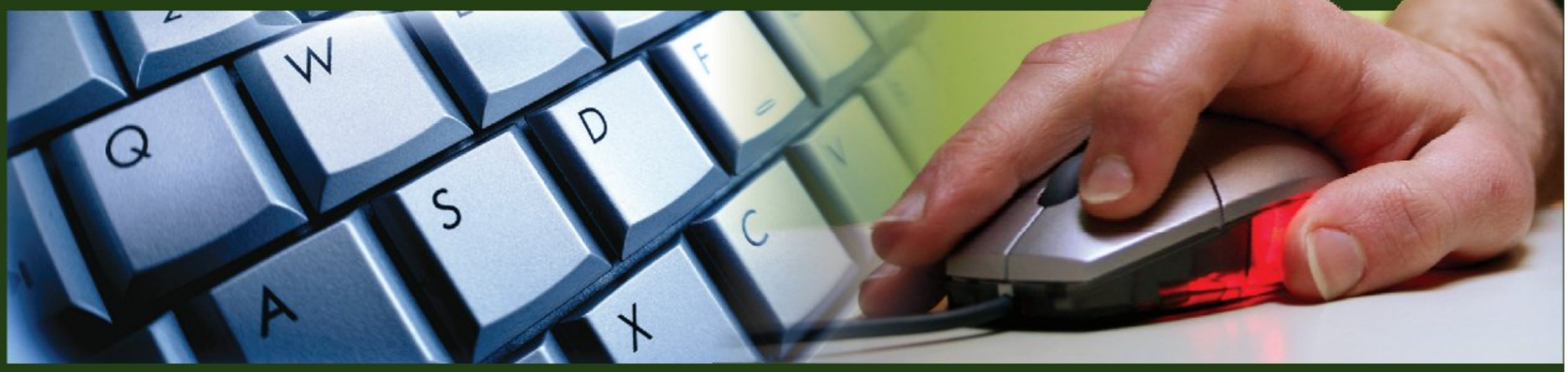
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卐 **ADMINISTRATIVE & PRODUCTION OFFICES**

Regd. Office

'Ramchhaya' 4577/15, Agarwal Road, Darya Ganj, New Delhi -110002
Tele: 011- 47630600, 43518550; Fax: 011- 23280316

Head Office

Kalindi, TP Nagar, Meerut (UP) - 250002
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CHAPTER

01

INTRODUCTION TO COMPUTER

The word computer has been derived from Latin language. A computer is an electronic device that manipulates information or data according to the set of instructions. It has the ability to store, retrieve and process data. A computer is used to type documents, send E-mails and browse the Internet. It is also used to handle accounting, database management, presentations, games and so on.

Functioning of a Computer

Computer performs four basic functions which are as follows

1. **Input** Information or data that is entered into a computer is called input. It sends data and instructions to the Central Processing Unit (CPU).
2. **Processing** It is the sequence of actions taken on data to convert it into information which is meaningful to the user. It can be calculations, comparisons or decisions taken by the computer.
3. **Output** It makes processed data available to the user. It is mainly used to display the desired result to the user as per input instructions.
4. **Storage** It stores data and programs permanently. It is used to store information during the time of program execution and possible to get any type of information from it.

Features of Computer

The key features of computer are as follows

1. **Speed** The computer can process data very fast at the rate of millions of instructions per second.
2. **Accuracy** Computers provide a high degree of accuracy. They respond to the user as per the input instructions.
3. **Storage Capacity** Computers are capable to store huge amount of data which depends on the capacity of hard disk.
4. **Versatility** Computers can do different types of work simultaneously. They can perform multiple tasks at a same time.

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5. **Automation** Once the instruction to do any work is given to the computer, the computer does its work automatically by itself.
6. **Diligence** Unlike human beings, a computer is free from monotony, tiredness, lack of concentration, etc. and can work for hours without creating any errors.
7. **Secrecy** Leakage of information is reduced by creating login system with password protection.
8. **Reliability** Computers are more reliable than human beings. Computers always produce exact results. The possibility of errors occur only if the input is wrong, i.e. the computers never make mistakes of their own accord.
9. **Plug and Play** Computers have the ability to automatically configure a new hardware and software component.

Terms Related to Computer

1. Hardware It is the collection of physical elements that constitutes a computer system. It is a comprehensive term for all the physical parts of a computer. e.g. Display screens, discs, keyboards, etc.

2. Software It is a set of programs and procedures. Software tells the hardware what to do and how to accomplish a task. e.g. Web browsers, word processors, etc.

3. Data Unprocessed raw facts and figures, like numbers, text on piece of paper, are known as data.

4. Information When data is processed, organised, structured or presented in a given context so as to be useful, then it is called information.

5. Instruction It is a command given to a computer in the computer language by the user.

6. Program It is a set of instructions given to a computer in order to perform some task.

History of Computer

Computer is not the creation of one day, rather it took a long period for the development of modern computer. *History of computer is described in this table.*

Invention	Inventor	Characteristics	Applications
Abacus **1602**	China	▪ First mechanical calculating device. ▪ A horizontal rod represents the one, tens, hundred, etc.	▪ Used for addition and subtraction operations. ▪ Calculation of square roots can also be performed.
Napier's Bones **1617**	John Napier (Scotland)	▪ Three dimensional structure. ▪ Holding numbers from 0 to 9 only. ▪ Represent graphical structure of calculating result.	▪ Perform multiplication on numbers. ▪ Technology used for calculation called Rabdologia.
Pascaline **1642**	Blaise Pascal (France)	▪ First mechanical **adding machine.** ▪ It was structured like rectangular box, with eight disc (represent number of units).	▪ Perform addition and subtraction of two numbers. ▪ Mainly designed with regard to the pressure of liquid.
Jacquard's Loom **1801**	Joseph Marie Jacquard (France)	▪ Mainly weaved a silk based pattern. ▪ Used **punched card for the sequence of operation.**	▪ Simplified the process of Textiles.
Analytical Engine **1837**	Charles Babbage (Father of Computer) (London)	▪ First general-purpose computer. ▪ Stored program in the form of 'pegs' also called **barrels.**	▪ It was a decimal machine used sign and magnitude for representation of a number.

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Invention	Inventor	Characteristics	Applications
Tabulating Machine **1890**	Herman Hollerith (America)	▪ It used punched cards with round holes. ▪ It was the first **electromechanical machine**, designed to process the data for **census in 1890.**	▪ Read one card at a time.
MARK-1 **1944**	Howard Aiken (America)	▪ Consists of interlocking panels of small glass, counters, switches and control circuits. ▪ Data can be entered manually.	▪ Mainly used in the war effort during World War-II. ▪ Magnetic drums are used for storage.
ENIAC **1946**	JP Eckert and JW Mauchly (America)	▪ It is a combination of twenty accumulators. ▪ First electronic digital computer.	▪ Used for weather prediction, atomic energy calculation and other scientific uses.
EDSAC **1949**	John Von Neumann (America)	▪ It was first *computer* which provided **storage capacity.** ▪ First computer program was run on machine.	▪ Capable of storing instructions and data in memory. ▪ Used mercury delay lines for memory, vacuum tubes for logic.
UNIVAC **1951**	J. Presper Eckert and John Mauchly (America)	▪ First general-purpose electronic computer with large amount of input and output.	▪ Used magnetic tapes as input and output.
IBM-650 Computer **1953**	IBM Company	▪ Provided input/output units converting alphabetical and special characters to two-digit decimal code.	▪ Payroll processing ▪ Oil refinery design ▪ Market research analysis

Generations of Computer

A generation refers to the state of improvement in the development of system. Computers are built of electromechanical, before generation. Each generation of computer is characterised by a major technological development that fundamentally changed the way, computers operate.

Generation	Switching Device	Storage Device/Speed	Operating System	Characteristics	Applications
First (1940-56)	Vacuum tubes	Magnetic drums (333 micro seconds)	Batch operating system (Machine language (Binary number 0's and 1's)	▪ Fastest computing device. ▪ Generate large amount of heat. ▪ Non-portable.	▪ Used for scientific purpose e.g. ENIAC, UNIVAC, MARK-1, etc.
Second (1956-63)	Transistors (Made up of semiconductor)	Magnetic core technology (10 micro seconds)	Time sharing OS, Multitasking OS (Assembly language, high level language)	▪ More reliable and less prone to hardware failure. ▪ Portable and generate less amount of heat.	▪ Used for commercial production e.g. PDP-8, IBM-1401, etc.
Third (1964-71)	Integrated Circuits (ICs) (Made up of silicon)	Magnetic core as primary storage medium (100 nano seconds)	Real-time system (High level language (FORTRAN, COBOL, ALGOL))	▪ Consumed less power. ▪ Highly sophisticated technology required.	▪ Database management system e.g. NCR-395, B6500, etc.

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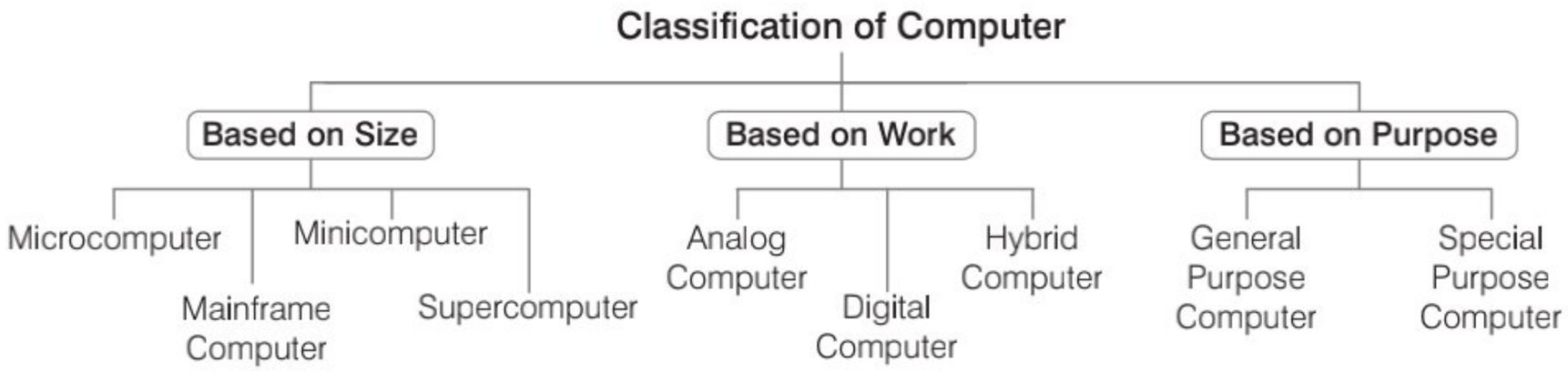
Generation	Switching Device	Storage Device/Speed	Operating System	Characteristics	Applications
Fourth (1971-Present)	Large Scale Integrated (LSI) circuit micro-processor	Semi conductor memory, Winchester disc (300 nano seconds)	Time sharing, GUI interface (PASCAL, ADA, COBOL-74, FORTRAN IV)	▪ More reliable and portable. ▪ This generation leads to better communication and resource sharing	▪ Distributed system, e.g. Intel 4004 chip, Macintosh.
Fifth (Present and Beyond)	Super Large Scale Integrated (SLSI) chips	Optical disc	Knowledge Information Processing System	▪ Parallel processing. ▪ Intel core micro-processor is implemented. ▪ Enables mega chips.	▪ Artificial intelligence e.g. Robotics

Tit-Bits

- **Siddhartha** was the first computer developed in India.
- **Alan Turing** is known as the father of the modern computer.
- **John Von Neumann** was introduced first architecture of computer in the year 1948.
- Transistors were invented by Bell Laboratory.
- In 1958, Jack St. Clair Kilby and Robert Noyce invented the first IC.
- In latest generation computers, the instructions are executed parallel as well as sequential.

Classification of Computer

Computers are mainly classified in three types as follows



Based on Size

On the basis of size, computers are categorised as follows

Microcomputer

These types of computers are the least powerful, yet the most widely used and are also called **portable computers.** Microcomputer consists of three basic categories of physical equipment, i.e. system unit, input/output unit and memory unit.

Some types of microcomputer are as follows

(a) **Desktop Computer or Personal Computer** (PC) These are small, relatively economical computers. These are based on the microprocessor technology (Integrated Circuit-IC).

(b) **Laptop** These computers are also known as **ultra book** or **notebook**. These are portable and lightweighted. They include rechargeable battery, so these can work anywhere.

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(c) **Handheld or Palmtop** Computer These are the smallest and are designed to fit into the palm. So, these are also known as Palmtop. They are practical for certain functions such as phone books and calendars. They use the pen for input instead of keyboard. e.g. PDA (Personal Digital Assistant), tablets, etc.

(d) **Tablet Computer** They have key features of the notebook computer, but these can accept input from a pen instead of the keyboard or mouse.

(e) **Workstation Computer** These are computers dedicated to a user or group of users engaged in business or professional work. It includes one or more high resolution displays and a faster processor than a Personal Computer (PC).

Minicomputer

These are smaller in size, faster and cost lower than mainframe computers. Initially, the minicomputer was designed to carry out some specific tasks, like engineering and Computer Aided Design (CAD) calculations. But now, they are being used as central computer which is known as Server. Minicomputers are IBM-17, DEC PDP-11, HP-9000, etc.

Mainframe Computer

These types of computers having large internal memory storage and comprehensive range of software. Mainframe computer serves as a backbone for the entire business world. It is considered as the heart of a network of computers or terminals that allow a large number of people to work at the same time. Mainframe computers are IBM-370, IBM-S/390, UNIVAC-1110, etc.

Supercomputer

These are the fastest and most expensive machines. They have high processing speed compared to other computers. Supercomputers are most powerful, large in size and memory, compared to all other computers.

The speed of supercomputers are measured in FLOPS (Floating Point Operations Per Second).

Supercomputers are used for highly calculation intensive tasks, such as weather forecasting, nuclear research, military agencies and scientific research laboratories.

(i) **CRAY-1** was the world's first supercomputer introduced by Seymour R CRAY in 1976.

(ii) **PARAM** was the first supercomputer developed in India in 1990.

(iii) **PARAM ISHAN** is the latest machine in the series of PARAM made by C-DAC and IIT Guwahati on 20th September, 2016.

Based on Work

On the basis of work, computers are categorised as follows

Analog Computer

These computers carry out arithmetic and logical operations by manipulating and processing of data. e.g. Speedometers, seismograph, etc.

Analog computer can perform several mathematical operations simultaneously. It uses continuous variables for mathematical operations and utilises mechanical or electrical energy.

Digital Computer

These do work by calculating the binary digits. A digital computer, not only performs mathematical calculations, but also combines the bytes to produce desired graphics, sounds. e.g. Desktop (PC).

Hybrid Computer

These are the combination of analog and digital computers. Machines used in hospitals like ECG and DIALYSIS are the commonly used hybrid computers.

Based on Purpose

On the basis of purpose, computers are categorised as follows

General Purpose Computer

General purpose computers are those computers, which are used to solve variety of problems by changing the program or instructions. e.g. To make small database, calculations, accounting, etc.

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Special Purpose Computer

Special purpose computers are those computers which are used to solve a single and dedicated types of problem. e.g. Automatic aircraft landing, multimedia computer, etc.

Quantum computer was first introduced by *Richard Feynman*. It uses quantum mechanical phenomena. It is the fastest computer imitating *brain working*.

Nano computer is a general team used to describe a computer smaller than a microcomputer, usually about the size of a credit card. e.g. Raspberry Pi which could be used in schools to teach science to children.

Pratyush India's fastest and first multi-petaflops (PF) supercomputer named Pratyush was unveiled at Pune-based Indian Institute of Tropical Meteorology (IITM).

Pratyush has 6.8 PF computational power installed at two MoES Institutes. 4.0 Peta Flops HPC facility at IITM, Pune and 2.8 Peta Flops facility at NCMRWF, Noida. Pratyush is fourth fastest supercomputer in the world dedicated for weather and climate research.

Note PF is a measure of a computer's processing speed.

Applications of Computer

Some of the areas where computers are being used are as follows

1. **Banking** Computers are used in bank for electronic money transfer, making deposits, voucher, bank sheet, etc.
2. **Education** Computer is a very effective tool which can be used for teaching and learning, result processing, student data processing, notes preparation, etc.
3. **Entertainment** Different types of entertainment fields such as multimedia, film making with animation, graphics, audio and visual design are done with the help of computer.
4. **Offices** Computers are used for preparing reports, storing/deleting reports, updating reports, etc. in office.
5. **Advertisement** Computers are used in the different fields of advertisement such as business advertisement, film advertisement, education advertisement, etc.
6. **Business** Computers are used in business for accounting, keeping all records up-to date, etc.

Artificial Intelligence (AI) is an area of computer science that emphasises the creation of intelligent machines that work and react like humans. Some of the activities computers with AI are designed for include : speech recognition, learning, planning, problem solving, etc.

Robotics is the branch of engineering and science that deals with the design, construction, operation and use of robots as well as computer systems for their control, sensory feedback and information processing.

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QUESTION BANK

1. The word computer has been derived from which of the following language?
(1) Greek (2) English
(3) Hindi (4) Latin

2. Input, output and processing devices grouped together represent a(n)
(1) mobile device
(2) information processing cycle
(3) circuit board
(4) computer system

3. Which of the following is the correct order of the four major functions of a computer?
(1) Process, Output, Input, Storage
(2) Input, Output, Process, Storage
(3) Process, Storage, Input, Output
(4) Input, Process, Output, Storage

4. Collecting the data and converting it into information is called
(1) processing (2) compiling
(3) importing (4) exporting
(5) None of these

5. Computer cannot perform
(1) input (2) output
(3) thinking (4) processing

6. A computer cannot perform which of the following functions? **[IBPS Clerk 2015]**
(1) Addition (2) Subtraction
(3) Bake a cake (4) Division
(5) None of these

7. Part number, description and number of parts ordered are examples of **[IBPS Clerk 2013]**
(1) control (2) output
(3) processing (4) feedback
(5) input

8. Benefits of computers are
(1) very fast and can store huge amount of data
(2) provide accurate output either input is correct or not
(3) think about the processing
(4) All of the above

9. A collection of unprocessed items is **[SBI PO 2015]**
(1) information (2) data
(3) memory (4) reports
(5) None of these

10. Which among the following cycle consists of an input, processing, output and storage as its constituents? **[IBPS Clerk Mains 2017]**
(1) Processing (2) Output
(3) Input (4) Storage
(5) Data

11. ..... is data that has been organised and presented in a meaningful fashion. **[IBPS Clerk Mains 2017]**
(1) A process (2) Software
(3) Storage (4) Information
(5) Data

12. Data or information used to run the computer is called **[IBPS Clerk 2013]**
(1) hardware (2) CPU
(3) peripheral (4) software
(5) None of these

13. The steps and tasks needed to process data, such as responses to questions or clicking an icon, are called **[IBPS Clerk Mains 2017]**
(1) instructions
(2) the operating system
(3) application software
(4) the system unit
(5) the hardware unit

14. The earliest calculating device is
(1) calculator
(2) abacus
(3) difference engine
(4) analytical engine
(5) None of the above

15. Abacus can perform
(1) addition (2) subtraction
(3) multiplication (4) Both '1' and '2'

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16. The Napier's technology used for calculation called
(1) Naptologia (2) Vibologia
(3) Semiconductor (4) Rabdologia

17. Pascaline is also known by
(1) abacus (2) adding machine
(3) division machine (4) difference machine

18. Punched cards were first introduced by
(1) Powers (2) Pascal
(3) Jacquard (4) Herman Hollerith
(5) None of these

19. Which of the following is known as father of computer?
(1) Dennis Ritchie (2) Napier
(3) Charles Babbage (4) Alan Turing

20. Analytical Engine developed by
(1) Blaise Pascal (2) Charles Babbage
(3) Dennis Ritchie (4) Alan Turing

21. The Analytical Engine developed during first generation of computers used ..... as a memory unit. **[RBI Grade B 2012]**
(1) RAM (2) floppies
(3) cards (4) counter wheels
(5) None of these

22. Tabulating machine was the first electromechanical machine developed by
(1) Herman Hollerith (2) Howard Aiken
(3) Blaise Pascal (4) John Napier

23. Who designed the first electronic computer-ENIAC?
(1) Von Neumann
(2) Joseph M Jacquard
(3) Presper Eckert and John W Mauchly
(4) All of the above

24. The first computer which provides storage is **[SSC CPO 2012]**
(1) EDSAC (2) EDVAC
(3) MARK-I (4) ACE

25. Name the first general purpose electronic computer. **[IBPS PO 2012]**
(1) ADVAC (2) ADSAC
(3) UNIVAC (4) EDVAC
(5) None of these

26. Computer size was very large in
(1) first generation (2) second generation
(3) third generation (4) fourth generation

27. First generation computers were based on
(1) transistors (2) conductors
(3) ICs (4) vacuum tubes

28. Computer built before the first generation computer was
(1) mechanical (2) electromechanical
(3) electrical (4) electronics

29. First generation computers used ..... languages. **[SBI Clerk 2012]**
(1) machine (2) assembly
(3) Both '1' and '2' (4) high level
(e) None of these

30. Speed of first generation computer was in **[IBPS Clerk 2012]**
(1) nano seconds (2) milli seconds
(3) nano-milli seconds (4) micro seconds
(5) None of these

31. The period of the second generation computers was
(1) 1946-1958 (2) 1940-1960
(3) 1956-63 (4) 1957-1964

32. Time sharing became possible in ..... generation of computers. **[SBI PO 2011]**
(1) first (2) second (3) third (4) fourth
(5) None of these

33. Integrated Chips or IC's were started to be use from which generation of computers? **[IBPS PO 2016]**
(1) 1st Generation (2) 2nd Generation
(3) 3rd Generation (4) 4th Generation
(5) 5th Generation

34. Chip is a common nickname for a(n) **[IBPS Clerk 2014, 15]**
(1) transistor (2) resistor
(3) integrated circuit (4) semiconductor
(5) None of these

35. The third generation computers were made with **[SBI PO 2014]**
(1) bio chips (2) transistors
(3) integrated circuits (4) vacuum tubes
(5) discrete components

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36. Integrated Circuit (IC) or chips used in computers are made with **[IBPS Clerk 2014]**
(1) copper (2) aluminium
(3) gold (4) silicon
(5) silver

37. A complete electronic circuit with transistors and other electronic components on a small silicon chip is called a(n) **[RBI Grade B 2012]**
(1) workstation (2) CPU
(3) magnetic disc (4) integrated circuit
(5) complex circuit

38. PCs are considered fourth-generation and contain **[SBI PO 2014]**
(1) information
(2) data
(3) vacuum tubes
(4) microprocessors
(5) transistors

39. Artificial Intelligence is an example of
(1) first generation computer
(2) second generation computer
(3) third generation computer
(4) fourth generation computer
(5) fifth generation computer

40. First computer of India is
(1) PARAM (2) Siddhartha
(3) IBM-370 (4) CRAY-1

41. Computer's basic architecture was developed by
(1) John Von Neumann
(2) Charles Babbage
(3) Blaise Pascal
(4) Jordan Murn

42. Who developed integrated chip?
(1) Robert Nayak (2) C Babbage
(3) JS Kilby (4) CV Raman

43. In latest generation computers, the instructions are executed
(1) only parallel
(2) only sequentially
(3) Both '1' and '2'
(4) Either '1' or '2'

44. Microcomputer hardware consists of three basic categories of physical equipment
(1) keyboard, monitor, hard drive
(2) system unit, input/output, memory
(3) system unit, input/output, secondary storage
(4) system unit, primary storage, secondary storage

45. Which of the following options correctly expresses the meaning of the term 'PCs'? **[IBPS PO 2012]**
(1) Independent computers for all working staff
(2) Personal computers widely available to individual workers with which they can access information from layer systems and increase their personal productivity
(3) Packed computers system formed by joining together of various computer terminals
(4) Computer manufactured by the Pentium Company
(5) None of the above

46. Which of the following is a small microprocessor based computer designed to be used by one person at a time? **[SBI Clerk 2014]**
(1) Netbook (2) Supercomputer
(3) All-in-one (4) Notebook
(5) Personal computer

47. Tablet PC is a type of
(1) microcomputer (2) supercomputer
(3) minicomputer (4) mainframe computer

48. Computers that are portable and convenient to use for users who travel, are known as
(1) supercomputers (2) minicomputers
(3) mainframe computers
(4) laptops

49. Desktop and personal computers are also known as **[SBI Clerk 2012]**
(1) supercomputers (2) servers
(3) mainframes (4) peripheral equipment
(5) microcomputers

50. Which of the following uses a handheld operating system? **[SBI PO 2013]**
(1) A supercomputer (2) A personal computer
(3) A laptop (4) A mainframe
(5) A PDA

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51. Palmtop computer is also known as
(1) personal computer
(2) notebook computer
(3) tablet PC
(4) handheld computer

52. A central computer that holds collections of data and programs for many PCs, workstations and other computers is a
(1) supercomputer (2) minicomputer
(3) laptop (4) server

53. Which computer is used for Computer Aided Design (CAD) calculations?
(1) Minicomputer (2) Mainframe computer
(3) Supercomputer (4) Microcomputer

54. Which of the following is generally costlier? **[SBI Clerk 2012, IBPS Clerk 2015]**
(1) Server (2) Notebook computer
(3) Personal computer (4) Laptop computer
(5) Mainframe

55. The user generally applies ..... to access mainframe or supercomputer.
(1) terminal (2) node
(3) desktop (4) handheld

56. These are specially designed computers that perform complex calculations extremely rapidly.
(1) Servers (2) Supercomputers
(3) Laptops (4) Mainframes

57. A ..... is a large and expensive computer capable of performing scientific and business applications.
(1) supercomputer (2) mainframe computer
(3) minicomputer (4) handheld computer

58. First supercomputer developed in India is
(1) PARAM (2) CRAY-1
(3) PARAM ISHAN (4) EPRAM

59. Pratyush is ..... fastest supercomputer in the world.
(1) first (2) second
(3) third (4) fourth

60. Pratyush supercomputer is dedicated for
(1) multimedia (2) weather forecasting
(3) recreation (4) military personnel

61. Which of the following is the India's first multi-petaflops (PF) supercomputer?
(1) PARAM (2) Pratyush
(3) PARAM Ishan (4) Tianhe-2

62. Analog computer works on the supply of
(1) continuous electrical pulses
(2) electrical pulses but not continuous
(3) magnetic strength
(4) physical strength

63. Seismograph is an example of
(1) Analog computer (2) Digital computer
(3) Hybrid computer (4) All of thes

64. These computers work by calculating the binary digits.
(1) Hybrid (2) Digital
(3) Analog (4) General purpose

65. Choose the odd one out. **[IBPS Clerk 2011]**
(1) Microcomputer
(2) Minicomputer
(3) Supercomputer
(4) Digital computer
(5) Notebook computer

66. A hybrid computer is the one having the combined properties of **[SBI Clerk 2013]**
(1) super and microcomputers
(2) mini and microcomputers
(3) analog and digital computers
(4) super and mini computers
(5) None of the above

67. Which types of computer are used in hospitals like ECG and DIALYSIS?
(1) Digital (2) Hybrid
(3) Analog (4) Microcomputer

68. General purpose computers are used for
(1) creating a small database
(2) performs calculation
(3) accounting
(4) All of the above

69. Which is not the example of special purpose computer?
(1) Automatic aircraft landing
(2) Word processor
(3) Multimedia computer
(4) All of the above

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70. Which type of computer is used in automatic aircraft landing?
(1) General computer
(2) Supercomputer
(3) Special purpose computer
(4) Microcomputer

71. Which of the following is the smallest and fastest computer imitating brain working? **[IBPS PO 2012]**
(1) Supercomputer
(2) Quantum computer
(3) Param-10000
(4) IBM chips
(5) None of these

72. In which of the following computers are used?
(1) Banking (2) Education
(3) Offices (4) All of these

73. It is the science that attempts to produce machines that display the same type of intelligence that humans do
(1) Nano science
(2) Nano technology
(3) Simulation
(4) Artificial Intelligence (AI)

74. Which of the following deals with the design, construction, operation and use of robots?
(1) Robotics (2) Artificial Intelligence
(3) Nano computer (4) Quantum computer

ANSWERS

1. *(4)*	2. *(4)*	3. *(4)*	4. *(1)*	5. *(3)*	6. *(3)*	7. *(3)*	8. *(1)*	9. *(2)*	10. *(5)*
11. *(4)*	12. *(5)*	13. *(1)*	14. *(2)*	15. *(4)*	16. *(4)*	17. *(2)*	18. *(3)*	19. *(3)*	20. *(2)*
21. *(4)*	22. *(1)*	23. *(3)*	24. *(1)*	25. *(3)*	26. *(1)*	27. *(4)*	28. *(2)*	29. *(1)*	30. *(4)*
31. *(3)*	32. *(2)*	33. *(3)*	34. *(3)*	35. *(3)*	36. *(4)*	37. *(4)*	38. *(4)*	39. *(5)*	40. *(2)*
41. *(1)*	42. *(3)*	43. *(3)*	44. *(2)*	45. *(2)*	46. *(5)*	47. *(1)*	48. *(4)*	49. *(5)*	50. *(5)*
51. *(4)*	52. *(4)*	53. *(1)*	54. *(5)*	55. *(2)*	56. *(2)*	57. *(1)*	58. *(1)*	59. *(4)*	60. *(2)*
61. *(2)*	62. *(1)*	63. *(1)*	64. *(2)*	65. *(4)*	66. *(3)*	67. *(2)*	68. *(4)*	69. *(2)*	70. *(3)*
71. *(2)*	72. *(4)*	73. *(4)*	74. *(1)*						

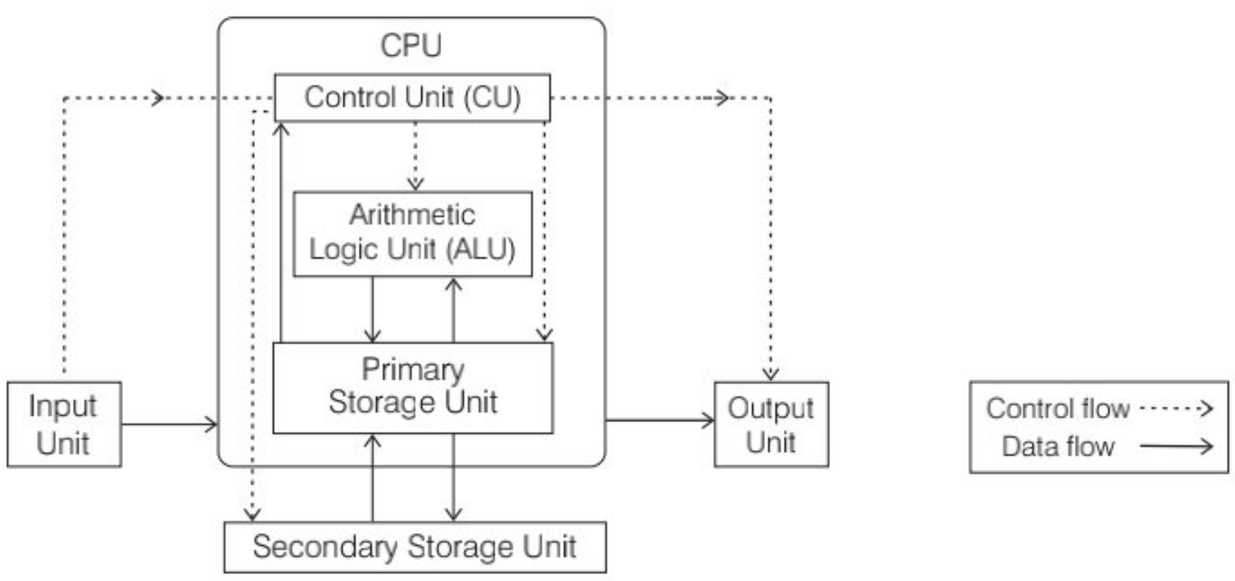
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CHAPTER

02

COMPUTER ARCHITECTURE

Computer architecture deals with the functional behaviour of a computer system as viewed by a programmer. It can also be described as the logical structure of the system unit that housed electronic components. The computer architecture forms the backbone for building successful computer systems. The first computer architecture was introduced in 1970.



Computer Architecture

Components of Computer

A computer consists of following three main components

1. Input/Output (I/O) Unit
2. Central Processing Unit
3. Memory Unit

Note System unit is a metal or plastic case that holds all the physical parts of the computer. The components that process data are located in it.

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Input Unit

The computer accepts coded information through input unit by the user. It is a device that is used to give required information to the computer. e.g. Keyboard, mouse, etc.

An input unit performs the following functions

(i) It accepts the instructions and data from the user.
(ii) It converts these instructions and data in computer in acceptable format.
(iii) It supplies the converted instructions and data to the computer system for further processing.

Output Unit

This unit sends the processed results to the user. It is mainly used to display the desired result to the user as per input instruction. e.g. Monitor, printer, plotter, etc.

The following functions are performed by an output unit

(i) It accepts the results produced by the computer which are in coded form and hence cannot be easily understood by user.
(ii) It converts these coded results to human acceptable form.
(iii) It supplies the converted results to the user.

Central Processing Unit (CPU)

It consists a set of registers, arithmetic logic unit and control unit, which together interpret and execute instructions in assembly language.

The primary functions of the CPU are as follows

(i) The CPU transfers instructions and input data from main memory to registers, i.e. internal memory.
(ii) The CPU executes the instructions in the stored sequence.
(iii) When necessary, CPU transfers output data from registers to main memory.

Central Processing Unit is often called the **brain of computer**. The CPU is fabricated as a single Integrated Circuit (IC) and is also known as **microprocessor**.

A CPU controls all the internal and external devices and performs arithmetic and logic operations.

The CPU consists of following main sub-systems

Arithmetic Logic Unit (ALU)

ALU contains the electronic circuitry that executes all arithmetic and logical operations on the available data. ALU uses **registers** to hold the data that is being processed.

Most ALUs can perform the following operations

(i) Logical operations (AND, NOT, OR, XOR).
(ii) Arithmetic operations (addition, subtraction, multiplication and division).
(iii) Bit-shifting operations (shifting or rotating a word by a specified number of bit to the left or right with or without sign extension).
(iv) Comparison operations (=, <, <=, >, >=)

Registers

These are used to quickly accept, store and transfer data and instructions that are being used immediately by the CPU. These registers are the top of the memory hierarchy and are the fastest way for the system to manipulate data. The number and size of registers vary from processor to processor.

Control Unit (CU)

CU coordinates with the input and output devices of a computer. It directs the computer to carry out stored program instructions by communicating with the ALU and the registers. It organises the processing of data and instructions.

The basic function of control unit is to fetch the instruction stored in the main memory, identify the operations and the devices involved in it and accordingly generate control signals.

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Microprocessor

It is the controlling element in a computer system and is sometimes referred to as the chip. Microprocessor is the main hardware that drives the computer. It is a large **Printed Circuit Board** (PCB), which is used in all electronic systems such as computer, calculator, digital system, etc. The speed of CPU depends upon the type of microprocessor used.

- *Intel 4004 was the first microprocessor made by Intel in 1971 by scientist Ted Hoff and engineer Frederico Faggin.*
- *Some of the popular microprocessors are Intel, Intel core i7, Dual core, Pentium IV, etc.*

Memory Unit

This unit is responsible to store programs or data on a temporary or permanent basis. It has primary memory (main memory) and secondary memory (auxiliary memory).

The input data which is to be processed is brought into main memory before processing.

Another kind of memory is referred to as secondary memory of a computer system. This unit is used to permanently store data, programs and output. This unit does not deal directly with CPU.

Motherboard

The main circuit board contained in any computer is called a motherboard. It is also known as the main board or logic board or system board or planar board. All the other electronic devices and circuits of computer system are attached to this board like, CPU, ROM , RAM, expansion slots, PCI slots and USB ports. It also includes controllers for devices like the hard drive, DVD drive, keyboard and mouse. In other words, motherboard makes everything in a computer work together.

Components on Motherboard

Various components on motherboard are as follows

(i) CMOS Battery
(ii) BIOS Chip
(iii) Fan
(iv) Expansion Slot
(v) SMPS
(vi) PCI Slot
(vii) Processor Chip
(viii) Buses

Interconnection of Units

CPU sends data, instructions and information to the components inside the computer as well as to the peripheral devices attached to it.

A bus is a set of wires used for interconnection, where each wire can carry one bit of data.

In other words, bus is a set of electronic signal pathways that allows information and signals to travel between components inside or outside of a computer.

A computer bus can be divided into two types

1. **Internal Bus** The **internal bus** connects components inside the motherboard like CPU and system memory. It is also called the **system bus**.
   Internal bus includes following buses
   (i) The command to access the memory or the I/O devices is carried by the **control bus**.
   (ii) The address of I/O devices or memory is carried by the **address bus**. The data to be transferred is carried by the **data bus**.
2. **External Bus** It connects the different external devices; peripherals, expansion slots, I/O ports and drive connections to the rest of computer. It is also referred to as the **expansion bus**.

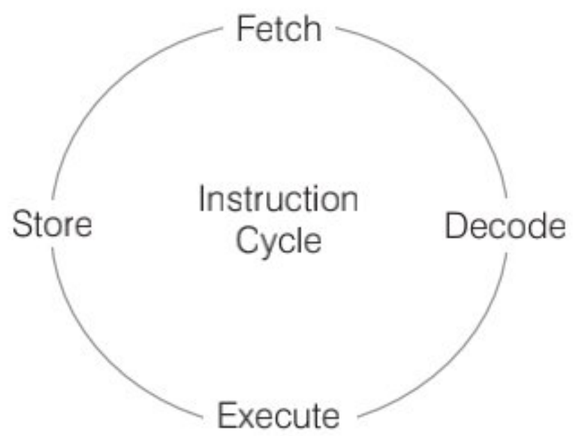
Tit-Bits

- **UPS** (Uninterruptible Power Supply), is an electrical apparatus that provides emergency power to a load when the input power source or mains power fails.
- **Buffer** is a temporary storage where register holds the data for further execution.
- **Accumulator** is a register in a CPU in which intermediate arithmetic and logic results are stored.
- An uniform interval of CPU time allocated for use in performing a task is known as time slice.
- The **speed of processor** is measured in millions of cycles per second or megahertz (MHz) by clock speed.
- **DMA** (Direct Memory Access) is a method that allows an input/output device to send or receive data directly to or from the main memory, by passing the CPU to speed up memory operations.

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Instruction Cycle

It represents the sequence of events that takes place as an instruction is read from memory and executed.



A simple instruction cycle consists of the following steps

1. **Fetching** the instruction from the memory.
2. **Decoding** the instruction for operation.
3. **Executing** the instruction.
4. **Storing** in memory.

In above steps, step 1 and 2 instructions are same and known as fetch cycle and step 3 and 4 instructions are different and known as execute cycle.

Instructions Format

Computer understands instructions only in terms of 0's and 1's, which is called the **machine language**. A computer program is a set of instructions that describes the steps to be performed for carrying out a computational task. The processor must have two inputs; *instructions* and *data*. The instructions tell the processor what actions are needed to be performed on the data. An instruction is further divided into two parts; operation (op-code) and operand.

The op-code represents action that the processor must execute and operand defines the parameters of the action and depends on the operation.

Tit-Bits

- **Machine cycle** is defined by the time, that takes to fetch two operands from registers and performs ALU operation and stores the result in a register.
- **Pipelining** improves execution speed by putting the execution steps of several instructions into parallel. It is called implement instruction prefetch.
- **Sockets** are the connecting points of chip on the motherboard.

