclusion is an irrational inference. But first conclusion is correct as it is impossible for a country to grow and produce all that it needs.

4. (b) Increase in the international opposition is due to the fact that some powerful nations don't want others to become powerful.

5. (b) From the statement, we can clearly say that 'A glass of wine will cure the woman suffering from breast cancer'.

6. (a) From the statement, we clearly say that 'India is country of people with diverse cultures, different languages and different social and economic setups'.

7. (c) Neither Conclusion I nor II follows.

8. (c) As per Conclusion I, healthy people don't need medicine is right but even, then people keep medicine in their home is also right.
Hence, both Conclusions I and II follow.

9. (b) The conclusion that follows the statement is Conclusion II because the only way escape the problem is to face it.

10. (a) Only Conclusion I follows.

11. (d) Both conclusions follow as it is human thinking manufactures a world for himself.

12. (d) Clearly, companies other than 'X' may also have recognition in camera industry. So, Conclusion I does not follows. Also Conclusion II does not follows as according to statement, the quality of camera, not of the cameraman. Hence, neither Conclusion I nor II follows.

13. (b) Here, only Conclusion II follows because this statement is a quote given by the Greek philosopher Socrates which implies that knowledge of word is too vast to be explored by a single person.

14. (a) Only Conclusion I follows because funding can improve quality of education along with other factors but funding alone cannot guarantee the enhancement of quality of education.

15. (b) Only conclusion II follows because the nation will not be able to provide a decent living to its citizens cause of the increasing population of our nation.

16. (a) Only Conclusion II is wrong which isn't related to statement.

17. (d) Given, both conclusions are not related to the statement, which gives the right conclusions.

18. (e) Conclusions I and II both are follow because both are related to the statement given.

19. (b) Only conclusion, 'Parents have an obsessive passion for a perfect development of their children thought good schooling.

20. (e) Both the conclusions follow the statement as both correctly explain the given statement.

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21. (a) Only Conclusion I follows as the person who emphasised the need to replace the present training programme by other method, to bring out the real merit of the managers.

22. (d) The statement says that greatest need in India is not for sophisticated gadgets but for programmes but this does not mean that there is an adequate number of sophisticated gadgets. Secondly, there is a need for programmes but it cannot be concluded that emphasis is being laid on procuring sophisticated gadgets. Hence, none of the conclusion follows.

23. (e) It is clear from the statement that a product of company 'X' has good quality and is also available at a reasonable price. Hence, both the conclusions follow.

24. (e) Both the conclusions follow. The waiver is incorporated because some of the students for MA will have previous experience and some of the students will not have previous experience of social work.

25. (e) Conclusions I and II convey almost the same meaning that principles related to Ethics and Morality seem to be good but are not practicable in real life. Hence, both the conclusions follow.

26. (d) Conclusion I does not follow because removal of an indisciplined student does not provide a reasonable solution to the problem. Conclusion II is not related to the statement. Hence, both the conclusions do not follow.

27. (c) As given in the condition in the statement, the actor either will take the full payment for his recent show or will not take any money for the same. Hence, either of the conclusions follows.

B. Expert Level Exercise

1. (d) As Kishan and Chander were arrested amongst them. So, they must be guilty politicians.

2. (b) Since above third floor, the building will have lift. So, Conclusion (b) follows.

3. (d) Both (b) and (c) follow. As minister have cars and come to public functions.

4. (d) From Statement I and II, we can conclude that electricity is one of the mode for providing energy. So, options (a) and (b) are ruled out. Option (c) is not correct as numbers are not talked about. Statements III and IV, talk about two basic advantages of electrically operated machines. So, it can be inferred that electrically operated machines are preferable to use. So, option (d) is correct.

28. (e) Clearly, the statement declares that the dowry is an evil practice and reflects its demerits. Thus, Conclusion I follows. Also, it is given that those who take dowry, dishonour womanhood. This implies that those who do not take dowry respect womanhood. So, conclusion II follows.

29. (a) According to the statement, tenders are invited from contractors experienced in executing construction jobs. So, Conclusion I follows. The availability of competent tenderers in construction is not mentioned. So, Conclusion II does not follow.

30. (d) Safety lockers are the best place to preserve valuables, it doesn't mean that valuables can not be preserved at any other place. Thus, Conclusion I does not follow. Conclusion II is opposite to the statement.

31. (a) All the students in my class are intelligent and Sunil is not intelligent. So, Sunil is not a student of my class.

32. (d) Neither statement I nor II can be drawn from the stated facts.

33. (d) Neither conclusion I nor II follows.

34. (d) From the given statements,

"Leaders are human beings"

and "All human beings need rest"

"Leaders need rest" follows

35. (b) From the above two statements it is not clear that parliament can assure the fundamental right.

36. (c) All the students in my class are intelligent and Kaushik is not intelligent. It means, Kaushik is not a student of my class.

5. (d) Option (d) can be concluded from the Statement I, as only rich can afford air-travel. So, all those who travel by air are rich.

6. (c) From Statement I, it can be concluded that 'all participants in the race are students'. Since, it is given in statement III that 'all girls participants in the race are invited for coaching' so options (a) and (b) cannot be concluded. Hence, answer is (c)

7. (d) Only Statements II and IV follow. These conclusions are exist in the option 'd'.

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24

Statement *and* Arguments

Argument is a fact that is being given by a person to support a statement in its favour or against it.

In this types of questions, a statement concerned with a issue is given, followed by certain arguments in favour or against that statement. These issues may be political, social or economical. You have to find out how some premises help to reach a certain conclusion, some of these make strong arguments while some make weak arguments. Generally, both the arguments are contrary to each other and refer to the positive and negative results of the action as mentioned in the statement issue.

Arguments can be of two types

- **Strong Argument** touches the practical and real aspect of the situation as described in the statement.
- **Weak Argument** is very simple, superfluous, ambiguous and long drawn one. These are of minor importance and also may not be directly related to the question.

Important Points

Following points should be taken into consideration while choosing a strong argument

- A strong argument should give the realistic diagonosis of the situation described in the statement.
- A strong argument should give deep analysis of the topic dealing with the statement.
- A strong argument should relate with the statement and be supported up by facts or established nations.
- A strong argument should not be more reiteration of the situation given in the statement.

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numbered I and II. You have to decide which of the arguments is a 'strong' argument and which one is 'weak' argument.

Give answer

(a) if only Argument I is strong
(b) if only Argument II is strong
(c) if either I or II is strong
(d) if neither I nor II is strong
(e) if both I and II are strong

Illustration 1. Statement Should small states be formed out of bigger states in India?

Arguments

I. Yes, there will be greater administrative convenience.
II. No, it will jeopardise the national integration.

Solution (e) Clearly, if we form smaller states out of bigger one in India, there will be of greater administrative convenience. Hence, Argument I is strong. Also, it may hamper the national integration. So, Argument II is also strong. Hence, both arguments are strong.

Illustration 2. Statement Should there be only one entrance test for all the medical colleges– both government and private in India?

Arguments

I. No, each college has unique requirements and decisions on admissions should be left to the concerned colleges.
II. Yes, this will bring in uniformity in the standard of students at the time of admission and will reduce multiplicity.

Solution (b) Only Argument II is strong because a common entrance test will brought a uniformity in the standard of students, which is necessary.

Illustration 3. Statement Should computers be used in all possible sectors in India?

Arguments

...ency and accuracy in the work.
...human resources which are at present

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Let us Practice

Base Level Exercise

Directions (Q. Nos. 1-23) *Study the following instructions carefully and then answer the questions that follow.*

In making decisions about important questions, it is desirable that a candidate is able to distinguish between 'strong' and 'weak' arguments so far as they relate to the questions. 'Weak' arguments may not be directly related to the trivial aspect of the question. Each question below is followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument and which is a 'weak'.

Give answer

(a) if only Argument I is strong
(b) if only Argument II is strong
(c) if either I or II is strong
(d) if neither I nor II is strong
(e) if both I and II are strong

1. **Statement** Should there be only one rate of interest for term deposit of varying duration in banks?

Arguments

I. No, people will refrain from keeping money for longer duration resulting into reduction of liquidity of the banks.

II. Yes, this will be much simple for the common people and they may be encouraged to keep more money in banks.

2. **Statement** Should the oil companies be allowed to fix the price of petroleum products depending on market conditions?

Arguments

I. Yes, this is the only one way to make the oil companies commercially viable.

II. No, this will put additional burden on the retail prices of essential commodities and will cause a lot of hardships to the masses.

3. **Statement** Should non-vegetarian food be totally banned in our country?

Arguments

I. Yes, it is expensive and therefore, it is beyond the means of most people in our country.

II. No, nothing should be banned in a democratic country like ours.

4. **Statement** Should India become a permanent member of UN's Security Council?

Arguments

I. Yes, India has emerged as a country which loves peace and amity.

II. No, let us first solve problems of our own people like poverty and malnutrition.

5. **Statement** Should foreign films be banned in India?

Arguments

I. Yes, they depict an alien culture which adversely affects our values.

II. No, foreign films are of a high artistic standard.

6. **Statement** Should all practising doctors be brought under government control so that they get salary from the government and treat patients free of cost?

Arguments

I. No, how can any country do such an undemocratic thing?

II. Yes, despite many problems, it will certainly help to minimise, if not eradicate, unethical medical practices.

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7. Statement Are nuclear families better than joint families?

Arguments

I. No, joints families ensure greater security.

II. Yes, nuclear families ensure greater freedom.

8. Statement Should system of offering jobs only to the wards of government employees be introduced in all government offices in India?

Arguments

I. No, it denies opportunity to many deserving individuals and government may stand to loss in the long run.

II. No, it is against the principle of quality. Does government not owe its responsibility to all its citizens?

9. Statement Should the sex determination during pregnancy be completely banned?

Arguments

I. Yes, this leads to discriminate female foeticide and eventually will lead to social imbalance.

II. No, people have the right to know about their unborn child.

10. Statement Should the opinion polls predicting outcome of elections before the elections be banned in India?

Arguments

I. Yes, this may affects the voters mind and may affect the outcome.

II. No, such polls are conducted all over the world.

11. Statement Should the vehicles older than 15 yr be barred in metros in India?

Arguments

I. Yes, this is a significant step to lower the pollution level in metros.

II. No, it will be very difficult for vehicle owners to shift to other parts of the country.

12. Statement Should persons convicted of criminal offences in the past be allowed to contest elections in India?

Arguments

I. No, such persons cannot serve the cause of the people and country.

II. Yes, it is democracy—Let people decide whom to vote.

13. Statement Should government close down loss-making public sector enterprises?

Arguments

I. No, all employees will lose their jobs, security and earning, what would they do?

II. Yes, in a competitive world, the rule is 'survival of the fittest'.

14. Statement Should the prestigious people who has committed crime, unmovingly be met with special treatment?

Arguments

I. Yes, the prestigious people don't commit crime intentionally.

II. No, it is our policy that everybody is equal before the law.

15. Statement Should India have no millitary force at all?

Arguments

I. No, other countries in the world do not believe in non-violence.

II. Yes, many Indians believe in non-violence.

16. Statement Should all professional colleges in India be encouraged to run their own courses without affiliations to any university?

Arguments

I. Yes, it is the only way to create more opportunities for those who seek professional training.

II. No, this will dilute the quality of professional training as all such colleges may not be equipped to conduct such courses.

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Statement Should India support all the international policies of USA?

Arguments

I. No, many other powerful countries don't support the same.

II. Yes, this is the only way to gain USA development funds.

Statement Is death perfect cure to the physical sufferings?

Arguments

I. Yes, when nothing is left, how can there be any ailment.

II. No, deep physical suffering reach the spirit and must be continuing in same intensity after death.

Statement Are the fabulous prices demanded by the art dealers for the original paintings of old masters justified?

Arguments

I. Yes, those are unattainable antique pieces of art hence, the price for the collection of art is justified.

II. No, modern painters can paint as well, if not better than them and for much less price.

Statement Does synonym mean exactly the same?

Arguments

I. Yes, a rich language has many words for same expression.

II. No, each so called synonym is different from the other word and if used in its place, it changes the meaning slightly.

21. Statement Is murder better than committing suicide?

Arguments

I. Yes, getting those who are responsible for problems, out of way, is better than sacrificing.

II. No, taking somebody's life or one's own life can never be right and there is always a third course to be taken.

22. Statement Do Scientists believe in religion?

Arguments

I. Yes, because Science as a profession does not come in the way of faith.

II. No, because religion and Science don't go together.

23. Statement Should strikes in the field of education be banned?

Arguments

I. Yes, it is against professional ethics.

II. Yes, it affects the students adversely.

Expert Level Exercise

Direction (Q. Nos. 1-8) *In the following questions, a statement is given followed by three/four alternative arguments. Study the statement carefully and mark the appropriate alternative.*

1. Statement Should the government ban all forms of protests including strikes and processions? **[SSC (10 + 2) 2011]**

Arguments

I. Yes, this is the only way to teach discipline to the employees.

II. No, government cannot deprive its citizens of their basic rights.

III. Yes, this is the only way to maximise productivity without disruption of work.

(a) Only argument I is strong

(b) Only argument II is strong

(c) Only argument III is strong

(d) None is strong

2. Statement Should there be a complete ban on celebration of various' 'day' in colleges?

Arguments

I. No, there is nothing wrong in celebrating the days and enjoying once in a while.

II. Yes, children are giving more importance to such celebrations than the studies.

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III. No, this type of celebration gives opportunity for children to express their feelings.

(a) Arguments I and II are strong
(b) Arguments II and III are strong
(c) Only Argument III is strong
(d) Only Argument II is strong
(e) None of the above

3. Statement Should the Government impose restrictions on access to sensitive information to the journalists to avoid the media hype?

Arguments

I. Yes, the media creates hype and publishes distorted information at times.

II. No, journalists should have an access to all the information as media is the best source to expose the malfunctions in the society.

III. Yes, at times it leads to harassment of those who are affected and alleged to be involved in the crisis.

(a) All I, II and III are strong
(b) Arguments I and II are strong
(c) Arguments II and III are strong
(d) Only Argument II is strong
(e) None of the above

4. Statement Should the Government introduce a system of obtaining bond from students for working in India before sanctioning education loan for higher studies?

Arguments

I. No, this is not a workable solution and will obstruct the development of young talent in the country.

II. Yes, this is the only way to ensure use of the talent of our country for the development of the country and not only an individual.

III. No, this step will be too harsh.

(a) Only Argument I is strong
(b) Only Argument II is strong
(c) Arguments I and II are strong
(d) None is strong
(e) None of the above

5. Statement Is it necessary that education should be job oriented?

Arguments

I. Yes, the aim of education is to prepare persons for earning.

II. Yes, educated person should stand on his own feet after completion of education.

III. No, education should be for sake of knowledge only.

IV. No, one may take up agriculture where education is not necessary.

(a) Arguments I and II are strong
(b) Arguments III and IV are strong
(c) Argument I is strong
(d) Arguments I and III are strong

6. Statement Should people with educational qualification higher than the optimum requirements be debarred from seeking jobs?

Arguments

I. No, it will further aggravate the problem of educated unemployment.

II. Yes, it creates complexes among employees and affects the work adversely.

III. No, this goes against the basic rights of the individuals.

IV. Yes, this will increase productivity.

(a) Arguments I and III are strong
(b) All are strong
(c) Arguments II and IV are strong
(d) None of the above

7. Statement Should all the youngsters below 21 yr of age be disallowed from going to a beer bar?

Arguments

I. No, it is not correct to prevent matured youngsters above 18 yr of age who can vote, from having fun.

II. Yes, the entry fee to such pubs should also be hiked.

III. No, there is no such curb in Western countries.

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I. Yes, this will help in preventing youngsters from getting into bad company and imbibing bad habits.

a) Only Argument I is strong
b) Arguments I and II are strong
c) Arguments III and IV are strong
d) Arguments I and IV are strong
e) None is strong

7. Statement Should all the school teachers be debarred from giving private tuitions?

Arguments

I. No, the needy students will be deprived of the expertise of these teachers.

II. Yes, this is an injustice to the unemployed educated people who can earn their living by giving tuitions.

III. Yes, only then the quality of teaching in schools will improve.

IV. Yes, now salary of these teachers is reasonable.

a) Arguments I and III are strong
b) Arguments I, II and III are strong
c) Arguments III and IV are strong
d) Arguments II, III and IV are strong
e) None of the above

Direction (Q. No. 9) *Read the following information carefully and answer the given question.*

[SBI (PO) 2013]

The convenience of online shopping is what I like best about it. Where else can you shop even at mid night wearing your night suit ? You do not have to wait in a line or wait till the shop assistant is ready to help you with your purchases. It is a much better experience as compared to going to a retail store.

—A consumer's view

8. Which of the following can be a strong argument in favour of retail store owners?

a) Online shopping portals offer a great deal of discounts which retail stores offer only during the sale season
b) One can compare a variety of products online which cannot be done at retail stores
c) Many online shopping portals offer the cash on delivery feature which is for those who are sceptical about online payments
d) Many consumers prefer shopping at retail stores which are nearer to their houses
e) In online shopping the customer maybe deceived as he cannot touch the product he is paying for.

Direction (Q. No. 10) *Read the following information carefully and answer the given question.*

[SBI (PO) 2013]

Despite repeated announcements that mobile phones were not allowed in the examination hall, three students were caught with their mobile phones.

A. Mobile phones now a days have a lot of features and it is easy to cheat with their help.

B. The invigilator must immediately confiscate the mobile phones and ask the students to leave the exam hall immediately.

C. Mobile phones are very expensive and leaving them in bags outside the exam hall is not safe.

D. There have been incidents where students who left the exam hall early stole the mobile phones kept in the bags of the students who were writing the exam.

E. The school authorities must ask the students to leave their phones in the custody of the invigilator before the exam in order to avoid thefts of mobile phones.

F. None of the other students were carrying their phones in the exam hall.

10. Which of the following among A, B, C and D may be a strong argument in favour of the three students who were caught with the mobile phone?

(a) Only A
(b) Both A and B
(c) Both C and D
(d) Only C
(e) Both B and D

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Answer *with* Explanations

A. Base Level Exercise

1. (*a*) If we apply the proposed scheme, people will not deposit their money for a longer period and thus liquidity with the bank will fall drastically. So, only Argument I holds.

2. (*b*) We know that, oil is an essential commodity and its prices govern the prices of other essential commodities. Also, the common people must be taken care of. Hence, Argument II holds strong.

3. (*b*) Restrictions on the diet of people will deny them their basic human right. So, only Argument II holds.

4. (*a*) Clearly, India seeks to bring different nations on friendly terms with each other. Also, internal problems of a nation should not discourage it from strengthening international relations. Hence, only Argument I holds strong.

5. (*d*) Foreign films depict the alien culture but they also help in learning. Hence, both arguments are not strong.

6. (*b*) For personal gain, doctor can mislead the patient into wrong and unnecessary treatment. Also, a policy beneficial to common people cannot be 'undemocratic'. So, only Argument II holds.

7. (*e*) There is more security in joint family as there are other members to help. Also in nuclear families, there are lesser persons, so lesser responsibilities and more freedom. Hence, both arguments are strong.

8. (*e*) Merit, fair selection and equal opportunities for all, these three factors, if taken care of, can help government recruit competent officials and also fulfil the objective of the constitution. Hence, both the arguments hold strong.

9. (*a*) This determination is done as parents mostly want a boy child. Also, people who have a right to know, they should only know about the health, development and general well being of the child before its birth. Hence, Argument I holds.

10. (*a*) The opinion polls may influence the thinking of an individual and thus, divert his mind. Also, blindly imitating a policy followed by other countries holds no relevance. Hence, only Argument I holds.

11. (*a*) 15 yr old vehicles cause much pollution in comparison to recent ones. As owners of these vehicles need not shift themselves. Hence, only Argument I holds.

12. (*a*) Persons with criminal background cannot stand to serve as the representatives of the common people, so they should not allowed to contest elections. Hence, only Argument I holds strong.

13. (*a*) Closing down public sector enterprises will definitely throw the engaged persons out of employment. Hence, only Argument I holds strong.

14. (*b*) The constitution of India has laid down the doctrine of 'equality before the law'. Also, we cannot find the intentions of a person behind committing a crime. Hence, only Argument II holds strong.

15. (*a*) Clearly, all the countries in the world facing problem of terrorism. So, practically India should have military. Hence, Argument I holds.

16. (*d*) Word 'only' makes Argument I vague. Also, Argument II does not hold the statement.

17. (*d*) Word 'only' makes Argument II vague but Argument I the example of other countries. Hence, neither Argument I nor II holds.

18. (*d*) Neither Argument I nor II holds strong both have lack logic.

19. (*a*) Fabulous prices for old master pieces are demanded because of their originality and innovative hard effects.

20. (*a*) Synonyms do not have the exact meaning of the given word but it is nearest to the meaning of the word.

21. (*b*) One should not become himself a criminal by murdering others so as to wipe out person responsible for problem.

22. (*a*) Profession and religion are altogether different. Hence, only Argument I is strong.

23. (*e*) Strikes are against the professional ethics, also affects the students adversely.

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Expert Level Exercise

1. (b) Word 'only' makes Argument I and Argument III Vague. So, Argument II is strong.

2. (b) Arguments II and III hold strong because at times student pays more attention in celebrating these day which disturb their studies but these days are important also because they provide them with a stage to express their felling about various things and aspects in life.

3. (a) All the three arguments are strong because they are giving the correct information are given to journalists.

4. (a) As India is democratic country and every person has its right about where he wants to work and singing such bonds does not ensure the correct use of talent of a country. So, Argument I is strong but Argument II is weak also Argument. III is a vague and hence is weak argument.

5. (a) After reading the statement, Arguments I and II are strong.

6. (d) Only argument III holds strong because this goes against the basic rights as an individual can seek any Job if he class the eligibility criteria. Arguments I, II and IV are vague hence are weak argument.

7. (d) Argument I is strong as it states the genuine reason against the such ban. Also, Argument IV is a convincing reason as huge amount of such people which are engaged in bad activities go there, so it may pull them into such activities. Arguments II and III are weak as they any how does not support the cause.

8. (e) All four arguments are weak because either they are vague or they are less important for such casue.

9. (e) We know that, in online shopping the customer cannot touch the product he is paying for.

10. (c) The strong arguments are C and D. As, mobile phones are very expensive and leaving them in bags outside the exam hall is not safe. And there have been incidents where students who left the exam hall early stole the mobile phones kept in the bags of the students who were writing the exam.

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25 Statement *and* Course of Action

Course of action is the feasible step taken after an event has happened or is about to happen.

This test is a framed to test candidates's decision making ability. A person is required to 'Decide' a course of action at every step of his life. In this type of questions, a situation is presented and some courses of action are suggested in the context of that situation. Correct course of action should either reduce the problem or improve the situation which is created by that problem. Course of action should be feasible and should relate with the practical aspect of life.

Basic Point for a Correct Course of Action

To solve these questions, the candidates are advised to keep in mind the following important points

- Correct course of action should either lessen the problem or improve the situation created by the problem.
- Simple problem must have simple course of action and not a complete are which may create more problems than to solve or reduce it.
- Course of action should be feasible and should relate with the practical aspect of life.
- If any course of action is followed with word 'only' it makes action weak.

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Directions (Illustrations 1-2) *Illustrations given below has a statement followed by two courses of action Numbered* I *and* II. *You have to assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the suggested courses of action logically follows for pursuing.*

Give answer
(a) if only I follows
(b) if only II follows
(c) if either I or II follows
(d) if neither I nor II follows
(e) if both I and II follow

Illustration 1. Statement If the retired professors of some institutes are also invited to deliberate on restructuring of the organisation, their contribution may be beneficial to the institute.

Courses of Action

I. Management may seek opinion of the employees before calling retired professors.

II. Management should involve experienced people for the systematic restructuring of the organisation.

Solution (b) We know it very clearly that retired professors have lots of experience and can give valuable suggestions. Hence, management should involved such experienced people. Seeking permission from the employees is not the right course of action.

Illustration 2. Statement Incessant rain for the past several days has posed the problem of overflowing and flood as the river bed is full of silt and mud.

Courses of Action

I. The people should be made aware about the eminent danger over radio/ television.

II. The silt and mud from the river bed should be cleared immediately after receding of the water level.

Solution (e) Each of the courses will provide relief to the victims. Hence, both the given courses of action will favour the solution.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-14) *Each question given below has a statement followed by two courses of action Numbered* I *and* II. *A course of action is a step or administrative decision to be taken for improvement follow up or further action in regard to the problem, policy, etc on the basis of the information given in the statement. You have to assume everything in the statement to be true, then decide which of the two suggested courses of action logically follows for pursuing.*

Given answer
(a) if only I follows
(b) if only II follows
(c) if either I or II follows
(d) if neither I nor II follows
(e) if both I and II follow

1. Statement Four cases of pick pocketing were reported at one of the most renowned [illegible] morning

Courses of Action

I. The hotel staff should be instructed to be vigilant and report any suspicious person or activity.

II. More CCTV cameras should be installed near the dining and reception areas of the hotel where these incidents took place.

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2. Statement Local villagers have reported that instances of illegal cutting of trees have increased over the last few months in the forest area.

Courses of Action

I. The local should be encouraged to report any such activities in the future as well.

II. Authorities should immediately look into the matter and put a stop to such illegal activities.

3. Statement Most of the children in India are not able to get education, because they get employed to earn livelihood in their childhood only.

Courses of Action

I. Education should be made compulsory for all children upto the age of 14.

II. Employment of children below the age of 14 yr should be banned.

4. Statement Most of the development plans are on paper only.

Courses of Action

I. The incharges should be instructed to supervise the field work regularly.

II. The supply of paper to such department should be cut short.

5. Statement The sale of a particular product has gone down considerably, causing great concern to the company.

Courses of Action

I. The company should make a proper study of rival products in the market.

II. The price of the product should be reduced and the quality improved.

6. Statement Footpaths of a busy road are crowded with vendors selling cheap items.

Courses of Action

I. With the help of police they should be driven away from footpaths.

II. Some space should be provided to them where they can earn their livelihood without blocking footpaths.

7. Statement Despite several efforts AIDS appears to be spreading rapidly in India.

Courses of Action

I. An awareness drive should be launched to increase awareness about AIDS.

II. Sexual promiscuity should be discoura- ged.

8. Statement Nearly 26% of all engineering graduates have been left unemployed owing to severe recession world-wide.

Courses of Action

I. All the unemployed students should be advised to take up jobs in foreign countries.

II. The unemployed students should be advised to take up jobs only after the recession is over.

9. Statement Many private schools have been violating Government directives and have been charging more fees than the specified limits.

Courses of Action

I. The Government should identify such schools and take stringent actions against them.

II. The Government should not limit school fees and keep it flexible for the schools to decide.

10. Statement A large number of patients admitted in a particular hospital have been diagnosed with a serious contagious disease.

Courses of Action

I. These patients should be immediately evicted from the hospital for fear of spread of the disease.

II. The hospital should make appropriate quarantine arrangements to control the spread of disease.

11. Statement Courts take too long in deciding important disputes of various departments.

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Courses of Action

I. Courts should be ordered to speed up matters.

II. Special powers should be granted to officers to settle disputes concerning their department.

12. Statement The killer enteric fever has so far claimed 100 lives in some tribal villages of Madhya Pradesh during the past three weeks.

Courses of Action

I. The residents of these villages should immediately be shifted to a non-infected area.

II. The government should immediately send a medical squad to this area to restrict spread of the killer disease.

13. Statement Youngsters are often found staring at obscene posters.

Courses of Action

I. Children should be punished and penalised if they are found doing so.

II. Any display of such materials should be banned.

14. Statement There have been incessant rains in the North-Eastern parts of our country. Chances of heavy floods are not being ruled out.

Courses of Action

I. The army should be given a notice to be on the alert.

II. Precautionary measures should be taken.

B. Expert Level Exercise

Directions (Q. Nos. 1-6) *Each question given below has a statement followed by two courses of action numbered* I *and* II. *A course of action is a step or administrative decision to be taken for improvement follow up or further action in regard to the problem, policy, etc on the basis of the information given in the statement. You have to assume everything in the statement to be true, then decide which of the two suggested courses of action logically follows for pursuing.*

Give answer

(a) if only I follows
(b) if only II follows
(c) if either I or II follows
(d) if neither I nor II follows
(e) if both I and II follow

1. Statement Despite repeated warnings to students and parents from the college, some students have finally not fulfilled the mandatory criteria of 75% attendance in order to appear for exams.

Courses of Action

I. The college should stop adhering to this particular criteria.

II. Either the parents or guardians of the defaulters should be called for a meeting.

2. Statement The students residing at the hostel of a university had to stay without electricity and water for 48 h not because of shortages but because of negligence by the hostel staff.

Courses of Action

I. The management of the university should look into the matter and take strict action against such negligence.

II. The students should leave the hostel and find some alternate accommodation.

3. Statement The packets of many of the packaged eatables convey incorrect information about the ingredients and nutrient content.

Courses of Action

I. All such products should be banned from the market if after a warning also correct information is not provided.

II. The issue should be ignored as long as the eatables are popular among the public.

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4. Statement The sales of ball-point pens manufactured by company Lixus have gone down considerably ever since the same company introduced a gel-ink pen in the market.

Courses of Action

I. Ball-point pens should not be manufactured by Lixus any more.

II. Lixus should immediately withdraw all gel-ink pens from the market so as to force people to buy ball-point pens.

5. Statement The Government airline has been making huge losses even as private airlines continue to prosper and make substantial profit.

Courses of Action

I. All the private airlines should be banned from their operation in the country.

II. The Government airlines should be instructed to increase passenger fare significantly in order to increaseits profit.

6. Statement Financial stringency prevented the State Government from paying salaries to its employees for the last three months.

Courses of Action

I. The State Government should reduce wasteful expenditure and arrange to pay the salaries of its employees.

II. The State Government should immediately curtail the staff strength.

Directions (Q. Nos. 7-11) *Each question contains one statement and two Courses of Action I and II. Assuming the statements to be true, decide which of the two courses of action most logically follows.* **[CLAT 2013]**

Give answers

(a) If only I follows

(b) If only II follows

(c) If either I or II follows

(d) If neither I nor II follows

7. Statement Indian children are very talented but are instead weak in Science and Mathematics.

Courses of Action

I. Teaching and textbooks are not available in mother language.

II. Education based on experiments in both the subjects is lacking.

8. Statement Despite of child labour laws, children can be seen working in hotels, shops, houses very frequently.

Courses of Action

I. The Government should not make such laws which cannot be enforced.

II. A proper education system for the primary level particularly for lower caste community may eradicate this problem.

9. Statement Kyoto protocol on environment is signed by almost every country of the world.

Courses of Action

I. As a result air, water and soil pollution have come down.

II. Increasing production of automobiles, refrigerators and fertilisers do not affect our environment.

10. Statement School dropout rate is very high in the rural areas as children support their parents in income earning activities.

Courses of Action

I. Public awareness programme on primary education should be expanded immediately to educate parents.

II. Compensation is not a remedy.

11. Statement Smoking is one of those human weaknesses which tend to test the will power of the smoker of the edge.

Courses of Action

I. It is very difficult for the smoker to give up smoking even if they want to do so.

II. Human beings have other weaknesses as well.

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Answer *with* Explanations

Base Level Exercise

1. (c) Both actions are strong, according to the statement.
2. (c) According to the statement, given both the courses of action are strong.
3. (c) We do not even need to think twice for answering this question as both courses of Actions I and II are constitutional obligations. Hence, both actions follow.
4. (a) Main problem according to question is that most of the development plans are on paper only. But if field work was supervised properly. Hence, only Action I follows.
5. (a) The company must know the reasons why the sale has gone down. Clearly, in this case, price of the product should not be reduced. Hence, only course of Action I will favour the solution.
6. (e) Both the steps are required.
7. (e) Both I and II are necessary steps towards prevention of AIDS.

Expert Level Exercise

1. (b) Either the parents or guardians of the defaults should be called for a meeting.
2. (a) The management of the university should look into the matter and take strick action against such negligence.
3. (a) All such product should be banned from the market if after a warning also correct information is not provided.
4. (d) In the given courses of action, none is strong as per the question.
5. (d) After working with statement, it is found that none of the action is strong.
8. (d) Both courses of action are not strong.
9. (a) The Government should identify such schools and take stringment actions against them.
10. (b) The hospital should make appropriate quarantine arrangements to control the spread of disease.
11. (e) Main problem according to the statement is delay in judgement. In this case, both courses of action will be beneficials and will improve the judicial process.
12. (e) It is obvious that both the courses of action are necessary steps and hence both follow.
13. (b) It is clear that obscene posters create unhealthy imprints on the impressionable fragile minds of children. Banning such poster will definitely have positive results.
14. (e) Precautions must be taken in case of to prevent a crisis. Hence, both courses of actions I and II will favour the solution.

6. (a) Main problem according to statement is delay in payment. To reduce wasteful expenditure would definitely be a right step towards solution. Hence, only course of action I will favour the solution.
7. (b) Only Conclusion II can follow as text book must be available but lack of experiment may be the reason.
8. (b) Only Conclusion II follows as primary education may eradicate the problem
9. (a) Only Conclusion I can follow.
10. (a) Only Conclusion I can follow.
11. (d) None of the conclusions follows.

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26 Verification of Truth of the Statement

Verification of truth of statements is based on such truth for the facts that will always hold strong and true.

In this chapter, we deal with questions which are associated with some objects. These objects have many parts/characters but there is one part which really defines the object or the main feature of that object. We are required to choose that one. The alternatives other than the correct answer also may bear a strong relationship with the things mentioned.

In this type of question, it is required to stress only on the truth of the fact that always hold. These types of questions are being discussed in the following examples.

Directions (Illustrations 1-3) *Choose the best alternative as the answer.*

Illustration 1. A pen always has ..... .

(a) nib (b) plastic (c) ink (d) refill

Solution (a) A pen is used for writing. We write with the help of nib. So, nib defines the pen best.

Illustration 2. A lotus flower always has ..... .

(a) petals (b) mud (c) root (d) water

Solution (a) A flower is a combination of petals. So, lotus flower will be also a combination of petals. Here, petals defines lotus flower.

Illustration 3. Atmosphere always has ..... .

(a) oxygen (b) air (c) germs (d) moisture (e) dust

Solution (b) Atmosphere is the layer of different gases. The gases are called air. So, the atmosphere is best defined by air.

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Let us Practice

Directions (1-28) Choose the best alternative as the answer.

1. A clock always has ..... .
(a) battery (b) numbers (c) alarm
(d) needles (e) frame

2. A man always has ..... .
(a) teeth (b) feet (c) eyes
(d) hands (e) heart

3. A car always has ..... .
(a) driver (b) bonet (c) dicky
(d) bumper (e) wheels

4. A cricket always has ..... .
(a) stumps (b) pitch (c) gloves
(d) pads (e) bat

5. A bulb always has ..... .
(a) filament (b) light (c) glass
(d) current (e) argon

6. A newspaper always has ..... .
(a) advertisement (b) news
(c) editor (d) paper
(e) date

7. A school always has ..... .
(a) principal (b) building
(c) library (d) teacher
(e) classes

8. A fan always has ..... .
(a) switch (b) blades (c) current
(d) wire (e) regulator

9. A disease always has ..... .
(a) cure (b) medicine (c) cause
(d) germ (e) patient

10. What always worries?
(a) Difficulty (b) Unrest
(c) Non-cooperation (d) Poignancy

11. A shoe always has ..... .
(a) laces (b) leather
(c) design (d) sole

12. A camera always has ..... .
(a) lens (b) reels
(c) flash (d) photograph
(e) photo

13. A danger always involve ..... .
(a) enemy (b) attack
(c) fear (d) help

14. Milk always contain ..... .
(a) sugar (b) fat
(c) calcium (d) water

15. Controversy always involve ..... .
(a) dislike (b) injustice
(c) passion (d) disagreement
(e) anger

16. Which of the following is associated with diamond?
(a) Hardness (b) Brilliance
(c) Use (d) Conductivity
(e) Sharpness

17. A cupboard always has ..... .
(a) clothes (b) door (c) shelf
(d) bolt (e) lock

18. A oasis always has ..... .
(a) travellers (b) water
(c) sand (d) camels
(e) forests

19. A dead has no ..... .
(a) sensation (b) heart beats
(c) bones (d) breathing
(e) movement

20. Quilt always has ..... .
(a) cotton (b) cover
(c) print (d) tags

21. A child must have ..... .
(a) toy (b) friends
(c) parents (d) education

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22. All animals have ..... .
(a) eyes (b) four legs
(c) horns (d) instincts
(e) tails

23. A hill always has ..... .
(a) trees (b) animals
(c) water (d) height

24. A song always has ..... .
(a) chorus (b) musician
(c) tymbal (d) word

25. A hospital always has ..... .
(a) nurse (b) room (c) doctor
(d) bed (e) telephone

26. A train always has ..... .
(a) engine (b) rails (c) driver
(d) guard (e) passenger

27. A mirror always ..... .
(a) reflects (b) retracts
(c) distorts (d) refracts
(e) reveals the truth

28. A book always has ..... .
(a) chapters (b) pages
(c) contents (d) pictures
(e) illustrations

29. Which of the following is always associated with justice?
(a) Hypocrisy (b) Magnanimity
(c) Legitimacy (d) Diminutiveness

30. Which one of the following is always found in 'bravery'?
(a) Experience (b) Courage
(c) Power (d) Knowledge

Answers

1. (d)	**2.** (e)	**3.** (e)	**4.** (e)	**5.** (a)	**6.** (b)	**7.** (d)	**8.** (b)	**9.** (c)	**10.** (b)
11. (d)	**12.** (a)	**13.** (c)	**14.** (c)	**15.** (d)	**16.** (a)	**17.** (c)	**18.** (b)	**19.** (e)	**20.** (a)
21. (c)	**22.** (d)	**23.** (d)	**24.** (d)	**25.** (c)	**26.** (a)	**27.** (a)	**28.** (b)	**29.** (c)	**30.** (b)

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27

Data Sufficiency

Data Sufficiency measures a candidate's ability to analyse a problem, recognize relevant information and decide whether the information given is enough to answer a problem or not.

A number of questions are being asked on reasoning in various competitive examinations these days. Data Sufficiency based questions are not new and unknown to the candidates. Generally, this section includes Coding-Decoding, Blood-Relations, Direction Sense Test, Ranking and Time Sequence Test, Arithmetical Reasoning, Mathematical Operations and Puzzle Test etc. The questions are followed by some statements containing facts etc. and on the basis of these facts, we have to decide which of the statement(s) is/are sufficient to answer the given question.

The problem based on this topic consists by two or more than two statements containing the information related to it. You have to decide whether the problem can be solved by using the information from the given statements combined or individually.

Directions (Illustrations 1-2) *The questions given below consist of a question followed by two statements labelled as* I *and* II. *We have to decide whether these statements give enough information required to answer the question or not.*

Give answer

(a) if Statement I, alone is sufficient to answer the question
(b) if Statement II, alone is sufficient to answer the question
(c) if Statement I and II together are needed to answer the question
(d) if Statement I or II alone is sufficient to answer the question
(e) if Statements I and II together are not sufficient to answer the question

Illustration 1. Who is older—Ritu or Situ?

I. Situ was born in the year 1980 and is 5 yr younger than Ritu's brother.
II. Ritu is twice as old as her brother.

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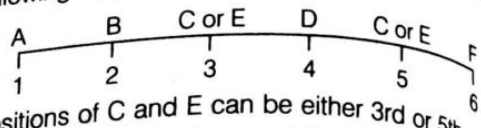
Solution (c) On the basis of Statement I, we can be certain that Situ is younger than Ritu's brother but we cannot find the age relationship between Ritu and Situ. Therefore, Statement I alone is not sufficient to answer the question. Statement II alone is not sufficient to answer the question because we cannot establish age relationship between Situ and Ritu. From Statement I, we find that Ritu's brother is older than Situ and from Statement II, we find that Ritu is older than her brother. From both the informations, we conclude that Ritu is older than Situ.

Illustration 2. Six persons A, B, C, D, E and F are sitting in a row. A and F are sitting at two extreme ends of the row. B is to the immediate right of A and D is 2nd left of F. What is the position of E with respect to A?

I. E is to the right of A.

II. E is to the left of C.

Solution (b) On the basis of the statements given in the question, we can arrange the persons in a row in the following way



Positions of C and E can be either 3rd or 5th.

From the Statement I, we get that E is to the right of A and hence, position of E can either be 3rd or 5th. Therefore, Statement I alone is not sufficient to answer the question. Statement II fixed the positions of C at 5th and E at 3rd place respectively. Therefore, we get our answer from Statement II.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-5) *Each of the questions given below consists of a question and two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question.* **[IBPS (Clerk) 2011]**

Give answer

(a) if the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question

(b) if the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question

(c) if the data either in Statement I alone or in Statement II alone is sufficient to answer the question

(d) if the data in both the Statements I and II together are not sufficient to answer the question

(e) if the data in both the Statements I and II together are necessary to answer the question

1. Village P is towards which direction of village R?

I. Village R is to the South-East of village T and T is to the North of village P.

II. Village Q is to the South of village P and to the South-West of village R.

2. Who among A, B, C, D and E, each having a different height, is the third tallest?

I. E is shorter than only B.

II. C is taller than only A.

3. How many sister does K have?

I. M is sister of K.

II. K's mother has three children.

4. In a row of thirty students facing North, what is R's position from the left end?

I. There are twelve students between R and Q.

II. T is tenth from the right end and there are sixteen students between T and R.

5. How is 'go' written in a code language?

I. 'go over there' is written as 'pa da na' in that code language.

II. 'go and sit' is written as 'sa ka pa' in that code language.

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Directions (Q. Nos. 6-15) *Each of the questions given below consists of a question and two statements numbered I and II. You have to decide whether the data provided in the statements are sufficient to answer the question.*

Give answer

a) if the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question

b) if the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question

c) if the data either in Statement I alone or in Statement II alone is sufficient to answer the question

d) if the data in both the Statements I and II together are not sufficient to answer the question

e) if the data in both the Statements I and II together are necessary to answer the question

6. How far is A from the starting point? If

I. a moves 5 km towards East, then 2 km towards left, 10 km towards right and finally, 2 km towards right and stops.

II. a moves 2 km towards East, then 2 km towards right, 13 km towards left and finally, 2 km towards left and stops.

7. On which day of the month is definitely Meena's birthday? If

I. Meena's brother correctly remembers that Meena's birthday is after 25th but before 29th of this month.

II. Meena's father correctly remembers that Meena's birthday is after 27th but before 31st of this month.

8. Kiran is elder to Manoj and Dilip is elder to Neelam. Who is the youngest? If

I. Kiran is elder to Neelam.

II. Manoj is younger than Dilip.

9. In a code language, 'al ed hop' means 'we play chess'. What is the code for word 'chess'? If

I. 'id nim hop' means 'we are honest'.

II. 'gob ots al' means 'they play cricket'.

10. In a certain code language, '146' means 'adopt good habits'. What is the code of 'habit' in that code language? If

I. '473' means 'like good pictures'.

II. '826' means 'passion becomes habit'.

11. How is Nisha related to Nidhi? If

I. Nisha's mother is sister of Nidhi's father.

II. Nidhi is the daughter of Nisha's grandmother's only son.

12. Towards which direction is P with respect to the starting poing?

I. P walked 20 m, took a right turn and walked 30 m, again took right turn and walked 20 m towards West.

II. P walked 30 m, took a left turn and walked 20 m, again took left turn and walked 30 m towards East.

[IBPS (PO) 2012]

13. Which of the following means 'very' in a certain code language? If

I. 'pit jo ha' means 'very good boy' in that code language.

II. 'jo na pa' means 'she is good' in that code language.

14. Town Q is towards which direction of town R? If

I. Town R is towards East of town B.

II. Town B is towards North of town Q.

15. What is the value of 144$16★7#9? If

I. '$' means '÷', '★' means '×' and '#' means '+'.

II. 16 $ 4 ★ 2 # 2 =10

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B. Expert Level Exercise

Directions (Q. Nos. 1-3) *Each of the questions given below consists of a question and three statements numbered I, II and III. You have to decide whether the data provided in the statements are sufficient to answer the question.*

[BOB (Clerk) 2011]

Give answer

(a) if the data in Statements I and II are sufficient to answer the question while the data in Statement III are not required to answer the question

(b) if the data in Statements I and III are sufficient to answer the question, while the data in Statement II are not required to answer the question

(c) if the data in Statements II and III are sufficient to answer the question, while the data in Statement I are not required to answer the question

(d) if the data in either Statement I alone or Statement II alone or Statement III alone are sufficient to answer the question

(e) if the data in all the Statements I, II and III together are necessary to answer the question

1. Among six people P, Q, R, S, T and V each lives on a different floor of a six storey building having six floors numbered one to six (the ground floor is numbered1, the floor above it, number 2 and so on and the topmost floor is numbered 6). Who lives on the topmost floor?

I. There is only one floor between the floors on which R and Q live, P lives on an even numbered floor.

II. T does not live on an even numbered floor. Q lives on an even numbered floor. Q does not live on the topmost floor.

III. S lives on an odd numbered floor. There are two floors between the floors on which S and P live. T lives on a floor immediately above R's floor.

2. There are six letters W, A, R, S, N and E. Is 'ANSWER' the word formed after performing the following operations using these six letters only?

I. E is placed fourth to the right of A. S is not placed immediately next to either A or E.

II. R is placed immediately next (either left or right) to E. W is placed immediately next (either left or right) to S.

III. Both N and W are placed immediately next to S. The word does not begin with R. A is not placed immediately next to W.

3. Point D is in which direction with respect to point B?

I. Point A is to the West of point B. point C is to the North of point B. point D is to the South of point C.

II. Point G is to the South of point D. point G is 4 m from point B. Point D is 9 m from point B.

III. Point A is to the West of Point B. Point B is exactly midway between points A and E. Point F is to the South of Point E. Point D is to the West of point F.

Directions (Q. Nos. 4-8) *These questions consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the appropriate answer.*

[IBPS (Clerk) 2013]

4. How is 'cost' written in the given code language?

I. In the code language 'tell me the cost' is coded as '@ 0 # 9' and 'cost was very high' is coded as '& 6 # 1'.

II. In the code language 'some cost was discount' is coded as '1 8 7 #' and 'some people like discount' is coded as '8 7 5 %'.

(a) The data in both the Statements I and II together are necessary to answer the question

(b) The data neither in Statement I nor in Statement II are sufficient to answer the question

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(d) The dat
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(e) The da
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5. Is D the
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(b) The da
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(c) The d
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The data either in Statement I alone or in Statement II alone are sufficient to answer the question

The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

The data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question

5. Is D the mother of S?

I. L is the husband of D. L has only three children.

II. N is the brother of S and P. P is the daughter of L.

The data in Statements II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

The data neither in Statement I nor in Statement II are sufficient to answer the question

The data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question

The data either in Statement I alone or in Statement II alone are sufficient to answer the question

The data in both the Statements I and II together are necessary to answer the question

6. Among five people—A, B, C, D and E sitting around a circular table facing the centre, who is sitting second to the left of D?

I. C is second to the left of A. B and D are immediate neighbours of each other.

II. D is to the immediate left of B. E is not an immediate neighbour of D and B.

The data in both the Statements I and II together are necessary to answer the question

The data either in Statement I alone or in Statement II alone are sufficient to answer the question

The data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question

The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

(e) The data neither in Statement I nor in Statement II are sufficient to answer the question

7. Among five friends—J, K, L, M and N each of a different height, who is the second tallest?

I. N is taller than M and K. K is shorter than M.

II. L is taller than N. J is not the tallest.

(a) The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

(b) The data neither in Statement I nor in Statement II are sufficient to answer the question

(c) The data in both the Statements I and II together are necessary to answer the question

(d) The data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question

(e) The data either in Statement I alone or in Statement II alone are not sufficient to answer the question

8. How many students are there in the class?

I. There are more than 20 but less that 27 students in the class.

II. There are more than 24 but less than 31 students in the class. The number of students in the class can be divided into groups such that each group contains 5 students.

(a) The data in both the Statements I and II together are necessary to answer the question

(b) The data neither in Statement I nor in Statement II are sufficient to answer the question

(c) The data either in Statement I alone or in Statement II alone are sufficient to answer the question

(d) The data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question

(e) The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

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Directions (Q. Nos. 9-11) *Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether tho data given in the statements are sufficient to answer the questions, Read both the statements.* **[SBI (PO) 2013]**

Give answer

(a) If the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question.

(b) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question

(c) if the data either in Statement I alone or Statement II alone are sufficient to answer the question

(d) if the data neither in Statement I nor II together are sufficient to answer the questions

(e) if the data in both Statements I and II together are necessary to answer the questions

9. Seventeen people are standing in a straight line facing South. What is Bhavna's position from the left end of the line ?

I. Sandeep is standing second to the left of Sheetal. Only five people stand between Sheetal and the one who is standing at the extreme right end of the line. Four people stand between Sandeep and Bhavna.

II. Anita is standing fourth to the left of Sheetal. Less than three people are standing between Bhavna and Anita.

10. Five letters A, E, G, N and R are arranged left to right according to certain conditions. Which letter is placed third?

I. G is placed second to the right of A. E is to the immediate right of G. There are only two letters between R and G.

II. N is exactly between A and G, neither A nor G is at the extreme end of the arrangement.

11. Six people S, T, U, V, W and X are sitting around a circular table facing the centre. What is T's position with respect to X?

I. Only two people sit between U and W. X is second to the left of W. V and T are immediate neighbours of each other.

II. T is to the immediate right of V. There are only two people between T and S. X is an immediate neighbour of S but not of V.

Answer *with* Explanations

A. Base Level Exercise

1. *(c)* The data in Statement I alone or in Statement II alone are sufficient to answer the question.

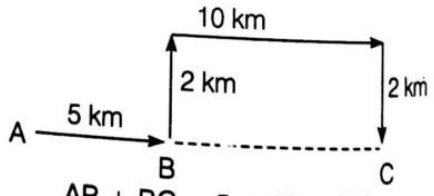
2. *(e)* The data in both the Statements I and II together are necessary to answer the question.

3. *(d)* The data given in both the Statements I and II together are not sufficient to answer the question.

4. *(b)* The data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question.

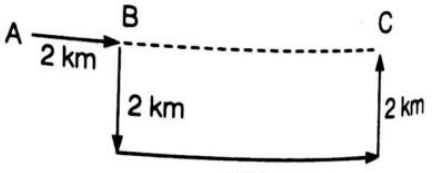
5. *(e)* The data in both the Statements I and II together are necessary to answer the question.

6. *(c)* I.



AB + BC = 5 + 10 = 15 km

II.



AB + BC = 2 + 13 = 15 km

So, either of the statement is sufficient to answer the question.

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Birthday according to the brother of Meena 26, 27, 28.

II Birthday according to the father of Meena 28, 29, 30.

Common date = 28

So, both the statement are necessary to answer the question.

Question cannot be answered even using both the statements. Because either Manoj or Neelam is the youngest.

From both the statements, we find that

ed hop → we play chess

nim hop → we are honest

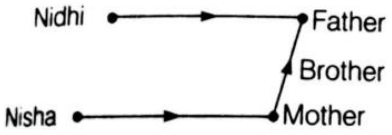
ots al → they play cricket

It is clear that 'ed' is the code for chess.

So, data in both the statements together is necessary to answer the question

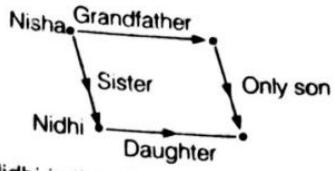
146 = adopt good habits. From Statement II, it is clear that 6 and habits are common in question and Statement II. Hence, 6 stands for habits. So, the information in statement II alone is sufficient to answer the question.

From Statement I,



Hence, Nidhi is the daughter of Nisha's maternal uncle.

From Statement II,



So, Nidhi is the sister of Nisha.

∴ Information given in any of the statement alone is sufficient to answer the question.

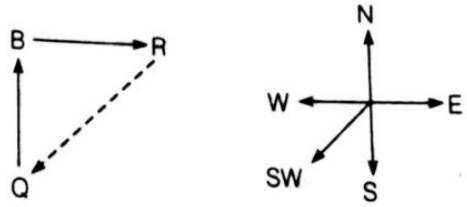
12. (c) From Statement I, P is South direction with respect to the starting point

From Statement II, P is in South direction with respect to the starting point.

So, the question can be answered from any of the statement alone.

13. (d) Data given in both the statements are not sufficient to solve the question because the code for 'very' is either 'pit' or 'ha'.

14. (e) From Statements I and II,



Hence, town Q is South-West towards Town R.
So, both statements are necessary for answer.

15. (a) From Statement I,

$$144\ \$16\ \bigstar\ 7\ \#\ 9$$

$$\Rightarrow \quad 144 \div 16 \times 7 + 9$$

$$\Rightarrow \quad \frac{144}{16} \times 7 + 9 = 63 + 9 = 72$$

So, Statement I alone is sufficient to answer the question.

Expert Level Exercise

1. (e) The data in Statements I, II and III together are necessary to answer the question.

2. (e) The data in Statements I, II and III together are necessary to answer the question.

3. (b) The data in Statements I and III are sufficient to answer the question, while the data in Statement II are not required to answer the question.

4. (e) From Statement I,

tell me the cost → @ 0 # 9

cost was very high → & 6 # 1

$\Rightarrow$ cost → #

From Statement II,

some cost was discount → 1 8 7 #

some people like discount → 8 7 5 %

$\Rightarrow$ some discount → 8 7

and cost → either 1 or #

Thus, we can get the code of 'cost' from Statement I only.

Hence, data in Statement I alone are sufficient to answer the question.

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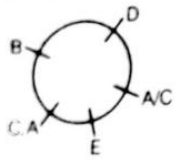
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5. (e) From Statement I, L is the husband of D. As L has three children, D also has three children.

From Statement II, N, S and P are siblings and are the children of L and of D also. Thus, D is the mother of S.

Hence, data in both the Statements I and II together are necessary to answer the question.

6. (i) From Statement II,



Hence, E is sitting second to the left of D.
Hence, data in Statement II alone are sufficient to answer the question.

7. (b) From Statement I,

$$N > M > K$$

From Statement II,

$$L > N$$

From both the Statements,

$$L > N > M > K$$

But height of J is not clear.
Thus, second tallest friend cannot be determined.
Hence, data neither in Statement I nor in Statement II are sufficient to answer the question.