QUESTION BANK

1. The basic function (s) performed by computer is/are
(1) data processing (2) data storage
(3) data movement (4) data control
(5) All of these

2. ..... forms the backbone for building successful computer system.
(1) Computer architecture
(2) Computer model
(3) Computer instructions
(4) None of the above

3. The first computer architecture was introduced in
(1) 1970 (2) 1968
(3) 1971 (4) 1973

4. Which circuit board is used in all electronic systems such as computer, calculators, digital system?
(1) Architecture (2) Printer
(3) Value (4) Register

5. The system unit
(1) coordinates input and output devices
(2) is the container that houses electronic components
(3) is a combination of hardware and software
(4) controls and manipulates data

6. Which of the following is metal or plastic case that holds all the physical parts of the computer? **[IBPS Clerk Mains 2017]**
(1) System unit (2) CPU
(3) Mainframe (4) Platform
(5) Microprocessor

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7. The components that process data are located in which of the following?
[IBPS Clerk Mains 2017]
(1) Input devices (2) Output devices
(3) System unit (4) Storage component
(5) Expansion board

8. Which of the following is not responsible for the performance of the computer?
[IBPS Clerk Mains 2017]
(1) number of keys in the keyboard
(2) format of the video/graphics word
(3) memory in the video/graphics word
(4) the clock speed of the processor
(5) number of cores available in the processor

9. A(n) ..... device is any device that provides information, which is sent to the CPU.
(1) input (2) output
(3) CPU (4) memory

10. Which of the following includes as a type of input?
(1) data (2) programs
(3) commands (4) user response
(5) All of these

11. Information that comes from external source and fed into computer software is called. **[IBPS RRB PO Mains 2017]**
(1) Output (2) Input
(3) Throughout (4) Reports
(5) Process

12. Input unit converts data in computer in .....
(1) suitable (2) acceptable
(3) understandable (4) rejectable

13. This unit sends the processed results to the user.
(1) Input (2) Output
(3) Memory (4) CPU

14. Output unit includes
(1) plotter (2) printer
(3) monitor (4) All of these

15. This component is required to process data into information and consists of integrated circuits. **[SBI Clerk 2011]**
(1) Hard disk (2) RAM
(3) CPU (4) ROM
(5) None of these

16. The Central Processing Unit (CPU) in a computer consists of
(1) input, output and processing
(2) control unit, primary storage and secondary storage
(3) control unit, arithmetic logic unit, memory unit
(4) All of the above

17. Which instruction is used for loading data into CPU accumulator register from memory?
(1) Load (2) Storage
(3) Machine (4) Access

18. Where does computer add and compare data?
(1) Hard disc (2) Floppy disc
(3) CPU chip (4) Memory chip

19. What is the brain of the computer?
[SSC CGL 2016]
(1) Keyboard (2) Mouse
(3) CPU (4) Printer

20. CPU is fabricated as a single integrated circuit which is known as
(1) Motherboard (2) Microprocessor
(3) ALU (4) CU

21. The CPU chip used in a computer is partially made of
(1) copper (2) iron (3) gold (4) silica

22. The main job of a CPU is to
(1) carry out program instructions
(2) store data/information for further use
(3) process data and information
(4) Both 1 and 3

23. The main purpose of time-sharing techniques used in computers is to make the best use of the
(1) CPU (2) peripherals
(3) secondary storage (4) floppy discs

24. The CPU is made up of two smaller components
(1) ALU and CU (2) ALU and RAM
(3) RAM and ROM (4) RAM and CUz

25. The CPU comprises of control, memory and ..... units. **[SBI PO 2013]**
(1) microprocessor (2) arithmetic/logic
(3) output (4) ROM
(5) input

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26. What is the responsibility of the logical unit in the CPU of a computer? **[IBPS Clerk 2015]**
(1) To produce result
(2) To compare numbers
(3) To control flow of information
(4) To do Maths work
(5) None of the above

27. Which unit of computer helps in communication between the memory and the arithmetic logical unit? **[IBPS RRB PO Mains 2017]**
(1) CMU (2) CCU
(3) UPS (4) CPU
(5) ALU

28. Which part of the computer is used for calculating and comparing? **[IBPS Clerk 2013]**
(1) ALU (2) Control unit
(3) Disc unit (4) Modem
(5) None of these

29. Pick the one that is used for logical operations or comparisons such as less than, equal to or greater than etc.
(1) ALU (2) CU
(3) Input unit (4) MU

30. What does ALU in computing denote? **[IBPS Clerk 2014]**
(1) Application and Logic Unit
(2) Algorithm Logic Unit
(3) Arithmetic Layered Unit
(4) Arithmetic Legal Unit
(5) Arithmetic Logic Unit

31. How many types of arithmetic operations does the ALU of computer perform?
(1) 4 (2) 2
(3) 5 (4) 8

32. Processors contain a control unit and a/an : **[SSC CGL 2016]**
(1) Control unit
(2) Primary storage unit
(3) Input unit
(4) Arithmetic logic unit

33. Which of the following executes the computer commands?
(1) Arithmetic unit (2) Logic unit
(3) Both '1' and '2' (4) Control unit

34. Which unit is a combinational digital electronic circuit that performs arithmetic and bitwise operations on integer binary numbers? **[IBPS RRB PO Mains 2017]**
(1) BOU (2) AEU (3) CPU (4) ALU
(5) UPS

35. Internal memory in a CPU is nothing but
(1) a set of registers (2) a set of ALU
(3) microprocessor (4) bus

36. Which among the following is a small set of data holding place that is a part of the computer processor and may hold an instruction, a storage address, or any kind of data? **[IBPS RRB PO Mains 2017]**
(1) Register (2) WAN
(3) Bus (4) Address
(5) Processor

37. The portion of the CPU that coordinates the activities of all the other computer components is the **[SBI PO 2015]**
(1) motherboard (2) coordination board
(3) control unit (4) arithmetic logic unit
(5) None of these

38. Which among the following is an important circuitry in a computer system that directs the operation of the processor? **[IBPS PO 2016]**
(1) Memory (2) Address Bus
(3) Accumulator (4) ALU
(5) Control unit

39. The part of a computer that coordinates all its functions, is called its **[IBPS Clerk Mains 2017]**
(1) ROM program (2) System board
(3) Arithmetic logic unit (4) Control unit
(5) None of these

40. The control unit controls other units by generating **[IBPS Clerk 2011]**
(1) control signal (2) timing signal
(3) transfer signal (4) command signal

41. Control unit of a digital computer is often called the
(1) clock (2) nerve centre
(3) Both '1' and '2' (4) IC

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42. Who invent the first microprocessor?
(1) Vint Cerf (2) Terence Percival
(3) John Mauchly (4) Ted Hoff

43. A microprocessor is the brain of the computer and is also called a
[RBI Grade B 2014]
(1) microchip (2) macrochip
(3) macroprocessor (4) calculator
(5) software

44. Microprocessors can be used to make
[SBI Clerk 2010]
(1) computer (2) digital system
(3) calculators (4) All of these
(5) None of these

45. The microprocessor is made up of millions of
(1) registers (2) transistors
(3) microchips (4) program counter

46. The microprocessor of a computer
(1) does not understand machine language
(2) understands machine language and high level language
(3) understands only machine language
(4) understands only high level languages

47. Memory unit that communicates directly with the CPU is called the
(1) main memory (2) secondary memory
(3) auxiliary memory (4) register

48. CPU retrieves its data and instructions from
(1) secondary memory (2) auxiliary memory
(3) main memory (4) All of these

49. Which computer memory is used for storing programs and data currently being processed by the CPU?
(1) Mass memory (2) Internal memory
(3) Non-volatile memory (4) PROM

50. The I/O processor has a direct access to ..... and contains a number of independent data channels.
(1) main memory (2) secondary memory
(3) cache (4) flash memory

51. The word 'computer' usually refers to the central processing unit plus
(1) external memory (2) internal memory
(3) input devices (4) output devices

52. The CPU and memory are located in which of the following devices?
[IBPS Clerk Mains 2017]
(1) Motherboard (2) Expansion board
(3) Storage device (4) Output device
(5) System unit

53. The main circuit board in the computer that connects the parts of the computer is the
[SBI Clerk 2015]
(1) motherboard (2) father board
(3) match board (4) hard drive
(5) special board

54. Personal computers use a number of chips mounted on a main circuit board. What is the common name for such boards?
(1) Daughterboard (2) Motherboard
(3) Broadboard (4) None of these

55. Which of the following are the components that reside on motherboard?
(1) CMOS battery (2) Fan
(3) PCI slot (4) All of these

56. The communication line between CPU, memory and peripherals is called a
[Union Bank of India Clerk 2011]
(1) bus (2) line
(3) media (4) All of these
(5) None of these

57. ..... connects components inside the motherboard like CPU and system memory.
(1) Data bus (2) Address bus
(3) Internal bus (4) External bus

58. The address of I/O device or memory is carried by the
(1) data bus (2) expansion bus
(3) address bus (4) system bus

59. A physical connection between the microprocessor memory and other parts of the micro computer is known as
(1) path (2) address bus
(3) route (4) All of these

60. The read/write line belongs to
(1) the data bus (2) the control bus
(3) the address bus (4) CPU bus

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61. The name of the location of a particular piece of data is its
(1) address
(2) memory name
(3) storage
(4) data location

62. Which of the following is used to connect the different external devices?
(1) Address bus (2) Data bus
(3) Control bus (4) External bus

63. Which is not an integral part of computer? **[SBI Clerk 2012]**
(1) CPU (2) Mouse
(3) Monitor (4) UPS
(5) None of these

64. A device that not only provides surge protection, but also furnishes the computer with battery backup power during a power outage is **[IBPS RRB PO Mains 2017]**
(1) Battery strip (2) UPS
(3) Surge strip (4) USB
(5) Memory

65. A temporary storage area, attached to the CPU, for I/O operations is a
(1) chip (2) buffer
(3) register (4) core

66. To measure the speed of the processor, ... is used.
(1) processing speed (2) clock speed
(3) memory (4) unit

67. A uniform interval of CPU time allocated for use in performing a task is known as
(1) real time (2) seek time
(3) down time (4) time slice

68. What is the full form of DMA?
(1) Direct Memory Access
(2) Dynamic Memory Access
(3) Direct Metho Access
(4) Double Memory Access

69. The machine cycle includes
(1) fetch (2) decode (3) execute (4) store
(e) None of these

70. When machine instructions are being executed by a computer, the instruction phase followed by the execution phase is referred to as
(1) program cycle (2) machine instruction
(3) instruction cycle (4) task cycle

71. ..... is the process of carrying out commands.
(1) Fetching (2) Storing
(3) Decoding (4) Executing

72. The processor must have two inputs
(1) instructions and data
(2) information and data
(3) input and output
(4) CPU and instructions

73. ..... defines the parameters of the action and depends on the operation.
(1) Op-code (2) Operand
(3) instructions (4) Data

74. Pipeline strategy is called implement
(1) instruction execution
(2) instruction prefetch
(3) instruction decoding
(4) instruction manipulation

75. On the motherboard, the connection points for chips are referred to as
(1) slots (2) sockets (3) ports (4) lines

ANSWERS

1. *(5)*	2. *(1)*	3. *(1)*	4. *(1)*	5. *(2)*	6. *(1)*	7. *(3)*	8. *(1)*	9. *(1)*	10. *(5)*
11. *(2)*	12. *(2)*	13. *(2)*	14. *(4)*	15. *(3)*	16. *(3)*	17. *(1)*	18. *(3)*	19. *(3)*	20. *(2)*
21. *(4)*	22. *(4)*	23. *(1)*	24. *(1)*	25. *(2)*	26. *(2)*	27. *(4)*	28. *(1)*	29. *(1)*	30. *(5)*
31. *(1)*	32. *(4)*	33. *(3)*	34. *(4)*	35. *(1)*	36. *(1)*	37. *(3)*	38. *(5)*	39. *(4)*	40. *(1)*
41. *(2)*	42. *(4)*	43. *(1)*	44. *(4)*	45. *(2)*	46. *(3)*	47. *(1)*	48. *(3)*	49. *(2)*	50. *(1)*
51. *(2)*	52. *(1)*	53. *(1)*	54. *(2)*	55. *(4)*	56. *(1)*	57. *(3)*	58. *(3)*	59. *(2)*	60. *(2)*
61. *(1)*	62. *(4)*	63. *(4)*	64. *(2)*	65. *(2)*	66. *(2)*	67. *(4)*	68. *(1)*	69. *(5)*	70. *(3)*
71. *(4)*	72. *(1)*	73. *(2)*	74. *(2)*	75. *(2)*					

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CHAPTER

03

COMPUTER HARDWARE

Computer hardware refers to the physical components of a computer that can be seen and touched by the user. By the use of these hardware devices, it made very easy for the computer for processing its data, store and retrieve. Hardware is one of the basic and necessary parts of a computer system.

Input Devices

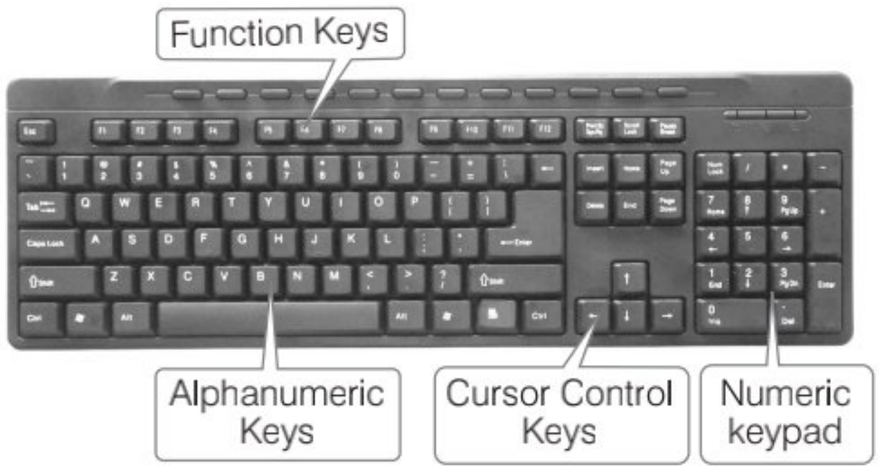
An input device can be defined as an electro mechanical device that allows the user to feed data into the computer for analysis and storage and to give commands to the computer. The data is entered into the main memory through the input devices. They accept instructions from the user and convert the accepted instructions into the machine language.

Some of the commonly used input devices are keyboard, mouse, trackball, joystick, light pen, touch screen, barcode reader, OMR, OCR, MICR, smart card reader, biometric sensor, scanner, Mic, web cam, PC card etc. which are described below.

Keyboard

It is one of the most common input devices. The user can type text and command using this device. The layout of the keyboard was borrowed from the regular typewriter with some additional keys. Keyboard is used to enter data or information in a computer system, which may be in numeric form or alphabetic form. When key is pressed, keyboard interacts with a keyboard controller and keyboard buffer.

Keyboard controller stores the code of pressed key in keyboard buffer. There are different types of keyboard such as *QWERTY*, *DVORAK* and *AZERTY*.



Keyboard

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Types of Keys on Keyboard

The keys are categorised under the following groups

1. **Alphanumeric Keys** include the alphabet keys (A, B, C, ..., Z) and number keys (0, 1, 2, 3, ..., 9).
2. **Numeric Keys** are located at the right hand side of the keyboard. They consist of digits and mathematical operators.
3. **Function Keys** are the programmable keys, i.e. the programs can assign some specific actions. They are numbered from F1 to F12.
4. **Cursor Control Keys** include four directional (left, right, up, down) arrow keys that are arranged in a inverted T formation between the alphanumeric and numeric keypad. Above the arrow keys there are four more keys to control the cursor. *These are as follows*
   (i) **Home** It is used to return the cursor to the beginning of the line or the beginning of a document.
   (ii) **End** It moves the cursor to the end of line.
   (iii) **Page Up** When it is pressed, the page view will be moved up one page and cursor goes to the back page.
   (iv) **Page Down** When it is pressed, the page view will be moved down one page and cursor goes to the next page.
5. **Other Keys** *A keyboard contains some other keys such as follows*
   (i) **Control Key** It performs a special operation with the combination of other keys.
   (ii) **Enter Key** It is used to finish an entry and begin the new entry in a document. Enter key is an alternative to press ok button.
   (ii) **Shift Key** Some keys on the keyboard like numeric keys have a symbol printed on their upper portion. Shift key is used to print these symbols. This key is also called combination key.
   (iii) **Escape Key** (Esc) It allows a user to cancel or abort operations, which are executing at present. It opens Start menu with the combination of Ctrl key.
   (iv) **Backspace Key** It is used to erase anything typed.
   (v) **Delete Key** It is used to erase information from the computer's memory and characters on the screen.
   (vi) **Caps Lock Key** It is used to type the alphabet in capital letters. It enables or disables all the letters from being typed in capital letters. When this key is enable, the alphabet would be in capital letters and when it is disabled, the alphabet would be in small letters.
   (vii) **Num Lock Key** It is used to enable and disable the numeric keypad.
   (viii) **Windows Key** It is used to open the Start menu.
   (ix) **Spacebar Key** It provides a space between two words. It is the longest key on the keyboard.
   (x) **Tab Key** It is used to move the cursor over to the right to a pre-set point. In Word document, tab is used to indent a paragraph.

Tit-Bits

- **QWERTY** keyboard contains total 104 keys.
- **Caps Lock** and **Num Lock** keys are called as 'toggle keys' because when pressed, they toggle or change their status from one state to another.
- Shift, Ctrl and Alt keys are also known as **modifier keys**.

Pointing Devices

A **pointing device** is used to communicate with the computer by pointing to the locations on the monitor. Movements of the pointing device are echoed on the screen by movements of the pointer. Some commonly used pointing devices are mouse, trackball, joystick, light pen, touch screen, etc. which are described below :

Mouse

It is a small handheld device having two buttons on its upper side and also has a small wheel between these buttons. It is a pointing device which provides a means to input data and commands in graphic form by selecting through moving an arrow called pointer on monitor.

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The mouse may be used to position the cursor on screen, move an object by dragging or select an object by clicking. Mouse was invented by Douglas Engelbart at Stanford Research Center in 1963.

There are three types of mouse as follows

(i) Wireless mouse
(ii) Mechanical mouse
(iii) Optical mouse

There are four actions of mouse as follows

1. **Click or Left Click** It selects an item on the screen.
2. **Double Click** It is used to open a document or program.
3. **Right Click** It displays a list of commands on the screen. Right clicking is used to access the properties of selected object.
4. **Drag and Drop** It is used to move an item on the screen.

Trackball

It is another pointing device which is an alternative to a mouse. Trackball is also used to control cursor movements and actions on a computer screen. It is generally built in laptop, since there is no space for the mouse to move on the laptop. Trackball is used on CAD/CAM workstations and sometimes seen on computerised special purpose workstations such as radar consoles in an air-traffic control room and sonar equipment on a ship or submarine.



Joystick

It is a device that moves in all directions and controls the movement of the cursor. Joysticks are used in flight simulators, CAD/CAM system, etc.


Joystick

A joystick is similar to a mouse except that the movement of cursor on screen stops working as soon as user stop moving the mouse. But with a joystick, the pointer continues moving in the previously pointing direction. Joystick allows movements in all directions (360°).

Light Pen

It is a handheld electro-optical pointing device, which is used for making drawings, graphics and for menu selection. The pen contains a photocell in a small tube. It senses the light from the screen when it becomes closer and generates a pulse. It is used to especially in Personal Digital Assistants (PDA). It is very useful in identifying a specific location on the screen. However, it does not provide any information when it held over a blank part of the screen.

Touch Screen

It is an input device that accepts input when the user places a fingertip on the computer screen. Touch screens have an infrared beam that criss-cross the surface of screen. The ability to interact directly with a display typically indicates the presence of a touch screen. Touch screen is generally used in applications like ATM, hospitals, airline reservation, supermarkets, etc.

Barcode Reader

It is an input device used for reading printed barcodes (Universal Product Code) available on product to be sold. A barcode reader emits a beam of light which reflects off the barcode image. A light sensitive detector in the barcode reader identifies the barcode image by recognising special bars at both the ends of the image.


Barcode Reader

A perfect example of a barcode reader, use in a super market where barcode scanner reads the price of a product. A barcode is a machine readable representation of information in the form of stripes of dark and light ink.


5050574807678
Barcode

Optical Mark Reader (OMR)

OMR is also known as Optical Mark Recognition. It is the process of detecting the presence of intended marked responses. OMR is mainly used

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to detect marks on a paper. It uses a beam of light that is reflected on the paper with marks, to capture presence and absence of data (marks).



Optical Mark Reader

The OMR interprets the pattern of marks into a data record and sends this to the computer for storage, analysis and reporting. OMR is widely used to read the answer of objective type tests, voting applications and other evaluation studies.

Optical Character Recognition (OCR)

OCR is a technique for the scanning of a printed page, translating it and then using the OCR software to recognise the image as **ASCII** text that is editable. It translates the array of dots into text that the computer can interpret as words and letters. OCR is widely used technique for acquiring the textual data from image. It is used in many applications such as telephone bills, electricity bills, insurance premium, etc. OCR technology is being developed for greater accurate recognition and is also known as Intelligent Character Recognition (ICR).

Magnetic Ink Character Recognition (MICR)

MICR reads the characters by examining their shapes in a matrix form and the information is then passed on to the computer. The characters are printed using a special ink, which contains iron particles that can be magnetised.



Format of a Cheque

It is generally used in banks to process the cheques for recognising the magnetic encoding numbers printed at the bottom of a cheque.

Smart Card Reader

It is a device which is used to access the microprocessor of a **smart card**. There are two kinds of smart cards; Memory cards and Microprocessor cards. Memory cards are the cards which contain only non-volatile memory storage components and some specific security logic. Microprocessor cards contain volatile memory and microprocessor components.

The card is made-up of plastic generally PVC. Smart cards are used in large companies and organisations for stronger security authentication.

Biometric Sensor

It is a device which recognises physical or behavioural traits of the individual. Biometric sensors are used for marking attendance of employees/students in organisations/institutions. As biometric sensors are working with accuracy so these are widely used in security purpose also.



Biometric Sensor

Scanner

It is used to convert the data and image on paper into the digital form. Scanner is an optical input device and uses light as an input source to convert an image into an electronic form that can be stored on the computer. Scanners can be used for storing the documents in their original form that can be modified and manipulated later on. Scanner stores images in both gray scale and color mode. *The most common types of scanners are as follows*

(i) **Handheld Scanners** They are very small in size which can be held in a hand. These are **less expensive** and **less wide**. Hence, in order to scan a single page image, multiple passes are required. But their handiness is a major advantage of handheld scanner.

(ii) **Flatbed Scanners** They are large and more expensive scanners that create high quality images. Flatbed scanners have a flat surface on which the printed image to be scanned, is placed. These scanners can scan a page in a single pass.

CamScanner

(iii) **Drum Scanners** They are medium size scanners with a rolling drum. The sheet is fed through the scanners so that the drum rolls over the entire sheet to be scanned (just as the sheets are fed in a fax machine).

Microphone (Mic)

We can send input to the computer through a special manual input device called **microphone** or **mic**. A mic converts the received sound into computer's format, which is called **Digitised Sound** or **Digital Audio**.

To convert a voice into digital form, you need an additional hardware known as **Sound Card**. Sound is used most often in multimedia, where we can make our presentations more attractive using recorded narration, music or sound effects.

A microphone can be attached to a computer to record sound. Now-a-days, microphones are also being used with speech recognition software. This means that we do not have to type, rather just have to speak and the spoken words appear in our document.

Webcam (Web Camera)

It is a video capturing device. Webcam is a digital camera attached to computers and can be used for video conferencing, online chatting, etc. A camera connected to a computer allows anyone, those are connected to the Internet, to view either a still picture or motion video of a user or other object.



Webcam with Computer



Webcam

Now-a-days, Webcams are either embedded into the display with laptop computers or connected *via* USB or firewire port or Wi-Fi to the computer.

PC Card

A PC card is a credit card size memory or I/O device that fits into a personal computer, usually a notebook or laptop computer. Probably the most common use of a PC card is the tele-communications modem for notebook computers.

Output Devices

An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing to the outside world. Some of the commonly used output devices are monitor, printers, plotter, speaker, headphones, projector etc. which are described below.

Monitor

It is also known as Visual Display Unit (VDU). The monitor is provided along with the computer to view the display result. A monitor is of two kinds; *monochrome display monitor* and *colour display monitor.* A monochrome display monitor uses only one colour to display text and colour display monitor can display 256 colours at a time. An image on the monitor is created by a configuration of dots, also known as **pixels.** The refresh rate of monitor is measured in Hertz (Hz).
The clarity of image depends on three factors which are as follows

1. **Resolution of Screen** Resolution refers to the number of pixels in horizontal and vertical directions. The resolution of monitor is higher when the pixels are closer together.
2. **Dot Pitch** It refers to the diagonal distance between two coloured pixels. The smaller the dot pitch, the better the resolution.
3. **Refresh Rate** It is the number by which per second. The higher the refresh rate, the more solid the image looks on the screen.

The popular types of monitor are as follows

1. **Cathode Ray Tube** (CRT) It is a typical rectangular shaped monitor that you see on a desktop computer. The CRT works in a same way as a television. CRT has a vacuum tube. CRT works by moving an electron beam back and forth across the back of the screen. A screen covered with a fine layer of phosphorescent elements, called *phosphores.*

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2. **Liquid Crystal Display** (LCD) These screens are used in laptops and notebook sized PCs. A special type of liquid is sandwiched between two plates. It is a thin, flat and light weight screen made up of any number of color or monochrome pixels arranged in front of a light source.
3. **Liquid/Light Emitted Diode** (LED) It is an electronic device that emits light when electrical current is passed through it. LEDs usually produce red light, but today's LEDs can produce RGB (Red, Green and Blue) light, and white light as well.
4. **3-D Monitor** It is a television that conveys depth perception to the viewer. 3-D describes an image that provides the perception of length. When 3-D images are made interactive then user feels involved with the scene and this experience is called **virtual reality**.
5. **Thin Film Transistor** (TFT) TFT and Active-Matrix LCD (AMLCD) is a Liquid Crystal Display (LCD). With active-matrix displays, each pixel is controlled by one to four transistors that can make the screen faster, brighter, more colorful than passive-matrix and capable of being viewed at different angles.

   Because of this improved technology, active-matrix screens are often more expensive.

Printers

A printer prints information and data from the computer onto a paper. It can print documents in color as well as in black and white. The quality of a printer is determined by the clarity of a print.

The speed of a printer is measured in Characters Per Second (CPS), Lines Per Minute (LPM) and Pages Per Minute (PPM). Printer resolution is a numerical measure of print quality that is measured in Dots Per Inch (DPI).

Printers are divided into two basic categories

Impact Printers

This type of printer strikes paper and ribbon together to form a character, like a typewriter. Impact printer can print a character or an entire line at a time. They use pins or hammers that pressed an inked ribbon against the paper. They are less expensive, fast and can make multiple copies with multipart paper.

There are four types of impact printer

1. **Dot Matrix Printer** It forms characters using rows of pins which impact the ribbon on top of the paper therefore also called pin printers. Dot matrix printers print one character at a time. It prints characters and images as a pattern of dots. Many dot matrix printers are bi-directional, that is they can print the characters from either direction, i.e. left or right.
2. **Daisy Wheel Printer** In daisy wheel printers, characters are fully formed on the petals, like typewriter keys. These printers produce high resolution output and are more reliable than dot matrix.
3. **Line Printer** It is a high-speed printer capable of printing an entire line of text at once instead of one or more characters at a time. These are impact shaped character printers which print one line at a time. Print quality of line printer is not high.
4. **Drum Printer** An old line printer technology that uses formed character images around a cylindrical drum as its printing mechanism. When the desired character for the selected position rotated around the hammer line, the hammer hit the paper from behind and pushed it into the ribbon and onto the character.

Non-Impact Printer

This type of printer uses electrostatic chemicals and inkjet technologies. They do not hit or impact a ribbon to print. It can produce high quality graphics and often a wide variety of fonts than impact printers. *There are following types of non-impact printer*

1. **Inkjet Printer** It is a printer that places extremely small droplets of ink onto paper to create an image. It sprays ink onto paper to form characters and prints high quality text and graphics.

CamScanner

2. **Thermal Printer** It uses heat on chemically treated paper to form characters. Fax machines that use rolls of paper are also of thermal printers type. It is relatively slow, expensive and requires special paper.
3. **Laser Printer** It provides the highest quality text and images for personal computer. They can print in different fonts that is, type styles and sizes. Laser printer uses laser beam onto photo sensitive surface for printing. It prints high quality graphics and more expensive than impact printers.
4. **Electromagnetic Printer** Electrographic or electro-photographic printers are very fast printers and they fall under the category of page printers. The electrographic technology have developed from the paper copier technology.
5. **Electrostatic Printer** These printers are generally used for large format printing. They are favoured by large printing shops because of their ability to print fast and making low cost.

Plotter

It is an output device that uses a pen, pencil, marker or other writing tools for making vector graphics. A plotter is a special kind of output channel like a printer, that produces images on paper. They are mainly used to produce large drawings or images such as construction plans, blueprints for mechanical objects, AUTOCAD, CAD/CAM, etc.

Plotters usually come in two designs as follows

1. **Flat Bed Plotter** These plotters are of small size to be kept on table with restriction of paper size.
2. **Drum Plotter** These plotters are of big size using rolls of paper of unlimited length.

Speaker

It is an output device that receives sound in the form of electric current. It needs a sound card connected to a CPU, that generates sound *via* a card.

These are used for listening music, for being audible in seminars during presentations, etc. Computer speakers are the speakers which are attached internally or externally to a computer system.

Headphones

These are a pair of small loudspeakers or less commonly a single speaker, held close to a user's ears and connected to a signal source such as an audio amplifier, radio, CD player or portable media player. They are also known as stereo phones, headsets or cans.

Projector

It is an output device which is used to project information from a computer onto a large screen, so it can be viewed by a large group of people simultaneously. Projectors are widely used for classroom training or conference holes with a large audience. It provides a temporary output display. There are mainly two types of projectors; LCD projector and DLP projector.

Both Input-Output Devices

Few devices that give input and also show or get the output through same device. These are as follows,

(i) Modems
(ii) Network cards
(iii) Touch screen
(iv) Headsets (headset consists of speakers and microphone in which speaker acts as output device and microphone acts as input device).
(v) Facsimile (FAX) (it has scanner to scan the document and also have printer to print the document).
(vi) Audio cards/sound cards.

Input/Output (I/O)Port

The peripheral devices can be connected to computer in several ways. Input/Output ports are the external interfaces that are used to connect input and output devices like printer, monitor and joystick to computer. The I/O devices are connected to the computer *via* the serial and

CamScanner

parallel ports, Universal Serial Bus (USB), firewire ports, etc.

1. **Parallel Port** It is an interface for connecting eight or more data wires. The data flows through the eight wires simultaneously. They can transmit eight bits of data in parallel. As result, parallel ports provide high speed data transmission. Parallel port is used to connect printer to the computer.
2. **Serial Port** It transmits one bit of data through a single wire. Since, data is transmitted serially as single bit. It provides slow speed data transmission. It is used to connect external modems, plotters, barcode reader, etc.
3. **Universal Serial Bus** (USB) It is a common and popular external port available with computers. Normally, two to four USB ports are provided on a PC. USB also has the plug and play feature, which allows devices ready to be run.
4. **Firewire** It is used to connect audio and video multimedia devices like video camera. Firewire is an expensive technology used for large data movement.

   Hard disk drive and new DVD drives connect through firewire. It has data transfer rate of upto 400 MB/sec.

Tit-Bits

- **MP3** is an audio coding format for digital audio which uses a form of lossy data compression.
- The I/O devices that are attached, externally to the computer machine are also called **peripheral devices**. These are hardware.
- **Speech recognition software** can interpret voice data into words that can be understood by the computer.
- A **dumb terminal** is simply an output device that accepts data from the CPU.

QUESTION BANK

1. Any component of the computer you can see and touch is **[IBPS Clerk 2015]**
(1) software (2) peripheral
(3) storage (4) CPU
(5) hardware

2. Which of the following is not a hardware? **[SSC FCI 2012]**
(1) Processor chip (2) Printer
(3) Mouse (4) Java

3. A (n) ..... device is any hardware component that allows you to enter data and instructions into a computer? **[SBI Clerk 2014]**
(1) interaction (2) input
(3) communication (4) output
(5) terminal

4. Computer gets ..... with the help of mouse, joystick or keyboard.
(1) insert (2) delete (3) input (4) output

5. Computer keyboard is an example of
(1) memory device (2) input device
(3) output device (4) Both '2' and '3'

6. The most common method of entering text and numerical data into a computer system is through the use of a **[SBI PO 2015]**
(1) plotter (2) scanner
(3) printer (4) keyboard
(5) None of these

7. Which key is also known as toggle keys?
(1) Caps lock (2) Num lock
(3) '1' and '2' both (4) None of these

8. You can use the Tab key to **[SBI Clerk 2013]**
(1) move a cursor across the screen
(2) indent a paragraph
(3) move the cursor down the screen
(4) Both '1' and '2'
(5) None of the above

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9. To move to the beginning of a line of text, press the ..... key.
(1) Page up (2) Shift
(3) Home (4) Enter

10. The ..... key will launch the Start button.
(1) Esc (2) Shift
(3) Window (4) Shortcut

11. Spacebar is used for
(1) giving space (2) deleting space
(3) moving next line (4) All of these

12. In a keyboard, left-right-up-down set of keys facilitates which among the following functions? **[IBPS RRB PO Mains 2017]**
(1) Deleting Data or Modification
(2) Page Scrolling to view a Document
(3) Launching Start Menu
(4) Initiating Search and Help
(5) Controlling RAM or process execution

13. Shift, Ctrl, Alt are examples of which among the following category?
[IBPS RRB PO Mains 2017]
(1) Modifier Keys (2) Primary Keys
(3) Function Keys (4) Alternate Keys
(5) Candidate Keys

14. Pointing device includes the following except
(1) mouse (2) joystick
(3) trackball (4) keyboard

15. What type of device is a computer mouse?
[IBPS Clerk 2013]
(1) Storage (2) Output
(3) Input (4) Input/output
(5) Software

16. Which of these is a pointing and draw device? **[IBPS PO 2012, IBPS Clerk 2013]**
(1) Mouse (2) Scanner
(3) Printer (4) CD-ROM
(5) Keyboard

17. First computer mouse was built by
[SSC CGL 2013]
(1) Douglas Engelbart
(2) William English
(3) Oaniel Coogher
(4) Robert Zawacki

18. Keyboard and ..... are the examples of input device. **[SBI Clerk 2014]**
(1) monitor (2) modem (3) printer
(4) mouse (5) CPU

19. Which is the best position for operating the mouse? **[IBPS Clerk 2011]**
(1) Tail away from the user
(2) Tail towards the user
(3) Tail facing the right
(4) Tail facing the left
(5) None of the above

20. Which button is called as middle button used as third mouse button by pressing on it? **[IBPS RRB PO Mains 2017]**
(1) right button (2) scroll wheel
(3) touch bar (4) light bar
(5) left button

21. Trackball is an example of a/an
[IBPS Clerk 2011]
(1) programming device (2) pointing device
(3) output device (4) software device
(5) printing device

22. A joystick is primarily used to/for ..... .
[IBPS Clerk 2012, SBI PO 2013]
(1) control sound on the screen
(2) computer gaming
(3) enter text
(4) draw pictures
(5) print text

23. A joystick allows movements in which angle?
(1) 30° (2) 60°
(3) 90° (4) 360°

24. A device, which is used for making drawings, graphics and for menu selection.
(1) Keyboard (2) Mouse
(3) Touch screen (4) Light Pen

25. ..... is generally used in applications like ATM, hospitals, airline reservation etc.
(1) Light pen (2) Touch screen
(3) Joystick (4) Trackball

26. The pattern of printed lines on most products are called **[SBI Clerk 2009]**
(1) prices (2) OCR
(3) scanners (4) barcodes
(5) None of these

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27. A barcode reader is an example of
(1) processing device (2) storage device
(3) input device (4) output device

28. An optical input device that interprets pencil marks on paper media is .....
[IBPS RRB PO Mains 2017]
(1) OMR (2) punch card reader
(3) optical scanners (4) magnetic tapes
(5) stylus

29. The OCR is used for the preparation of
[IBPS Clerk 2013]
(1) electricity bills (2) insurance premium
(3) telephone bills (4) All of these
(5) None of these

30. The OCR recognises the ..... of the characters with the help of light source.
[SBI Clerk 2009]
(1) size (2) shape (3) colour
(4) used ink (5) None of these

31. What does MICR stand for?
[IBPS Clerk 2014, RBI Grade B 2014]
(1) Magnetic Ink Character Register
(2) Magnetic Ink Code Reader
(3) Magnetic Ink Code Register
(4) Magnetic Ink Character Recognition
(5) Magnetic Ink Cases Reader

32. Large amounts of cheques are processed by using
(1) OCR (2) MICR
(3) OMR (4) All of these

33. Which of the following is/are the kind of smart card?
(1) Memory card (2) Micro processor card
(3) '1' and '2' both (4) None of these

34. Which of the following device which recognises physical traits of an individual?
(1) Smart card (2) Biometric sensor
(3) Bard code (4) MICR

35. A device that makes copies and reproduces text and images is called
(1) CPU (2) memory
(3) printer (4) scanner

36. A..... is used to read handwritten or printed text to make a digital image that is stored in memory. **[RBI Grade B 2012]**
(1) printer (2) laser beam
(3) scanner (4) touchpad
(5) None of these

37. The input device to be used to get a printed diagram into a computer is the
[IBPS Clerk 2013, IBPS Clerk 2015]
(1) printer (2) mouse
(3) keyboard (4) touchpad
(5) scanner

38. A scanner scans **[SBI PO 2015]**
(1) pictures
(2) text
(3) both pictures and text
(4) Neither pictures nor text
(5) None of the above

39. It is a video capturing device **[IBPS PO 2012]**
(1) webcam (2) microphone
(3) monitor (4) mouse
(5) scanner

40. What type of device is a digital camera?
(1) Input (2) Output
(3) Software (4) Storage

41. Which of the following could be digital input devices for computers?
[RBI Grade B 2014]
(1) Digital camcorder
(2) Microphone
(3) Scanner
(4) All of these
(5) None of these

42. Which of the following groups consists of only input devices? **[SBI Clerk 2011]**
(1) Mouse, Keyboard, Monitor
(2) Mouse, Keyboard, Printer
(3) Mouse, Keyboard, Plotter
(4) Mouse, Keyboard, Scanner
(5) None of the above

43. Results are obtained from computer through its
(1) input unit (2) ALU unit
(3) CU unit (4) output unit

CamScanner

44. After a picture has been taken with a digital camera and processed appropriately, the actual print of the picture is considered as
(1) data (2) output
(3) input (4) the process

45. Using output device one can .....
[IBPS RRB PO Mains 2017]
(1) View or Print Data (2) Modify Data
(3) Store Data (4) Replicate Data
(5) Enter Data

46. Which among the following is the smallest unit in an image in a computer screen?
[IBPS RRB PO Mains 2017]
(1) Unit (2) Pixel (3) Array
(4) Resolution (5) Clip

47. What type of device is a computer monitor?
[SBI Clerk 2014]
(1) Software (2) Processing
(3) Storage (4) Input
(5) Output

48. Soft copy refers to ..... . **[IBPS Clerk 2013]**
(1) printed output (2) digitizing
(3) music sounds (4) screen output
(5) None of these

49. The higher the resolution of a monitor, the **[IBPS PO 2011]**
(1) larger the pixels
(2) less clear the screen is
(3) further apart the pixels
(4) closer together the pixels
(5) None of the above

50. The most familiar output device for the micro computers is
(1) screen (2) TV
(3) printer (4) monitor

51. The CRT is ..... in shape.
[RBI Grade B 2013, SBI PO 2011]
(1) circular (2) rectangular
(3) eclipse (4) conical
(5) None of these

52. CRT has a **[RBI Grade B 2013]**
(1) hollow tube (2) vacuum tube
(3) long tube (4) round tube
(5) None of these

53. The rate at which scanning is repeated in a CRT is called **[SBI Clerk 2009]**
(1) refresh rate (2) resolution
(3) pitch (4) bandwidth
(5) None of these

54. ..... provides hard copy output on paper.
[SBI Clerk 2015]
(1) Mouse (2) Keyboard
(3) LCD monitor (4) Scanner
(5) Printer

55. Printer is an example of **[SBI Clerk 2014]**
(1) output device (2) input device
(3) processing device (4) storage device
(5) None of these

56. What are the units used to count the speed of a printer? **[IBPS Clerk 2013]**
(1) CPM (2) DPI
(3) PPM (4) BIT
(5) None of these

57. ..... printer cannot print more than one characters at a time. **[SSC CHSL 2013]**
(1) Line (2) Daisy wheel
(3) Laser (4) Dot matrix

58. Speed of line printer is limited by the speed of **[IBPS PO 2012, Clerk 2013]**
(1) paper movements (2) cartridge used
(3) length of paper (4) All of these
(5) None of these

59. An example of peripheral equipment is
(1) printer (2) CPU
(3) spreadsheet (4) microcomputer

60. Dot matrix is a type of
(1) tape (2) printer
(3) disk (4) bus
(5) None of these

61. Dot matrix printer is
(1) unidirectional (2) bi-directional
(3) sequential (4) random

62. The impact printers are
(1) dot matrix (2) drum
(3) inkjet (4) Both '1' and '2'

CamScanner

63. Drum printer is an example of
(1) input (2) output
(3) processing (4) storage

64. The example of non-impact printers are **[RBI Grade B 2013]**
(1) Laser-Dot matrix (2) Inkjet-Laser
(3) Inkjet-Dot matrix (4) Dot matrix
(5) None of these

65. Line printer speed is specified in terms of
(1) LPM (Lines Per Minute) **[RBI Grade B 2013]**
(2) CPM (Characters Per Minute)
(3) DPM
(4) Any of the above
(5) None of the above

66. In laser printers, printing is achieved by deflecting laser beam on to ..... surface of a drum. **[SBI PO, IBPS Clerk 2011, 2013]**
(1) magnetised
(2) photosensitive
(3) magnetic
(4) Either '1' or '2'
(5) None of these

67. Which of the following printers, are you sure, will not to use if your objective is to print on multi carbon forms?
(1) Daisy wheel (2) Dot matrix
(3) Laser (4) Thermal

68. Laser printers belong to
(1) line printer (2) page printer
(3) band printer (4) dot matrix printer

69. Which of the following produces high quality output?
(1) Impact printer (2) Non-impact printer
(3) Plotter (4) Both '1' and '2'

70. Resolution of laser printer is specified in terms of
(1) DPI (2) LPM
(3) CPM (4) PPM

71. A hard copy would prepared on a **[SBI Clerk 2013]**
(1) line printer (2) dot matrix printer
(3) plotter (4) type writer terminal
(5) All of these

72. All of the following are examples of input device except
(1) scanner (2) mouse
(3) keyboard (4) printer

73. It is used to produce large drawings or images such as construction plans, blueprints for mechnanical object etc.
(1) Printer (2) Plotter
(3) MICR (4) OCR

74. What type of devices are computer speakers or headphones? **[IBPS Clerk 2015, SBI Clerk 2012]**
(1) Input (2) Input/Output (3) Software
(4) Storage (5) Output

75. Which of the following devices is used to give input as well as to display output?
(1) Tourch screen (2) Headsets
(3) Facsimile (4) Audio cards
(5) All of these

76. The transfer of data from a CPU to peripheral devices of computer is achieved through **[SSC CGL 2012]**
(1) interfaces (2) buffer memory
(3) modems (4) I/O ports

77. A parallel port is most often used by a **[SSC CPO 2011]**
(1) printer (2) monitor
(3) mouse (4) external storage device

78. ..... ports provide slow speed data transmission.
(1) Serial (2) Parallel
(3) Firewire (4) USB

79. Which is not an item of hardware? **[IBPS Clerk 2013]**
(1) An MP3 file (2) A keyboard
(3) A mouse (4) Printer
(5) None of these

80. USB in data cables stands for **[IBPS Clerk 2014]**
(1) Unicode Smart Bus
(2) Universal Structural Bus
(3) Unicode Serial Bus
(4) Universal Smart Bus
(5) Universal Serial Bus

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81. USB refers to **[SSC MTS 2013]**
(1) a storage device (2) a processor
(3) a port type (4) a serial bus standard

82. Which of the following are properties of USB? **[IBPS Clerk Mains 2017]**
(1) Platform independent
(2) Platform dependent
(3) Source dependent
(4) Software dependent
(5) Software Independent

83. ..... is used to connect audio and video multimedia devices like video camera.
(1) Firewire (2) Serial port
(3) Parallel port (4) USB

84. The ..... format reduces an audio file to about one-tenth of its original size, while preserving much of the original quality of the sound. **[SBI Clerk 2014]**
(1) DOC (2) PNG (3) GIF
(4) MP3 (5) VMEG

85. Peripheral devices such as printers and monitors are considered to be ..... .
[IBPS Clerk 2013]
(1) hardware (2) software
(3) data (4) information
(5) source code

86. External devices such as printers, keyboards and modems are known as
[IBPS PO 2011, IBPS Clerk 2015]
(1) add-on devices
(2) peripherals
(3) extra software devices
(4) PC expansion slot add-ons
(5) special buys

87. ..... can interpret voice data into words that can be understood by the computer.
[IBPS Clerk 2014]
(1) Speech input hardware
(2) Speech recognition software
(3) Word recognition software
(4) Talking software
(5) Other than those given as options

88. Dumb terminals have terminals and
[SBI PO 2015]
(1) mouse (2) speakers
(3) keyboard (4) mouse or speakers
(5) None of these

89. Which one of the following input device is user-programmable? **[IBPS Clerk 2015]**
(1) Dumb terminal (2) Smart terminal
(3) VDT (4) Intelligent terminal
(5) All of these

90. Input devices are used to provide the steps and tasks the computer needs to process data and these steps and tasks are called
[IBPS Clerk 2015]
(1) program (2) design
(3) information (4) instructions
(5) flow chart

ANSWERS

1. (5)	2. (4)	3. (2)	4. (3)	5. (2)	6. (4)	7. (3)	8. (2)	9. (3)	10. (3)
11. (1)	12. (2)	13. (1)	14. (4)	15. (3)	16. (1)	17. (1)	18. (4)	19. (2)	20. (2)
21. (2)	22. (2)	23. (4)	24. (4)	25. (2)	26. (4)	27. (3)	28. (1)	29. (4)	30. (2)
31. (4)	32. (2)	33. (3)	34. (2)	35. (4)	36. (3)	37. (5)	38. (3)	39. (1)	40. (1)
41. (4)	42. (4)	43. (4)	44. (2)	45. (1)	46. (2)	47. (5)	48. (4)	49. (4)	50. (4)
51. (2)	52. (2)	53. (1)	54. (5)	55. (1)	56. (2)	57. (4)	58. (1)	59. (1)	60. (2)
61. (2)	62. (4)	63. (2)	64. (2)	65. (2)	66. (2)	67. (3)	68. (2)	69. (2)	70. (1)
71. (5)	72. (4)	73. (2)	74. (5)	75. (5)	76. (4)	77. (1)	78. (1)	79. (1)	80. (5)
81. (3)	82. (1)	83. (1)	84. (4)	85. (1)	86. (2)	87. (2)	88. (4)	89. (4)	90. (4)

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CHAPTER

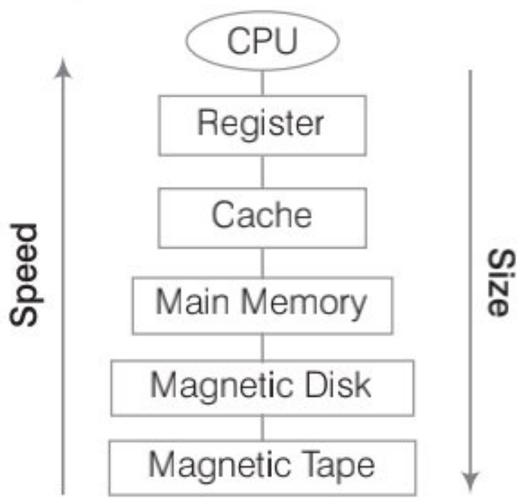
04

COMPUTER MEMORY

The computer memory is one of the most important elements in a computer system. It stores data and instructions required during the processing of data and output results. Storage may be required for a limited period of time, instantly or for an extended period of time. It also relates to many devices that are responsible for storing data on a temporary or a permanent basis.

Memory Hierarchy

The hierarchical arrangement of storage in current computer architectures is called the memory hierarchy. The computer uses a hierarchy of memory that is organised in a manner to enable the fastest speed and largest capacity of memory as shown in figure. The memory is characterised on the basis of two key factors; capacity and access time.



Parameters of Memory

Some related parameters of memory are as follows

1. **Storage Capacity** It is representative of the size of memory. The capacity of internal memory or main memory can be expressed in terms of number of words or bytes.
2. **Access Modes** A memory is comprised of various memory locations. The information from these memory locations can be accessed randomly, sequentially and directly.
3. **Access Time** The access time is the time required between the desired modes for a read or write operation till the data is made available or written at the desired location.
4. **Physical Characteristics** In this respect, the devices can be categorised into four main categories as electronic, magnetic, mechanical and optical.
5. **Permanence of Storage** Its permanence is high for future use in magnetic materials.

Types of Memory

In general, the memory is classified into two categories as follows

1. Primary memory or Main memory
2. Secondary memory or Auxiliary memory

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Primary Memory

The memory unit that communicates directly with the CPU is called main memory or internal memory or primary memory. The primary memory allows the computer to store data for immediate manipulation and to keep track of what is currently being processed. It has limited storage capacity.

Main memory is volatile in nature, it means that when the power is turned OFF, the contents of this memory are lost forever.

Primary memory can be further classified in two categories which are as follows

1. **Random Access Memory** (RAM) It is also known as read/write memory, that allows CPU to read as well as write data and instructions into it. RAM is used for the temporary storage of input data, output data and intermediate results.

   There are two categories of RAM as follows

   (i) **Dynamic RAM** (DRAM) It is made up of memory cells where each cell is composed of one capacitor and one transistor. DRAM must be refreshed continually to store information. DRAM is slower, less- expensive and occupies less space on the computer's motherboard.

   (ii) **Static RAM** (SRAM) It retains the data as long as power is provided to the memory chip.

   SRAM needs not be refreshed periodically. It uses multiple transistors for each memory cell. It does not use capacitor. SRAM is often used cache memory due to its high speed. SRAM is more expensive and faster than DRAM.

2. **Read Only Memory** (ROM) It is also known as non-volatile memory or permanent storage. It does not lose its contents when the power is switched OFF.

   ROM can have data and instructions written to it only one time. Once a ROM chip is programmed at the time of manufacturing, it cannot be reprogrammed or rewritten. So, it has only read capability, not write.

   There are three categories of ROM as follows

   (i) **Programmable ROM** (PROM) It is also non-volatile in nature. Once a PROM has been programmed, its contents can never be changed. It is one-time programmable device.

   These types of memories are found in video game consoles, mobile phones, implantable medical devices and high definition multimedia interfaces.

   (ii) **Erasable Programmable ROM** (EPROM) It is similar to PROM, but it can be erased by exposure to strong ultraviolet light, then rewritten. So, it is also known as Ultraviolet Erasable Programmable ROM (UVEPROM).

   (iii) **Electrically Erasable Programmable ROM** (EEPROM) It is similar to EPROM, but it can be erased electrically, then rewritten electrically and the burning process is reversible by exposure to electric pulses. It is the most flexible type of ROM, and is now commonly used for holding BIOS.

Apart from above memory, there is also some other memory that helps to primary memory which are as follows

Cache Memory

It is a storage buffer that stores the data which is used more often, temporarily and makes, them available to CPU at a fast rate. Cache memory is a very high speed memory placed in between RAM and CPU. It increases the speed of processing.

Cache memory is very expensive, so it is smaller in size. Generally, computers have cache memory of sizes 256 KB to 2 MB.

Flash Memory

It is a kind of semiconductor based non-volatile rewritable memory, used in digital camera, mobile phone, printer, etc.

Virtual Memory

It is a technique that allows the execution of processes that are not completely in main memory. One major advantage of this scheme is that programs can be larger than main memory.

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Secondary Memory/ Storage

This memory stores much larger amounts of data and information for extended periods of time. Data in secondary memory cannot be processed directly by the CPU, it must first be copied into primary memory, i.e. RAM. It is the slower and cheaper form of memory. Secondary storage is used to store data and programs when they are not being processed. It is also non-volatile in nature. Due to this, the data remain in the secondary storage as long as it is not overwritten or deleted by the user. It is a permanent storage.

Secondary memory devices include as follows

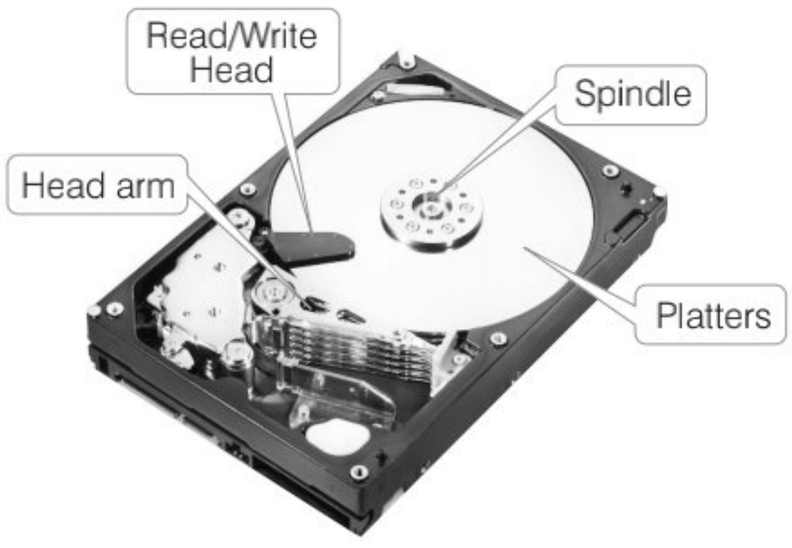
Magnetic Storage Magnetic storage is the manipulation of magnetic fields on a medium in order to record audio, video or other data. It includes hard disk drive, floppy disk and magnetic tape.

Optical Storage Optical storage is any storage type in which data is written and read with a laser. It includes CD, DVD and Blu-ray disc.

Solid State Storage Solid state storage is a type of storage technique that employs storage devices built using silicon microchip based storage architecture. It includes pen/flash drive, memory card.

Hard Disk Drive (HDD)

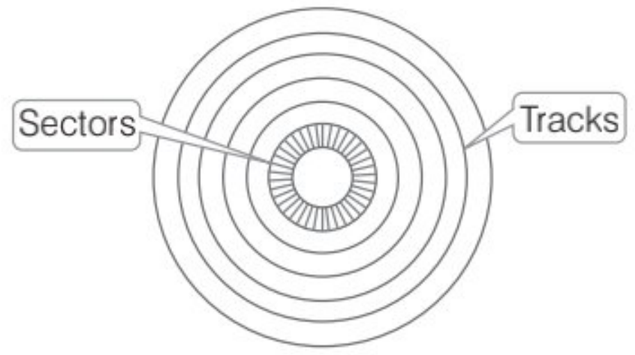
It is a non-volatile and random access digital data storage device. HDD is a data storage device used for storing and retrieving digital information using rotating disks (platters) coated with magnetic material. All programs of a computer are installed in hard disk. It is a fixed disk i.e. cannot be removed from the drive.



Hard Disk Drive

It consists of a **spindle** that holds non-magnetic flat circular disks, called **platters**, which hold the recorded data. Each platter requires two read/write heads, that are used to write and read information from a platter.

All the read/write heads are attached to a single access arm so that they cannot move independently.



Tracks and Sectors

The information is recorded in bands; each band of information is called a **track**. Each platter has the same number of tracks and a track location that cuts across all platters is called a **cylinder.**

The tracks are divided into pie-shaped sections known as **sectors.**

Floppy Disk (Diskette)

It is used to store data but it can store small amount of data and it is slower to access than hard disks. Floppy disk rounds in shape and a thin plastic disk coated with iron oxide. Data is retrieved or recorded on the surface of the disk through a slot on the envelope. Floppy disk is removable from the drive. Floppy disk is available in three sizes; 8 inch, $5\frac{1}{4}$ inch and $3\frac{1}{2}$ inch.

Magnetic Tape

These tapes are made of a plastic film-type material coated with magnetic materials to store data permanently. Data can be read as well as recorded. It is usually 12.5 mm to 25 mm wide and 500 m to 1200 m long.

Magnetic tapes hold the maximum data, which can be accessed sequentially. They are generally used to store backup data or that type of data, which is not frequently used or to transfer data from one system to another.

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Compact Disc (CD)

It is the most popular and the least expensive type of optical disc. A CD is capable of being used as a data storage device alongwith storing of digital audio. The files are stored on this particular contiguous sectors.

CDs are categorised into three main types as follows

(i) CD-ROM
(Compact Disc-Read Only Memory)
(ii) CD-R (Compact Disc- Recordable)
(iii) CD-RW (Compact Disc- Rewritable)

Digital Video Disc (DVD)

DVD is also known as Super Density Disc (SDD) or Digital Versatile Disc (DVD). It is an optical disc storage media. DVDs offer higher storage capacity than CDs while having the same dimensions.

Depending upon the disc type, DVD can store several Gigabytes of data (4.7 GB-17.08 GB). DVDs are primarily used to store music or 6 movies and can be played back on your television or computer too. They are not rewritable media.

DVDs come in three varieties as follows

(i) DVD-ROM
(Digital Video Disc-Read Only Memory)
(ii) DVD-R (DVD-Recordable)
(iii) DVD-RW (DVD-Rewritable)

Tit-Bits

- The rate at which data is written to disc or read from disc is called **data transfer rate**.
- **Root directory** is the main folder of disc. It contains information about all folders on the disc.

Blu-ray Disc

It is an optical disc storage medium designed to re-capture the data normally in DVD format. Blu-ray disc (BD) contains 25 GB (23.31 GB) per layer space. The name Blu-ray disc refers to the blue laser used to read the disc, which allows information to be stored at a greater density than the longer- wavelength red laser used in DVDs. Blu-ray can hold almost 5 times more data than a single layer DVD.

The variations in the formats are as follows

(i) BD-ROM (Read only)
(ii) BD-R (Recordable)
(iii) BD-RW (Rewritable)
(iv) BD-RE (Rewritable)

Pen/Thumb Drive

Pen drive is also known as flash drive. A flash drive is a data storage device that consists of flash memory (key memory) with a portable USB (Universal Serial Bus) interface. USB flash drives are typically removable, rewritable and much smaller than a floppy disk.

Today, **flash drives** are available in various storage capacities as 256MB, 512MB, 1GB, 4GB, 16GB upto 64 GB. They are widely used as an easy and small medium to transfer and store the information from the computers.

Memory Cards

These are the data storage devices in a chip shaped which can store the data in it. They are commonly used in many electronic devices, including digital cameras, mobile phones, laptop computers.

They are small, re-recordable, easily portable and very light weighted.

Secondary Memory Devices and their Storage Method and Capacity are as follows

Secondary Memory Devices	Storage Method	Capacity
Floppy Disk (5.25 inch)	Magnetic	1.2 MB
Floppy Disk (3.5 inch)	Magnetic	1.44 MB
Floppy Disk (8 inch)	Magnetic	80 KB to 242 KB
CD-ROM	Optical	640 MB to 680 MB
DVD-ROM	Optical	4.7 GB to 17 GB
Pen Drive	Solid State	1 GB to 512 GB
Magnetic Tape	Magnetic	upto 1 TB

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Basic Units of Memory Measurements

1 Bit	=	Binary Digit (0 or 1)
4 Bits	=	1 Nibble
8 Bits	=	1 Byte = 2 Nibble
1024 Bytes	=	1 KB (KiloByte)
1024 KB	=	1 MB (MegaByte)
1024 MB	=	1 GB(GigaByte)
1024 GB	=	1 TB(TeraByte)
1024 TB	=	1 PB(PetaByte)

1024 PB	=	1 EB(ExaByte)
1024 EB	=	1 ZB(ZettaByte)
1024 ZB	=	1 YB (YottaByte)
1024 YB	=	1 (BrontoByte)
1024 BB	=	1 (GeopByte)

Note *Bit is the smallest memory measurement unit. GeopByte is the highest memory measurement unit. A byte can represent 256 (0-255 or 2^8) distinct values.*

QUESTION BANK

1. Which is representative of the size of the memory?
(1) Storage capacity
(2) Access mode
(3) Access time
(4) Permanence storage

2. Where is data saved permanently?
(1) Memory (2) Storage
(3) CPU (4) Printer

3. Where are programs and data to be used by the computer available? **[SSC FCI 2012]**
(1) Processing unit (2) Output
(3) Storage (4) Input

4. How many types of memory does a computer have?
(1) Four (2) Eight
(3) One (4) Two

5. Primary storage is ..... as compared to secondary storage.
(1) slow and inexpensive
(2) fast and inexpensive
(3) fast and expensive
(4) slow and expensive

6. The key feature(s) of internal memory is/are
(1) limited storage capacity
(2) temporary storage
(3) fast access and high cost
(4) All of the above

7. Internal storage is also called main
(1) memory (2) area
(3) screen (4) unit

8. The two kinds of main memory are
(1) ROM and RAM
(2) primary and secondary
(3) floppy disk and hard disk
(4) direct and sequential

9. Which memory is used as temporary memory?
(1) Non-volatile memory
(2) Volatile memory
(3) Hard disk memory
(4) Read only memory

10. Which of the following is a correct definition of volatile memory?
(1) It does retain its contents at high temperatures
(2) It is to be kept in air-tight boxes
(3) It loses its contents on failure of power supply
(4) It does not lose its contents on failure of power supply

11. Cache and main memory will not be able to hold their contents when the power is OFF. They are **[Allahabad Bank PO 2012]**
(1) dynamic (2) static
(3) volatile (4) non-volatile
(5) faulty

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12. Which of the following is not an access mode?
(1) Random (2) Sequential
(3) Continuous (4) Direct

13. .....memory in a computer is where information is temporarily stored while it is being accessed or worked on by the processor. **[IBPS RRB PO 2017]**
(1) Logical (2) Secondary
(3) ROM (4) RAM
(5) Cache

14. Why RAM is so called? **[IBPS Clerk 2015]**
(1) Because it is read and write memory
(2) Because it is a volatile memory
(3) Because it can be selected directly for storing and retrieving data and instructions of any location of chip
(4) Because it is a non-volatile memory
(5) None of the above

15. Which of the following is not true about RAM? **[IBPS PO 2015, IBPS Clerk 2014]**
(1) RAM is the same as hard disk storage
(2) RAM is a temporary storage area
(3) RAM is volatile
(4) RAM is a primary memory
(5) Other than those given as options

16. Virtual memory allocates hard disk space to supplement the immediate, functional memory capacity of **[SBI PO 2014]**
(1) ROM (2) EPROM
(3) The registers (4) Extended memory
(5) RAM

17. Information stored in RAM need to be **[IBPS Clerk 2011]**
(1) check (2) refresh periodically
(3) modify (4) detecting errors
(5) None of these

18. Storage that retains its data after the power is turned OFF is referred to as **[SBI Clerk 2009]**
(1) volatile storage (2) non-volatile storage
(3) sequential storage (4) direct storage
(5) None of these

19. Dynamic RAM consumes ..... power and ..... than static RAM.
(1) more, faster (2) more, slower
(3) less, slower (4) less, faster

20. Which of the following memory chip is faster? **[SBI Clerk 2012]**
(1) There is no certainty (2) DRAM
(3) SRAM (4) RAM
(5) None of these

21. The advantage of DRAM is
(1) it is cheaper than SRAM
(2) it can store more than that of SRAM
(3) it is faster than SRAM
(4) data can be erased easily in it as compared to SRAM

22. What is called the permanent memory built into your computer?
(1) RAM (2) ROM
(3) CPU (4) CD-ROM

23. Permanent instructions that the computer use when it is turned ON and that cannot be changed by other instructions are contained in
(1) ROM (2) RAM
(3) ALU (4) SRAM

24. Which of the following is not a ROM?
(1) PROM (2) EPROM
(3) EEPROM (4) EDPROM

25. When you first turn on a computer, the CPU is preset to execute instructions stored in the **[IBPS PO 2015]**
(1) RAM (2) flash memory
(3) ROM (4) CD-ROM
(5) ALU

26. A disc's content that is recorded at the time of manufacture and that cannot be changed or erased by the user is **[IBPS Clerk 2013]**
(1) memory only (2) write only
(3) once only (4) run only
(5) read only

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27. An area of computer that temporarily holds data waiting to be processed is
(1) CPU (2) memory
(3) storage (4) file

28. The difference between memory and storage is that memory is ..... and storage is ..... . **[IBPS Clerk 2015]**
(1) temporary; permanent
(2) permanent; temporary
(3) slow; fast
(4) non-volatile; volatile
(5) None of the above

29. Cache memory acts between
(1) CPU and RAM
(2) RAM and ROM
(3) CPU and hard disk
(4) All of these

30. The most frequently used instructions of a computer program are likely to be fetched from
(1) the hard disk (2) cache memory
(3) RAM (4) registers

31. Which of the following is the high speed memory which compensates the gap in speeds of processor and main memory? **[IBPS Clerk 2015]**
(1) Cache (2) PROM
(3) EPROM (4) SRAM
(5) None of these

32. ..... acts as temporary high speed holding area between the memory and the CPU thereby improving processing capabilities. **[IBPS Clerk 2012]**
(1) ROM (2) RAM
(3) Temporary memory (4) Cache memory
(5) Flash memory

33. Which of the following statements is/are true? **[RBI Grade B 2012]**
(1) Cache memories are bigger than RAM
(2) Cache memories are smaller than RAM
(3) ROM are faster than RAM
(4) Information in ROM can be written by users
(5) None of the above

34. ..... is having more memory addresses than are physically available. **[SBI PO 2014]**
(1) Virtual memory (2) System software
(3) Application software (4) RAM
(5) Vertical memory

35. Virtual memory is **[SBI Clerk 2011]**
(1) an extremely large main memory
(2) an extremely large secondary memory
(3) an illusion of extremely large main memory
(4) a type of memory used in super computers
(5) None of the above

36. ..... is the ability of a device to 'jump' directly to the requested data. **[IBPS Clerk 2012]**
(1) Sequential access (2) Random access
(3) Quick access
(4) All of the above
(5) None of the above

37. The ..... is the amount of data that a storage device can move from the storage to the computer per second. **[IBPS Clerk 2012]**
(1) data migration rate
(2) data digitising rate
(3) data transfer rate
(4) data access rate
(5) None of the above

38. The main directory of a disk is called the ..... directory. **[IBPS PO 2015]**
(1) Network
(2) Folder
(3) Root
(4) Other than those given as options
(5) Program

39. The ..... indicates how much data a particular storage medium can hold. **[IBPS Clerk 2013]**
(1) storage (2) access
(3) capacity (4) memory
(5) None of these

40. What is the main folder on a storage device? **[RBI Grade B 2012]**
(1) Root directory (2) Interface
(3) Device driver (4) Platform
(5) Main directory

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41. Which of the following computer's memory is characterised by low cost per bit stored?
(1) primary (2) secondary
(3) hard disk (4) All of these

42. Secondary storage
(1) does not require constant power
(2) does not magnetic media
(3) consists of four main types of devices
(4) does not store information for later retrieval

43. Which of the following is not used as secondary storage?
(1) Semi-conductor memory
(2) Magnetic disks
(3) Magnetic drums
(4) Magnetic tapes

44. The secondary storage devices can only store data but they cannot perform
(1) arithmetic operations
(2) logic operations
(3) fetch operations
(4) All of the above

45. Where do you save the data that, your data will remain intact even when the computer is turned OFF?
(1) RAM
(2) Motherboard
(3) Secondary storage device
(4) Primary storage device

46. The term ..... refers to data storage systems that make it possible for a computer or electronic device to store and retrieve data. **[SBI PO 2010]**
(1) retrieval technology
(2) input technology
(3) output technology (4) storage technology
(5) None of these

47. The storage device used to compensate for the difference in rates of flow of data from one device to another is termed as **[SBI PO 2011]**
(1) chip (2) channel
(3) floppy (4) call
(5) buffer

48. Which of the following is the magnetic storage device?
(1) Hard disk (2) Compact disc
(3) Audio tapes (4) All of these

49. The concentric circles on the floppy disk are further divided into
(1) tracks (2) sectors
(3) cylinders (4) circles

50. A track location that cuts across all platters is called a
(1) cylinder (2) spindle
(3) diskette (4) platters

51. The primary device that a computer uses to store information is **[Punjab & Sind Bank Clerk 2010]**
(1) TV (2) storehouse
(3) desk (4) hard drive
(5) None of these

52. Hard disk devices are considered ..... storage. **[SBI Clerk 2014]**
(1) flash (2) temporary
(3) worthless (4) non-volatile
(5) non-permanent

53. The thick, rigid metal plotters that are capable of retrieving information at a high rate of speed are known as **[SBI Clerk 2014]**
(1) hard disks (2) SAN
(3) soft disks (4) flash memory
(5) None of the above

54. Hard drive is used to store **[IBPS Clerk Mains 2017]**
(1) volatile data
(2) non-volatile data
(3) permanent data
(4) temporary data
(5) intermediate data

55. The hard drive is normally located
(1) next to the printer **[SBI PO 2014]**
(2) plugged into the back of the computer
(3) underneath the monitor
(4) on top of the CD-ROM
(5) inside the system base unit

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56. Data on a floppy disk is recorded in rings called
(1) sectors (2) ringers
(3) rounders (4) tracks

57. Which of the following is/are example(s) of magnetic storage media?
(1) Zip disk (2) CD-ROM
(3) Floppy disk (4) DVD
(5) Both '1' and '3'

58. Floppy disks are organised as **[IBPS PO 2012]**
(1) files (2) heads and folders
(3) tracks and sectors (4) All of these
(5) None of the above

59. The capacity of 3.5 inch floppy disk is **[SBI Clerk 2012]**
(1) 1.40 MB (2) 1.44 GB
(3) 1.40 GB (4) 1.45 MB
(5) 1.44 MB

60. The most common storage device for the personal computer is the **[SBI Clerk 2014]**
(1) floppy disk
(2) USB personal computer
(3) mainframe
(4) a laptop
(5) None of the above

61. Which of the following has the smallest storage capacity? **[IBPS Clerk 2015]**
(1) Zip disk (2) Hard disk
(3) Floppy disk (4) Data cartridge
(5) CD

62. 'FDD' stands for **[IBPS Clerk 2015]**
(1) Floppy Drive Detector
(2) Floppy Drive Demodulator
(3) Floppy Disk Drive
(4) Floppy Demodulator Disc
(5) None of the above

63. ..... is the process of dividing the disc into tracks and sectors. **[SBI PO 2015, IBPS Clerk Mains 2017]**
(1) Tracking (2) Formatting
(3) Crashing (4) Allotting
(5) None of these

64. Data on a floppy disk was recorded in rings called **[IBPS RRB PO 2017]**
(1) flip (2) ringers (3) rounders
(4) fields (5) segments

65. Tape drive provides ..... access to data.
(1) timely (2) sporadic
(3) random (4) sequential

66. Magnetic tape is not practical for applications where data must be quickly recalled because tape is
(1) a random access medium
(2) a sequential access medium
(3) a read only medium
(4) fragile and easily damaged
(5) an expensive storage medium

67. Which of the following storage media provides sequential access only?
(1) Floppy disk (2) Magnetic disk
(3) Magnetic tape (4) Optical disc
(5) None of these

68. Which of the following can hold maximum data?
(1) Optical disc (2) Floppy disk
(3) Magnetic disk (4) Magnetic tape

69. Which storage device is mounted on 'reels'?
(1) Floppy disk (2) Hard disk
(3) Magnetic tapes (4) CD-ROM

70. Which of the following storage devices can be used for storing large backup data?
(1) Floppy disk (2) Hard disk
(3) Magnetic tape (4) All of these

71. On a CD-RW, you can
(1) read and write information
(2) only read information
(3) only write information
(4) read, write and rewrite information

72. Which of the following are advantages of CD-ROM as a storage media? **[RBI Grade B 2014]**
(1) CD-ROM is an inexpensive way to store large amount of data and information
(2) CD-ROM discs retrieve data and information more quickly than magnetic disks
(3) CD-ROMs make less errors than magnetic media

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(4) All of the above
(5) None of the above

73. Which media has the ability to have data/information stored (written) on them by users more than once? **[RBI Grade B 2014]**
(1) CD-R discs (2) CD-RW discs
(3) Zip discs (4) Optical discs
(5) CD-RW discs and Zip discs

74. What is the difference between a CD-ROM and CD-RW? **[IBPS PO 2015]**
(1) They are the same—just two different terms used by different manufactures.
(2) A CD-ROM can be written to and a CD-RW cannot.
(3) Other than those given as options
(4) A CD-ROM holds more information than a CD-RW.
(5) A CD-RW can be written to but a CD-ROM can only be read from.

75. Compact disc that can store approximately 650-800 MB of data or 74-80 min of music are **[SBI Clerk 2015]**
(1) zip discs (2) CD-ROM
(3) video cards (4) pressing machines
(5) floppy diskettes

76. The CD-ROM drive is used to **[Allahabad Bank PO 2011]**
(1) play compact discs (2) play music
(3) install software (4) control digital information
(5) None of the above

77. A flat metallic disk that contains a large amount of permanently stored information read optically, is called a
(1) monitor (2) ALU
(3) CD-ROM (4) RAM
(5) None of these

78. CD-ROM is an example of **[RBI Grade B 2014]**
(1) input device
(2) output device
(3) Both input & output
(4) Memory device
(5) None of the above

79. Which of the following has the largest storage capacity for removable media?
(1) Floppy disk (2) CD-ROM
(3) DVD (4) Partitioned space

80. Which of the following is an example of optical disc? **[Allahabad Bank PO 2011]**
(1) Digital versatile discs (2) Magnetic disks
(3) Memory disks (4) Data bus disks
(5) None of the above

81. DVD refers to **[SSC MTS 2013]**
(1) Digital Video Developer
(2) Digital Video Device
(3) Digital Video Disc
(4) None of the above

82. A DVD is an example of a (n) **[SBI Clerk 2014]**
(1) optical device
(2) output device
(3) hard disk
(4) solid state storage device
(5) None of the above

83. Which of the following discs can be read only? **[IBPS Clerk 2015]**
(1) DVD-R (2) DVD-ROM
(3) DVR-RW (4) CD-R
(5) None of these

84. These memories are used in many electronic devices, including digital camera, mobile phones etc.
(1) Memory card (2) Pen drives
(3) Blu-ray (4) Magnetic tape

85. Which is not a storage device? **[SBI PO 2013, 14, IBPS Clerk 2014]**
(1) Floppy Disk (2) Printer
(3) DVD (4) Hard Disk
(5) CD

86. Which of the following is not an example of secondary storage device?
(1) CD (2) Floppy
(3) Hard disc (4) RAM

87. The size of any word/number in a computer is measured in
(1) bits (2) bytes
(3) meter (4) litre

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88. The term bit is short for **[SBI Clerk 2009]**
(1) megabyte (2) binary language
(3) binary digit (4) binary number
(5) None of these

89. A 'bit' refers to **[SBI Clerk 2014]**
(1) a form of storage
(2) a value equal to a kilobyte
(3) a value equal to a megabyte
(4) the smallest unit of digital information
(5) the same things as a pixel

90. Which among the following is another name for a group of 4 bits?
(1) Nibble **[IBPS Clerk 2015, IBPS PO 2016]**
(2) Byte (3) KiloByte
(3) MegaByte (5) PetaByte

91. How many bits make a half byte?
(1) 2 (2) 4 (3) 6 (4) 8
(5) None of these

92. Which of the following is the smallest measure of storage? **[SBI Clerk 2012]**
(1) Tera byte (2) Gigabyte
(3) Kilobyte (4) Megabyte
(5) Byte

93. A byte can represent any number between 0 and **[IBPS Clerk 2012]**
(1) 2 (2) 255
(3) 256 (4) 1024
(5) 1025

94. A byte is a collection of **[IBPS Clerk 2012]**
(1) four bits (2) six bits
(3) eight bits (4) ten bits
(5) twelve bits

95. A collection of 8 binary digits 0's or 1's in a string format is known as
(1) bit (2) byte
(3) kilobyte (4) kilobit

96. ..... are used to measure both computer memory (RAM) and storage capacity of Floppy disks, CD-ROM drives and Hard drives. **[SBI Clerk 2015]**
(1) Bytes (2) Bits
(3) Octal numbers (4) Hexadecimal numbers
(5) Binary numbers

97. How many bits are equal to one byte ? **[SSC CGL 2016]**
(1) 8 (2) 6
(3) 7 (4) 2

98. Instructions and memory address are represented by **[IBPS Clerk 2015]**
(1) character code (2) binary codes
(3) binary word (4) parity bit
(5) None of these

99. The computer abbreviation KB usually means **[IBPS PO 2011]**
(1) keyblock (2) kernelboot
(3) keybyte (4) ketbit
(5) kilobyte

100. Kilobyte equals to how many bytes? **[SBI Clerk 2012]**
(1) 1000 (2) 1035
(3) 100 (4) 1008
(5) 1024

101. One thousand bytes represent a
(1) megabyte (2) gigabyte
(3) kilobyte (4) terabyte

102. Which of the following statements is valid?
(1) 1 KB = 1024 bits
(2) 1 MB = 2048 bits
(3) 1 MB = 1000 kilobits
(4) 1 KB = 1000 bytes
(5) 1 MB = 1024 kilobytes

103. A ..... is approximately a million bytes. **[SBI PO 2014]**
(1) gigabyte (2) kilobyte
(3) megabyte (4) terabyte
(5) None of these

104. What does the computer abbreviation 'MB' used for? **[SBI Clerk 2012, IBPS Clerk 2014]**
(1) Megabit (2) Millionbytes
(3) Megabytes (4) Millionbit
(5) Microbytes

105. The amount of memory (RAM or ROM) is measured in **[SBI PO 2014]**
(1) bytes (2) bits
(3) megabytes (4) megabits
(5) hertz

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106. How many kilobytes make a megabyte? **[IBPS Clerk 2015]**

(1) 128 (2) 1024
(3) 256 (4) 512
(5) 64

107. A ... is approximately one billion bytes. **[IBPS Clerk 2014, SBI PO 2015]**

(1) kilobyte (2) bit
(3) gigabyte (4) megabyte
(5) None of the above

108. The term 'gigabyte' refers to **[IBPS PO 2012]**

(1) 1024 byte (2) 1024 kilobyte
(3) 1024 megabyte (4) 1024 gigabyte
(5) None of these

109. Which of the following is the largest unit of storage? **[SBI PO 2015]**

(1) GB (2) KB
(3) MB (4) TB
(5) None of these

110. Which of the following is correct sequence of smallest to largest unit of storage size? **[SBI PO 2014]**

(1) Petabyte, Kilobyte, Megabyte, Gigabyte, Terabyte
(2) Kilobyte, Megabyte, Terabyte, Petabyte, Gigabyte
(3) Megabyte, Terabyte, Gigabyte, Kilobyte, Petabyte
(4) Kilobyte, Megabyte, Petabyte, Terabyte, Gigabyte
(5) Kilobyte, Megabyte, Gigabyte, Terabyte, Petabyte

111. ..... (HHDD) is a technology where the conventional disk drive is combined with non-volatile flash memory, of typically 128 MB or more to cache data during normal use. **[SSC CGL 2017]**

(1) Hyper Hard Disk Drive
(2) Hybrid Hard Disk Drive
(3) Hybrid Helium Disk Drive
(4) Hyper Helium Disk Drive

ANSWERS

1. (1)	2. (2)	3. (3)	4. (4)	5. (3)	6. (4)	7. (1)	8. (1)	9. (2)	10. (3)
11. (3)	12. (1)	13. (4)	14. (3)	15. (1)	16. (5)	17. (2)	18. (2)	19. (3)	20. (3)
21. (1)	22. (2)	23. (1)	24. (4)	25. (3)	26. (5)	27. (2)	28. (1)	29. (1)	30. (2)
31. (1)	32. (4)	33. (2)	34. (1)	35. (3)	36. (2)	37. (2)	38. (3)	39. (3)	40. (1)
41. (2)	42. (1)	43. (1)	44. (4)	45. (3)	46. (4)	47. (5)	48. (1)	49. (2)	50. (1)
51. (4)	52. (4)	53. (1)	54. (3)	55. (5)	56. (4)	57. (5)	58. (3)	59. (5)	60. (1)
61. (3)	62. (3)	63. (2)	64. (5)	65. (4)	66. (2)	67. (4)	68. (4)	69. (3)	70. (1)
71. (4)	72. (1)	73. (2)	74. (5)	75. (2)	76. (1)	77. (3)	78. (4)	79. (3)	80. (1)
81. (3)	82. (1)	83. (2)	84. (1)	85. (2)	86. (4)	87. (1)	88. (3)	89. (4)	90. (1)
91. (2)	92. (5)	93. (2)	94. (3)	95. (2)	96. (1)	97. (1)	98. (2)	99. (5)	100. (5)
101. (3)	102. (5)	103. (3)	104. (3)	105. (3)	106. (2)	107. (3)	108. (3)	109. (4)	110. (5)
111. (2)									

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CHAPTER

05

DATA REPRESENTATION

Data representation refers those methods which are used internally to represent information stored in a computer. Computers store lots of different types of information as numbers, text, graphics, sounds, etc.

Number System

It defines a set of values that is used to represent *quantity*. Digital computers internally use the binary number system to represent data and perform arithmetic calculations.

Types of Number System

The number systems generally used by a computer are as follows

Binary Number System

This system is very efficient for computers, but not for humans. It contains only two unique digits 0's and 1's. It is also known as *Base 2* system. A string, which has any combination of these two digits (0 and 1 are called a bit) is called binary number. The computer always calculates input in binary form.
e.g. $(10101)_2$

Here, 2 represents base of binary number.

> *A list of the first several power of 2 is*
> $2^0 = 1,\ 2^1 = 2,\ 2^2 = 4,\ 2^3 = 8,\ 2^4 = 16,\ 2^5 = 32,$
> $2^6 = 64,\ 2^7 = 128,\ 2^8 = 256,\ 2^9 = 512,$
> $2^{10} = 1024,\ 2^{11} = 2048$

Decimal Number System

The number system that we use in our day-to-day life is decimal number system.

It consists of 10 digits from 0 to 9. These digits can be used to represent any numeric value. It is also known as *Base 10* system or positional number system. e.g. $(1275)_{10}$, $(10406)_{10}$

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Octal Number System

It consists of 8 digits from 0 to 7. It is also known as *Base 8* system. Each position of the octal number represents a successive power of eight.

A list of the first several powers of 8 *is*
$8^0 = 1, 8^1 = 8, 8^2 = 64, 8^3 = 512, 8^4 = 4096, 8^5 = 32768$

Representation of Octal Numbers in Binary

Octal	Binary Digits
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Hexadecimal Number System

It provides us with a shorthand method of working with binary numbers. There are 16 unique digits available in this system.

These are 0 to 9 and *A* to *F*, where *A* denotes 10, *B* denotes 11, ..., *F* denotes 15.

It is also known as Base 16 system or simply Hex.

So, each position of the hexadecimal number represents a successive power of 16.

A list of the first several powers of 16 *is*
$16^0 = 1, 16^1 = 16, 16^2 = 256,$
$16^3 = 4096, 16^4 = 65536$

Decimal, Binary and Hexadecimal Equivalents

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Conversion between the Number Systems

Different types of conversion between the number systems are discussed below

Decimal to Binary

To convert decimal to binary, following steps are involved

***Step* 1** Divide the given number by 2.

***Step* 2** Note the quotient and remainder. Remainder should be 0 or 1.

***Step* 3** If quotient $\neq 0$, then again divide the quotient by 2 and back to step 2.
If quotient = 0, then stop the process.