8. (a) From Statement I,

Number of students in the class
= 21 or 22 or 23 or 24 or 25 or 26

From Statement II,

Number of students in the class
= 25 or 26 or 27 or 28 or 29 or 30

Since number of students can be divided into groups of 5 students, therefore number of students must be a multiple of 5.

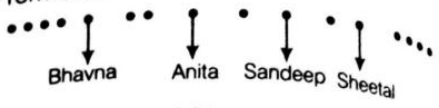
Number of students in the class = 25 or 30

Combining Statement I and II,

Number of students in the class = 25

Hence, the data in both the Statements I and II together are necessary to answer the question.

9. (e) From Statements I and II,



Thus, position of Bhavna can be found out using both of the statements.

10. (c) From Statement I,

R A _ G E

Clearly, the left place or empty place is filled by N.

From Statement II,

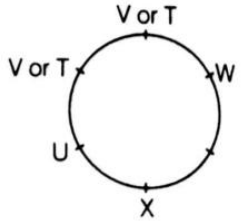
_ A N G _

_ G N A _

Clearly, N is at third place.

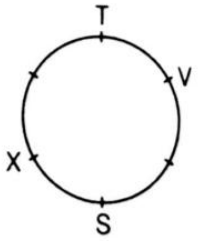
Hence, the data in Statement I alone or in Statement II alone are sufficient to answer the question.

11. (b) From Statement I,



Hence, position of T with respect to X cannot be found out using the data provided in Statement I alone.

From Statement II,



Here, it is clear that T is second to the left of X.

Hence, the data in Statement II alone are sufficient to answer the question.

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Input-Output

Input is group of words, numbers or data that is fed into the system or expended in its operation to achieve output or a result, while **output** *means an artifact of the arrangement that has been created by someone or some process.*

Input-Output questions are based on a given input of line of words or numbers or words and numbers that are organised step by step follow a specific rule to arrive at the final step. Candidates are required to be conversant with the rule of arrangement of words or numbers or words and numbers. They are required to observe the change in order of words or numbers in each step sequentially to specify the rule of arrangement of words and numbers.

Generally, each set of questions on Input-Output is based on a particular rule. The different sets of questions involves different rules of arrangement of words or numbers. Thus, there is no fixed number of rules of arrangement of words or numbers. However, most common type of questions on input involves arrangement of words as per dictionary or in alphabetical order or arrangement of numbers in ascending or descending order. Generally, one word or number is arranged in every step and procedure is continued until all the words or numbers get arranged according to a specific rule.

Types of Questions

There are mainly four types of questions that are asked from Input-Output; Shifting, Arranging, Arithmetic Operations and Miscellaneous.

1. **Shifting** In this type of questions, the given words of the Input are shifted as per a fixed pattern.
2. **Arranging** In this type of questions, the numbers or the words are arranged as per a given order. The given order can be alphabetical order in case of words and ascending or descending order in case of numbers.

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3. **Arithmetic Operations** In this type of questions, the Input has some numbers. Different steps are obtained by taking the numbers of the input and different arithmetic operations are performed after that.

4. **Miscellaneous** The type of questions cover miscellaneous questions. The Input can be anything and machine performs a set of random operations on this.

Identifying the Types of Problem

Step I Check for Arrangement

First of all check that if there is any arrangement. In case of arrangement, words would be arranged in alphabetical order and the number would be arranged in increasing or decreasing order.

To check it, just look at the first two-three steps, if an Arrangement is found than the problem is Arrangement based problem.

Important points

- Here are some points which you can use for some Input-Output based questions.
- First of all, observe the given input line of words or numbers and the last step of rearrangement, so that candidate may get an idea about the changes effected in various steps of rearrangement.
- In order to know what changes have been made in each step, observe two consecutive steps carefully.
- Now, correlate the input, the last step and any one of the middle steps. This will enable you to identify the rule of arrangement.

Step II Next Check for Shifting

If the given problem is not arrangement based, then check whether shifting is taking place.

Just check the first two-three steps, if the words from a particular position are moving to another particular position and that is being repeated, then the given problem is Shifting problem.

Step III Check for Arithmetic Operation

Arithmetic operation is possible if and only if the input has only the numbers. If the input has numbers and the chances of arrangement and shifting are not there, the problem is based on arithmetic operations for sure.

Directions (Illustrations 1-5) *Study the following information carefully and answer the given questions. A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.*

Input rose petal 29 32 86 goal 41 toll
Step I 29 rose petal 32 86 goal 41 toll
Step II 29 toll rose petal 32 86 goal 41
Step III 29 toll 32 rose petal 86 goal 41
Step IV 29 toll 32 rose 41 petal 86 goal

Step IV is the last step of the rearrangement.

1. Step III of an input is 15 yes 24 80 today never go 59, which of the following will definitely be the input?

(a) 24 80 today never go 59 15 yes
(b) 24 80 today yes never go 59 15
(c) 24 15 yes 80 today never go 59
(d) Cannot be determined
(e) None of the above

2. Input man 79 over 63 like 43 joy 15. How many steps will be required to complete the rearrangement?

(a) Six (b) Seven (c) Eight
(d) Nine (e) None of these

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step III of an input is 18 tower 38 basket 82 76 hall new, which of the following will be step VII?

a) 18 tower 38 hall 76 new basket 82
b) 18 tower 38 new 76 hall 82 basket
c) 18 tower 38 hall 76 new 82 basket
d) There will be no such step
e) None of the above

4. Input 94 join for 81 style home 32 48, which of the following steps will be the last?

a) VI (b) V (c) VII
d) IX (e) None of these

5. Step II of an input is 27 world go 57 48 stem 35 kite. How many more steps will be required to complete the rearrangement?

a) Five (b) Four (c) Three
d) Six (e) None of these

Solutions (Q. Nos. 1- 5)

1. d) *Input* cannot be determined as we cannot judge the initial position of letters and numbers.

2. e) *Input* man 79 over 63 like 43 joy 15
Step I 15 man 79 over 63 like 43 joy
Step II 15 over man 79 63 like 43 joy
Step III 15 over 43 man 79 63 like joy
Step IV 15 over 43 man 63 79 like joy
Step V 15 over 43 man 63 like 79 joy
So, five more steps are required to complete the rearrangement.

3. c) *Step III* 18 tower 38 basket 82 76 hall new
Step IV 18 tower 38 new basket 82 76 hall
Step V 18 tower 38 new 76 basket 82 hall
Step VI 18 tower 38 new 76 hall basket 82
Step VII 18 tower 38 new 76 hall 82 basket
So, the correct Step VII is given in option (b).

4. a) *Input* 94 join for 81 style home 32 48
Step I 32 94 join for 81 style home 48
Step II 32 style 94 join for 81 home 48
Step III 32 style 48 94 join for 81 home
Step IV 32 style 48 join 94 for 81 home
Step V 32 style 48 join 81 94 for home
Step VI 32 style 48 join 81 home 94 for.
So, last step is Step VI.

5. a) *Step II* 27 world go 57 48 stem 35 kite
Step III 27 world 35 go 57 48 stem kite
Step IV 27 world 35 stem go 57 48 kite
Step V 27 world 35 stem 48 go 57 kite
Step VI 27 world 35 stem 48 kite go 57
Step VII 27 world 35 stem 48 kite 57 go
So, five more steps are required to complete the rearrangement.

Directions (Illustrations 6-10) *In an SSB interview for the NDA, a group testing officer allocates the following instructions to the candidates divided into 7 groups, who have to perform the tasks according to the input.*

Group I Monkey crawling long jump and rope climbing.
Group II Monkey crawling rope jump and long climbing.
Group III Rope crawling monkey climbing long and jump.
Group IV Climbing monkey crawling rope jump and long.
Group V Climbing monkey and rope jump crawling long and so on.

The questions below are based on logic given above.

6. If the task of IInd group is 'Nothing is without be achieved to determination', then which will be the VIth group?

(a) Without is nothing determination to achieved to
(b) Achieved nothing determination to is be without
(c) Nothing is achieved without be to determination
(d) Data is inadequate
(e) None of the above

7. If 'Terrorism Bush job incurbing remarkable did a' is Vth group task, then which is 'Bush did incurbing remarkable job a terrorism' group?

(a) V (b) IV (c) II
(d) VI (e) None of these

8. Asad is first selected for 1st group "You are my inspiration, guide and instructor", after sometime he was shifted to group IV. What is his new group task?

(a) Instructor you are and inspiration guide my
(b) You are my guide instructor and inspiration
(c) Inspiration and guide instructor you are my
(d) Data inadequate
(e) None of the above

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9. If the last VIIth group is "Not job you for this selected are", then which group is Ist?

(a) You are selected for this not job
(b) Selected for this job you are not
(c) Not you are selected for this job
(d) You are not selected for this job
(e) None of the above

10. If the task of VIth group is "Pollution is becoming cause of deadly diseases", then what is IIIrd group?

(a) Pollution is cause of deadly diseases becoming
(b) Diseases becoming is cause of deadly pollution
(c) Becoming is pollution diseases deadly of cause
(d) Data inadequate
(e) None of the above

Solutions (Q. Nos. 6-10)

6. *(b) Group II* is nothing (a) is (b) without (6) be (d) achieved (e) to (c) determination (7).

In same logic group VI will be achieved (e) nothing (a) determination (7) to (c) is (b) be (d) without (6).

7. *(c) Group V* is terrorism (7) Bush (a) job (e) incurbing (6) remarkable (d) did (b) a (c).

It can also be solved by going back but the above system is more convenient. So, Bush (a) did (b) incurbing (6) remarkable (d) job (e) a (c) terrorism (7) will be group II.

8. *(a) Group I* is you (a) are (b) my (c) inspiration (d) guide (e) and (6) instructor (7). Group IV will be Instructor (7) you (a) are (b) and (6) inspiration (d) guide (e) my (c).

9. *(d) Last group VII* is not (c) job (7) you (a) for (e) this (6) selected (d) are (b). In same logic Ist group is You (a) are (b) not (c) selected (d) for (e) this (6) job (7).

10. *(e) Group VI* is pollution (e) is (a) becoming (7) cause (c) of (b) deadly (d) diseases (6). Group III will be Diseases (6) of (b) is (a) becoming (7) cause (c) pollution (e) deadly (d).

The above questions will be solved, thus

Group I to II Based on arrangements of words to different positions. The third word of previous group becomes sixth and sixth become third, interchanging their places.

Group II to III First three words get reversed and so the group of last four.

Group III to IV Next time we reverse the group of first 4 words and then the last three.

Group IV to V In group V same rule follows as in Group I to Group II.

To solve the problems more easily, we can give numbers to each word.

Group I Monkey (a) crawling (b) long (c) jump (d) and (e) rope (6) climbing (7).

Group II Monkey (a) crawling (b) long (6) jump (d) and (e) rope (c) climbing (7).

Group III Monkey (6) crawling (b) long (a) jump (7) and (c) rope (e) climbing (d).

Group IV Monkey (7) crawling (a) long (b) jump (6) and (d) rope (e) climbing (c).

Group V Monkey (7) crawling (a) long (e) jump (6) and (d) rope (b) climbing (c).

Group VI Monkey (e) crawling (a) long (7) jump (c) and (b) rope (d) climbing (6).

Group VII Monkey (c) crawling (7) long (a) jump (e) and (6) rope (d) climbing (b). Here, it ends because groups are 7 only.

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Let us Practice

Base Level Exercise

Directions (Q. Nos. 1-5) *Study the following information carefully and answer the given questions.*

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.

Input sale data 18 23 for 95, then 38
Step I data sale 18 23 for 95, then 38
Step II data 95 sale 18 23 for, then 38
Step III data 95 for sale 18 23, then 38
Step IV data 95 for 38 sales 18 23, then
Step V data 95 for 38 sale 23 18, then
Step VI data 95 for 38 sale 23, then 18
Step VI is the last step of the rearrangement of the above input.

As per the rules followed in the above steps, find out in each of the following questions the appropriate step for the given input.

1. **Input** year 39 stake 47 house full 94 55
How many steps will be required to complete the rearrangement?
(a) Five (b) Six (c) Four
(d) Seven (e) None of these

2. **Step II of an input is** car 83 lost ever 32 46 74 now.
How many more steps will be required to complete the rearrangement?
(a) Three (b) Four (c) Five
(d) Six (e) None of these

3. **Step III of an input is** and 79 code 27 18 new goal 34.
Which of the following will definitely be the input?
(a) code and 79 27 18 new goal 34
(b) code 27 18 new goal 34 and 79
(c) code 27 and 18 79 new goal 34
(d) Cannot be determined
(e) None of the above

4. **Input** water full never 35 78 16 height 28
Which of the following steps will be the last?
(a) VI (b) VII (c) VIII
(d) IX (e) None of these

5. **Step II of an input is** high 69 store pay 36 43 15 there.
Which of the following will be Step VI?
(a) high 69 pay 43 store 36 there 15
(b) high 69 pay 43 store 36 15 there
(c) high 69 pay 36 43 store 15 there
(d) there will be no such step
(e) None of the above

Directions (Q. Nos. 6-10) *Study the following information carefully and answer the given questions.* **[IBPS (Clerk) 2011]**

When an input line of words and numbers is given to a word and number arrangement machine, it rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement. (All the numbers are two-digit numbers)

Input pink for 25 72 white jar 12 96
Step I 96 pink for 25 72 white jar 12
Step II 96 for pink 25 72 white jar 12
Step III 96 for 72 pink 25 white jar 12
Step IV 96 for 72 jar pink 25 white 12
Step V 96 for 72 jar 25 pink white 12
Step VI 96 for 72 jar 25 pink 12 white
Step VI is the last step of the rearrangement as the desired arrangement is reached.

As per the rules followed in the above steps, find out in each of the following questions the appropriate step for the given input. (All the numbers are two-digit numbers).

6. **Input** 16 power failure 61 53 new cost 27
How many steps will be required to complete the rearrangement?
(a) Six (b) Seven (c) Five
(d) Four (e) None of these

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7. Step II of an input is 84 ask quit these 39 12 old 51.
Which of the following will definitely be the input?
(a) quit these 39 12 old 84 ask 51
(b) quit these 39 12 old 51 84 ask
(c) quit 84 these ask 39 12 old 51
(d) Cannot be determined
(e) None of the above

8. Step III of an input is 63 bed 58 never go home 46 28.
How many more steps will be required to complete the rearrangement?
(a) Four (b) Three (c) Five
(d) Six (e) None of these

9. Input rows 25 columns 39 46 fear star 72.
Which of the following will be the last step?
(a) V (b) VI (c) VII
(d) VIII (e) None of these

10. Input ordinary 47 tablet 36 dry 91 32 handle. Which of the following will be the Step VI?
(a) 91 dry 47 handle 36 32 ordinary tablet
(b) 91 dry 47 handle 36 ordinary 32 tablet
(c) 91 dry 47 handle 36 ordinary tablet 32
(d) There will no such step
(e) None of the above

Directions (Q. Nos. 11-12) *Study the following information carefully and answer the given questions.*

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.

Input joy far 35 27 16 96 height star
Step I 96 joy far 35 27 16 height star
Step II 96 far joy 35 27 16 height star
Step III 96 far 35 joy 27 16 height star
Step IV 96 far 35 height joy 27 16 star
Step V 96 far 35 height 27 joy 16 star and Step V is the last step of the rearrangement.

As per the rules followed in the above steps, find out in each of the following questions the appropriate step for the given input.

11. Input organise 19 12 stable room 35 72 house.
How many steps will be required to complete the arrangement?
(a) Five (b) Six
(c) Seven (d) Four
(e) None of these

12. Input bake never store 51 26 33 age 49.
Which of the following will be Step V?
(a) 51 age 49 bake 33 never 26 store
(b) 51 age 49 bake never store 26 33
(c) 51 age bake never store 26 33 49
(d) 51 bake never store 26 33 age 49
(e) There will be no such step

Directions (Q. Nos. 13-15) *A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.*

Input but 32 71 glory fair south 65 84
Step I south but 32 71 glory fair 65 84
Step II south 84 but 32 71 glory fair 65
Step III south 84 glory but 32 71 fair 65
Step IV south 84 glory 71 but 32 fair 65
Step V south 84 glory 71 fair but 32 65
Step VI south 84 glory 71 fair 65 but 32 and Step VI is the last step of the rearrangement.

As per the rules followed in the above steps, find out in each of the following questions the appropriate step for the given input.

13. Step III of an input is year 92 ultra 15 23 strive house 39.
How many more steps will be required to complete the rearrangement?
(a) Three (b) Four
(c) Two (d) Five
(e) None of these

14. Input any how 49 24 far wide 34 69.
Which of the following steps will be the last but one?
(a) VI (b) VII
(c) V (d) VIII
(e) None of these

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15. Step II of an input is town 74 pair 15 31 nice job 42. Which of the following is definitely the input?

(a) pair 15 31 town nice job 42 74
(b) pair 15 town 31 74 nice job 42
(c) pair 15 town 74 31 nice job 42
(d) Cannot be determined
(e) None of the above

Directions (Q. Nos. 16-19) *Given an input line, the machine rearranges them step by step as per the illustration given below.*

Input show must 73 85 go 69 on 32
Step I 32 show must 73 85 go 69 on
Step II 32 go show must 73 85 69 on
Step III 32 go 69 show must 73 85 on
Step IV 32 go 69 must show 73 85 on
Step V 32 go 69 must 73 show 85 on
Step VI 32 go 69 must 73 on show 85
Step VII 32 go 69 must 73 on 85 show and Step VII is the last step in the arrangement.

As per the rules followed in the following questions the appropriate step for the given input.

16. Step III of an input is 14 but 26 not just 63 fundamental 47.
Which of the following is definitely the input?

(a) 26 14 but not just 63 fundamental 47
(b) 63 26 but 14 not just 63 fundamental 47
(c) fundamental 26 14 but not just 63 47
(d) Cannot be determined
(e) None of the above

17. Step I of an input is 34 fire dress well 63 43 prime 52.

Which of the following steps will be the last but one?

(a) IV (b) III (c) VI
(d) VII (e) V

18. What will be the fourth step for the following input?
Input just in time for 36 48 14 59

(a) 14 for 36 in just time 48 59
(b) 14 for 36 just in time 48 59
(c) 14 for 36 in 48 just time 59
(d) Cannot be determined
(e) None of the above

19. Step II of an input is 23 fine 49 sixty rely 38 56 next, how many more steps will be required to complete the arrangement?

(a) 2 (b) 5 (c) 6
(d) 4 (e) None of these

Directions (Q. Nos. 20-24) *Study the following information carefully and answer the given questions.* **[IBPS (PO) 2012]**

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement. (All the numbers given in the arrangement are two-digit numbers).

Input gone over 35 69 test 72 park 27
Step I 27 gone over 35 69 test 72 park
Step II 27 test gone over 35 69 72 park
Step III 27 test 35 gone over 69 72 park
Step IV 27 test 35 park gone over 69 72
Step V 27 test 35 park 69 gone over 72
Step VI 27 test 35 park 69 over gone 72
Step VII 27 test 35 park 69 over 72 gone and Step VII is the last step of the rearrangement of the above input as the desired arrangement is obtained. As per the rules followed in the above steps, find out the appropriate step for the given input in each of the following questions.

20. Input 86 open shut door 31 49 always 45. How many steps will be required to complete the rearrangement?

(a) Five (b) Six
(c) Seven (d) Four
(e) None of these

21. Step III of an input is 25 yes 37 enemy joy defeat 52 46.

Which of the following is definitely the Input?

(a) enemy 25 joy defeat yes 52 37 46
(b) 37 enemy 25 joy yes defeat 52 46
(c) enemy joy defeat 25 52 yes 46 37
(d) Cannot be determined
(e) None of the above

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22. Step II of an input is 18 win 71 34 now if victory 61.

How many more steps will be required to complete the rearrangement?

(a) Three (b) Four (c) Five
(d) Six (e) More than six

23. Input where 47 59 12 are they going 39. Which of the following steps will be last but one?

(a) VII (b) IV (c) V
(d) VIII (e) None of these

24. Step II of an input is 33 store 81 75 full of goods 52.

Which of the following will be step VI?

(a) 33 store 52 of 75 81 full goods
(b) 33 store 52 of 75 full 81 goods
(c) 33 store 52 of 75 goods 81 full
(d) There will be no such step
(e) None of the above

Directions (Q. Nos. 25-29) *Study the following information to answer the given questions.*

[IBPS (Clerk) 2011]

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule. The following is an illustration of input and rearrange- ment. (All the numbers are two-digit numbers.)

Input sine 88 71 cos theta 14 56 gamma delta 26
Step I cos sine 71 theta 14 56 gamma delta 26 88
Step II delta cos sine theta 14 56 gamma 26 88 71
Step III gamma delta cos sine theta 14 26 88 71 56
Step IV sine gamma delta cos theta 14 88 71 56 26
Step V theta sine gamma delta cos 88 71 56 26 14 and

Step V is the last step of the arrangement of the above input as the intended arrangement is obtained.

As per the rules followed in the above steps, find out in each of the following questions the appropriate steps for the given input.

Input for the questions

Input for 52 all 96 25 jam road 15 hut 73 bus stop 38 46 (All the numbers given in the arrangement are two-digit numbers).

25. Which word/number would be at the 6th position from the left in Step V?

(a) 25 (b) stop
(c) jam (d) all
(e) road

26. Which of the following would be the Step III?

(a) hut for bus all 25 jam road 15 stop 38 96 73 52 46
(b) for bus all 25 jam road 15 hut 38 stop 96 46 73 52
(c) hut for bus all jam road 15 stop 38 96 73 52 46 25
(d) for bus all 25 jam road 15 hut stop 38 46 96 73 52
(e) None of the above

27. Which word/number would be at 8th position from the right in Step IV?

(a) 15
(b) road
(c) hut
(d) jam
(e) stop

28. Which of the following would be Step VII?

(a) stop road jam hut for bus all 15 96 73 52 46 38 25
(b) road jam hut for bus all stop 15 25 38 46 52 73 96
(c) stop road jam hut for bus all 96 73 52 46 38 25 15
(d) jam hut for bus all 25 road stop 15 96 73 52 46 38
(e) There will be no such step as the arrangement gets established at Step VI

29. Which step number would be the following output?
bus all for 52 25 jam road 15 hut stop 38 46 96 73.

(a) VI
(c) II (b) III
(d) V
(e) There will be no such step

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Directions (Q. Nos. 30-34) *Given an input, a coding machine generates pass-codes for six batches every day as follows.*

Input the shopkeeper offered discount to customers. Pass code for

Batch I customer the shopkeeper offered discount to

Batch II customer discount the shopkeeper offered to

Batch III customer discount offered the shopkeeper to and so on until the arrangement is completed. After the arrangement is completed the next batch gets the same code as that for batch I.

Duration of each batch is 1 h. There is a break of one hour after the fourth batch. Sixth batch is the last batch. Now, answer the following questions.

30. If the pass-code for the second batch is, do lean window out of not, what will be the pass-code for the fourth batch?

(a) do lean of not out window
(b) do lean of out not window
(c) do lean not out window of
(d) do lean not of window out
(e) None of the above

31. If the input is, please do not delay the matter, what will be the pass-code for third batch?

(a) do please not delay the matter
(b) delay do matter please not the
(c) delay do matter not please the
(d) delay do matter not the please
(e) None of the above

32. If the pass-code for third batch is, brisk every for morning go walk, what will definitely be the input?

(a) morning brisk go walk for every
(b) morning go brisk walk for every
(c) morning go walk brisk for every
(d) Cannot be determined
(e) None of the above

33. If the pass-code for the second batch is, children for not is good watching television, what will be the pass-code for the fifth batch?

(a) children for good not is watching television
(b) children for good is not watching television
(c) children good for is not television watching
(d) Cannot be determined
(e) None of the above

34. If the input is necessary arrangements have already been made.
How many batches are required to complete the arrangement?

(a) Three (b) Four (c) Five
(d) Six (e) None of these

B. Expert Level Exercise

Directions (Q. Nos. 1-6) *Study the following information carefully and answer the given questions.* **[Corporation Bank (PO) 2010]**

A word and number arrangement machine, when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.

Input gone 93 over 46 84 now for 31
Step I 31 gone 93 over 46 84 now for
Step II 31 over gone 93 46 84 now for
Step III 31 over 46 gone 93 84 now for
Step IV 31 over 46 now gone 93 84 for
Step V 31 over 46 now 84 gone 93 for and

Step V is the last step of the rearrangement of the above input.

As per the rules followed in the above steps, find out in each of the following questions the appropriates step for the given input.

1. Step III of an input is 15 window 29 93 86 sail tower buy. Which of the following will be step VI?

(a) 15 window 29 tower 86 sail 93 buy
(b) 15 window 29 tower 86 93 sail buy
(c) 15 window 29 tower 93 86 sail buy
(d) There will be no such step
(e) None of the above

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2. Input station hurry 39 67 all men 86 59.
How many steps will be required to complete the rearrangement?
(a) Four (b) Five (c) Six
(d) Three (e) None of these

3. Step II of an input is 49 zone car battery 56 87 71 down.
Which of the following is definitely the input?
(a) car 49 battery zone 56 87 71 down
(b) zone 49 car battery 56 87 71 down
(c) battery car 49 zone 56 87 71 down
(d) Cannot be determined
(e) None of the above

4. Input news 79 53 glory for 46 29 task.
Which of the following will be step IV?
(a) 29 task 46 news 53 glory 79 for
(b) 29 task 46 news 53 79 glory for
(c) 29 task 46 news 79 53 glory for
(d) 29 news 79 53 glory for 46 task
(e) None of the above

5. Step III of an input is 27 tube 34 gas chamber row 74 53.
Which of the following steps will be the last but one?
(a) VI (b) VII (c) VIII
(d) V (e) None of these

6. Step II of an input is 19 yr 85 74 near gone 26 store.
How many more steps will be required to complete the rearrangement?
(a) Three (b) Four (c) Two
(d) Five (e) None of these

Directions (Q. Nos. 7-11) *Study the given information and answer the following questions.*

[SBI (PO) 2013]

When a word and number arrangement machine is given an input line of words and numbers, it arranges them following a particular rule. The following is an illustration of input and rearrangement (All the numbers are two-digit numbers)

Input 40 made butter 23 37 cookies salt extra 52 86 92 fell now 19
Step I butter 19 40 made 23 37 cookies salt extra 52 86 92 fell now
Step I cookies 23 butter 19 40 made 37 salt extra 52 86 92 fell now
Step III extra 37 cookies 23 butter 19 40 made salt 52 86 92 fell now
Step IV fell 40 extra 37 cookies 23 butter 19 made salt 52 86 92 now
Step V made 52 fell 40 extra 37 cookies 23 butter 19 salt 86 92 now
Step VI now 86 made 52 fell 40 extra 37 cookies 23 butter 19 salt 92
Step VII salt 92 now 86 made 52 fell 40 extra 37 cookies 23 butter 19

Step VII is the last step of the above arrangement as the intended arrangement is obtained.

As per the rules followed in the given steps, find out the appropriate steps for the given input.

Input 32 proud girl beautiful 48 55 97 rich family 61 72 17 nice life

7. How many steps will be required to complete the given input?
(a) Five (b) Six (c) Seven
(d) Eight (e) Nine

8. Which of the following is the third element from the left end of Step VI?
(a) Beautiful (b) Life
(c) 61 (d) Nice
(e) 17

9. Which of the following is Step III of the given input?
(a) proud 72 gi 48 family 32 beautiful 17 55 97 rich 61 nice life
(b) life 55 girl 48 family 32 beautiful 17 proud 97 rich 61 72 nice
(c) girl 48 family 32 beautiful 17 proud 55 97 rich 61 72 nice life
(d) family 32 beautiful 17 proud girl 48 55 97 rich 61 72 nice life
(e) girl 48 life 55 family 32 beautiful 17 proud 97 rich 61 72 nice

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10. What is the position of 'nice' from the left end in the final step?
(a) Fifth (b) Sixth
(c) Seventh (d) Eighth
(e) Ninth

11. Which element is third to the right of 'family' in Step V?
(a) Beautiful (b) 17 (c) Proud
(d) 97 (e) 32

Directions (Q. Nos. 12-15) *The following questions are based on grammatical rules.*

Input cigarette smoking is injurious to health.
Rule I follows smoking of rule
Rule II cigarette when smoked
Rule III due to
Rule IV in any form etc.

Solve the problems by using above rules.

A grammer teacher instructs her students with the following inputs for restatement as per given rules.

Input cigarette smoking is injurious to health.
Rule I smoking of cigarette is injurious to health
Rule II cigarette when smoked injurious health
Rule III health is injured due to smoking
Rule IV smoking in any form is injurious to health.

As per rules dictated by the teacher, find out (as a student), the relevant step or the input, as asked in the given problems.

12. **Input** tobacco chewing is harmful for teeth. Which of the following rules is chewing of tobacco is injurious for teeth?
(a) II (b) III (c) I
(d) IV (e) None of these

13. Students are benefited due to coachings, in which rule of given input?
(a) I
(b) III
(c) II
(d) Data inadequate
(e) None of the above

14. **Rule IV on an input is** coachings in any form are beneficial for the students, what would be rule I for the input?
(a) taking of coachings is beneficial to the students
(b) coaching when taken, benefit the student
(c) students are benefited due to coachings
(d) Data inadequate
(e) None of the above

15. **Input** given by a teacher is Excessive weightlifting is harmful for joints, which of the following will be rule III of the input?
(a) weights are harmful for joints
(b) excessive weights, when lifted harm joints
(c) weightlifting in any form harm joints
(d) joints are harmed due to excessive weightlifting
(e) Data inadequate

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Answer *with* Explanations

A. Base Level Exercise

1. (*b*) *Input* year 39 stake 47 house full 94 55
Step I full year 39 stake 47 house 94 55
Step II full 94 year 39 stake 47 house 55
Step III full 94 house year 39 stake 47 55
Step IV full 94 house 55 year 39 stake 47
Step V full 94 house 55 stake year 39 47
Step VI full 94 house 55 stake 47 year 39
Hence, six step will required to complete the arrangement.

2. (*b*) *Step II* car 83 lost ever 32 46 74 now
Step III car 83 ever lost 32 46 74 now
Step IV car 83 ever 74 lost 32 46 now
Step V car 83 ever 74 lost 46 32 now
Step VI car 83 ever 74 lost 46 now 32
So, four more step to complete the arrangement.

3. (*d*) *Input* cannot be determined

4. (*a*) *Input* water full never 35 78 16 height 28
Step I full water never 35 78 16 height 28
Step II full 78 water never 35 16 height 28
Step III full 78 height water never 35 16 28
Step IV full 78 height 35 water never 16 28
Step V full 78 height 35 never water 16 28
Step VI full 78 height 35 never 28 water 16
Hence, Step VI will be the last step.

5. (*d*) *Step II* high 69 store pay 36 43 15 there
Step III high 69 pay store 36 43 15 there
Step IV high 69 pay 43 store 36 15 there
Step V high 69 pay 43 store 36 there 15
Step VI will not exist

6. (*a*) *Input* 16 power failure 61 53 new cost 27
Step I 61 16 power failure 53 new cost 27
Step II 61 cost 16 power failure 53 new 27
Step III 61 cost 53 16 power failure new 27
Step IV 61 cost 53 failure 16 power new 27
Step V 61 cost 53 failure 27 16 power new
Step VI 61 cost 53 failure 27 new 16 power
Hence, six steps are required to complete the rearrangement.

7. (*d*) We cannot determine the input.

8. (*a*) *Step III* 63 bed 58 never go home 46 28
Step IV 63 bed 58 go never home 46 28
Step V 63 bed 58 go 46 never home 28
Step VI 63 bed 58 go 46 home never 28
Step VII 63 bed 58 go 46 home 28 never
Hence, four more steps are required to complete the rearrangement.

9. (*a*) *Input* rows 25 columns 39 46 fear star 72
Step I 72 rows 25 columns 39 46 fear star
Step II 72 columns rows 25 39 46 fear star
Step III 72 columns 46 rows 25 39 fear star
Step IV 72 columns 46 fear rows 25 39 star
Step V 72 columns 46 fear 39 rows 25 star
Hence, Step V is the last step.

10. (*b*) *Input* ordinary 47 tablet 36 dry 91 32 handle
Step I 91 ordinary 47 tablet 36 dry 32 handle
Step II 91 dry ordinary 47 tablet 36 32 handle
Step III 91 dry 47 ordinary tablet 36 32 handle
Step IV 91 dry 47 handle ordinary tablet 36 32
Step V 91 dry 47 handle 36 ordinary tablet 32
Step VI 91 dry 47 handle 36 ordinary 32 tablet

11. (*d*) *Input* organise 19 12 stable room 35 72 house
Step I 72 organise 19 12 stable room 35 house
Step II 72 house orgnise 19 12 stable room 35
Step III 72 house 35 organise 19 12 stable room
Step IV 72 house 35 organise 19 room 12 stable
So, four steps will required to complete the arrangement.

12. (*a*) *Input* bake never store 51 26 33 age 49
Step I 51 bake never store 26 33 age 49
Step II 51 age bake never store 26 33 49
Step III 51 age 49 bake never store 26 33
Step IV 51 age 49 bake 33 never store 26
Step V 51 age 49 bake 33 never 26 store

13. (*b*) *Step III* year 92 ultra 15 23 strive house 39
Step IV year 92 ultra 39 15 23 strive house
Step V year 92 ultra 39 strive 15 23 house
Step VI year 92 ultra 39 strive 23 15 house
Step VII year 92 ultra 39 strive 23 house 15
So, four more steps are required.

14. (*c*) *Input* any how 49 24 for wide 34 69
Step I wide any how 49 24 for 34 69
Step II wide 69 any how 49 24 for 34
Step III wide 69 how any 49 24 for 34
Step IV wide 69 how 49 any 24 for 34
Step V wide 69 how 49 for any 24 34
Step VI wide 69 how 49 for 34 any 24
So, Step V is first step from last.

15. (*d*)
16. (*d*)
17. (*e*)
18. (*a*
19. (
20.
21.
22.
23.
24

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15. (*e*) *Input* cannot be determined

16. (*e*) cannot be determined

17. (*e*) *Step I* 34 fire dress well 63 43 prime 52
Step II 34 dress fire well 63 43 prime 52
Step III 34 dress 43 fire well 63 prime 52
Step IV 34 dress 43 fire 52 well 63 prime
Step V 34 dress 43 fire 52 prime well 63
Step VI 34 dress 43 fire 52 prime 63 well
So, the step last but one is Step V

18. (*c*) *Input* just in time for 36 48 14 59
Step I 14 just in time for 36 48 59
Step II 14 for just in time 36 48 59
Step III 14 for 36 just in time 48 59
Step IV 14 for 36 in just time 48 59

19. (*d*) *Step III* 23 fine 38 49 sixty rely 56 next
Step IV 23 fine 38 next 49 sixty rely 56
Step V 23 fine 38 next 49 rely sixty 56
Step VI 23 fine 38 next 49 rely 56 sixty
So, to complete the arrangement four steps are required.

20. (*b*) *Input* 86 open shut door 31 49 always 45
Step I 31 86 open shut door 49 always 45
Step II 31 shut 86 open door 49 always 45
Step III 31 shut 45 86 open door 49 always
Step IV 31 shut 45 open 86 door 49 always
Step V 31 shut 45 open 49 86 door always
Step VI 31 shut 45 open 49 door 86 always
Hence, six steps are required to complete the rearrangement.

21. (*d*) *Input* cannot be determined of the given Step III.

22. (*b*) *Step II* 18 win 71 34 now if victory 61
Step III 18 win 34 71 now if victory 61
Step IV 18 win 34 victory 71 now if 61
Step V 18 win 34 victory 61 71 now if
Step VI 18 win 34 victory 61 now 71 if
Hence, four more steps are required to complete the rearrangement.

23. (*e*) *Input* where 47 59 12 are they going 39
Step I 12 where 47 59 are they going 39
Step II 12 where 39 47 59 are they going
Step III 12 where 39 they 47 59 are going
Step IV 12 where 39 they 47 going 59 are
Hence, Step III is the last but one.

24. (*c*) *Step II* 33 store 81 75 full of goods 52
Step III 33 store 52 81 75 full of goods
Step IV 33 store 52 of 81 75 full goods
Step V 33 store 52 of 75 81 full goods
Step VI 33 store 52 of 75 goods 81 full

Solutions (*Q. Nos. 25-29*) *The word and number arrangement steps are*

Step I all for 52 25 jam road 15 hut 73 bus stop 38 46 96
Step II bus all for 52 25 jam road 15 hut stop 38 46 96 73
Step III for bus all 25 jam road 15 hut stop 38 46 96 73 52
Step IV hut for bus all 25 jam road 15 stop 38 96 73 52 46
Step V jam hut for bus all 25 road 15 stop 96 73 52 46 38
Step VI road jam hut for bus all 15 stop 96 73 52 46 38 25
Step VII stop road jam hut for bus all 96 73 52 46 38 25 15

25. (*a*) **26.** (*d*) **27.** (*b*) **28.** (*c*) **29.** (*c*)

30. (*d*) *Batch II* do lean window out of not
Batch III do lean not window out of
Batch IV do lean not of window out

31. (*b*) *Input* please do not delay the matter
Batch I delay please do not the matter
Batch II delay do please not the matter
Batch III delay do matter please not the

32. (*d*) Cannot be determined

33. (*e*) *Batch II* children for not is good watching television
Batch III children for good not is watching television
Batch IV children for good is not watching television
Batch V children for good is not television watching.

34. (*c*) *Input* necessary arrangements have already been made
Batch I already necessary arrangements have been made
Batch II already arrangements necessar have been made
Batch III already arrangements bee necessary have made
Batch IV already arrangements been ha necessary made
Batch V already arrangements been ha made necessary
So, the last batch is V.

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B. **Expert Level Exercise**

1. (*a*) *Step III* 15 window 29 93 86 sail tower buy
Step IV 15 window 29 tower 93 86 sail buy
Step V 15 window 29 tower 86 93 sail buy
Step VI 15 window 29 tower 86 sail 93 buy

2. (*b*) *Step I* 39 station hurry 67 all men 86 59
Step II 39 station 59 hurry 67 all men 86
Step III 39 station 59 men hurry 67 all 86
Step IV 39 station 59 men 67 hurry all 86
Step V 39 station 59 men 67 hurry 86 all
Hence, five more step to required the rearrangement.

3. (*d*) *Input* cannot be determined

4. (*b*) *Input* news 79 53 glory for 46 29 task
Step I 29 news 79 53 glory for 46 task
Step II 29 task news 79 53 glory for 46
Step III 29 task 46 news 79 53 glory for
Step IV 29 task 46 news 53 79 glory for

5. (*d*) *Step III* 27 tube 34 gas chamber row 74 53
Step IV 27 tube 34 row gas chamber 74 53
Step V 27 tube 34 row 53 gas chamber 74
Step VI 27 tube 34 row 53 gas 74 chamber So, the step last but one is Step V.

6. (*b*) *Step II* 19 yr 85 74 near gone 26 store
Step III 19 yr 26 85 74 near gone store
Step IV 19 yr 26 store 85 74 near gone
Step V 19 yr 26 store 74 85 near gone
Step VI 19 yr 26 store 74 near 85 gone
Hence, four more step to required the rearrangement.

Solutions (Q. Nos. 7-11)

Input 32 proud girl beautiful 48 55 97 family 61 72 17 nice life
Step I beautiful 17 32 proud girl 48 55 97 family 61 72 nice life
Step II family 32 beautiful 17 proud girl 48 97 rich 61 72 nice life
Step III girl 48 family 32 beautiful 17 proud 97 rich 61 72 nice life
Step IV life 55 girl 48 family 32 beautiful 17 proud 97 rich 61 72 nice
Step V nice 61 life 55 girl 48 family 32 beautiful 17 proud 97 rich 72
Step VI proud 72 nice 61 life 55 girl 48 family 32 beautiful 17 97 rich
Step VII rich 97 proud 72 nice 61 life 55 girl 48 family 32 beautiful 17

7. (*c*) **8.** (*d*) **9.** (*c*) **10.** (*a*) **11.** (*b*)

12. (*c*) *Input* tobacco chewing is injurious for teeth. Chewing of tobacco is injurious for teeth. So, rule I follows

13. (*b*) In this due to comes, so rule III follows. Students are benefited due to coachings.

14. (*a*) *Rule IV* coaching in any form are beneficial for the students.
Rule I taking of coachings is beneficial to the students.

15. (*d*) *Rule III* will follow rule due to. So, joints are harmed due to excessive weightlifting is the answer.

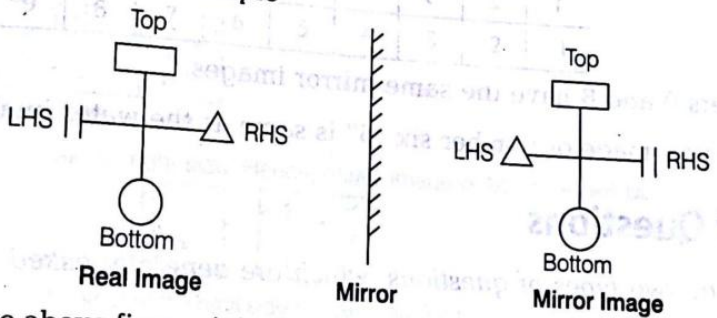
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1 Mirror Image

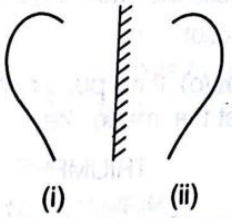
The figure obtained by putting a mirror in front of the real image is known as mirror image or we can say that the reflection of an object into the mirror is called its mirror image.

Let us consider an example

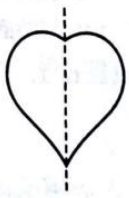


From the above figure, it is clear that in a mirror image top and bottom of a image does not change but the LHS (left hand side) of real image becomes RHS (right hand side) in mirror image and RHS in real image becomes LHS in mirror image. So, it can be concluded that the mirror image is the lateral in version of real image.

Now, look at the following figures.



If we combine both the figures, we get a new figure in the shape of heart.



Take a mirror and place it along the vertical dotted line running through the middle of this shape. You will see that the half figure on the left together with its image in the mirror on the right gives the complete figure of the heart.

So, we can say that on combining the original and mirror image together, they form a symmetry.

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Mirror Images of Capital Letters

Real Image	A	B	C	D	E	F	G	H	I	J	K	L	M
Mirror Image	A	ꓭ	Ↄ	ᗡ	Ǝ	Ⅎ	⅁	H	I	Ⅼ	ꓘ	Ⅼ	M
Real Image	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Mirror Image	И	O	ꟼ	Ò	Я	Ƨ	T	U	V	W	X	Y	Ƹ

The letters which have the same mirror images are—A, H, I, M, O, T, U, V, W, X and Y.

Mirror Images of Small Letters

Real Image	a	b	c	d	e	f	g	h	i	j	k	l	m
Mirror Image	ɒ	d	ɔ	b	ɘ	ɟ	ϱ	ɥ	i	ɾ	ʞ	l	m
Real Image	n	o	p	q	r	s	t	u	v	w	x	y	z
Mirror Image	n	o	ϱ	p	ɿ	ƨ	ɟ	u	v	w	x	ʏ	ƹ

The letters which have the same mirror images are— i, l, o, v, w and x.

Mirror Images of Numbers

1	2	3	4	5	6	7	8	9	0
ɩ	Ƨ	Ɛ	↊	Ƨ	ϭ	ᄀ	8	ϱ	0

Numbers 0 and 8 have the same mirror images.

The mirror image of number six "6" is same as the water image of number "9".

Types of Questions

There are two types of questions, which are generally asked in exams, regarding mirror images.

Type 1 Letter/Number Images

Here, we are given with a combination of letters/words/numbers. We have to find their mirror images out of given alternatives.

Directions (Illustrations 1-4) *In each of the following questions, you are given a combination of alphabets and/or numbers followed by four alternatives (a), (b), (c) and (d). Choose the alternative which most closely resembles the mirror image of the given combination.*

Illustration 1. FUN

(a) ꟻUN (b) UИ⅁
(c) NUF (d) NUꟻ

Solution (a) If we put a mirror in front of the word, we get the following image

FUN | ꟻUN

Illustration 2. TRIUMPHS

(a) SHPMUIRT (b) SPMIURT
(c) STRIUMPH (d) SHꟼMUIRT

Solution (d) If we put a mirror in front of the word, we will get the image like

TRIUMPHS | SHꟼMUIRT

Illustration 3. 2 3 4 5

(a) ↊Ɛ↊Ƨ (b) ƧᵬƐƧ
(c) Ɛ↊ƧƐ (d) Ƨ↊ƐƧ

Solution (c) If we put a mirror in front of the number, we will get the image like

2345 | Ɛ↊ƧƐ

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Illustration 4. 73AP4OD8

(a) 7ƐA9ƭOD8 (b) 8DOƭ9AƐ7
(c) 7ƐA9ƭOD8 (d) 8DOƭPAƐ7

Solution (b) If we put a mirror in front of the number, we will get the image like

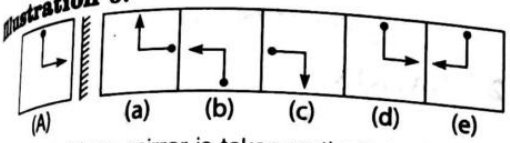
73AP40D8 ‖ 8D0ƭ9AƐ7

Type 2 Geometrical Images

In this types of questions, we deal with figures having defined geometrical shapes.

Directions (Illustrations 5 - 6) *In each of the following questions, choose the correct mirror image from alternatives (a), (b), (c), (d) and (e) of the figure (A).*

Illustration 5.



Solution (e) Here, mirror is taken vertically to right side. Hence, mirror image of figure (A) will be like

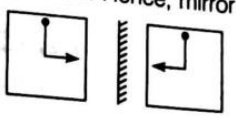
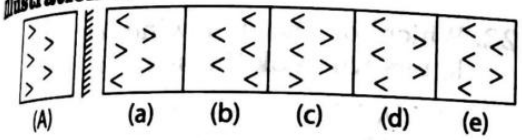
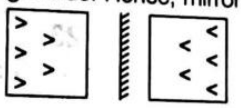


Illustration 6.



Solution (b) Here, mirror is taken vertically to right side. Hence, mirror image of figure (A) will be like



Note It is not necessary that a mirror is to be kept at the right side of figure, but it can be kept any where in the question and so accordingly we can find the mirror image

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-18) *In each of the following questions, four alternative are given, which follow the word number marked as question. You have to select one alternative, which exactly matches with the mirror image of the word/number in the question.*

1. NIRMALA

(a) ALAMRIN (b) AJAMRIN
(c) NRILAMA (d) INRMALA

2. VINAYAKA

(a) INVAYAKA (b) AKAYANIV
(c) AKAYANIV (d) NIVYAAKA

3. OBSTINATE

(a) ƎTANITSBO (b) BOSTINATE
(c) ETANITSBO (d) SOBTNIATE

4. PROCRASTINATE

(a) ETANITSARCORP (b) ƎTANITSAЯOOЯ
(c) RPORCASTNITAE (d) ETPROCRASTINA

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5. PRECARIOUS

(a) ƧUOIRAƆƎRԀ (b) SUOIRACERP
(c) SUOPRECARI (d) SPRECARIOU

6. PERFECTION

(a) NOITCEFERP (b) RPEFECTION
(c) NOITCEFREԀ (d) ERPFECTION

7. VISHAL

(a) LAHSIV (b) VISHAL
(c) LAHSIV (d) VISHAL

8. FIXING

(a) GNIXIF (b) ꟻIXIИG (c) GИIXIF (d) ꟻIXIИG

9. ZEBRA

(a) ARBEZ (b) ARBEZ
(c) ARBEZ (d) ARBEZ

10. FANTASY

(a) YSATNAF (b) FNTASAY
(c) YSATNAF (d) YFANTSAY

11. ARUNACHAL [SSC (Steno) 2013]

(a) LAHCANURA (b) ARUNACHAL
(c) LAHCANURA (d) ARUNACHAL

12. RADIANT

(a) TNAIDAR (b) TNAIDAR
(c) TRADIAN (d) TIANRAD

13. BENEDICTION

(a) NOITCIDENEB (b) NEBEDICTION
(c) NOITCIDENEB (d) NOIBENEDICT

14. 2 4 7 5 9 6

(a) 6 9 5 7 4 2 (b) 2 4 7 5 9 6
(c) 6 9 5 7 4 2 (d) 2 4 7 5 9 6

15. BUZZER

(a) RЭZZUB (b) RUZZEB
(c) RЭZZUB (d) REZZBU

16. 1 3 9 4

(a) 4 ɘ 3 1 (b) ⅄ ɘ ε 1 (c) ⅄ ε ɘ 1 (d) 4 ɘ ε 1

17. GUIDED

(a) ƆƎIUƆ (b) ƆƎIUIG
(c) ƆƎIUƆ (d) DEIUG

18. disturb

(a) qursip (b) dıstuɥ (c) disturd (d) dıʇsıp

19. How many letters of the English alphabet appears same when looked at in a mirror. [CG PSC 2019]

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

Directions (Q. Nos. 20-21) *In each of the following questions, you are given a combination of alphabets and/or numbers followed by four alternatives* (a), (b), (c) *and* (d). *Choose the alternative, which most closely resembles the mirror image of the given combination.*

20. NATIONAL

(a) LAИOITAИ (b) LAИOITAИ
(c) LAИOITAИ (d) LAИOITAИ

21. ANS43Q12

(a) ANSƐ⅄OIS (b) SIOƐ⅄SNA
(c) SNA⅄ƐOSI (d) I⅄OƐ⅄SNA

22. Which of the following collections of letters will look the same in the mirror?

(a) OSMIHOM (b) VHRTRVH
(c) HIMOSTA (d) AOVIVOA

23. Looking into a mirror, the clock shows 9 : 30 as the time. The actual time is

(a) 2 : 30 (b) 3 : 30
(c) 4 : 30 (d) 6 : 30

24. When seen through a mirror, a clock shows 8:30. The correct time is

(a) 2 : 30 (b) 3 : 30
(c) 5 : 30 (d) 8 : 30

25. By looking in a mirror, it appears that it is 6 : 30 in the clock. What is the real time?

(a) 6 : 30 (b) 5 : 30
(c) 6 : 00 (d) 5 : 50

26. A clock seen through a mirror shows quarter past three. What is the correct time shown by the clock?

(a) 9 : 45 (b) 9 : 15
(c) 8 : 45 (d) 3 : 15

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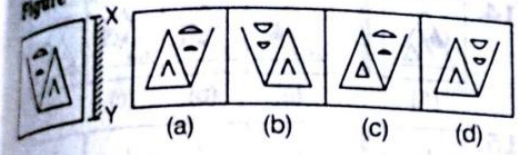
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Expert Level Exercise

Directions (Q. Nos. 1-2) *In each of the following questions, choose the correct mirror image of the figure given from amongst the four alternatives (a), (b), (c) and (d) given along with it.*

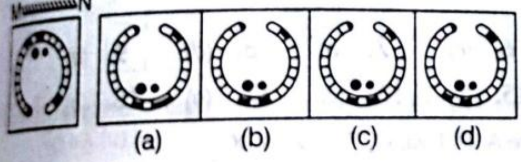
1. Which of the answer figures is exactly the miror image of the problem figure when the mirror is held at XY?
[SSC (Multitasking) 2012]

Problem Figure | Answer Figures



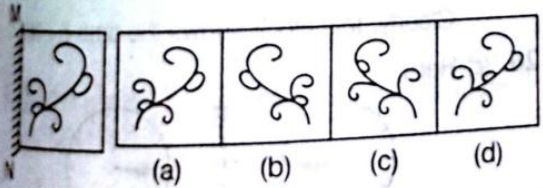
2. If a mirror is placed on the line MN, then which of the answer figures is the right image of the given problem figure?
[SSC (CGL) 2012]

Problem Figure | Answer Figures

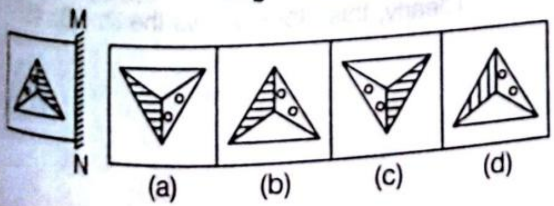


Directions (Q. Nos. 3-4) *In the following questions if a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?*
[SSC (CPO) 2013]

3. Problem Figure | Answer Figures

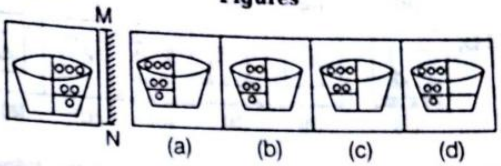


4. Problem Figure | Answer Figures



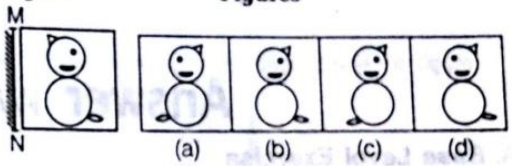
5. Which of the answer figures is exactly the mirror image of the given figure, when the mirror is held on the line MN?
[SSC (FCI) 2012]

Problem Figure | Answer Figures



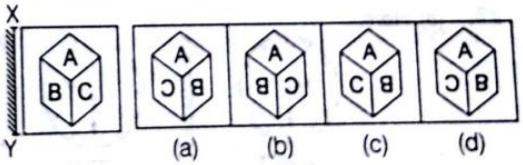
6. If a mirror is placed on the line MN, then which or the answer figures is the right image of the given figure?
[SSC (Multitasking) 2013]

Problem Figure | Answer Figures



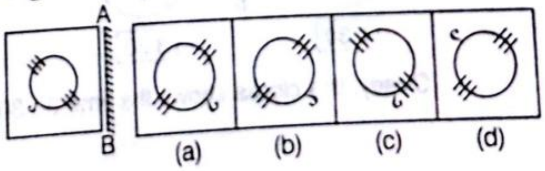
7. If a mirror is placed on the line XY, then which of the answer figures is the right image of the given figure? [SSC (CGL) 2013]

Problem Figure | Answer Figures



8. If a mirror is placed on the line AB, then which of the answer figures is the right image of the given figure?
[SSC (Multitasking) 2013]

Problem Figure | Answer Figures

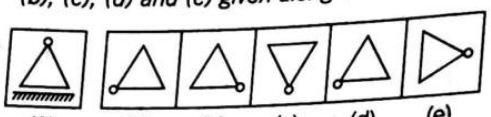


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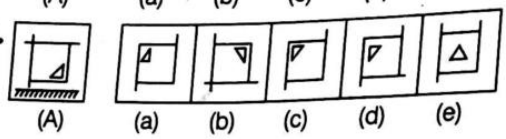
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Directions (Q.Nos. 9-10) *In each of the following questions choose the correct mirror image of the figure (A) from amongst the five alternatives (a), (b), (c), (d) and (e) given along with it.*

9.