***Step* 4** First remainder is called as **Least Significant Bit** (LSB) and last remainder is called as **Most Significant Bit** (MSB).

***Step* 5** Arrange all remainders from MSB to LSB.

Example $(43)_{10} \rightarrow (?)_2$

		Remainder
2	43	1 → LSB
2	21	1
2	10	0
2	5	1
2	2	0
2	1	1 → MSB
	0	

Then, $(43)_{10} \rightarrow (101011)_2$

Binary to Decimal

To convert binary to decimal, following steps are involved

***Step* 1** Multiply the all binary digits by powers of 2.

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Step 2 The power for integral part will be positive and for fractional part will be negative.

Step 3 Add the all multiplying digits.

Example $(1101.10)_2 \rightarrow (?)_{10}$

$$(1101.10)_2 = 1\times 2^3 + 1\times 2^2 + 0\times 2^1 + 1\times 2^0 + 1\times 2^{-1} + 0\times 2^{-2}$$
$$= 8 + 4 + 0 + 1 + 0.5 + 0 = 13.5$$

Then, $(1101.10)_2 \rightarrow (13.5)_{10}$

Binary to Octal

To convert binary to octal, following steps are involved

Step 1 Make the group of 3 bits from right to left. If the left most group has less than 3 bits, put in the necessary number of leading zeroes on the left.

Step 2 Now, convert each group to decimal number.

Example $(110110100)_2 \rightarrow (?)_8$

110	110	100
↓	↓	↓
6	6	4

Then, $(110110100)_2 \rightarrow (664)_8$

Octal to Binary

Convert every digit of the number from octal to binary in the group of 3 bits.

Example $(1034.5)_8 \rightarrow (?)_2$

1	0	3	4	5
↓	↓	↓	↓	↓
001	000	011	100	101

Then, $(1034.5)_8 \rightarrow (001000011100.101)_2$

Binary to Hexadecimal

To convert a binary number to its hexadecimal equivalent, follow these steps

Step 1 Start making the group of 4 bits each from right to left from the given binary number. If the left most group has less than 4 bits, put in the necessary number of leading 0's on the left.

Step 2 Now, each group will be converted to decimal number.

Example $(11110101111011)_2 \rightarrow (?)_{16}$

0011	1101	0111	1011
↓	↓	↓	↓
3	13	7	11
	D		*B*

Then, $(11110101111011)_2 \rightarrow (3D7B)_{16}$

Hexadecimal to Binary

For this type of conversion, convert each hexadecimal digit to 4 bits binary equivalent.

Example $(BA81)_{16} \rightarrow (?)_2$

B = 11	*A* = 10	8	1
↓	↓	↓	↓
1011	1010	1000	0001

Then, $(BA81)_{16} \rightarrow (1011101010000001)_2$

Decimal to Octal

To convert decimal to octal, following steps are involved

Step 1 Divide the given number by 8.

Step 2 Note the quotient and remainder. Digits of remainder will be from 0 to 7.

Step 3 If quotient ≠ 0, then again divide the quotient by 8 and go back to step 2.

Step 4 If quotient = 0 or less than 8 then stop the process.

Step 5 Write each remainder from left to right starting from MSD to LSD.

Example $(97647)_{10} \rightarrow (?)_8$

8	97647	7 LSD
8	12205	5 ↑
8	1525	5 |
8	190	6 |
8	23	7 |
8	2	2 MSD
	0	

Then, $(97647)_{10} \rightarrow (276557)_8$

Octal to Decimal

To convert octal to decimal, following steps are involved

Step 1 Multiply each digit of octal number with powers of 8.

Step 2 These powers should be positive for integral part and negative for fractional part.

Step 3 Add the all multiplying digits.

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Example $(327.4)_8 \rightarrow (?)_{10}$

$$(327.4)_8 = 3\times 8^2 + 2\times 8^1 + 7\times 8^0 + 4\times 8^{-1}$$
$$= 3\times 64 + 2\times 8 + 7\times 1 + \frac{4}{8}$$
$$= 192 + 16 + 7 + 0.5 = 215.5$$

Then, $(327.4)_8 \rightarrow (215.5)_{10}$

Decimal to Hexadecimal

To convert decimal to hexadecimal, following steps are involved

***Step* 1** Divide the given number by 16.

***Step* 2** Note the quotient and remainder. Digits of remainder will be 0 to 9 or A to F.

***Step* 3** If quotient ≠ 0, then again divide the quotient by 16 and go back to step 2.

***Step* 4** If quotient = 0 or less than 16, then stop the process.

***Step* 5** Write each remainder from left to right starting from MSD to LSD.

Example $(929987)_{10} \rightarrow (?)_{16}$

16	929987	3	LSD
16	58124	$12 \rightarrow C$	↑
16	3632	0	
16	227	3	
16	14	$14 \rightarrow E$	MSD
	0		

Then, $(929987)_{10} \rightarrow (E\,30\,C\,3)_{16}$

Hexadecimal to Decimal

To convert hexadecimal to decimal, following steps are involved

***Step* 1** Multiply each digit of hexadecimal number with powers of 16.

***Step* 2** These powers should be positive for integral part and negative for fractional part.

***Step* 3** Add the all multiplying digits.

Example $(BC9.8)_{16} \rightarrow (?)_{10}$ $(BC\,9.\,8)_{16}$

$$= B\times 16^2 + C\times 16^1 + 9\times 16^0 + 8\times 16^{-1}$$
$$= 11\times 256 + 12\times 16 + 9\times 1 + \frac{8}{16}$$
$$= 2816 + 192 + 9 + 0.5 = 3017.5$$

Then, $(BC9.8)_{16} \rightarrow (3017.5)_{10}$

Octal to Hexadecimal

To convert octal to hexadecimal, following steps are involved

***Step* 1** Convert the each digit of octal number to binary number.

***Step* 2** Again, convert each binary digit to hexadecimal number.

Example $(7632)_8 \rightarrow (?)_{16}$

Now,

7	6	3	2
↓	↓	↓	↓
111	110	011	010

$(7632)_8 \rightarrow (111\,110\,011\,010)_2$

1111	1001	1010
↓	↓	↓
15	9	10
F		A

Then, $(7632)_8 \rightarrow (F9A)_{16}$

Hexadecimal to Octal

To convert hexadecimal to octal, following steps are involved

***Step* 1** Convert the each digit of hexadecimal number to binary number.

***Step* 2** Again, convert each binary digit to octal number.

Example $(AC2D)_{16} \rightarrow (?)_8$

A	C	2	D
↓	↓	↓	↓
1010	1100	0010	1101

Now, $(AC2D)_{16} \rightarrow (1010\,1100\,0010\,1101)_2$

001	010	110	000	101	101
↓	↓	↓	↓	↓	↓
1	2	6	0	5	5

Then, $(AC2D)_{16} \rightarrow (126055)_8$

Computer Codes

In computer, any character like alphabet, digit or special character is represented by collection of 1's and 0's in a unique coded pattern. In computers, the code is made up of fixed size groups of binary positions. *The binary coding schemes that are most commonly used are as follows*

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BCD

BCD stands for Binary Coded Decimal. This system was developed by IBM. It is a number system where *four bits* are used to represent each decimal digits. BCD is a method of using binary digits to represent the decimal digits (0-9). In BCD system, there is no limit on size of a number.

ASCII

ASCII stands for American Standard Code for Information Interchange. These are standard character codes used to store data so that it may be used by other software programs. Basically, *ASCII codes are of two types which as follows*

(i) **ASCII-7** It is a *7-bit* standard ASCII code. It allows $2^7 = 128$ (from 0 to 127) unique symbols or characters.

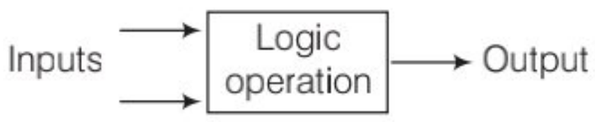
(ii) **ASCII-8** It is an extended version of ASCII-7. It is an *8-bit* code, allows $2^8 = 256$ (0 to 255) unique symbols or characters.

EBCDIC

EBCDIC stands for Extended Binary Coded Decimal Interchange Code. In EBCDIC, characters are represented by eight bits. These codes store information which is readable by other computers. It allows $2^8 = 256$ combination of bits.

Logic Gate

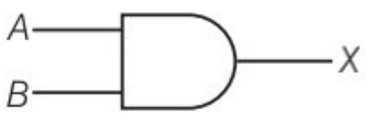
It is a basic building block of a digital circuit that has two inputs and one output. The relationship between the input and the output is based on a certain logic. These gates are implemented using electronic switches like transistors, diodes.



Types of Logic Gate

There are various types of logic gate as follows:

1. **AND Gate** This gate is also represented by (·) like $(A \cdot B)$. In AND gate, it returns True only if both the conditions or inputs are True otherwise it returns False.

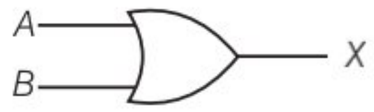


Truth Table of AND Gate

A	*B*	*X*
0	0	0
0	1	0
1	0	0
1	1	1

$\therefore \quad X = A \cdot B$

2. **OR Gate** This is represented by (+) like $(A + B)$. It returns True if any one of the conditions or inputs is True and if both conditions are False then it returns False.

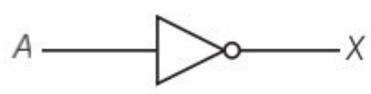


Truth Table of OR Gate

A	*B*	*X*
0	0	0
0	1	1
1	0	1
1	1	1

$\therefore \quad X = A + B$

3. **Inverter or NOT Gate** This gate is also represented by (′) like A'. In NOT gate, it returns True if input is false and vice-versa.

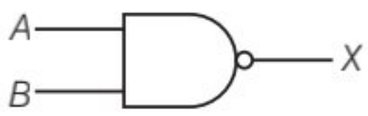


Truth Table of NOT Gate

A	$X = A'$
0	1
1	0

4. **NAND Gate** It is basically the inverse of the AND gate. This gate is designed by combining the AND and NOT gates.

   It returns False only if the both conditions or inputs are True otherwise it returns True.



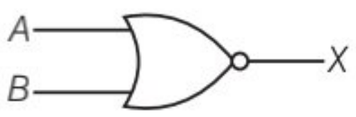
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Truth Table of NAND Gate

A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

$$X = (\overline{A \cdot B}) = \overline{A} + \overline{B}$$

5. **NOR Gate** It is an inverse of an OR gate. This gate is designed by combining the OR and NOT gates. It returns True only if both the conditions or inputs are False otherwise it returns False.



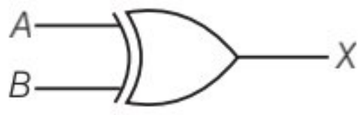
Truth Table of NOR Gate

A	***B***	***X***
0	0	1
0	1	0
1	0	0
1	1	0

$$X = (\overline{A + B}) = \overline{A} \cdot \overline{B}$$

Note NAND and NOR gates are also called universal gates.

6. **Exclusive-OR or XOR Gate** It performs based on the operation of OR gate. It returns True only if one condition is true from both the conditions otherwise it returns False.



Truth Table of XOR Gate

A	***B***	***X***
0	0	0
0	1	1
1	0	1
1	1	0

$$X = A \oplus B$$

$$X = \overline{A}B + A\overline{B}$$

Tit-Bits

- **UNICODE** uses 16-bits to represent a symbol in the data. It represents any non-english character, scientific symbol in any language like Chinese, Japanese.
- Sign bit is the most significant bit, i.e. used to represent the sign of a number that could be either +ve or −ve.
- One's complement of binary number is defined as the value obtained by inverting all the bits

  e.g. 110100

  One's complement is

  001011

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QUESTION BANK

1. There are how many types of number system?
(1) One (2) Two
(3) Three (4) Four

2. Modern computers represent characters and numbers internally using one of the following number systems.
(1) Penta (2) Octal
(3) Hexa (4) Septa
(5) Binary

3. In the binary language, each letter of the alphabet, each number and each special character is made up of a unique combination of
(1) 8 bytes (2) 8 KB
(3) 8 characters (4) 8 bits

4. To perform calculation on stored data computer, uses ..... number system.
(1) decimal (2) hexadecimal
(3) octal (4) binary

5. Which of the following is not a binary number? **[IBPS Clerk 2011]**
(1) 001 (2) 101
(3) 202 (4) 110
(5) 011

6. The number system based on '0' and '1' only, is known as
(1) binary system
(2) barter system
(3) number system
(4) hexadecimal system

7. Binary system is also called
(1) base one system (2) base two system
(3) base system (4) binary system

8. Which of the following is an example of binary number? **[IBPS Clerk 2011]**
(1) 6AH1 (2) 100101
(3) 005 (4) ABCD
(5) 23456

9. Numbers that are written with base 10 are classified as
(1) decimal number
(2) whole number
(3) hexadecimal number
(4) exponential integers
(5) Mantissa

10. Decimal number system is the group of ..... numbers.
(1) 0 or 1 (2) 0 to 9
(3) 0 to 7 (4) 0 to 9 and A to F

11. The octal system **[IBPS Clerk 2011]**
(1) needs less digits to represent a number than in the binary system
(2) needs more digits to represent a number than in the binary system
(3) needs the same number of digits to represent a number as in the binary system
(4) needs the same number of digits to represent a number as in the decimal system
(5) None of the above

12. A hexadecimal number is represented by
(1) three digits (2) four binary digits
(3) four digits (4) All of these

13. Hexadecimal number system has ..... base.
(1) 2 (2) 8 (3) 10 (4) 16

14. Hexadecimal number system consists of
(1) 0 to 9 (2) A to F
(3) Both '1' and '2' (4) Either '1' or '2'

15. A hexadigit can be represented by **[IBPS Clerk 2012]**
(1) three binary (consecutive) bits
(2) four binary (consecutive) bits
(3) eight binary (consecutive) bits
(4) sixteen binary (consecutive) bits
(5) None of the above

16. Which of the following is invalid hexadecimal number?
(1) A0XB (2) A0F6
(3) 4568 (4) ACDB

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17. What type of information system would be recognised by digital circuits?
(1) Hexadecimal system
(2) Binary system
(3) Both '1' and '2'
(4) Only roman system

18. The binary equivalent of decimal number 98 is **[IBPS Clerk 2012]**
(1) 1110001 (2) 1110100
(3) 1100010 (4) 1111001
(5) None of these

19. Conversion of decimal number $(71)_{10}$ to its binary number equivalent is **[IBPS Clerk 2012]**
(1) $(110011)_2$ (2) $(1110011)_2$
(3) $(0110011)_2$ (4) $(1000111)_2$
(5) None of these

20. Conversion of decimal number $(61)_{10}$ to its binary number equivalent is **[IBPS Clerk 2012]**
(1) $(110011)_2$ (2) $(11001110)_2$
(3) $(111101)_2$ (4) $(11111)_2$
(5) None of these

21. What is the value of the binary number 101?
(1) 3 (2) 5 (3) 6 (4) 101

22. Decimal equivalent of $(1111)_2$ is **[IBPS Clerk 2012]**
(1) 11 (2) 10 (3) 1 (4) 15
(5) 13

23. $(1010)_2$ equivalent decimal number is
(1) 8 (2) 9 (3) 10 (4) 11

24. The binary number 10101 is equivalent to decimal number .....
(1) 19 (2) 12
(3) 27 (4) 21

25. Which of the following is octal number equivalent to binary number $(110101)_2$?
(1) 12 (2) 65
(3) 56 (4) 1111

26. Which of the following is a binary number equivalent to octal number $(.431)_8$?
(1) $(100011001)_2$ (2) $(.100011001)_2$
(3) $(100110100)_2$ (4) $(.100110001)_2$

27. To convert binary number to decimal, multiply the all binary digits by power of
(1) 0 (2) 2 (3) 4 (4) 6

28. Which of the following is hexadecimal number equivalent to binary number $(1111\ 1001)_2$?
(1) 9F (2) FF (3) 99 (4) F9

29. Conversion of binary number $(1001001)_2$ to hexadecimal is **[SBI PO 2011]**
(1) $(40)_{16}$ (2) $(39)_{16}$
(3) $(49)_{16}$ (4) $(42)_{16}$
(5) None of these

30. Conversion of binary number $(101110)_2$ to hexadecimal is **[SBI PO 2011]**
(1) $(35)_{16}$ (2) $(46)_{16}$
(3) $(2E)_{16}$ (4) $(50)_{16}$
(5) None of these

31. Which of the following is the correct binary form of $4A2.8D_{16}$? **[IBPS PO Mains 2017]**
(1) 010010100010.10001101_2
(2) 010110100010.11101101_2
(3) 011110100010.10001101_2
(4) 010010111110.10001101_2
(5) None of the above

32. Which of the following is an octal number equal to decimal number $(896)_{10}$?
(1) 0061 (2) 6001
(3) 1006 (4) 1600

33. Conversion of decimal number $(42)_{10}$ to its octal number equivalent is
(1) $(57)_8$ (2) $(42)_8$
(3) $(47)_8$ (4) $(52)_8$

34. Determine the octal equivalent of $(432267)_{10}$
(1) $(432267)_8$ (2) $(346731)_8$
(3) $(2164432)_8$ (4) $(123401)_8$
(5) None of these

35. Determine the decimal equivalent of $(456)_8$
(1) $(203)_{10}$ (2) $(302)_{10}$
(3) $(400)_{10}$ (4) $(402)_{10}$

36. Conversion of octal number $(3137)_8$ to its decimal equivalent is
(1) $(1631)_{10}$ (2) $(1632)_{10}$
(3) $(1531)_{10}$ (4) $(1931)_{10}$

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37. Conversion of decimal number $(15)_{10}$ to hexadecimal number is
(1) $(14)_{16}$ (2) $(13)_{16}$
(3) $(F)_{16}$ (4) $(7F)_{16}$

38. Conversion of decimal number $(93)_{10}$ to hexadecimal number is
(1) $(2D)_{16}$ (2) $(5D)_{16}$
(3) $(62)_{16}$ (4) $(31)_{16}$

39. Which of the following is a hexadecimal number equal to 3431 octal number?
(1) 197 (2) 917
(3) 791 (4) 971
(5) 719

40. The method used for the conversion of octal to decimal fraction is
(1) digit is divided by 8
(2) digit is multiplied by the corresponding power of 8
(3) digit is added with 8
(4) digit is subtracted with 8

41. MSD refers as
(1) Most Significant Digit
(2) Many Significant Digit
(3) Multiple Significant Digit
(4) Most Significant Decimal

42. LSD stands for
(1) Long Significant Digit
(2) Least Significant Digit
(3) Large Significant Digit
(4) Longer Significant Decimal

Directions (43 and 44) *Triangle represents Δ (1) and circle represents o (0). If triangle appears in unit's place then its value is 1. If it appears in 10's place its value is doubled to 2 like that it continues. Using the given terminology answer the following questions. For example.*

$\Delta = 1$

$\Delta^{\circ}\Delta = 4, 0, 1 = 4 + 0 + 1$

$\Delta o = 2$ **[IBPS PO Mains 2017]**

43. How will you represent '87' in this code language?
(1) oΔΔΔoΔΔ (2) ΔoΔoΔΔΔ
(3) ΔΔoΔΔΔΔ (4) ΔooΔooΔ
(5) ΔΔoΔΔΔo

44. What will be the code for ΔΔoooΔo?
(1) 98 (2) 95
(3) 96 (4) 94
(5) 99

45. How many values can be represented by a single byte?
(1) 4 (2) 16 (3) 64 (4) 256

46. Which of the following is not a computer code?
(1) EBCDIC (2) ASCII
(3) CISC (4) UNICODE

47. ASCII stands for **[IBPS Clerk 2011,2014]**
(1) American Special Computer for Information Interaction
(2) American Standard Computer for Information Interchange
(3) American Special Code for Information Interchange
(4) American Special Computer for Information Interchange
(5) American Standard Code for Information Interchange

48. The most widely used code that represents each character as a unique 8-bit code is **[IBPS Clerk 2011]**
(1) ASCII (2) UNICODE
(3) BCD (4) EBCDIC
(5) None of these

49. Today's mostly used coding system is/are
(1) ASCII (2) EBCDIC
(3) BCD (4) Both '1' and '2'

50. In EBCDIC code, maximum possible characters set size is
(1) 356 (2) 756 (3) 556 (4) 256

51. Code 'EBCDIC' that is used in computing stands for
(1) Extension BCD Information Code
(2) Extended BCD Information Code
(3) Extension BCD Interchange Conduct
(4) Extended BCD Interchange Conduct

52. Most commonly used codes for representing bits are
(1) ASCII (2) BCD
(3) EBCDIC (4) All of these

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53. The coding system allows non-english characters and special characters to be represented
(1) ASCII (2) UNICODE
(3) EBCDIC (4) All of these

54. Which of the following character set supports Japanese and Chinese fonts? **[IBPS Clerk Mains 2017]**
(1) EBCDIC
(2) ASCII
(3) BC
(4) ECBI
(5) UNICODE

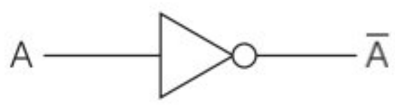
55. Two inputs A and B of NAND gate have 0 output, if
(1) A is 0 (2) B is 0
(3) both are zero (4) both are 1

56. Gate having output 1 only when one of its input is 1 is called
(1) AND (2) NOT
(3) OR (4) NOR

57. Gate is also known as inverter.
(1) OR (2) NOT
(3) XOR (4) NAND

58. The only function of NOT gate is to .....
(1) Stop signal
(2) Invert input signal
(3) Act as a universal gate
(4) Double input signal
(5) Half input signal

59. Following diagram depicts which logic gate? **[IBPS PO Mains 2017]**



(1) NOR Gate (2) NOT Gate
(3) OR Gate (4) NAND Gate
(5) None of these

60. The NAND gate is AND gate followed by .....
(1) NOT gate (2) OR gate
(3) AND gate (4) NOR gate
(5) XOR gate

61. The NOR gate is OR gate followed by .....
(1) AND gate (2) NAND gate
(3) NOT gate (4) OR gate
(5) XOR gate

62. The NOR gate output will be high if the two inputs are
(1) 00 (2) 01
(3) 10 (4) 11
(5) None of these

63. Which of following are known as universal gates?
(1) NAND & NOR (2) AND & OR
(3) XOR & OR (4) AND
(5) OR

64. Gate whose output is 0 only when inputs are different is called
(1) XOR (2) XNOR
(3) NOR (4) NAND
(5) None of these

65. If Δ represents '1' and represents o. What will be the one's complement of oΔΔooΔ? **[IBPS PO Mains 2017]**
(1) 011001 (2) 100110
(3) 101010 (4) 000000
(5) 111111

ANSWERS

1. *(4)*	2. *(5)*	3. *(4)*	4. *(4)*	5. *(3)*	6. *(1)*	7. *(2)*	8. *(2)*	9. *(1)*	10. *(2)*
11. *(1)*	12. *(2)*	13. *(4)*	14. *(3)*	15. *(4)*	16. *(1)*	17. *(3)*	18. *(3)*	19. *(4)*	20. *(3)*
21. *(2)*	22. *(4)*	23. *(3)*	24. *(4)*	25. *(2)*	26. *(2)*	27. *(2)*	28. *(4)*	29. *(3)*	30. *(3)*
31. *(1)*	32. *(4)*	33. *(4)*	34. *(5)*	35. *(2)*	36. *(1)*	37. *(3)*	38. *(2)*	39. *(5)*	40. *(2)*
41. *(1)*	42. *(2)*	43. *(2)*	44. *(1)*	45. *(4)*	46. *(3)*	47. *(5)*	48. *(1)*	49. *(4)*	50. *(4)*
51. *(2)*	52. *(4)*	53. *(2)*	54. *(5)*	55. *(4)*	56. *(3)*	57. *(2)*	58. *(2)*	59. *(2)*	60. *(1)*
61. *(3)*	62. *(1)*	63. *(1)*	64. *(1)*	65. *(2)*					

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CHAPTER

06

COMPUTER SOFTWARE

Software is a collection of computer programs and related data that provide the instructions for telling a computer what to do and how to do. A software is an interface between the user and the computer hardware. It is responsible for controlling, integrating and managing the hardware components of a computer system and for accomplishing specific tasks.

Types of Software

Software can be divided into two major categories

1. System software
2. Application software

System Software

It consists of several programs, which are directly responsible for controlling, integrating and managing the individual hardware components of a computer system. System software also provides the interface between the user and components of the computer. Depending on the functionality, the system software can be further divided into following categories:

1. **Operating System** It consists of programs which control, coordinate and supervise the activities of the various components of a computer system. Its function is to provide link between the computer hardware and the user. It provides an environment to run the programs. e.g. MS-DOS, Windows XP/2000/98, Unix, Linux, etc.

   The operating system performs the following functions

   (i) It recognises input from keyboard, sends output to the display screen.
   (ii) It makes sure that programs running at the same time do not interfere with each other.
   (iii) It is also responsible for security, ensuring that unauthorised users do not access the system.

BIOS

The Basic Input/Output System (BIOS) is commonly known as **System BIOS.** The BIOS controls various electronic components within the main computer system. The initial function of the BIOS is to initialise system devices such as the RAM, hard disk, CD/DVD drive, video display card and other hardwares.

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2. **Device Drivers** A software, which is written with the objective of making a device functional when it is connected to the computer is called device driver. It is a system software that acts like an interface between the device and the user.

   Every device, whether it is a printer, monitor, mouse or keyboard has a driver program associated with it for its proper functioning.
3. **Language Translator** It helps in converting programming languages to machine language. The translated program is called object code. There are three different kinds of language translator : Assembler, Compiler and Interpreter.

Linker

It is a system program that links together several object modules and libraries to form a single and coherent program (executable). The main purpose of linker is to resolve references among files. Linker is used to determine the memory locations that code from each module will occupy and relates its instruction by adjusting absolute references.

Loader

It is a kind of system software which is responsible for loading and relocation of the executable program in the main memory. It is a part of operating system that brings an executable file residing on disk into memory and starts its execution process.

Application Software

It is a computer software designed to help the user to perform single or multiple tasks. It is a set of instructions or programs designed for specific uses or applications, that enable the user to interact with a computer. Application softwares are also called the end-user programs. These programs do the real work for users.

There are two types of application software

General Purpose Software

These softwares are those softwares which are used for any general purpose. They allow people to do simple computer tasks.

Some of the general purpose software are as follows

1. **Word Processing Software** A word processor is a software program capable of creating, storing and printing of documents. Word processors have the ability to create a document and make changes anywhere in the document.

   Today, the word processor is one of the most frequently used programs or online services used on a computer system.

   e.g. Microsoft Word, WordPerfect (Windows only), AppleWorks (Mac only), OpenOffice.org Writer, etc.
2. **Electronic Spreadsheets** Spreadsheet applications (sometimes referred to simply as spreadsheets) are the computer programs that accept data in a tabular form and allow you to create and manipulate spreadsheets electronically.

   The relationship between cells are called **Formulas** and the names of the cells are called **Labels**. e.g. Microsoft Excel, Corel Quattro Pro, Lotus 1-2-3, OpenOffice.org Calc, etc.
3. **Presentation Software** Presentation is the practice of showing and explaining the contents of a topic to an audience or a learner visually. People, in a variety of settings and situations, use presentation software to make their presentations more interesting and professional.

   e.g. Microsoft PowerPoint, Corel Presentations, Lotus Freelance Graphics, OpenOffice.org Impress, etc.
4. **Database Management System** (DBMS) A DBMS refers to the software that is responsible for sorting, maintaining and utilising a database.

   It enables a user to define, create and maintain the database and provide controlled access on it. e.g. Microsoft Access, Corel Paradox, MySQL, OpenOffice.org Base, etc.

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5. **Desktop Publishing (DTP) Software** It is a tool for graphic designers and non-designers to create visual communications for professional or desktop printing as well as for online or on screen electronic publishing.
   e.g. Quark XPress, Adobe PageMaker, 3B2, CorelDraw, Corel Ventura, Illustrator, etc.
6. **Graphics Software** (Image Editing) It is an application program or collection of programs that enables a person to manipulate visual images on a computer system. Most graphics softwares have the ability to import and export one or more graphics file formats.
   e.g. DirectX, Adobe Photoshop, piZap, Microsoft Publisher, Picasa, etc.
7. **Multimedia Software** Multimedia includes a combination of text, audio, still images, animation, video or interactivity content forms. e.g. Macro-Media Flash, Xilisoft Video Converter, VLC Media Player, Nimbuzz, etc.

Specific Purpose Software

These softwares are designed to perform specific tasks. This type of application software generally has one purpose to execute.

Some of the specific purpose application softwares are described below

1. **Inventory Management System and Purchasing System** Inventory is a list of goods and materials available in a stock. Inventory management system is generally used in departmental stores or in an organisation to keep the records of the stock of all the physical resources.
   e.g. Fishbowl, AdvancePro, etc.
2. **Payroll Management System** It is used by all modern organisations to encompass every employee of the organisation who receives a regular wages or other compensation. e.g. Namely, UltiPro, etc.
3. **Hotel Management System** It refers to the management techniques used in the hotel sector. These can include hotel administration, accounts, billing, marketing, housekeeping, front office or front desk.
   e.g. Djubo, Aatithya HMS, Hotelogix PMS, etc.
4. **Reservation System** A reservation system or Central Reservation System (CRS) is a computerised system used to store and retrieve information and conduct transactions related to air travel, hotels, car rental or other activities. Today, number of websites like www.yatra.com, www.makemytrip.com provide online booking for tourists.
5. **Report Card Generator** It is an application software which is commonly used in schools by the examination department to prepare and generate the report cards of the students.
6. **Accounting Software** It is an application software that records and processes accounting transactions within functional modules such as accounts payable, accounts receivable, payroll and trial balance. e.g. Tally. ERP9, HDPOS, MARG, Profit book etc.
7. **Billing System** It refers to the software that is used to perform the billing process. It handles the tracking of labled products and services delivered to a customer or set of customers. e.g. Billing Manager, Billing Tracker, kBilling, etc.

System Utilities

These programs perform tasks related to the maintenance of the computer system. These are the packages which are loaded into computer during time of installation of operating system. They are used to support, enhance, expand and secure existing programs and data in the computer system.

System utility mainly consists of the following functions

1. **Disk Compression** It increases the amount of information that can be stored on a hard disk by compressing all information stored on a hard disk. e.g. DiskDoubler, SuperStor Pro, DoubleDisk Gold , etc.

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2. **Disk Fragmenter** It detects computer files whose contents are broken across several locations on the hard disk and moves the fragments to one location to increase efficiency. It can be used to rearrange files and unused space on your hard disk. e.g. MyDefrag, Diskeeper, Defraggler, etc.
3. **Backup Utilities** It can make a copy of all information stored on a disk and restore either the entire disk or selected files.
4. **Disk Cleaners** It is used to find files that have not been used for a long time. This utility also serves to increase the speed of a slow computer. e.g. Bleach Bit cleaner, etc.
5. **Anti-virus** It is the utility which is used to scan computer for viruses and prevent the computer system files from being corrupt. e.g. Kaspersky, AVG, McAfee, Avira, etc.
6. **Text Editor** It is a program that facilitates the creation and correction of text. A text editor supports special commands for text editing, i.e. you can write, delete, find and replace words, lines, paragraphs, etc. e.g. MS-Word, WordPad, Notepad etc, in which Notepad is the most popular text editor.

Tit-Bits

- **Adobe Page Maker** is a typesetting tool formely widely used for desktop publishing.
- **Fully Backup** contains a copy of every program, data and system file on a computer.
- **Firmware** is a combination of software and hardware. e.g. ROMs, PROMs and EPROMs.
- **Freeware** is commonly used for copyrighted software that is given away for free by its owner.
- **CAD** (Computer Aided Design) **Software** is used by architects, engineers, drafters and other to create precision drawings.

QUESTION BANK

1. The term used to describe the intangible instructions that tell the computer what to do is **[IBPS Clerk 2015]**

(1) hardware (2) software
(3) storage (4) input/output
(5) None of these

2. Software refers to **[IBPS Clerk 2012]**

(1) the physical components that a computer is made of
(2) firmware
(3) programs
(4) people ware
(5) None of these

3. Which of the following is software? **[IBPS Clerk 2014]**

(1) Keyboard
(2) Internet Explorer
(3) Scanner
(4) Mouse
(5) Printer

4. The primary purpose of software is to turn data into **[RBI Grade B 2014]**

(1) information (2) programs
(3) objects (4) charts
(5) websites

5. Computer software is **[SBI Clerk 2015]**

(1) used only for output (2) a computer peripheral
(3) used for input (4) a set of instructions
(5) used only in operating systems

6. The steps and tasks needed to process data, such as responses to questions or clicking an icon, are called

(1) instructions (2) the operating system
(3) application software (4) the system unit

7. The two broad categories of software are

(1) word processing and spreadsheet
(2) transaction and application
(3) Windows and Mac OS
(4) system and application

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8. System software
(1) allows the user to diagnose and troubleshoot the device
(2) is a programming language
(3) is a part of productivity suite
(4) is an optional form of software
(5) helps the computer manage internal resources

9. The programs designed to govern the computer hardware system are called the
(1) system software (2) application software
(3) utility software (4) All of these

10. A collection of various programs that helps control your computer is called **[SBI Clerk 2015]**
(1) system software (2) application software
(3) Microsoft Excel (4) Microsoft Word
(5) Microsoft Outlook

11. This type of software works with end-users, application software and computer hardware to handle the majority of technical details. **[RBI Grade B 2014, IBPS PO 2012]**
(1) Communications software
(2) Application software
(3) Utility software
(4) System software
(5) None of the above

12. It is the set of programs that enables your computers hardware device and application software to work together. **[SBI PO 2010]**
(1) Management (2) Processing
(3) Utility (4) System software
(5) None of these

13. A(n) ..... is a software that helps a computer control to operate efficiently and keep track of data.
(1) application system (2) hardware system
(3) software system (4) operating system

14. A computer cannot 'boot' if it does not have the **[Union Bank of India Clerk 2012]**
(1) compiler (2) loader
(3) operating system (4) assembler
(5) None of these

15. The ..... tells the computer how to use its components. **[IBPS Clerk 2011]**
(1) utility (2) application
(3) operating system (4) network
(5) None of these

16. Operating system is a
(1) application software (2) system software
(3) hardware (4) language

17. The ..... manual tells you how to use a software program. **[RBI Grade B 2012]**
(1) documentation (2) programming
(3) user (4) technical
(5) designer

18. What does the acronym BIOS stand for? **[SBI Clerk 2014, RBI Grade B 2013]**
(1) Basic Input/Outer System
(2) Basic Internal Output System
(3) Basic Inner/Output System
(4) Basic Input/Output Systemisation
(5) Basic Input/Output System

19. ..... includes boot firmware and power management. **[SBI Clerk 2015]**
(1) CD-ROM (2) Internal buses
(3) BIOS (4) Chip Set
(5) RAM

20. In order for a peripheral to operate correctly, its ..... must be installed.
(1) device driver
(2) user interface
(3) internet connection
(4) operating system

21. Which of the following is a system software?
(1) Database programs (2) Word processors
(3) Spreadsheets (4) Device drivers

22. ..... helps in converting programming language to machine language.
(1) Operating system (2) Device driver
(3) Language translator (4) Linker

23. A linker program
(1) places the program in the memory for the purpose of execution
(2) relocates the program to execute from the specific memory area allocated to it

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(3) links the program with other programs needed for its execution
(4) interfaces the program with the entities generating its input data

24. The main purpose of ..... is to resolve references among files. **[SBI PO 2012]**
(1) text editor (2) loader
(3) antivirus (4) linker
(5) None of these

25. Which of the following system software resides in main memory always? **[IBPS Clerk 2011]**
(1) Text editor (2) Assembler
(3) Linker (4) Loader
(5) None of these

26. A kind of system software, which is responsible for loading and relocating of the executable program in the main memory
(1) loader (2) linker
(3) translator (4) presentation software

27. Specialised program that allows user to utilise in specific application is classified as **[IBPS RRB PO Mains 2017]**
(1) relative program
(2) application program
(3) appropriate program
(4) replicate program
(5) logical program

28. ..... is a software which is used to do particular task. **[IBPS Clerk Mains 2017]**
(1) Operating system (2) Program
(3) Data software (4) Data
(5) Application software

29. Software designed for a specific purpose/ application such as pay calculations, processing of examination result, etc are known as
(1) utility software (2) system software
(3) application software (4) customised software

30. Application software **[IBPS Clerk 2011]**
(1) is used to control the operating system
(2) is designed to help programmers
(3) performs specific task for computer users
(4) is used for making design only
(5) All of the above

31. The software that is used to create text-based documents are referred to as ..... **[SBI PO 2013]**
(1) DBMS
(2) suites
(3) spreadsheets
(4) presentation software
(5) Word processors

32. Which of the following general purpose softwares allow you to do mathematical or financial calculation?
(1) Word processing program
(2) Spreadsheet program
(3) Presentation prgram
(4) Database program

33. Spreadsheet software is used
(1) to keep simple company accounts,
(2) calculate employee commission payments
(3) as simple stock control system
(4) All of the above

34. Which software is used to create presentations to show to customers or staff members?
(1) Report Generation
(2) Graph Generator
(3) Presentation software
(4) Picture generator

35. Database software is used to
(1) discard sales records
(2) store contacts list
(3) keep customer records
(4) generate report

36. DTP is a tool for graphic designers and non-designers to create visual communications for professional. DTP stands for
(1) Device Transfer Protocol
(2) Desktop Publishing
(3) Device Transfer Programs
(4) All of the above

37. Corel Ventura, Illustrator are the examples of
(1) Word Processing (2) Graphic
(3) Multimedia (4) Spreadsheet
(5) DTP

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38. DirectX is a **[RBI Grade B 2013]**
(1) computer part
(2) a user interface
(3) operating system
(4) software that drives graphic software
(5) None of the above

39. Which among the following is not an example of a system software?
(1) Operating system (2) Debugger
(3) Software Driver (4) Adobe Photoshop

40. Which application software is used for a special purpose? **[IBPS RRB PO Mains 2018]**
(1) General purpose software
(2) Special purpose software
(3) Important software
(4) System software
(5) None of the above

41. Which types of software is used in organisations to keep track of products in stocks?
(1) Enterprise Resource Planning (ERP) software
(2) Payroll Software
(3) Human resource planning software
(4) Accounting software
(5) Inventory management software

42. A software program that adds functionality to your computer or help your computer perform better is called as **[IBPS RRB PO Mains 2017]**
(1) utility program
(2) function program
(3) specialised program
(4) manufacturer program
(5) compiling program

43. Which of the following techniques can be used to store a large number of files in a small amount of storage space?
(1) File adjustment (2) File copying
(3) File compatibility (4) File compression

44. What type of software creates a smaller file that is faster to transfer over the Internet? **[IBPS Clerk Mains 2017]**
(1) Compression (2) Fragmentation
(3) Unzipped (4) Abstraction
(5) Encapsulation

45. ..... is a Windows utility program that locates and eliminates unnecessary fragments and rearranges files and unused to disk space to optimise operations. **[SBI PO 2013]**
(1) Backup (2) Disk cleanup
(3) Disk defragmenter (4) Restore
(5) Disk restorer

46. When files are broken up into small parts on a disk they are said to be
(1) fragmented (2) contiguous
(3) sectored (4) disbursed

47. It can make copies of all information stored on a disk or either restore the entire disk
(1) Restore utility (2) Disk cleaner
(3) Backup software (4) Defragmenter

48. What is backup? **[Union Bank 2011, RBI Grade B 2012]**
(1) Connect his network to more component
(2) Copy to save a data from original source to other destination
(3) Filter on old data from new data
(4) Access data from tape
(5) None of the above

49. A(n) ..... backup contains a copy of every program, data and system file on a computer. **[Allahabad Bank Clerk 2011]**
(1) restoration (2) bootstrap
(3) differential (4) full
(5) None of these

50. Disk cleaner helps to free
(1) data (2) recycle bin
(3) spaces (4) information

51. They can find files that are unnecessary to computer operation, or take up considerable amounts of space.
(1) Antivirus (2) Sweep
(3) Disk cleaner (4) Disk Formatting

52. Which of the following Windows utilities erase unneeded files?
(1) Backup or Restore Wizard
(2) Disk Cleanup
(3) Disk Defragmenter
(4) Antivirus

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53. Text editor is a/an **[RBI Grade B 2013]**
(1) application software (2) system software
(3) utility software (4) all purpose software
(5) None of these

54. Which of the following is not related to a utility software?
(1) Text editor
(2) Antivirus program
(3) Disk compression software
(4) Railway reservation system

55. Utility programs include
(1) virus scanning software
(2) backup software
(3) disk defragmenter
(4) All of the above

56. Which of the following is an example of utility software?
(1) Text editor (2) Backup utility
(3) Compression utility (4) Disk defragmenter
(5) All of these

57. Which of the following is not related to an application software?
(1) Word processor
(2) DBMS
(3) Operating system
(4) Railway reservation system

58. ..... disk encryption is a technology (hardware or software) where data is encrypted before storage. **[SCC CGL 2017]**
(1) Half (2) Whole
(3) Double (4) Triple

59. ..... means that their source code is not available.
(1) Fireware (2) Freeware
(3) Freefall (4) Firmware

60. In computer terminology, 'CAD' stands for
(1) Computer Applied Design **[SBI PO 2014]**
(2) Computer Algorithm and Design
(3) Computer Application Design
(4) Computer Aided Design
(5) Other than those given as options

ANSWERS

1. *(2)*	2. *(3)*	3. *(2)*	4. *(1)*	5. *(4)*	6. *(1)*	7. *(4)*	8. *(5)*	9. *(1)*	10. *(1)*
11. *(4)*	12. *(4)*	13. *(4)*	14. *(3)*	15. *(3)*	16. *(2)*	17. *(3)*	18. *(5)*	19. *(3)*	20. *(1)*
21. *(4)*	22. *(3)*	23. *(3)*	24. *(4)*	25. *(4)*	26. *(1)*	27. *(2)*	28. *(5)*	29. *(3)*	30. *(3)*
31. *(5)*	32. *(2)*	33. *(4)*	34. *(3)*	35. *(3)*	36. *(2)*	37. *(5)*	38. *(4)*	39. *(4)*	40. *(2)*
41. *(5)*	42. *(1)*	43. *(4)*	44. *(1)*	45. *(3)*	46. *(1)*	47. *(3)*	48. *(2)*	49. *(4)*	50. *(3)*
51. *(3)*	52. *(2)*	53. *(3)*	54. *(4)*	55. *(4)*	56. *(5)*	57. *(3)*	58. *(2)*	59. *(2)*	60. *(4)*

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CHAPTER

07

OPERATING SYSTEM

An Operating System (OS) is a program which acts as an interface between the user and the computer hardware. The interface enables a user to utilise hardware resources very efficiently. Operating system is an organised collection or integrated set of specialised programs that controls the overall operations of a computer. It is a program that must be on any computer for proper booting.

Functions of Operating System

Following functions are provided by an operating system to the convenience of users

Process Management It is a process by which operating system can control the planning, monitoring and performance of a CPU. A process is the basic unit of execution in the operating system.

Memory Management It is a process of controlling and coordinating computer memory. It ensures that all processes are able to access their memory or not.

File Management It is the main function of operating system. It manages all data files in a computer system.

Device Management It is a process of managing the operation and maintenance of input/output devices. It also facilitates the interface between all the connected devices.

Types of Operating System

Types of an operating systems are as follows

1. Batch Processing Operating System

In this operating system, a number of jobs are put together and executed as a group. This operating system is a responsible for scheduling the jobs according to priority and the resource required. e.g. Unix.

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2. Single User Operating System

It is a type of operating system which allows only one user at a time. Operating system for personal computer (PC) is a single user OS. They are designed to manage one task at a time.

e.g. MS-DOS, Windows 9X.

3. Multi User Operating System

This OS allows multiple users to access a computer system concurrently. It is used in computer networks that allows same data and applications to be accessed by multiple users at the same time. e.g. VMS.

4. Multi-Tasking Operating System

In this operating system, more than one processes can be executed concurrently. It also allows the user to switch between the running applications. e.g. Linux, Unix, Windows 95.

Multi-tasking OS further classified into two types

(i) **Preemptive Multitasking OS** It is a type of multitasking that allows computer programs to share operating system and underlying hardware resources.

(ii) **Cooperative Multitasking OS** It is the simplest form of multitasking. In it, each program can control the CPU for as long as it need it.

5. Time Sharing Operating System

This operating system allows multiple programs to simultaneously share the computer resources. It provides to each process to be run on. e.g. Mac OS.

6. Real Time Operating Sytem (RTOS)

These operating systems are designed to respond to an event within a predetermined time. They are often used in applications such as flight reservation system, military applications, etc. is types of operating system increase the availability and reliability of the system. e.g. Linux etc.

There are two types of real time operating system

(i) **Hard Real Time OS** In this RTOS, all the tasks are required to be completed within the specified time limits.

(ii) **Soft Real Time OS** In this RTOS, all the tasks are not required to be completed within the specified time limits.

User Interface

The user interface is one of the most important parts of any operating system. It allows users to easily access and communicate with the applications and the hardware. *The user can interact with the computer by using mainly two kinds of interface*

1. Graphical User Interface (GUI)

It is a computer program that enables a person to communicate with a computer through the use of symbols, visual metaphors and pointing devices. It is best known for its implementation in Apple products.

The first graphical user interface was designed by Xerox Corporation in 1970s. GUIs can be found in handheld devices such as MP3 players, portable media players, gaming devices, etc.

2. Character User Interface (CUI)

It is also known as Command Line Interface (CLI). CUI is a mechanism of interacting with a computer system or software by typing, commands to perform specific tasks. CUI only uses text types one after another just as commands used in MS-DOS.

Booting

Booting is starting up a computer or computer appliance until it can be used. It can be initiated by hardware such as a Start button or by software command. There are two types of booting

- ***Cold Booting*** *When a computer is turned ON after it has been completely shutdown.*
- ***Warm Booting*** *When a computer is restarted by pressing the combination of Ctrl + Alt + Del keys or by restart button.*

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Some Important Operating Systems

Some popular operating systems are as follows

1. **UNIX** The first version of Unix was developed in 1969 by Ken Thompson and Dennis Ritchie. It is primarily used to a server rather than a workstation and should not be used by anyone who does not understand the system.
2. **Apple Macintosh** (Mac OS) It was introduced in January, 1984 by Steve Jobs and was initially named as system software, which was later renamed as Mac OS.
3. **LINUX** The first Linux Kernel was released in September, 1991 by Linus Torvalds. It is an open source software. Linux is similar to Unix in operations. It is difficult to understand by anyone.
4. **Microsoft Windows** It is an operating system, based on GUI, developed by Microsoft. Microsoft first introduced an operating environment named Windows in November 1985 in response to the growing interest in GUIs.

Mobile Operating System

This OS operates on Smartphones, Tablets and Digital Mobile devices. It controls mobile devices and its design supports wireless communication and different types of mobile applications. It has built-in support for mobile multimedia formats.

Some popular mobile operating systems are as follows

1. **Android** It is a mobile OS developed by Google, which is based on Linux (Main part of operating system). It is basically designed for touch screen mobile devices like Tablets, Smartphones etc. Now-a-days, it is most common used in mobile phones. The latest version of Android is Pie which was released on 6th August, 2018.
2. **Symbian** It is the OS developed and sold by Symbian Ltd. It is an open source mobile OS designed for Smartphones. It has been used by many major handset manufacturers including Motorola, Nokia, Samsung, Sony etc. The latest version of Symbian is Nokia Belle which was released in October 2012.
3. **iOS** It is the popular mobile operating system developed by Apple Incorporation. This operating system is commonly used in Apple iPhone, iPod Touch, iPad etc. The latest version of iOS is iOS 11.4.1 which was released on 9th July, 2018.
4. **BlackBerry** It is the most secure operating system used in leading Smartphones developed by BlackBerry company. It also supports WAP 1.2. The latest version of BlackBerry is BlackBerry OS 10.3.3 which was released in 2016.

MS-DOS (Microsoft-Disk Operating System)

The DOS OS was developed by Microsoft in 1980 for micro computers. MS-DOS was the first operating system that run on PC developed by IBM corporation in 1981. DOS is a single user operating system. It is only operating system which can be loaded in the main memory of the computer using a single disk.

Structure of DOS

There are four essential programs associated with the control of computer and the way it interacts with them.

1. **The Boot Record** It includes loading the operating system into main memory. It is the main program of MS-DOS.
2. **The Basic Input/Output System** (BIOS. sys) It provides an interface between the hardware and programs.
3. **The MSDOS. sys Program** It is a collection of program routines and data tables that provides high level programs such as application programs.
4. **The Command.com Program** It provides a standard set of commands that gives users access to file management, configuration and miscellaneous functions.

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Configuration of DOS

Config. sys, Autoexec. bat and files provide the environment to computer to set commands.

(i) **Config. sys** It adjusts the system acoording to commands.

(ii) **Autoexec.bat** When the system is powered on, this file executes in automatically command line.

Important Extensions and their Meaning

Extensions	Meaning
.exe	Executable files
.com	Command files
.bat	Batch files
.doc	Document files
.txt	Text files
.prg	Program files
.ovr	Over lays
.sys	System files

Types of MS-DOS Commands

There are two kinds of MS-DOS command, Internal and External.

1. **Internal Commands** These commands are automatically loaded into main memory when the booting process gets completed.
   e.g. DATE, TIME, VER, VOL, DIR, COPY, CLS, etc.
2. **External Commands**
   These commands require external files to be loaded in the computer to run.
   e.g. Checking disk, comparing disk, formatting, etc.

Important Commands and their Uses

Commands	Description
CALL	Call one batch program from another
CD	Change Directory-move to a specific folder
CLS	Clear the screen
COPY	Copy one or more files to another location
DATE	Display or set the date
DEL	Delete one or more files
DIR	Display a list of files and folders
ERASE	Delete one or more files
EDIT	View and edit files
EXIT	Quit the current script/routine and set an error level
FORMAT	To erase and prepare the disk drive
IF	Conditionally perform a command
MD	Create new folders
MOVE	Move files from one folder to another
PATH	Display or set a search path for executable files
PRINT	Prints data to a printer port
REN	Rename a file or directory
RD	Remove an empty directory
SORT	Sort input and displays the output to the screen
START	Start a program, command or batch file
TIME	Display or set the system time
TYPE	Display the contents of a text file
VER	Display version information
XCOPY	Copy multiple files, directories, or drives from one location to another

Tit-Bits

- **Spooling** is the process of sending data to a spool (or buffers or temporary storage area) of computer's memory.
- **Kernel** is the core of the operating system that supports the process by providing a path to the peripheral devices.
- **Shell** is the program which interprets commands given by the user.
- **Thread** is a task that runs with other tasks concurrently within the same process.

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QUESTION BANK

1. Which of the following is the type of software that controls the internal operations in the computer and controls how the computer works well all its parts?
(1) Shareware **[RBI Grade B 2012]**
(2) Public domain software
(3) Application software
(4) Operating system software
(5) None of the above

2. ..... controls the way in which the computer system functions and provides a means by which users can interact with the computer.
(1) The operating system
(2) The motherboard
(3) The platform
(4) Application software

3. A collection of programs that controls how your computer system runs and processes information is called **[IBPS Clerk 2014]**
(1) operating system (2) computer
(3) office (4) compiler
(5) interpreter

4. It is the program that manages the hardware of the computer system including the CPU, memory storage devices and input/output devices.
(1) Software (2) Operating system
(3) hardware (4) System software

5. An operating system is a/an **[SSC CGL 2013]**
(1) accounting software
(2) application software
(3) system software
(4) utility software

6. Which of the following is the correct reason to use an operating system?
(1) To manage resources
(2) To control the hardware
(3) To provide an interface between the hardware and user
(4) To make the system user friendly
(5) All of these

7. The primary purpose of the Windows operating system is
(1) to make the most efficient use of the computer hardware
(2) to allow people to use the computer
(3) to keep systems programmer's employed
(4) to make computers easier to use

8. Every computer has a(n) ....., many also have ..... **[RBI Grade B 2014]**
(1) operating system; a client system
(2) operating system; instruction sets
(3) application programs; an operating system
(4) application programs; a client system
(5) operating system; application programs

9. Which of the following is/are function of operating system?
(1) User interface
(2) File system manipulation
(3) Resource allocation
(4) All of the above

10. A program in execution is called
(1) process (2) instruction
(3) procedure (4) function

11. Memory utilisation factor shall be computed as
(1) memory in use/allocated memory
(2) memory in use/total memory connected
(3) memory allocated/free existing memory
(4) memory committed/total memory available
(5) None of the above

12. Which one of the following is not the function of operating system?
(1) Resource Management
(2) File Management
(3) Networking
(4) Processor Management

13. When a file contains instruction that can be carried out by the computer, it is often called a(n) ..... file.
(1) data (2) information
(3) executable (4) application
(5) None of these

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14. Grouping and processing all of a firm's transactions at one time, is called **[IBPS Clerk 2011]**

(1) a database management system
(2) batch processing (3) a real time system
(4) on-time system (5) None of these

15. ..... is used for very large files or where a fast response time is not critical. The files to be transmitted are gathered over a period and then send together as a batch.

(1) Batch processing (2) Online processing
(3) File processing (4) Data processing

16. Which of the following system is a function of dedicated PCs?

(1) Meant for a single user
(2) Meant for the single task
(3) Deal with single software
(4) Deal with only editing

17. Windows operating system is ..... and ..... .

(1) multitasking, multiuser
(2) multi user, single tasking
(3) single user, multitasking
(4) single tasking, singleuser

18. Operating system that allows only one user to work on a computer at a time is known as **[IBPS Clerk 2015]**

(1) single user operating system
(2) multiuser operating system
(3) single tasking operating system
(4) multitasking operating system
(5) real time operating system

19. An operating system is said to be multiuser, if

(1) more than one programs can run simultaneously
(2) more than one users can work simultaneously
(3) Either '1' or '2'
(4) None of the above

20. ..... provides process and memory management services that allow two or more tasks, jobs or programs to run simultaneously.

(1) Multitasking
(2) Multithreading
(3) Multiprocessing
(4) Multicomputing

21. Which of the following terms explains the execution of more than one file at the same on a single processor?

(1) Single tasking (2) Multi-tasking
(3) Scheduling (4) Multiprocessing

22. ..... is a feature for scheduling and multi-programming to provide an economical interactive system of two or more users. **[IBPS Clerk 2012]**

(1) Time sharing (2) Multisharing
(3) Time tracing (4) Multiprocessing
(5) None of these

23. The simultaneously processing of two or more programs by multiple processors, is **[IBPS Clerk 2011]**

(1) Multiprogramming (2) Multitasking
(3) Time sharing (4) Multiprocessing
(5) None of these

24. Real time systems must have

(1) pre-emptive kernels
(2) non-pre-emptive kernels
(3) Both '1' and '2'
(4) Either '1' or '2'

25. RTOS stands for

(1) Real-Time Operating System
(2) Reliable Time Operating System
(3) Reboot Time Operating System
(4) None of the above

26. System running more than one process concurrently are called **[SSC CGL 2016]**

(1) Multiprocessing
(2) Multiprogramming
(3) Real time
(4) Batch processing

27. Which of the following refers to the means by which an OS or any other program interacts with the user? **[SBI Clerk 2014]**

(1) Program front-end (2) Programming interface
(3) User login (4) User interface
(5) User compatibility

28. The first graphical user interface was designed by

(1) Apple Inc. (b) Microsoft
(3) Xerox Corporation (d) None of these

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29. ..... only uses text types one after another just as commands used in MS-DOS
(1) CUI (2) CLI
(3) Both '1' and '2' (4) GUI

30. Which process checks to ensure the components of the computer are operating and connected properly? **[SBI PO 2012]**
(1) Booting (2) Processing
(3) Saving (4) Editing
(5) None of these

31. What happens when you boot up a PC? **[RBI Grade B 2012]**
(1) Portions of the operating system are copied from disk into memory
(2) Portions of the operating system are copied from memory onto disk
(3) Portions of the operating system are complied
(4) Portions of the operating system are emulated
(5) The PC gets switched off

32. What do you understand by the term 'booting'? **[RBI Grade B 2012]**
(1) The process of starting the computer from the power-off position
(2) Connecting computer of the electric switch
(3) Increasing the memory of the computer
(4) The process of shut down the computer
(5) None of the above

33. Restart of computer is called ..... when computer is already ON.
(1) cold booting (2) warm booting
(3) shut down (4) logging off
(5) None of these

34. The first version of Unix was developed by
(1) Ken Thompson (2) Presper Eckert
(3) J W Mauchly (4) Herman Hollerith

35. The PC (Personal Computer) and the Apple Macintosh are examples of two different
(1) platforms (2) applications
(3) programs (4) storage devices

36. Which of the following is an operating system? **[SBI Clerk 2014]**
(1) Linux (2) Debugger
(3) Mozilla (4) Google Chrome
(5) Intel 8085

37. Linux is a type of ..... software. **[IBPS Clerk 2011]**
(1) shareware (2) commercial
(3) proprietary (4) open source
(5) hidden type

38. Which of these is not a part of the UNIX operating system?
(1) Kernel (2) Shell
(3) Programs (4) Linux

39. Windows software was developed by a company called
(1) Microsoft Corporation
(2) IBM (3) Wipro
(4) Apple

40. Which of the following is the latest version of MS Windows?
(1) Windows 7 (2) Windows 8
(3) Windows 14 (4) Windows 8.2

41. WINDOWS, UNIX and LINUX are called ..... .
(1) Application (2) Operating system
(3) Hardware (4) System

42. Which among the following is not a mobile operating system? **[IBPS PO 2016]**
(1) Android (2) Safari
(3) Symbian (4) iOS
(5) BlackBerry

43. Which of the following operating systems was first developed by Microsoft?
(1) Windows ME (2) Windows NT
(3) Windows 97 (4) Windows XP
(5) MS-DOS

44. Which one of the following file names is invalid in DOS? **[RBI Grade B 2013]**
(1) RIT. bat (2) LISTEN.bin
(3) RLUA.btt (4) TALK.bas
(5) None of these

45. Which one of the following DIR commands lists a group of files? **[RBI Grade B 2013]**
(1) DIR INVOICE.bas (2) DIR RESCUE.bas
(3) DIR PAYROLL.bas (4) DIR TOOL?.bas
(5) None of these

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46. 'DOS' floppy disk/operating system does not have **[SBI PO 2014]**
(1) a boot record (2) a file allocation table
(3) a root directory (4) a virtual memory
(5) All of the above

47. Which file in MS-DOS contains internal commands that are loaded during booting process?
(1) CONFIG.sys (2) MSDOS.sys
(3) BIOS.sys (4) COMMAND.com

48. What is the name of the batch file that is automatically run when MS-DOS is booted?
(1) Config.sys (2) Config. bat
(3) Autoexe.bat (4) Run.bat

49. MS-DOS is usually supplied on a
(1) hard disk (2) cartridge tape
(3) CD ROM (4) floppy disk
(5) None of these

50. Which of the following is the main program of MS-DOS?
(1) Boot Record (2) ID.sys
(3) MSDOS.sys (4) Command.com
(5) All of these

51. Which of the following operating systems is also known as single user operating system?
(1) Windows (2) Linux
(3) Unix (4) DOS
(5) None of these

52. The main difference between Windows and DOS is the ability to
(1) multitasking (2) speed up
(3) run a program (4) run without power
(5) None of these

53. '>' symbol in DOS commands is used to **[SBI Clerk 2007]**
(1) compare two values (2) redirect input
(3) redirect output (4) filter data
(5) None of these

54. Usually, in MS-DOS, the primary hard disk drives has the drive letter ..... . **[RBI Grade B 2012]**
(1) A (2) B
(3) C (4) D
(5) None of these

55. Which of the following is not usual file extension in DOS? **[RBI Grade B 2012]**
(1) .exe (2) .bat
(3) .0 (4) .com
(5) None of these

56. Which commands are automatically loaded into main memory?
(1) Internal (2) External
(3) Viral (4) Situational
(5) None of these

57. Which type of commands in MS-DOS needs external files to perform their action?
(1) Internal commands (2) External commands
(3) Batch commands (4) Redirectories
(5) None of these

58. Which one of the following DOS commands sends contents of the screen to an output device? **[RBI Grade B 2013]**
(1) BREAK (2) DISK COPY
(3) MORE (4) ASSIGN
(5) None of these

59. Which of the following is not an external command of DOS?
(1) LABEL (2) FORMAT
(3) CHKDSK (4) CLS

60. CHKDSK can be used to find
(1) disk's bad portion (2) occupied space
(3) free space (4) All of these

61. While working with MS-DOS, which command transfers a specific file from one disk to another?
(1) Copy (2) Disk copy
(3) Time (4) Rename
(5) Date

62. DEL command is used to
(1) delete files (2) delete directory
(3) delete lables (4) delete contents of file
(5) Both '1' and '2'

63. This command is used to display a list of files and sub-directories that are in the directory you specify.
(1) DER (2) DIS
(3) DIR (4) DAR
(5) None of these

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64. The purpose of DISKCOPY command is to **[RBI Grade B 2014]**
(1) format the disk if it is not formatted before a write operation is initiated on it
(2) overwrite the existing contents of the destination disk as it copies the new information to it
(3) make an exact copy of a floppy disk
(4) All of the above
(5) None of the above

65. Which command is used to delete file from a directory in DOS? **[SBI Clerk 2007]**
(1) REN (2) DEL (3) CD (4) MD
(5) None of these

66. In MS-DOS, which of the following commands is used to delete directory with all sub-directories and files?
(1) Delete (2) Del (3) Deltree (4) Move
(5) None of these

67. Which one of the following DOS commands sends contents of the screen to an output device?
(1) BREAK (2) DISK COPY
(3) MORE (4) ASSIGN

68. In DOS, the DIR command is used to
(1) display content of a file **[SSC CGL 2013]**
(2) delete file
(3) display list of files and sub-directories
(4) copy files

69. The DOS command, which cannot be executed with versions 1 and 2 is **[RBI Grade B 2014, RBI Grade B 2013]**
(1) GRAPHICS (2) FIND
(3) LABEL (4) MODE
(5) None of these

70. Which of the following is not an internal command of DOS?
(1) VER (2) COPY
(3) FORMAT (4) VOL
(5) TIME

71. Which one of the following is an MS-DOS external command? **[SSC CHSL 2012]**
(1) DIR (2) COPY
(3) FORMAT (4) PROMPT

72. A command, in DOS, used to set a name to a disk, is
(1) VOL (2) REN
(3) LABEL (4) CLS

73. In DOS, the 'label' command is used to
(1) create the label of disk **[SBI Clerk 2007]**
(2) change the label of disk
(3) remove the label of disk
(4) Both '1' and '2'
(5) All of the above

74. Which of the following is not an operating system?
(1) Windows (2) DOS
(3) Linux (4) Unix
(5) CP/M

75. The process of transferring data intended for a peripheral device into a disk, so that it can be transferred to peripheral at a more convenient time or in bulk, is known as
(1) multiprogramming
(2) spooling
(3) caching
(4) virtual programming

ANSWERS

1. *(4)*	2. *(1)*	3. *(1)*	4. *(2)*	5. *(3)*	6. *(5)*	7. *(4)*	8. *(5)*	9. *(4)*	10. *(1)*
11. *(2)*	12. *(3)*	13. *(3)*	14. *(2)*	15. *(1)*	16. *(1)*	17. *(3)*	18. *(1)*	19. *(2)*	20. *(1)*
21. *(2)*	22. *(1)*	23. *(4)*	24. *(1)*	25. *(1)*	26. *(2)*	27. *(4)*	28. *(3)*	29. *(3)*	30. *(1)*
31. *(1)*	32. *(1)*	33. *(2)*	34. *(1)*	35. *(1)*	36. *(1)*	37. *(4)*	38. *(4)*	39. *(1)*	40. *(2)*
41. *(2)*	42. *(2)*	43. *(5)*	44. *(3)*	45. *(4)*	46. *(5)*	47. *(3)*	48. *(3)*	49. *(1)*	50. *(1)*
51. *(2)*	52. *(1)*	53. *(3)*	54. *(3)*	55. *(3)*	56. *(1)*	57. *(2)*	58. *(5)*	59. *(4)*	60. *(4)*
61. *(1)*	62. *(5)*	63. *(3)*	64. *(4)*	65. *(2)*	66. *(3)*	67. *(2)*	68. *(3)*	69. *(3)*	70. *(3)*
71. *(3)*	72. *(3)*	73. *(4)*	74. *(5)*	75. *(2)*					

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CHAPTER

08

PROGRAMMING CONCEPTS

Program can be defined as a set of instructions that need to be executed to accomplish a computing task. A person who writes or performs the program is known as programmer. Programmer uses some specific languages to write program which is known as programming languages e.g. C++, Java, etc.

Programming Language

It is a set of commands, instructions and other syntax use to create a software program. Programming language must be simple, easy to learn and use. It must be consistent in terms of syntax and semantics.

Programming languages are mainly categorised into three parts which are as follows

Low Level Language (LLL)

These programming languages are more difficult to understand. It is designed to operate and handle the entire instruction set of a computer system directly which are generally used to write the system software. e.g. Machine language and Assembly language.

1. **Machine Language** It is the only language understood by the computers. Sometimes, it referred to as machine code or object code or binary language. It is a collection of binary digits (0 or 1) or bits that the computer reads and interprets.
2. **Assembly Language** It is a low level programming language which is used as an interface with computer hardwares. It uses structured commands as substitutions for numbers, allowing humans to read the code easier than looking at binary codes.

Medium Level Language (MLL)

It serves as the bridge between raw hardware and programming layer of a computer system. It is designed to improve the translated code before it is executed by the processor. e.g. C.

High Level Language (HLL)

It is an advanced computer programming language that is not limited to one computer, designed for a specific job and is easier to understand. The main advantage of high level languages over low level languages is that they are easier to read, write and understand. e.g. BASIC, C, FORTRAN, Java, Pascal, etc.

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Some High Level Languages and Their Application Areas

Language	Year	Developer	Application Area	Nature
FORTRAN (Formula Translation)	1957	a team of programmers at IBM	Calculation	Compiled
ALGOL (Algorithmic Language)	1958	A commitee of European and American computer scientists	Scientific purpose	Compiled
LISP (List Processing)	1958	John McCarthy at the Massachusetts Institute of Technology (MIT)	Artificial intelligence	Compiled and Interpreted
COBOL (Common Business Oriented Language)	1959	Grace Hopper	Business management, string oriented	Compiled
BASIC (Beginner's All purpose Symbolic Instruction Code)	1964	John G. Kemeny and Thomas E. Kurtz at Dartmouth College in New Hampshire	Programming for educational purpose	Interpreted
Pascal	1970	Niklaus Wirth	Education	Compiled
C	1972	Dennis Ritchie at Bell Labs	System programming	Compiled
C ++	1985	Bjarne Stroustrup at Bell Labs	System object programming	Compiled
Java	1995	James Gosling at Sun Microsystems	Internet oriented programming	Compiled and Interpreted

Terms Related to Programming

Program Documentation

It is a kind of documentation that gives a comprehensive procedural description of a program. It shows as to how software is written. The program documentation describes what exactly a program does by mentioning about the requirements of the input data and effect of performing a programming task.

OOPs

OOPs stands for Object Oriented Programming in which programs are considered as a collection of objects. Each object is nothing but an instance of a class.

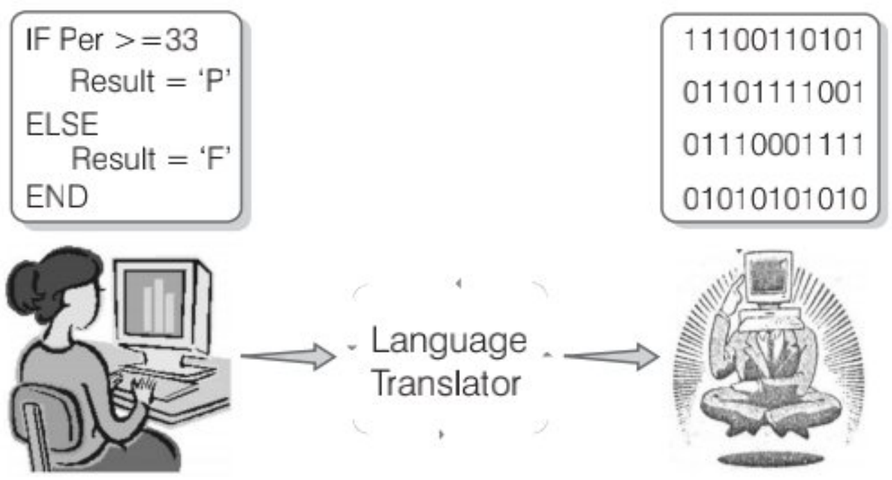
De-Bugging

It is the process of locating and fixing or bypassing bugs (errors) in computer program code.

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Language Translator

It helps in converting programming languages to machine language.



The translated program is called the object code. Depending upon used programming languages, *language translator is divided into three categories which are as follows*

1. **Assembler** It converts a program written in assembly language into machine language. Assembly language consists of mnemonic code, which are difficult to learn and are machine dependent.
2. **Interpreter** It converts a HLL program into machine language by converting it line-by-line. If there is any error in any line, it stops the execution of the program immediately and reports to the user at the same time. Program execution cannot resume until the error is rectified by the user. Interpreter is very useful for debugging and suitable for novice programmer. This is a slow process and consumes less memory space.
3. **Compiler** It converts HLL program into machine language, which can be understood by the processor. For each high level language, the machine requires a separate compiler. A compiler creates a unique object program, i.e. if a source program is compiled, there is no need of that source program because output can be obtained by executing that object program. Compiler converts the entire HLL program in one go and reports all the errors of the program alongwith the line numbers.

Generation of Languages

The concept of language generations, sometimes called levels, is closly connected to the advances in technology that brought about computer generations. *The five generations of language are as follows*

(i) The first generation languages or 1 GLs are low level languages like machine language.

(ii) The second generation languages or 2GLs are also low level languages that generally consist of assembly language.

(iii) The third generation languages or 3GLs are high level languages such as Java.

(iv) The fourth generation languages or 4GLs are the languages that consist of statements similar to the statements of human language. 4GLs are commonly used in database programming and scripting programming.

(v) The fifth generation languages or 5GLs are programming languages that contain visual tools, which help to develop a program. A good example of 5GLs is Visual Basic.

Error

An error in a program is called bug. It is a term used to describe any issue that arises unexpectedly that cause a computers not function properly.

Types of Error

The types of error are classified into four categories which are as follows

1. **Syntax Error** When the rules of the programming language are not followed,the compiler will show syntax error.
2. **Semantic Error** Semantic errors are reported by the compiler when the statements written in the program are not meaningful to the compiler.
3. **Logical Error** Logical errors are those errors that occur in the output of the program.The presence of logical errors leads to undesired or incorrect output.
4. **Runtime Error** Runtime errors are those errors that occur during the execution of a program.It generally occurs due to some illegal operation performed in the program.

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Algorithm

An algorithm is a step by step method of solving a problem. It is commonly used for data processing, calculation and other related computer and mathematical operations.

The desirable features of an algorithm are

(i) Each step of algorithm should be simple.
(ii) It must be in a finite number of steps.
(iii) It should be as efficient as possible.
(iv) It should be clear in the sense.
(v) It should be effective, i.e. it must lead to a unique solution of the problem.

Tit-Bits

- **Visual Basic** is an interpreted language.
- **Reserved words** are words that a programming language has set aside for its own use.
- **Pseudocode** is not a programming language, but simply an informal way of describing a program. It does not follow any syntax strictly.
- **Control structure** is a statement or block of statements in a programming language that determined the control flow or sequence of execution of other instructions or statements.
- **Looping** is a control structure which is used in a program to execute a particular set of statements repeatedly.

QUESTION BANK

1. The instructions that tell a computer how to carry out the processing tasks are referred to as computer **[IBPS PO 2015]**
(1) programs (2) processors
(3) input devices (4) memory modules
(5) None of these

2. A set of rules for telling the computer what operations to perform is called a **[IBPS PO 2012]**
(1) Procedural language (2) Structures
(3) Natural language (4) Command language
(5) Programming language

3. Which of the following contains specific rules and words that express the logical steps of an algorithm? **[IBPS Clerk 2014]**
(1) Programming language
(2) Syntax
(3) Programming structure
(4) Logical chart
(5) Flow chart

4. A (n) ..... program is one that is ready to run and does not need to be altered in any way. **[IBPS Clerk 2013]**
(1) interpreter (2) high level
(3) compiler (4) COBOL
(5) executable

5. A factor in the selection of source language is
(1) programmer skill (2) language availability
(3) program compatibility with other software
(4) All of the above

6. Languages which can easily interact with the hardware are called
(1) High level languages
(2) Low level languages
(3) Middle level languages
(4) All of the above

7. Machine language **[SBI PO 2013]**
(1) is the language in which programs were first written
(2) is the only language understood by the computer
(3) differs from one type of computer to another
(4) All of the above
(5) None of the above

8. The use of combination of 1's and 0's is feature of which of the following type of computer language? **[IBPS PO 2016]**
(1) High Level Language
(2) PASCAL
(3) Machine Language
(4) C
(5) COBOL

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9. Each model of a computer has a unique
(1) assembly of a computer
(2) machine language
(3) high level language
(4) All of the above

10. All computer execute
(1) BASIC programs
(2) COBOL programs
(3) Machine language programs
(4) FORTRAN programs

11. The language which can be relocated easily is
(1) Machine language (2) Assembly language
(3) Low level language
(4) Middle level language

12. Assembly language **[IBPS Clerk 2011]**
(1) uses alphabetic codes in place of binary numbers used in machine language
(2) is the easiest language to write programs
(3) need not be translated into machine language
(4) All of the above
(5) None of the above

13. Which language is CPU dependent ?
(1) C (2) Assembly
(3) Java (4) All except Java

14. ..... serves as the bridge between raw hardware and programming layer of a computer system.
(1) Medium level language
(2) Low level language
(3) High level language
(4) Both '1' and '2'

15. Which of the following is a machine independent program?
(1) High level language (2) Low level language
(3) Assembly language (4) Machine language

16. Computer language used for calculation is
(1) LOGO (2) FORTRAN
(3) BASIC (4) C + +

17. Which of the following computer language is a mathematically oriented language used for scientific problems?
(1) Fortran (2) Cobol
(3) Lisp (4) Prolog

18. FORTRAN stands for **[SBI Clerk 2011]**
(1) Formal Translation
(2) Formative Translation
(3) Formal Transaction
(4) Formula Transaction
(5) Formula Translation

19. Main application area of ALGOL is
(1) General (2) Scientific
(3) Engineering (4) Commercial

20. LISP is designed for
(1) artificial intelligence
(2) GUI
(3) CUI
(4) optical fibre

21. Lisp is the second oldest high level programming language. Here, Lisp stands for
(1) Level Program (2) Level Process
(3) List Processing (4) List Program

22. What does CO stand in COBOL? **[IBPS Clerk 2012]**
(1) Common Object
(2) Common Oriented
(3) Common Operating
(4) Computer Oriented
(5) None of the above

23. Which of the following is not characteristic of COBOL?
(1) It is a very standardised language
(2) It is a very efficient in terms of coding and execution
(3) It had limited facilities for mathematical notation
(4) It is very readable language

24. ..... is a string oriented.
(1) SNOBOL (2) COBOL
(3) PASCAL (4) PERL

25. A computer program used for business application is
(1) LOGO (2) COBOL
(3) BASIC (4) FORTRAN

26. C language developed by Dennis Ritchie in
(1) 1970 (2) 1971 (3) 1972 (4) 1973

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27. C++ language developed by **[IBPS Clerk 2012]**
(1) Dennis Ritchie (2) Charles Babbage
(3) Niklaus Wirth (4) Bjarne Stroustrup
(5) John McCharthy

28. Java is referred to as a **[SBI PO 2014]**
(1) high level language (2) complex language
(3) hardware device driver
(4) low level language
(5) programming mid level language

29. Computer language used on Internet is
(1) PASCAL (2) Java
(3) BASIC (4) LOGO

30. The language used for development of various games is
(1) C (2) C++ (3) Java (4) SQL

31. Which of the following is a programming language for creating special programs like Applets? **[IBPS Clerk 2012]**
(1) Java (2) Cable (3) Domain name
(4) Net (5) COBOL

32. Which among the following is/are interpreted language? **[SBI PO 2011]**
(1) C (2) C++
(3) Java (4) Visual Basic
(5) Both '3' and '4'

33. Which of the following is not a computer language ? **[SBI PO 2014]**
(1) BASIC (2) COBOL
(3) LOTUS (4) FORTRAN
(5) None of these

34. C, BASIC, COBOL and Java are examples of ..... languages. **[IBPS Clerk 2015]**
(1) Low level (2) Computer
(3) System programming
(4) High level
(5) None of these

35. ..... is a written description of a computer program's functions. **[SBI PO 2014]**
(1) Explanatory instructions
(2) Graphical user interface
(3) Plug and play
(4) README files
(5) Documentation

36. Translator program used in assembly language is called **[SBI Clerk 2012]**
(1) compiler (2) interpreter
(3) translation (4) translator
(5) assembler

37. The ..... program is used to convert mnemonic code to machine code. **[SBI Clerk 2011]**
(1) Debug (2) C++
(3) FORTRAN (4) Assembler
(5) None of these

38. The function of an assembler is **[IBPS PO 2011]**
(1) to convert basic language into machine language
(2) to convert high level language into machine language
(3) to convert assembly language into machine language
(4) to convert assembly language into low level language
(5) None of the above

39. An assembler is a
(1) programming language dependent
(2) syntax dependent
(3) machine dependent
(4) data dependent

40. Which of the following is not true about an assembler?
(1) Translates instructions of assembly language in machine language
(2) It translates the C program
(3) It is involved in program's execution
(4) It is a translating program

41. Compiler is the
(1) name given to the computer operator
(2) part of the digital machine to store the information
(3) operator of boolean algebra
(4) translator of source program to object code

42. Compiling creates a (n) **[RBI Grade B 2012]**
(1) Error-free program
(2) Program specification
(3) Subroutine
(4) Algorithm
(5) Executable program

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43. Computer programs are written in a high level programming language, however the human readable version of a program is called **[IBPS PO 2015]**

(1) Word size (2) Source code
(3) Instruction set (4) Application
(5) Hard drive

44. Second generation languages are languages that consists of

(1) machine language (2) assembly language
(3) Java (4) visual basic

45. Which of the following generation languages consist of statements similar to the statements of human language?

(1) 1GL (2) 2GL (3) 3GL (4) 4GL

46. Error in a program is called

(1) bug (2) debug (3) virus (4) noise

47. Error which occurs when program tried to read from file without opening it is classified as

(1) execution error messages
(2) built in messages
(3) user defined messages
(4) half messages
(5) None of the above

48. A set of step-by-step procedures for accomplishing a task is known as a (n) **[IBPS Clerk 2015]**

(1) Algorithm
(2) Hardware program
(3) Software
(4) Firmware program
(5) None of the above

49. ..... are words that a programming language has set aside for its own use. **[IBPS PO 2011]**

(1) Control words (2) Control structures
(3) Reserved words (4) Reserved keys
(5) None of these

50. ..... is a cross between human language and a programming language.

(1) Pseudocode **[IBPS PO 2012]**
(2) Java
(3) The Java virtual machine
(4) The compiler
(5) None of the above

51. In programming, repeating some statements is usually called **[SSC CGL 2013]**

(1) looping (2) control structure
(3) compiling (4) structure

ANSWERS

1. *(1)*	2. *(5)*	3. *(3)*	4. *(5)*	5. *(3)*	6. *(2)*	7. *(4)*	8. *(3)*	9. *(2)*	10. *(3)*
11. *(2)*	12. *(1)*	13. *(2)*	14. *(1)*	15. *(1)*	16. *(2)*	17. *(1)*	18. *(5)*	19. *(2)*	20. *(1)*
21. *(3)*	22. *(2)*	23. *(2)*	24. *(2)*	25. *(2)*	26. *(3)*	27. *(4)*	28. *(1)*	29. *(2)*	30. *(3)*
31. *(1)*	32. *(5)*	33. *(3)*	34. *(4)*	35. *(5)*	36. *(5)*	37. *(4)*	38. *(3)*	39. *(3)*	40. *(2)*
41. *(4)*	42. *(5)*	43. *(2)*	44. *(2)*	45. *(4)*	46. *(1)*	47. *(1)*	48. *(1)*	49. *(3)*	50. *(1)*
51. *(1)*									

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CHAPTER

09

MICROSOFT WINDOWS

Microsoft Windows stands for 'Microsoft- Wide Interactive Network Development for Office Work Solution.' Microsoft Windows is a series of graphical interface operating system developed, marketed and sold by Microsoft. A user can easily interact with the windows programs or applications by selecting relevant options, through the mouse or by entering characters through the keyboard.

Versions of MS-Windows

Some important versions of MS-Windows are as follows

Windows NT (New Technology)

A version of Windows introduced in July, 1993 and made specifically for businesses. It offers better control over workstation capabilities to help network administrators.

Features

(i) It is based on High Level Language.

(i) It is able to run on DOS, Windows 3 and Win 32 applications.

(iii) It has a 32-bit Windows applications.

(iv) It provides higher stability and security.

Windows 95

It is a graphical user interface based operating system. It was released on 24th August, 1995 by Microsoft.

Features

(i) It is a mixed of 16-bit/32-bit Windows operating system.

(ii) It is consumer-oriented.

(iii) It supports FAT32 file system, multi-display, Web TV and the Internet Explorer.

Windows 98

It was developed in 1998. This was produced in two main versions. The first Windows 98 version was plagued with programming errors but the Windows 98 second edition came out later was much better with many errors resolved.

Features

(i) It supports Internet Explorer 4.0.1.

(ii) Windows 98 was the first operating system to use the Windows Driver Model (WDM).

(iii) It includes a FAT32 converter utility for converting FAT16 drives to FAT32 without formatting the partition.

(iv) It also supports many peripheral devices (USB, DVD etc).

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Windows ME

Windows ME (Millennium Edition) launched in June 2000, but it has been historically plagued with programming errors which may be frustrating for home users.