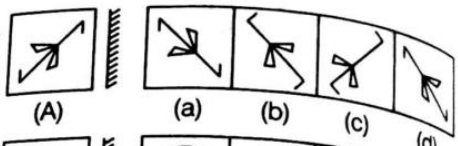


10.

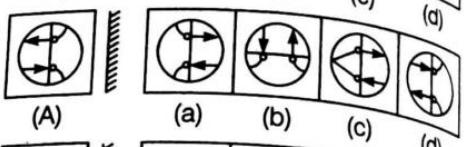


Directions (Q. Nos. 11-15) *In each of the following questions, choose the correct mirror image of the figure (A) from amongst the four alternatives (a), (b), (c) and (d) given along with it.*

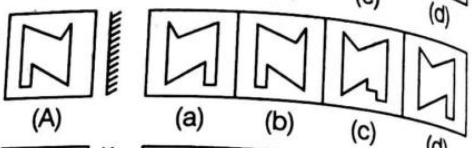
11.



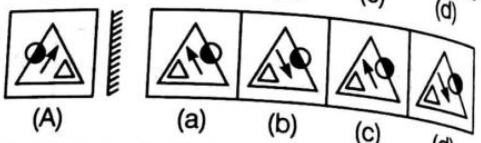
12.



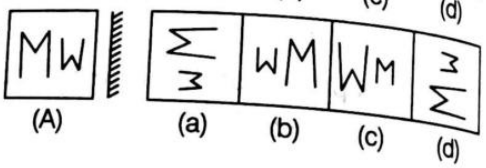
13.



14.



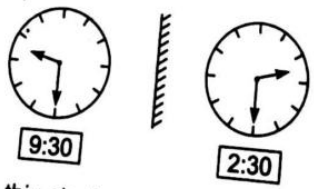
15.



Answer *with* Explanations

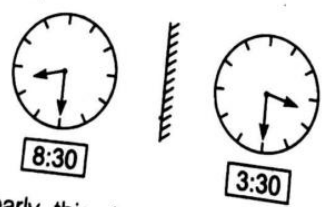
A. Base Level Exercise

1. (b) **2.** (c) **3.** (a) **4.** (b) **5.** (a) **6.** (c) **7.** (a) **8.** (d) **9.** (a)
10. (a) **11.** (c) **12.** (b) **13.** (c) **14.** (d) **15.** (a) **16.** (c) **17.** (a) **18.** (b)
19. (c) The English alphabets which appear same in mirror are A, H, I, M, O, T, U,V, W, X.
20. (b) **21.** (b) **22.** (d)
23. (a) Here,



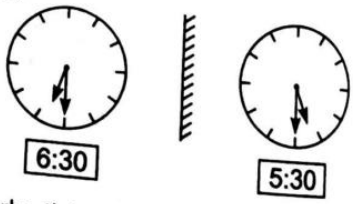
Clearly, this clocks shows the time 2 : 30.

24. (b) Here,



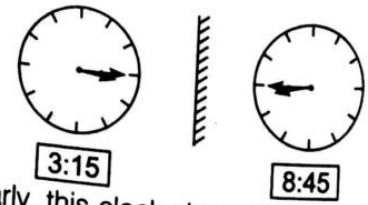
Clearly, this clocks shows the time 3 : 30.

25. (b) Here,



Clearly, this clock shows the time 5 : 30.

26. (c) Here,



Clearly, this clock shows the time 8 : 45

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Expert Level Exercise

1. (a) Answer figure (a) is the correct mirror image.



2. (d) Answer figure (d) is the right mirror image of question figure.



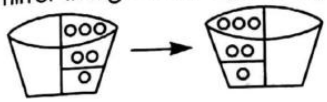
3. (b) The correct mirror image is given is option (b) *i.e.*,



4. (b) The correct mirror image is given in option (b) *i.e.*,



5. (a) The mirror image of the given figure is



6. (a) The mirror image of the problem figure is answer figure (a).



7. (a) Option (a) is the correct mirror image of problem figure



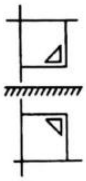
8. (a) The correct mirror image is given in figure option (a).



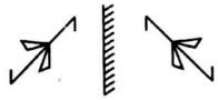
9. (c) The correct mirror image is given in figure option (c) *i.e.*,



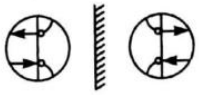
10. (b) The correct mirror image is given in figure option (b) *i.e.*,



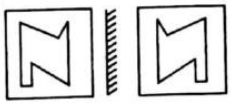
11. (d) The correct mirror image is given in figure option (a) *i.e.*,



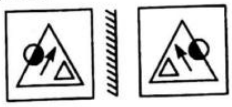
12. (a) The correct mirror image is given in figure option (a) *i.e.*,



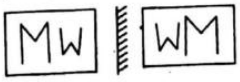
13. (a) The correct mirror image is given in figure option (a) *i.e.*,



14. (a) The correct mirror image is given in figure option (a) *i.e.*,



15. (b) The correct mirror image is given in figure option (b) *i.e.*,



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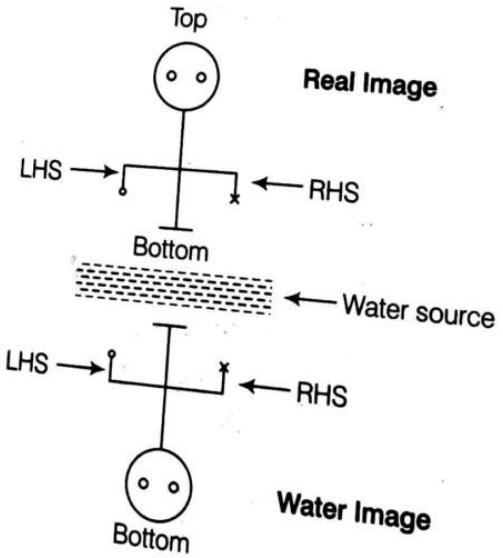
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2

Water Image

The reflection of an object into the water is called its water image. It is obtained by inverting an object vertically i.e., upside down.

The water image of the figure looks like the mirror image of the figure when the mirror is placed horizontally at the bottom of the figure. When an object is placed near a water source like river, poud or water tub etc. Then, image formed in the water is called water image of that object. *e.g.*,



From the above figure, it is clear that the water image is a inverted from a real image in which LHS (Left Hand Side) and RHS (Right Hand Side) remain at their initial position *i.e.*, remains on the same side as they are in original figure but the top and bottom of the figure gets interchanged *i.e.*, top becomes bottom and bottom becomes top.

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Water Images of Capital Letters

Real image	A	B	C	D	E	F	G	H	I	J	K	L	M
Water image	∀	B	C	D	E	Ⅎ	⅁	H	I	ſ	K	⅂	W
Real image	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Water image	И	O	b	Ò	Я	Ƨ	⊥	∩	Λ	M	X	⅄	Ƹ

The letters which have the same water images are — C, D, E, H, I, K, O, X.

Water Images of Small Letters

Real Image	a	b	c	d	e	f	g	h	i	j	k	l	m
Water Image	ɒ	p	c	q	ɘ	ɟ	ɑ	ɥ	!	ɾ	ʞ	l	ɯ
Real Image	n	o	p	q	r	s	t	u	v	w	x	y	z
Water Image	u	o	b	d	ɹ	ƨ	ɟ	n	ʌ	ʍ	x	ʎ	z

The letters which have the same water images are — c, l, o, x.

Water Images of Numbers

Real Image	0	1	2	3	4	5	6	7	8	9
Water Image	0	ſ	Ƨ	Ɛ	↓	Ƨ	⅁	ㄥ	8	ɑ

Numbers 0, 3 *and* 8 have the same water images.

ypes of Questions

There are two types of questions based on water images, which can be asked in various mpetitive examinations.

ype 1 Letter/Number Images

... given a combination of letters /numbers and have to find their water images.

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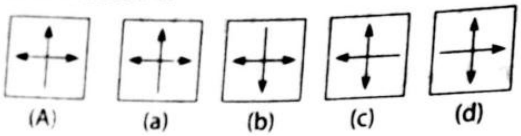
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Type 2 **Geometrical Images**

In this case, we are given some figures/shapes and we have to find corresponding wate images.

Direction (Illustration 4) *In each of the following questions, choose the correct water image of the figure (A) fr the given four alternatives (a), (b), (c) and (d).*

Illustration 4.



Solution (b) The water image of the figure (A) will be



Let us Practice

A. Base Level Exercise

Directions (Q.Nos. 1-12) *In each of the following questions, a word/group of letters or numbers or both is followed by four alternatives (a), (b), (c), (d) showing possible water image of that word/group of letters or numbers or both. One, out of these four alternatives, is the exact water image of that word/group of letters or numbers or both. Chooses from the alternatives is the correct water image of that word/group of letters or numbers or both*

1. CORDIAL

(a) COЯDIAL (b) COЯDIAT
(c) COЯDIAJ (d) JAIDROƆ

2. PRECARIOUS

(a) ЬЯECAЯIOUS (b) ƧUOIЯAƆEЯq
(c) ЬЯECAЯIOUS (d) ЬЯECAƧUOIЯ

3. SUPERFLOUS

(a) ƧUOJFЯEqUƧ (b) ƧUϽƎЯƎJOUƧ
(c) ƧUϽƎƧUOJFЯ (d) ƧUϽƎЯƎJOUƧ

4. POLEMIC

(a) qOJƎIOM (b) OIMƎJOq
(c) ЬOJƎMIC (d) ЬOJMOIƎ

5. FECUND

(a) ᗡNUϽƎꟻ (b) ꟻƎϽUИD
(c) ꟻƎϽDNU (d) ꟻƎϽUИD

6. RADIANT

(a) ЯADITNAI (b) ЯADIANT
(c) ЯADIAИT (d) TИAIDAЯ

7. MUNDANE

(a) WUИƎИAИD (b) WUИDAИE
(c) WUИDAИE (d) ƎИADUИM

8. OBLITERATE

(a) OBꞀITERATE (b) ƎTAЯETIꞀBO
(c) OBꞀITƎTAЯƎ (d) OBꞀITERATE

9. D6Z7F4

(a) Dϐ2ꞀFㅓ (b) Dϐ2ꞀƎㅓ
(c) Dϐ2ꞀƎㅓ (d) D6ZㅓF7

10. ab45CD67

(a) aPㅓSCD6Ꞁ (b) gPㅓSCDϐㅓ
(c) gPㅓSCDϑㅓ (d) gPㅓSCD9Ꞁ

11. TㅓFW

(a) ㅓTㅓW (b) ㅓTㅓM
(c) ㅓTFM (d) ㅓTFW

12. WOMAN

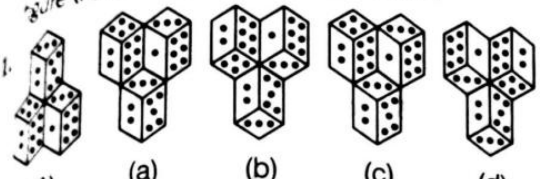
(a) WOMAN (b) ИAMOW
(c) MOMAN (d) MOMAИ

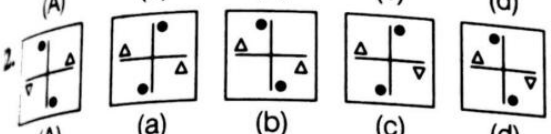
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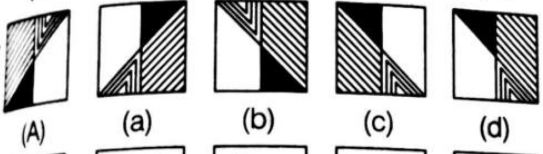
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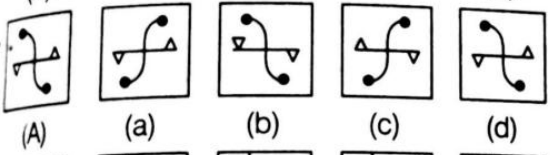
Expert Level Exercise

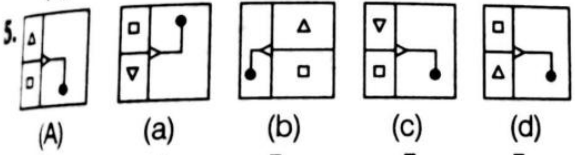
Directions (Q.Nos. 1-16) *In each of the following questions, a figure marked (A) is followed by four other figures (a), (b), (c) and (d) showing the possible water images of figure (A). Choose the correct water image of the figure (A) out of given four alternatives.*

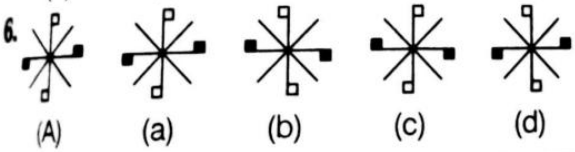
1.

(A) (a) (b) (c) (d)

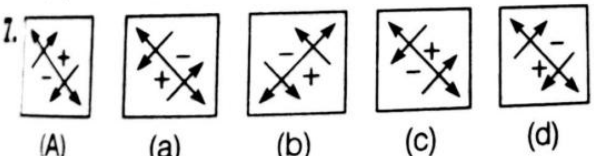
2.

(A) (a) (b) (c) (d)

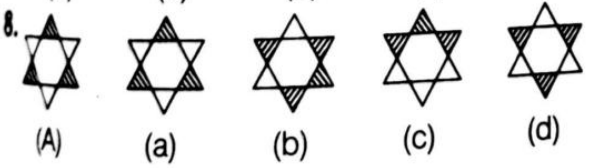
3.

(A) (a) (b) (c) (d)

4.

(A) (a) (b) (c) (d)

5.

(A) (a) (b) (c) (d)

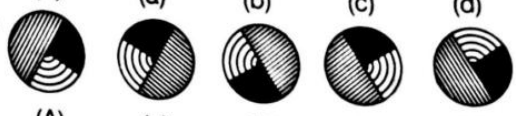
6.

(A) (a) (b) (c) (d)

7.

(A) (a) (b) (c) (d)

8.

(A) (a) (b) (c) (d)

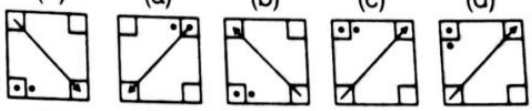
9.

(A) (a) (b) (c) (d)

10.

(A) (a) (b) (c) (d)

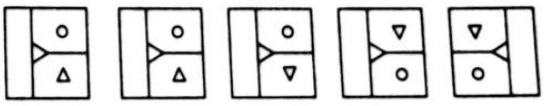
11.

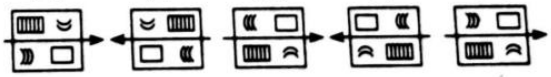
(A) (a) (b) (c) (d)

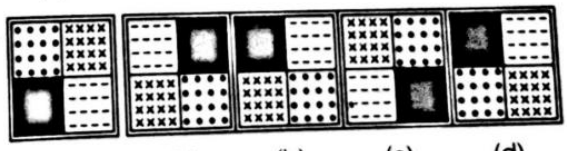
12.

(A) (a) (b) (c) (d)

13.

(A) (a) (b) (c) (d)

14.

(A) (a) (b) (c) (d)

15.

(A) (a) (b) (c) (d)

16.

(A) (a) (b) (c) (d)

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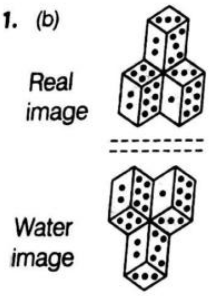
Answers *with* Explanations

A. Base Level Exercise

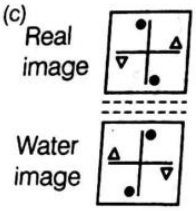
1. (b) **2.** (a) **3.** (d) **4.** (c) **5.** (b) **6.** (c) **7.** (c) **8.** (d) **9.** (c)
10. (b) **11.** (b) **12.** (b)

B. Expert Level Exercise

1. (b)

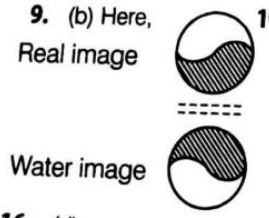


2. (c)



3. (c) **4.** (c) **5.** (a) **6.** (b) **7.** (b)

8. (d) **9.** (b) Here,



10. (d) **11.** (d) **12.** (c) **13.** (d) **14.** (c)

15. (d) **16.** (d)

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(c)

3

b)

Series

Series is continuous sequence of figure following a certain defined pattern.

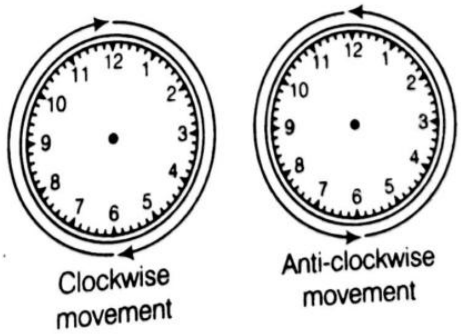
This chapter deal with questions which are based upon the continuation of series. In this types of questions a series of figures is given as problem figure and the candidates are asked to select one of the figures from the set of answer figures which will continue the given sequence.

This type of problem on series consists of four/five figures forming the set of problem figures followed by four/five other figures forming the set of answer figures. The four/five consecutive problem figures form a definite sequence and you will be required to select one of the figures from the set of answer figures which will continue the same sequence correctly

To solve questions on series a candidate must have a clear vision of the concept like rotation, angles, steps of movement, different position etc which are discussed below

1. Rotational Direction

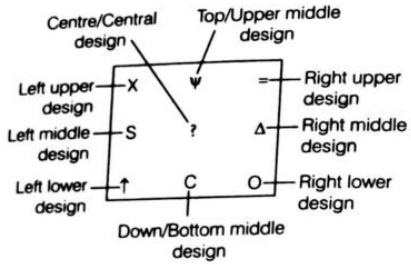
The rotational direction basically states the clockwise and anti-clockwise directions.



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2. Position of Designs

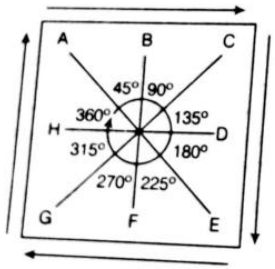
The candidate should be aware of the designs and their positions to gauge their movement.



3. Angular Movement of Designs

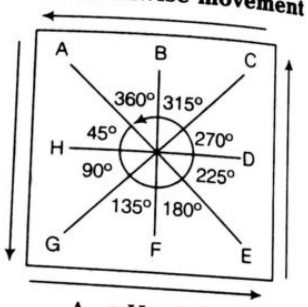
This provides the knowledge of angular movement of designs in clockwise and anti-clockwise directions.

Clockwise movement



$A \rightarrow B = 45°$
$A \rightarrow C = 90°$
$A \rightarrow D = 135°$
$A \rightarrow E = 180°$
$A \rightarrow F = 225°$
$A \rightarrow G = 270°$
$A \rightarrow H = 315°$
$A \rightarrow A = 360°$

Anti-clockwise movement



$A \rightarrow H = 45°$
$A \rightarrow G = 90°$
$A \rightarrow F = 135°$
$A \rightarrow E = 180°$
$A \rightarrow D = 225°$
$A \rightarrow C = 270°$
$A \rightarrow B = 315°$
$A \rightarrow A = 360°$

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gauge their

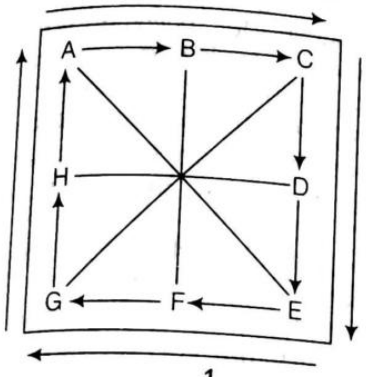
and anti-

t

4. Movement of Designs Through Distance

This provides the knowledge of movement of designs through distance in clockwise and anti-clockwise directions.

Clockwise movement



$A \to B = \frac{1}{2}$ arm/step

$A \to C = 1$ arm/step

$A \to D = 1\frac{1}{2}$ arm/step

$A \to E = 2$ arm/step

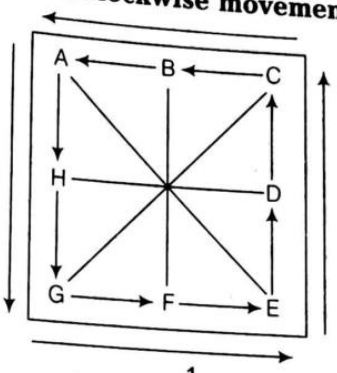
$A \to F = 2\frac{1}{2}$ arm/step

$A \to G = 3$ arm/step

$A \to H = 3\frac{1}{2}$ arm/step

$A \to A = 4$ arm/step

Anti-clockwise movement



$A \to H = \frac{1}{2}$ arm/step

$A \to G = 1$ arm/step

$A \to F = 1\frac{1}{2}$ arm/step

$A \to E = 2$ arm/step

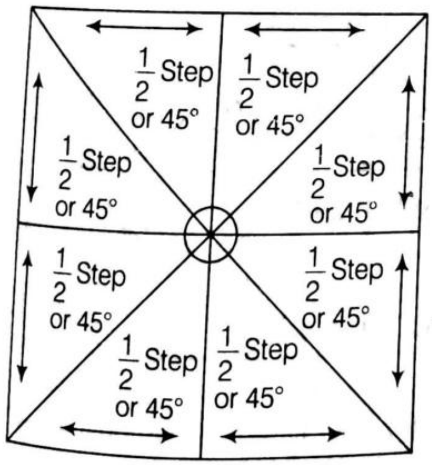
$A \to D = 2\frac{1}{2}$ arm/step

$A \to C = 3$ arm/step

$A \to B = 3\frac{1}{2}$ arm/step

$A \to A = 4$ arm/step

The concept of angular movement and movement through distance can be combined together and described as below



From the given figure,

$45° = \frac{1}{2}$ step, $90° = 1$ step, $135° = 1\frac{1}{2}$ step,

$180° = 2$ step and so on.

These concepts will be very helpful in solving the problems based on series, analogy and classification in pecularity and other problems based on symmetry and visual designs.

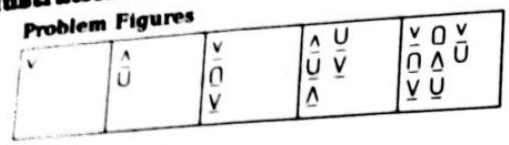
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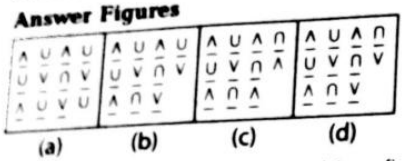
Now, let us solve some questions to have total conceptual clarity

Illustration 1.

Problem Figures



Answer Figures

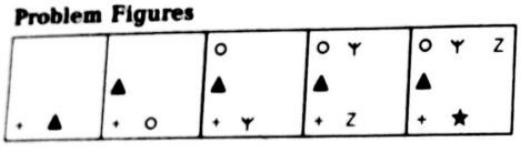


(a) (b) (c) (d)

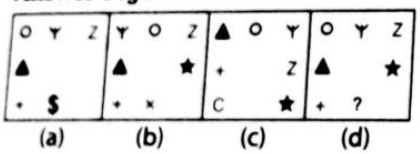
Solution (b) In each successive problem figures, two, three, four,... elements are added and the previous elements/designs rotates through 180°.

Illustration 2.

Problem Figures



Answer Figures

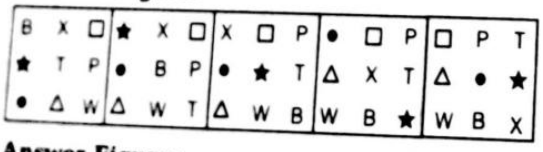


(a) (b) (c) (d)

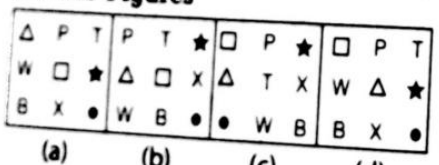
Solution (d) In each successive problem figures, the designs/elements on the right hand side is shifted to left hand side and a new design is added the right hand side in each step.

Illustration 3.

Problem Figures



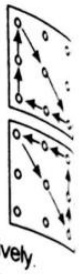
Answer Figures



(a) (b) (c) (d)

Solution (a) To solve this type of complicated problem, make as many dots in the main design as there are small designs.

In the problem figure (a) to (b), we see that there is movement of left upper design by 1/2 arm in clockwise direction to become central middle design, central design by 1/2 arm in clockwise direction to become right lower design and so on.



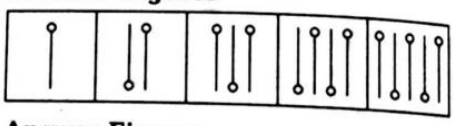
Similarly, in the problem figure (b) to (c) left upper design move by 1/2 arm in anti-clockwise to become central design and so on, in both cases three designs do not changes it position in upper corner and lower corner, respectively.

Now, we should move from problem figure (a) to problem figure (b) and so an to detect the pattern.

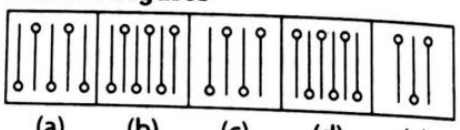
Directions (Illustrations 4-7) *Each of the following questions consists of four/five figures as the problem figure followed by four/five figures marked (a), (b), (c), (d), (e) as the answer figures. Select correct answer figure which will continue the series as established by the problem figures.*

Illustration 4.

Problem Figures



Answer Figures

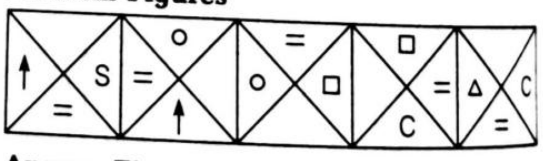


(a) (b) (c) (d) (e)

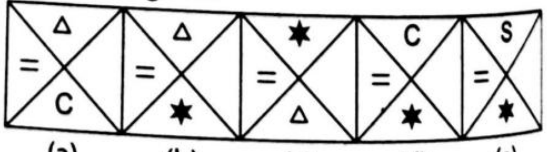
Solution (b) In each step a pin is added on the left hand side of existing pin/pins. The head of the pin is in a direction opposite to adjacent pin.

Illustration 5.

Problem Figures



Answer Figures



(a) (b) (c) (d) (e)

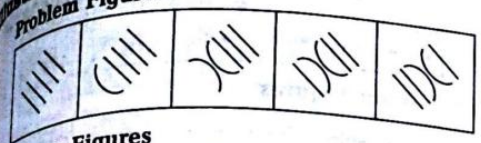
Solution (c) The first two symbols in anti-clockwise direction interchanges their positions while the third symbol moves one step anti-clockwise and is replaced by a new one in each step.

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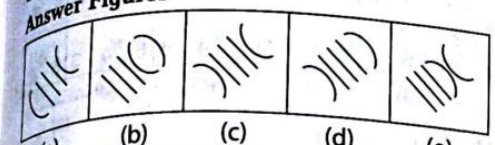
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Illustration 6.

Problem Figures



Answer Figures

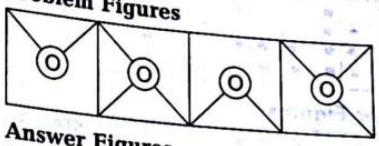


(a) (b) (c) (d) (e)

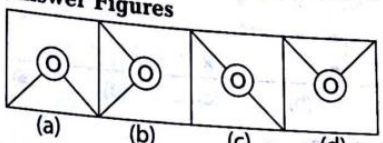
Solution *(e)* In the first step, the lowermost line segment is converted into a curve. In the second step, the second line segment also gets converted into a curve and the existing curve is inverted.

Illustration 7.

Problem Figures



Answer Figures



(a) (b) (c) (d)

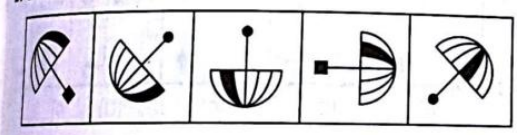
Solution *(d)* As we move from figure (a) to figure (b) two line segments move one step in anti-clockwise direction and one line segment is added. While we move from figure (b) to figure (c), one line segment is deleted. Similar changes and movements occur in the subsequent figures.

Let us Practice

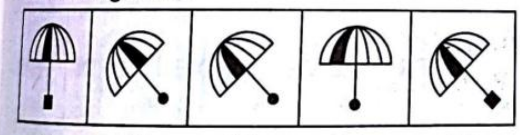
A. Base Level Exercise

Directions (Q. Nos. 1- 27) *In each of the questions given below which one from the four/ five answer figures should come at the right of the problem figures to complete the series logically.*

1. Problem Figures

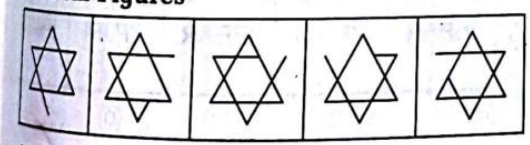


Answer Figures

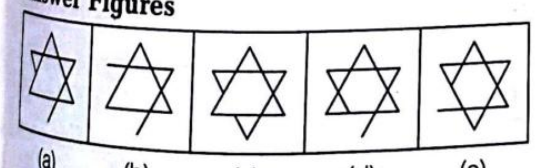


(a) (b) (c) (d) (e)

2. Problem Figures

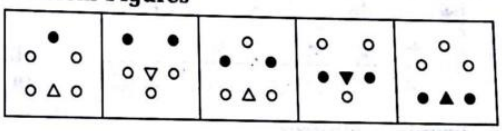


Answer Figures

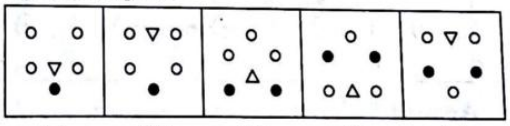


(a) (b) (c) (d) (e)

3. Problem Figures

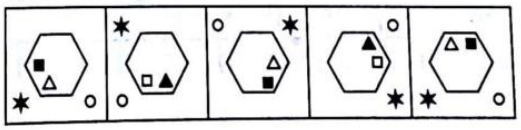


Answer Figures

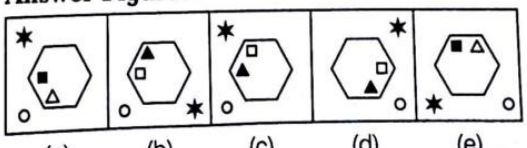


(a) (b) (c) (d) (e)

4. Problem Figures



Answer Figures

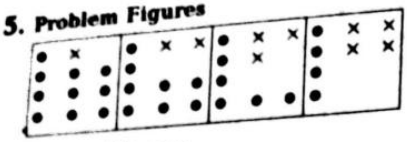


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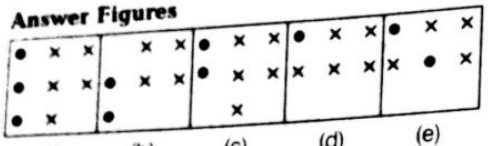
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5. Problem Figures

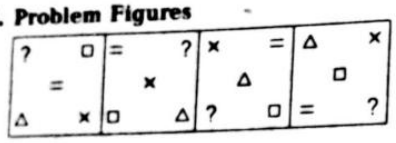


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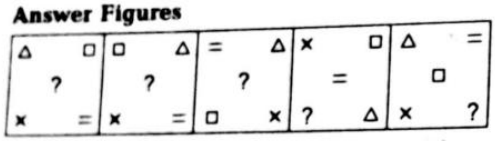


(a) (b) (c) (d) (e)

6. Problem Figures

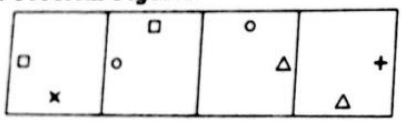


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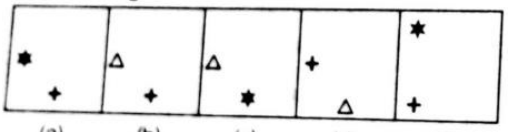


(a) (b) (c) (d) (e)

7. Problem Figures

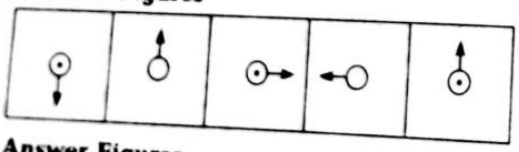


Answer Figures

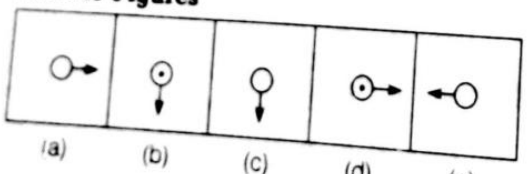


(a) (b) (c) (d) (e)

8. Problem Figures

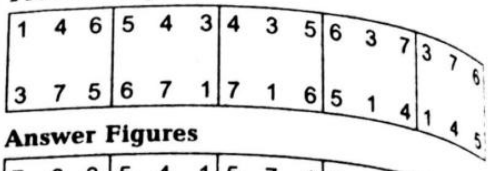


Answer Figures

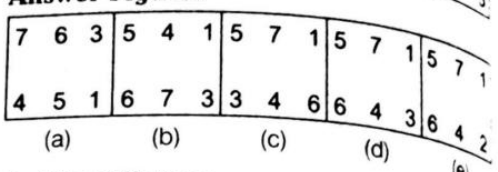


(a) (b) (c) (d) (e)

9. Problem Figures

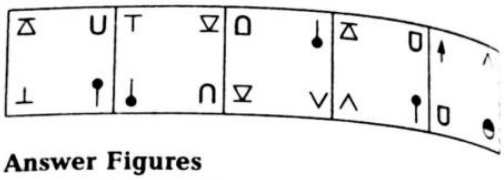


Answer Figures

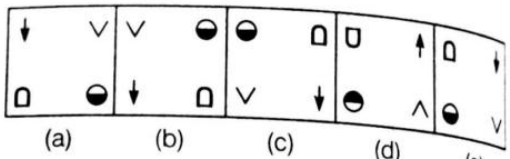


(a) (b) (c) (d) (e)

10. Problem Figures

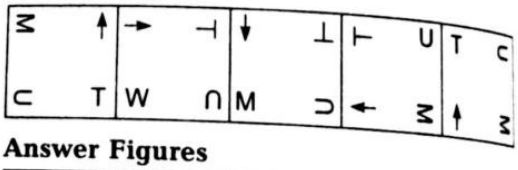


Answer Figures

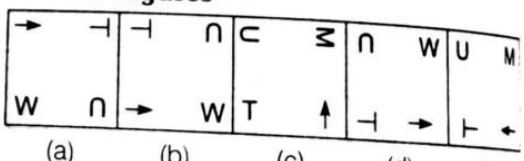


(a) (b) (c) (d) (e)

11. Problem Figures

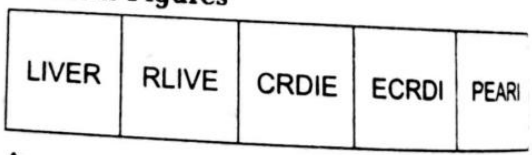


Answer Figures

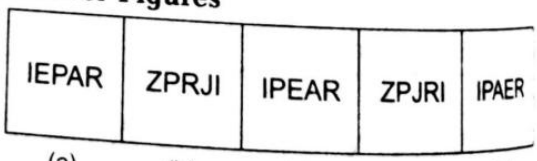


(a) (b) (c) (d) (e)

12. Problem Figures



Answer Figures

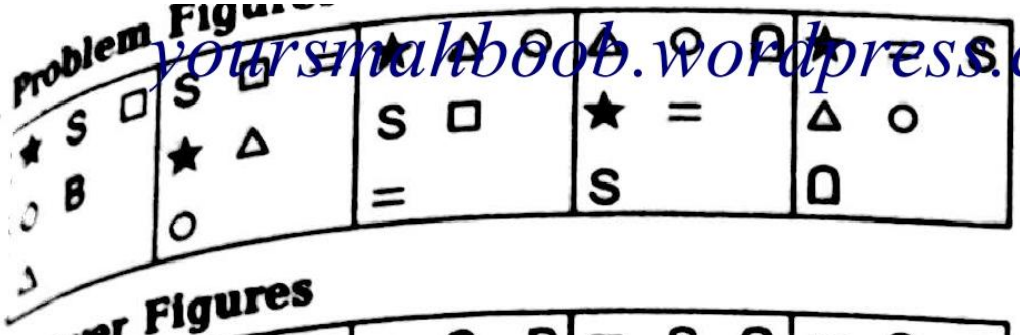


(a) (b) (c) (d) (e)

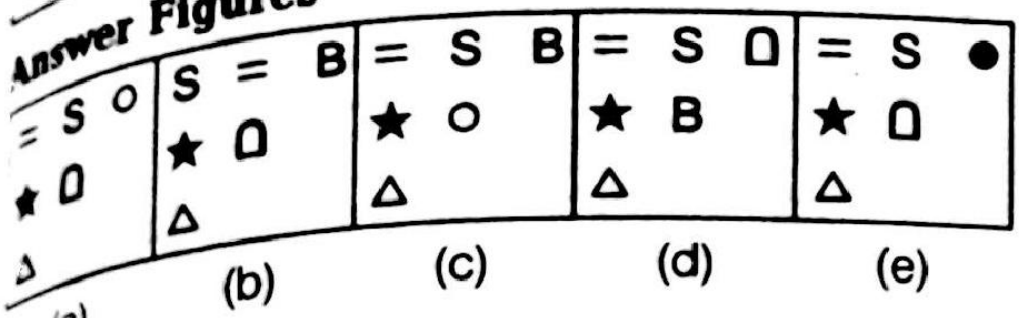
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Problem Figures



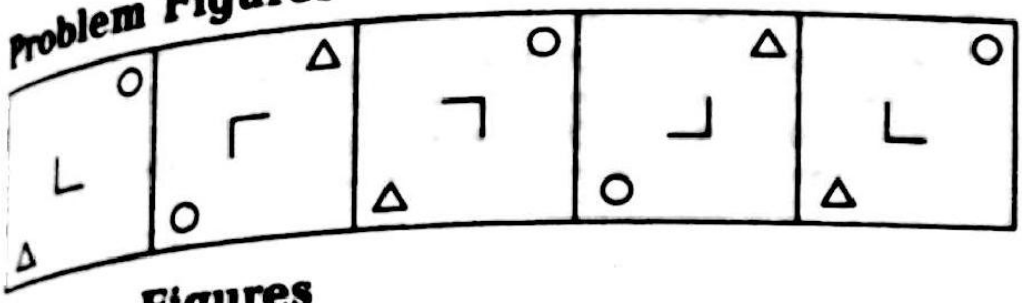
Answer Figures



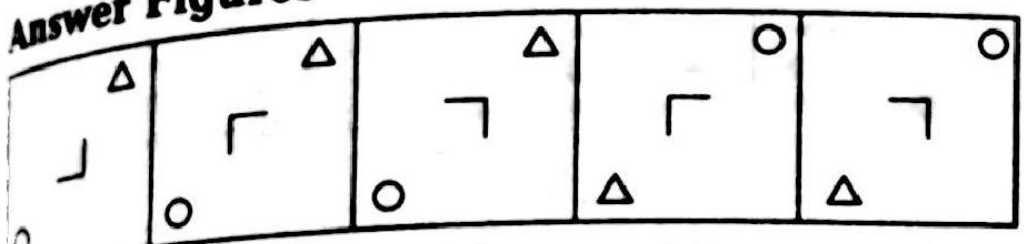
(a) (b) (c) (d) (e)

18.

Problem Figures



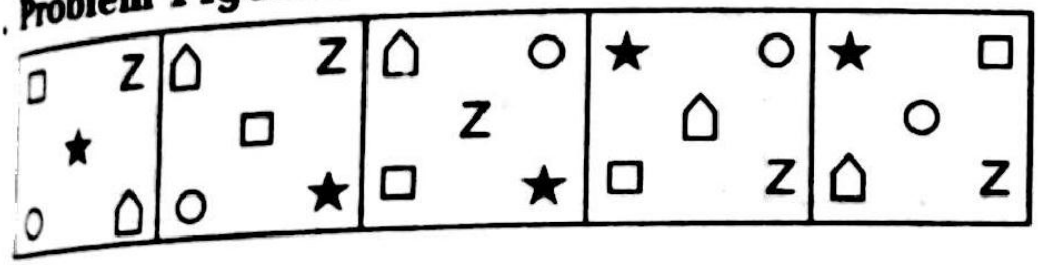
Answer Figures



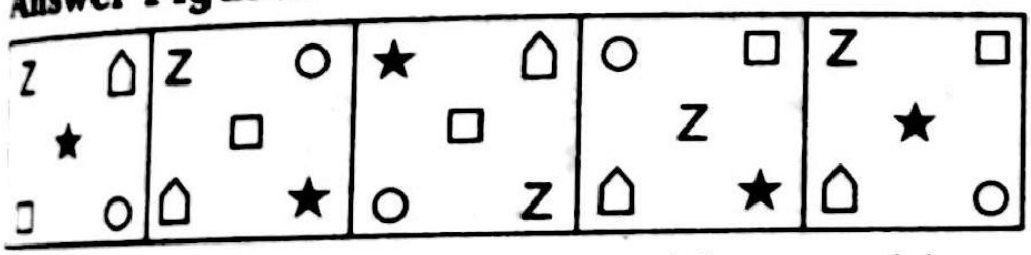
(a) (b) (c) (d) (e)

19.

Problem Figures



Answer Figures



(a) (b) (c) (d) (e)

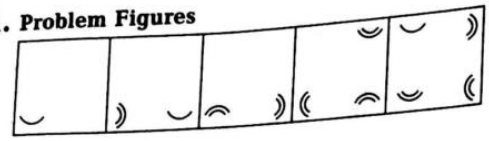
20.

Problem Figures

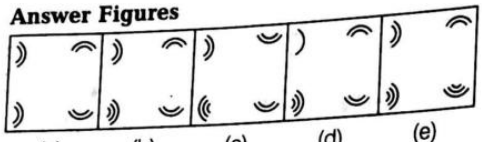
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21. Problem Figures

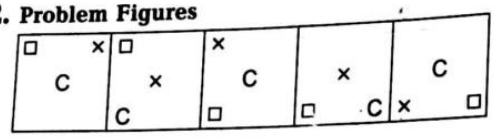


Answer Figures

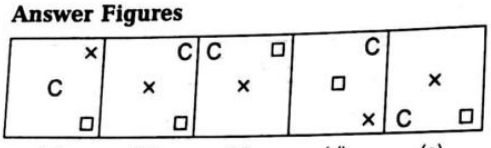


(a) (b) (c) (d) (e)

22. Problem Figures

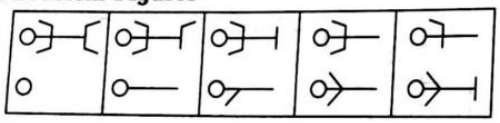


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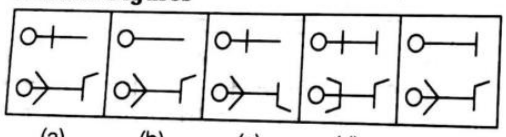


(a) (b) (c) (d) (e)

23. Problem Figures

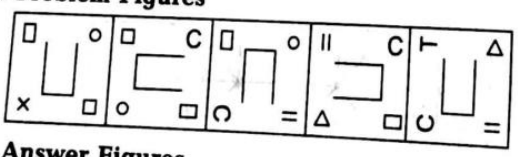


Answer Figures

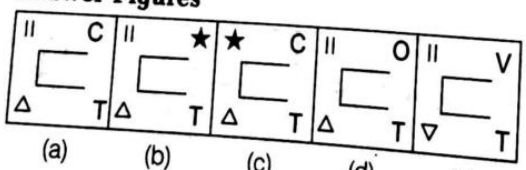


(a) (b) (c) (d) (e)

24. Problem Figures

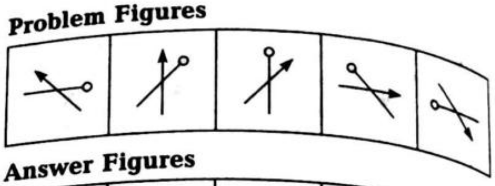


Answer Figures

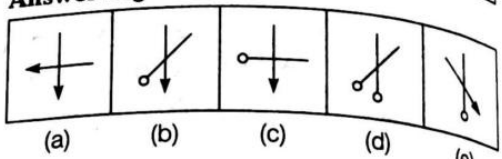


(a) (b) (c) (d) (e)

25. Problem Figures

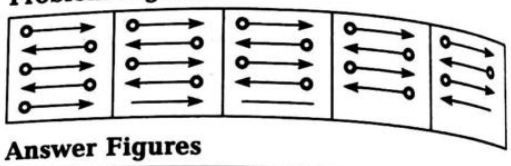


Answer Figures

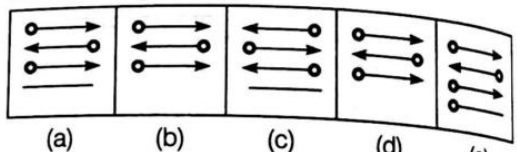


(a) (b) (c) (d) (e)

26. Problem Figures

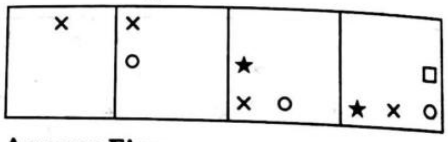


Answer Figures

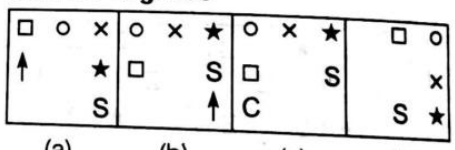


(a) (b) (c) (d) (e)

27. Problem Figures



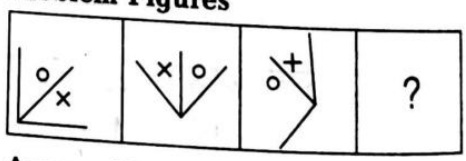
Answer Figures



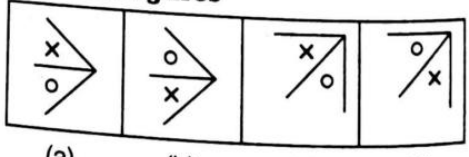
(a) (b) (c) (d)

Directions (Q. Nos. 28-38) *Which figure from the answer figures will come in place of question mark (?) in the following questions?*

28. Problem Figures



Answer Figures

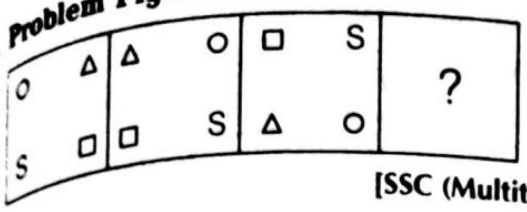


(a) (b) (c) (d)

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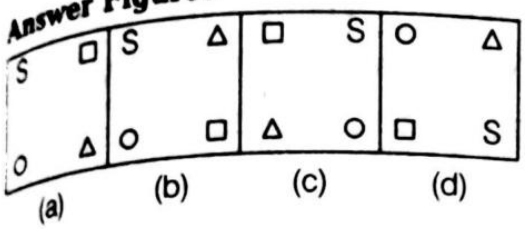
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29. **Problem Figures**



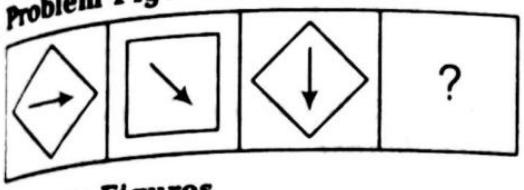
[SSC (Multitasking) 2012]

Answer Figures

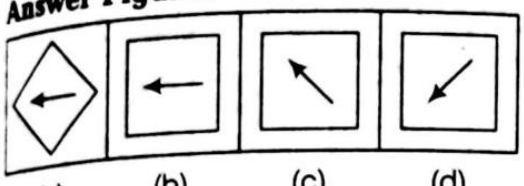


(a) (b) (c) (d)

30. **Problem Figures**

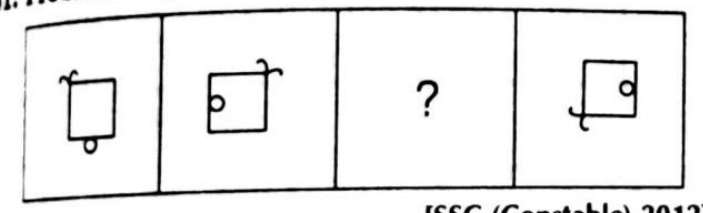


Answer Figures



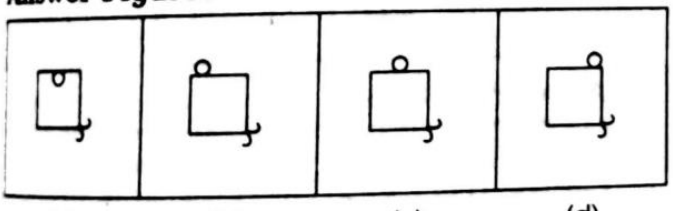
(a) (b) (c) (d)

31. **Problem Figures**



[SSC (Constable) 2012]

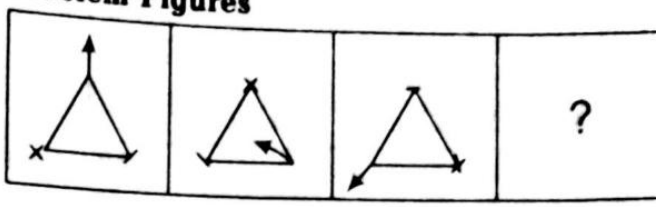
Answer Figures



(a) (b) (c) (d)

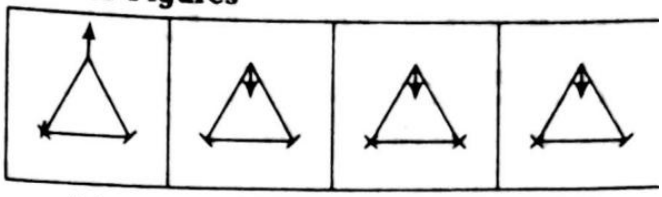
32. **Problem Figures**

33. **Problem Figures**



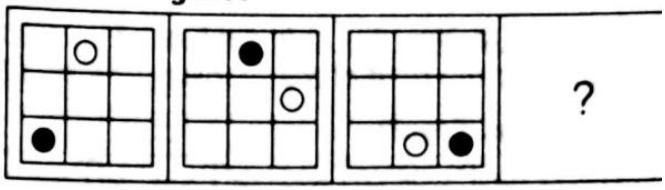
[SSC (CPO) 20

Answer Figures



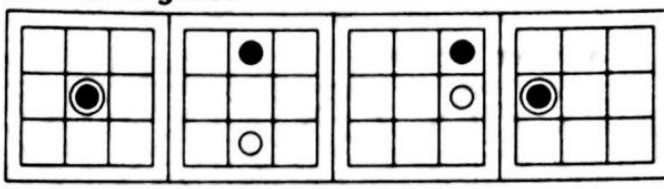
(a) (b) (c) (d)

34. **Problem Figures**



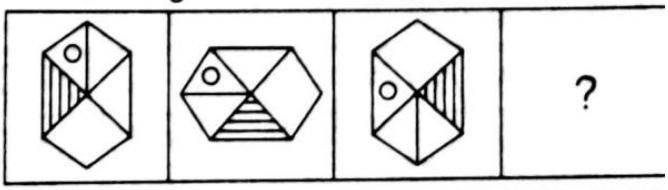
[SSC (Steno) 20

Answer Figures



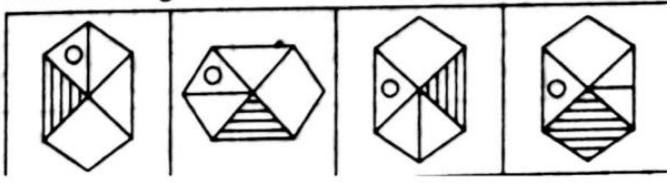
(a) (b) (c) (d)

35. **Problem Figures**



[SSC (10 + 2) 20

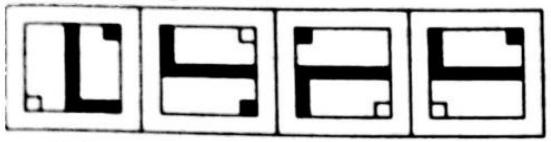
Answer Figures



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[SSC (10 + 2) 2013]

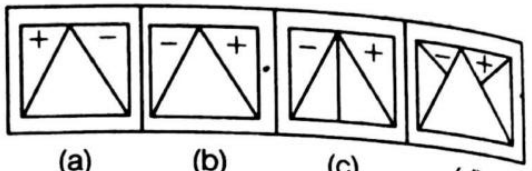
Answer Figures



(a) (b) (c) (d)

[SSC (Multitasking) 2013]

Answer Figures

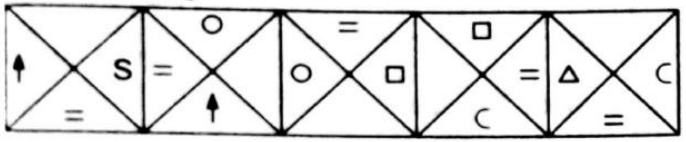


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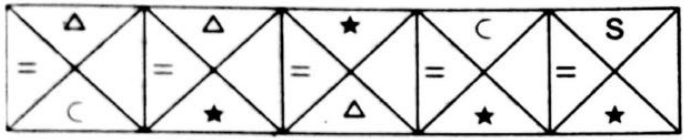
Expert Level Exercise

Directions (Q. Nos. 1-43) *In each of the questions given below which one of the five answer figures, should come after at the right of the problem figures, if the sequence were to be continued.*