Features

(i) It is designed for single CPU.
(ii) It supports 8 or more CPU (the maximum 32 CPU).
(iii) The minimum internal storage is 64MB and maximum 4GB.
(iv) It introduced Multilingual User Interface (MUI).

Windows XP

It is an OS produced by Microsoft for use on personal computers. Microsoft released Windows XP on 25th October, 2001.

Some versions of Windows XP are as follows

(i) Windows XP Home edition is a version made for home users.
(ii) Windows XP Professional is made for business users.

Features

(i) It has various users with independent profiles.
(ii) It has 3.75 GB free space on the disk and that the total size of the disk is 19.5 GB.
(iii) Atleast 64 MB of RAM internal storage.
(iv) It provides 1.5 GB of available space on the hard disk.
(v) It includes video adapter and monitor with Super VGA (Video Graphics Array) or higher resolution.
(vi) It supports sound card, CD-ROM, DVD-ROM drive, speakers or headphones.

Windows Vista

It is an operating system developed by Microsoft for use on personal computers, including home and business desktops, laptops, tablet PCs and media center PCs. It was released worldwide on 30th January, 2007.

Features

(i) It can be installed Pentium 4, higher, 512MB RAM, 32 MB video card and 40 GB hard disk.
(ii) It enhances the features of visual style.

Windows 7

It is an OS released by Microsoft on 22nd October, 2009. It is an upgrade of Windows XP and Vista. It does not include some standard applications like Windows Movie Maker, Windows Mail, etc.

Features

(i) It supports 64-bit processor.
(ii) It provides touch, speech, handwriting recognition.
(iii) It supports a playback of media in MP4.
(iv) It includes Windows Bio-metric framework.
(v) It provides multiple firewall.

Windows 8

It is a personal computer operating system that was developed by Microsoft and released on 26th October, 2012.

Features

(i) It is a 64-bit logical CPU.
(ii) It provides 3D Graphic supports and Internet Explorer-10.
(iii) It is based on Microsoft's Metro design language.
(iv) It supports new emerging technology like USB 3.0, cloud computing.

Windows 10

It is a personal computer operating system developed and released by Microsoft on 29th July, 2015.

Features

(i) It is easy to used social media sites like Facebook, Twitter.
(ii) Windows 10 will also include a 'game DVR' mode to allow recordings of the last 30 seconds of play, all better for the social gaming.
(iii) Windows 10 interface to adapt based on the hardware it is running on.

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Tit-Bits

- **Object Linking and Embedding (OLE)** provides a compare documents combining information from several different application programs such as graphs, charts, music, video, clipart, etc.
- To shut down the computer, we need to click Start button and then select Shut down key.
- **Windows Explorer** is a file manager application that is included with releases of the Microsoft Windows OS.

Desktop

When we turn ON the computer then the first screen, which will be display on the computer is known as desktop.

The background image of desktop is called wallpaper. A small arrow or blinking symbol, moving on the desktop, is called cursor. Desktop contains Start menu, Task bar, icons, gadgets, etc.

Some important components of desktop are organised as follows

Icons

A small image of a program, shown on the desktop with program name is known as icon. Icons are small pictures that represent files, folders, programs and other items.

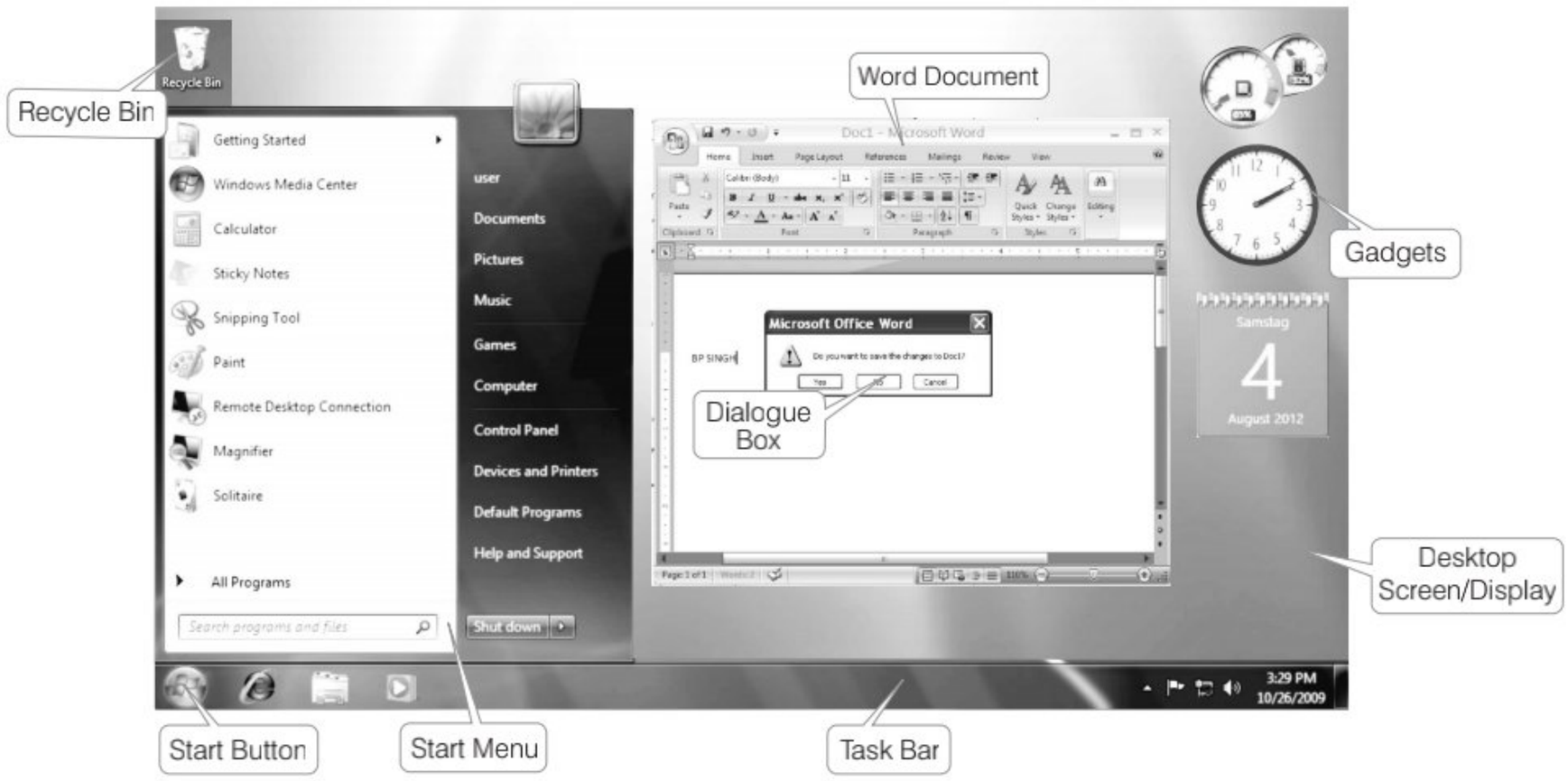
Users can open these programs by double click on icons. If you move an icon on your desktop, this is called 'dragging' and after releasing it, it will be called 'dropping.'

Some of the icons displayed on the desktop are as follows

1. **Computer** It is the most important icon on the desktop, which contains icons of document folders, hard disk's partition, each removable disk drive. e.g. Floppy disk, CD, DVD, etc. It also allows the users to access drives, printers, removable disk or other system applications.
2. **Recycle Bin** It is also a form of icon on the desktop, which contains deleted files, folders or shortcuts. If we delete a file or folder then it goes to recycle bin. From recycle bin, we can restore the deleted files or folders on proper place.

   Once the recycle bin is empty then we won't be able to restore those files and folders again.
3. **Network** It consists of all network connections, which make possible to connect the computer from Intranet.
4. **Documents** This folder contains all your files which you have created and saved in it. It also contains all types of file format Word processor, Spreadsheet, PowerPoint, image, etc.

STRUCTURE OF WINDOWS



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Task Bar

Initially, the long horizontal bar at the bottom of the desktop is known as Task bar. When we open a program or any window, then the button of that program will be displayed on the task bar.

Generally, task bar consists of three parts

(i) Start button (ii) Middle section

(iii) Notification area

Start Menu

This menu is the main gateway of our computer's program such as files, folders and settings. Start menu also contains most recently opened programs.

Start menu have following options

1. **All Programs** It contains a list of installed programs. When we install any software, it automatically shows in this menu.
2. **Favourites** It is a collection of book marked web pages.
3. **Documents** It shows a list of most recently opened documents.
4. **Setting** It includes Control Panel, Printers, Taskbar, etc.
5. **Find** It searches for specific files or folders.
6. **Log Off** It provides a password to protect from unauthorised access.
7. **Turn Off** (Shut down) To shut down or restart the system.

Structure of a Window

Window is a rectangular area which provides an environment to run many programs.

Some parts of the window are as follows

Title Bar

It is located at the top of window or any dialog box, which displays the name of the window or software program. Title bar contains atleast three small buttons.

1. **Close Button** At the right edge of the title bar, there is a square containing a [X] called the Close button. It helps to terminate the running program.
2. **Minimize Button** It reduces to window to a button on the task bar. It helps to shrink the window.
3. **Maximize Button** It enlarges the window to occupy the whole desktop. It expands the size of window fit to the desktop.

Scroll Bar

It appears at the right (or left) side or at the bottom of the window. A window can display a document, i.e. larger than the window area, so with the help of scroll bar arrow, the user can scroll a document in the window area to bring the view of hidden portion of document. There are two types of scroll bars, i.e. Horizontal scroll bar and Vertical scroll bar.

Menu Bar

Each window contains its own menu which performs specific actions when they have been selected.

The menu bar consists of several options as follows

1. **File Menu** contains options like New, Open, Close, Save, Save As, Print, etc.
2. **Edit Menu** contains options like Undo, Cut, Copy, Paste, Clear, etc.
3. **View Menu** like Normal, Toolbar, Print Layout, etc.
4. **Insert Menu** contains options like Header, Footer, etc.
5. **Help Menu** for tutorials or helpful information.

Dialog Box

When we perform certain operation on our document and click on the Close button without saving the document then dialog box will be appear on the screen.

Generally, dialog box contains message, Close button, Yes button, No button and Cancel button. It is mainly used to suggest that what to do next.

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Main Programs Inside the Windows

Notepad

It is a text editor program. Notepad is most commonly used to the edit or view text files. The file format of Notepad files is .txt (text document).

To open Click on Start button → All Programs → Accessories → Notepad

WordPad

It is an another text editor program including some few features such as complex formatting, pictures, etc. The extension of WordPad file is *.rtf* (rich text format).

To open Click on Start button → All Programs → Accessories → WordPad

Paint

It is a drawing program, used to create drawing or edit digital pictures (images). The extension of paint file is *.png* or. *jpg* or. *bmp*.

To open Click on Start button → All Programs → Accessories → Paint

Calculator

It performs addition, subtraction, multiplication, division, etc.

To open Click on Start button → All Programs → Accessories → Calculator

Media Player

Windows media player is an easy-to-use interface to play digital media files, organise digital media collection, burn CDs, etc.

To open Click on Start button → All Programs → Windows Media Player

Games

Windows have some games like Chess Titans, Hearts, Freecell, Mahjong Titans, Purble place, Solitaire, Spider Solitaire, etc.

To open Click on Start button → All Programs → Games

Tit-Bits

- **Standby** drops the computer into a very low power mode.
- **Hibernate** is a feature of computer operating system where the contents of RAM are written to non-volatile storage such as hard disk before power OFF the computer.
- **Clipboard** is a temporary storage in computer memory that stores the cutted or copied data.

Files

These are the collection of data stored on auxiliary storage media. In Windows, files are the basic unit to store data. The name given to a file or document by the user is called *file name*. Each file has a specific filename and has a *file extension* that identifies the file type. *Some common filename extensions are as follows*

.docx	MS-Word document
.rtf	WordPad document
.txt	Notepad text file
.eml	E-mail file
.exe	Executable file
.xlsx	MS-Excel file
.htm, **.html**	HTML file (Web page)
.pptx	MS-PowerPoint presentation

ZIP File ZIP stands for Zone Information Protocol. This is an application that allows for the compression of application files.

Executable File When a file contains instructions that can be carried out by the computer, it is often called an executable file.

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Folders

These are containers that you can use to store files. Folders can also store other folders, i.e. sub-folders. You can create any number of sub-folders and each can hold any number of files and additional sub-folders.

Windows Libraries

A library can contain files and folders stored on the local computer. Users interact with libraries in ways similar to how they would interact with other folders.

Different types of library are as follows

(i) **Documents Library** It is used to organise and arrange Word processing documents, Spreadsheets, Presentation and other text related files.

(ii) **Pictures Library** It is used to organise and arrange your digital pictures.

(iii) **Music Library** It is used to organise and arrange your digital music, such as songs, etc.

(iv) **Videos Library** It is used to organise and arrange your videos, such as clips, recording, etc.

MS-Windows Shortcut Keys

Keys	Description
Delete	Delete characters to the right of cursor
Backspace	Delete characters to the left of the cursor
Ctrl + A	Select all
F3	Search for a file or folder
Alt + Enter	View properties for the selected item
Alt + F4	Close the active item, or quit the active program
Alt + Spacebar	Opens the shortcut menu for the active window
F2	Rename selected item
Ctrl + Right Arrow	Move the insertion point to the beginning of the next word
Ctrl + Left Arrow	Move the insertion point to the beginning of the previous word
Ctrl + Alt + Del	Restart the computer
Ctrl + Esc	Display the Start menu
F5	Refresh the active window
Esc	Cancel the current task
Window	To display or hide the Start menu
Window + D	To display the desktop
Window + L	To Lock the keyboard

QUESTION BANK

1. In Windows NT, NT stands for
(1) New Terminology
(2) New Technique
(3) New Technology
(4) Normal Technique

2. If you are performing Windows 98 operating system to Windows XP you are performing a(n) **[IBPS Clerk 2014]**
(1) push up
(2) China
(3) patch
(4) pull down
(5) update

3. Which of the following is not a feature of Windows 98?
(1) It supports Internet Explorer 4.0.1.
(2) It also supports many peripheral devices USB, DVD
(3) It was the first operating system to use the WDM
(4) It provides multiple firewall.

4. In Windows ME, what does ME stand for?
(1) Millennium Edition
(2) Micro Expert
(3) Macro Expert
(4) Multi Expert

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5. Windows XP released in
(1) 2000 (2) 1998
(3) 1999 (4) 2001

6. Which of the following is an example of a system software?
(1) Windows 7 (2) MS Word 2010
(3) MS PowerPoint 2010 (4) Openoffice Writer

7. Windows 95, Windows 98 and Windows NT are known as what?
(1) Processor (2) Domain names
(3) Modems (4) Operating systems

8. Which of the following is not a version of the Windows operating system software for the PC? **[IBPS PO 2015]**
(1) ME (2) 98 (3) XP (4) Linux
(5) 95

9. Which of the following is not an in-built software application found in MS Windows?
(1) Paint (2) CD Player
(3) Disk Defragmentor (4) Volume Control
(5) MS Word

10. What is Windows Explorer? **[SBI Clerk 2014]**
(1) Personal Computer (2) Network
(3) File Manager (4) Drive
(5) Web Browser

11. Background of screen is known as
(1) application (2) window
(3) desktop (4) frame

12. The background image of desktop is called as
(1) graphics (2) deskcover
(3) wallback (4) wallpaper

13. The desktop of a computer refers to
(1) the visible screen
(2) the area around the monitor
(3) the top of the mouse pad
(4) the inside of a folder

14. A blinking indicator that shows you where your next action will happen, is
(1) CPU (2) cursor
(3) toolbar (4) boot

15. Graphical pictures that represent an object like file, folder, etc. are **[RBI Grade B 2014]**
(1) task bar (2) windows
(3) desktop (4) icons
(5) None of these

16. A/An ..... contains programs that can be selected.
(1) pointer (2) menu (3) icon (4) button

17. To open disk, mouse pointer is placed on disk icon and then
(1) mouse is dragged pushing the button
(2) mouse is double-clicked
(3) mouse is rotated around
(4) mouse is clicked after rotating it

18. When you want to move an icon on your desktop, this is called
(1) double clicking (2) highlighting
(3) dragging (4) pointing

19. To display the contents of a folder in Windows Explorer, you should..... **[SBI PO 2013]**
(1) click on it (2) collapse it
(3) name it (4) give it a password
(5) rename it

20. Factor making Windows popular is
(1) multitasking capacity
(2) desktop features
(3) user friendly
(4) being inexpensive

21. All the deleted files go to
(1) Recycle Bin (2) Task Bar
(3) Tool Bar (4) Computer

22. Generally, you access the recycle bin through an icon located
(1) on the desktop (2) on the hard drive
(3) on the shortcut menu
(4) in the properties dialog box

23. Which of the following is used to access a file from the computer store? **[IBPS Clerk Mains 2017]**
(1) Insert (2) Retrieve
(3) File (4) Print
(5) Find

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24. The taskbar is located
(1) on the start menu
(2) at the bottom of the screen
(3) on the quick launch toolbar
(4) at the top of the screen

25. In the split window mode, one title bar looks darker than the other, because **[RBI Grade B 2012]**
(1) darker title bar shows window not in use
(2) darker title bar shows active window
(3) darker title bar shows unavailable window
(4) Both '1' and '2'
(5) None of the above

26. Choices are referred to as
(1) options (2) exit (3) boot (4) folder
(5) None of these

27. Date and time are available on the desktop at
(1) Keyboard (2) Recycle Bin
(3) My Computer (4) Task Bar
(5) None of these

28. Which of the following is appropriate method to shutdown computer?
(1) Click 'Start' then select 'Shut down'
(2) Click 'Start' then select 'Restart'
(3) Click 'Start' then switch user
(4) Switch off monitor

29. End menu is available at which button?
(1) End (2) Start **[IBPS PO 2011]**
(3) Turn off (4) Restart
(5) Reboot

30. When you install a new program on your computer, it is typically added to the menu.
(1) All Programs (2) Select Programs
(3) Start Programs (4) Desktop Programs

31. Why do you log-off from your computer when going out from your office? **[IBPS Clerk Mains 2017]**
(1) Someone might steal your files, passwords, etc.
(2) In order to save electricity
(3) Logging off is essential to increase performance
(4) Logging off is mandatory before you go out
(5) Logging off is a good exercise to perform regularly

32. Which of the following refers to the rectangular area for displaying information and running programs? **[SBI PO 2013]**
(1) Desktop (2) Dialog box
(3) Menu (4) Window
(5) Icon

33. Title bar, ribbon, status bar, views and document workspace are components of ..... program.
(1) windows (2) browser
(3) explorer (4) Website

34. Active window means the
(1) active window is designated by a different color toolbar that other open window
(2) window that is currently open
(3) Both '1' and '2'
(4) window that is last used
(5) None of the above

35. To 'maximize' a window means to
(1) fill it to capacity
(2) expand it to fit the desktop
(3) put only like files inside
(4) drag it to the recycle bin

36. To shrink a window to an icon,
(1) open a group window
(2) minimize a window
(3) maximize a window
(4) restore a window

37. Which of the following are lists of commands that appear on the screen? **[IBPS Clerk 2015]**
(1) GUIs (2) Icons
(3) Menus (4) Windows
(5) Stack

38. Commands at the top of a screen such; FILE-EDIT-FONT-TOOLS to operate and change things within program comes under
(1) menu bar (2) tool bar
(3) user friendly (4) Word processor

39. What is an on-screen display listing of available options of functions on a computer? **[SBI Clerk 2015]**
(1) Document (2) View
(3) Tool (4) Format
(5) Menu

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40. Menus are the part of **[RBI Grade B 2014]**
(1) hardware (2) user interface
(3) status bar (4) monitor
(5) None of these

41. For creating a new document, you use which command at File menu?
(1) Open (2) Close (3) New (4) Save

42. What menu is selected to cut, copy and paste?
(1) File (2) Tools
(3) Special (4) Edit

43. Help menu is available at which button?
(1) End (2) Start
(3) Turn off (4) Restart

44. It is easier to change the name of file using ..... process.
(1) transforming
(2) christening
(3) renaming
(4) retagging

45. The steps involved to open a document are **[RBI Grade B 2013]**
(1) select the document to open from the File down menu
(2) click on the Open option in the Tools menu
(3) Both '1' and '2'
(4) can be different for different Word document
(5) None of the above

46. A computer message is "Do you really want to delete the selected file (s)"? The user clicks 'Yes' key. It is called
(1) program response (2) user output
(3) user response (4) program output

47. A symbol or question on the screen that prompts you to take action and tell the computer what to do next, is
(1) scanner (2) questionnaire
(3) information seeker (4) prompt and dialog box
(5) None of these

48. ..... menu type is also known as a drop down menu.
(1) Fly-down (2) Pop-down
(3) Pop-up (4) Pull-up
(5) Pull-down

49. A .... is an additional set of commands that the computer displays after you make a selection.
(1) dialog box (2) sub menu
(3) menu selecting (4) All of these

50. Anything written on the screen is called
(1) cursor (2) text
(3) folder (4) boot
(5) None of these

51. ..... lets you leave a screen or program.
(1) Boot (2) Programs
(3) Exit (4) Text

52. A ..... is an icon on the desktop that provides a user with immediate access to a program or file.
(1) kernel (2) buffer
(3) shortcut (4) spooler

53. What is the full form of RTF? **[IBPS Clerk Mains 2017]**
(1) Richer Text-Formatting
(2) Rich Text Format
(3) Right Text Fishing
(4) Right Text Font
(5) Rich Text Font

54. The extension of paint file is/are
(1) .png (2) .jpg
(3) .bmp (4) All of these

55. Which of the following options is used to open calculator?
(1) Start button → All Programs → Accessories → Calculator
(2) Start button → All Programs → Calculator
(3) Start button → Accessories → Calculator
(4) All of the above

56. ..... is an easy-to-use interface to play digital media files.
(1) Wordpad (2) Notepad
(3) Mediaplayer (4) Games

57. To start Spider Solitaire game, we used to follow
(1) Start → All Programs → Games
(2) Start → All Programs → Games → Spider Solitaire
(3) Start → All programs → Accessories → Games → Spider Solitaire
(4) None of the above

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58. When you cut or copy information it gets place in the ..... . **[IBPS Clerk 2013]**
(1) clipart (2) clipboard
(3) motherboard (4) Both '1' and '2'
(5) None of these

59. A clipboard **[RBI Grade B 2014]**
(1) is used to save data on disk in the event of a power failure
(2) is able to retain the contents even when computer is switched OFF
(3) is available only in Microsoft Word
(4) is a temporary storage in computer memory and temporarily stores the cut or copied data
(5) None of the above

60. What is the command used to remove text or graphics from a document, the information is then stored on a clipboard so you can paste it.
(1) Chop (2) Cut (3) Clip (4) Cart away

61. A saved document is referred to as a
(1) file (2) word (3) folder (4) project
(5) None of these

62. The name given to a document by the user is called
(1) filename (2) program
(3) data (4) record

63. A ..... is a collection of information saved as a unit.
(1) folder (2) file
(3) path (4) file extension

64. Information kept about a file includes
(1) print setting (2) deletion data
(3) Both '1' and '2' (4) size

65. A file is often referred to as a **[RBI Grade B 2012]**
(1) wizard (2) document
(3) pane (4) device
(5) documentation

66. Which of the following statements is a false conceiving file names? **[IBPS Clerk 2014]**
(1) Every file in the same folder must have a unique name
(2) The file name comes before the dot (.)
(3) File extension is another name for the type
(4) The file extension comes before the dot (.) followed by the file name
(5) Files may share the same name or the same extension, but not both at the same time

67. File extensions are used in order to
(1) name the file
(2) ensure the file name is not lost
(3) identify the file
(4) identify the file type

68. Which of the following contained at the end of the file name and help to determine the type of file? **[SBI Clerk 2014]**
(1) File property (2) File type
(3) File name (4) File subname
(5) File extension

69. What are .bas, .doc, .htm examples of in computing? **[IBPS PO 2015]**
(1) Extensions (2) Protocols
(3) Database (4) Domains
(5) None of these

70. What is the default file extension for all Word documents? **[RBI Asstt. 2012]**
(1) WRD (2) TXT (3) DOC (4) FIL
(5) WD

71. You organise files by storing them in **[RBI Grade B 2012]**
(1) archives (2) lists
(3) indexes (4) folders
(5) None of these

72. ..... may be included in other folder while making hierarchical structure folder.
(1) Minifolder
(2) Small folder
(3) Sub-folder
(4) Object folder

73. Which of the following refers to containers used to store related documents located on the computer? **[SBI Clerk 2014]**
(1) Labels (2) Indexes
(3) Programs (4) Folders
(5) Sections

74. You can keep your personal files/folders in
(1) My Folder (2) Documents
(3) My Files (4) My Text

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75. When embedding object into document, one of the following occurs **[RBI Grade B 2014]**

(1) embedded object becomes a part of the document
(2) embedded object remains outside object to the document, but loaded with document
(3) Both becomes a zip file
(4) Both '1' and '2'
(5) None of the above

76. Which of the following shortcut keys represents the correct sequence for copy, paste and cut commands?

(1) Ctrl + V; Ctrl+C; Ctrl+V
(2) Ctrl + C; Ctrl+V; Ctrl+X
(3) Ctrl + X; Ctrl+C; Ctrl+V
(4) Ctrl + C; Ctrl+X; Ctrl+V

77. Which of the following keys is used to delete characters to the left of the cursor? **[SBI PO 2014]**

(1) Alt + Delete (2) Shift
(3) Esc (4) Delete
(5) Backspace

78. To restart the computer, following combination of keys is used

(1) Del + Ctrl (2) Backspace + Ctrl
(3) Esc + Ctrl (4) Insert + Esc
(5) Ctrl + Alt + Del

79. Which of the following shortcut keys is used to close current or active window? **[IBPS RRB PO Mains 2018]**

(1) Alt+F4 (2) Ctrl+F4 (3) Alt+F6 (4) Ctrl+F6
(5) Ctrl+Esc

ANSWERS

1. *(3)*	2. *(5)*	3. *(4)*	4. *(1)*	5. *(4)*	6. *(1)*	7. *(4)*	8. *(4)*	9. *(5)*	10. *(3)*
11. *(3)*	12. *(4)*	13. *(1)*	14. *(2)*	15. *(4)*	16. *(3)*	17. *(2)*	18. *(3)*	19. *(1)*	20. *(2)*
21. *(1)*	22. *(1)*	23. *(2)*	24. *(2)*	25. *(2)*	26. *(1)*	27. *(4)*	28. *(1)*	29. *(2)*	30. *(1)*
31. *(1)*	32. *(4)*	33. *(1)*	34. *(3)*	35. *(2)*	36. *(2)*	37. *(3)*	38. *(1)*	39. *(5)*	40. *(2)*
41. *(3)*	42. *(4)*	43. *(2)*	44. *(3)*	45. *(3)*	46. *(3)*	47. *(4)*	48. *(5)*	49. *(1)*	50. *(2)*
51. *(3)*	52. *(3)*	53. *(2)*	54. *(4)*	55. *(1)*	56. *(3)*	57. *(2)*	58. *(2)*	59. *(4)*	60. *(2)*
61. *(1)*	62. *(1)*	63. *(2)*	64. *(4)*	65. *(2)*	66. *(4)*	67. *(4)*	68. *(5)*	69. *(1)*	70. *(3)*
71. *(4)*	72. *(3)*	73. *(4)*	74. *(2)*	75. *(1)*	76. *(2)*	77. *(5)*	78. *(5)*	79. *(1)*	

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CHAPTER

10

MICROSOFT OFFICE

Microsoft Office was developed by Microsoft Inc in 1988. It is a collection of softwares, based on specific purpose and mainly used in office work. You can start any software of MS-Office by using the Start button.

There are five packages of MS-Office

1. MS-Word (Word Processing Software)
2. MS-Excel (Spreadsheet Software)
3. MS-PowerPoint (Presentation Software)
4. MS-Access (Database Management Software)
5. MS-Outlook (E-mail Client)

Microsoft Word

MS-Word is a Word processing application which is one of the most important and widely used applications found on computer. It provides tools for editing, formatting and printing of documents smaller than 45 Kb. The document can be a poster, report, letter, brochure, Web page, newsletter, etc.
e.g. WordStar, Notepad for Windows.

Start MS-Word

There are two methods of starting MS-Word which are as follows

(i) Click on Start button and then click on Run option. Run dialog box will be appear on screen. Now, type winword on text box and press Enter key.

(ii) Click Start button → All Programs → Microsoft Office → Microsoft Office Word 2007.

It opens MS-Word with a blank document. By default, the name of the blank document is Document1.docx, where.docx are the extensions of a MS-Word file.

Components of Microsoft Word

The components of MS-Word are as follows

(i) **Title Bar** It shows the name of the application and name of the file. It consists of three control buttons, i.e.
   (a) *Minimize* (reduces the window but Word still active)
   (b) *Restore* (brings Word window to the maximum original size)
   (c) *Close* (Close the word window)

(ii) **Standard Tool Bar** It displays the symbol for the common operation like Open, Print, Save, etc.

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(iii) **Ribbon** It is a set of tools and commands across the top of the screen. It consists of a panel of commands which are organised into a set of tabs.

(iv) **Tab** On the ribbon, it contains the buttons needed to edit characters, text and layout.

(a) **Home tab** Consists of Clipboard (Cut, Copy, Paste), Font (Size, Color, Bold, Italic, Underline), Paragraph (Bullets/ Numbering, Indent), Styles, Editing (Find and Replace).

(b) **Insert tab** Consists of Pages (Cover Page, Blank Page, Page Break), Tables (Table), Illustrations (Picture, ClipArt, Shapes, SmartArt, Chart), Links (Hyperlink, Book mark, cross-referenec), Header & Footer, Text (TextBox, Date & Time, Object), Symbols (Equation, Symbol).

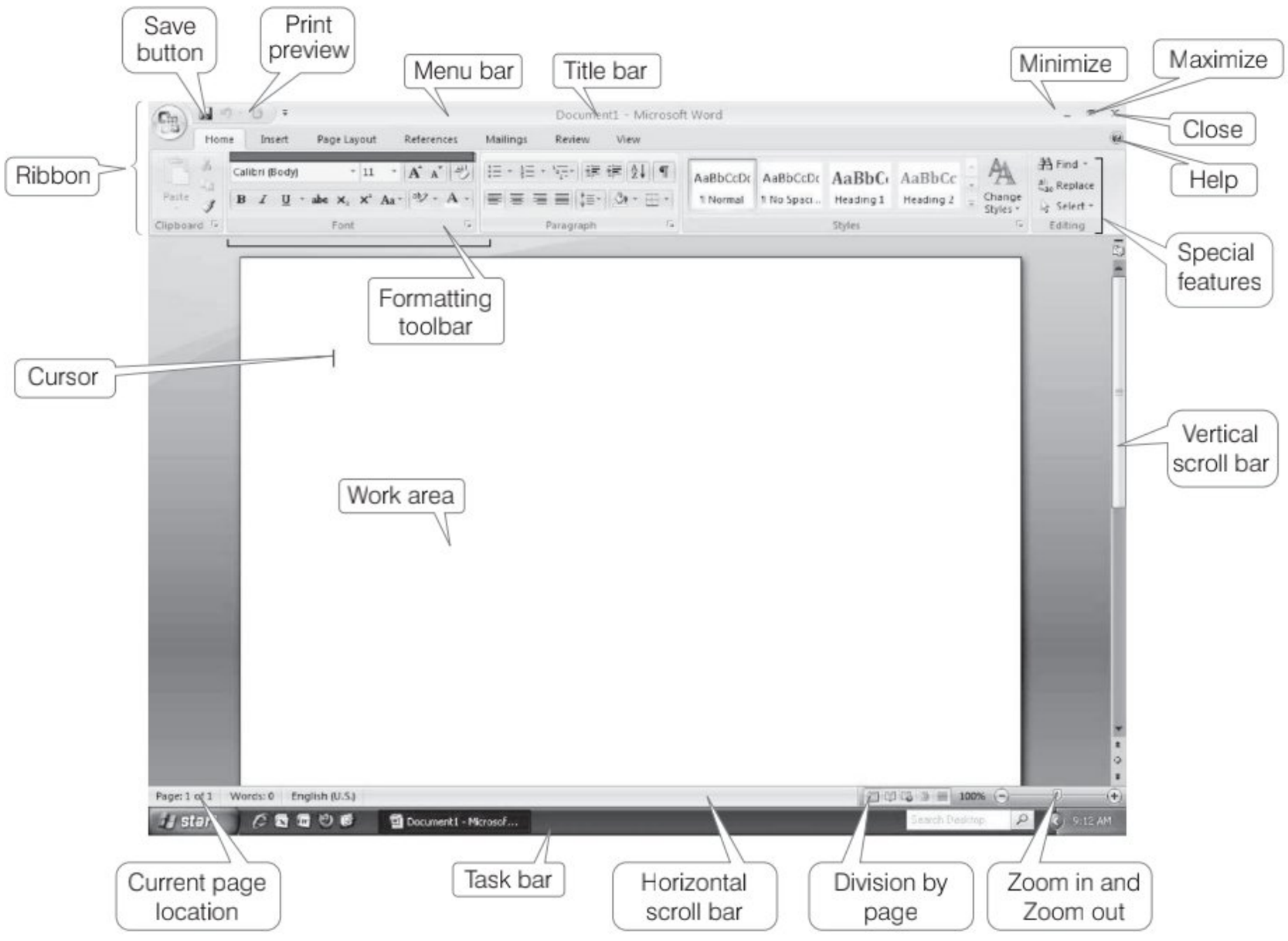
(c) **Page Layout tab** Consists of Themes, Page Setup, Page Background, Paragraph, Arrange.

(d) **References tab** Consists of Table of Contents, Footnotes, Citations & Bibliography, Captions, Index, Table of Authorities.

(e) **Mailings tab** Consists of Create, Start Mail Mrge, Write and Insert Fields, Preview Results and Finish.

(f) **Review tab** Consists of Proofing (Spelling & Grammar, Thesaurus, Translate), Comments, Tracking, Changes, Compare, Protect.

(g) **View tab** Consists of Document Views (Print Layout, Full Screen Reading), Show/Hide, Zoom, Window, Macros, etc.



Microsoft Word Window

(v) **Ruler** It appears on the top of the document window. It allows to format the horizontal or vertical alignment of text in a document.

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There are two types of rulers

(a) **Horizontal ruler** It indicates the width of the document and is used to set left and right margins.

(b) **Vertical ruler** It indicates the height of the document and is used to set top and bottom margins.

(vi) **Status Bar** It displays the information such as page number, current page, current template, column number and line number, etc.

(vii) **Work Area** It is the rectangular area of the document window that can be use to type the text. It is also called as *workplace.*

(viii) **Cursor** It is also called insertion pointer. It denotes the place where text, graphics or any other item would be placed when you type, overwrite or insert them.

Features of Microsoft Word

The features of MS-Word are described below

(i) **Text Editing** It provides editing, adding and deleting text, modification of text content i.e. cut, copy and paste.

When, we cut any text in our document, it will save in hard drive temporarily, till we paste it on any other place.

(ii) **Format Text** It offers to modify the text in any of the available hundreds of text designs. It formats text in various styles such as bold, italic, underline, etc.

(iii) **Indentation** It denotes the distance text boundaries and page margins. It offers three types of indentation– positive, hanging and negative indent.

(iv) **Page Orientation** It facilitates selection of typed text printed or visible in horizontal view or vertical view on a specified size of the page. Word offers Portrait–vertically oriented and Landscape–horizontally oriented.

(v) **Find and Replace** This feature allows flexibility and comfort to the user to replace a text with a substituted text at all places.

(vi) **Spell Check** This facilitates automatic and manual checking of spelling mistakes and also suggests a few possible alternate options for incorrect spelt words.

(vii) **Thesaurus** It contains a comprehensive dictionary and thesaurus feature offers *synonym* options for a word.

(viii) **Bullets and Numbering** A list of bullets and numbering features used for tables, lists, pages and tables of content. Bullets are arranged in unordered lists and numbering are arranged in ordered lists.

(ix) **Graphics** It provides the facility of incorporating drawings in the documents which enhances their usefulness.

(x) **Object Linking and Embedding** (OLE) It is a program integration technology that is used to share information between programs through objects. Objects save entities like charts, equations, video clips, audio clips, pictures, etc.

(xi) **Horizontal and Vertical Scroll Bars** They enable one to move up and down or left and right across the window. The horizontal scroll bar is located above the status bar. The vertical scroll bar is located along the right side of the screen to move up and down the document.

(xii) **Save a Document** When we create a new document, it will be saved into the hard drive. To save a document, user has three common ways

(i) To click on Save option from File menu.

(ii) Select Save button from Standard toolbar.

(iii) Pressing Ctrl + S key.

Tit-Bits

- MS-Word was first released in 1983 under the name Multi-Tool Word for Xenix Systems.
- In MS-Word, a default alignment for the paragraph is left.
- Word has a list of predefined typing, spelling, capitalization and grammar errors that **Autocorrect** can detect and correct.

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Shortcut Keys of MS-Word and their Descriptions

Standard Toolbar

Tool Name	Shortcut	Description
New	Ctrl + N	Creates a new document.
Open	Ctrl + O or Ctrl + F12	Opens an existing document.
Save	Ctrl + S or Shift + F12	Saves the active document.
	F12	Opens a save as dialog box.
Select	Ctrl + A	Selects all contents of the page.
Print	Ctrl + P or Ctrl + Shift + F12	Prints the active document.
Print Preview	Ctrl + F2	Displays full pages as they are printed.
Spelling	F7	Checks the spelling in the active document.
Cut	Ctrl + X	Cuts the selected text and puts it on the clipboard.
Copy	Ctrl + C	Copies the selected text and puts it on the clipboard.
Paste	Ctrl + V or Shift + Insert	Inserts the clipboard contents at the insertion point.
Format Painter	Ctrl + Shift + C	Copies the formatting of the selected text to a specified location.
Undo	Ctrl + Z	Reverses certain commands.
Redo	Ctrl +Y	Reverses the action of the Undo button.
Help	F1	Provides the help for working on MS -Word.
Find	Ctrl + F	Opens Find and replace dialog box with find tab
Insert	Ctrl + K	Inserts link.
Delete	Ctrl + Del	Deletes word to the right of cursor.
	Ctrl + Backspace	Deletes word to the left of cursor.
Insert	Alt + Shift + D	Insert the current date.
	Alt + Shift + T	Insert the current time.

Formatting Toolbar

Tool Name	Shortcut	Description
Style	Ctrl + Shift + S	Applies a style or records a style.
Font	Ctrl + Shift + F	Changes the font of the selected text.
Font Size	Ctrl + Shift + P	Changes the font size of the selected text.
Bold	Ctrl + B	Makes the selected text bold.
Italic	Ctrl + I	Makes the selected text italic.
Underline	Ctrl + U	Makes the selected text underline.
Aligned Left	Ctrl + L	Aligns the paragraph at left indent. (By default)
Center	Ctrl + E	Centers the paragraph between the indents.
Aligned Right	Ctrl + R	Aligns the paragraph at right indent.
Justify	Ctrl + J	Aligns the paragraph at both right and left indents.
Line space	Ctrl + 5	To increase line spacing

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Microsoft Excel

An electronic spreadsheet is used for analysing, sharing and managing information for accounting purpose performing mathematical calculations, budgeting, billing etc. A spreadsheet is a matrix of rows and columns similar to an accounting ledger. The spreadsheet program also provides tools for creating graphs, inserting pictures and chart, analysing the data etc. e.g. Corel Quattro Pro, Snowball, Lotus-1-2-3, Apple Numbers etc.