Problem Figures

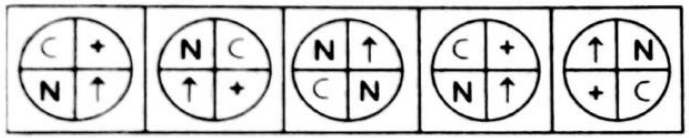


Answer Figures

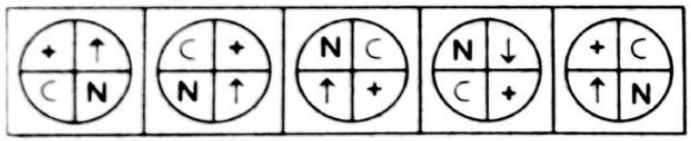


(a) (b) (c) (d) (e)

Problem Figures

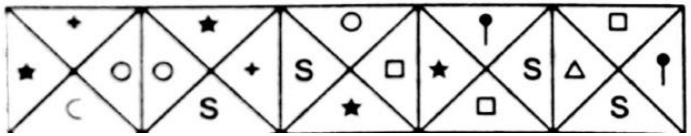


Answer Figures

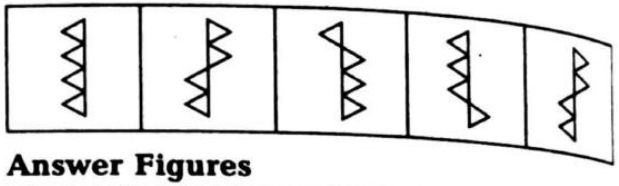


(a) (b) (c) (d) (e)

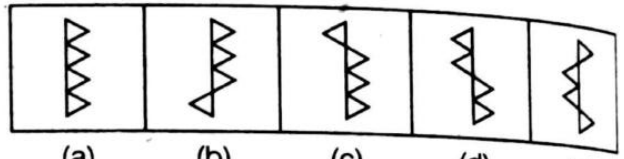
Problem Figures



4. **Problem Figures**

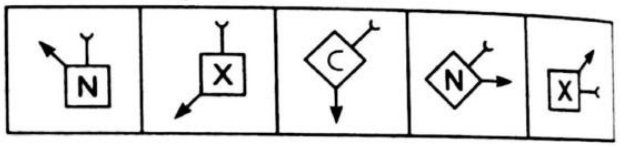


Answer Figures

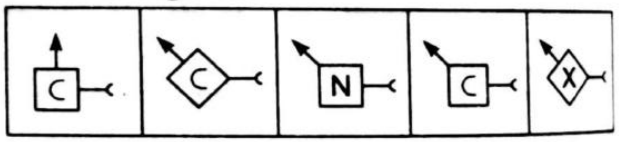


(a) (b) (c) (d) (e)

5. **Problem Figures**

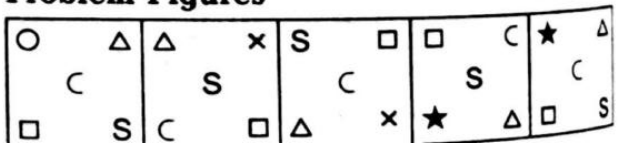


Answer Figures



(a) (b) (c) (d) (e)

6. **Problem Figures**



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11. Problem Figures

Answer Figures

(a) (b) (c) (d) (e)

12. Problem Figures

Answer Figures

(a) (b) (c) (d) (e)

13. Problem Figures

Answer Figures

(a) (b) (c) (d) (e)

14. Problem Figures

SOUND	PSUEN	NPSUE	BNSLU

Answer Figures

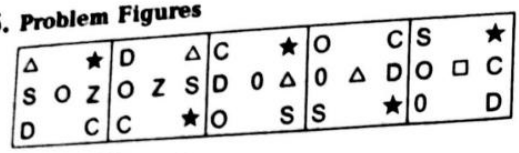
LUBNS	BJNLG	JUNLS	JUNGS	BUNGS

(a) (b) (c) (d) (e)

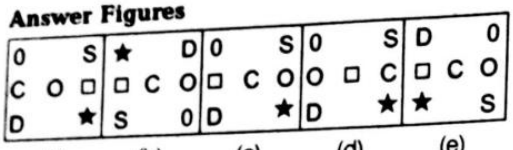
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15. Problem Figures

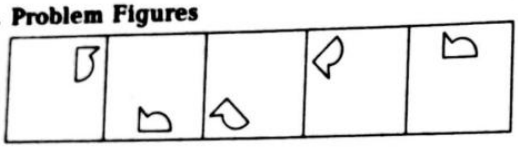


Answer Figures

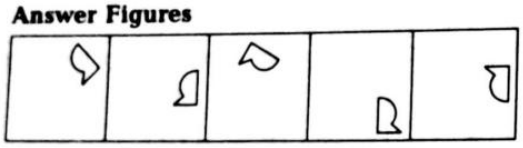


(a) (b) (c) (d) (e)

16. Problem Figures

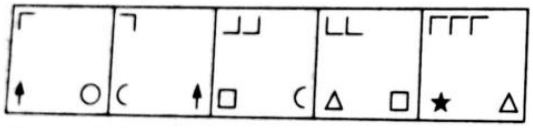


Answer Figures

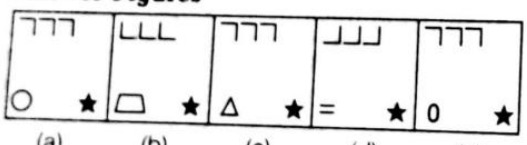


(a) (b) (c) (d) (e)

17. Problem Figures

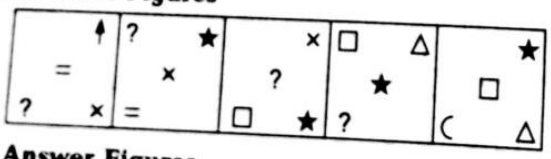


Answer Figures

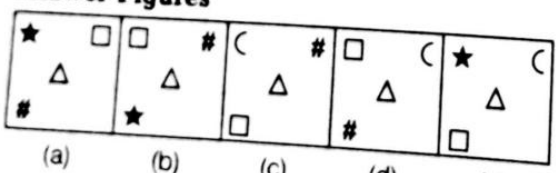


(a) (b) (c) (d) (e)

18. Problem Figures

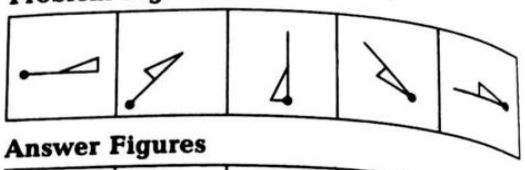


Answer Figures

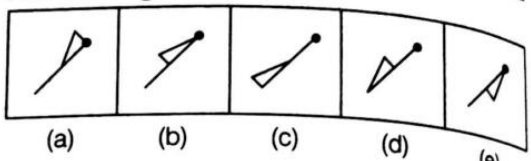


(a) (b) (c) (d) (e)

19. Problem Figures

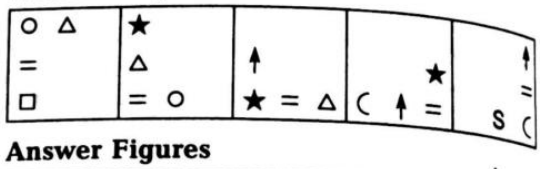


Answer Figures

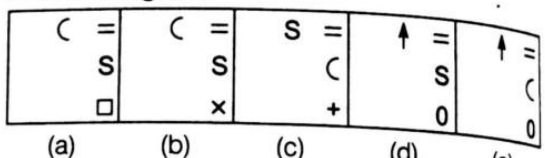


(a) (b) (c) (d) (e)

20. Problem Figures

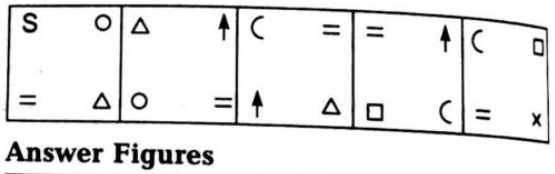


Answer Figures

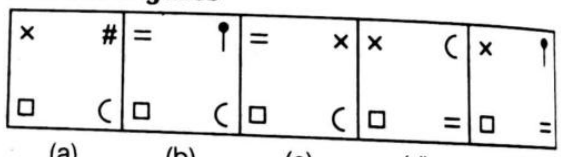


(a) (b) (c) (d) (e)

21. Problem Figures

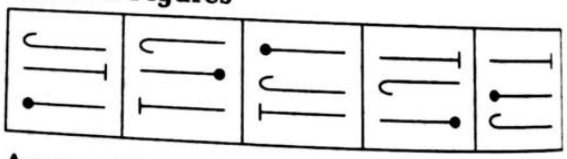


Answer Figures

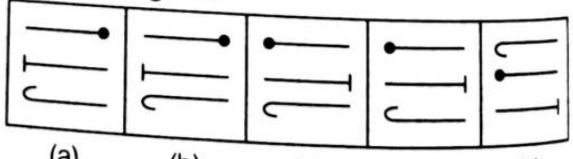


(a) (b) (c) (d) (e)

22. Problem Figures



Answer Figures



(a) (b) (c) (d) (e)

23.

24.

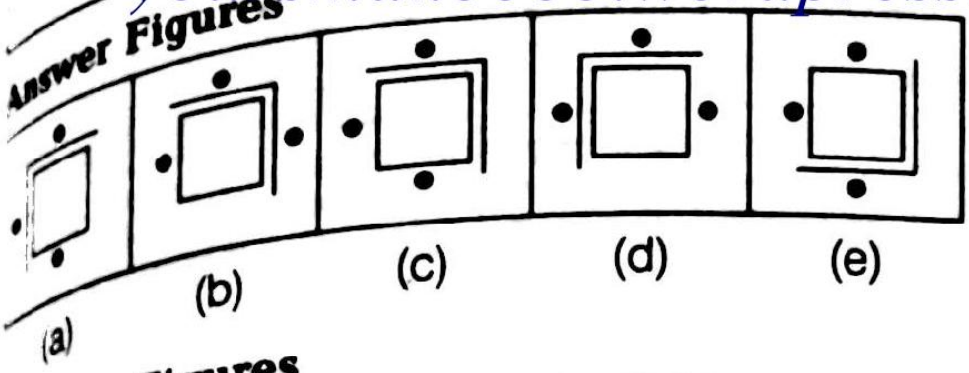
25.

26.

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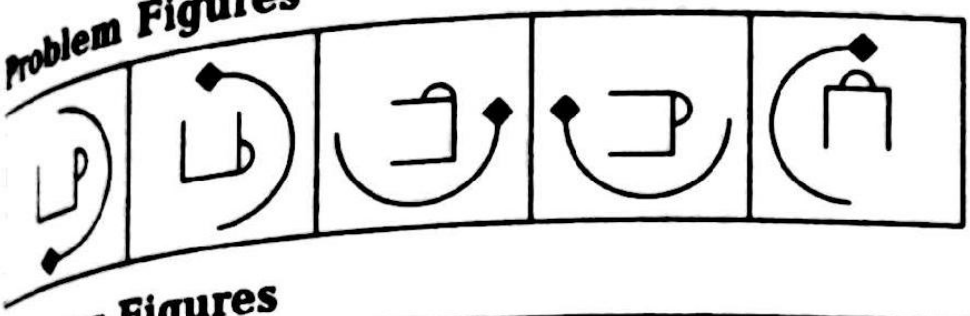
Answer Figures



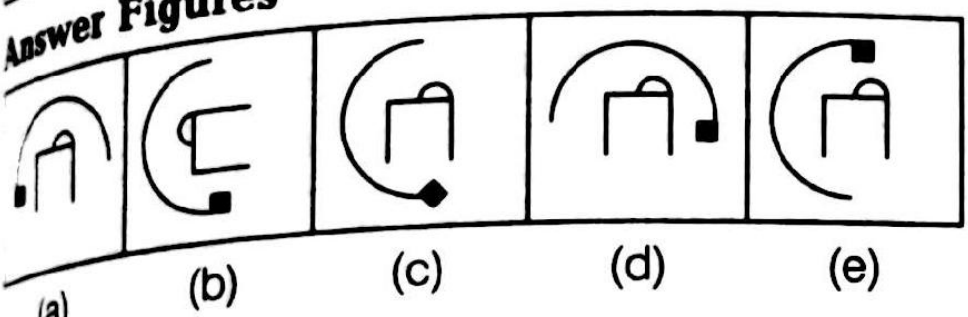
(a) (b) (c) (d) (e)

28.

Problem Figures



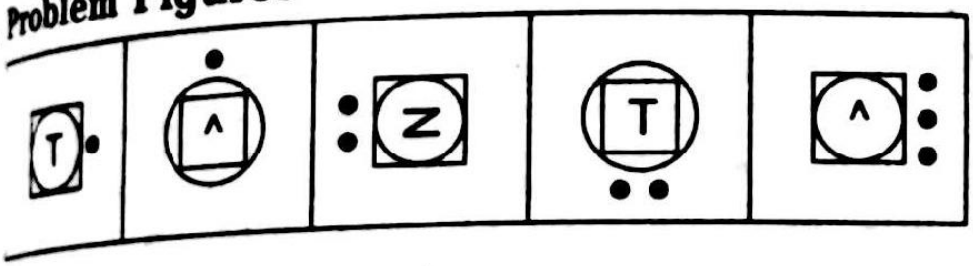
Answer Figures



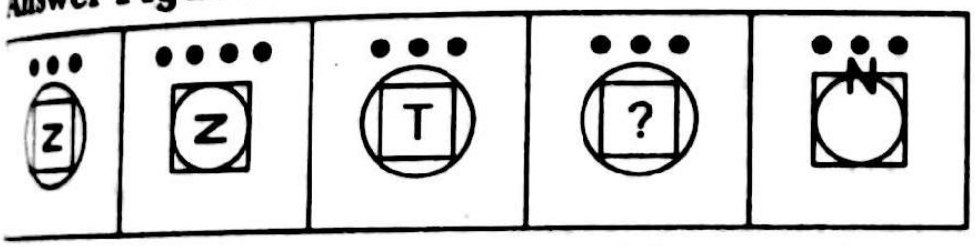
(a) (b) (c) (d) (e)

29.

Problem Figures



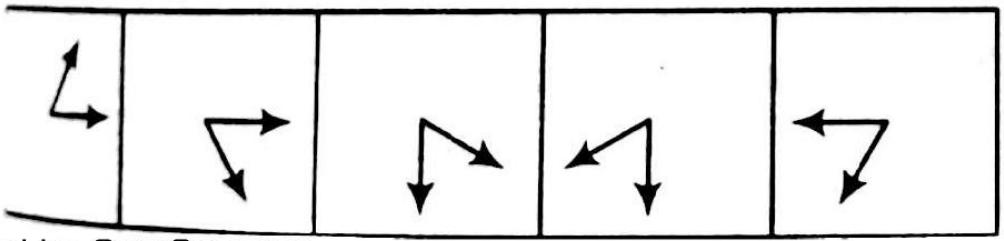
Answer Figures



(a) (b) (c) (d) (e)

30.

Problem Figures

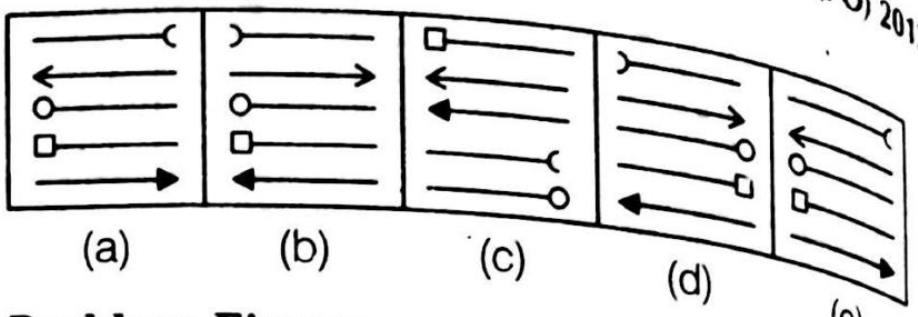


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Answer Figures

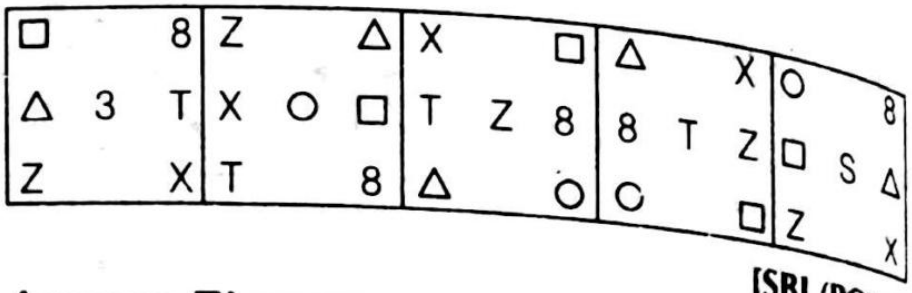
[SBI (PO) 2013]



(a) (b) (c) (d) (e)

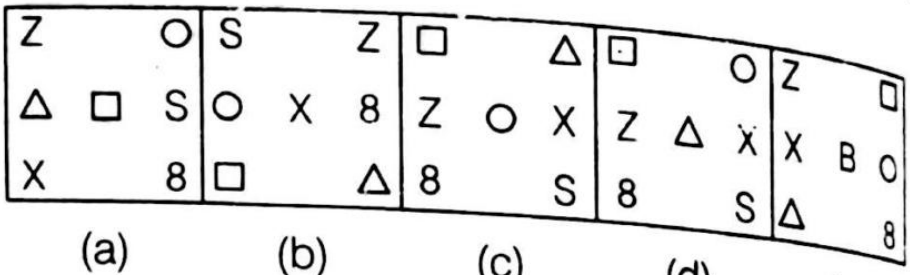
36. Problem Figures

13]



[SBI (PO) 2013]

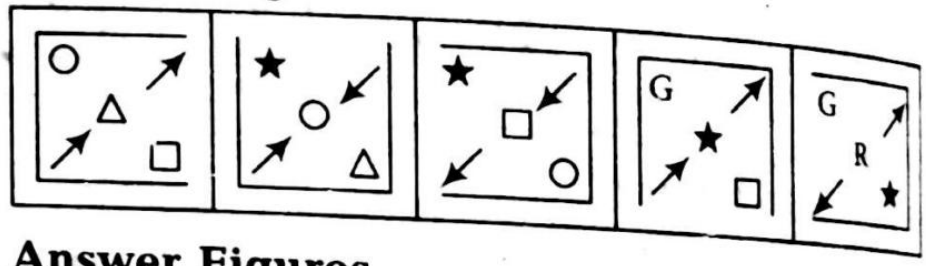
Answer Figures



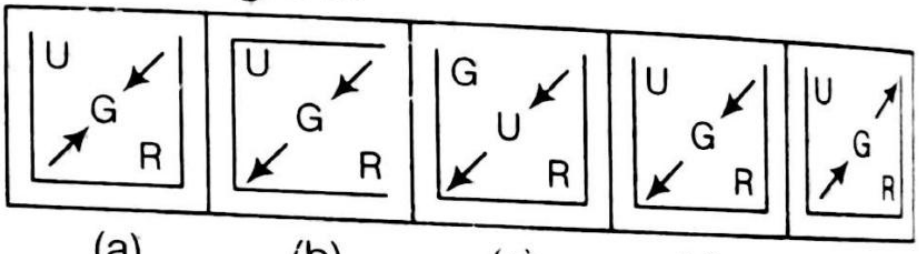
(a) (b) (c) (d) (e)

37. Problem Figures

13]



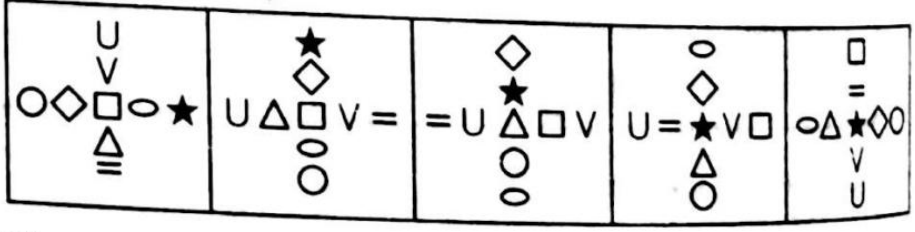
Answer Figures



(a) (b) (c) (d) (e)

38. Problem Figures

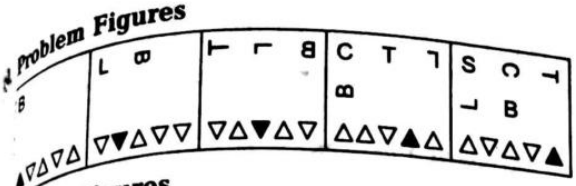
13]



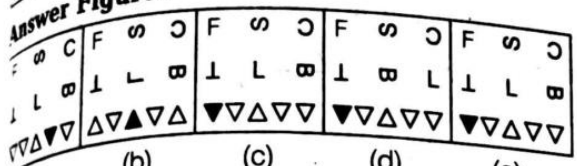
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Problem Figures

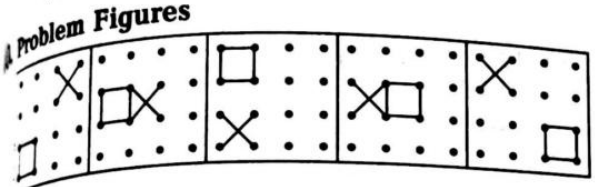


Answer Figures

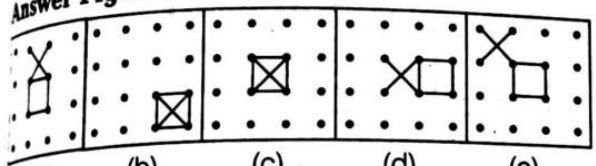


(a) (b) (c) (d) (e)

Problem Figures

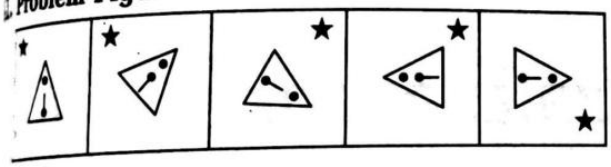


Answer Figures

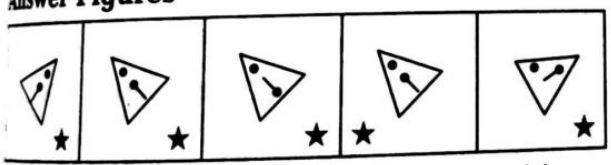


(a) (b) (c) (d) (e)

Problem Figures

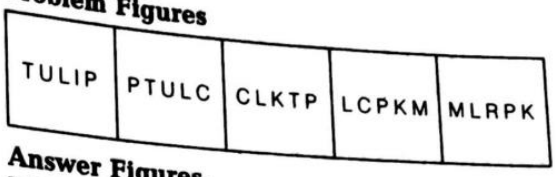


Answer Figures

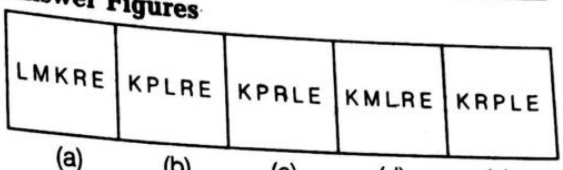


(a) (b) (c) (d) (e)

42. Problem Figures

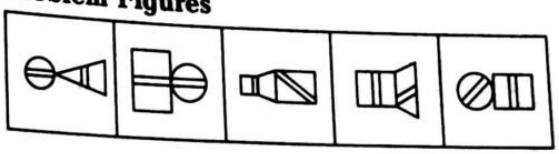


Answer Figures

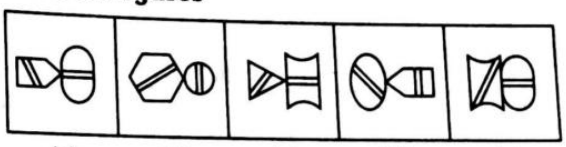


(a) (b) (c) (d) (e)

43. Problem Figures

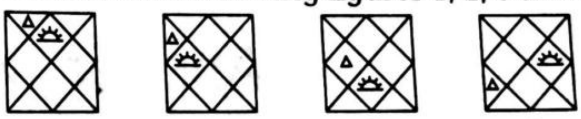


Answer Figures



(a) (b) (c) (d) (e)

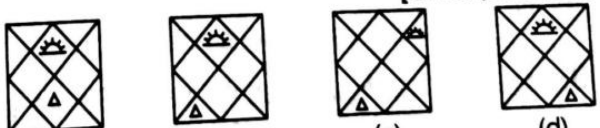
44. Consider the following figures 1, 2, 3 and 4



1 2 3 4

In the figure from (a) to (d) above, two symbols are shown to change their position in a regular direction. Following the same sequence, which one of the following will appear at the fifth stage?

[UPSC (CSAT) 2013]



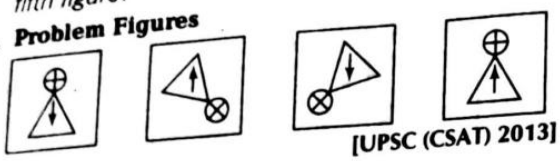
(a) (b) (c) (d)

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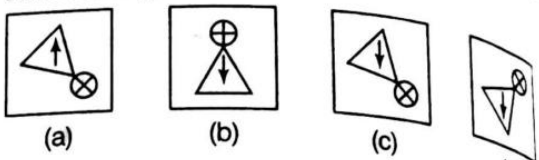
Directions (Q. Nos. 45-47) *In each item, there are two sets of figures; first four figures named problem figures are next four figures named answer figures indicated as (a), (b), (c) and (d). The problem figures follow a particular sequence. In accordance with the same, which one of the four answer figures should appear as the fifth figure.*

45. Problem Figures



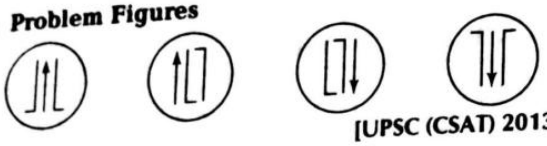
[UPSC (CSAT) 2013]

Answer Figures



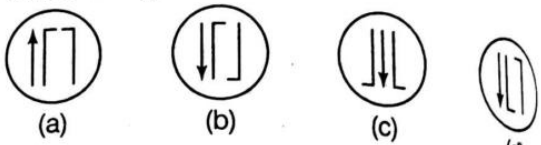
(a) (b) (c) (d)

46. Problem Figures



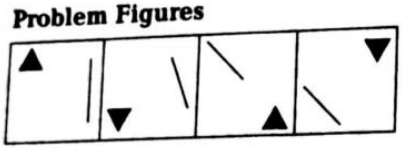
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Answer Figures



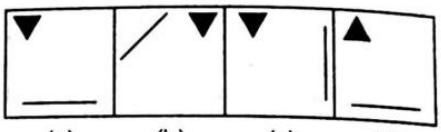
(a) (b) (c) (d)

47. Problem Figures



[UPSC 2012]

Answer Figures



(a) (b) (c) (d)

Answer *with* Explanations

A. Base Level Exercise

1. (*c*) On close observation, we can see that the same figure appears alternately and each time it reappears it gets a rotation of 135° anti-clockwise and the shaded part moves one step from right to left after a rotation of 270°.

2. (*a*) In every figure half of the line disappears and the disappearance of line is anti-clockwise.

3. (*a*) Designs in figure first, third and fifth are shaded from upper to lower. Similarly, designs in second, fourth and answer figure are shaded from upper to lower.

4. (*c*) In the next figure of hexagon of two designs '★' and 'o' are moving clockwise. Also, two designs '■' and 'Δ' are moving anti-clockwise and are alternately shaded.

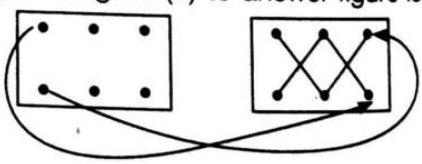
5. (*c*) The two dots are lost and one cross appears in each subsequent figure. So, in continuation with the given series of figures, the next figure would be (c).

6. (*b*) The upper and lower left elements move to upper and lower right positions, the upper right comes to lower left, the lower right comes to the centre and central element comes to the upper left in each subsequent step.

7. (*a*) The two elements move clockwise from side to side and alternately replaced by a new element.

8. (*c*) In first and second diagrams, arrow is in opposite directions and in second diagram point disappears from circle, *i.e.*, (c). Similar logic will follow.

9. (*d*) Pattern followed by figure (a) to (b); figure (c) to (d) and figure (e) to answer figure is



10. (*e*) In problem figure (a) to (b), (c) to (d) each figure is rotating 90° clockwise and in problem figure (b) to (c), two symbols are replaced with another one and each symbol is rotating 270° clockwise.

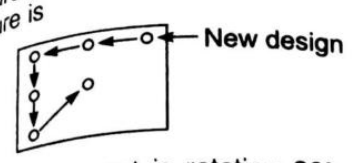
11. (*d*) As we move from figure (a) to (b) all designs move one step anti-clockwise and rotation is 90° clockwise. Problem figure (c) to (d) follow the same pattern.

12. (*c*) From problem figure (a) to (b), (c) to (d) and figure (e) to answer figure. Last letter becomes first letter and each letter moves one step right.

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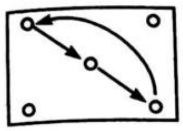
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14. (a) The pattern followed by figure (a) to figure (b); figure (c) to figure (d) and figure (e) to answer figure is



15. (b) Central element is rotating 90° clockwise and corner elements are interchanging their positions.

16. (c) Pattern followed from figure (a) to figure (b); figure (c) to figure (d) and figure (e) to answer figure is



17. (e) The elements move one step anti- clockwise in each step one element is added on each step. First to the right and then to the left of the main element.

18. (c) The elements move half a side and one side anti-clockwise in alternate steps and an element is added alternately on each side.

19. (a) A new line is added as a side to each one of the preexisting squares, a new line appears in a new square and a line appears inside the square, when the square is completely formed.

20. (d) Starting from below in each consecutive step, the second, third, fourth and the first element remains in its positions respectively, while others reverse their positions.

21. (c) The dot moves two steps, three steps, four steps and five steps respectively, in clockwise direction.

22. (b) Here, first two arcs and then one arc is add in the successive figures alternatively and existing arcs rotate 90° anti-clockwise on each step.

23. (b) As we move from figure (a) to (b) and figure (b) to (c), figure follow the given pattern.

(i) Symbol × moves from corner to the centre.

(ii) Symbol C moves from centre to the corner.

(iii) Symbol □ moves to the adjacent corner.

24. (c) One line in the lower designs is added and one line from the upper design is deleted in a set order in each successive figure.

25. (d) All the symbols move in clockwise direction and the middle figure also rotates clockwise but each rotation is of 90°. Also, one of the symbol is replaced with new one. All four figures at corner interchanges their place diagonally.

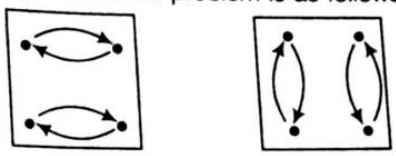
25. (b) On close observation, we find that arrow rotates 45° clockwise and the other lines rotate 45° anti-clockwise in each successive figure.

26. (a) One sign is removed from the symbols starting from the left hand side of the bottom.

27. (d) The symbol '×' moves one step and two steps in anti-clockwise direction alternately and a new symbol is added before and after alternately.

28. (b) Lines are moving 45° anti-clockwise the symbols 'o' and '×' are changing positions alternately.

29. (a) The sequence of the problem is as follows



From Fig. 1st to Fig. 2nd Fig. 2nd to Fig. 3rd
From Fig. 3rd to answer figure

30. (d) In each successive figure, the outer figure rotates clockwise and the inner figure rotates clockwise 45°, respectively.

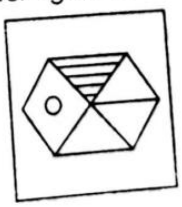
31. (c) The whole design is revolved with an angle of 90° in a clockwise direction from one figure to the next figure and the solid sphere 'O' which always touches one of the sides of the square, goes in inside in every even numbered figure.

32. (b) In each alternate step the arrow moves clockwise and small circle moves anti-clockwise by 90° and gets inverted.

33. (d) In each successive problem figure, the small figure at the end of vertices of the triangle moves clockwise and the arrow moves in and out alternately in each successive steps.

34. (d) In each successive problem figure, black dot moves three steps clockwise and white dot moves two steps clockwise.

35. (c) Each time the figure is rotated by 90° in anti-clockwise direction and the small circle is moved one block in clockwise direction. So, the correct answer figure is



36. (d) Each time, the arrow attached to the figure gets inverted and line containing circle is attached to the figure in opposite direction of the previous line attached.

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37. (*b*) Every figure is rotating 90° clockwise.

38. (*b*) Missing figure is option (b) as in transition from figure 1 to 2 is inverted and position of '+' and '–' are interchanged same pattern will follow for third missing figure.

B. Expert Level Exercise

1. (*c*) The first two symbols interchange positions in anti-clockwise direction while the third symbol moves one step anti-clockwise and is replaced by a new one in each step.

2. (*a*) While moving from problem figure (a) to (b), all the signs move one step in clockwise direction and from problem figure (b) to (c), the signs diagonally opposite to one another, exchanges their positions. The same process is repeated in the subsequent figures.

3. (*b*) Changes in the symbol takes place as shown in the diagrams. It is clear from the diagrams that changes from problem figure (a) to (b) is rotation of 90° anti-clockwise, every time to get the subsequent figures and a new sign is formed in the place of ●.

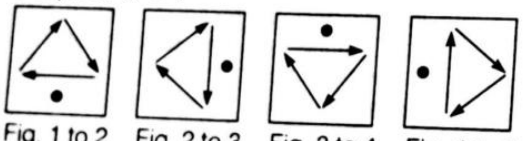


Fig. 1 to 2 Fig. 2 to 3 Fig. 3 to 4 Fig. 4 to 5

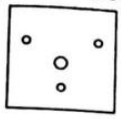
4. (*a*) From problem figure (a) to (b), first and second triangles are inverted, from problem figures (c) to (d), second and third triangles are inverted. Therefore, from problem figure (e) to the answer figure, third and fourth triangles will be inverted.

5. (*d*) The inner design of the main figure is repeated in problem figure (d) and the square rotates 45° clockwise in every subsequent step. The arrow moves to the adjacent centre of the square in an anti-clockwise direction.

6. (*a*) As we move from problem figure (a) to (b), changes in the symbols take place as shown in the diagram and in the subsequent figures changes in figures are obtained by rotating this diagram 90° clockwise for each subsequent step and the symbol in place of sign ● is replaced by a new one alternatively.



39. (*c*) The correct figure will be



7. (*a*) In each problem figure, symbol × moves diagonally, symbol ★ also moves diagonally and the third symbol moves anti-clockwise same side and is replaced by a new figure.

8. (*c*) In each problem figure, = and Δ move in anti-clockwise direction. Symbol × moves to a position which is in front of it and the fourth symbol replaces with new one.

9. (*b*) As per rule 2, if figure (a) is the reverse of figure (d) and figure (b) is reverse of figure (e), then answer figure will be reverse of figure (c).

10. (*d*) The main figure in problem figure (a) is same as in problem figure (e). Therefore, figure (b) will be same as the answer figure. Small circles are moving anti-clockwise and blank circle is blackened and black circle appears without shading.

11. (*e*) As we move from problem figure (a) to (b), first two figures rotate in 90° anti-clockwise direction and other two figures rotate in 90° clockwise direction.

From problem figure (c) to (d), first two figures rotate in 90° clockwise direction and other two figures rotate in 90° anti-clockwise direction.

So, following this rule of problem figure (a) to (b), answer figure (e) obtain from problem figure (e).

12. (*d*) As we move from problem figure (a) to (b), upper left corner figure change and upper right corner figure comes in the middle and middle figure comes to lower left corner and remaining figure moves one place is followed while moving in a clockwise direction.

Same rule from problem figure (c) to (d).

So, according to given rule, answer figure (d) preceded problem figure (e).

13. (*b*) As we move from problem figure (a) to (b), four figures in upper half part move one place in anti-clockwise direction and four figures in lower half part move one place in clockwise direction.

Same rule is being followed as we move from problem figure (c) to (d).

So, by the same rule answer figure (b) is obtained from problem figure (e).

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As we move from problem figure (a) to (b), third letter from the left remains unchanged and first letter and fourth letter from the left move one place to the right and two new letters replace them.

Same rule is being followed as we move from problem figure (c) to (d).

So following same rule answer figure (d) obtained from problem figure (e).

As we move from problem figure (a) to (b), each corner figures move one place in clockwise direction to reach another corner and three figures in the middle which two right side figures move one place left and left side figure comes in right. Same rule is being followed as we move from problem figure (c) to (d).

In each of the subsequent figures, the design moves one side and half side, respectively in clockwise direction. Again, as we move problem figure (a) to (b), it rotates 90°, anti-clockwise and as we move from figure (b) to (c), it rotates 45° clockwise and is reversed.

As we move from problem figure (a) to (b), the arrow moves to right anti-clockwise replacing circle and a new symbol is formed at its place and the upper design is reversed. As we move from figure (b) to (c), symbol C moves to the right anti-clockwise replacing arrow and a new symbol is formed at its place and the upper design rotates 90° clockwise. The same process is repeated in the subsequent figures.

Changes in the symbols from problem figure (a) to (b) take place as shown in the diagram and a new design is formed in place of ●. The change, which is obtained by rotating the diagram 180° alternatively, takes place in the subsequent figures are as follows



The figure rotates anti-clockwise making an angle of 45° while moving from figure (a) to (b) and the design at the back of it is reversed.

In each step, the first sign (counting in clockwise direction) goes to the fourth position and is replaced by a new one. The second symbol remains as it is, the third symbol becomes the first and the fourth symbol becomes the third.

21. (*a*) Changes in the symbols take place as shown in the diagram and a new symbol replaces the old one in place of sign ●.



22. (*b*) The second and third symbols, the first and second symbols and the first and third symbols interchange their positions stepwise. The hook by headed symbol gets inverted in each next step, the pin-headed is inverted in each next step and the third one is laterally inverted in every second step.

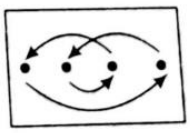
23. (*c*) Dots move clockwise one step as we move from problem figure (b) to (d) and problem figure (d) to the answer figure and one line is added to the main figure in a particular way.

24. (*c*) As we move from problem figure (a) to (b), the outer arc is inverted and the semi-circle in the inner figure moves half side. From problem figure (b) to (c), the outer arc rotates 90° clockwise and the inner figure rotates 90° in anti-clockwise direction. The same process is repeated in the subsequent figures.

25. (*a*) The dots move anti-clockwise and their numbers are increased by one in every subsequent figure and the sign at the centre changes from T to ^ and ^ to Z. The same changes take place in the subsequent figures.

26. (*d*) In each step whole figures rotates 45° in clockwise direction.

27. (*e*) The sequence of the problem is as follows



Problem figure (a) to (b)
Problem figure (c) to (d)
Problem figure (e) to answer figure.

28. (*d*) In each alternate step on curve line adds in bottom and upper size.

29. (*b*) In problem figure (a) to (b) middle three designs go to both sides. Similar, rule follow from problem figure (c) to (d). Hence, similar rule follow from problem figure (e) to answer figure.

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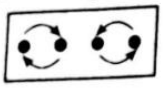
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30. (a) In each alternate step, one more (●) and one more ( ) is decreasing

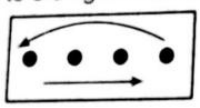
31. (a) In each step, one design (◯) is increasing in opposite sequence

32. (d) Figure (c) is obtained by rotating figure (a) by 180° and a leaf to right of it. Similarly, figure (d) is obtained by rotating figure (b) by 180° and adding a leave to the right of it. So, the correct answer figure will be (d).

33. (c) In each consecutive figure the string of elements are rotated through 45° anti-clock wise directions and when moved form 1st to 2nd figure element changed as



from 2nd to 3rd figure elements changed as

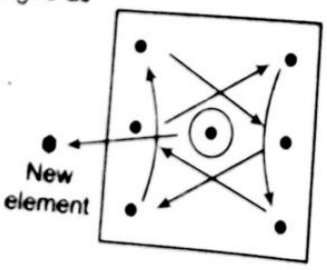


from 3rd to 4th figure elements change their places as they changed when moved to figure (b) from figure (a).

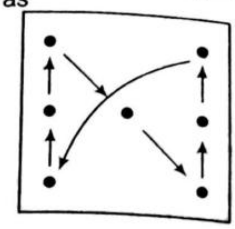
34. (b) The angle arm is changed upside down after every 2 figure. Element is upper half rotates clockwise successive and becomes lower elements and similarly the lower elements interchange their place and becomes upper half elements and so on.

35. (a) When moved form 1st figure to 2nd figure top two elements interchange their place and lower three element shifts one place upward and rotates through 180°.
Now on moving from 2nd figure to 3rd figure, 2nd elements form top becomes top element and rotates through 180°. 3rd and 4th elements interchange their places. Top and bottom elements interchange their places and gets rotate through 180° and so on.

36. (c) When moved form figure 1 to 2 elements changed as



Now, when move form figure 2 to 3 elements change as



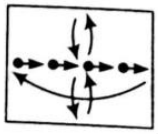
and similar we can detect the other pattern and obtain the answer.

37. (d) The figure (⌊⌋) moves by 90° anti-clockwise direction each 4th step and other element move as  in first step and in second step as  and arrows change as  and then reverse its direction.

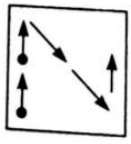
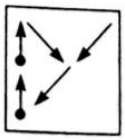
38. (c) From figure 1 to 2 element changes are follows



and from figure 2 to 3 as follows



39. (a) The element moves in the sequences and a left corner's element replaced by new element. The element (▲) changes the direction in each step inwards and outwards alternately.

40. (d) In given figure '□' and '✕' elements move as  and  , respectively

41. (b) In first step, the element (Δ) rotates through 45° 90°, 135°,... clockwise and element (●) rotates toward vertex of triangle and next step, it takes proper postion and ★ moves 90° clockwise after 2 figures.

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problem figure (a) is as related problem figure (b) as well as problem figure (c) is related problem figure (d).

The left figure moves towards right figure and a new figure appears on the left hand side. The lines in the right figure rotates 90° and 45° clockwise, alternatively, whereas lines in the left figure rotate 90° and 45°, alternatively after every two steps.

From the four figures, we can say that the pattern of movement of the triangle is anti-clockwise one box at a time, along the outer edge, while the movement of the semi-circle like element is anti-clockwise along the inner four squares. Thus, option (b) represents the next movements of the two elements proceeding from figure 4.

From the problem figures, we can see that the triangle with the circle at the top is moving clockwise 120 degrees at a time while the arrow inside the triangle is alternating between up and down.

46. (*b*) There are three positions in the given problem figures – left, right and center. The three arrows and sticks occupy one of these three positions. In each succeeding figure the arrows and sticks move towards the left and if they were at the extreme left in the previous figure, they come back from the right after getting inverted.

Thus, based on the last problem figure, we can say that the next figure should have a downward arrow at the extreme left, the stick at the right will come to the center and the stick to the left will go to the right getting inverted. This configuration is satisfies by option (b) which is the right answer.

47. (*d*) In the first figure, triangle is pointed towards up, followed by pointed towards down, followed by pointed towards up, followed by pointed towards down. So, in the answer choice triangle should point up.

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4

Analogy

Analogy refers to correspondence or similarity in relationship. When a figure exhibits some kind of relationship with another figure on some basis then the two figures are said to be analogous to each other.

Figures are related in some or other ways. Some of them are as follows

- Based on shape
- Based on orientation of figure
- Based on number of elements
- Based on mirror image
- Based on water image
- Rotation of figure
- Movement of figure
- Replacement of positions of element

In the questions based on analogy, two sets of figures namely problem figures and answer figures are given. The set of problem figures consists of two parts.

The first part comprises of two figures which have some relationship between them on the basis of a certain rule.

The second part comprises of one figure and a sign of '?'. You are asked to select one figure from the set of answer figures to replace '?' but maintaining similar relationship as depicted between the first two figures.

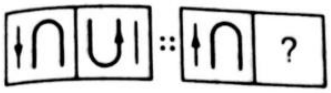
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Directions (Illustrations 1-5) *The second figure of the first part of the problem figures bears a certain relationship to the first figure. Similarly, one of the figures in answer figures bears the same relationship to the first figure of the second part. You have to select that figure from the set of answer figures which would come on the place of "?".*

Illustration 1.

Problem Figures



Answer Figures

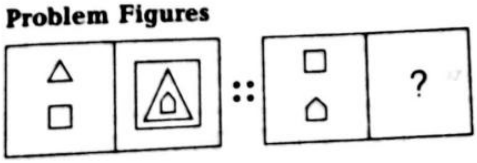


(a) (b) (c) (d) (e)

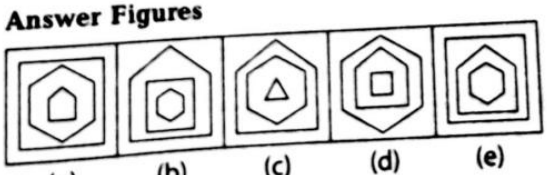
Solution (*d*) Considering the first two figures, both the figures interchange their positions and gets reversed at the new positions. The arrow head is shifted to the arm of U-shaped figure and becomes reversed.

Illustration 2.

Problem Figures



Answer Figures

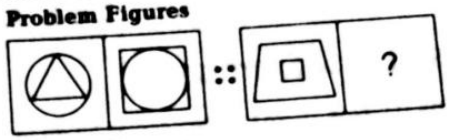


(a) (b) (c) (d) (e)

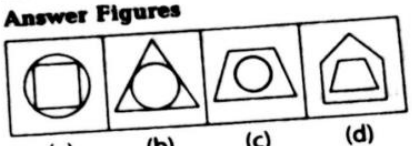
Solution (*b*) The lower element gets enlarged and becomes outer most one. The upper element also gets enlarged and becomes the middle element while a new ele one more side than the lower element a innermost position.

Illustration 3.

Problem Figures



Answer Figures

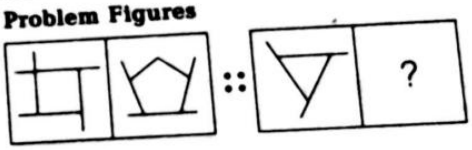


(a) (b) (c) (d)

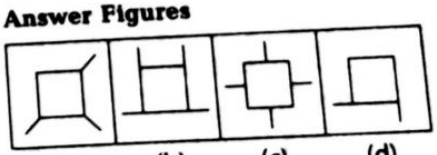
Solution (*d*) The outer figure is replaced by a figure which has one more side than the inner figure. Also, the inner figure is replaced by a figure similar to the outer figure.

Illustration 4.

Problem Figures



Answer Figures

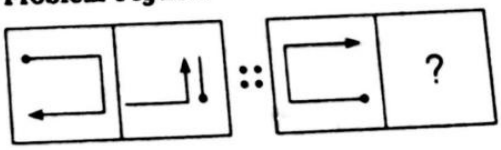


(a) (b) (c) (d)

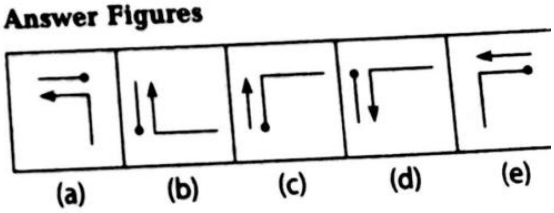
Solution (*d*) The number of sides in the central figure increases by one and the number of line segments attached to the central figure also decreases by one.

Illustration 5.

Problem Figures



Answer Figures

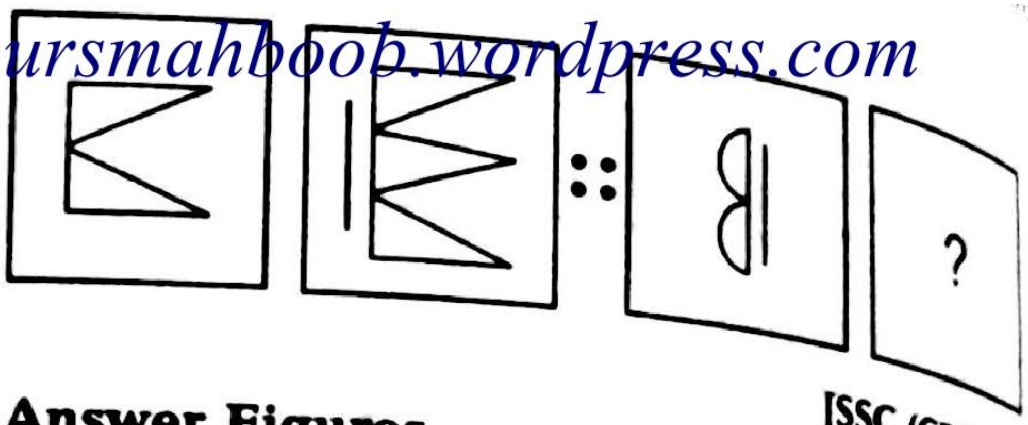


(a) (b) (c) (d) (e)

Solution (*d*) The line attached to the small blac rotates 90° anti-clockwise. The remaining port the figure rotates 90° clockwise and is inverte

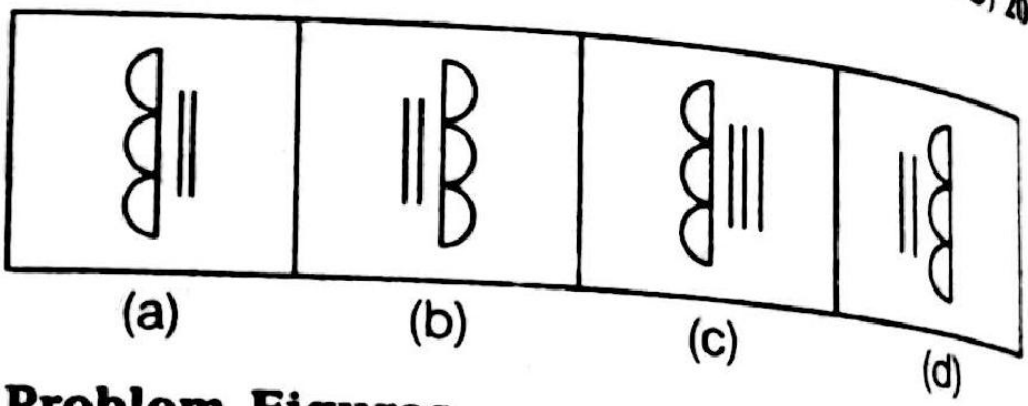
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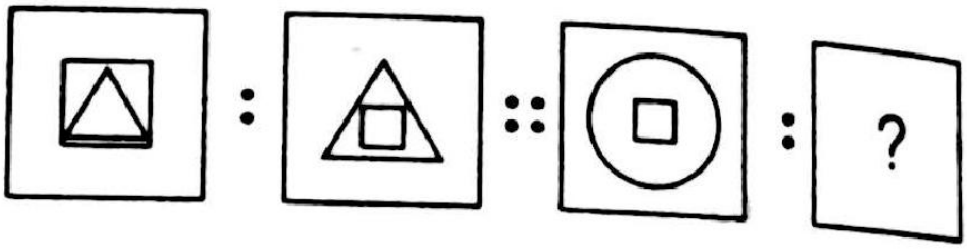


Answer Figures

[SSC (CPO) 2010]

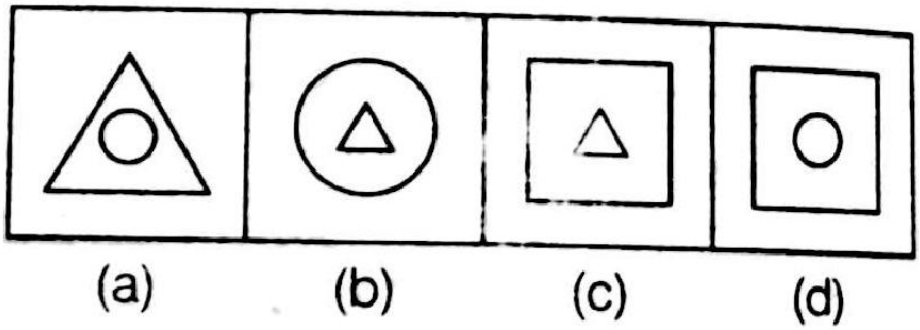


5. Problem Figures

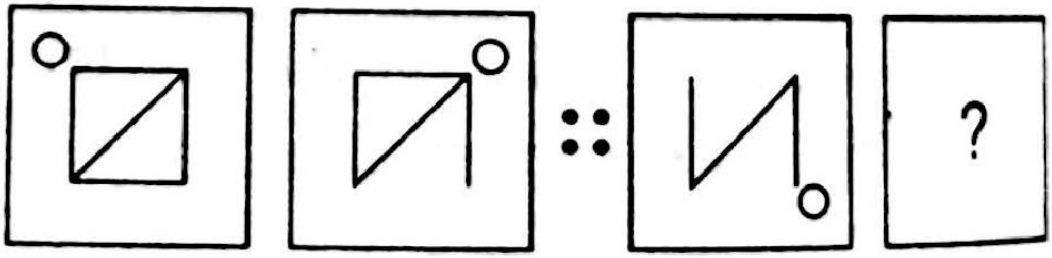


[SSC (10 + 2) 2013]

Answer Figures



6. Problem Figures



Answer Figures

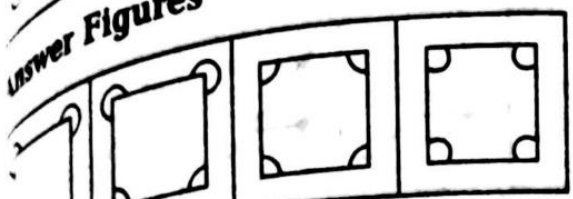
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Problem Figures



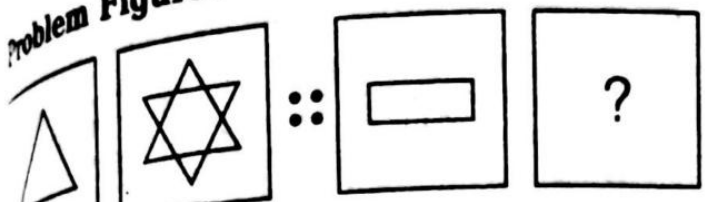
Answer Figures



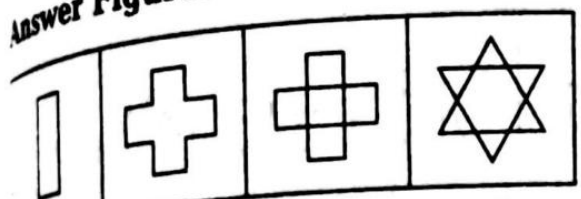
(a) (b) (c) (d)

12.