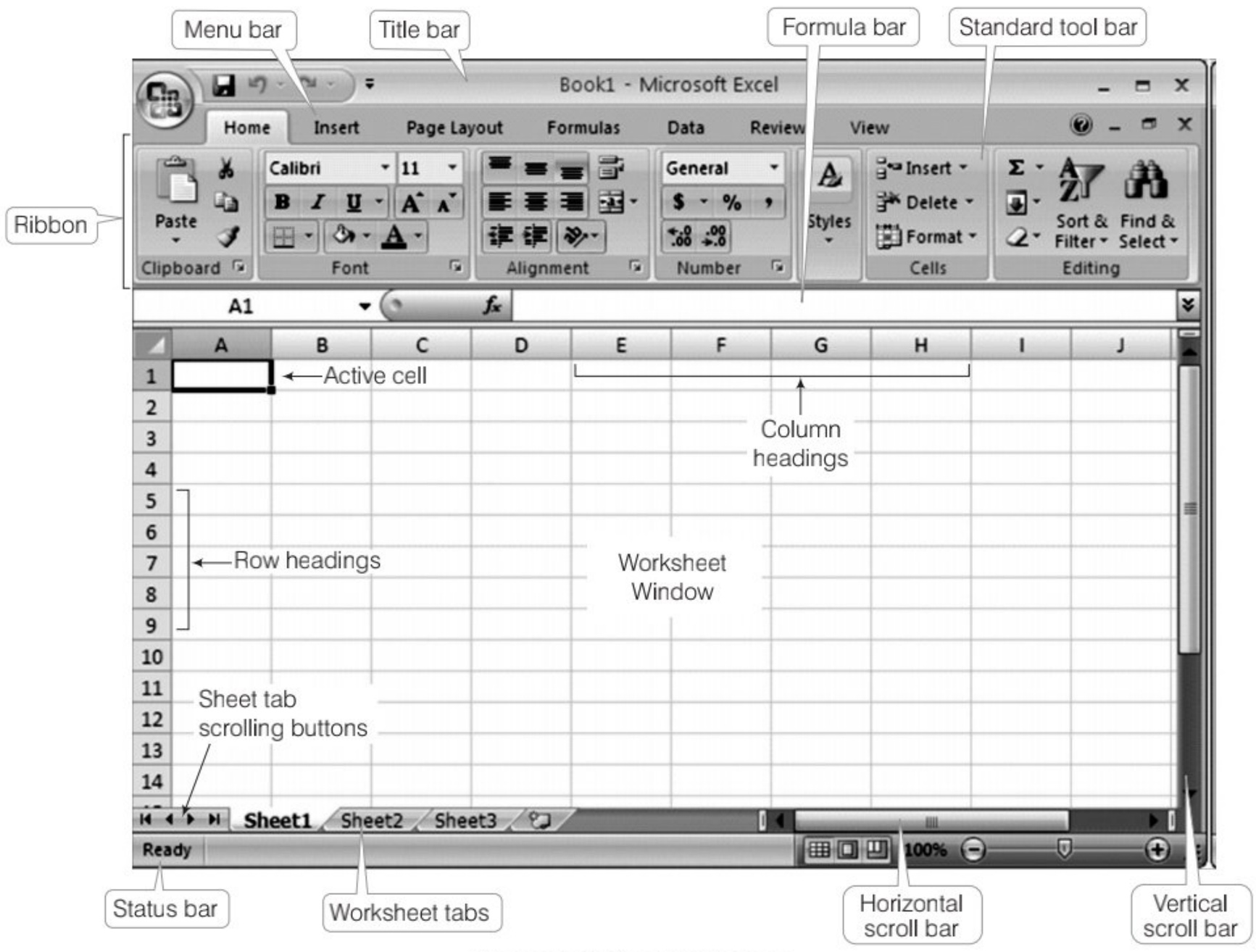
Start MS-Excel

To start MS-Excel software, we can follow any one method out of them

(i) Click on Start button and then click on Run option. Run dialog box will be appear on screen. Now, type excel on text box and press Enter key.

(ii) Click Start button → All Programs → Microsoft Office → Microsoft Office Excel 2007

By default, the name of the blank spreadsheet is Book1.xlsx, where .xls and .xlsx are the extensions of a MS-Excel spreadsheet.



Microsoft Excel Window

Components of Microsoft Excel

The components of MS-Excel are as follows

1. **Title Bar** It shows the name of the application and name of the file. It consists of three control buttons, i.e. minimize, maximize and close.
2. **Ribbon** It consists of a panel of commands which are organised into a set of tabs.

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3. **Tab** On the ribbon, it contains the buttons needed to edit characters, text and layout.
   (i) **Home tab** Consists of Clipboard, Font, Alignment, Number, Styles, Cells and Editing.
   (ii) **Insert tab** Consists of Tables, Illustrations, Charts, Links and Text.
   (iii) **Page Layout tab** Consists of Themes, Page Setup, Scale to Fit, Sheet Options and Arrange.
   (iv) **Formulas tab** Consists of Function Library, Defined Names, Formula Auditing and Calculation.
   (v) **Data tab** Consists of Get External Data, Connections, Sort & Filter, Data Tools and Outline.
   (vi) **Review tab** Consists of Proofing, Comments and Changes.
   (vii) **View tab** Consists of Workbook Views, Show/Hide. Zoom, Window and Macros.
4. **Status Bar** It displays information about the currently active worksheet. It includes page number, view shortcuts, zoom slider, etc.
5. **Formula Bar** It is located below the ribbon. It is used to enter and edit worksheet data. *It includes*
   (i) **Name box** displays the all references or column and row location of the active cell.
   (ii) **Functions** are predefined formulas that perform calculations by using specific values, called arguments.

Functions

Predefined formulas in MS-Excel are called functions.

There are different types of functions

Function	Description	Example
SUM	It is used to add all the values provided as argument.	= SUM (A1 : A5)
AVERAGE	This function calculates the average of all the values provided as argument.	= AVERAGE (A1 : A5)
COUNT	This function counts the number of cells that contain number.	= COUNT (A1 : A5)
MAX	This function is used to return maximum value from a list of arguments.	= MAX (A1 : A5)
MIN	This function is used to return minimum value from a list of arguments.	= MIN (A1 : A5)

Where, A1 : A5 is a range between the cells of A1 and A5.

Basics of Spreadsheet

The basic terms of spreadsheet are as follows

1. A **spreadsheet** is a software tool thatlets one enter, calculate, manipulate and analyse set of numbers.
2. The intersection of each row and column is called **cell**. A cell is an individual container for data. *It may hold*
   (i) Numbers (Constants)
   (ii) Formulas (Mathematical equations)
   (iii) Text (Labels)
3. An array of cells is called a **sheet** or **worksheet**. A worksheet holds information presented in tabular format with text.
4. A **workbook** is a document that contains one or more worksheet. Each new workbook has created three worksheets by default.
5. A **row** is given a number that identifies, it starts from 1, 2, 3, 4, 5, ... so on.
6. A **column** is given a letter that identifies it starts from A ... Z, AA ... AZ, BA, BB ... BZ so on.
7. **Active cell** is a cell in which you are currently working.
8. A **cell pointer** is a cell-boundary that specifies which cell is active at that moment.
9. A **formula** is an equation that calculates the value to be displayed. A formula must begin with equal to (=) sign.
10. A **cell address** is used to specified the intersecting of row and column of the letter and number on worksheet.

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Charts

These are the graphical and pictorial representation of worksheet data.

Types of Charts

There are various types of charts.

1. **Area Chart** It emphasises the magnitude of change over time.
2. **Column Chart** It shows data changes over a period of time or illustrates comparisons among items.
3. **Bar Chart** It illustrates comparisons among individual items. Categories are organised vertically and values horizontally.
4. **Line Chart** It shows trends in data at equal intervals. It is useful for depicting the change in a value over period of time.
5. **Pie Chart** It shows the proportional size of items that make up only one data series to the sum of the items.
6. **XY (Scatter) Chart** It shows the relationships among the numeric values in several data series or plots two groups of numbers as series of XY coordinates. Scatter compares pairs of values.

Components of a Chart

Components of a chart are as follows

1. **Chart Area** This is the total region surrounding the chart.
2. **Plot Area** The area where data is plotted. The plot area is bounded by axes in a 2D-Chart whereas in 3D-Chart it is bounded by walls and floor.
3. **Chart Title** The descriptive text aimed at helping user identify the chart.
4. **Axis Title** These are the titles given to three axis, i.e. X, Y and Z.
5. **Data Series** A row or column of numbers that are plotted in a chart is called a data series.
6. **Gridlines** These are horizontal and vertical lines which inserted in the chart to enhance its readability.
7. **Legends** It helps to identify various plotted data series.
8. **Data Label** It provides additional information about a data marker.
9. **Data Table** It is defined as a range of cells that are used for testing and analysing outcomes on a large scale.

Tit-Bits

- **$ sign** locks the cells location to a fixed position.
- **Stacked Bar Column** shows the relationship of individual items to the whole.
- **Chart wizard** is used to create charts in MS-Excel.
- **Embedded chart** is a chart that is drawn on an existing sheet.

Shortcut Keys of MS-Excel and their Descriptions

Shortcut Keys	Description
F2	Edit the selected cell.
F5	Go to a specific cell. e.g. C6
F7	Checks the spellings
F11	Create chart.
Ctrl + Shift + ;	Enter the current time.
Ctrl + ;	Enter the current date.
Alt + Shift + F1	Insert new worksheet.
Shift + F3	Opens the Insert Function window.
Shift + F5	Opens Find and Replace dialog box with find tab.
Ctrl + A	Select all contents of the worksheet.
Ctrl + B	Bold highlighted selection.
Ctrl + I	Italic highlighted selection.
Ctrl + K	Insert link.
Ctrl + U	Underline highlighted selection.
Ctrl + P	Bring up the Print dialog box to begin printing.
Ctrl + Z	Undo the last action.
Ctrl + F9	Minimize current workbook.
Ctrl + F10	Maximize currently selected workbook.
Ctrl + F6	Switch between open workbooks/ windows.
Ctrl + Page Up	Move to the previous sheet between Excel worksheets in the same Excel document.

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Shortcut Keys	Description
Ctrl + P	Bring up the Print dialog box to begin printing.
Ctrl + Z	Undo the last action.
Ctrl + F9	Minimize current workbook.
Ctrl + F10	Maximize currently selected workbook.
Ctrl + F6	Switch between open workbooks/ windows.
Ctrl + Page Up	Move to the previous sheet between Excel worksheets in the same Excel document.
Ctrl + Page Down	Move to the next sheet between Excel worksheets in the same Excel document.
Ctrl + Tab	Move between two or more open Excel files.
Alt + =	Create a formula to sum all of the above cells.
Shift + Home	Go to the first cell in the current row.
Ctrl + Shift + !	Format number in comma format.
Ctrl + Shift + $	Format number in currency format.
Ctrl + Shift + #	Format number in date format.
Ctrl + Shift + %	Format number in percentage format.
Ctrl + Shift + @	Format number in time format.
Ctrl + Space	Select entire column.
Shift + Space	Select entire row.

Microsoft PowerPoint

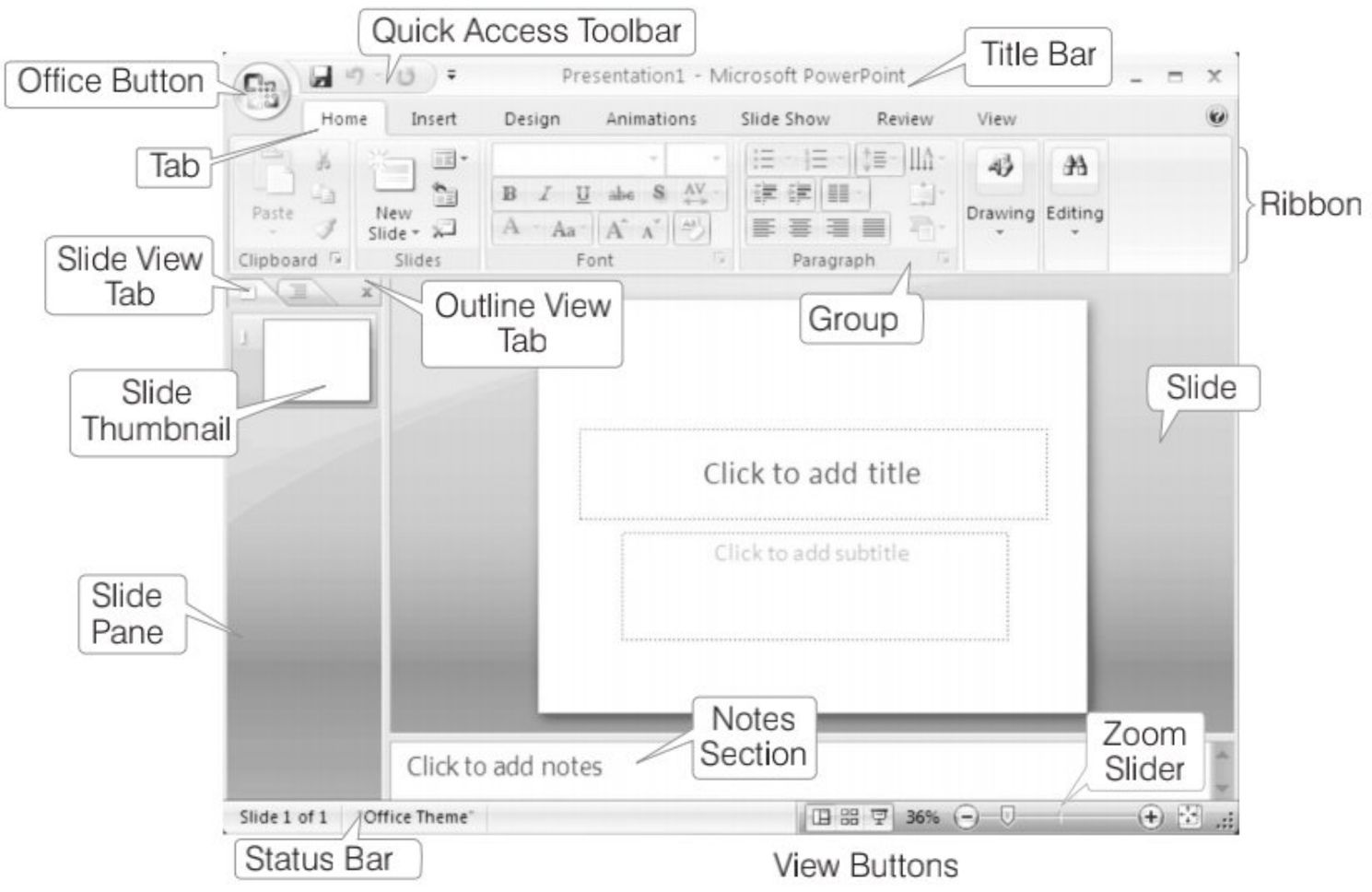
The application software that can create professional looking visual aids is called presentation graphics software. The presentation software is used for creation of the slides and to display the information in the form of presentation of slides. A presentation software provides tools like editor that allows insertion and formatting of text and methods for inserting and manipulating graphics images along with sound and visual effects.

Start MS-PowerPoint

To start the MS-PowerPoint software, we need to

Click Start button → All Programs → Microsoft Office → Microsoft Office PowerPoint 2007

By default, the name of the blank document is Presentation1. ppt, where .ppt or .pptx is the extension of a PowerPoint file.



Microsoft PowerPoint Window

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Components of PowerPoint

Various components of MS-PowerPoint 2007 window are described below

1. **Title Bar** It contains the name of currently opened file followed by software name.
2. **Ribbon** It is same as Word and Excel, just few tabs are different like Animations, Slide Show, etc.
3. **Slide** It appears in the centre of the window. You can create your presentation by adding content to the slides.
4. **Slide Pane** This area of PowerPoint window displays all the slides that are added in the presentation.
5. **Slide View Tab** This tab displays a thumbnail view of all the slides.
6. **Outline View Tab** This tab displays the text contained in the presentation in an outline format.
7. **Notes Section** This can be used for creating notes.
8. **Status Bar** It displays the number of the slide that is currently being displayed.

PowerPoint Views

Different types of views available in PowerPoint 2007 are explained below

1. **Normal View** This is the main editing view, where you write and design your presentations, i.e. actual screen which is displayed.
2. **Slide Sorter View** It provides a view of slides in thumbnail form. This view makes it easy to sort and organise the sequence of the slides at the time of creating presentation.
3. **Notes Page View** In this view, the notes pane is located just below the slide pane. Here, notes that apply to the current slide can be typed. Later, these notes can be printed and referred while giving actual presentation.
4. **Slide Show View** This is used to deliver a presentation to the audience. Slide Show view takes up the full computer screen, like an actual presentation. To exit Slide Show view, press **Esc** key from the keyboard.
5. **Master View** This view includes Slide view, Handout view and Notes view. They are the main slides that store information about the presentation, including background color, fonts effects, placeholder sizes and positions.

Tit-Bits

- **Trigger** is defined as an object or item that performs on the slide when we click the mouse.
- The MS-PowerPoint can maximum zoom to 400% only.
- In MS-PowerPoint, we can add many types of **image and sound** format such as .gif, .bmp, .png, .jpg, .giv, .wav, .mid, etc.

Shortcut Keys of Microsoft PowerPoint and their Descriptions

Shortcut Keys	Description
F5	View the Slide Show.
Shift + Ctrl + Home	Selects all text from the cursor to the start of the active text box.
Shift + Ctrl + End	Selects all text from the cursor to the end of the active text box.
S	Stop the slide show press S again to restart the slide show.
Esc	End the slide show.
Ctrl + A	Select all items on the page or the active text box.
Ctrl + B	Applies bold to the selected text.
Ctrl + F	Opens the find and replace dialog box with find tab.
Shift + click each slide	Select more than one slides
Ctrl + H	Opens the find and replace dialog box with replace tab.
Ctrl + I	Applies italic to the selected text.
Ctrl + M	Inserts a new slide.
Ctrl + N	Opens a new blank presentation.

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Shortcut Keys	Description
Ctrl + O	Opens the Open dialog box.
Ctrl + T	Opens the Font dialog box.
Ctrl + U	Applies underlining to the selected text.
Ctrl + V	Paste the cutted or copied text
Ctrl + W	Closes the presentation.
Ctrl + Y	Repeats or undo the last command entered.
Home	Moves cursor to beginning of current line of text.
End	Moves cursor to end of current line of text.
Ctrl + Home	Moves cursor in beginning of presentation.
Ctrl + End	Moves cursor to end of presentation.
Shift + Click each side	Select more than one slide in a presentation.
F1	Opens the help dialog box.

Microsoft Access

A database is a collection of logically related and similar data. Database stores similar kind of data for a specific purpose that is organised in such a manner that any information can be retrieved from it, when needed. Microsoft Access is an application which allows the creating of databases. Microsoft Access is a Relational Database Management System (RDBMS).

Start MS-Access

To start the MS-Access software, we need to

Click Start button → All Programs → Microsoft Office → Microsoft Office Access 2007

By default, accdb is the extension of a MS-Access.

Components of MS-Access

Within MS-Access, there are four components as follows

1. **Table** stores the data in your database.
2. **Queries** get information from the data stored in the tables.

There are five types of queries

Query Type	Description
Select query	Retrieves data from one or more tables and displays the recordset in a datasheet. This is the most common type of query.
Parameter query	Prompts the user to enter values that define the query, such as a specified region for sales results.
Cross-tab query	Arranges a recordset to make it more easily visible, using both row headings and column headings.
Action query	Creates a new table or changes an existing table.
SQL query	An advanced query that is created by using an SQL statement.

3. **Reports** allow printing of data, based on queries or tables created by the user.
4. **Forms** make it easy to enter data in the tables. A form is an interface for adding and editing data.

MS-Access Templates

It is a complete tracking application with predefined tables, forms, reports, queries, macros and relationships. MS-Access includes a collection of database templates, *which are described as*

1. **Assets** It is used to create an assets database to keep track of assets, including assets details and owners.
2. **Contacts** It is used to create a contact database to manage information about people.
3. **Events** It is used to create an events database for tracking upcoming meeting, dealings, etc.
4. **Faculty** It is used to create a faculty database to keep track of information about faculty.
5. **Marketing Projects** It is used to create a marketing projects database to keep track time- sensitive deliverable and vendor status for project.
6. **Students** It is used to create students database to keep information about your students including contacts, their guardians.

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Elements of MS-Access

In MS-Access, database holds various elements for every database operation

1. **Field Name** It is a label provided for a field that specifies the type of information contained in a particular field.
2. **Field Type/Data Type** It specifies the type of data stored in the field such as textual data and numerical data or combination of both. The default size of data type is 50 in MS-Access.

There are various data types as follows

Data Type	Field length or Field size
Text	0-255 characters
Memo	0-65535 characters
Number	1, 2, 4 or 8 bytes
Date/Time	8 bytes
Currency	8 bytes
Auto Number	4 bytes
Yes/No	1 bit (0 or 1)
OLE object	upto 1 GB
Hyperlink	Each part contains 2048 characters

3. **Field Length** Field refers length or width to the maximum number of characters that a field can contain.
4. **Primary Key** A field which is used to uniquely identify the records in a table. The primary key cannot contain null value.
5. **Validation Rule** It is a condition that must be met before data is accepted into database.
6. **MS-Access View** You can create a table by two most popular ways
   (i) **Datasheet View** It shows the data in the database and also allows you to enter and edit the data but not allow to change the database.
   (ii) **Design View** It allows you to create or change the table and also set the keys.
7. **Filtering Data** It enables to display only those records in a table that meet a specified filter criterion.
8. **Relationship** It is an association between access tables or queries that use related fields. It is a link between tables and enables us to accessed data from both tables simultaneously.
   Relationship can be divided into *three* catogories as One-to-One, One-to-Many and Many-to-Many
9. **Attributes** These can be defined as the characteristics of an entity to identify it uniquely. Such as student's attributes are Roll-No, Section, Name, etc.

Tit-Bits

- **Memo** allows long blocks of text that use text formatting.
- Each character requires **one byte** for its storage.
- **Validation Text** appears if a validation rule is not satisfied.
- The **Required field property** makes data entry compulsory so that the field cannot be left blank.

Shortcut Keys of MS-Access and their Descriptions

Working with Database Object

Shortcut Keys	Description
Ctrl + N	Create a new database.
Ctrl + O	Open an existing database.
Alt + N	Create a new database object.
Alt + O	Open database object.
Ctrl + S	Save a database object.
Ctrl + P	Print the current or selected database object.
Ctrl + C	Copy the selected object.
Ctrl + X	Cut the selected object.
Ctrl + V	Paste the cutted or copied object.
Delete	Delete an object.

Working with Tables

Shortcut Keys	Description
Ctrl + Plus sign (+)	Add a new record.
Ctrl + Semicolon(;)	Insert the current date.
Ctrl + Shift+Colon(:)	Insert the current time.

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Shortcut Keys	Description
Ctrl + Alt + Spacebar	Insert the default value for a field.
Ctrl + Apostrophe(')	Insert the value from the same field in the previous record.
Ctrl + A	Select all records.
Ctrl + Minus sign (–)	Delete the current record.
Esc	Undo changes made to the current field/record.

Navigation in a Table

Shortcut Keys	Description
Tab	Next field
Shift + Tab	Previous field
Page Down	Next screen
Page Up	Previous screen
Ctrl + ↑	First record
Ctrl + ↓	Last record
↓	Next record
↑	Previous record

Design View

Shortcut Keys	Description
Alt + D	Open a database object in design view.
Alt + Enter	Display a property sheet in design view.
Alt + V + P	Open property sheet for the selected object in design view.

Common Tasks

Shortcut Keys	Description
Ctrl + B	Bold letters
Ctrl + I	Italicise letters
Ctrl + U	Underline letters
Ctrl + F	Find text
Ctrl + H	Replace text
F5	Refresh
F2	Rename
Ctrl + A	Select All
Ctrl + Y	Redo Last Action
Ctrl + Z	Undo Last Action
Ctrl + W	Close the active window
F1	Open Microsoft Access help
Ctrl + Shift + A	Sort selected data in ascending order
Ctrl + Shift + Z	Sortselecteddataindescendingorder
F7	Check spelling

Microsoft Outlook

It is an E-mail client and personal information manager that is available as a part of Microsoft Office suite.

Windows mobile devices are the version of MS-Outlook, enables users to synchronise their E-mails data to their smartphones.

MS-Outlook can work with Microsoft exchange server and Microsoft sharepoint server for multiple users in an organisation such as shared mailboxes, calendars, exchange public folders, sharepoint lists and meeting schedules.

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QUESTION BANK

MS-Word

1. Microsoft Office was developed by ..... in ...
(1) Microsoft Inc, 1970s
(2) Microsoft Inc, 1980s
(3) Sun Microsoft, 1980s
(4) Sun Microsoft Inc, 1970s

2. Which of the following is a basic software of MS-Office?
(1) MS-Word (2) MS-Excel
(3) MS-PowerPoint (4) MS-Access
(5) All of the above

3. MS-Word is a
(1) tabular data formatting software
(2) Word processing software
(3) presentation software
(4) E-mail client

4. What is MS-Word? **[SBI Clerk 2015]**
(1) It is a calculating tool.
(2) It is a planning tool.
(3) It is a chart.
(4) It is a networking tool.
(5) It is a document typing tool.

5. Microsoft Office Word is a(n)
(1) area in the computer's main memory in which Microsoft Office text files are stored temporarily
(2) program included with Windows 2000 that can be used only to create or edit text files, smaller than 64k, that do not require formatting
(3) classified password that prevents unauthorised users from accessing a protected Microsoft Office item or document
(4) full featured Word processing program that can be used to create and revise professional looking documents easily

6. A program which helps to create written documents and lets you go back and make corrections as necessary.
(1) Spreadsheet (2) Personal writer
(3) Word printer (4) Word processor

7. A Word processor would be used best to
(1) paint a picture **[IBPS Clerk 2011]**
(2) draw a diagram
(3) type a story
(4) work out income and expenses
(5) None of the above

8. This program is made by Microsoft and embedded with Windows and used to view Web document. **[RBI Grade B 2013]**
(1) Netscape (2) Outlook Express
(3) Internet Explorer (4) MS-Word
(5) None of these

9. You can start Microsoft Word by using which button?
(1) New (2) Start
(3) Program (4) All of these

10. When you start MS-Word, the opening document has the name as
(1) DOC 1 (2) Document1
(3) Document (4) Workbook

11. What is the default file extension for all Word documents? **[RBI Grade B 2012, IBPS Clerk 2014]**
(1) WRD (2) TXT
(3) DOC (4) FIL
(5) WD

12. The first bar of MS-Word is
(1) menu bar (2) status bar
(3) title bar (4) formatting toolbar

13. Editing a document that has been created means **[IBPS Clerk 2015]**
(1) saving it (2) printing it
(3) scanning it (4) correcting it
(5) None of these

14. A ..... is an additional set of commands that the computer displays after you make a selection from main menu. **[SBI Clerk 2009]**
(1) dialog box (2) sub menu
(3) menu selection (4) All of these
(5) None of these

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15. Microsoft Word is a word processor developed by Microsoft. In MS-Word, Spelling Check is a feature available in which tab?
(1) File (2) Home (3) Insert (4) Review
(5) References

16. MS-Word is a text or document editing application program that comes in the package of MS-Office Suite. Which among the given options is not related with MS-Word? **[IBPS PO 2016]**
(1) Page Layout (2) Antivirus
(3) Mailings (4) Format Painter
(5) SmartArt

17. In order to choose the font for a sentence in a Word document **[IBPS Clerk 2011]**
(1) select Font in the Format menu
(2) select Font in the Edit menu
(3) select Font in the Tools menu
(4) select Font in the View menu
(5) None of the above

18. When computer users ..... a document, they change its appearance.
(1) Edit (2) Create (3) Save (4) Format
(5) None of these

19. In Word, the Replace option is available on
(1) File menu (2) Edit menu
(3) Insert menu (4) View menu
(5) Format menu

20. Which of the following is not an option of Edit menu?
(1) Cut (2) Copy
(3) Paste (4) Page Setup
(5) None of these

21. Which bar is usually located below title bar that provides categorised options?
(1) Menu bar (2) Status bar
(3) Tool bar (4) Scroll bar
(5) None of these

22. The process of making changes to an existing document is referred to as ... it. **[SBI Clerk 2014]**
(1) editing (2) changing
(3) modifying (4) creating
(5) adjusting

23. Most of the editing tools are available under which menu?
(1) File (2) Format
(3) Edit (4) All of these
(5) None of these

24. To move to the beginning of a line of text, press the ... key.
(1) Page up (2) A
(3) Home (4) Enter
(5) None of these

25. In which menu, we will find the command document? **[RBI Grade B 2013]**
(1) File (2) Insert
(3) Tools (4) Data
(5) None of these

26. Which of the following is not a font style?
(1) Bold (2) Italic
(3) Regular (4) Superscript
(5) Bold-Italic

27. Portrait and landscape are
(1) page orientation (2) paper size
(3) page layout (4) page margin
(5) page gap

28. Which of the following should be used to move a paragraph from one place to another in a Word document?
(1) Copy and paste (2) Cut and paste
(3) Delete and retype (4) Find and replace
(5) None of these

29. To move the text from its original position to another position without deleting it is called
(1) scrolling (2) searching
(3) moving (4) copying
(5) halting

30. Which of the following displays the buttons for changing text style, alignment and size?
(1) Standard toolbar (2) Status bar
(3) Drawing toolbar (4) Formatting toolbar

31. For printing a document, you have to put on
(1) Printer (2) Monitor
(3) Scanner (4) All of these
(5) None of these

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32. Blinking point which shows your position in the text is called
(1) cursor (2) blinker (3) position
(4) states (5) place

33. After selecting the 'Replace' option from the Edit menu, the following dialog box will be appear.
(1) Replace (2) Find
(3) Find and Replace (4) Edit

34. Which of the following justification align the text on both the sides left and right of margin? **[IBPS Clerk 2012]**
(1) Right (2) Justify
(3) Both sides (4) Balanced
(5) None of these

35. Auto-text can be used to insert .... . in document. **[RBI Grade B 2014]**
(1) Text (2) Graphics
(3) Either 1 or 2 (4) Both '1' and '2'
(5) None of these

36. About margins **[RBI Grade B 2014]**
(1) all sections in a document need to have same margin
(2) different section can have different margins
(3) Word have predefined margins settings for all documents
(4) can't say, depend on the version of Word
(5) None of the above

37. When entering text within a document, the Enter key is normally pressed at the end of every **[IBPS PO 2011, IBPS Clerk 2013]**
(1) line (2) sentence
(3) paragraph (4) word
(5) file

38. In order to delete a sentence from a document, you would use **[IBPS Clerk 2015]**
(1) highlight and copy (2) cut and paste
(3) copy and paste (4) highlight and delete
(5) select and paste

39. Soft page breaks **[RBI Grade B 2013]**
(1) are induced by the user
(2) are inserted by word automatically at the end of the page
(3) can be deleted
(4) are the one to show end of paragraph
(5) None of the above

40. When working in the page break preview, you can
(1) view exactly where each page break occurs
(2) add or remove page breaks
(3) change the print area
(4) All of the above
(5) None of the above

41. In Word, you can force a page break **[IBPS PO 2011]**
(1) by positioning your cursor at the appropriate place and pressing the F1 key
(2) by positioning your cursor at the appropriate place and pressing the Ctrl+Enter
(3) by using the insert/section break
(4) by changing the font size of your document
(5) None of the above

42. Where you can find the horizontal split bar on MS-Word screen?
(1) On the left of horizontal scroll bar
(2) On the right of horizontal scroll bar
(3) On the top of vertical scroll bar
(4) On the bottom of vertical scroll bar

43. In MS-Word, the default alignment for paragraph is
(1) left aligned (2) centered
(3) right aligned (4) justified
(5) None of these

44. Which of the following is not available on the ruler of MS-Word screen?
(1) Left indent (2) Right indent
(3) Centre indent (4) All of these

45. You specify the save details of your file in the **[RBI Grade B 2013]**
(1) "Save as a file" dialog box
(2) "Save the file as" dialog
(3) "File save" dialog box
(4) Any of '1' and '2'
(5) None of the above

46. To save an existing document with a different file name, click
(1) Save button on the Standard toolbar
(2) Save on the File menu

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(3) Save As button on the Standard toolbar
(4) Save As on the File menu
(5) None of the above

47. How many ways you can save a document? **[SBI PO 2012]**
(1) 3 (2) 4 (3) 5 (4) 6
(5) 8

48. Word has a list of predefined typing, spelling, capitalisation and grammar errors that ..... can defect and correct.
(1) autoentry (2) autocorrect
(3) autoadd (4) autospell
(5) autoword

49. Where header appears?
(1) Top (2) Bottom
(3) Centre (4) All of these
(5) None of these

50. Keyboard shortcut for Cut command is **[SBI Clerk 2015]**
(1) Ctrl + W (2) Ctrl + Y
(3) Ctrl + Z (4) Ctrl + X
(5) Ctrl + V

51. To increase the line spacing, use the ..... shortcut keys.
(1) Ctrl + L (2) Ctrl + E
(3) Ctrl + I (4) Ctrl + M
(5) Ctrl + 5

52. Shortcut for displaying the full page as they are printed.
(1) Ctrl + F1 (2) Ctrl + F2
(3) Shift + F1 (4) Shift + F2
(5) Alt + F2

53. The shortcut key to print documents is **[IBPS PO 2012]**
(1) Ctrl + D (2) Ctrl + A
(3) Ctrl + B (4) Ctrl + C
(5) Ctrl + P

54. Which is the shortcut key to display Open dialog box?
(1) F12 (2) Shift + F12
(3) Alt + F12 (4) Ctrl + F12
(5) None of these

55. To move to the bottom of a document while working on MS-Word, which command is used? **[IBPS Clerk 2014]**
(1) Home key
(2) End key
(3) Ctrl + Page Down Key
(4) Insert key
(5) Ctrl + End key

56. To undo the last work, we have to use which of the following Windows shortcut key? **[SBI PO 2014]**
(1) Ctrl + P (2) Ctrl + U
(3) Ctrl + A (4) Ctrl + Z
(5) Ctrl + W

57. Shortcut key to go to last line in the document **[SBI PO 2014]**
(1) Ctrl + Last (2) Ctrl + L
(3) Ctrl + End (4) Alt + End
(5) Alt + L

58. Which of the following can be used to select the entire document? **[IBPS Clerk 2013, IBPS PO 2011]**
(1) Ctrl + A (2) Alt + F5
(3) Shift + A (4) Ctrl + K
(5) Ctrl + H

59. What is the shortcut key for centering the text selected by the user in Word? **[IBPS Clerk 2011]**
(1) Ctrl + A (2) Ctrl + B
(3) Ctrl + C (4) Ctrl + D
(5) Ctrl + E

60. To open a new file in MS-Word, the shortcut key is
(1) Ctrl + X (2) Ctrl + N
(3) Ctrl + Y (4) Ctrl + V

MS-Excel

1. MS-Excel is used for **[SBI Clerk 2012]**
(1) letter writing
(2) spreadsheet calculation
(3) presentation
(4) painting
(5) None of the above

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2. What kind of software would you most likely use to keep track of a billing account? **[IBPS PO 2015]**
(1) Web Authoring (2) Electronic Publishing
(3) Spreadsheet (4) Word Processing
(5) PowerPoint

3. Excel worksheet data can be shared with Word document by **[RBI Grade B 2014]**
(1) inserting an Excel file into Word
(2) copy and paste Excel worksheet into Word document
(3) link Excel data in a Word document
(4) All of the above
(5) None of the above

4. A worksheet is made of columns and rows, wherein **[RBI Grade 2013]**
(1) columns run horizontally and rows run vertically
(2) columns run vertically and rows run horizontally
(3) the run is dependent on the application being used
(4) Both '2' and '3'
(5) None of the above

5. Which of the following software applications would be the most appropriate for performing numerical and statistical calculations? **[RBI Grade B 2012]**
(1) Database
(2) Document processor
(3) Graphics package
(4) Spreadsheet
(5) PowerPoint

6. The file responsible for starting MS-Excel is **[RBI Grade B 2013]**
(1) MS.Excel (2) MS.exe
(3) Excel.exe (4) Excel.com
(5) None of these

7. Anything that is typed in a worksheet appears **[RBI Grade B 2013]**
(1) in the formula bar only
(2) in the active cell only
(3) in both active cell and formula bar
(4) All of the above
(5) None of the above

8. Which one is the example of spreadsheet package? **[IBPS Clerk 2011]**
(1) VisiCalc (2) Unity
(3) Ada (4) Snowball
(5) None of these

9. Which option will we use to give heading in the form ?
(1) Label (2) Text box
(3) Option group (4) Insert
(5) None of these

10. The extension of saved file in MS-Excel is
(1) .xis (2) .xas
(3) .xlsx (4) .xll
(5) .lxs

11. Alignment buttons are available on which toolbar?
(1) Status (2) Standard
(3) Formatting (4) All of these
(5) None of these

12. In Excel, the intersection of a column and a row is called **[RBI Grade B 2014]**
(1) cell (2) grid (3) table (4) box
(5) None of these

13. What does an electronic spreadsheet consist of? **[IBPS Clerk 2011]**
(1) Rows (2) Columns
(3) Cells (4) All of these
(5) None of these

14. A collection of worksheets is called **[RBI Grade B 2014]**
(1) Excel book (2) Worksheets
(3) Excel sheets (4) Workbook
(5) None of these

15. All of the following terms are related to spreadsheet software except **[SBI Clerk 2011]**
(1) worksheet (2) cell
(3) formula (4) virus detection
(5) None of these

16. Which of the following is an active cell in Excel? **[IBPS Clerk 2011]**
(1) Current cell (2) Formula
(3) Range (4) Cell address
(5) None of these

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17. How are the data organised in a spreadsheet? **[SBI Clerk 2008]**
(1) Lines and spaces (2) Layers and planes
(3) Height and width (4) Rows and columns
(5) None of these

18. The basic unit of a worksheet into which you enter data in Excel is called a **[IBPS Clerk 2008]**
(1) tab (2) cell (3) box (4) range
(5) None of these

19. The advantage of using a spreadsheet is
(1) calculations can be done automatically
(2) changing data automatically updates calculations
(3) more flexibility
(4) All of the above

20. A ..... is rectangular grid of rows and columns used to enter data.
(1) cell (2) workspace
(3) worksheet (4) spreadsheet
(5) Both '3' and '4'

21. The default view in Excel is ..... view.
(1) Work (2) Auto
(3) Normal (4) Roman

22. It is a software tool that lets one enter, calculate, manipulate set of numbers.
(1) speedsheet (2) spreadsheet
(3) slide sheet (4) All of these
(5) None of these

23. Borders can be applied to
(1) cells (2) paragraph
(3) text (4) All of these
(5) None of these

24. The cell having bold boundary is called
(1) relative (2) active
(3) absolute (4) mixed
(5) passive

25. You can create hyperlinks from the Excel workbook to
(1) a Web page on company Internet
(2) a Web page on the Internet
(3) other Office 97 application documents
(4) All of the above

26. To select a column the easiest method is to
(1) double click any cell in the column
(2) drag from the top cell in the column to the last cell in the column
(3) click the column heading
(4) click the row heading
(5) None of the above

27. Which among the following is not such an operation which can be carried out on objects in graphic program?
(1) Spell check (2) Change size
(3) Move (4) Delete
(5) None of the above

28. Which of the following will you use as an option for saving a file?
(1) Save button on Standard toolbar
(2) Save option from File menu
(3) Pressing Ctrl + S
(4) All of the above

29. What function displays row data in a column or column data in a row?
(1) Hyperlink (2) Index
(3) Transpose (4) Rows
(5) None of these

30. In Excel, ... allows users to bring together copies of workbooks that other users gave worked on independently. **[SBI Clerk 2011]**
(1) copying (2) merging
(3) pasting (4) compiling
(5) None of these

31. Insert date, format page number and insert auto text are buttons on the ..... toolbar.
(1) formatting (2) header and footer
(3) standard (4) edit
(5) None of these

32. On saving a worksheet, the 'Save As' dialog box **[RBI Grade B 2013, 14]**
(1) is used to open the saved Excel files
(2) is used for saving the file for the first time
(3) is used for saving the file by some alternative name
(4) Both '2' and '3'
(5) None of the above

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33. The letter and number of the intersecting column and row is the **[IBPS PO 2012]**
(1) cell location (2) cell position
(3) cell address (4) cell coordinates
(5) cell contents

34. Magnifier button is available on
(1) Print Preview toolbar **[RBI Grade B 2014]**
(2) Standard toolbar
(3) Formatting toolbar
(4) Both '1' and '2'
(5) None of the above

35. Which of the following is not a valid formula in Microsoft Excel? **[IBPS Clerk 2014]**
(1) = A2 + A1 (2) = A2 + 1
(3) = 1 + A2 (4) = 1A + 2
(5) = A1 + A2

36. Which command is used to calculate total characters in a cell? **[RBI Grade B 2014]**
(1) Len (2) Length (3) Mid (4) Sid
(5) None of these

37. The function TODAY ( ) in Excel, enters the current **[RBI Grade B 2014]**
(1) system time in a cell
(2) system date and time in a cell
(3) system date only
(4) time at which the current file was opened
(5) None of the above

38. Which of the following characteristics is used to compute dynamically the results from Excel data? **[IBPS Clerk 2012]**
(1) Goto (2) Table
(3) Chart (4) Diagram
(5) Formula and function

39. Which area in an Excel window allows entering values and formulas? **[RBI Grade B 2013]**
(1) Standard Toolbar (2) Menu Bar
(3) Title Bar (4) Formula Bar
(5) None of the above

40. = Sum (B1 : B10) is an example of a
(1) function (2) formula
(3) cell address (4) value
(5) None of these

41. You can copy data or formulas
(1) with the copy, paste and cut commands on the Edit menu
(2) with commands on a shortcut menu
(3) with buttons on the standard toolbars
(4) All of the above
(5) None of the above

42. A cell entry can be edited in the cell or in the
(1) menu bar (2) edit menu
(3) function bar (4) formula bar
(5) None of these

43. In Excel, this is a prerecorded formula that provides a shortcut for complex calculations.
(1) Value (2) Data series
(3) Function (4) Field
(5) None of these

44. In Excel, an active cell can be represented by
(1) 4A (2) A4
(3) A$4 (4) A4
(5) $A4

45. Three types of data can be entered in a worksheet, as number/characters, text and
(1) formulas (2) functions
(3) logic (4) All of these
(5) None of these

46. The physical arrangement of elements on a page is referred to as a document's
(1) Features
(2) Format
(3) Pagination
(4) Grid

47. Cell address $A4 in a formula means it is a
(1) mixed cell reference
(2) absolute cell reference
(3) relative cell reference
(4) All of the above
(5) None of the above