Problem Figures



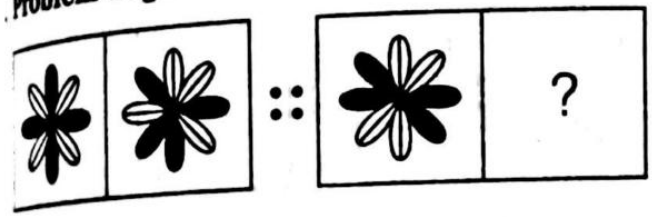
Answer Figures



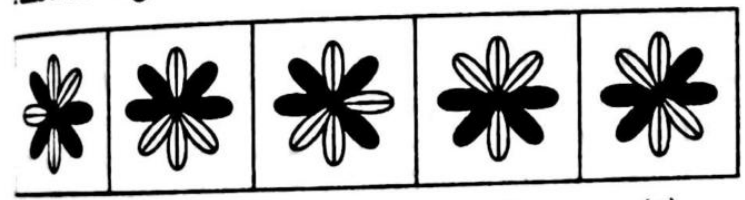
(a) (b) (c) (d)

13.

Problem Figures



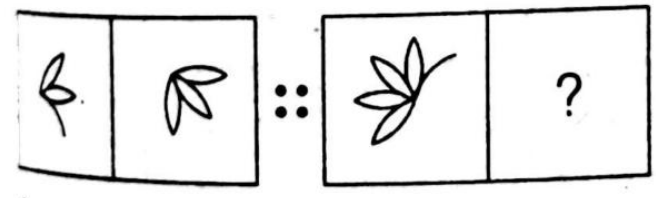
Answer Figures



(a) (b) (c) (d) (e)

14.

Problem Figures

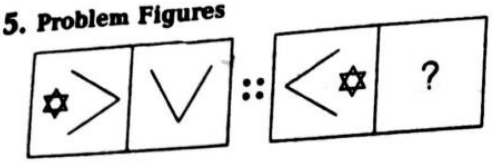


Answer Figures

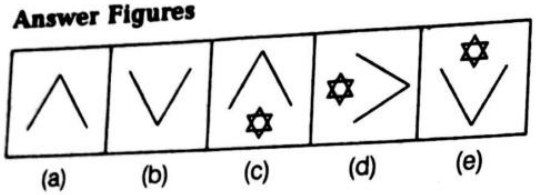
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15. Problem Figures

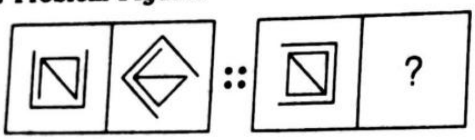


Answer Figures

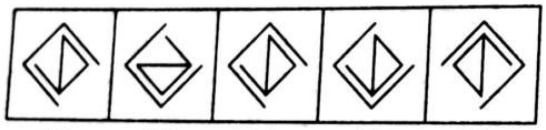


(a) (b) (c) (d) (e)

16. Problem Figures

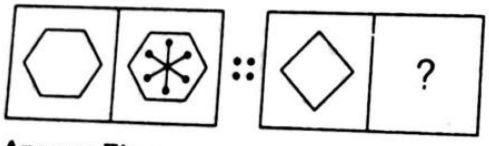


Answer Figures

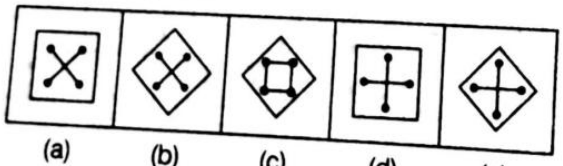


(a) (b) (c) (d) (e)

17. Problem Figures

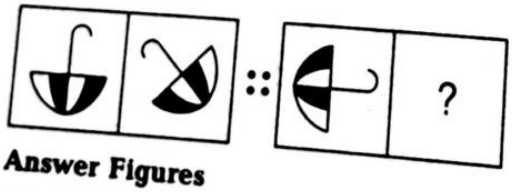


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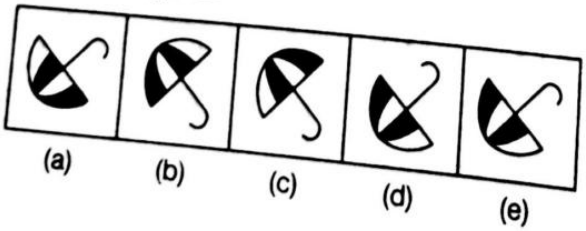


(a) (b) (c) (d) (e)

18. Problem Figures

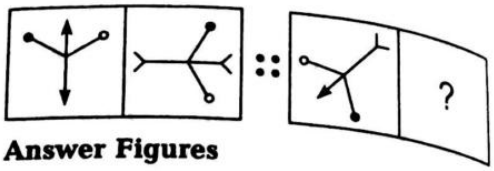


Answer Figures

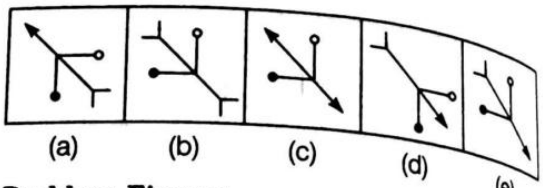


(a) (b) (c) (d) (e)

19. Problem Figures

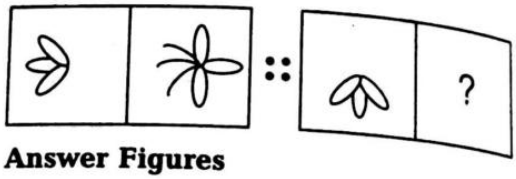


Answer Figures

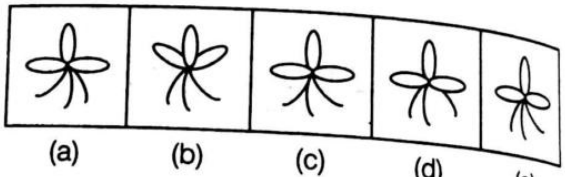


(a) (b) (c) (d) (e)

20. Problem Figures

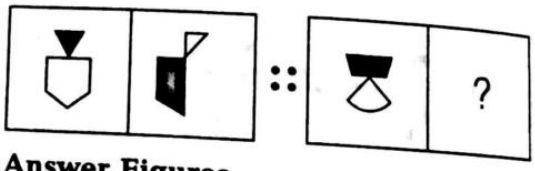


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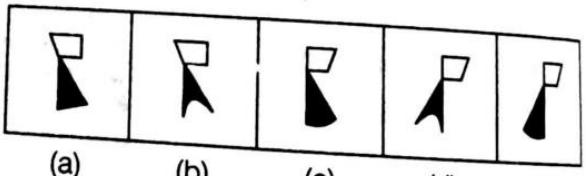


(a) (b) (c) (d) (e)

21. Problem Figures

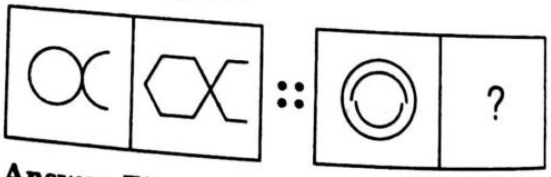


Answer Figures

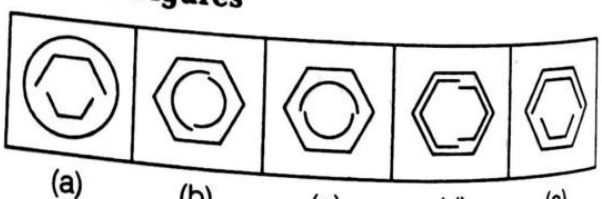


(a) (b) (c) (d) (e)

22. Problem Figures



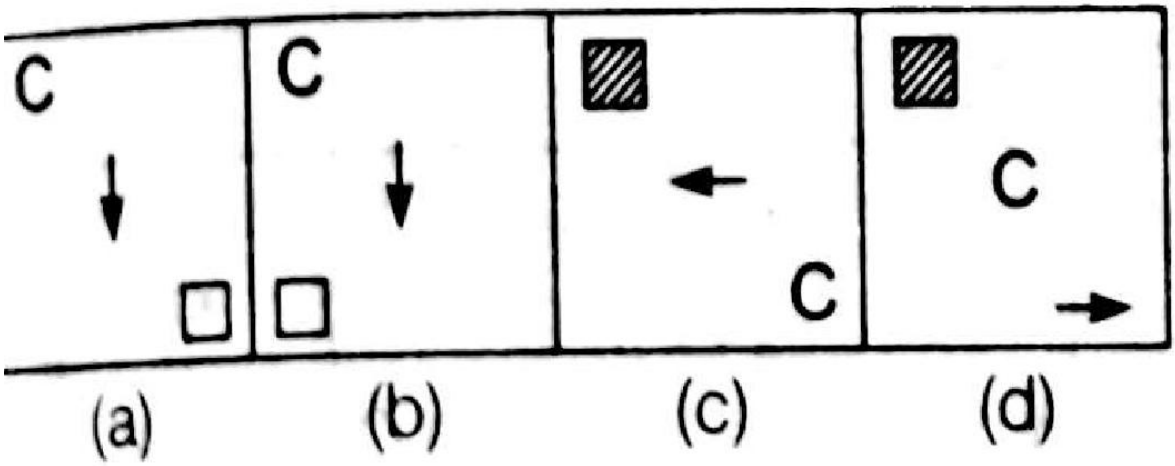
Answer Figures



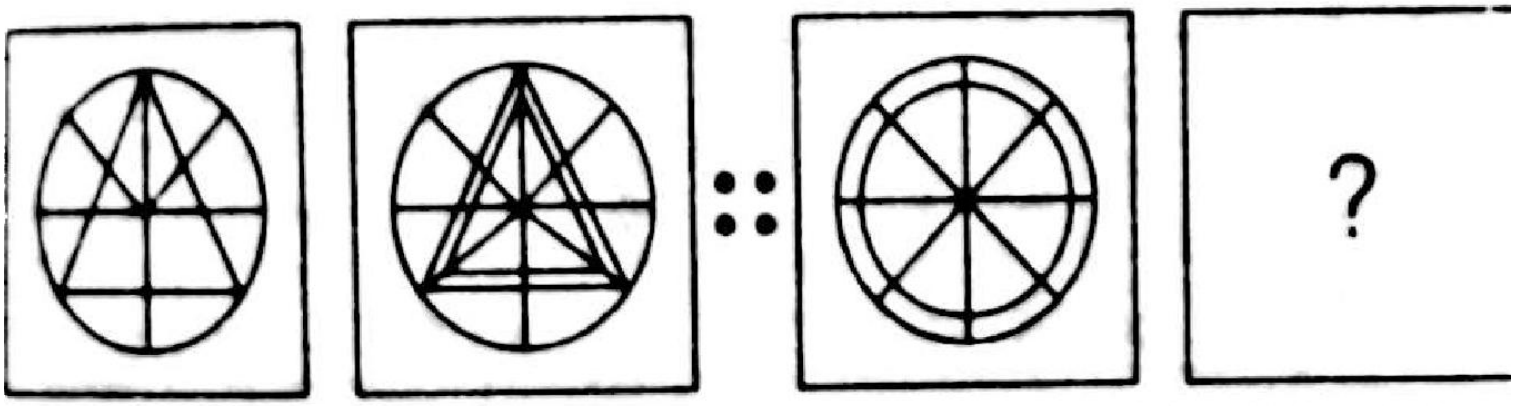
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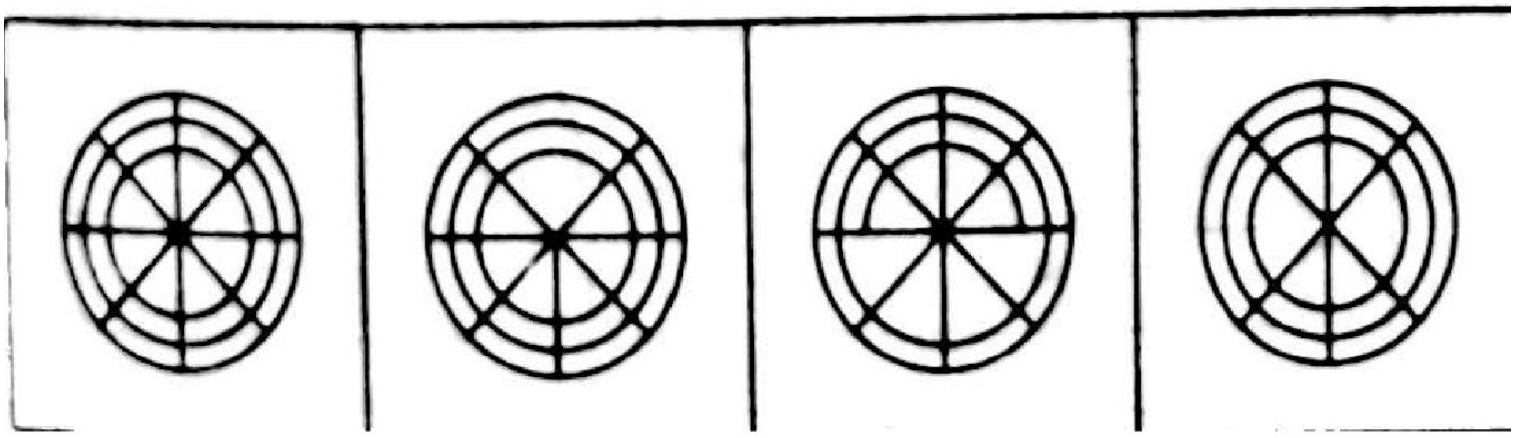


Problem Figures



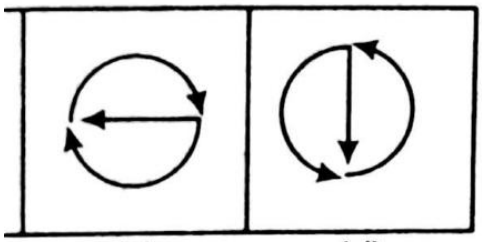
[SSC (Multitasking) 201

Answer Figures

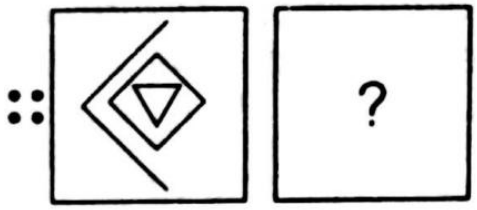


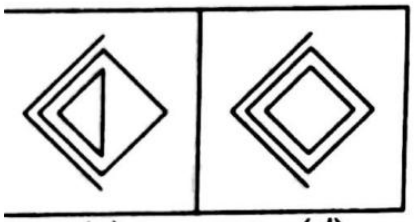
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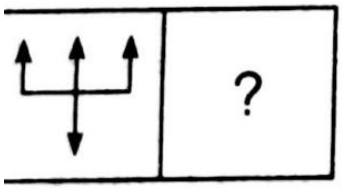


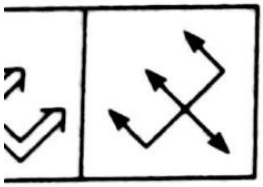
(c) (d)



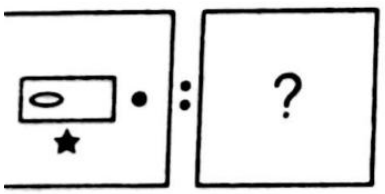


(c) (d)





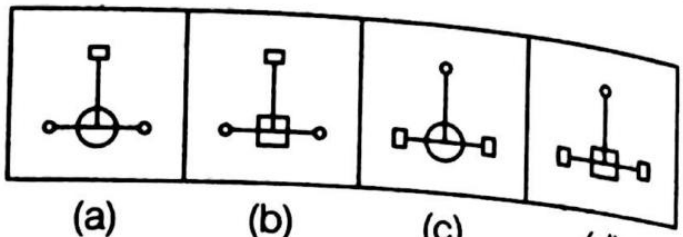
(d)



[SSC (10+2) 2013]

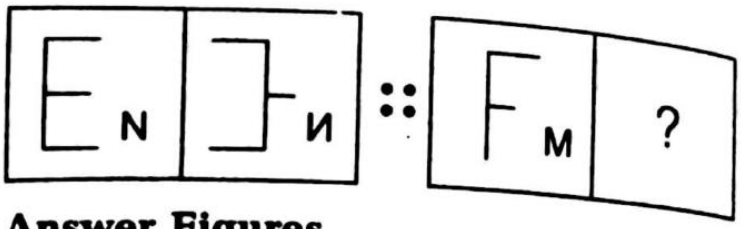
[SSC (10+2) 2013]

Answer Figures

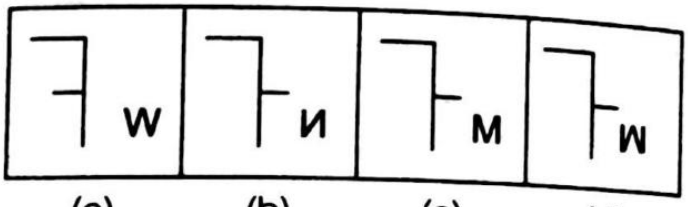


(a) (b) (c) (d)

10. Problem Figures

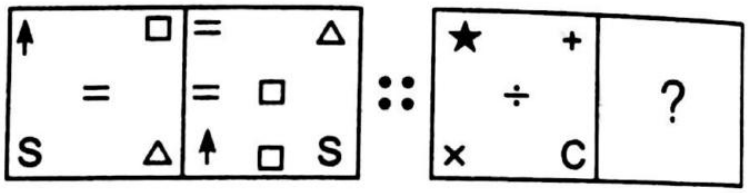


Answer Figures

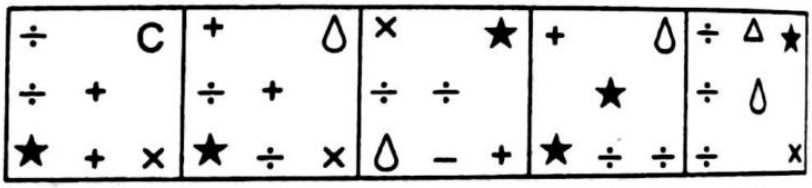


(a) (b) (c) (d)

11. Problem Figures

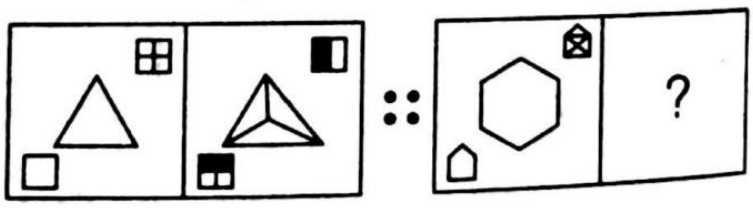


Answer Figures

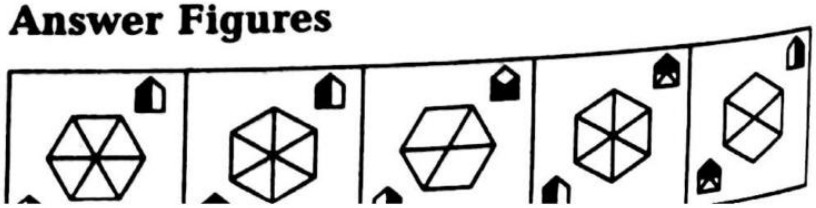


(a) (b) (c) (d) (e)

12. Problem Figures



Answer Figures



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[SSC (10 + 2) 2013]

d)

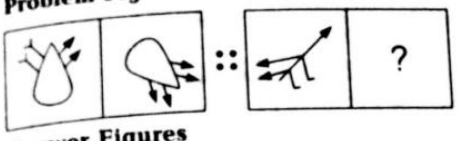
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W

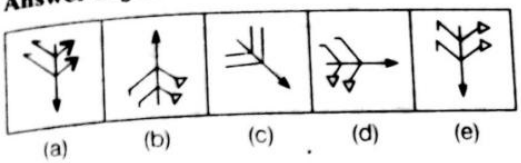
(e)

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13. Problem Figures

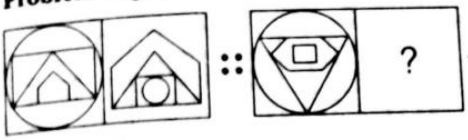


Answer Figures

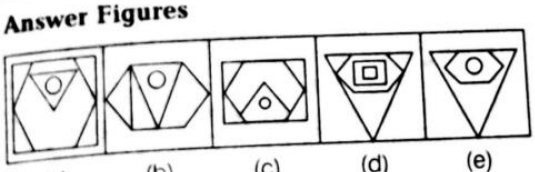


(a) (b) (c) (d) (e)

14. Problem Figures

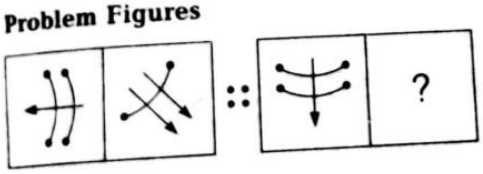


Answer Figures

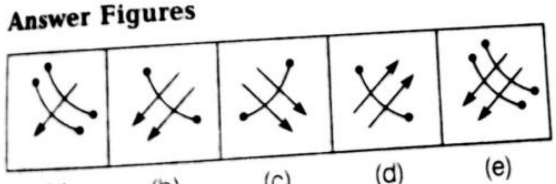


(a) (b) (c) (d) (e)

15. Problem Figures

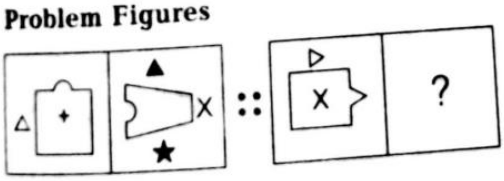


Answer Figures

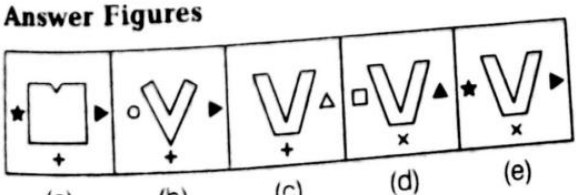


(a) (b) (c) (d) (e)

16. Problem Figures

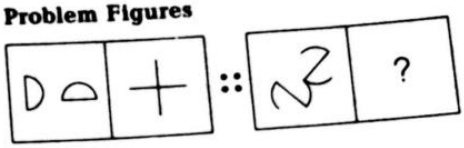


Answer Figures

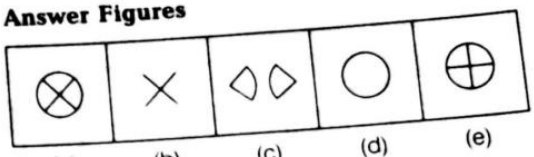


(a) (b) (c) (d) (e)

17. Problem Figures

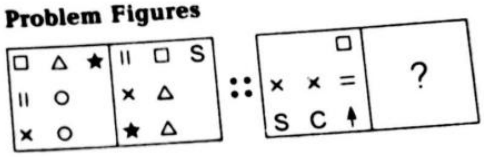


Answer Figures

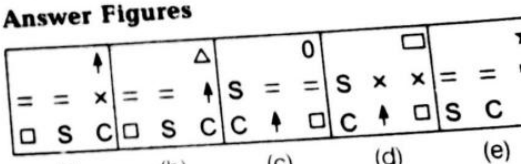


(a) (b) (c) (d) (e)

18. Problem Figures

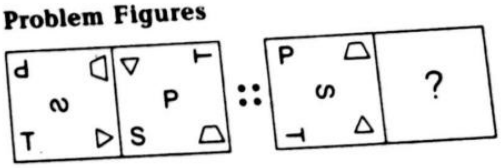


Answer Figures

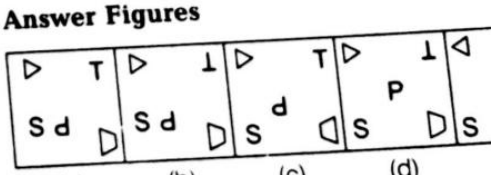


(a) (b) (c) (d) (e)

19. Problem Figures

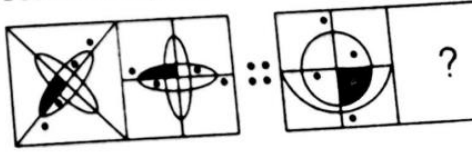


Answer Figures

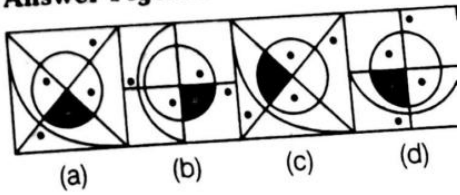


(a) (b) (c) (d)

20. Problem Figures



Answer Figures

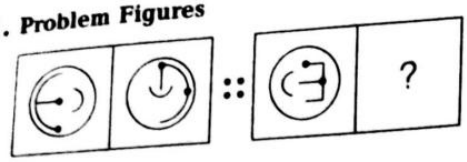


(a) (b) (c) (d)

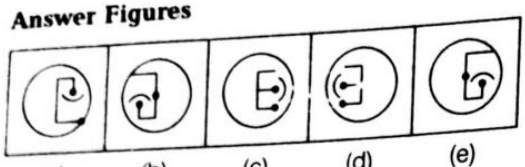
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21. Problem Figures

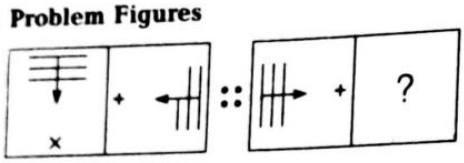


Answer Figures

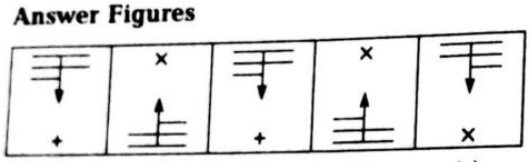


(a) (b) (c) (d) (e)

22. Problem Figures

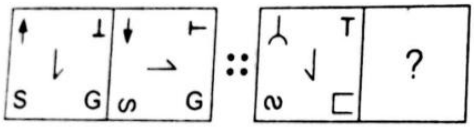


Answer Figures

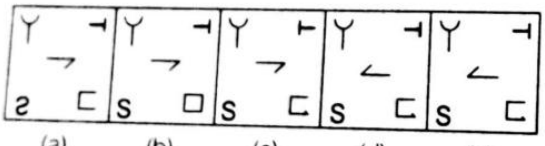


(a) (b) (c) (d) (e)

23. Problem Figures

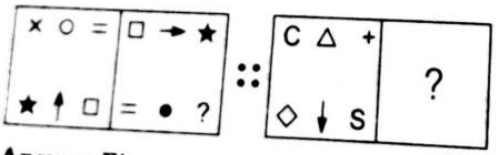


Answer Figures

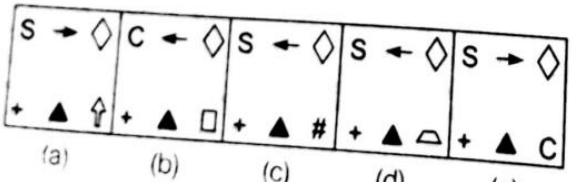


(a) (b) (c) (d) (e)

24. Problem Figures

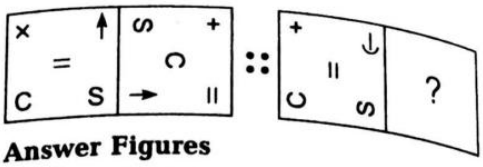


Answer Figures

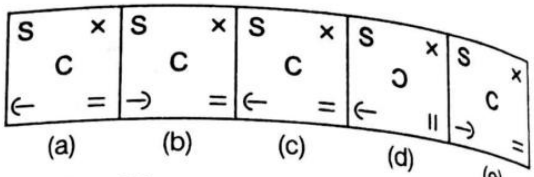


(a) (b) (c) (d) (e)

25. Problem Figures

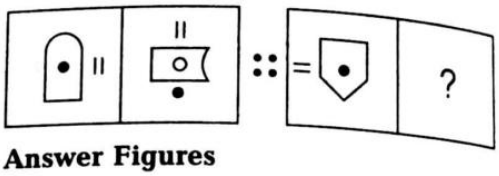


Answer Figures

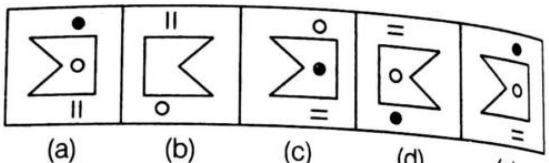


(a) (b) (c) (d) (e)

26. Problem Figures

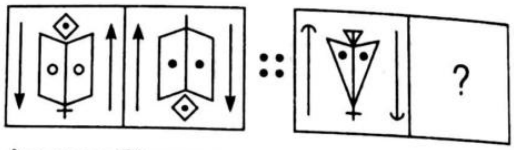


Answer Figures

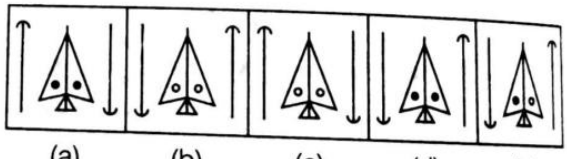


(a) (b) (c) (d) (e)

27. Problem Figures

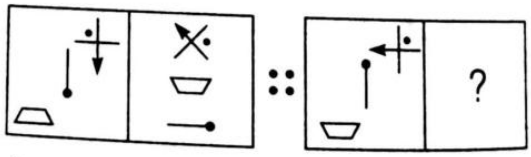


Answer Figures

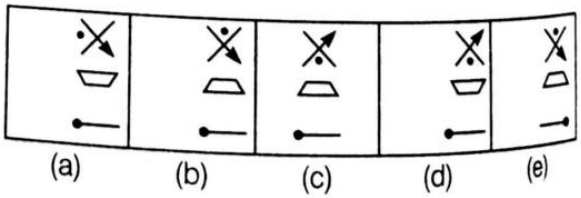


(a) (b) (c) (d) (e)

28. Problem Figures



Answer Figures

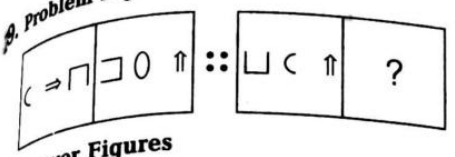


(a) (b) (c) (d) (e)

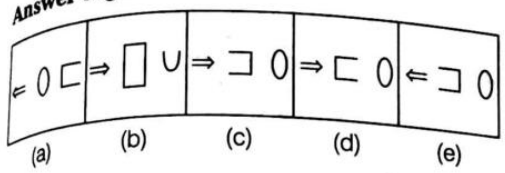
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29. Problem Figures

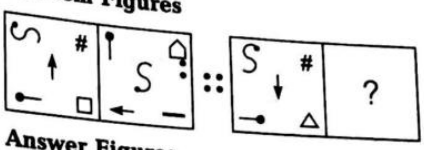


Answer Figures

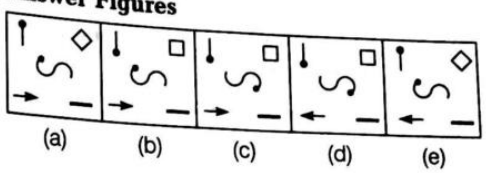


(a) (b) (c) (d) (e)

30. Problem Figures



Answer Figures



(a) (b) (c) (d) (e)

Answer *with* Explanations

Base Level Exercise

1. (c) First design of first pair of problem figures is inverted and then placed on the original to get the second figure of the pair. Similar, concept is used in second pair.

2. (d) Second figure of each figure is mirror image of first figure.

3. (a) From problem figure the inner most figure becomes outer most figure and outer most figure becomes the inner most figure *i.e.*, first and third figure interchanged.

4. (a) From problem figure the number of line in inner segment and outer segment increases. So, this happens in first figure.

5. (d) The outer figure comes inside, the inner figure comes outside.

6. (b) The symbol 'O' is moving from one corner to another in clockwise direction 90° in each step and one line is removed while second figure is formed.

7. (a) One more arm/side is added to the first figure to arrive at the second figure. The half-circle at the corner of the sides, which were at the outside, comes in.

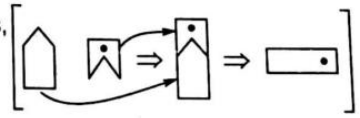
8. (c) First design of first pair of problem figure is rotated by 90° and then it is placed on the original to get the second figure of the pair similar concept is used in second pair to get the right answer.

9. (d) Shaded leaves at left and upper interchange places with 45° anti-clockwise rotation, unshaded leaves and rest remain at their old position.

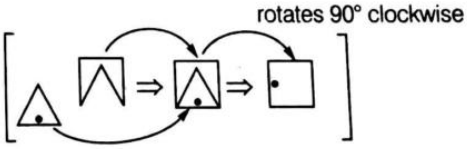
10. (b) Half of the petals is added to the anti-clockwise side and figure is rotated by 45°.

11. (d) Both the figures are superimposed on each other and the figure thus obtained rotated 90° clockwise.

As,



Similarly,



12. (a) Both the figures interchange positions. Single figure is converted into three figures and the *vice-versa*.

13. (c) The square is rotated 45° anti-clockwise and the arrow rotates 90° anti-clockwise.

14. (b) The figure rotates 180° and three lines are added to the lower portion of the figure.

15. (a) The main figure is rotated 90° clockwise and the other small figure is deleted.

16. (b) The outer figure rotates 135° clockwise, the inner figure rotates 45° clockwise and gets inverted at its new position.

17. (b) The outer figure remains the same and a new figure is formed inside the main figure with same number of lines and dots as of the main figure – 'six' as the main figure is a hexagon.

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18. (*a*) Figure rotates 45° anti-clockwise, shaded portion becomes white and *vice-versa*, also the handle of the figure is reversed.

19. (*e*) The figure rotate 90° clockwise and heads of the arrows are reversed.

20. (*e*) The main figure rotates 180° and three curved lines, are added to the figure. They all are added and facing the same direction.

21. (*e*) Right-half portion of the lower figure and left-half portion of the upper figure have been deleted and lower part, so formed, is filled black and the upper part which was black made white, as we move from problem figure first to second.

22. (*e*) The complete circle is converted into a hexagon and semi-circle is converted into half hexagon.

23. (*c*) One 'V' line is shifted to the top of the main figure and inverted.

24. (*d*) The larger figure becomes small, gets inverted and occupies the top position inside the circle which gets enlarged.

B. Expert Level Exercise

1. (*a*) The symbol in the middle position is reversed and shifts to the top left position, symbol at the top right position shifts to the bottom right position and is shaded and symbol at bottom left position rotates 90° anti-clockwise and occupies the central position.

2. (*a*) In the second figure, a small figure is generating, same as inside the circle. So, this happen in fourth figure.

3. (*c*) In the first to second figure all figure gets inverted and figure (c) is inverted figure of third.

4. (*d*) Problem figure second is mirror image of problem figure first. So, the option (d) is the mirror image of problem figure third.

5. (*d*) From first figure to second figure the designs are inverted.

6. (*a*) From figure first to second the inner triangle gets inverted. So, the answer figure (a) is obtained.

7. (*c*) Second figure is the replication of first figure in both pairs.

Similarly,



Also, second figure of each pair is rotated 45°.

8. (*d*) Inner elements of the figure becomes outer elements and *vice-versa*.

9. (*d*) Circle and arrow at the corner gets interchanged and circle in the middle of the figure gets converted to square. Same pattern is followed to obtain missing figure.

10. (*d*) From first figure to second figure both the designs are inverted horizontally but the middle line remains constant.

11. (*a*) The movement of diagrams are as follows:

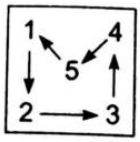


Diagram at 1 becomes now 5 and diagram at 5 becomes 4 and 4 is replicated.

12. (*b*) Number of lines equal to the number of sides are added inside the main figure. The outer designs interchange their positions and half of these are shaded.

13. (*a*) Whole figure is rotated 135° clockwise. One set of outer items remains as it is and the other set gets inverted vertically.

14. (*a*) The inner most figure becomes the outer most and the *vice-versa*. The two middle figures also interchange between themselves.

15. (*d*) The figure rotated 45° clockwise in such a way that one curved line is deleted and one arrow is added. The arrows get inverted at their new position.

16. (*b*) The figure is rotated 90° anti-clockwise, curved portion is pressed and the figure is pressed from one side. The symbol inside the figure rotated 45° and comes out of the smaller side, the triangle moves clockwise and is shaded and a new sign is added.

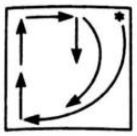
17. (*b*) Straight line in the figure intersect and curved positions of the figure are deleted.

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black and the
white, as we
second.
to a hexagon
alf hexagon.
e main figure
ets inverted
de the circle
both the
the middle
llows:
gram at 5
of sides
he outer
d half of
One set
other set
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(a) As we move from problem figure first to second, all the symbols change their positions as shown in the diagram and a new symbol replaces the symbol '*'. Changes from problem figure third to answer figure will be obtained by rotating the above diagram 90° anti-clockwise and reversing it in its new position.



(c) The symbol at the top left position rotates 180° clockwise and comes at the centre, the symbol at top right position rotates 90° clockwise and comes at the bottom right position, the symbol at the bottom right position rotates 90° clockwise and comes to the top left position, the symbol at the bottom left position rotates 90° clockwise and gets reversed at the bottom left position.

(e) The main figure rotates 45° clockwise and the dots outside the figure move to the other side of the line.

(c) The larger arc is reversed and the dot on it moves to right by 180°, the smaller arc rotates 90° clockwise and the pin rotates 90° anti-clockwise.

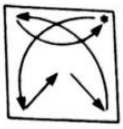
(e) The main figure rotates 90° clockwise and also moves to one side. At the same time one of the lines of one side is deleted. The small sign moves anti-clockwise and rotates 45°.

(c) Sign at the top left position is being inverted, sign at top right position rotates 90° clockwise, sign at the bottom left position rotates 90° clockwise, sign at the central position rotates 90° anti-clockwise and the sign at bottom right position remains unchanged.

(c) All the symbols interchange positions as shown in the diagram. Also, each of the symbols change their direction at the new position in a specific order and the symbol in place of + is replaced by new symbol.



25. (a) All the signs change positions as shown in the diagram and the sign × is replaced by a new sign and it rotates in a specific order.



26. (e) The main figure rotates 90° clockwise and the protruted portion of the figure is pressed in. Shaded dot comes out of the figure, sign of = moves 180° anti-clockwise and a blank dot is formed inside the main figure.

27. (b) The entire figure along with arrows is reversed, black dots become white and *vice-versa* and a line segment from the head of the figure is removed.

28. (c) The figure at the top right position rotates 135° clockwise, the symbol at the central position rotates 90° anti-clockwise and moves to the bottom position and the figure at bottom left position is inverted and moves to the central position.

29. (b) The half circle at the left (most) shifts to the right, to the second position, circle is completed as it moves to the right. Second figure rotates 90° anti-clockwise on its axis and shifts to the third position. The third figure rotates 90° clockwise and shifts to the first position.

30. (b) The symbol at the top left position rotates 90° anti-clockwise and moves to the central position, symbol at the top right position rotates 90° and moves to the bottom right position, symbol at the bottom left position rotates 90° clockwise and moves to the top left position, symbol at the central position rotates 90° anti-clockwise and moves to the bottom left position and symbol at the bottom right position shifts to the top right position one additional side is being added to it.

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5

Classification

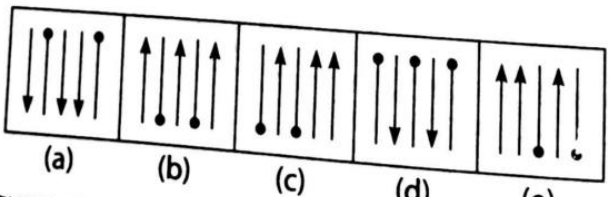
Classification is the act or process of putting people or things into a group or a class. In this chapter, we deal with problems of ***odd man-out type****.*

This test is designed to judge candidates ability to classify or segregate a group of objects, from the given objects, on the basis of their common properties *i.e.,* it is a process of marking out a homogeneous group from a heterogeneous larger group. In this type of questions you will be asked to find out a figure which is different in nature/character from the main group.

In this chapter, we deal with questions which have a set of four/five figures, out of which all except one are alike or have some common nature/characteristics. You will have to select the exclusively different figure from the given set. Here, some examples are given which will illustrate the different types of questions which are generally asked in various competitive examinations.

Directions (Illustrations 1-5) *Out of these five/four set of given figures, four/three are similar in a certain way. One figure is not like the other four/three. Find out the figure which does not belong to the group.*

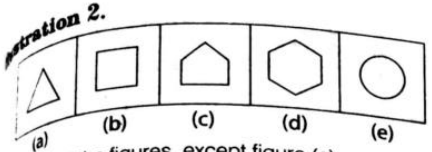
Illustration 1.



Solution (*d*) In all the figures except figure (d), there are two pins and three arrows. In figure (d), there are three pins and two arrows; thus it is different from the others.

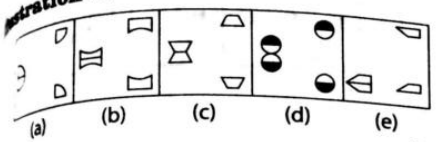
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...stration 2.



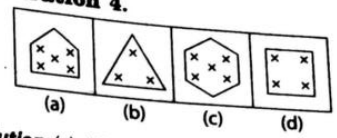
...ution (e) All the figures, except figure (e) are made of ...es. But figure (e) is not thus, it is different.

...stration 3.



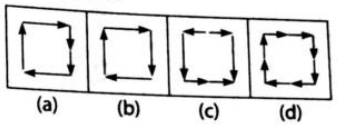
...ution (d) In each figure except figure (d), the upper ...ght element is identical to the lower part of the left ...hand side element and the lower right element is ...dentical to the upper part of the left hand side ...element.

Illustration 4.



Solution (c) All the figures except figure (c) have the same number of crosses (×) as the number of sides of the main element (outer figure), *e.g.*, The first is a pentagon and thus, have five cross inside in it. Similarly, the second and fourth.

Illustration 5.



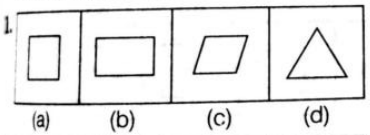
Solution (c) In all the figures except for (c), the rotation of the arrows is in clockwise direction. But in figure (c), four arrows are moving in an anti-clockwise direction.

Let us Practice

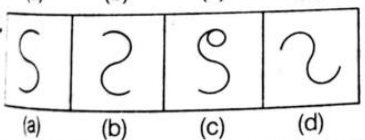
Base Level Exercise

...rections (Q. Nos. 1-18) *In each of the following problems, out of four figures marked (a), (b), (c) and (d), three are similar in a certain manner, but, one figure is different from other three. Choose the figure which is different from others.*

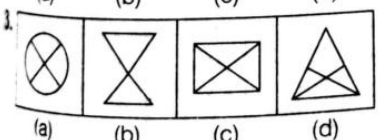
1.



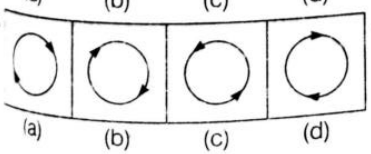
2.



3.



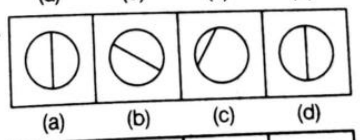
4.



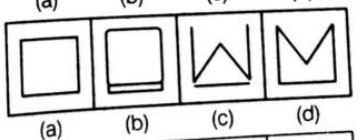
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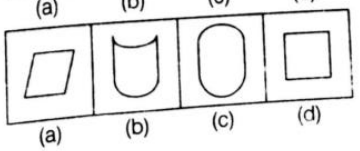
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7.



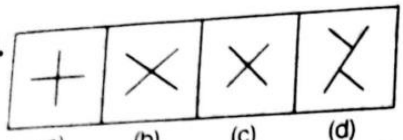
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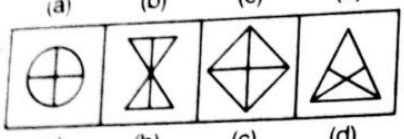


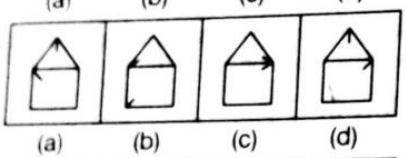
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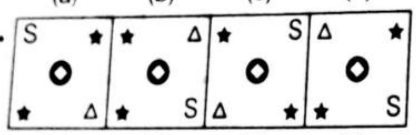
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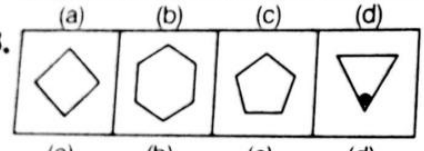
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9.

(a) (b) (c) (d)

10.

(a) (b) (c) (d)

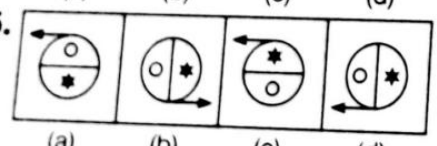
11.

(a) (b) (c) (d)

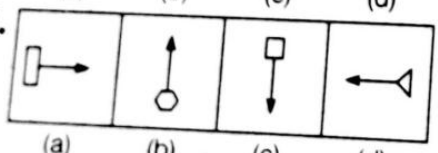
12.

(a) (b) (c) (d)

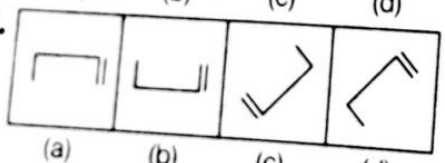
13.

(a) (b) (c) (d)

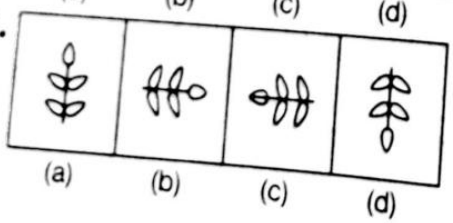
14.

(a) (b) (c) (d)

15.

(a) (b) (c) (d)

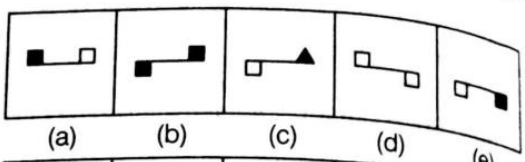
16.

(a) (b) (c) (d)

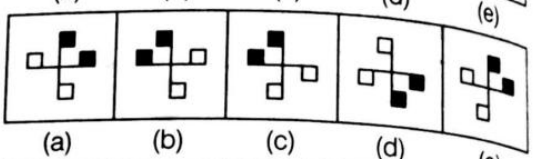
17.

(a) (b) (c) (d)

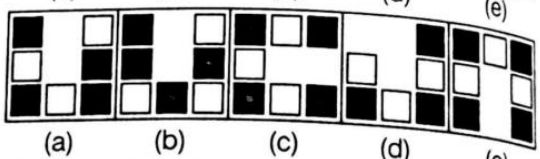
18.

(a) (b) (c) (d)

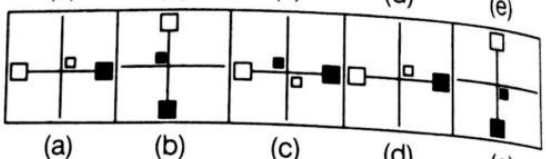
[SSC (10+2) 2012]

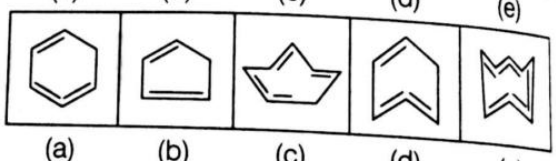
Directions (Q. Nos. 19-28) *In each problem, out of five figures marked (a), (b), (c), (d) and (e), four are similar in a certain manner. Choose the figure which is different from others.*

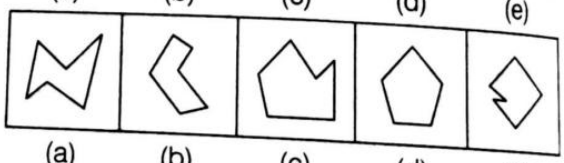
19.

(a) (b) (c) (d) (e)

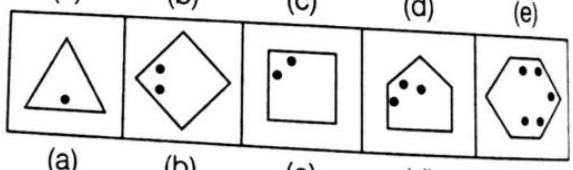
20.

(a) (b) (c) (d) (e)

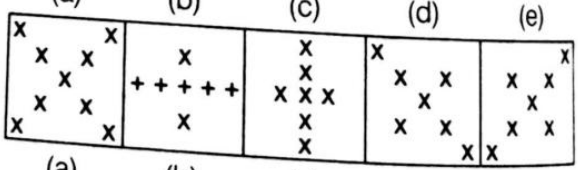
21.

(a) (b) (c) (d) (e)

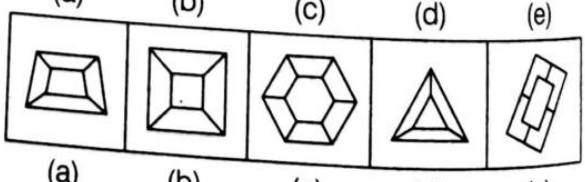
22.

(a) (b) (c) (d) (e)

23.

(a) (b) (c) (d) (e)

24.

(a) (b) (c) (d) (e)

25.

(a) (b) (c) (d) (e)

26.

(a) (b) (c) (d) (e)

27.

(a) (b) (c) (d) (e)

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30.

(a) (b) (c) (d)

31.

(a) (b) (c) (d)

32.

(a) (b) (c) (d)

Directions (Q. Nos. 29-32) *In the following questions, choose the figure which is different from the other three.* **[RRB (ECR) 2009, 2008]**

29.

(a) (b) (c) (d) (e)

30.

(a) (b) (c) (d) (e)

31.

(a) (b) (c) (d) (e)

32.

(a) (b) (c) (d) (e)

Expert Level Exercise

Directions (Q. Nos. 1-37) *In each of the problems, out of five/four figures four/three are similar in a certain manner. Choose the figure which is different from others.*

1.

(a) (b) (c) (d) (e)

2.

(a) (b) (c) (d) (e)

3.

(a) (b) (c) (d) (e)

4.

(a) (b) (c) (d)

[SSC (Constable) 2012]

5.

(a) (b) (c) (d) (e)

6.

(a) (b) (c) (d) (e)

7.

(a) (b) (c) (d) (e)

8.

(a) (b) (c) (d) (e)

9.

(a) (b) (c) (d) (e)

10.

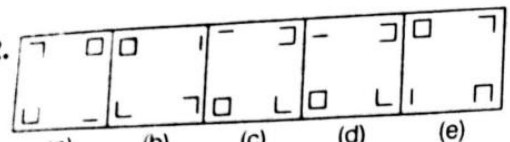
(a) (b) (c) (d) (e)

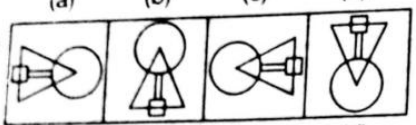
11.

(a) (b) (c) (d) (e)

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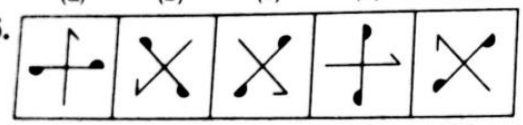
12.

(a) (b) (c) (d) (e)

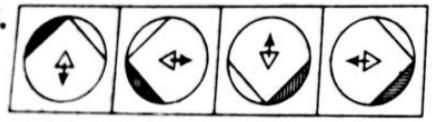
13.

(a) (b) (c) (d)

[SSC (10 + 2) 2013]

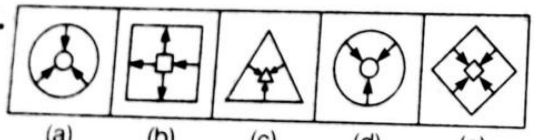
14.

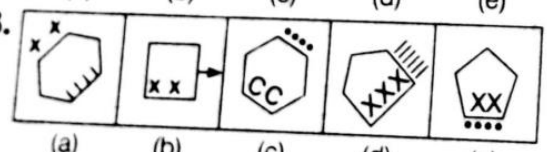
(a) (b) (c) (d) (e)

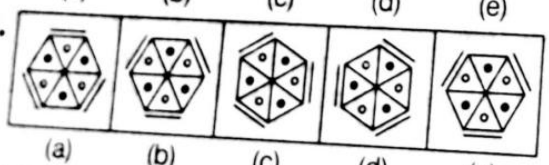
15.

(a) (b) (c) (d) (e)

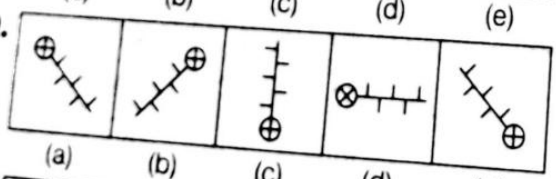
16.

(a) (b) (c) (d)

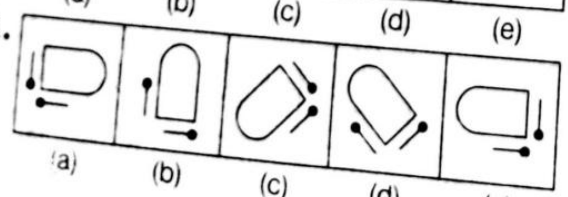
[SSC (10 + 2) 2013]

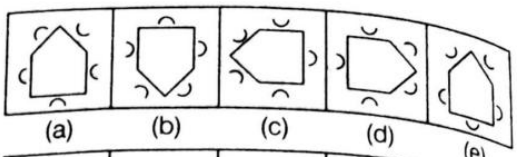
17.

(a) (b) (c) (d) (e)

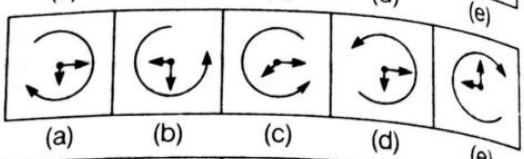
18.

(a) (b) (c) (d) (e)

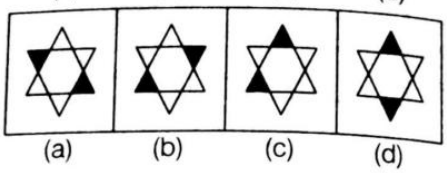
19.

(a) (b) (c) (d) (e)

20.

(a) (b) (c) (d) (e)

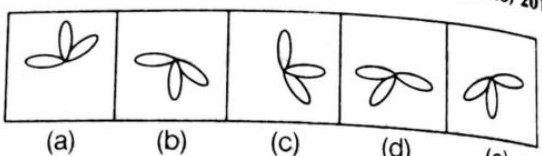
21.

(a) (b) (c) (d) (e)

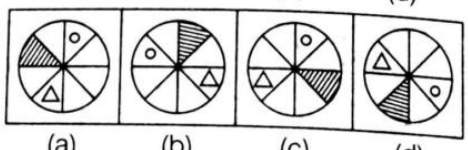
22.

(a) (b) (c) (d) (e)

23.

(a) (b) (c) (d) (e)

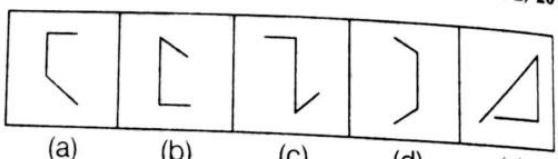
24.

(a) (b) (c) (d)

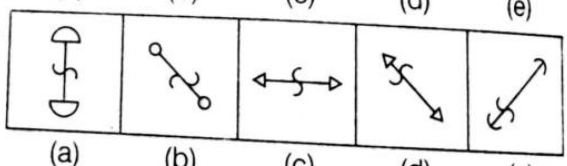
[SSC (Steno) 2012]

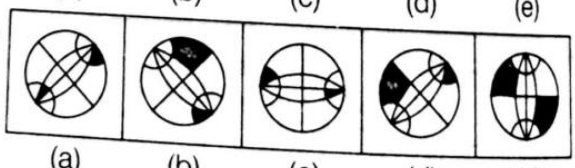
25.

(a) (b) (c) (d) (e)

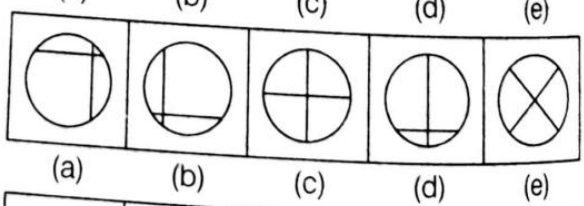
26.

(a) (b) (c) (d)

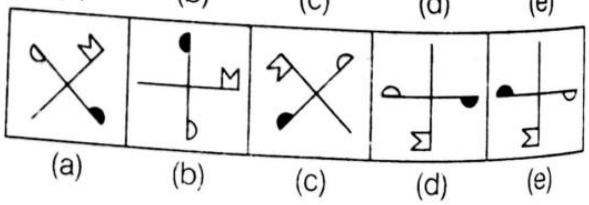
[SSC (10 + 2) 2013]

27.

(a) (b) (c) (d) (e)

28.

(a) (b) (c) (d) (e)

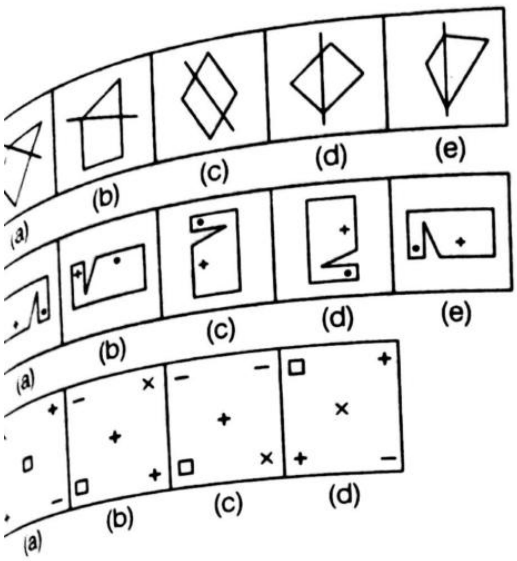
29.

(a) (b) (c) (d) (e)

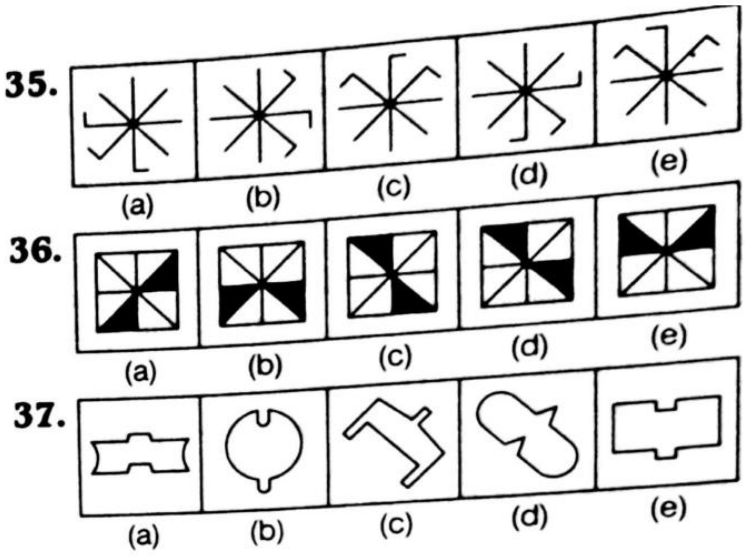
30.

(a) (b) (c) (d) (e)

31.

(a) (b) (c) (d) (e)

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Answer *with* Explanations

Base Level Exercise

1. (*d*) Except figure (d), all other figures are made up of four lines.
2. (*c*) Figure (c) has one closed loop. Others do not have such loop.
3. (*b*) Figure (b) is divided into two parts while others is being divided into four parts.
4. (*c*) Direction of arrows in all figures except for figure (c), are in clockwise direction.
5. (*d*) Except for figure (d), all other figures are made of straight lines only.
6. (*c*) All figures except in figure (c), circles are divided into two equal parts.
7. (*c*) All figures except figure (c) ...

14. (*b*) All the figures except figure (b), are divided into two equal parts.

15. (*d*) In all the figures except (d), both the designs inside the circle are rotating 90° anti-clockwise. Whereas the arrow is moving 180° anti-clockwise.

16. (*d*) In all the figures except figure (d), the arrow is added at the side of the figure whereas in figure (d) it is added to the corner.

17. (*b*) All the figures except figure (b), are rotated form of the same figure.

18. (*c*) Except figure (c), all have undivided leave.

19. (*c*) Except figure (c), all other figures ...

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25. (c) The difference in number of lines of the figure and the dot-dots in it is two, except in figure (e), where the difference is one.

26. (b) All the figures, except figure (b) consist of '×' (cross) signs only. But figure (b) consist of '×' (cross) and '+' (plus) signs as well.

27. (e) Except figure (e), all other figures have common features that corners of inner figure and outer figure are joined with straight line.

28. (e) All the figures are made of two circles of different sizes, each circle is having a line within it. One line is vertical and the other horizontal. But in figure (e), both the lines are horizontal.

29. (*d*) Figure (d) is made up two geometrical figures while others are single geometrical figures.

30. (*a*) In all others, there is only one vertical line where as in option (a) there are two such lines.

31. (*d*) Except figure (d), all oval shape circles have two straight lines inside it which are parallel to each others.

32. (*d*) In all the figures except figure (d), there are two arrows and two dots at the bottom of lines.

Expert Level Exercise

1. (*b*) In all other figures, the symbol M is pointing inward but in (b) it is not.

2. (*d*) In all other figures, two arcs are facing inward and two arcs are facing outward.

3. (*b*) In figure (b) only, the small line segment attached to the main line segment at the bottom is perpendicular to it.

4. (*c*) Except (c), all figures have their legs pointing upside.

5. (*e*) The two small lines at the end of the lines are pointing in the same direction but in figure (e), they are pointing in different direction. clockwise and anti-clockwise.

6. (*e*) Only in figure (e), all the arrows are facing to the same direction. It is not the case in others.

7. (*d*) In all other figures, except (d), all the numbers from 1 to 5 are in a serial order.

8. (*c*) In all other figures except (c), all the four small figures in it are arranged in anti-clockwise direction and in ascending order of their sides.

9. (*d*) In all other figures, the number of black blocks inside the square is odd. In figure (d), it is even.

10. (*c*) In all other figures except (c), both the line segments are perpendicular to each other.

11. (*a*) In all other figures except (a), one dot is outside the figure and one inside.

12. (*b*) All other figures contain figures with one, two, three and four number of sides. Figure (b) contains two figures with two sides each.

13. (*b*) Except figure (b) the straight line touches circle and square but in figure (b) they are extended into the square and circle.

14. (*d*) In all other figures shaded portion of the central figure and sign — are on the same side. In figure (d) these two are on the opposite sides.

15. (*b*) In all the other figures except (b), in all the designs half arrow and half dot are facing each other.

16. (*d*) In each figure except (d) the shaded region is on the anti-clockwise side of the unshaded region.

17. (*b*) In all the other figures, except (b), all the arrows are directed towards inside.

18. (*e*) In all the other figures, except (e), symbols inside and outside the figures are placed along the different sides of the figures. In figure (e), these symbols are placed in the same direction.

19. (*d*) In all the figures, except figure (d), the line is placed adjacent to the shaded circle.

20. (*c*) Only in figure (c), the cross inside the circle is attached in line with the main line segment.

21. (*a*) All the figures are placed straight with base down, then one of the pins lies along base and the other pin lies along left side of the figure. Figure (a) does not follow this rule and hence, is different from others.

22. (*c*) All the arcs along the sides of the figure are arranged in such a way that any three arcs adjustment are placed in similar fashion, i.e., they face sides of the figure or faces outside. Figure (c) does not follow this rule and hence, is different from other figures.

23. (*c*) In all the other figures, except (c), both the arrows are perpendicular to each other.

24. (*c*) Except (c) all have shaded portion opposite to each other.

25. (*b*) All other figures, except (b), can be obtained by rotating one another.

26. (*c*) In all figure, except (c) the shaded part and the triangle have one empty space similarly the shaded part and the small circle have one empty space in between.

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(d) In all other figures, except (d), one of the lines is perpendicular to the vertical line.

(b) In figure (b), position of S is different from other figures.

(e) In figure (e), both shaded designs have the common base, *i.e.*, the middle line.

(a) In all the other figures, the circle contains chords of equal length.

(c) Only in figure (c), both the semi-circles, white and black, lie on the same side of the line segment.

(c) Only in figure (c), the straight line divides the figure into two equal part.

33. (*b*) Only in figure (b), placement of symbols '•' and '+' is different from rest of the figures.

34. (*c*) Except (c), all have the similar mathem notations having two '+' sign.

35. (*e*) In all the other figures, two bent lines segments faces clockwise direction and single bent line faces in anti-clockwise direction. In figure (e), the case is just the opposite.

36. (*c*) All other figures except (c), have a line of symmetry.

37. (*c*) All other figures except (c), are similar in a way that protruding in and out portions of each of the figures are identical.

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6

Paper Folding *and* Cutting

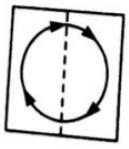
Paper folding and cutting involves a process in which a transparent sheet is folded and then some cut are made.

In the questions based on paper folding and cutting few figures are given showing the way in which a piece of paper is to be folded and then cut from a particular section. The dotted line is the reference line along which the paper is to be folded and the arrow indicates the direction of the fold. Thus, these figures indicate the sequence in which the paper is to be folded. The designs from the cut will appear on each one of the folds made on the paper. In questions based on paper folding and cutting it can be asked to find either the folded or unfolded pattern of the sheet.

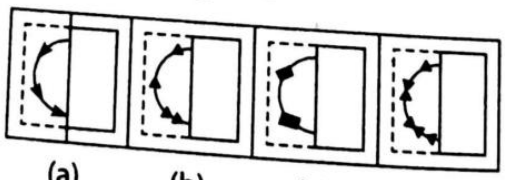
Examples given below will give a better idea about the type of questions asked in various competitive examples

Directions (Illustration 1) *In each of the following problems, a square transparent sheet with a pattern is given. Figure out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded along the dotted line.*

Illustration 1. Transparent Sheet



Answer Figures



(a) (b) (c) (d)

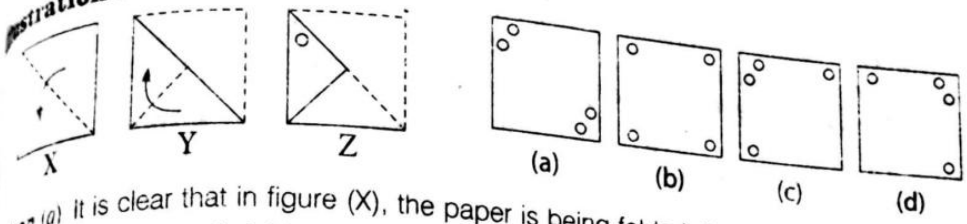
Solution (c) The right half of the transparent sheet is being folded along the dotted line and placed on the left half of the sheet. The figure thus, obtained resembles the answer figure (c).

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Directions (Illustrations 2-3) *In each of the following questions, a set of three figures (X), (Y) and (Z) have been given, showing a sequence in which paper is folded and finally cut from a particular section. Below these figures a set of answer figures marked (a), (b), (c) and (d) showing the design which the paper actually assumed when it is unfolded are also given. You need to select the answer figure which is closest to the original piece of paper.*

Illustration 2.



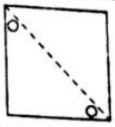
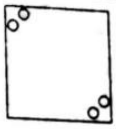
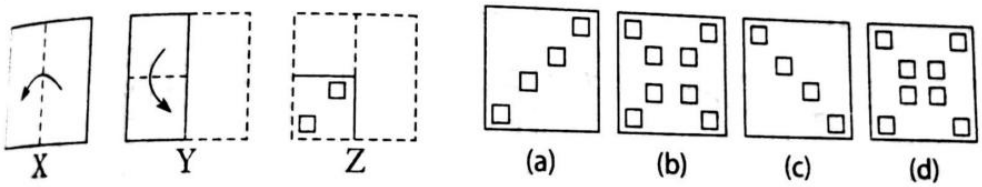
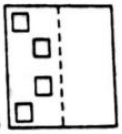
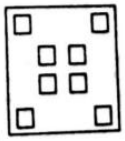
Solution *(a)* It is clear that in figure (X), the paper is being folded diagonally to divide it in to two equal parts. In figure (Y) rest part is folded by touching upper corner. Now, in given figure (Z). the cut is marked at the position which is occupied. Thus after unfolding the first fold the figure will look like as  then after unfolding the last fold the transparent sheet will look like as given in option (a) *i.e.*, 

Illustration 3.



Solution *(d)* In figure (X), the square sheet of paper is being folded along the vertical line of symmetry so that right half of the sheet overlaps the left half. In figure (Y), the sheet is folded further to a quarter.

In figure (Z), two squares are punched in the folded sheet. Clearly, the punched squares will be created in each quarter of the paper and after unfolding the first fold the figure will look like as  then after unfolding the last fold the transparent sheet will look like as given in option (d) *i.e.*, 

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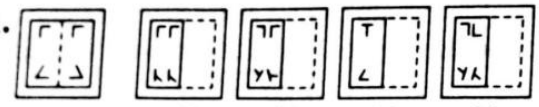
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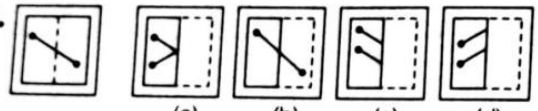
Let us Practice

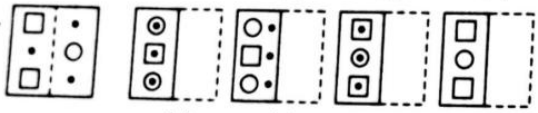
A. Base Level Exercise

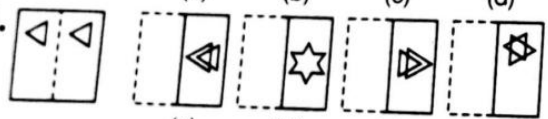
Directions (Q. Nos. 1-22) *In each of the following questions, a figure marked as transparent sheet is given and followed by four answer figures, one out of these four options resembles the figure which is obtained by folding transparent sheet along the dotted line. Find the answer from these figures.*

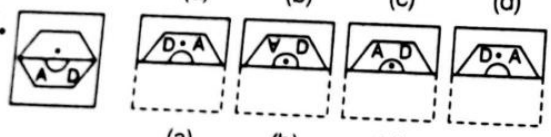
Transparent Sheet | **Answer Figures**

1. 

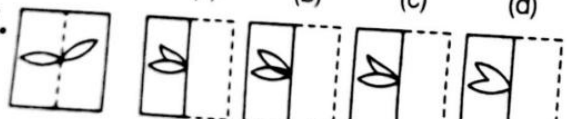
2. 

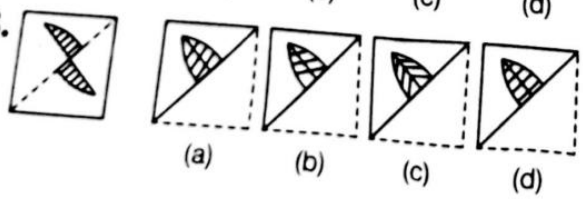
3. 

4. 

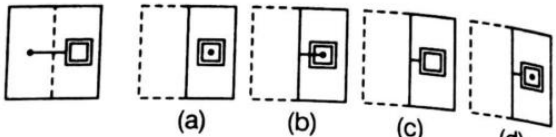
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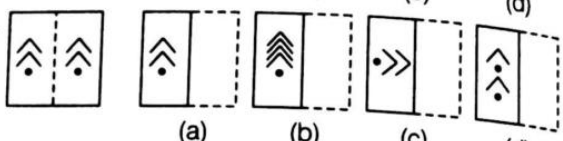
6. 

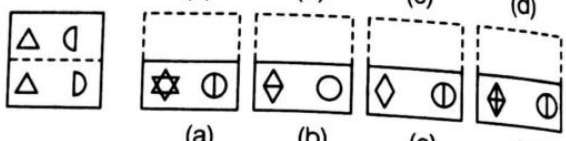
7. 

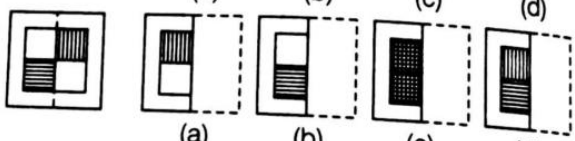
8. 

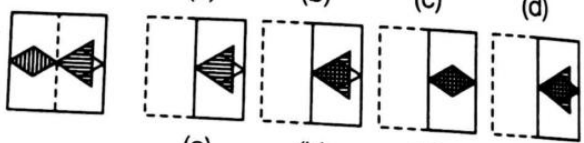
Transparent Sheet | **Answer Figures**

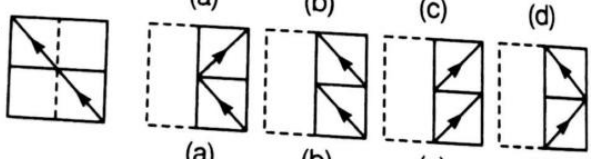
9. 

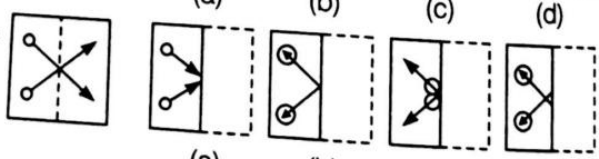
10. 

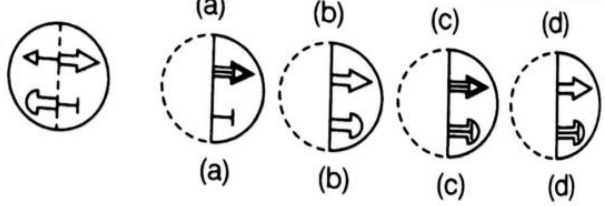
11. 

12. 

13. 

14. 

15. 

16. 

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24. A piece of paper is folded and a cut is made as shown below. From the given responses indicate how it will appear when opened? [SSC (Multitasking) 2012]

Problem Figures

Answer Figures

(a) (b) (c) (d)

25. A piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened? [SSC (Steno) 2012]

Problem Figures

Answer Figures

(a) (b) (c) (d)

26. If the following pattern is drawn on a transparent rectangular sheet and folded along the dotted line, how does it appear? [SSC (10+2) 2012]

Problem Figure

Answer Figures

(a) (b) (c) (d)

transparent sheet

heet is given and btained by folding

Answer Figures

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

(a) (b) (c) (d)

A square sheet of paper has been folded and punched as shown below. You have to find out from amongst the four response figures, how it will appear when opened?

Problem Figures

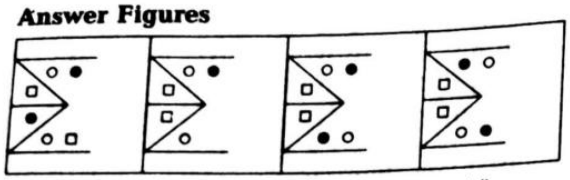
Answer Figures

(a) (b) (c) (d)

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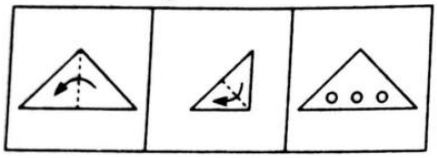
Answer Figures



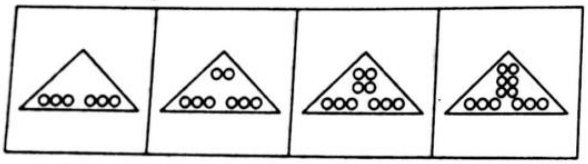
(a) (b) (c) (d)

27. A triangular sheet of paper has been folded and punched as shown in the following series of figures. How will it appear when opened? **[SSC (Steno) 2011]**

Problem Figures

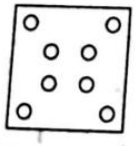


Answer Figures

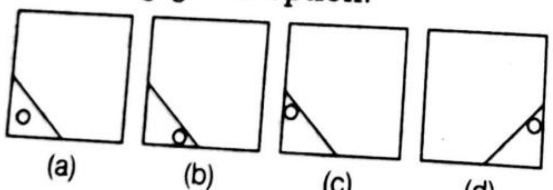


(a) (b) (c) (d)

28. A square paper is folded in a particular manner and a punch is made. When unfolded, the paper appears as given below

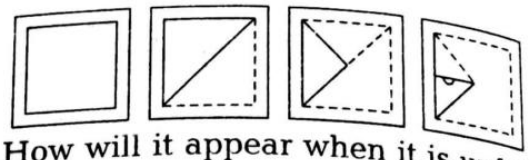


Find out the manner in which the paper is folded and punch is made from the following given option.

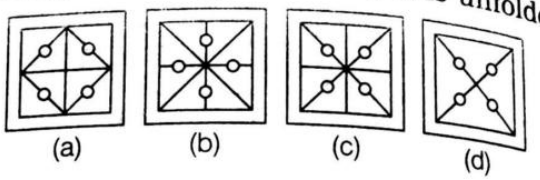


(a) (b) (c) (d)

29. A piece of paper is folded and punched as shown in figure below

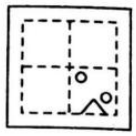


How will it appear when it is unfolded?

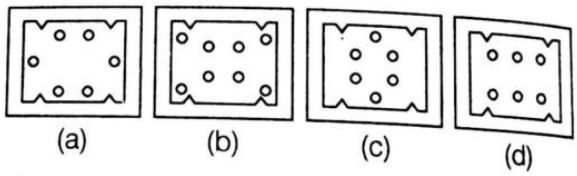


(a) (b) (c) (d)

30. A piece of paper is folded and punched as shown below

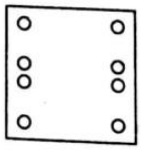


From the given responses, indicate how it will appear when it is unfolded?

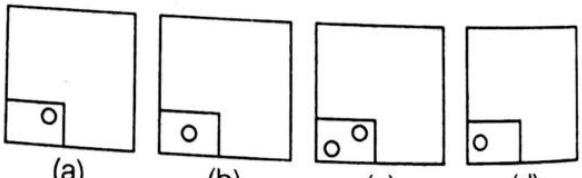


(a) (b) (c) (d)

31. A square paper is folded in a particular manner and a punch is made. When unfolded, the paper appears as shown below



Find the manner in which the paper is folded and punch is made from the options given.



(a) (b) (c) (d)

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B. Expert Level Exercise

Directions (Q. Nos. 1-20) *In each of the following questions, a set of three figures (X), (Y) and (Z) have been given, showing a sequence in which a paper is folded and finally cut at a particular section. Below these figures a set of answer figures marked (a), (b), (c) and (d) showing the design which the paper actually acquires when it is unfolded are also given. You have to select the answer figure which is closest to the unfolded piece of paper.*

1.

2.

3.

4.

5.

6.

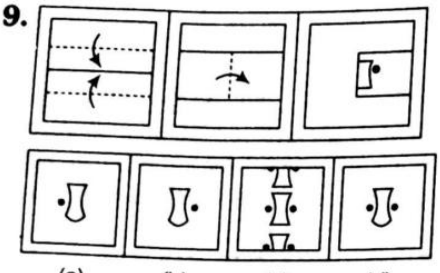
7.

8.

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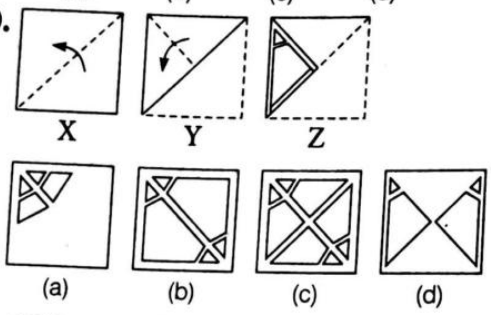
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9.



(a) (b) (c) (d)

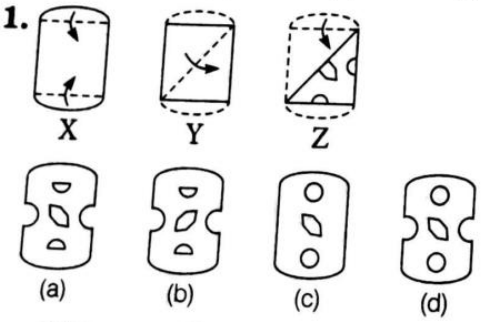
10.



X Y Z

(a) (b) (c) (d)

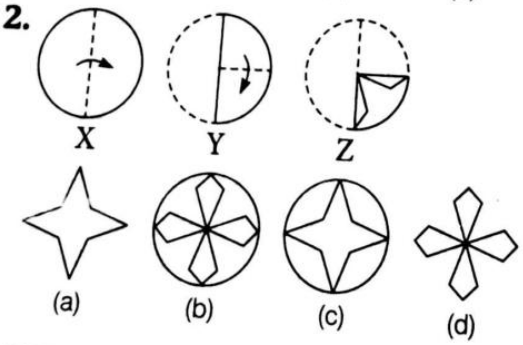
11.



X Y Z

(a) (b) (c) (d)

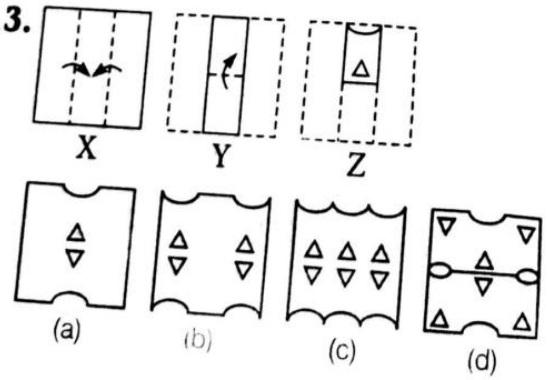
12.



X Y Z

(a) (b) (c) (d)

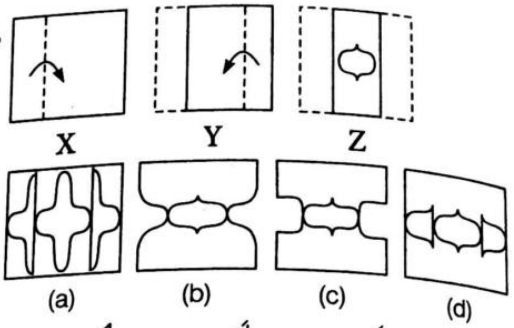
13.



X Y Z

(a) (b) (c) (d)

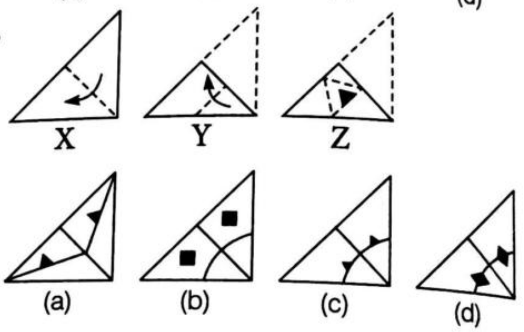
14.



X Y Z

(a) (b) (c) (d)

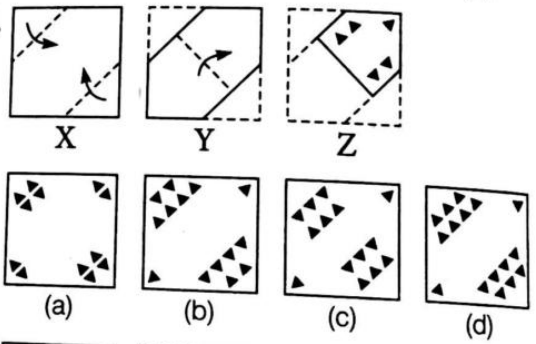
15.



X Y Z

(a) (b) (c) (d)

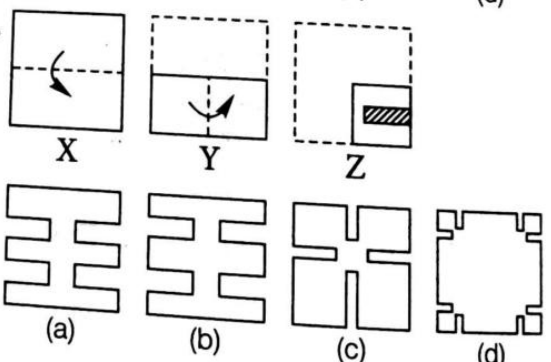
16.



X Y Z

(a) (b) (c) (d)

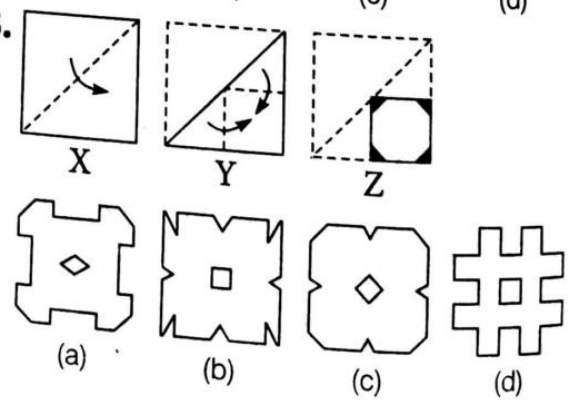
17.



X Y Z

(a) (b) (c) (d)

18.



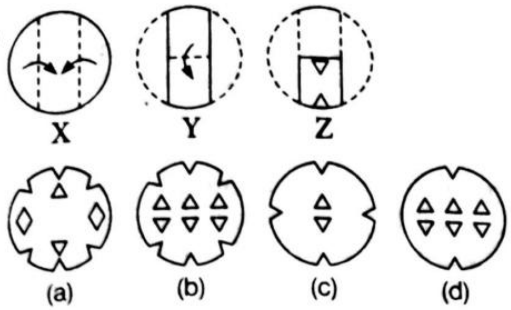
X Y Z

(a) (b) (c) (d)

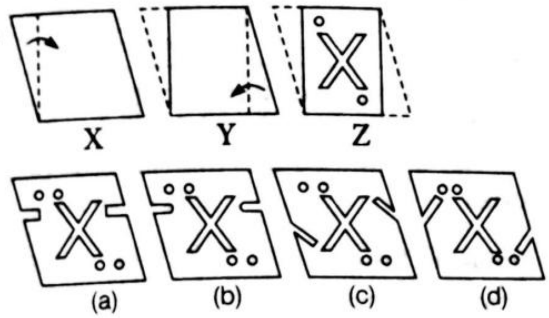
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19.



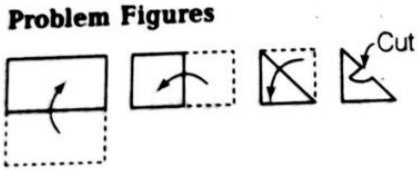
20.



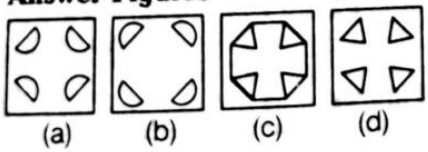
21. A piece of paper is folded and cut as shown below in the questions figures. From the given answer figures, indicate how it will appear when opened?

[SSC (Multitasking) 2014]

Problem Figures



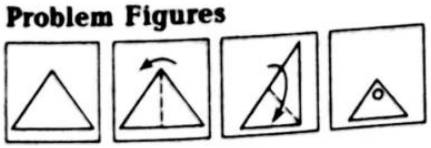
Answer Figures



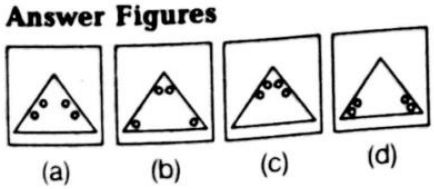
22. A piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

[SSC (Multitasking) 2013]

Problem Figures



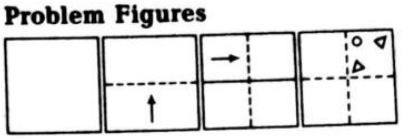
Answer Figures



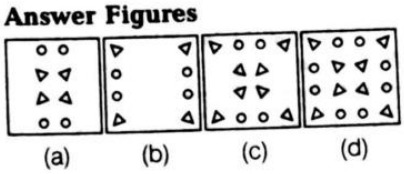
23. A piece of paper is folded and cut /punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

[SSC (10 + 2) 2013]

Problem Figures



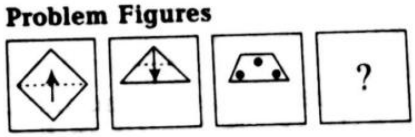
Answer Figures



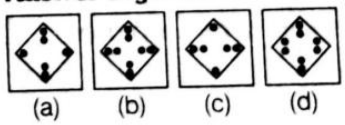
24. A piece of paper is folded and cut / punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

[SSC (10 + 2) 2013]

Problem Figures



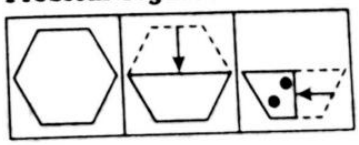
Answer Figures



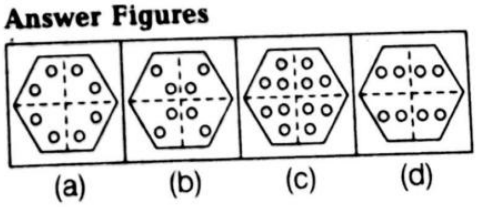
25. A piece of paper is folded and cut/punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

[SSC (10 + 2) 2013]

Problem Figures



Answer Figures

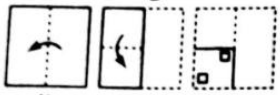


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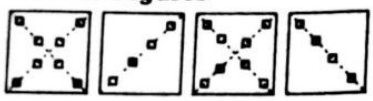
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Directions (Q. Nos. 26-27) *In the following questions, a piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?*
[SSC (CPO) 2013]

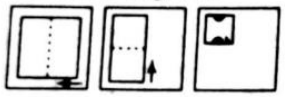
26. Problem Figures



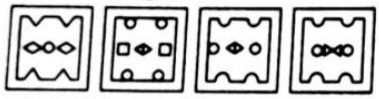
Answer Figures



27. Problem Figures **[SSC (CPO) 2013]**

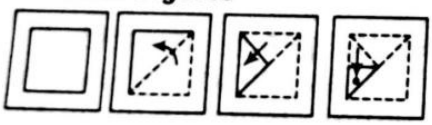


Answer Figures

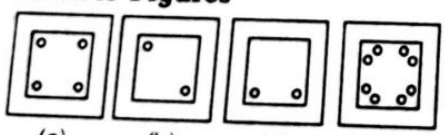


28. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?
[SSC (CGL) 2013]

Problem Figures

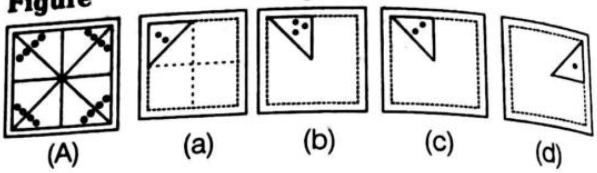


Answer Figures



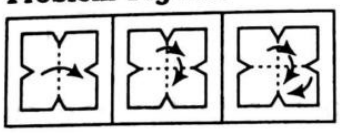
29. A square piece of paper is folded in a particular manner and punched and then unfolded. The unfolded paper is given below. Find out the manner in which the paper was folded and punched from the answer figure.
[SSC (Multitasking) 2013]

Problem Figure **Answer Figures**

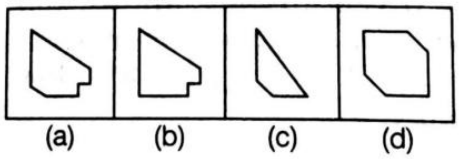


30. A square piece of paper cut at the edges as shown is taken and folded as shown below. How would the folded pattern look?
[SSC (Multitasking) 2013]

Problem Figures

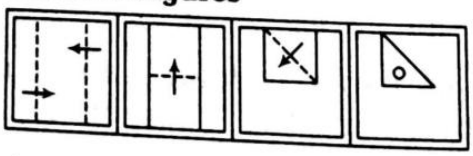


Answer Figures

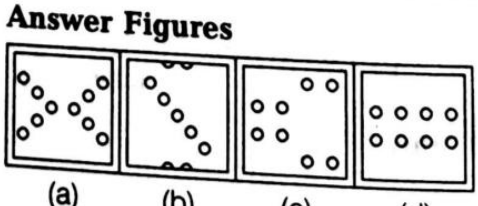


31. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?
[SSC (CGL) 2013]

Problem Figures



Answer Figures



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32. A piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened?

[SSC (Steno) 2013]

Problem Figures

Answer Figures

(a) (b) (c) (d)

36.

Directions (Q. Nos. 33-34) *In each of the following questions, a set of four figures (P), (X), (Y) and (Z) have been given, showing a sequence in which a paper is folded and finally cut at a particular section. Below these figures a set of answer figures marked (a), (b), (c) and (d) showing the design which the paper actually acquires when it is unfolded are also given. You have to select the answer figure which is closest to the unfolded piece of paper.*

33.

P X Y Z

(a) (b) (c) (d)

34.

P X Y Z

(a) (b) (c) (d)

37.

35. A piece of paper folded and cut as shown in the question figures. From the given answer figures, indicate how it will appear when opened?

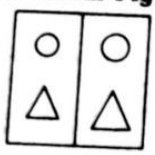
[SSC (FCI) 2012]

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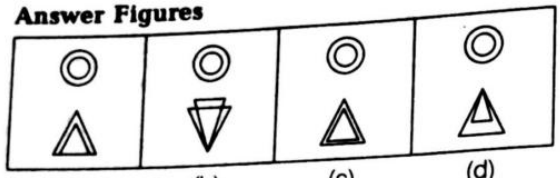
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38. A square transparent sheet with a pattern is given. Figure out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the middle line shown? [SSC (10+2) 2011]

Problem Figure



Answer Figures



(a) (b) (c) (d)

Answers

A. Base Level Exercise

1. (c)	**2.** (a)	**3.** (c)	**4.** (d)	**5.** (b)	**6.** (c)	**7.** (b)	**8.** (d)	**9.** (b)	**10.** (a)
11. (a)	**12.** (d)	**13.** (d)	**14.** (a)	**15.** (b)	**16.** (c)	**17.** (b)	**18.** (a)	**19.** (c)	**20.** (a)
21. (b)	**22.** (d)	**23.** (a)	**24.** (d)	**25.** (c)	**26.** (d)	**27.** (d)	**28.** (a)	**29.** (b)	**30.** (b)
31. (d)									

B. Expert Level Exercise

1. (a)	**2.** (c)	**3.** (b)	**4.** (b)	**5.** (d)	**6.** (c)	**7.** (b)	**8.** (c)	**9.** (c)	**10.** (c)
11. (d)	**12.** (b)	**13.** (c)	**14.** (c)	**15.** (d)	**16.** (b)	**17.** (b)	**18.** (c)	**19.** (d)	**20.** (d)
21. (a)	**22.** (a)	**23.** (c)	**24.** (d)	**25.** (b)	**26.** (a)	**27.** (d)	**28.** (d)	**29.** (c)	**30.** (c)
31. (a)	**32.** (a)	**33.** (c)	**34.** (d)	**35.** (d)	**36.** (c)	**37.** (a)	**38.** (d)		

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C (10+2) 2011]

10. (a)
20. (a)
30. (b)

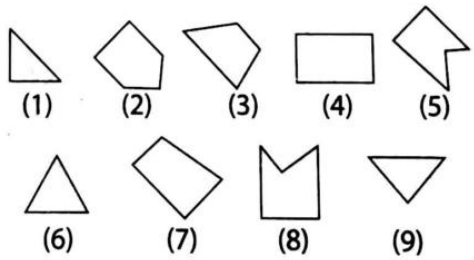
7 Grouping of Identical Figures

When different figures are grouped on the basis of certain pattern, then this is called grouping of identical figures.

In this chapter, we have a set of few figures which are numbered as 1, 2, 3, 4 and so on. We are required to analyse these figures and classify them into groups consisting of figures having more or less than same properties. The best answer is to be selected from a given set of fairly close alternatives.

Direction (Illustration 1) *In each of the following question, group the given figures into three classes using each figure only once.*

Illustration 1.



(a) (7, 8, 9) (2, 4, 3) (1, 5, 6)
(b) (1, 3, 2) (4, 5, 7) (6, 8, 9)
(c) (1, 6, 8) (3, 4, 7) (2, 5, 9)
(d) (1, 6, 9) (3, 4, 7) (2, 5, 8)

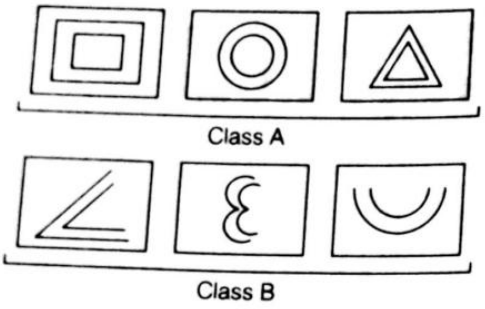
Solution (*d*) Figures (1), (6) and (9) are all triangles.
Figures (3), (4) and (7) are all quadrilaterals.
Figures (2), (5) and (8) are all pentagons.

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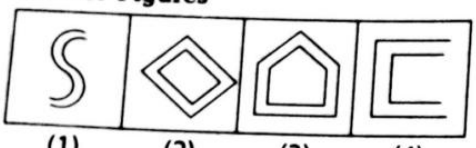
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Direction (Illustration 2) *There are two classes of three figures each. Class 'A' figures differ in certain way from the figures in class 'B'. Which two of the four answer figures belong to class 'A'?*

Illustration 2.



Answer Figures



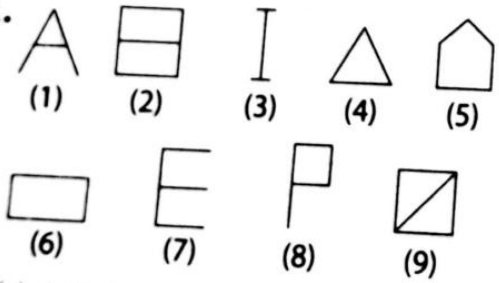
(a) Both 1 and 3 (b) Both 1 and 2 (c) Both 2 and 4 (d) Both 2 and 3

Solution (d) Each figure in class A consists of two similar closed figures, which are placed one inside the other.

Let us Practice

Directions (Q. Nos. 1-15) *In each of the following questions, group the given figures into three classes using each figure only once.*

1.



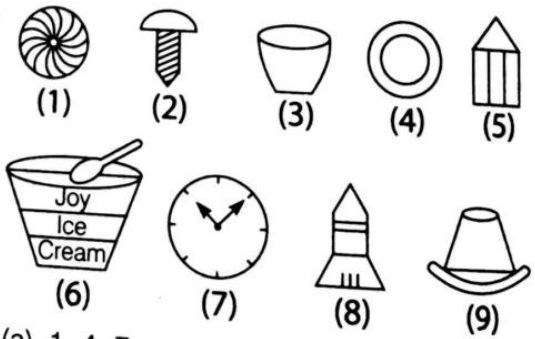
(a) 1, 3, 4
2, 5, 9
6, 7, 8

(b) 1, 2, 3
4, 5, 6
7, 8, 9

(c) 1, 5, 9
2, 4, 7
3, 6, 8

(d) 3, 7, 8
1, 6, 5
4, 2, 9

2.



(a) 1, 4, 7
2, 5, 8
3, 6, 9

(b) 1, 3, 6
2, 5, 8
4, 7, 9

(c) 1, 2, 4
3, 5, 8
6, 7, 9

(d) 1, 4, 9
2, 5, 8
3, 6, 7

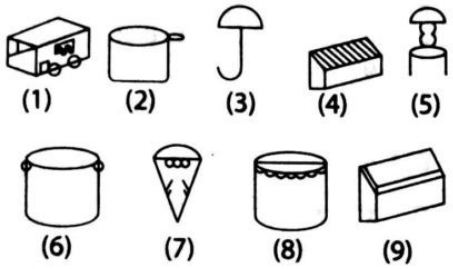
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the other.

3.



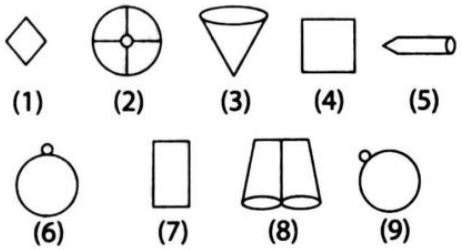
(a) 1, 4, 9
2, 6, 8
3, 5, 7

(b) 1, 4, 5
3, 6, 8
2, 7, 9

(c) 1, 4, 6
2, 7, 8
3, 5, 9

(d) 1, 3, 6
2, 4, 7
5, 8, 9

4.



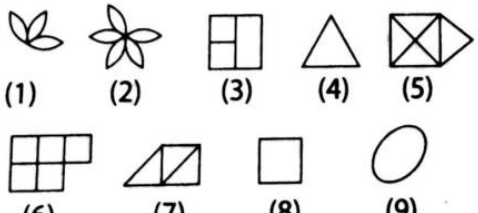
(a) 1, 2, 4
3, 5, 6
8, 7, 9

(b) 9, 7, 6
5, 3, 1
4, 8, 2

(c) 2, 3, 4
7, 6, 5
9, 8, 1

(d) 1, 4, 7
2, 6, 9
3, 5, 8

5.



[SSC (CGL) 2002]

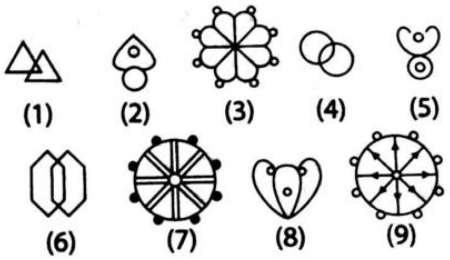
(a) 1, 2, 3
4, 8, 9
5, 7, 6

(b) 4, 5, 7
3, 1, 2
7, 8, 9

(c) 1, 3, 7
8, 9, 4
2, 5, 6

(d) 3, 5, 6
8, 7, 4
9, 1, 2

6.



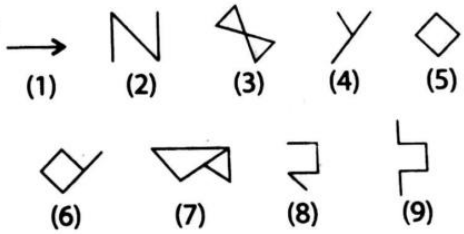
(a) 1, 4, 8
2, 5, 7
3, 9, 6

(b) 1, 4, 6
2, 5, 8
3, 7, 9

(c) 1, 4, 6
2, 5, 7
3, 8, 9

(d) 1, 2, 3
4, 5, 6
7, 8, 9

7.



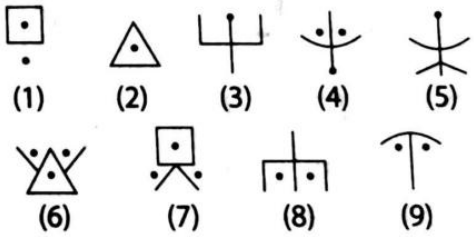
(a) 1, 5, 6
2, 3, 4
7, 8, 9

(b) 1, 2, 4
3, 5, 8
6, 7, 9

(c) 5, 6, 7
1, 2, 4
3, 8, 9

(d) 1, 2, 4
3, 5, 7
6, 8, 9

8.



(a) 1, 7, 8
2, 6, 5
3, 4, 9

(b) 1, 8, 9
2, 3, 5
4, 6, 7

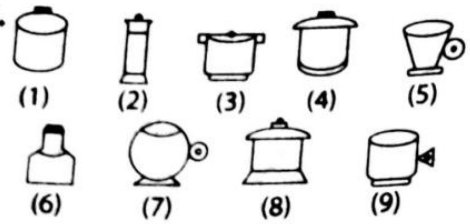
(c) 2, 3, 5
1, 7, 8
4, 6, 9

(d) 2, 6, 7
1, 3, 4
5, 8, 9

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9.



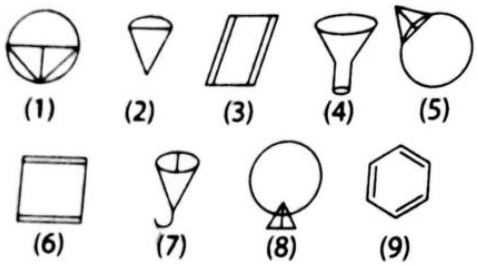
(a) 1, 4, 6
2, 3, 8
5, 7, 9

(b) 2, 3, 8
4, 5, 7
1, 6, 9

(c) 5, 7, 9
3, 4, 8
2, 9, 1

(d) 1, 4, 6
2, 3, 5
6, 7, 8

10.



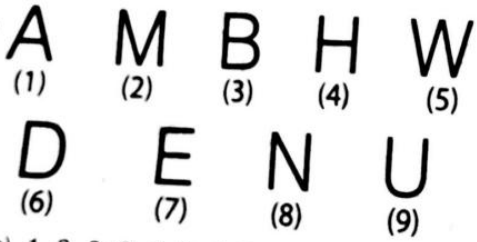
(a) 1, 5, 8
2, 6, 7
3, 4, 9

(b) 1, 5, 7
2, 6, 8
3, 4, 9

(c) 1, 7, 8
2, 6, 9
3, 4, 5

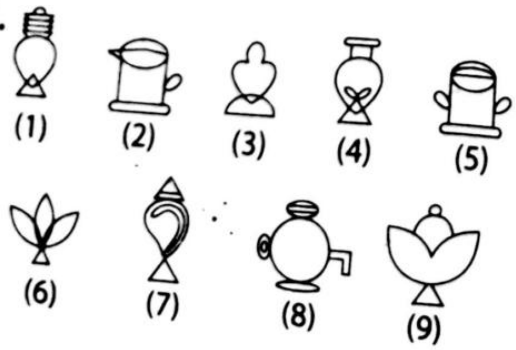
(d) 1, 5, 8
2, 4, 7
3, 6, 9

11.



(a) 1, 3, 6; 2, 8, 9; 4, 7, 5
(b) 1, 4, 8; 2, 5, 7; 3, 6, 9
(c) 1, 4, 7; 2, 5, 8; 3, 6, 9
(d) 1, 4, 7; 3, 5, 8; 2, 6, 9

12.



[SSC (CGL) 2003]

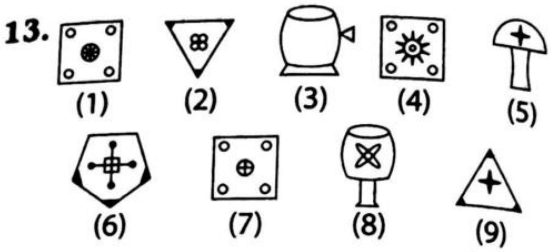
(a) 1, 4, 7
2, 5, 8
3, 6, 9

(b) 1, 4, 5
2, 6, 8
3, 7, 9

(c) 1, 7, 9
3, 6, 8
2, 4, 6

(d) 1, 6, 9
2, 5, 8
3, 4, 7

13.



[SSC (CGL) 2003]

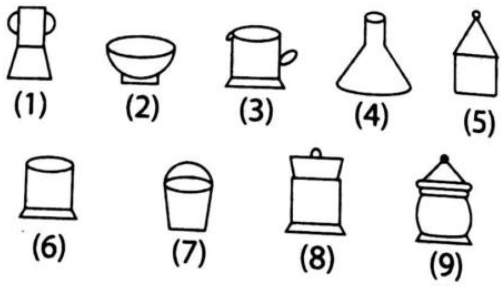
(a) 1, 4, 7
3, 6, 9
2, 5, 8

(b) 1, 4, 7
2, 6, 9
3, 5, 8

(c) 1, 6, 9
2, 4, 7
3, 5, 8

(d) 1, 5, 7
2, 6, 9
3, 4, 8

14.



[SSC (CGL) 2003]

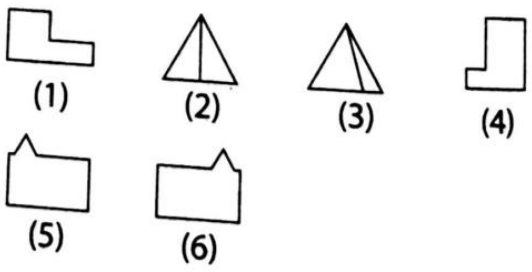
(a) 1, 4, 7
2, 5, 9
3, 8, 6

(b) 2, 6, 9
1, 4, 7
5, 8, 3

(c) 1, 4, 7
2, 3, 6
5, 8, 9

(d) 3, 5, 1
4, 7, 8
6, 2, 9

15.



[SSC (CGL) 2009]

(a) 1, 4
2, 3
5, 6

(b) 1, 5
2, 6
4, 3

(c) 1, 6
2, 3
4, 5

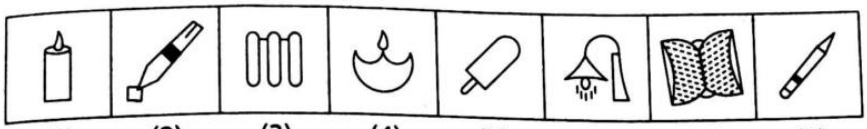
(d) 1, 2
3, 6
4, 5

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Direction (Q. No. 16) *A series of figures is given which can be grouped into classes. Select the group into which the figures can be classified from the given responses.*

16.



[SSC (CPO) 2010]

(a) 146, 35, 278 (b) 258, 138, 46 (c) 37, 145, 258 (d) 258, 16, 47

Answer *with* Explanations

1. (*a*) Grouping the figures on the basis of sides, we get
Figures made by three lines = 1, 3, 4
Figures made by four lines = 6, 7, 8
Figures made by five lines = 2, 5, 9

2. (*a*) Figures which have one small and one big circle = 1, 4, 7
Figures which have one sharp point = 2, 5, 8
Figures which have shapes like bucket = 3, 6, 9

(*a*) Figures 1, 4 and 9 are the similar.
Figures 2, 6 and 8 are the similar.
Figures 3, 5 and 7 are the similar.

4. (*d*) Figures of four sides = 1, 4, 7
Figures of one big and small circle = 2, 6, 9
Figures 3, 5 and 8 are wide and narrow from other sides.

5. (*c*) Figures 1, 3 and 7 have three petals, three rectangles and three triangles, respectively. So, they should be grouped in one group figures 4, 8 and 9 have one triangle, one rectangle and one circle respectively. So, they should be grouped in one group.
Figures 2, 5 and 6 have five petals, five triangles and five squares, respectively. So, they should be grouped in one group.

6. (*b*) Figures 1, 4 and 6 have two triangles, two circles and two hexagons, respectively.
Figures 2, 5 and 8 are similar in shape.
In figures 3, 7 and 9, there are eight small circles around a big circle.

7. (*b*) Figures 1, 2 and 4 are made of three lines.
Figures 3, 5 and 8 are made of four lines.
Figure 6, 7 and 9 are made of five lines.

8. (*b*) Figures 2, 3 and 5 are one pointed structure.
Figures 1, 8 and 9 are two pointed structure.
Figures 4, 6 and 7 are three pointed structure.

9. (*a*) There is one point above the figures 2, 3 and 8.
There is one small rectangle above the figures 1, 4 and 6.
There is one handle in figures 5, 7 and 9.

10. (*d*) There are three triangles and one circle in figures 1, 5 and 8.
There is one angle in figures 2, 4 and 7.
Figures 3, 6 and 9 are made of six sides.

11. (*b*) Figures 1, 4 and 8 are made of three lines.
Figures 2, 5 and 7 are made of four sides.
Figures 3, 6 and 9 are circular in shape.

12. (*a*) Figures 1, 4 and 7; 3, 6 and 9; 2, 5 and 8 are similar.

13. (*b*) Figures 1, 4 and 7; 2, 6 and 9; 3, 5 and 8 are similar.

14. (*c*) Figures 1, 4, 7; 2, 3, 6 and 5, 8, 9 are similar.

15. (*a*) Figures 1 and 4 are similar.
Figures 2 and 3 are similar.
Figures 5 and 6 are similar.

16. (*a*) Grouping the figure on the basis of their use, figures 1, 4, 6 are used for lighting. Figures 3 and 5 are used for playing and figures 2,7 and 8 are used for learning.

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8

Formation of Figures

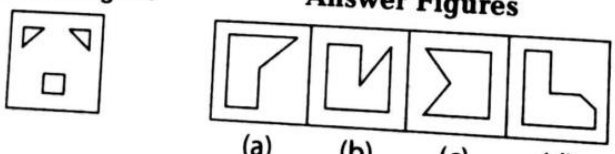
Formation of figure is using the fragmented part to construct a desired figure. Formation of figure requires a high spatial visualisation skill. As different fragmented parts of a figure are to be combined to form the desired figure.

In this chapter , two sets of figures are provided namely **problem figure** and **answer figure**. A candidate is asked to arranged the different components of the problem figure, so as to form one of the answer figure.

Examples given below will give a better idea about the types of questions

Illustration 1. In the question given below, find out which of the figures can be formed from the pieces given in the problem figure.

Problem Figure **Answer Figures**

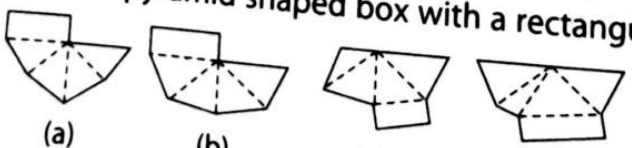


Solution (a) Using all the components given in problem figure we can arrange them as

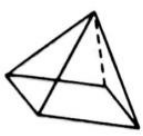


So Option (a) is the correct answer.

Illustration 2. Which of the following figures shown below, when folded along the dotted lines, will form a pyramid shaped box with a rectangular base?



Solution (d) By folding figure (d), we get a pyramidal shaped box with a rectangular base as shown below



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Let us Practice

Basic Level Exercise

Directions (Q. Nos. 1-13) *In each of the following questions, find out which of the figures (a), (b), (c) and (d) can be formed from the pieces given in problem figures.*

1. Problem Figure

Answer Figures

(a) (b) (c) (d)

[SSC (CGL) 2000]

2. Problem Figure

(a) (b) (c) (d)

...ed figure. ...different figure.

...a figure ...ponents

...estions ...can be

3. Problem Figure

Answer Figures

(a) (b) (c) (d)

[SSC CGL 2012]

4. Problem Figure

Answer Figures

(a) (b) (c) (d)

...g the

...e as

5. Problem Figure

Answer Figures

(a) (b) (c) (d)

6. Problem Figure

Answer Figures

(a) (b) (c) (d)

7. Problem Figure

Answer Figures

(a) (b) (c) (d)

8. Problem Figure

Answer Figures

(a) (b) (c) (d)

9. Problem Figure

Answer Figures

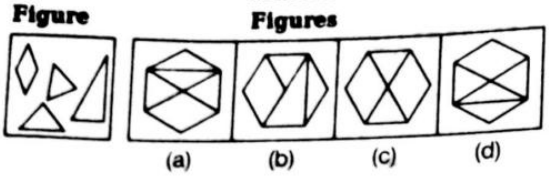
(a) (b) (c) (d)

[SSC (DEO & LDC) 2010]

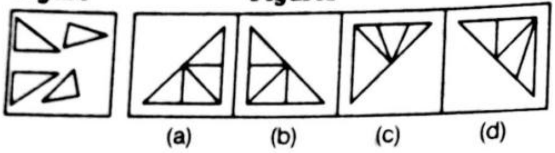
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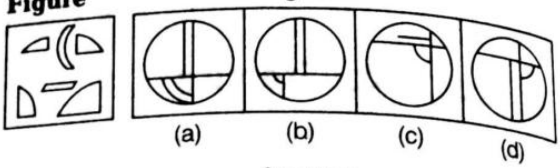
10. Problem Figure / Answer Figures



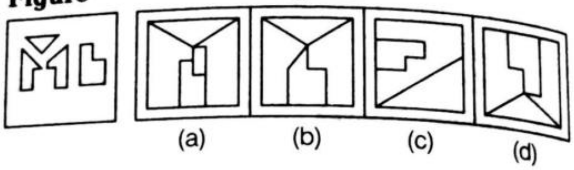
11. Problem Figure / Answer Figures



12. Problem Figure / Answer Figures



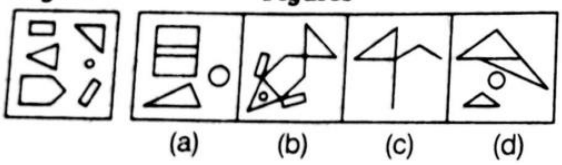
13. Problem Figure / Answer Figures



B. Expert Level Exercise

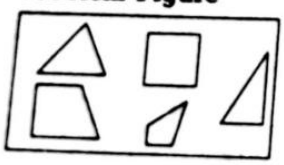
1. Which of the answer figures includes the separate components found in the question figure?

Problem Figure / Answer Figures

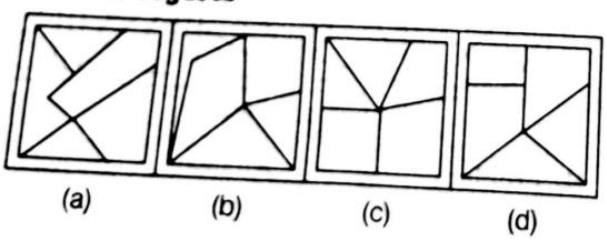


2. Among the four answer figures, which one can be formed from the cut out pieces given below in the question figure? **[SSC (CPO) 2011]**

Problem Figure

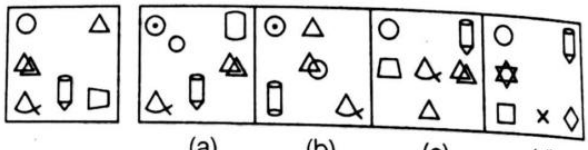


Answer Figures

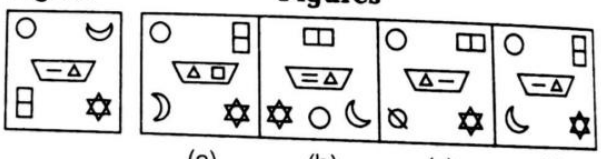


Directions (Q. Nos. 3-5) *In each of the following questions, select the alternative in which the specified components of the problem figure are found?*

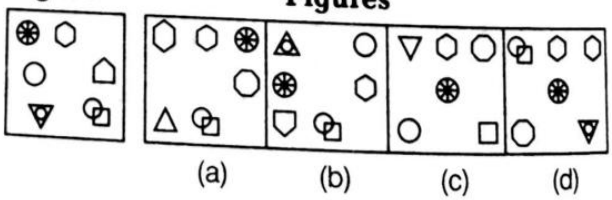
3. Problem Figure / Answer Figures



4. Problem Figure / Answer Figures



5. Problem Figure / Answer Figures

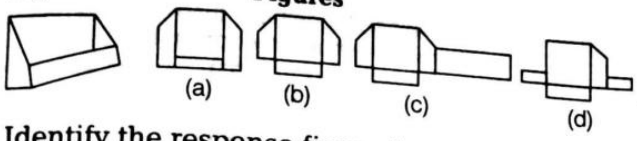


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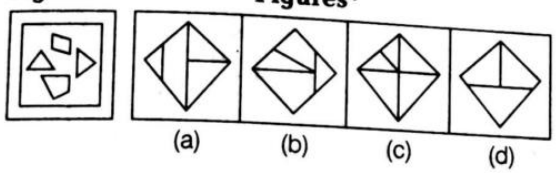
6. Which of the following figures (a), (b), (c) and (d) when folded along the lines will produce the problem figure?

Problem Figure **Answer Figures**



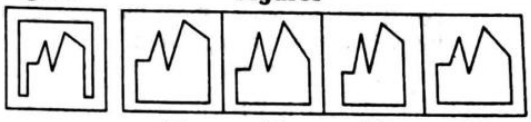
7. Identify the response figure in which the figures given are found.

Problem Figure **Answer Figures**



8. Which of following answer figure can be combined with the question figure, so as to form a square.

Problem Figure **Answer Figures**



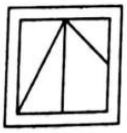
Answer *with* Explanations

A. Base Level Exercise

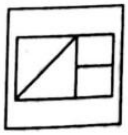
1. (*a*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (a).



2. (*b*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



3. (*b*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



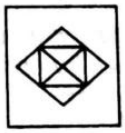
4. (*b*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



5. (*b*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



6. (*b*) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



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7. (c) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (c).



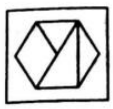
8. (c) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (c).



9. (b) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



10. (b) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



11. (b) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



12. (a) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (a).

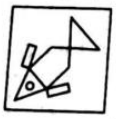


13. (d) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (d).



B. Expert Level Exercise

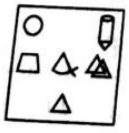
1. (b) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



2. (c) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (c).



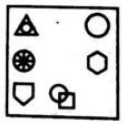
3. (c) The correct figure containing all the essential elements is given by option (c).



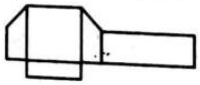
4. (d) The correct figure containing all the essential elements is given by option (d).



5. (b) The correct figure containing all the essential elements is given by option (b).



6. (c) When the problem figure is unfolded, then it will look like as given in option (c).



7. (b) When different parts of the problem figure are combined together, then the correct figure formed is shown by option (b).



8. (a) The correct answer figure is given an option (a) *i.e.*,



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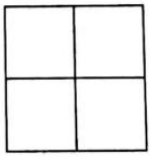
Counting Figures

Counting of figure is simply the realisation of different geometrical figure from a complex one.

The questions asked on the counting of figures are designed to test the analytical deposition of candidates and check his ability to count different similar figures in a complex figure. The figures which are asked to count are straight lines, triangles, square, rectangles etc.

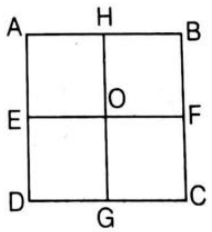
Examples given below will give a better idea about the type of question asked

Illustration 1. How many squares are there in the figure given below?



(a) 4 (b) 5 (c) 6 (d) 7

Solution (*b*) Naming the figure,

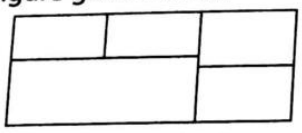


Clearly, there are five squares in the given figures *viz.*
AHOE, HOFB, FOGC, OGDE and ABCD

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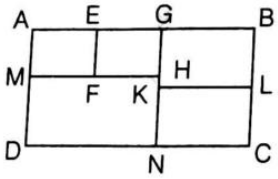
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Illustration 2. How many rectangles are there in the figure given below?



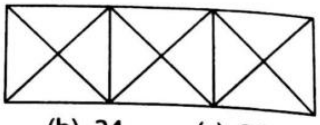
(a) 6 (b) 7 (c) 8 (d) 9

Solution *(d)* The figure in the question has been labeled as under



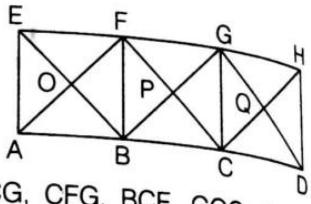
Clearly, there are nine rectangles in the figure given as above namely, AEFM, EGHF, AGHM, GBLK, KLCN, GBCN, MHND, ABCD and AGND.

Illustration 3. How many triangles are there in the given figure?



(a) 28 (b) 24 (c) 25 (d) 26

Solution (a) Naming the figure,



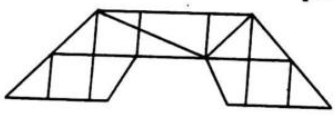
Clearly, there are 28 triangles in the given figure, they are EOF, AOE, AOB, BOF, ABF, BEF, ABE, AEF, BPF, FPG, CPG, BPC, BFG, BCG, CFG, BCF, GQC, CDQ, DQH, GQH, GDC, GDH, GHC, CDH, AFC, BGD, EBG and FCH.

Let us Practice

A. Base Level Exercise

Directions (Q. Nos. 1-3) *Study the figure given below to answer the questions that follow.*

[RRB (TC/CC) 2005]



1. How many squares are there in this figure?

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

2. If all the independent triangles in the above figure were coloured in such a way that two nearby triangles with a common side will not be of the same colour. What is the minimum number of colours required?

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

3. Count the number of triangles in the above figure.

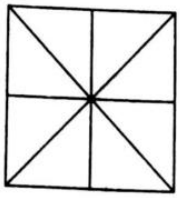
(a) 22 (b) 23 (c) 28 (d) 15

4. How many triangles are there in the following figure?



(a) 10 (b) 6 (c) 8 (d) 5

5. How many triangles are there in the following figures?



(a) 16 (b) 12 (c) 10 (d) 8

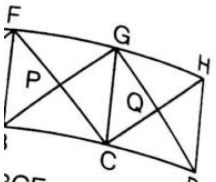
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riangles are there in



5 (d) 26



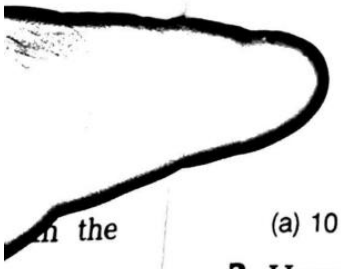
CF, GQC, CDQ, CDH, AFC, BGD,



In the

(d) 15

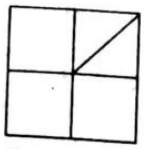
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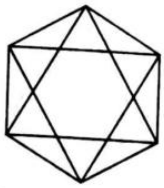


6. Total number of squares in the following figures are



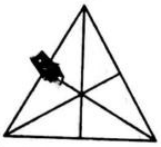
(a) 6 (b) 8 (c) 5 (d) 10

7. How many triangles are there in the following figure?



(a) 32 (b) 18 (c) 20 (d) 25

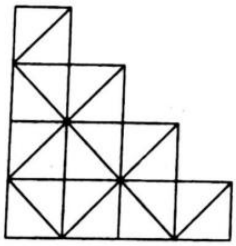
8. How many triangles are there in the following figure?



(a) 16 (b) 15 (c) 9 (d) 17

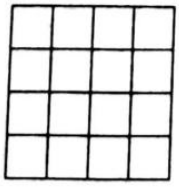
B. Expert Level Exercise

1. How many squares are there in the given figures? [SSC (CPO) 2011]



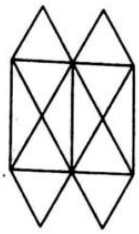
(a) 10 (b) 13 (c) 12 (d) 14

2. How many squares are there in the following figure?



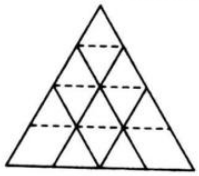
(a) 16 (b) 17
(c) 26 (d) 30

9. How many triangles are there in the following figure? [CG PSC 2013]



(a) 20 (b) 22
(c) 16 (d) 24

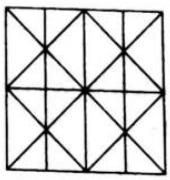
10. Consider the following figure and answer the item that follows



What is the total number of triangles in the above grid? [CSAT 2012]

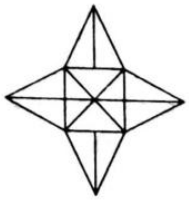
(a) 27 (b) 26
(c) 23 (d) 22

3. What is the number of straight lines in the following figure?



(a) 11 (b) 14
(c) 16 (d) 17

4. How many triangles are there in the following figure?

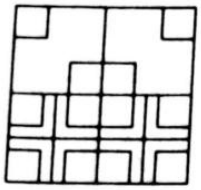


(a) 18 (b) 28
(c) 20 (d) 24

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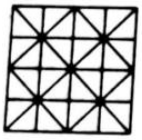
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5. How many squares are there in this figure? [SSC (10 +2) 2012]



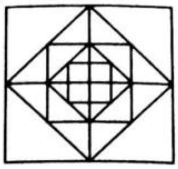
(a) 24
(b) 23
(c) 27
(d) 26

6. Find out the number of squares in the given pattern. [SSC (Multitasking) 2013]



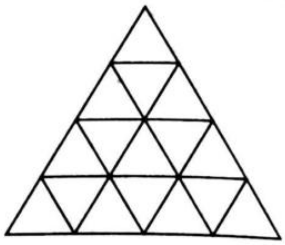
(a) 26
(b) 30
(c) 35
(d) 38

7. How many total squares are there in the following figure?



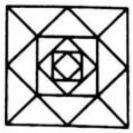
(a) 12 (b) 13 (c) 16 (d) 17

8. Find out the number of triangles in the given pattern. [SSC (Multitasking) 2013]



(a) 23 (b) 26 (c) 27 (d) 29

9. The number of triangles in this figure is



(a) 20 (b) 22 (c) 26 (d) 28

Answer *with* Explanations

A. Base Level Exercise

1. (*b*) There are four squares in the figure.

2. (*a*) Required number of colours (minimum) = 2

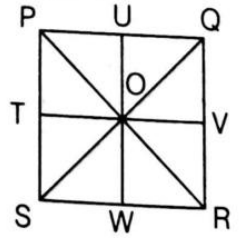
3. (*d*) Total number of triangles in the given figure = 15

4. (*a*) Naming the figure,



Names of the triangles are
AFG, GBH, HCI, IDJ, JEF, ACJ, CEG, EBI, BDF, ADH.
Hence, there are 10 triangles in this figure.

5. (*a*) Naming the figure,



Name of the triangles present in the figure are
POU, UOQ, QOV, VOR, ROW, WOS, SOT, TOP, SOP, POQ, QOR, ROS, SPR, QPR, SQP, SQR
Hence, there are 16 triangles present in the figure.

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e there in the

(d) 17

ngles in the
ltitasking) 2013]

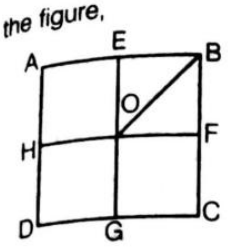
(d) 29

s figure is

d) 28

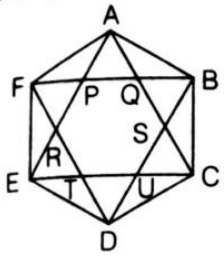
ure are
)T, TOP
P, SQR
t in the

Naming the figure,



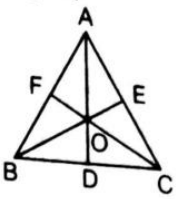
Name of the squares are
AEOH, EBFO, HOGD, OFCG, ABCD.
Hence, there are total 5 squares in this figure.

Naming the figure,



Name of triangles in the figure are
APF, AQP, ABQ, AQF, ABF, ABP, EDT, DTU, DUC, DEU, DEC, DTC, FPR, EFR, ERT, EFP, EFT, BQS, BCS, SUC, BCU, BCQ,
AEC, BDF, AEF, ABC, DEF, BCD, ABS, AFR, RED, DSC.
Hence, there are 32 triangles in the figure.

8. (*a*) Naming the figure,



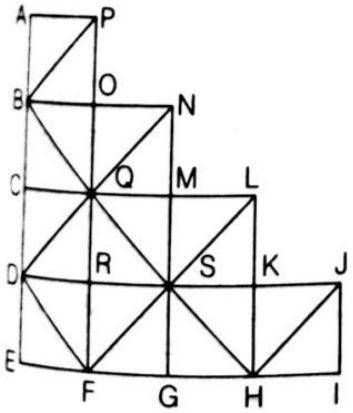
There are 16 triangles in the figure, *viz.*
AOF, AOE, FOB, EOC, BOD, DOC, AOB, AOC, BOC, ADB, ADC, ABC, ABE, BEC, ACF, BCF.

9. (*b*) The number of triangles in the upper most and lower most part of the figure = 2 + 2 = 4
The number of small triangles in the middle part of the figure = 8
The number of medium triangles in the middle part of the figure = 8
The number of big triangles in the middle part of the figure = 2
Total number of triangles = 4 + 8 + 8 + 2 = 22

10. (*c*) The number of triangles of unit length
= 1 + 3 + 5 + 3 = 12
The number of triangles of length 2 units
= 1 + 2 + 3 = 6
and there is one inverted triangle of length 2 units.
So, total number of triangles of length 2 units
= 6 + 1 = 7
The number of triangles of length 3 units
= 1 + 2 = 3
The number of triangles of length 4 units = 1
Total number of triangles = 12 + 7 + 3 + 1 = 23

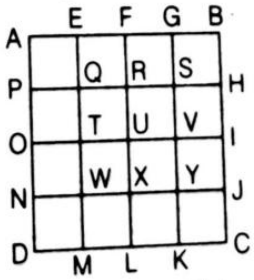
pert Level Exercise

Naming the figure,



Name of the squares are
ABOP, BCQO, OQMN, CDRQ, QRSM, MSKL, DEFR, RFGS, SGHK, KHIJ, BDSN, CEGM, DFSQ, QFHL.
Hence, there are 14 squares in this figure.

2. (*d*) Naming the figure,



There are 16 squares which are equal parts of big square ABCD and the other squares are
AFUO, FUIB, OULD, ULCI, PRXN, RXJH QSYW, TVKM, TVGE, AGYN, EBJW, PSKD, QHCM.
Hence, there are 30 squares in this figure.

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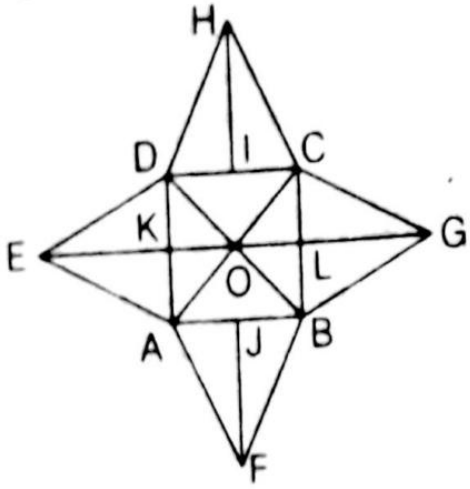
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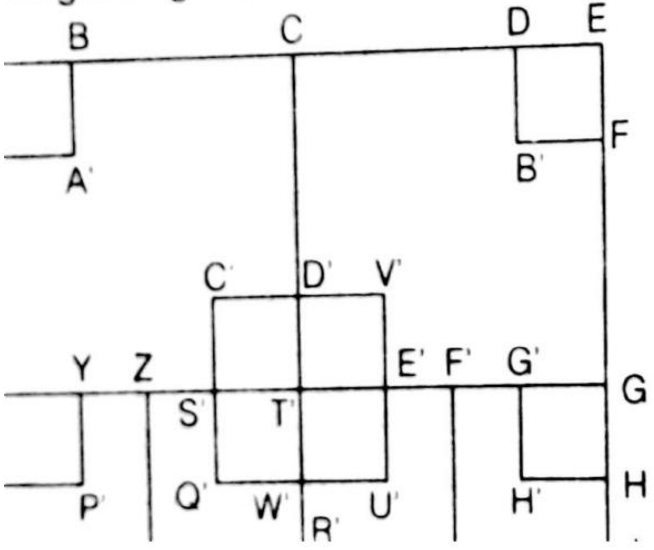
C, CD, AD, AC, BD, EG, FH, EF, FG, GH,
KL

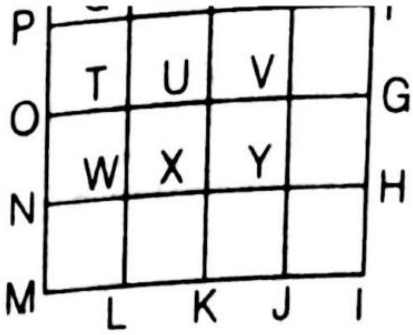
ng the figure,



arly, there are 28 triangles in the figure,
ely
HIC, EKD, EKA, FJA, FJB, GLB, GLC, DHC,
), FAB, GBC, DOK, OKA, DOC, OLC, OLB,
B, DOA, BOC, ABC, ACD, ABD, BCD, BOG,
G, EOA, EOD.

ming the figure,





Square formed with four triangl
XKWU, WOQU = 4

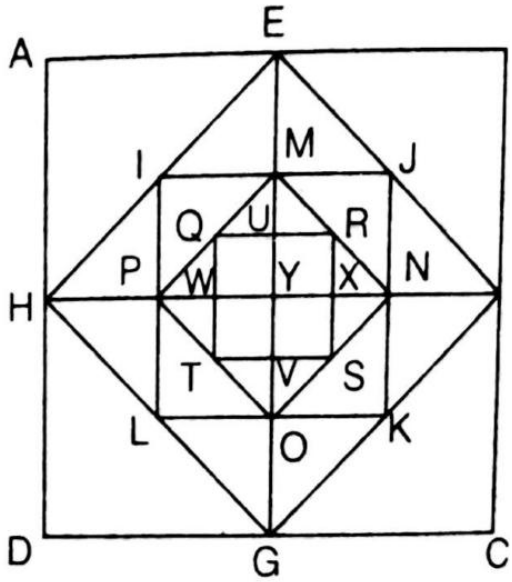
Square formed with four small
BDVT, CEGU, PRXN, QSYW,
TVJL, UGIK, OCGK = 10

Squares formed with nine small
BEHW, PSJM, QFIL = 4

Largest square = AEIM = 1

∴ Total squares = 16 + 4 + 10 + 4

7. (*d*) Naming the figure,



Clearly, there are 17 squares i

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Number of triangles of unit length
$= 1 + 3 + 5 + 7$
$= 16$

Number of triangles of length 2 units
$= 1 + 2 + 3 = 6$.

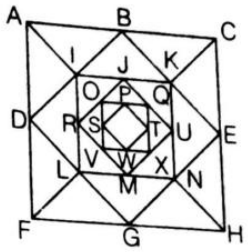
Total number of triangles of length 2 units
$= 6 + 1 = 7$

Number of triangles of length 3 units
$= 1 + 2 = 3$

Number of triangles of Length 4 units = 1

Total number of triangles
$= 12 + 7 + 3 + 1$
$= 23$

9. (*d*)



The simple outer triangles are AID, AIB, BIK, BCK, CKE, KEN, ENH, NGH, NGL, LFG, DLF and DLI *i.e.*, 12 triangles

The simple middle triangles are : IJR ORV, RLM, VXM, UMN, QUX, KJU and JOQ *i.e.*, 8 triangles

The simple innermost triangles are OSP, PQT, SVW and TWX *i.e.*, 4 triangles. The bisected triangles are ABD, BCE, DFG and EGH *i.e.*, 4 triangles

Total number of triangles
$= 12 + 8 + 4 + 4 = 28$

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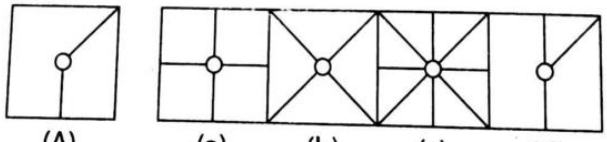
Embedded Figures

A figure is said to be an embedded figure when that figure is contained by another figure.

A figure suppose figure (A) is said to be embedded in figure (B), if figure (B) contains a part of figure (A). In this chapter, we deal with questions in which an original figure is followed by four alternative answers. One of the answer figures, is embedded or hidden in the original figure. You are required to select from the alternatives that which figure clearly shows the embedded portion of the original figure.

Directions (Illustrations 1-4) *In the following questions, figure (A) is embedded in any one of the four alternative figures (a), (b), (c) and (d). Find the alternative which contains figure (A) as its part.*

Illustration 1.



Solution (c) On close observation, we find figure (A) is embedded in figure (c) as shown

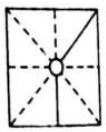
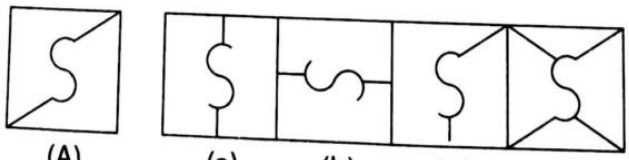


Illustration 2.



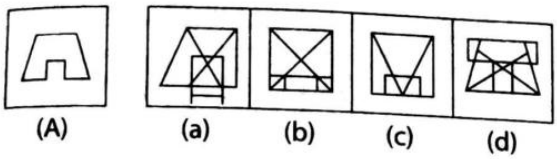
Solution (d) On close observation figure (A) is embedded in figure (d) as shown



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Illustration 3.



Solution (*d*) On close observation figure (A) is embedded in figure (d) as shown

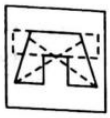
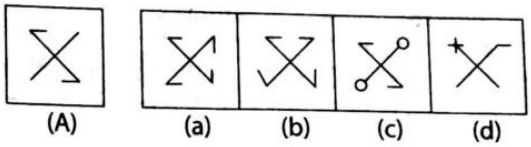


Illustration 4.



Solution (c) On close observation figure (A) is embedded in figure (c) as shown

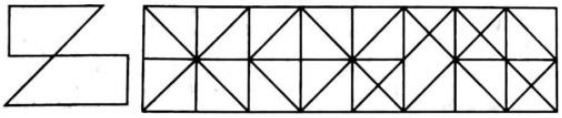


Let us Practice

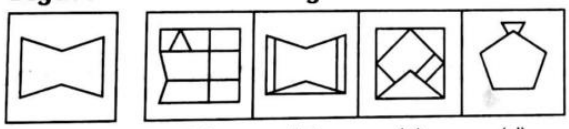
A. Base Level Exercise

Directions (Q. Nos. 1-16) *In each of the following problems. Choose the alternative figure in which the problem figure is embedded.*

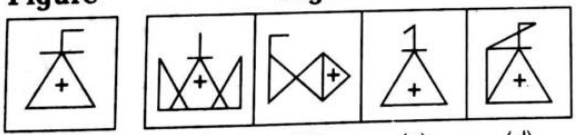
1. **Problem Figure** **Answer Figures**



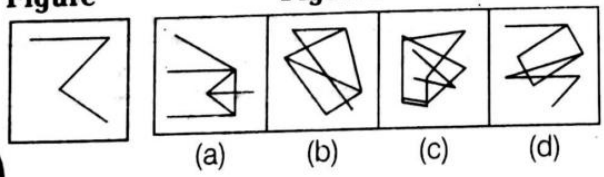
2. **Problem Figure** **Answer Figures**



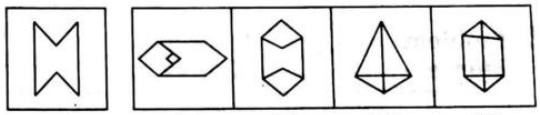
3. **Problem Figure** **Answer Figures**



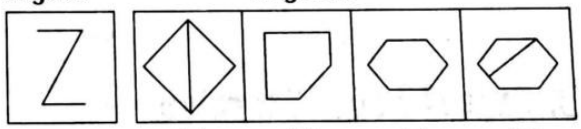
4. **Problem Figure** **Answer Figures**



5. **Problem Figure** **Answer Figures**

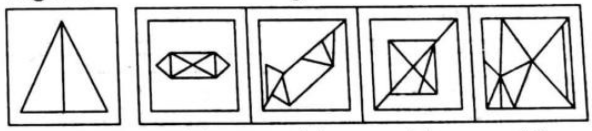


6. **Problem Figure** **Answer Figures**



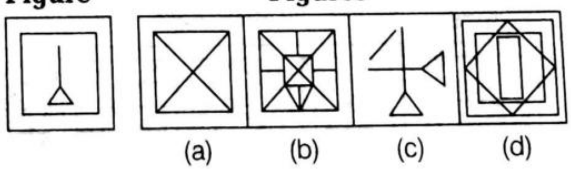
[SSC (Steno) 2011]

7. **Problem Figure** **Answer Figures**



[SSC (CPO) 2010]

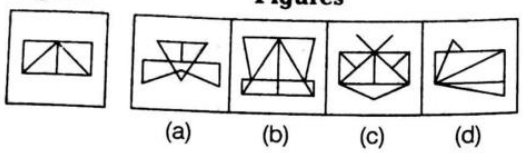
8. **Problem Figure** **Answer Figures**



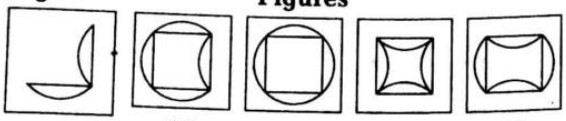
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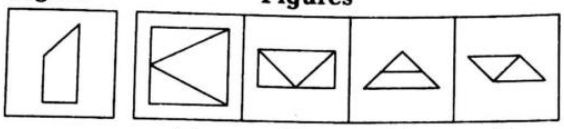
9. Problem Figure / Answer Figures



10. Problem Figure / Answer Figures

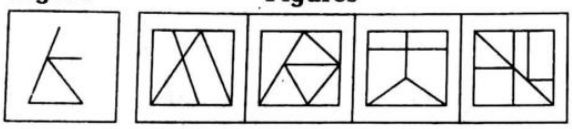


11. Problem Figure / Answer Figures



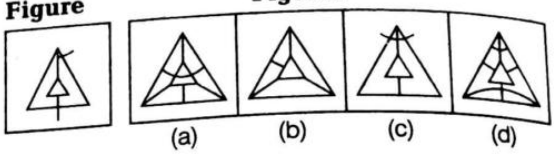
[SSC (CGL) 2010]

12. Problem Figure / Answer Figures

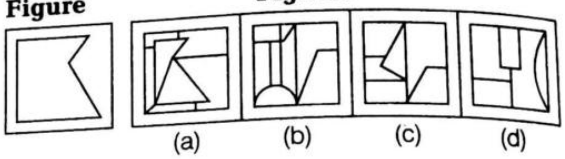


[SSC (Steno) 2012]

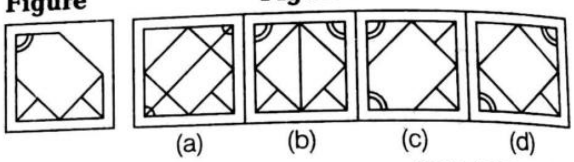
13. Problem Figure / Answer Figures



14. Problem Figure / Answer Figures

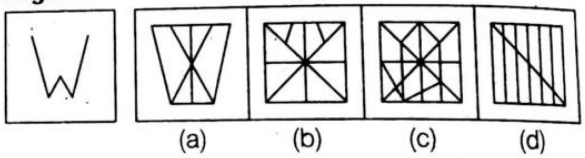


15. Problem Figure / Answer Figures



[SSC (CGL) 2012]

16. Problem Figure / Answer Figures

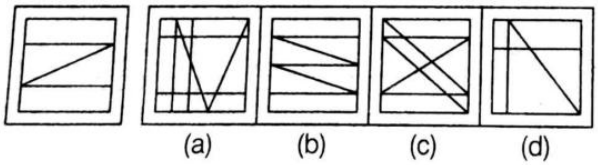


[SSC (10+2) 2011]

B. Expert Level Exercise

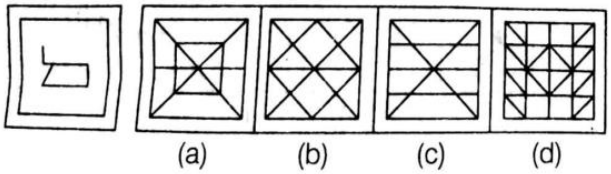
Directions (Q. Nos. 1-16) *In the following problems from the given answer figures, select the one in which the problem figure is hidden/ embedded.*

1. Problem Figure / Answer Figures



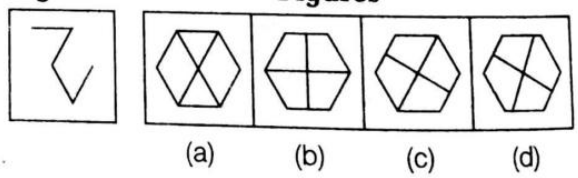
[SSC (10 +2) 2011]

2. Problem Figure / Answer Figures

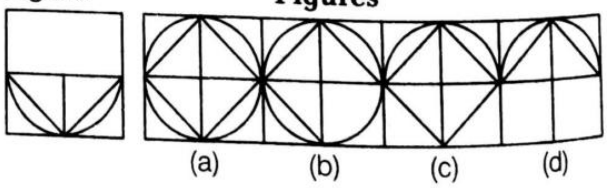


[SSC (CGL) 2011]

3. Problem Figure / Answer Figures



4. Problem Figure / Answer Figures



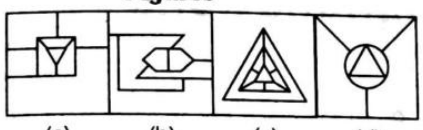
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5. Problem Figure



Answer Figures

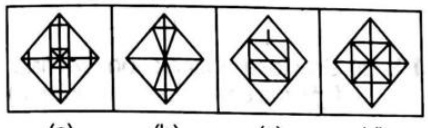


(a) (b) (c) (d)

6. Problem Figure



Answer Figures



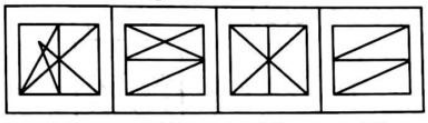
(a) (b) (c) (d)

[SSC (Multitasking) 2012]

7. Problem Figure

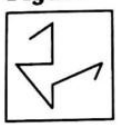


Answer Figures

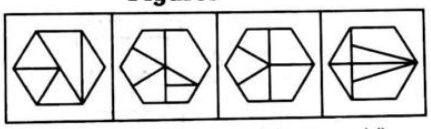


(a) (b) (c) (d)

8. Problem Figure

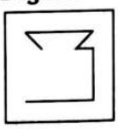


Answer Figures

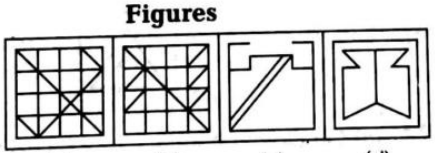


(a) (b) (c) (d)

9. Problem Figure

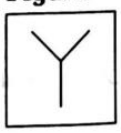


Answer Figures

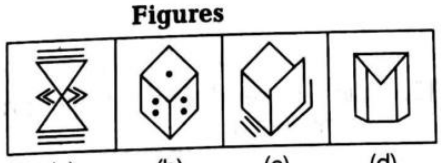


(a) (b) (c) (d)

10. Problem Figure

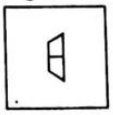


Answer Figures

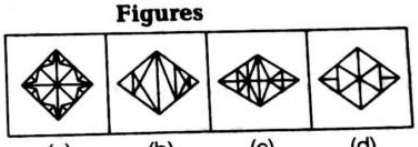


(a) (b) (c) (d)

11. Problem Figure

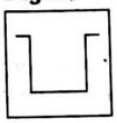


Answer Figures

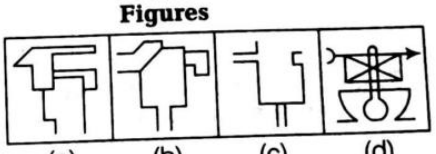


(a) (b) (c) (d)

12. Problem Figure

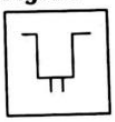


Answer Figures

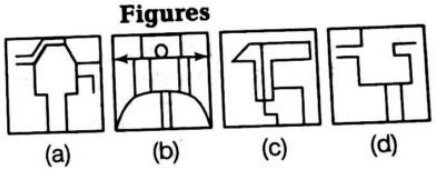


(a) (b) (c) (d)

13. Problem Figure

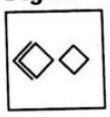


Answer Figures

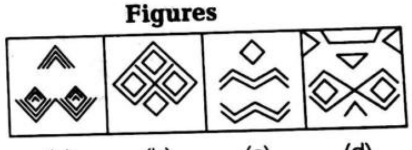


(a) (b) (c) (d)

14. Problem Figure

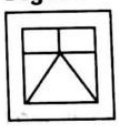


Answer Figures

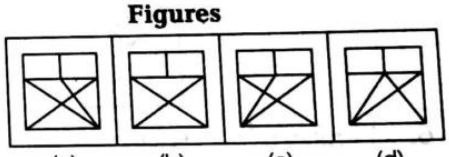


(a) (b) (c) (d)

15. Problem Figure

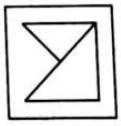


Answer Figures

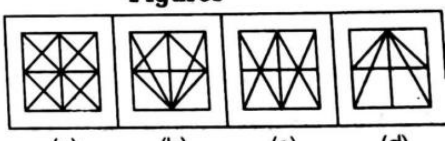


(a) (b) (c) (d)

16. Problem Figure



Answer Figures



(a) (b) (c) (d)

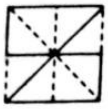
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Answer *with* Explanations

A. Base Level Exercise

1. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



2. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



3. (*d*) On close observation, we find that the problem figure is embedded in figure (d) as shown below



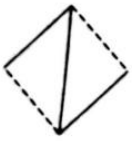
4. (*c*) On close observation, we find that problem figure is embedded in figure (c) as shown below



5. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



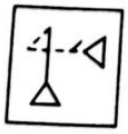
6. (*a*) Problem figure is fitted in the answer figure (a) as shown



7. (*c*) In answer figure (c), problem figure is embedded.



8. (*c*) On close observation, we find that the problem figure is embedded in figure (c) as shown below



9. (*c*) On close observation, we find that the problem figure is embedded in figure (c) as shown below



10. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



11. (*b*) In answer figure (b), problem figure is embedded.



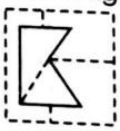
12. (*b*) In answer figure (b) the problem figure is embedded.



13. (*c*) On close observation, we find that the problem figure is embedded in figure (c) as shown below



14. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



15. (*b*) In answer figure (b) the problem figure is embedded.



16. (*a*) In answer figure (a), problem figure is embedded.



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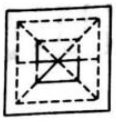
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B. Expert Level Exercise

1. (*c*) In answer figure (c), problem figure is embedded.



2. (*a*) In answer figure (a), problem figure is embedded.



3. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



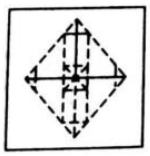
4. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



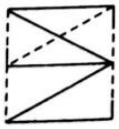
5. (*c*) On close observation, we find that the problem figure is embedded in figure (c) as shown below



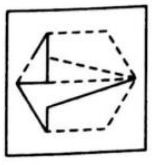
6. (*a*) The problem figure will be embedded in answer figure (a).



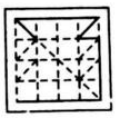
7. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



8. (*d*) On close observation, we find that the problem figure is embedded in figure (d) as shown below



9. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



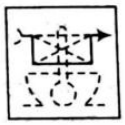
10. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



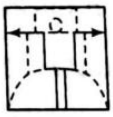
11. (*c*) On close observation, we find that the problem figure is embedded in figure (c) as shown below



12. (*d*) In answer figure (d), question figure is embedded.



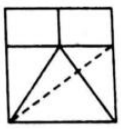
13. (*b*) In answer figure (b), question figure is embedded.



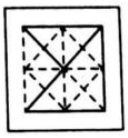
14. (*b*) On close observation, we find that the problem figure is embedded in figure (b) as shown below



15. (*d*) On close observation, we find that the problem figure is embedded in figure (d) as shown below



16. (*a*) On close observation, we find that the problem figure is embedded in figure (a) as shown below



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11

Figure Completion

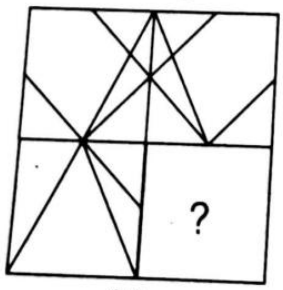
Figure completion is a way or process to find out a missing part of a incomplete figure.

In this chapter, we deal with the questions in which a part of figure is missing, generally $\frac{1}{4}$ th part of figure and a candidate is asked to find the missing part from the option figure. These type of questions are designed to test the candidate's ability to correlate missing visual parts.

Here, you are required to understand the general structure of the figure, then choose the correct alternative.

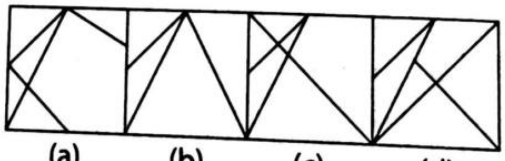
Illustration 1. *In the following question, complete the missing segment by selecting from the given alternatives, (a), (b), (c) and (d).*

Problem Figure



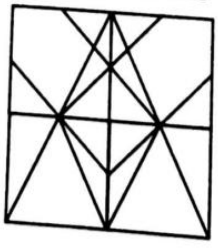
(X)

Answer Figures



(a) (b) (c) (d)

Solution *(b)* If figure, as shown in the alternative (b), is placed in the place of missing portion of the original figure, original is completed and looks like the figure shown below

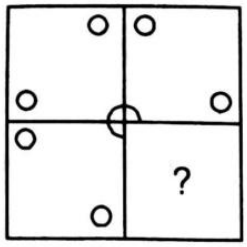


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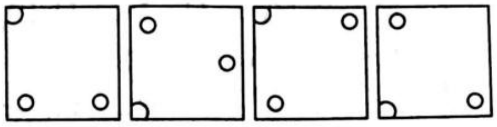
Illustration 2. *Select a figure from the four alternatives, which when placed in the missing portion (?) of the original figure as shown by figure (X), would complete the pattern.*

Problem Figure



(X)

Answer Figures



(a) (b) (c) (d)

Solution (c) If option (c) is placed in the missing portion of the original figure, it completes the original figure and the figure will look like the figure given below

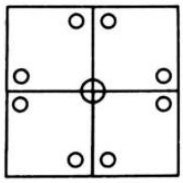
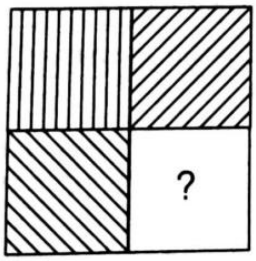


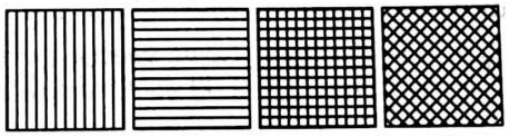
Illustration 3. . *Select a figure from the four alternatives, which when placed in the missing portion (?) of the original figure, as shown by figure (X), would complete the pattern.*

Problem Figure



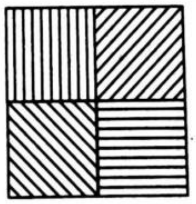
(X)

Answer Figures



(a) (b) (c) (d)

Solution (*b*) It is clear that answer figure (b) completes the original figure, which looks like the figure given below



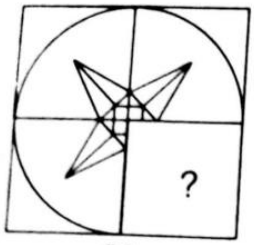
This array of lines are rotating 45° in clockwise direction.

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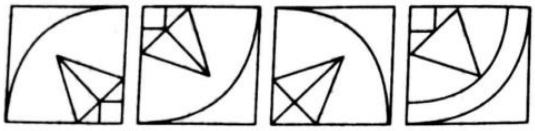
Illustration 4. *Select a figure from the four alternatives, which when placed in the missing portion of the original figure, as shown by figure (X), would complete the pattern.*

Problem Figure



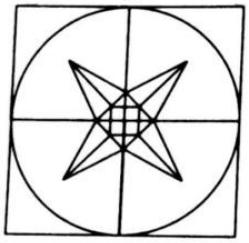
(X)

Answer Figures



(a) (b) (c) (d)

Solution (*b*) Clearly, option (b) completes the original figure which looks like the figure given below

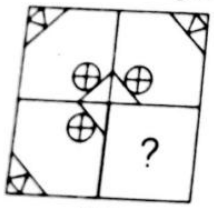


Let us Practice

Directions (Q. Nos. 1-22) *In each of the following problems, select a figure from the given four alternatives, which when placed in the blank space of problem figure (X) would complete the pattern.*

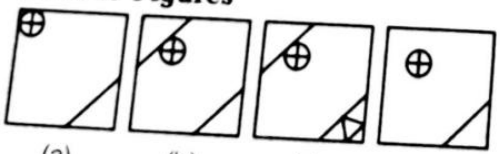
A. Base Level Exercise

1. Problem Figure



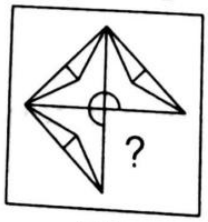
(X)

Answer Figures



(a) (b) (c) (d)

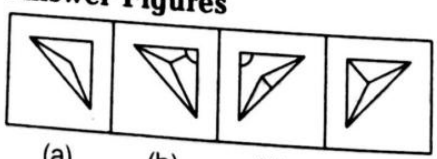
2. Problem Figure



(X)

[SSC (Steno) 2011]

Answer Figures



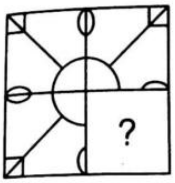
(a) (b) (c) (d)

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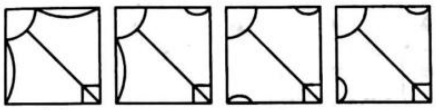
ortion of the

3. Problem Figure



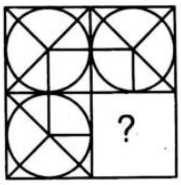
(X)

Answer Figures



(a) (b) (c) (d)

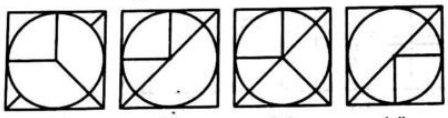
4. Problem Figure



(X)

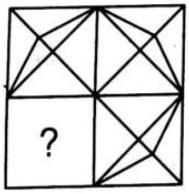
[SSC (CPO) 2013]

Answer Figures



(a) (b) (c) (d)

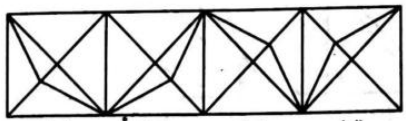
5. Problem Figure



(X)

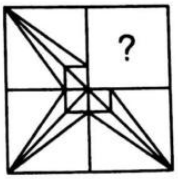
Answer Figures

2011]



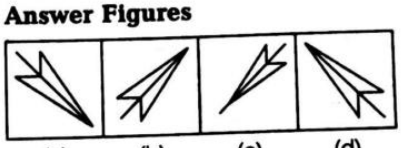
(a) (b) (c) (d)

6. Problem Figure



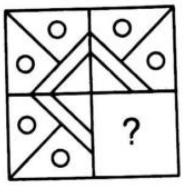
(X)

Answer Figures



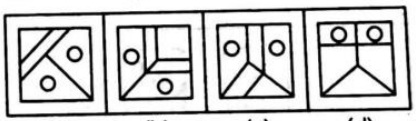
(a) (b) (c) (d)

7. Problem Figure



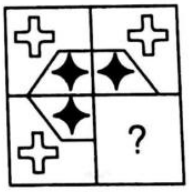
(X)

Answer Figures



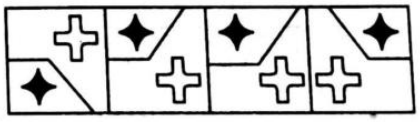
(a) (b) (c) (d)

8. Problem Figure



(X)

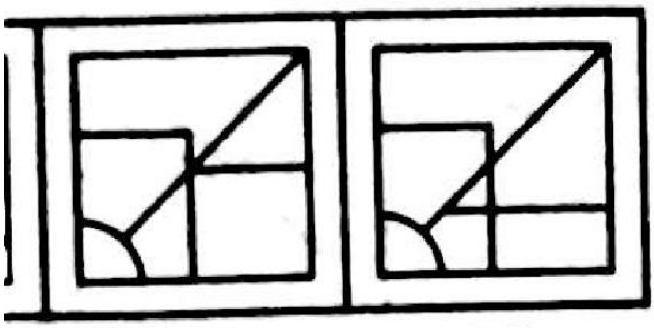
Answer Figures



(a) (b) (c) (d)

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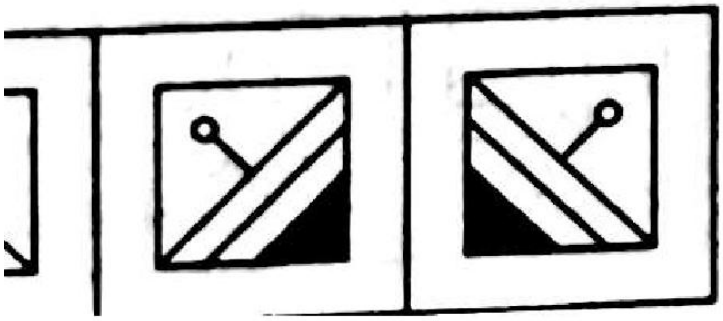
(c) (d)

13.

e

[SSC (10 + 2) 2013]

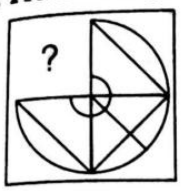
es



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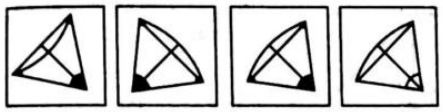
15. Problem Figure



(X)

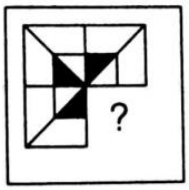
[SSC (Multitasking) 2013]

Answer Figures



(a) (b) (c) (d)

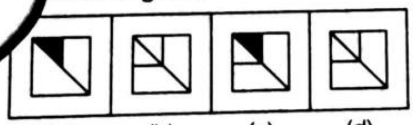
16. Problem Figure



(X)

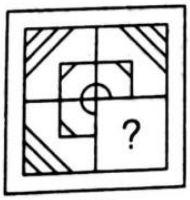
[SSC (Steno) 2011]

Answer Figures



(a) (b) (c) (d)

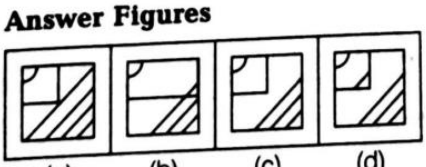
17. Problem Figure



(X)

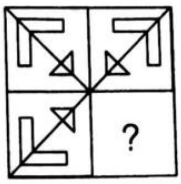
[SSC (Multitasking) 2013]

Answer Figures



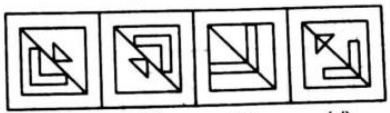
(a) (b) (c) (d)

18. Problem Figure



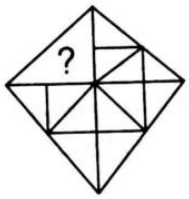
[SSC (10+2) 2011]

Answer Figures



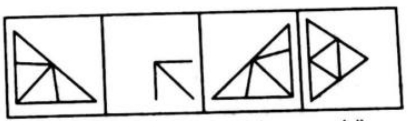
(a) (b) (c) (d)

19. Problem Figure



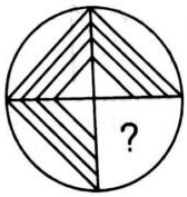
(X)

Answer Figures



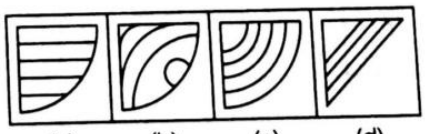
(a) (b) (c) (d)

20. Problem Figure



(X)

Answer Figures

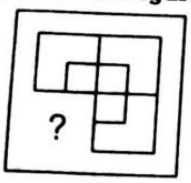


(a) (b) (c) (d)

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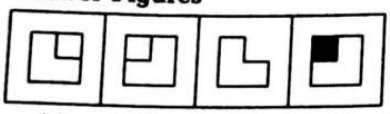
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21. Problem Figure



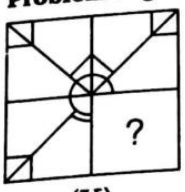
(X)

Answer Figures



(a) (b) (c) (d)

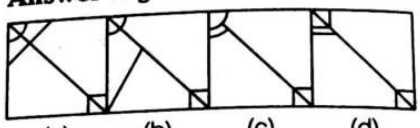
22. Problem Figure



(X)

[RRB (ASM) 2009]

Answer Figures

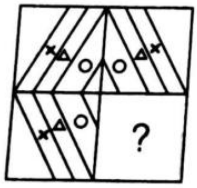


(a) (b) (c) (d)

B. Expert Level Exercise

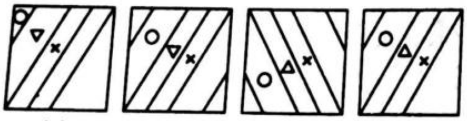
Directions (Q.Nos. 1-18) *In each of the following problems, select a figure from the given forur alternatives, which when placed in the black space of problem figure (X) would complete the pattern.*

1. Problem Figure



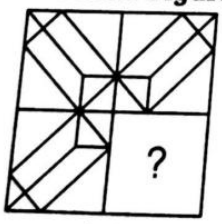
(X)

Answer Figures



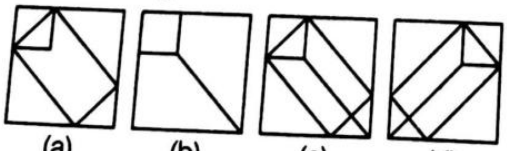
(a) (b) (c) (d)

2. Problem Figure



(X)

Answer Figures



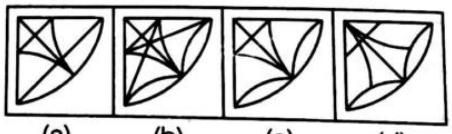
(a) (b) (c) (d)

3. Problem Figure



(X)

Answer Figures



(a) (b) (c) (d)

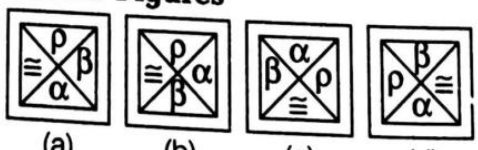
4. Problem Figure



(X)

[SSC (10+2) 2013]

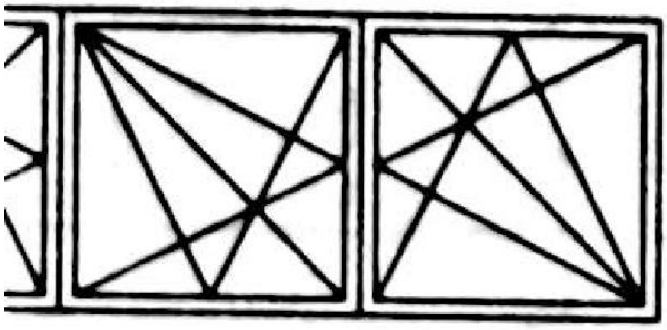
Answer Figures



(a) (b) (c) (d)

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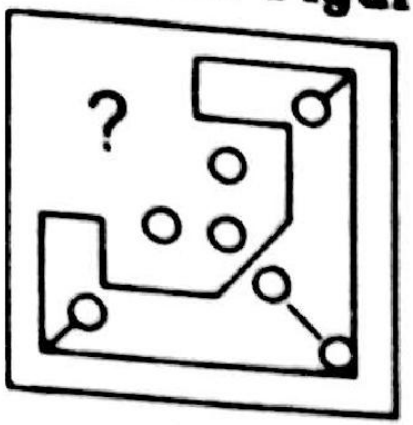


(c) (d)

10.

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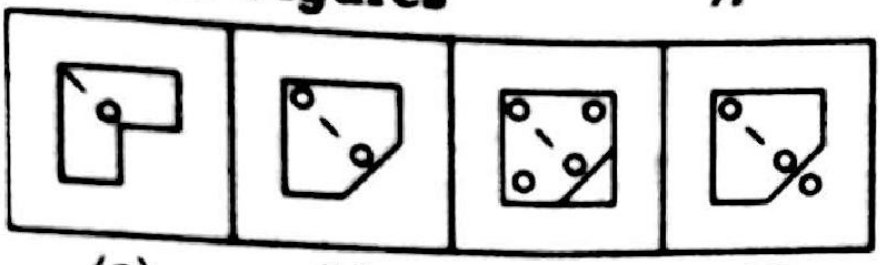
Problem Figure **14.**



(X)

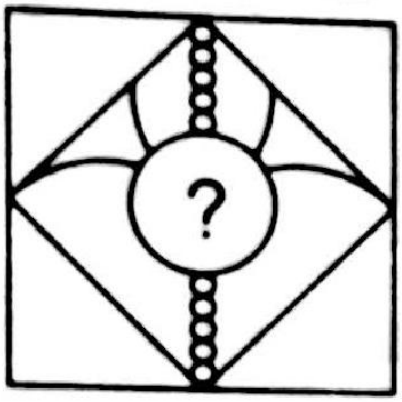
[SSC (Steno) 2012]

Answer Figures



(a) (b) (c) (d)

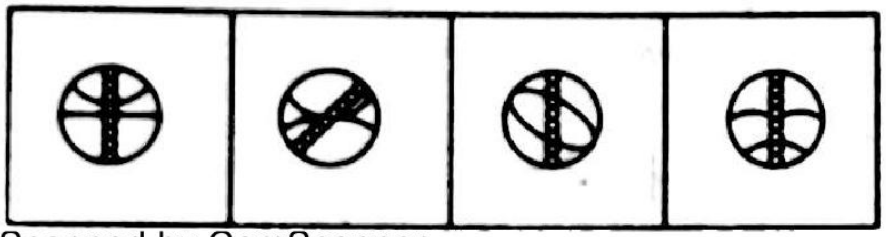
Problem Figure **15.**



(X)

[SSC (CGL) 2013]

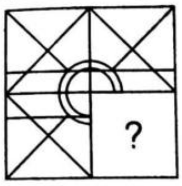
Answer Figures



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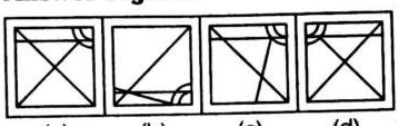
17. Problem Figure



(X)

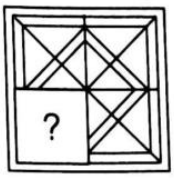
[SSC (10 + 2) 2003]

Answer Figures



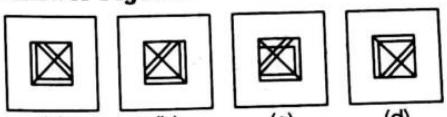
(a) (b) (c) (d)

18. Problem Figure



(X)

Answer Figures



(a) (b) (c) (d)

Answer *with* Explanations

A. Base Level Exercise

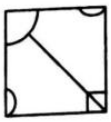
1. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



2. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



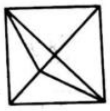
3. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



4. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



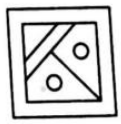
5. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



6. (*b*) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



7. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



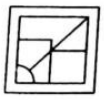
8. (*b*) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



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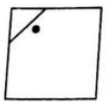
9. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



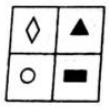
10. (b) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



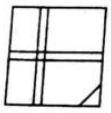
11. (a) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



12. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



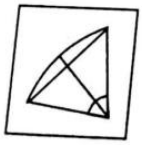
13. (a) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



14. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,

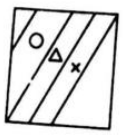


15. (d) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,

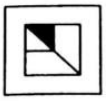


B. Expert Level Exercise

1. (d) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



16. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



17. (d) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



18. (d) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



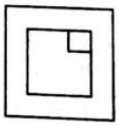
19. (b) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



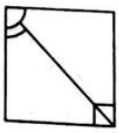
20. (d) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



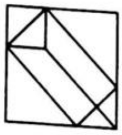
21. (a) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



22. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



2. (c) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



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3. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



4. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



5. (*c*) The missing figure which will complete the figure pattern is given by option (c) *i.e.*,



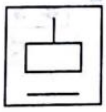
6. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



7. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



8. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



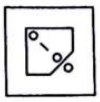
9. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



10. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



11. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



12. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



13. (*b*) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



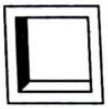
14. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



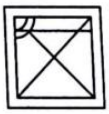
15. (*b*) The missing figure which will complete the figure pattern is given by option (b) *i.e.*,



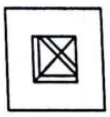
16. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



17. (*d*) The missing figure which will complete the figure pattern is given by option (d) *i.e.*,



18. (*a*) The missing figure which will complete the figure pattern is given by option (a) *i.e.*,



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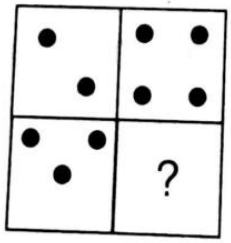
Figure Matrix

Figure matrix is a 2×2 as 3×3 representation of figures following a certain pattern in matrix form.

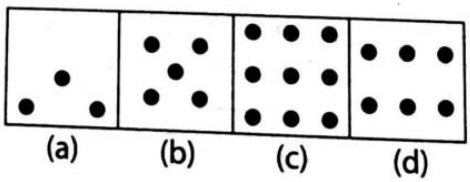
In this chapter, we deal with questions which have either 2×2 or 3×3 matrix. These matrix are formed by a group of figures. Corresponding rows or corresponding columns follow a certain pattern. You are required to analyse each of the sets to find out the common pattern and on the basis of that, the missing figure is to be identified from a set of alternatives, so as to complete the matrix.

Directions (Illustrations 1-2) *In each of the following questions, find out which of the answer figures (a), (b), (c) and (d) completes the figure matrix?*

Illustration 1. **Problem Figure**



Answer Figures

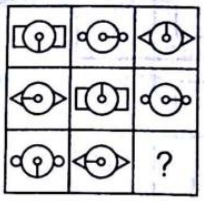


Solution (*d*) Clearly, in the upper row, the number of dots in the second figure is twice the number of dots in the first figure. Similarly, in the lower row, the number of dots in the second figure must be twice the number of dots in the lower first figure.
So, number of dots in missing segment is $= 2 \times 3 = 6$

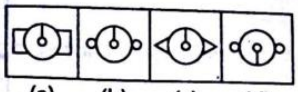
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Illustration 2. **Problem Figure**



Answer Figures



(a) (b) (c) (d)

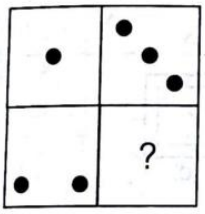
Solution *(a)* In each row, the central part of the first figure rotates either 90° clockwise or 90° anti-clockwise to form the central part of the second figure and the central part of the first figure rotates 180° to form the central part of the third figure. Also, in each row, there are three types of geometrical figures are there rectangles, circles and triangles.

Let us Practice

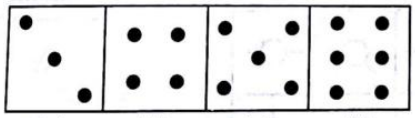
A. Base Level Exercise

Directions (Q. Nos. 1-10) *In each of the following questions, find out which of the answer figures (a), (b), (c) and (d) completes the figure matrix?*

1. **Problem Figure**

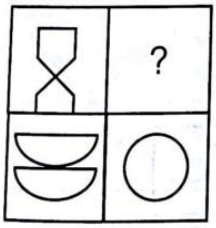


Answer Figures

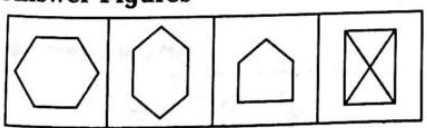


(a) (b) (c) (d)

2. **Problem Figure**

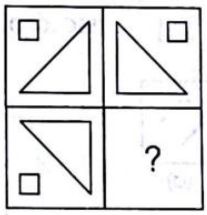


Answer Figures

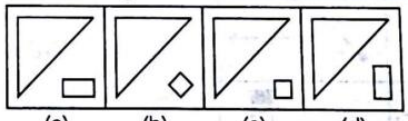


(a) (b) (c) (d)

3. **Problem Figure**



Answer Figures

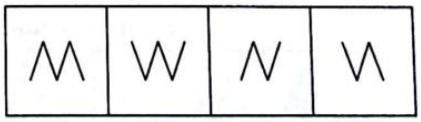


(a) (b) (c) (d)

4. **Problem Figure**



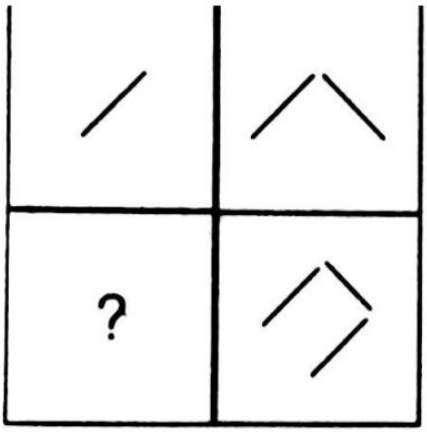
Answer Figures



(a) (b) (c) (d)

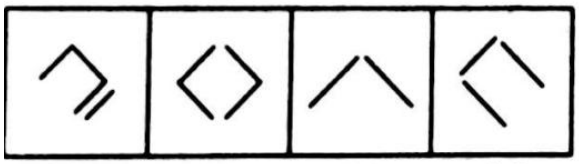
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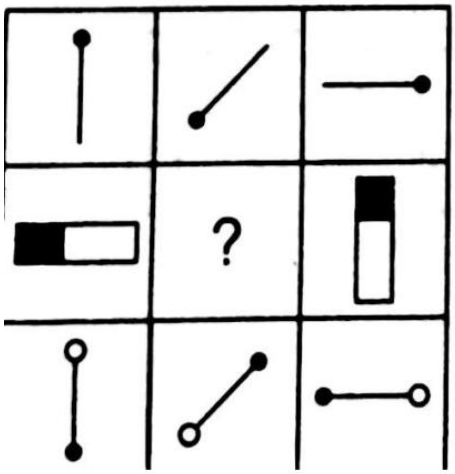


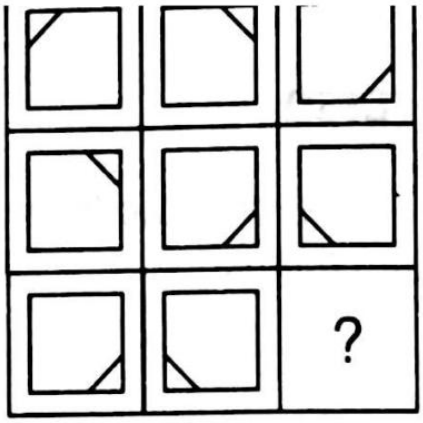
[SSC (CPO) 2013]

Answer Figures

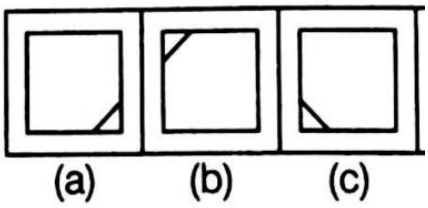


Problem Figure

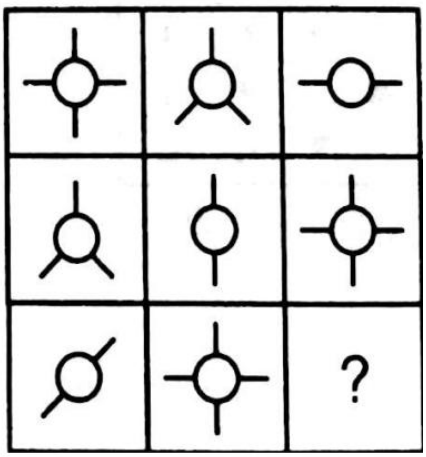




Answer Figures



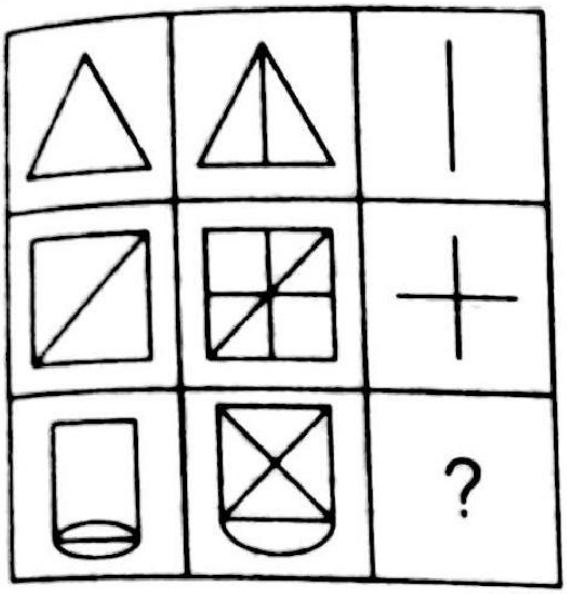
10. Problem Figure



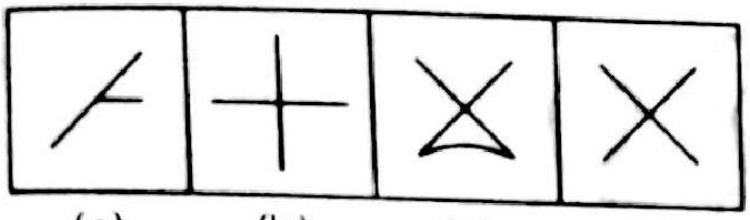
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1. Problem Figure

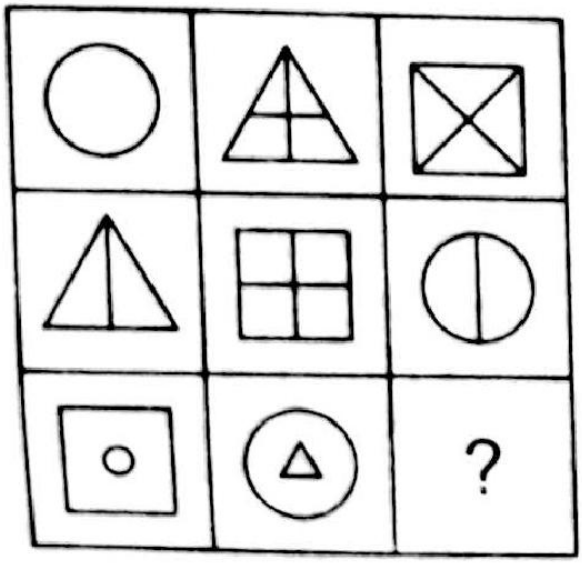


Answer Figures

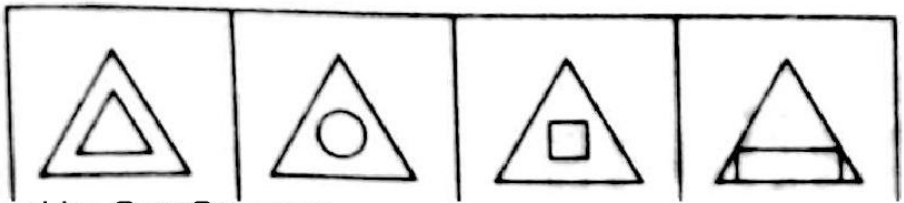


(a) (b) (c) (d)

2. Problem Figure



Answer Figures



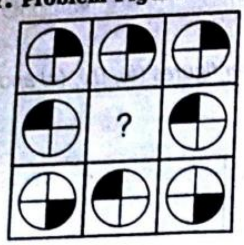
4.

5.

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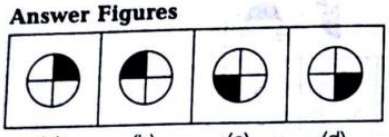
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7. Problem Figure



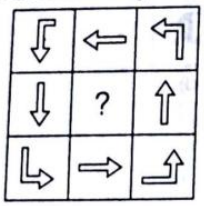
[CSAT 2013]

Answer Figures

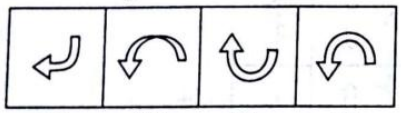


(a) (b) (c) (d)

8. Problem Figure

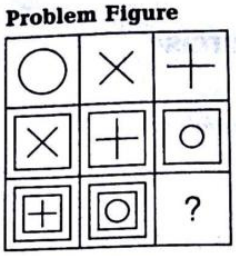


Answer Figures

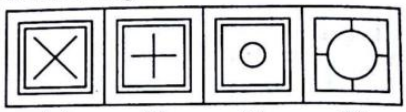


(a) (b) (c) (d)

9. Problem Figure

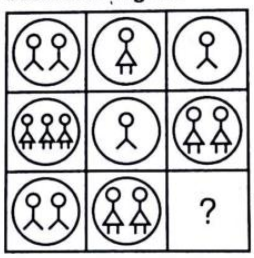


Answer Figures

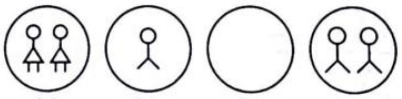


(a) (b) (c) (d)

10. Problem Figure



Answer Figures



(a) (b) (c) (d)

Answer *with* Explanations

A. Base Level Exercise

1. (*d*) In each row of figure, the number of dots in the second figure is thrice the number of dots in the first figure.

2. (*b*) The two parts of the first figure are rearranged and joined along the longer sides. The common side is then removed to form the second figure.

3. (*c*) Columnwise, second element is the mirror image of first element.

4. (*a*) The pattern followed is



Hence, option (a) is the correct answer.

5. (*d*) The pattern followed is



Hence, option (d) is the correct answer.

6. (*b*) In clockwise direction, every figure is increasing with one line. So, it will be 4 lines in figure (b).

7. (*d*) Each row, the second figure is obtained by rotating the first figure 135° anti-clockwise.

8. (*c*) In each row, the third figure is a collection of the common elements.

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9. (b) Figures in each row are rotating clockwise 90°.

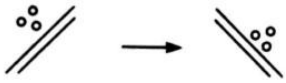
10. (a) In figure each row consists of a circle and two segments or three line segments or four line segments. So in third row only the figure with three line segments is missing.

Expert Level Exercise

1. (d) The third figure in each row comprises of parts which are not common in the first two figures.

2. (c) There is triangle after circle and square after triangle. In the last row, we have to find the figure inside the triangle. In the next segment of circle, there is triangle and a square will be inside the triangle.

3. (b) The pattern followed is



Hence, option (b) is the correct answer

4. (d) Clearly, there are three types of shadings of circles, one is unshaded, another has its right half shaded with vertical lines and yet another and has its upper half shaded with horizontal line. Also, two of the figures in each row have one triangle shaded.

5. (a) Clearly, there are three types of arrows—one arrow is with a single head and without any base, other arrow with double head having a circle at its base, last arrow is with triple head having a rectangle at its base.

   Also, in each row, the arrows point to three directions—upwards, downwards and towards the right.

6. (d) Clearly, in each row, the second figure forms the innermost which is also at the outermost position and first figure at middle position.

7. (d) In first and third set, the black portion of middle image is diagonally opposite to that of first image. Hence, second image in second set must be option (d).

8. (d) If we use figure (d) from the alternatives, the given matrix is complete.

9. (a) Each column has one '+', one 'o' and one '×'. First figure of each column is without boundary and second one is in the square. Third figure is in two squares. As, there are '+' and 'o' in third column.



   So, figure '×' will be surrounded by two squares.

10. (c) Clearly, in each row, the number of elements in the third figure is equal to the difference in the number of elements in the first and second figures. Also, the third figure has the same types of elements as that of first figure.

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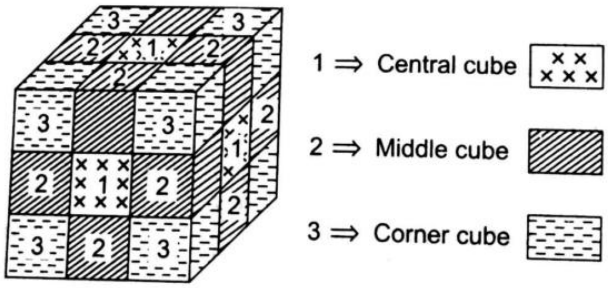
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13

Cube *and* Dice

Cube

A cube is three-dimensional figure, having 8 corners, 6 surfaces and 12 edges.



Important Facts

If a cube is painted on all of its surfaces with the same colour and then divided into smaller cubes of equal size, then after separation, number of smaller cubes, so obtained will be calculated as under

- Number of smaller cubes with three surfaces painted = 8
- Number of smaller cubes with two surfaces painted = $(n-2) \times 12$
- Number of smaller cubes with one surface painted = $(n-2)^2 \times 6$
- Number of smaller cubes with no surface painted = $(n-2)^3$

Here, n = Number of divisions on the surface of the bigger cube

$$= \frac{\text{Length of edge of big cube}}{\text{Length of edge of one smaller cube}}$$

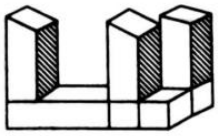
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Counting the Number of Cubes/ Blocks in the Given Figures

When the number of cubes (or blocks/ cuboids) in a figure needs to be counted, the procedure is described with the help of the following illustrations.

Illustration 1. Count the number of blocks in the given figure.



(a) 6 (b) 7 (c) 8 (d) 9

Solution (*b*) It is clear from the figure that there are four blocks in the lower layer close to the ground. Also, there are 3 blocks standing over the lower layer of blocks.

Thus, there are 4 + 3 = 7 blocks in the given figure.

Directions (Illustrations 2-3) *Read the following information carefully to answer the questions that follows.*

A cube is coloured red on two opposite faces, blue on two adjacent faces and yellow on two remaining faces. It is then cut into two halves along the plane parallel to the red faces. One piece is then cut into four equal cubes and the other one into 32 equal cubes.

Illustration 2. How many cubes will not have any coloured faces?

(a) 0 (b) 16 (c) 4 (d) 8

Solution (c) Only 4 smaller cubes from inside the cube will have none of their faces painted.

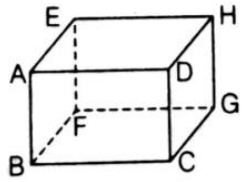
Illustration 3. How many cubes will not have any red faces?

(a) 8 (b) 16 (c) 20 (d) 24

Solution (*b*) 16 cubes from the second layer from the bottom will not have any red faces.

Dice

A dice is three-dimensional figure with 6 surfaces. It may be in the form of a cube or a cuboid. After observing these figures, we have to find the different side (opposite or adjacent) of the dice.



Front surface ⟶ ABCD
Back surface ⟶ EFGH
] opposite,

Top surface ⟶ ADHE
Bottom surface ⟶ BCGF
] opposite,

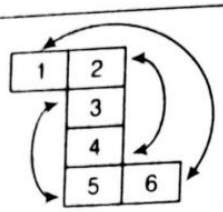
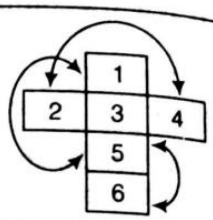
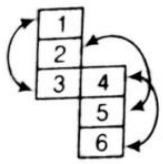
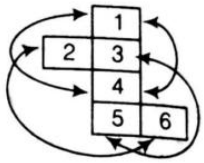
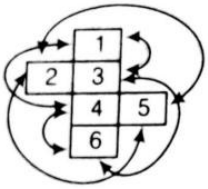
Left surface ⟶ ABFE
Right surface ⟶ DCGH
] opposite

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Dice Formation

A dice is formed by folding a sheet of paper. *These forms may be*

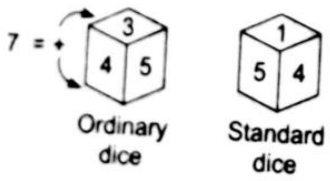
1 lies opposite of 6 2 lies opposite of 4 3 lies opposite of 5 	1 lies opposite of 5 2 lies opposite of 4 3 lies opposite of 6 
1 lies opposite of 3 2 lies opposite of 5 4 lies opposite of 6 	1 lies opposite of 4 2 lies opposite of 6 3 lies opposite of 5 
1 lies opposite of 4 2 lies opposite of 5 3 lies opposite of 6 	

Types of Dice

There are two types of dice

1. **Ordinary dice** In this type of dice, the sum of opposite sides is not 7. But the sum of two adjacent sides are seven.

2. **Standard dice** In such type of dice, the sum of opposite sides is 7 or sum of adjacent side is not 7.



Ordinary dice — Standard dice

Here, $1 + 4 = 5$

$\Rightarrow$ $4 + 5 = 9$

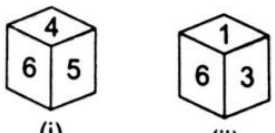
$\Rightarrow$ $1 + 5 = 6$

Opposite of 1 $\longrightarrow$ 6

Opposite of 2 $\longrightarrow$ 5

Opposite of 3 $\longrightarrow$ 4

Illustration 4. Two positions of a dice are shown below. Identify the number at the bottom when the top is '3'?



(i) (ii)

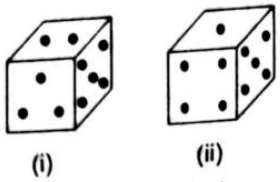
(a) 2 (b) 4 (c) 5 (d) 16

Solution (c) Using both dice, we can say 1, 3, 4 and 5 are adjacent sides of 6. So, 2 is opposite to 6. Here, 4 and 6 are adjacent to 5. So, either 1 or 3 is opposite to 5. But 1 and 3 both are adjacent and when 1 is at top, then 3 is its adjacent side. So, 3 lies opposite of 5. Hence, when the top is 3, then the number at the bottom will be 5.

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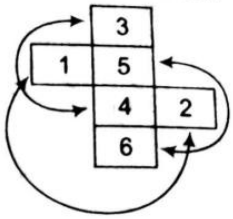
Illustration 5. What number of dots will be there on the face opposite to the face that contains 2 dots?



(i) (ii)

(a) 1 (b) 3 (c) 4 (d) 6

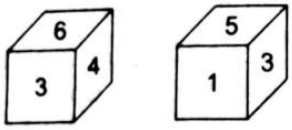
Solution (a) From the unfolded figure of dice, we can see that number 1 will appear on the opposite surface on which number 2 lies.



Let us Practice

A. Base Level Exercise

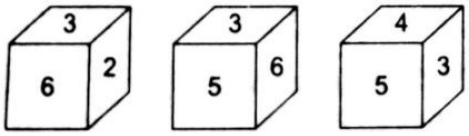
1. On the basis of two figures of dice you have to tell what number will be there on the opposite side of number 5?



(i) (ii)

(a) 1 (b) 3
(c) 4 (d) 5

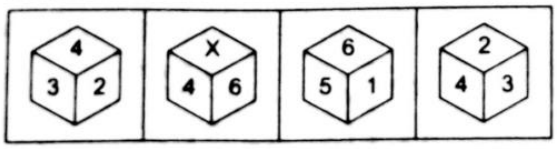
2. Three positions of a dice are given below



Identify the number on the face opposite to 6. [SSC (Steno) 2011]

(a) 1 (b) 4
(c) 5 (d) 7

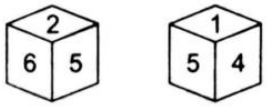
3. Given below are the different positions of a dice



What shall come in the place of 'X'? [SSC (FCI) 2012]

(a) 3 (b) 5
(c) 2 (d) 1

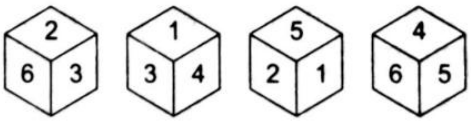
4. What number is at the opposite of 3 in the figure shown below? The given two positions are of the same dice whose each surface bears a number among 1, 2, 3, 4, 5 and 6.



(i) (ii)

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

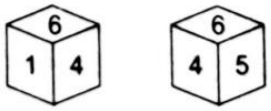
5. Four positions of a dice are given below



Identify the number at the bottom when the top is 3. [SSC (10+2) 2012]

(a) 5 (b) 1 (c) 2 (d) 6

6. Two positions of a dice are shown below when number 1 is on the top. What number will be there at the bottom?



(i) (ii)

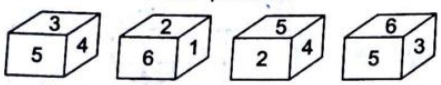
(a) 2
(b) 3
(c) 5
(d) Data inadequate

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Directions (Q. Nos. 7-9) *In each of the following questions, four positions of the same dice have been shown. You have to see these figures and select the number opposite to the number as asked in each of the question.*

7.

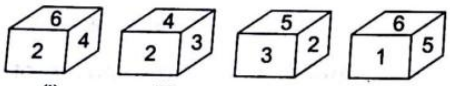


(i) (ii) (iii) (iv)

Which number is at the opposite of number 5?

(a) 6 (b) 5
(c) 1 (d) 3

8.



(i) (ii) (iii) (iv)

Which number is at the opposite of number 2?

(a) 4 (b) 1
(c) 5 (d) 3

9.

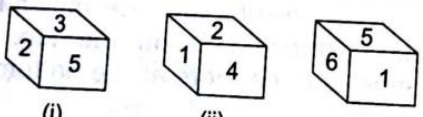


(i) (ii) (iii) (iv)

Which number is at the opposite of number 5?

(a) 4 (b) 6
(c) 1 (d) 3

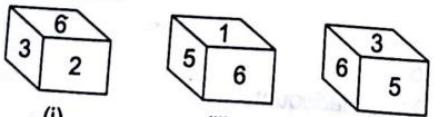
10. Which number is on the face opposite to face having number 1? **[SSC (CPO) 2008]**



(i) (ii) (iii)

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

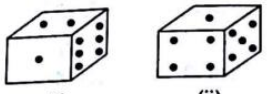
11. Which number is at the opposite of number 6?



(i) (ii) (iii)

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

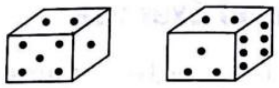
12. All the surfaces of the dice contain different numbers in the form of dots. Consider both the figures of dice and tell how many dots are there on the face opposite to the face that contains four dots?



(i) (ii)

(a) 2 (b) 3 (c) 5 (d) 6

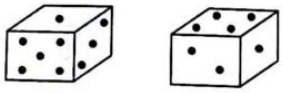
13. When number 1 is at the top, which number will come at the bottom?



(i) (ii)

(a) 1 (b) 2 (c) 3 (d) 6

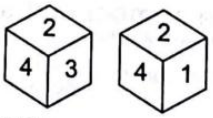
14. Two positions of a dice are shown below. When there are two dots at the bottom, the number of dots at the top will be



(i) (ii)

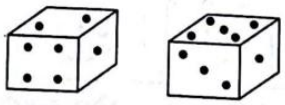
(a) 2 (b) 3 (c) 5 (d) 6

15. Which number will appear on the face opposite to 1? **[SSC (10+2) 2012]**



(a) 6 (b) 5 (c) 4 (d) 3

16. Two positions of a cube are shown below. When the number 4 will be at the bottom, then which number will come at the top?



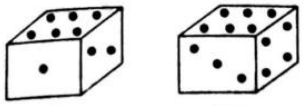
(i) (ii)

(a) 3
(b) 5
(c) 6
(d) Data inadequate

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17. Two positions of a block are shown below

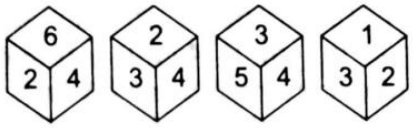


(i) (ii)

When six is at the bottom, what number come at the top?

(a) 1 (b) 2 (c) 4 (d) 5

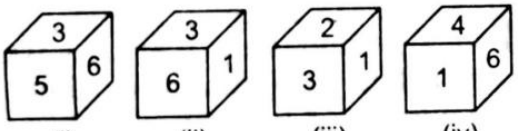
18. A dice is thrown four times and its different positions are shown below. What number is opposite to face showing 2? [CPO 2013]



(a) 6 (b) 3 (c) 4 (d) 5

Directions (Q. Nos. 19-23) *In each of the following questions, four positions of the same dice have been shown. You have to observe these figures and select the number opposite to the number as asked in each of the question.*

19.

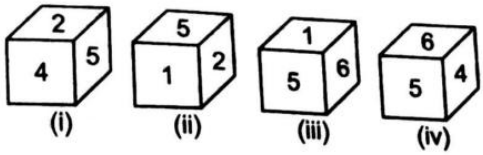


(i) (ii) (iii) (iv)

Which number is on the opposite surface of number 3?

(a) 4 (b) 6 (c) 5 (d) 1

20.

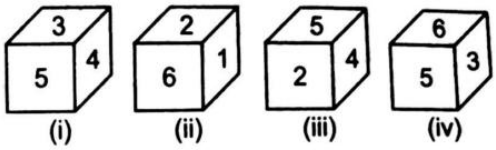


(i) (ii) (iii) (iv)

Which number is opposite to number 1?

(a) 4 (b) 6
(c) 2 (d) 3

21.

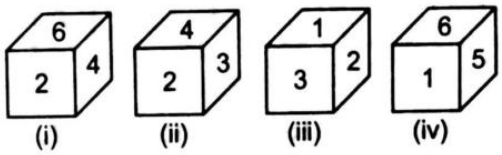


(i) (ii) (iii) (iv)

Which number is opposite to number 5?

(a) 6 (b) 5
(c) 1 (d) 3

22.

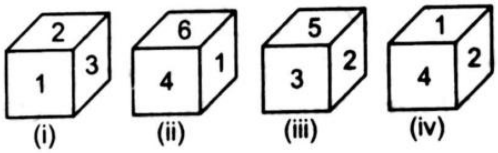


(i) (ii) (iii) (iv)

Which number is opposite to number 2?

(a) 4 (b) 6
(c) 5 (d) 3

23.



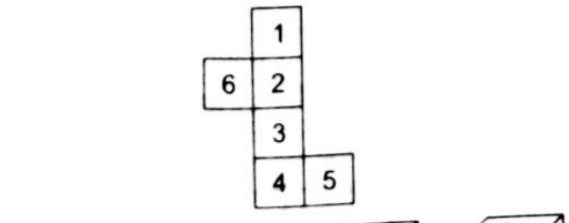
(i) (ii) (iii) (iv)

Which number is opposite to number 5?

(a) 4 (b) 6 (c) 1 (d) 3

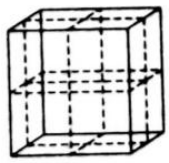
B. Expert Level Exercise

1. According to given figure of dice, which option is correct. [SSC (Multitasking) 2011]



(a) (b) (c) (d)

2. A cube which is painted red on the outer surface is of 2 inches height, 2 inches wide and 2 inches across. If it is cut into one inch cubes as shown by dotted lines, then indicate the number of cubes which are red on two sides?



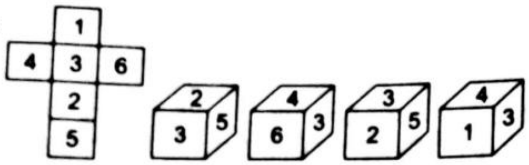
(a) 8 (b) 0 (c) 4 (d) 6

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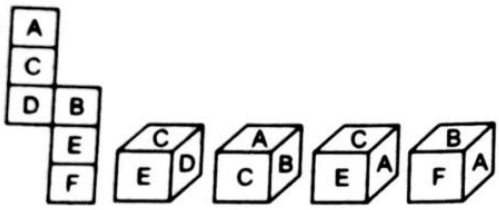
Directions (Q. Nos. 3-4) *The sheet of paper shown in the figure given on the left hand side of problem, is folded to form a box. Choose the correct alternative which will truely represent the position of various numbers/symbols/letters in diagram.*

3.



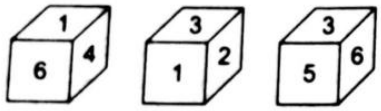
(a) (b) (c) (d)

4.



(a) (b) (c) (d)

5. A cube has six numbers marked 1, 2, 3, 4, 5 and 6 on its faces. Three views of the cube are shown below

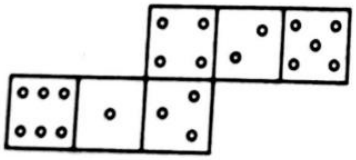


What possible numbers can exist on the two faces marked A and B, respectively?



(a) 2 and 3 (b) 6 and 1
(c) 1 and 4 (d) 3 and 1

6. How many dots lie opposite to the face having three dots, when the given figure is folded to form a cube?



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

Directions (Q. Nos. 7-8) *Read the following information carefully to answr the questions that follow*

A cube is coloured red on all of its faces. It is then cut into 64 smaller cubes of equal size. The smaller cubes, so obtained are now separated.

7. How many smaller cubes will have atleast two surfaces painted with red colour?

(a) 4 (b) 18 (c) 32 (d) 24

8. How many smaller cubes have two surfaces painted with red colour?

(a) 24 (b) 8 (c) 12 (d) 20

Directions (Q. Nos. 9-12) *Read the following information carefully to answer the questions that follow.*

A cuboid of dimensions (6 cm × 4 cm × 1cm) is painted black on both the surfaces of dimensions (4 cm × 1cm), green on the surfaces of dimensions (6 cm × 4 cm) and red on the surfaces of dimensions (6 cm × 1 cm). Now, the block is divided into various smaller cubes of side 1 cm each. The smaller cubes, so obtained are separated.

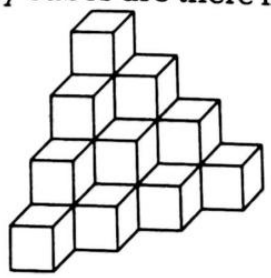
9. How many cubes will have all three colours black, green and red each atleast on one side?

(a) 16 (b) 12 (c) 10 (d) 8

10. If cubes having only black as well as green colour are removed, then how many cubes will be left?

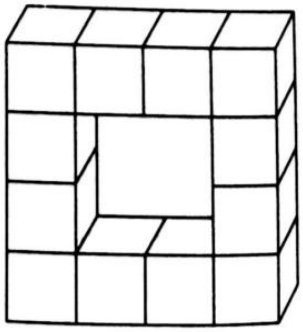
(a) 4 (b) 8 (c) 16 (d) 20

11. How many cubes are there in the group?



(a) 10 (b) 16 (c) 18 (d) 20

12. How many cubes are there in this diagram?



(a) 16 (b) 12 (c) 10 (d) 8

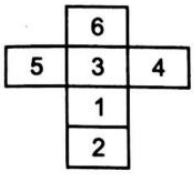
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Answer *with* Explanations

A Base Level Exercise

1. (*c*) The unfolded structure of given dice can be shown as



Clearly, number 4 is opposite to number 5.

2. (*b*) From dice II and III 3 and 5 are two common numbers. Hence, 6 and 4 are opposite to each other.

From second method (dice I and II)

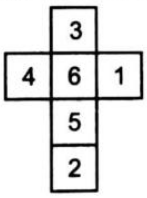
(since, 3 is common)

1 is opposite to 3

2 is opposite to 5

4 is opposite to 6

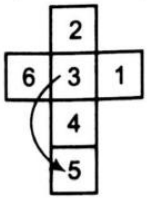
3. (*a*) Expanded form of the dice is



Thus, $X = 3$

4. (*c*) It is clear from both the positions that 2, 6,1 and 4 appear adjacent to 5. Therefore, 3 must appear at the opposite.

5. (*a*) According to question, expanded form of dice is



So, opposite of 3 is 5.

6. (*c*) Number 6 is common to both the positions of the dice. We assume the dice in figure (ii) to be rotated, so that 6 remains on the top face. Clearly, 5 and 1 will be opposite to each other.

7. (*c*) From the figures (i), (iii) and (iv), it is clear that numbers adjacent to 5 are 3, 4, 2 and 6. Hence, number 1 will be opposite to number 5.

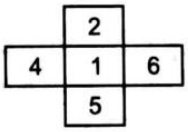
8. (*b*) It is clear from all the figures that numbers 6, 4, 3 and 5 appear on the adjacent surfaces of number 2. Hence, number 1 will be opposite to number 2.

9. (*c*) It is clear from all the figures that 2, 3, 4 and 6 appear on the adjacent surfaces of number 1. So, number 1 will be opposite to number 5.

10. (*b*) The numbers 2, 4, 5 and 6 are on the surfaces adjacent to 1. So, 3 is on the surface opposite to 1.

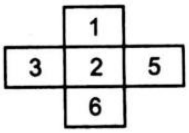
11. (*d*) The numbers 1, 2, 3 and 5 are on adjacent faces of 6. Hence, 4 is opposite to 6.

12. (*d*) The positions of numbers on the faces of dice can be shown as given in the following figure.



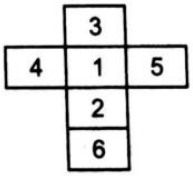
From this figure, we observe that number 6 will appear on the opposite surface to the surface occupied by number 4.

13. (*d*) The positions of number as shown in the figure.



Hence, number 6 will be opposite to number 1.

14. (*b*) From both the figures, it is clear that number 3 will be opposite to number 2.



15. (*d*) Dice I → 2 3 4

Dice II → 2 1 4

So, opposite side of 1 is 3.

16. (*a*) Number 1 is common to both the positions of the dice. Let us assume figure (ii) to be rotated, so that 1 remains on the right hand side face and the numbers 5 and 3 move to the faces hidden behind 2 and 4. Clearly, if 4 is at the bottom, then 3 must lie on the top.

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17. (*d*) From figures (i) and (ii), we conclude that the numbers 1, 2, 3 and 4 appear adjacent to 6. Thus, the number 5 will appear opposite to 6. Therefore, when six is at the bottom, 5 will be at the top.

18. (*d*) From the first, second and fourth positions of the dice, it is clear that the neighbouring faces of 2 have 6, 4, 3 and 1.

Thus, opposite face of 2 will have 5.

19. (*a*) From the figures (i), (ii) and (iii), it is clear that numbers 5, 6, 1 and 2 are on the adjacent surfaces of number 3. Hence, 4 is opposite to number 3.

20. (*a*) It is clear from the figures that number 3 is opposite to number 5, number 6 is opposite to number 2 and number 1 will be opposite to number 4.

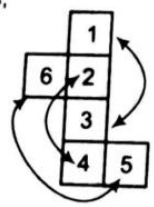
21. (*c*) From the figures (i), (iii) and (iv), it is clear that numbers adjacent to 5 are 3, 4, 2 and 6. Hence, number 1 will be opposite to number 5.

22. (*c*) Figures (i), (ii) and (iii) show that numbers 6, 4, 3 and 1 appear on the adjacent surfaces of the number 2. Hence, number 5 will be opposite to number 2.

23. (*c*) Figures (i), (ii) and (iv) show that numbers 2, 3, 4 and 6 appear on the adjacent surfaces of number 1. Hence, number 1 will be opposite to number 5.

B. Expert Level Exercise

1. (*c*) As,



So,

1 ⟷ 3
2 ⟷ 4
6 ⟷ 5

2. (*b*) From the figure there are no such cube which is painted red only on two sides.

3. (*d*) From the question figure, it is clear that 4 is opposite to 6, 1 is opposite to 2 and 3 is opposite to 5. Figures (a), (b) and (c) will not be identical to question figure because numbers forming the opposite pairs appear on the adjacent surfaces.

4. (*b*) From the question figure, it is clear that A is opposite to D, C is opposite to E and B is opposite to F. Hence, figures (a), (c) and (d) are not identical to question figure.

5. (*a*) Looking at the first two figures we see that 2 is opposite to 6 and 3 is opposite to 4. The third figure tells us that 5 is opposite to 1. Thus, the numbers A and B, which are adjacent to 5 could be any of the following four, 6 and 4, 4 and 2, 2 and 3, and 3 and 6. Out of these only 2 and 3 is given as a option (a).

6. (*d*) When this figure is folded to form a cube, then the face bearing six dots will be opposite to the face bearing three dots.

7. (*c*) Number of smaller cubes with atleast two surfaces painted

= Number of cubes with three surfaces painted + Number of cubes with two surfaces painted

$= 8 + (n-2) \times 12$

$= 8 + (4-2) \times 12 = 8 + 24 = 32$

8. (*a*) Number of smaller cubes with two surfaces painted $= (4-2) \times 12 = 24$

9. (*a*) All the sixteen cubes there on the boundary of this block will have all three colours each, atleast on one side.

10. (*c*) A total of sixteen cubes will be left, if cubes with black as well as green colours are removed.

11. (*d*) From the top most row of the figure

Cube in 1st row = 1

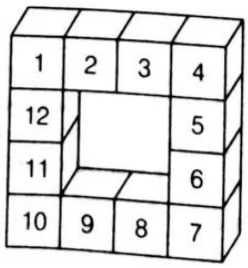
Cube in 2nd row = 3

Cube in 3rd row = 6

Cube in 4th row = 10

∴ Total number of cubes = 1 + 3 + 6 + 10 = 20

12. (*b*) From figure, it is automatically clearify that figure having 12 cubes as below



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