48. In this chart, only one data series can be plotted
(1) pie (2) line
(3) bar (4) column
(5) None of these

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49. This chart shows the relationship of parts to a whole.
(1) pie (2) line
(3) stacked bar (4) embedded
(5) None of these

50. A chart placed in a worksheet is called
(1) formatting chart (2) embedded chart
(3) aligning chart (4) hanging chart
(5) None of these

51. Scatter chart is also known as
(1) XX chart (2) YX chart
(3) XY chart (4) YY chart
(5) XZ chart

52. In Excel, charts are created using which option? **[SBI Clerk 2009]**
(1) Chart wizard (2) Pivot table
(3) Pie chart (4) Bar chart
(5) None of these

53. Pie charts are typically created by using which of the following?
(1) Browser software
(2) Database software
(3) Desktop publishing software
(4) Word processing software
(5) Spreadsheet software

54. Pressing Ctrl + F9 in Excel
(1) prints 9 worksheets
(2) prints a sheet
(3) prints 9 followed by spaces
(4) inserts 9 cells at the current location
(5) None of the above

55. To select the current column, press
(1) Ctrl + Spacebar (2) Ctrl + B
(3) Shift + Enter (4) Ctrl + Enter
(5) Ctrl + Shift

56. The cell accepts your typing as its contents, if you press
(1) Enter (2) Ctrl + Enter
(3) Tab (4) Insert
(5) None of these

57. Which key is used in combination with another key to perform a specific task?
(1) Function (2) Space bar
(3) Arrow (4) Control
(5) None of these

58. Which of the following commands in Office 2007, can be used to go to the first cell in the current row? **[IBPS Clerk 2014]**
(1) Tab (2) Shift + Tab
(3) Esc + Home (4) Shift + Home
(5) Home

59. In a worksheet in MS-Excel, what is short-cut key to hide entire row? **[SBI PO 2014]**
(1) Ctrl + 2 (2) Ctrl + 9
(3) Ctrl + N (4) Ctrl + –
(5) Ctrl + N

60. To select entire row, which shortcut is used? **[SBI PO 2014]**
(1) Shift + space (2) Ctrl + space
(3) Alt + space (4) None of these
(5) None of these

MS-PowerPoint

1. Which software is used to create presentation?
(1) Microsoft Word (2) Microsoft Excel
(3) Microsoft PowerPoint
(4) Microsoft Access
(5) All of the above

2. What is the extension of PowerPoint in Microsoft Office 2007?
(1) .ptp (2) .pptx (3) .ppx (4) .ptx
(5) .pt

3. You can add any picture in your document from which menu?
(1) File (2) Edit (3) Insert (4) Format
(5) View

4. Which of the following should you use if you want all the slides in the presentation to have the same 'look'?
(1) The slide layout option
(2) Add a slide option
(3) Outline view
(4) A presentation design template
(5) None of the above

5. The ..... defines the appearance and shape of letters, numbers and special characters.
(1) font (2) font size
(3) point (4) paragraph formatting
(5) None of these

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6. ..... shows how the contents on printed page will appear with margin, header and footer.
(1) Draft (2) Full screen reading
(3) Outline (4) Page layout
(5) None of these

7. By default, on which page the header or footer is printed? **[IBPS Clerk 2011]**
(1) On first page (2) On alternative page
(3) On every page (4) All of these
(5) None of these

8. To find the paste special option, or use the Clipboard group on the ..... tab of Power Point. **[IBPS Clerk 2013]**
(1) Design (2) Slide Show
(3) Page Layout (4) Insert
(5) None of these

9. This is to insert an object, which is not miss print to its originating document into a destination document? **[RBI Grade B 2014]**
(1) Cell (2) Embed
(3) Defaults (4) Any of these
(5) None of these

10. Selecting Portrait changes our page from **[RBI Grade B 2014]**
(1) a wide to tall orientation
(2) a tall to wide orientation
(3) a normal font size to a condensed one
(4) a condensed font size to a normal one
(5) None of the above

11. Which of the following controls the format and placement of the titles and text you on slides, as well as, background items and graphics you want to appear on every slide? **[IBPS Clerk 2015]**
(1) Slide (2) Copyright
(3) Layout (4) Design
(5) None of these

12. Which of the following views is the best view to use when setting transition effects for all slides in presentation?
(1) Slide sorter view (2) Notes page view
(3) Slide view (4) Outline view
(5) None of these

13. Which PowerPoint view displays each slide of the presentation as a thumbnail and is useful for rearranging slides? **[IBPS Clerk 2013]**
(1) Slide sorter (2) Slide show
(3) Slide master (4) Notes page
(5) Slide design

14. Which is a feature included in Microsoft PowerPoint software that allows the user to see all the slides in a presentation at one time? **[IBPS PO 2016]**
(1) Slide Sorter (2) Slide Master
(3) Handout Master (4) Slide Header
(5) Reading View

15. To add a header or footer to your handout, you can use the
(1) Title master (2) Slide master
(3) Handout master (4) All of these
(5) None of these

16. The maximum zoom percentage in MS-PowerPoint is **[IBPS Clerk 2009]**
(1) 100% (2) 200% (3) 400% (4) 500%
(5) None of these

17. In Microsoft PowerPoint, two kinds of sound effect files can be added to the presentation are
(1) .wav files and .mid files
(2) .wav files and .gif files
(3) .wav files and .jpg files
(4) .jpg files and .gif files
(5) None of the above

18. Which file format can be added to a PowerPoint show?
(1) .jpg (2) .giv (3) .wav (4) All of these
(5) None of these

19. PowerPoint provides ..... number of layouts for use with blank presentation.
(1) 20 (2) 22 (3) 24 (4) 26
(5) None of these

20. In PowerPoint, the Header and Footer buttons can be found on the Insert tab in which group? **[IBPS PO 2012, Clerk 2013]**
(1) Illustrations group (2) Object group
(3) Insert group (4) Tables group
(5) None of these

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21. Which command brings you to the first slide in your presentation?
(1) Next slide button (2) Page up
(3) Ctrl + Home (4) Ctrl + End
(5) None of these

22. Which of the following allows you to select more than one slides in a presentation?
(1) Alt + click each slide
(2) Shift + drag each slide
(3) Shift + click each slide
(4) Ctrl + click each slide
(5) None of the above

23. Which of the following will not advance the slides in a slide show view?
(1) Esc key (2) Spacebar
(3) Enter key (4) Mouse button
(5) None of the above

24. Which of the following bypasses the Print dialog box when printing individual slides or an entire presentation?
(1) File, Print preview (2) Print button
(3) File, Print (4) Ctrl + P
(5) None of these

25. Which key on the keyboard can be used to view slide show?
(1) F1 (2) F2
(3) F5 (4) F10
(5) None of these

MS-Access & MS-Outlook

1. In MS-Access, a table can have……primary key/keys.
(1) One (2) Two (3) Three (4) Four
(5) None of these

2. Which of the following is a DBMS software?
(1) Access (2) Excel
(3) Word (4) PowerPoint
(5) None of these

3. How many types of relationships are there in MS-Access?
(1) 3 (2) 4
(3) 5 (4) 6
(5) None of these

4. Attributes can be defined for
(1) entity (2) switch board
(3) macro (4) pages
(5) None of these

5. In order to include picture data type must be **[RBI PO 2009]**
(1) OLE (2) hyperlink
(3) Yes/No (4) picture
(5) None of these

6. What is the default size of the data type in MS-Access ? **[SBI Clerk 2010]**
(1) 50 (2) 60
(3) 70 (4) 80
(5) None of these

7. Which is the short key to invoke the spell checker in MS-Access? **[RBI Grade B 2013]**
(1) F2 (2) F7
(3) Alt+F7 (4) F3
(5) None of these

8. We can't make query by Insert menu? **[RBI Grade B 2013]**
(1) True (2) False
(3) Cannot say (4) Sometimes
(5) None of the above

9. A template is a **[RBI Grade B 2014]**
(1) pattern of worksheet
(2) heading
(3) title
(4) theme
(5) None of the above

10. E-mail client is the feature of
(1) MS-Word (2) MS-Excel
(3) MS-PowerPoint (4) MS-Access
(5) MS-Outlook

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ANSWERS

MS-Word

1. *(2)*	2. *(5)*	3. *(2)*	4. *(5)*	5. *(2)*	6. *(4)*	7. *(3)*	8. *(4)*	9. *(2)*	10. *(2)*
11. *(3)*	12. *(3)*	13. *(4)*	14. *(2)*	15. *(4)*	16. *(2)*	17. *(1)*	18. *(1)*	19. *(2)*	20. *(4)*
21. *(1)*	22. *(1)*	23. *(3)*	24. *(3)*	25. *(4)*	26. *(4)*	27. *(1)*	28. *(2)*	29. *(4)*	30. *(4)*
31. *(1)*	32. *(1)*	33. *(3)*	34. *(2)*	35. *(4)*	36. *(2)*	37. *(1)*	38. *(4)*	39. *(2)*	40. *(4)*
41. *(3)*	42. *(3)*	43. *(1)*	44. *(3)*	45. *(1)*	46. *(4)*	47. *(1)*	48. *(2)*	49. *(1)*	50. *(4)*
51. *(5)*	52. *(2)*	53. *(5)*	54. *(5)*	55. *(3)*	56. *(4)*	57. *(3)*	58. *(1)*	59. *(5)*	60. *(2)*

MS-Excel

1. *(2)*	2. *(3)*	3. *(4)*	4. *(2)*	5. *(4)*	6. *(3)*	7. *(3)*	8. *(4)*	9. *(1)*	10. *(3)*
11. *(3)*	12. *(1)*	13. *(4)*	14. *(4)*	15. *(4)*	16. *(1)*	17. *(4)*	18. *(2)*	19. *(4)*	20. *(5)*
21. *(3)*	22. *(2)*	23. *(4)*	24. *(2)*	25. *(4)*	26. *(2)*	27. *(5)*	28. *(4)*	29. *(3)*	30. *(2)*
31. *(1)*	32. *(3)*	33. *(3)*	34. *(1)*	35. *(4)*	36. *(1)*	37. *(4)*	38. *(5)*	39. *(4)*	40. *(2)*
41. *(4)*	42. *(4)*	43. *(3)*	44. *(2)*	45. *(4)*	46. *(2)*	47. *(1)*	48. *(1)*	49. *(3)*	50. *(2)*
51. *(3)*	52. *(1)*	53. *(5)*	54. *(5)*	55. *(1)*	56. *(1)*	57. *(4)*	58. *(4)*	59. *(2)*	60. *(1)*

MS-PowerPoint

1. *(3)*	2. *(2)*	3. *(3)*	4. *(4)*	5. *(1)*	6. *(4)*	7. *(4)*	8. *(5)*	9. *(2)*	10. *(1)*
11. *(3)*	12. *(1)*	13. *(1)*	14. *(1)*	15. *(3)*	16. *(3)*	17. *(1)*	18. *(4)*	19. *(3)*	20. *(5)*
21. *(3)*	22. *(3)*	23. *(1)*	24. *(4)*	25. *(3)*					

MS-Access & MS-Outlook

1. *(1)*	2. *(1)*	3. *(1)*	4. *(1)*	5. *(1)*	6. *(1)*	7. *(2)*	8. *(1)*	9. *(1)*	10. *(5)*

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CHAPTER

11

DATABASE CONCEPTS

A database is a collection of logically related information in an organised way so that it can be easily accessed, managed and updated. Some other operations can also be performed on database such as adding, updating and deleting data.

Fundamentals of Database

For defining database, two terms, which are used frequently with database, should be known as

1. **Data** These are raw and unorganised facts that need to be processed such as digital representation of text, numbers, graphical images or sound. e.g. A student's test score is one piece of data.
2. **Information** When data is processed, organised, structured or presented in a given context to make it useful or meaningful, it is called information. *e.g.* The class's average score is the information that can be concluded from the given data.

Types of Database

Databases are of three types, namely as follows

1. **Network Database** In this type of database, data is represented as a collection of records and relationships among data are represented as links.
2. **Hierarchical Database** In this type of database, data is organised in the form of tree with nodes. Nodes are connected *via* links.
3. **Relational Database** This database is also known as structured database in which data is stored in the form of tables. Where, columns define the type of data stored in the table and rows define the information about the data.

Components of a Database

A database consists of several different components. Each component listed, is called an object.

Database components are described below

1. **Tables** These are the building blocks or relation of any relational database model where all the actual data is defined and entered. Different types of operation are done on the tables such as storing, filtering, retrieving and editing of data. Tables consist of cells at the intersection of records (rows) and fields (columns), *which are described below*
   (i) **Field** It is an area (within the record) reserved for a specific piece of data. e.g. Customer number, customer name, street address, city, state, phone number, current address etc. Field of a table is also known as column.

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(ii) **Record** It is the collection of data items of all the fields pertaining to one entity, i.e. a person, company, transition, etc. Record of a table is also known as row or a tuple and the number of records in a relation is called the cardinality of that relation.

2. **Queries** These are basically questions based on the data available in a database. A query consists of specifications indicating which fields, records and summaries a user wants to fetch from a database. Queries allow you to extract data based on the criteria that you define.
3. **Forms** Although you can enter and modify data in datasheet view of tables but you neither control the user's action very well nor you can do much to facilitate the data-entry process. To overcome this problem, forms are introduced.
   Like tables, forms can be used to view and edit your data. However, forms are typically used to view the data in an underlying table one record at a time.
   e.g. A user can create a data entry form that looks exactly like a paper form. People generally prefer to enter data into a well-designed form, rather than a table.
4. **Reports** When you want to print those records which are fetched from your database, design a report. Access even has a **wizard** to help produce mailing labels.

Database Management System (DBMS)

A DBMS is a collection of interrelated data and a set of programs to retrieve data from a database. It is an organised collection of data viewed as a whole, instead of a group of separate unrelated files.

The primary goal of DBMS is to provide an environment that is both convenient and efficient for user to store and retrieve database information.

e.g. MySQL, Oracle, FoxPro, dBASE, SyBase MS-Access. The purpose of database management system is to bridge the gap between information and data.

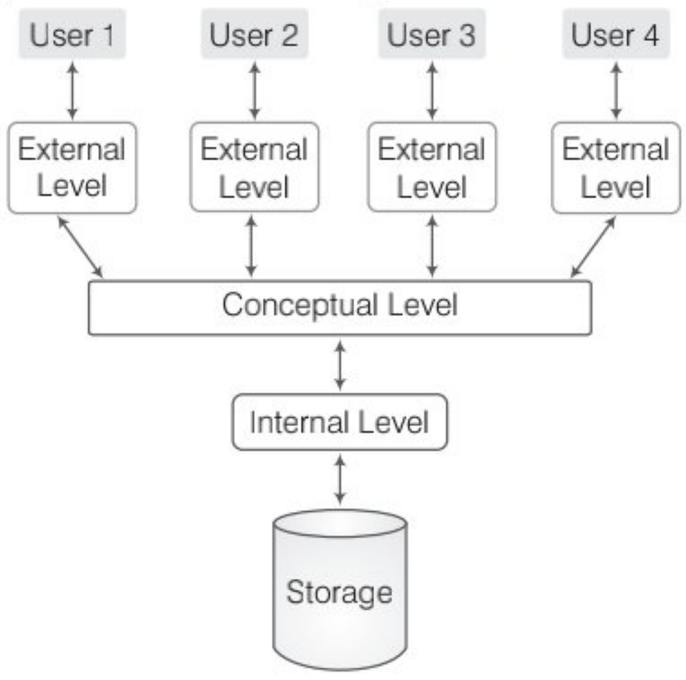
The basic processes that are supported by DBMS are as follows

(i) Specification of data types, structures and constraints to be considered in an application
(ii) Storing the data
(iii) Manipulation of the database
(iv) Querying the database to retrieve desired information
(v) Updating the content of the database

Architecture of DBMS

The architecture of DBMS is divided into three levels are as follows

1. **Internal Level** It is the lowest level of data abstraction that deals with the physical representation of the database on the computer. It is also known as physical level. It defines how the data are actually stored and organised on the storage medium.



Architecture of DBMS

2. **Conceptual Level** It is the overall view of the database and includes all the information that is going to be represented in the database. It describes what type of data is stored in the database, the relationship among the data without effecting to the physical level. It is also known as logical level.

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3. **External Level** This is the highest level of data abstraction which describes the interaction between the user and the system.

   It permits the users to access data in a way that is customised according to their needs, so that the same data can be seen by different users in different ways, at the same time. It is also known as view level.

Advantages of DBMS

There are following advantages of DBMS

1. **Reduction in Data Redundancy** The duplication of data refers to data redundancy. DBMS cannot make separate copies of the same data. All the data is kept at a place and different applications refer to data from centrally controlled system.
2. **Better Interaction with Users** In DBMS, the availability of upto-date information improves the data to be access or respond as per user requests.
3. **Improvement in Data Security** DBMS can allow the means of access to the database through the authorised channels.

   To ensure security, DBMS provides security tools, *i.e.* username and password.
4. **Maintenance of Data Integrity** Data integrity ensures that the data of database is accurate. In DBMS, data is centralised and used by many users at a time, it is essential to enforce integrity controls.
5. **Ease of Application Development** The application programmer needs to develop the application programs according to the user's need. The other issues like concurrent access, security, data integrity, etc. are handled by database itself. This makes the application development an easier task.
6. **Backup and Recovery** The DBMS provides backup and recovery subsystem that is responsible to recover data from hardware and software failures.

Disadvantages of DBMS

As there are many advantages, DBMS also have some minor disadvantages.

These disadvantages are listed here

1. **Cost of Hardware and Software** A processor with high speed of data processing and memory of large size is required to run the DBMS software. It means that you have to upgrade the hardware used for file based system. Similarly, database software is also very costly.
2. **Complexity** The provision of the functionality that is expected from a good DBMS makes the DBMS an extremely complex piece of software. Failure to understand the system can lead to bad design decisions, which can have serious consequences for an organisation.
3. **Cost of Staff Training** Mostly DBMS are often complex systems so the training for user to use the database is required. The organisation has to pay a lot of amount for the training of staff to run the DBMS.
4. **Appointing Technical Staff** The trained technical persons such as database administrator, application programmers, etc. are required to handle the database. You have to pay a lot of amount to these persons. Therefore, the system cost increases.
5. **Database Failure** In most of the organisations, all data is integrated into a single database. If database is corrupted due to power failure or it is corrupted on the storage media, then our valuable data may be lost or whole system stop.

Applications of DBMS

Some applications of DBMS are as follows

1. **Banking** For customer information, accounts, loans and other banking transactions.
2. **Reservation** For reservation and schedule information.
3. **Universities** For student information, course registration, grades etc.
4 **Credit Card Transaction** For purchase of credit cards and generation of monthly statements.

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5. **Telecommunication** For keeping records of calls made, generating monthly bill, etc.
6. **Finance** For storing information about holdings, sales and purchase of financial statements.
7. **Sales** For customer, product and purchase information.

Relational Database

In a relational database, data is stored in different tables with relationships to each other. These tables communicate and share information, which facilitates data search ability, organisation and reporting.

In the case of relational database, a Relational Database Management System (RDBMS) performs these tasks. An important feature of this database system is that a single database can be spread across several tables.

e.g. Base, Oracle, DB2, SyBase, Informix, etc.

Terms Related to Database

Various terms related to relational database are as follows

1. **Relation** It is a table with columns and rows which represent the data items and relationships among them. It has three important properties a name, cardinality and a degree.

   These properties help us to further define and describe relations

   (i) **Name** The first property of a relation is its name, which is represented by the tide or the entity identifier.

   (ii) **Cardinality** The second property of a relation is its cardinality, which refers to the number of tuples (rows) in a relation.

   (iii) **Degree** The third property of a relation is its degree, which refers to the number of attributes (columns) in each tuple.
2. **Domain** It is a collection of all possible values from which the values for a given column or an attribute is drawn. A domain is said to be atomic if elements are considered to be indivisible units.
3. **Attributes** The heading columns of a table are known as attributes. Each attribute of a table has a distinct name.
4. **Tuples** The rows in a relation are also known as tuples. Each row or tuple has a set of permitted values for each attribute.

Keys

Key is one of the important concepts of database. A key is defined as the column or set of columns in a table that is used to identify either row of data in a table or establish relationship with another table.

If a table has id, name and address as the column names then each one is known as the key for that table. The keys are also used to uniquely identify each record in the database table.

Types of Keys

There are mainly four types of keys which are described below

1. **Primary Key** It is a set of one or more attributes that can uniquely identify tuples (rows) within the relation. The primary key should be chosen in such a way, i.e. its value must not be changed. There should not be duplicacy in the record of primary key. Primary key can be atomic or composite. The field chosen as primary key, cannot accept null value.
2. **Candidate Key** The set of all attributes which can uniquely identify each tuple (row) of a relation, are known as candidate keys. Each table may have one or more candidate keys and one of them will become the primary key. The candidate key of a relation is always a minimal key.
3. **Alternate Key** From the set of candidate keys after selecting one of the keys as primary key, all other remaining keys are known as alternate keys.

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4. **Foreign Key** It is a non-key attribute whose value is derived from the primary key of the same or some another table. The relationship between two tables is established with the help of foreign key.

   A table may have multiple foreign keys and each foreign key can have a different referenced table. Foreign keys play an essential role in database design, when tables are broken apart then foreign keys make it possible for them to be reconstructed.

Tit-Bits

- Dr. EF Codd represented 12 rules for Relational Database Management System (RDBMS) in 1970.
- **Schema** is a logical structure of the database.
- **Instances** are the actual data contained in the database at a particular point of time.
- **Data duplication** wastes the space, but also promotes a more serious problem called data inconsistency.

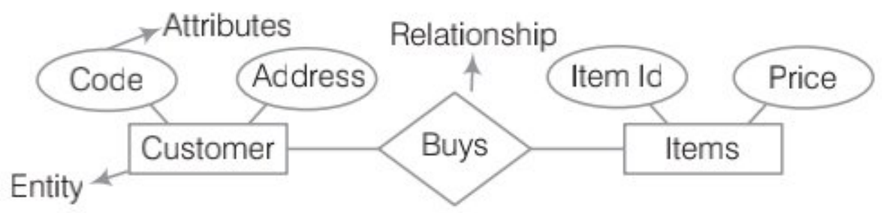
Database Languages

There are various types of database languages

1. **Data Definition Language** (DDL) It is used to define structure of your tables and other objects in database. In DBMS, it is used to specify a database schema as a set of definitions.
2. **Data Manipulation Language** (DML) It provides various commands used to access and manipulate data in existing database. This manipulation involves inserting data into database tables, retrieving existing data, deleting data from existing tables and modifying existing data.
3. **Data Control Language** (DCL) These commands are used to assign security levels in database which involves multiple user setups. They are used to grant defined role and access privileges to the users.

Entity-Relationship Model (E-R Model)

It represents the entities contained in the database. It is a diagrammatically representation of entities and relationship between them. It is also known as E-R diagram.



E-R Diagram

Some terms related to E-R model are described below

Entity

It is an object that has its existence in the real world. It includes all those things about which the data are collected. "Entities are represented in rectangles." e.g. Customer buys goods, it means customer and goods are entities.

Attributes

It describes the characteristics or properties of entity. In tables, attributes are represented by columns. Attributes are drawn in elliptical shapes. e.g. ITEM entity may contain code and price.

Entity Set

It is a set of entities of the same type that shares same properties or attributes. e.g. Students is an entity set of all student entities in the database.

Entity set is of two types as follows

1. **Strong Entity Set** It has a primary key or can be easily distinguishable each attribute.
2. **Weak Entity Set** It does not posses sufficient attributes to form a primary key.

Relationship

It is an association among several entities. A relationship describes how two or more entities are related to each other. It is represented by diamond shape.

Relationship can be divided into three parts

(i) One to one (ii) Many to one
(iii) One to many

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QUESTION BANK

1. A computer checks the ..... of username and password for a match before granting access. **[SBI Clerk 2011]**

(1) website (2) network
(3) backup file (4) database
(5) None of these

2. A ..... is a collection of data that is stored electronically as a series of records in a table.

(1) spreadsheet (2) presentation
(3) database (4) Web page

3. A collection of interrelated records is called a **[RBI Grade B 2012]**

(1) utility file
(2) management information system
(3) database
(4) spreadsheet
(5) datasheet

4. Which of the following is the organised collection of large amount of interrelated data stored in a meaningful way used for manipulation and updating? **[IBPS Clerk Mains 2017]**

(1) Database (2) File
(3) Folder (4) Data-mining
(5) Data source

5. Items such as names and addresses are considered as

(1) input (2) data (3) output (4) records

6. Which type of database, organised the data in the form of tree with nodes?

(1) Network Database (2) Hierarchical Database
(3) Relational Database
(4) Multiple Database

7. The database stores information in **[SBI PO 2010]**

(1) rows and columns (2) blocks
(3) tracks and sectors (4) All of these
(5) None of these

8. To locate a data item for storage is **[IBPS PO 2012]**

(1) field (2) feed
(3) database (4) fetch
(5) None of these

9. Devices that could be used to input data into a database are

(1) keyboard, fax roller ball
(2) mouse, keyboard, monitor
(3) mouse, keyboard, touch screen
(4) All of the above

10. In a relational database, a data structure that organises the information about a single topic into rows and columns, is **[RBI PO 2011]**

(1) block (2) record (3) tuple (4) table
(5) None of these

11. The smallest unit of information about a record in a database is called a

(1) cell (2) field
(3) record (4) query

12. ..... are distinct items that don't have much meaning to you in a given context. **[SBI PO 2012]**

(1) Fields (2) Data
(3) Queries (4) Properties
(5) None of these

13. The cardinality property of a relation, refers to the

(1) number of database (2) number of columns
(3) number of rows (4) number of tables

14. Rows of a relation are called

(1) relation (2) tuples
(3) data structure (4) an entity

15. A collection of related files is called a **[SBI PO 2011, IBPS Clerk 2013]**

(1) character (2) field
(3) database (4) record
(5) None of these

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16. In the relational modes, cardinality is termed as **[IBPS Clerk 2011]**
(1) number of tuples (2) number of attributes
(3) number of tables (4) number of constraints
(5) None of the above

17. Which of the following contains information about a single 'entity' in the database like a person, place, event or thing?
(1) Query (2) Form
(3) Record (4) Table

18. DBMS is comprised of tables that made up of rows called ..... and columns called ..... .
(1) fields, records (2) records, fields
(3) address, fields (4) ranges, sheet
(5) records, ranges

19. What is a stored question about information in a database? **[SBI Clerk 2015]**
(1) Query (2) Sort (3) Report (4) Record
(5) Field

20. A program that generally has more user-friendly interface than a DBMS is called a
(1) front end (2) repository
(3) back end (4) form

21. Which of the following objects is/are contained in database?
(1) Table (2) Query
(3) Form (4) All of these

22. Which of the following places the common data elements in order from smallest to largest?
(1) Character, File, Record, Field, Database
(2) Character, Record, Field, File, Database
(3) Character, Field, Record, File, Database
(4) Bit, Byte, Character, Record, Field, File, Database

23. What is the overall term for creating, editing, formatting, storing, retrieving a text document? **[IBPS PO 2012]**
(1) Word processing (2) Spreadsheet design
(3) Web design (4) Database management
(5) Presentation generation

24. The database administrator's function in an organisation is **[SBI PO 2010]**
(1) to be responsible for the technical aspects of managing the information contained in organisational databases
(2) to be responsible for the executive level aspects of decision regarding the information management
(3) to show the relationship among entity classes in a data warehouse
(4) to define which data mining tools must be used to extract data
(5) None of the above

25. The code that relational database management systems use to perform their database task is referred to as
(1) QBE (2) SQL
(3) OLAP (4) Sequel Server

26. DBMS helps to achieve
(1) data independence
(2) centralised control of data
(3) selection of data (4) Both '1' and '2'

27. Which out of the following is not a DBMS software?
(1) dBASE (2) FoxPro (3) Oracle (4) SyBase
(5) Database 2000

28. In which, the database can be restored up to the last consistent state after the system failure?
(1) Backup (2) Recovery
(3) Redundancy (4) Security

29. ..... provides total solutions to reduce data redundancy, inconsistency, dependence and unauthorised access of data. **[IBPS Clerk 2012]**
(1) DBMS (2) Tables
(3) Database (4) Protection password
(5) Centralisation of data

30. Periodically adding, changing and deleting file records is called ..... file.
(1) updating (2) upgrading
(3) restructuring (4) renewing

31. Architecture of database management can be viewed as
(1) two levels (2) four levels
(3) three levels (4) one level

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32. A collection of conceptual tools for describing data, relationships, semantics and constraints is referred to as **[IBPS Clerk 2012]**

(1) E-R model (2) database
(3) data model (4) DBMS
(5) None of these

33. ..... is one reason for problems of data integrity. **[IBPS Clerk 2012]**

(1) Data availability constraints
(2) Data inconsistency
(3) Security constraints
(4) Unauthorised access of data
(5) Data redundancy

34. ..... means that the data contained in a database is accurate and reliable.

(1) Data redundancy
(2) Data integrity
(3) Data reliability
(4) Data consistency
(5) None of the above

35. Which of the following contains data descriptions and defines the name, data type and length of each field in the database?

(1) Data dictionary (2) Data table
(3) Data record (4) Data filed
(5) None of these

36. An advantage of the database management approach is

(1) data is dependent on programs
(2) data redundancy increases
(3) data is integrated and can be accessed by multiple programs
(4) All of the above

37. Which of the following is the drawback of DBMS?

(1) Improvement in Data
(2) Backup and recovery
(3) Complexity
(4) Maintenance of Data Integrity

38. In which of the following, database are used?

(1) Banking (2) Finance
(3) Sales (4) All of these

39. A database that contains tables linked by common fields is called a

(1) centralised database (2) flat file database
(3) relational database (4) All of these

40. Oracle is a (n) **[IBPS Clerk 2014, IBPS Clerk Mains 2017]**

(1) hardware (2) high level language
(3) operating system (4) system software
(5) RDBMS

41. A set of possible data values is called

(1) attribute (2) degree (3) tuple (4) domain

42. The purpose of the primary key in a database is to **[IBPS Clerk 2015]**

(1) unlock the database
(2) provide a map of the data
(3) uniquely identify a record
(4) establish constraints on database operations
(5) None of these

43. In case of entity integrity, the primary key may be

(1) not null (2) null
(3) Both '1' and '2' (4) any value
(5) None of these

44. In files, there is a key associated with each record which is used to differentiate among different records. For every file, there is atleast one set of keys that is unique. Such a key is called

(1) unique key (2) prime attribute
(3) index key (4) primary key

45. Which of the following types of table constraints will prevent the entry of duplicate rows?

(1) Primary key (2) Unique
(3) Null (4) Foreign key
(5) None of these

46. The particular field of a record that uniquely identifies each record is called the **[SBI PO 2012]**

(1) key field (2) primary field
(3) master field (4) order field
(5) None of these

47. ..... is a primary key of one file that also appears in another file. **[IBPS Clerk 2013]**

(1) Physical key (2) Primary key
(3) Foreign key (4) Logical key
(5) None of the above

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48. ..... is an invalid type of database key. **[IBPS Clerk 2013]**
(1) Structured primary key
(2) Atomic primary key
(3) Primary key
(4) Composite primary key
(5) None of the above

49. Key to represent relationship between tables is called **[SBI Clerk 2010]**
(1) primary key (2) secondary key
(3) foreign key (4) composite key
(5) None of the above

50. Dr. E F Codd represented ..... rules that a database must obey if it has to be considered truly relational. **[IBPS Clerk 2012]**
(1) 10 (2) 8 (3) 12 (4) 6
(5) 5

51. A logical schema **[SBI PO 2011]**
(1) is the entire database
(2) is a standard way of organising information into accessable part
(3) describes how data is actually stored on disk
(4) All of the above
(5) None of the above

52. Data duplication wastes the space, but also promotes a more serious problem called
(1) isolated **[IBPS PO 2015]**
(2) data inconsistency
(3) other than those given as options
(4) program dependency
(5) separated data

53. When data changes in multiple lists and all lists are not updated. This causes **[RBI Grade B 2012]**
(1) Data redundancy (2) Information overload
(3) Duplicate data (4) Data consistency
(5) Data inconsistency

54. Which database language is used to access data in existing database?
(1) DDL (2) DML
(3) DCL (4) None of these

55. An E-R diagram is a graphic method of presenting **[IBPS Clerk 2011]**
(1) primary keys and their relationships
(2) primary keys and their relationships to instances
(3) entity classes and their relationships
(4) entity classes and their relationships to primary keys
(5) None of the above

56. In an E-R diagram, an entity set is are represented by
(1) rectangle (2) square (3) ellipse (4) triangle
(5) circle

57. In an E-R diagram, attributes are represented by
(1) rectangle (2) square
(3) ellipse (4) circle

58. In E-R diagram, relationship type is represented by **[IBPS Clerk 2012]**
(1) ellipse (2) dashed ellipse
(3) rectangle (4) diamond
(5) None of these

59. An entity set that does not have sufficient attributes to form a primary key, is a **[IBPS Clerk 2011]**
(1) strong entity set (2) weak entity set
(3) simple entity set (4) primary entity set
(5) None of these

60. Relationship can be divided into
(1) One to one (2) Many to one
(3) One to many (4) All of these

ANSWERS

1. *(4)*	2. *(3)*	3. *(3)*	4. *(1)*	5. *(2)*	6. *(2)*	7. *(1)*	8. *(4)*	9. *(3)*	10. *(4)*
11. *(2)*	12. *(1)*	13. *(3)*	14. *(2)*	15. *(4)*	16. *(1)*	17. *(3)*	18. *(2)*	19. *(1)*	20. *(4)*
21. *(4)*	22. *(3)*	23. *(4)*	24. *(1)*	25. *(2)*	26. *(4)*	27. *(5)*	28. *(2)*	29. *(4)*	30. *(1)*
31. *(3)*	32. *(3)*	33. *(1)*	34. *(2)*	35. *(1)*	36. *(3)*	37. *(3)*	38. *(4)*	39. *(3)*	40. *(5)*
41. *(4)*	42. *(3)*	43. *(1)*	44. *(4)*	45. *(1)*	46. *(2)*	47. *(3)*	48. *(1)*	49. *(3)*	50. *(3)*
51. *(2)*	52. *(2)*	53. *(5)*	54. *(2)*	55. *(3)*	56. *(1)*	57. *(3)*	58. *(4)*	59. *(2)*	60. *(4)*

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CHAPTER

12

DATA COMMUNICATION AND NETWORKING

The term communication means sending or receiving information. When we communicate, we share information or data. A communication system can be defined as the collection of hardware and software that facilitates intersystem exchange of information between different devices.

Data Communication

It is the exchange of data between two devices using some form of transmission media. It includes the transfer of data or information and the method of preservation of data during the transfer process. Data is transferred from one place to another in the form of signals. *There are three types of signals*

1. **Digital Signal** In this signal, data is transmitted in electronic form, i.e. binary digits (0 or 1).
2. **Analog Signal** In this signal, data is transmitted in the form of radiowaves like in telephone line.
3. **Hybrid Signal** These signals have properties of both analog signal and digital signal.

Communication Channel

The communication channel refers to the direction of signal flow between two linked devices.

There are mainly three types of communication channel as follows

1. **Simplex Channel** In this channel, the flow of data is always in one direction, with no capability to support response in other direction. This communication is unidirectional. Only one of the communicating devices transmits information and the other can only receive it.
   e.g. Radio, Television, Keyboard, etc.
2. **Half Duplex Channel** In this channel, the data can flow in both directions, but not at a same time. When one device transmits information, then other can only receive at that point of time. e.g. Walkie –Talkie.
3. **Full Duplex Channel** In this channel, the flow of data is in both directions at a time, i.e. both stations can transmit and receive information simultaneously.
   e.g. Wireless handset (mobile phone).

Communication Media

Communication media of a network refer to the transmission media or the connecting media used in the network. It can be broadly defined as anything that can carry information from a source to destination. It refers to the physical media through which communication signals can be transmitted from one point to another.

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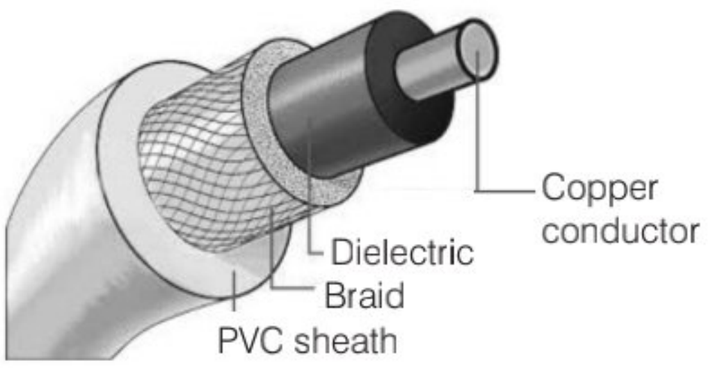
Transmission media can be divided into two broad categories

Guided Media or Wired Technologies

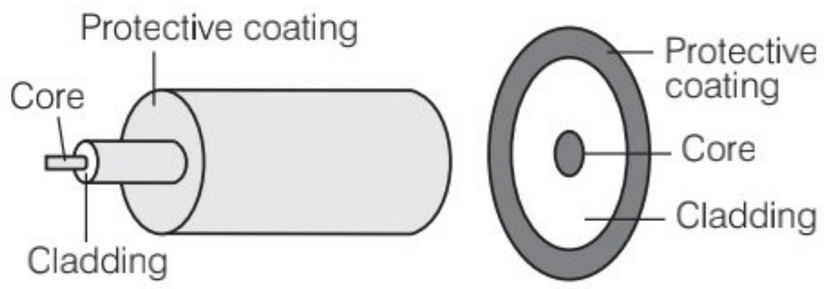
The data signal in guided media is bound by the cabling system that guides the data signal along a specific path. It consists of a cable composed of metals like copper, tin or silver.

Basically, they are divided into three categories

1. **Ethernet Cable or Twisted Pair Cable** In this cable, wires are twisted together, which are surrounded by an insulating material and an outer layer called jacket. One of the wires is used to carry signals to the receiver and the other is used only as a ground reference.
   e.g. Local area networks use twisted pair cable.
2. **Co-axial Cable** It carries the signal of higher frequency data communication through the network. It has a single inner conductor that transmits electric signals and the outer conductor acts as a ground and is wrapped in a sheet of teflon or PVC. Co-axial cable is commonly used in transporting multi-channel television signals in cities.
   e.g. Cable TV network.



3. **Fibre Optic Cable** It is made up of glass or plastic and transmits signals in the form of light from a source at one end to another.
   Optical fibres allow transmission over longer distance at higher bandwidth which is not affected by electromagnetic field. The speed of optical fibre is hundred of times faster than co-axial cables.



Unguided Media or Wireless Technologies

It is the transfer of information over a distance without the use of enhanced electrical conductors or wires. When the computers in a network are interconnected and data is transmitted through waves, then they are said to be connected through unguided media. *Some commonly used unguided media of transmission are*

1. **Radio wave Transmission** When two terminals communicate by using radio frequencies then such type of communication is known as radio wave transmission. This transmission is also known as Radio Frequency (RF) transmission. These are omnidirectional. Radio waves, particularly those waves that propagate in the sky mode, can travel long distances..
2. **Microwave Transmission** Microwaves are electromagnetic waves having frequencies range from 0.3 to 300 GHz. Microwaves are unidirectional. Microwaves have a higher frequency than that of radio waves.
   Microwave is one of the fastest media for data transmission over communication channel. It is used in cellular network and television broadcasting.
3. Infrared Wave Transmission Infrared waves are the high frequency waves used for short-range communication. These waves do not pass through the solid-objects. They are mainly used in TV remote, wireless speakers.
4. **Satellite Communication** The communication across longer distances can be provided by combining radio frequency transmission with satellites. It works over a long distance and fast communication. It is used for communication to ships, vehicles, planes and handheld terminals.

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Tit-Bits

- **Bluetooth** is a wireless technology used for exchanging data over short distances to create a Personal Area Network (PAN).
- **Bandwidth** determines the data transfer rate which is measured in Cycle Per Second (CPS) or Hertz (Hz).
- **Throughput** is the amount of data that is actually transmitted between the two computers. It is specified in bits per second (bps). Giga bits per second (Gbps) is the fastest speed unit per data transmission.

Computer Network

It is a collection of two or more computers, which are connected together to share information and resources. Computer network is a combination of hardware and software that allows communication between computers over a network.

Note *ARPANET stands for Advanced Research Projects Agency Network. It was the first network developed by Vint Cerf in 1969.*

Benefits of Network

Some of the benefits of network are discussed below

1. **File Sharing** Networking of computer helps the users to share data files.
2. **Hardware Sharing** Users can share devices such as printers, scanners, CD-ROM drives, hard drives, etc, in a computer network.
3. **Application Sharing** Applications can be shared over the network and this allows implementation of client/server applications.
4. **User Communication** This allows users to communicate using E-mail, newsgroups, video conferencing within the network.

Types of Computer Network

Computer network is broadly classified into various types as follows

Local Area Network (LAN)

LAN is a small and single-site network. It connects network devices over a relatively short distance.

It is a system in which computers are interconnected and the geographical area such as home, office, buildings, school may be within a building to 1 km. On most LANs, cables are used to connect the computers. LANs are typically owned, controlled and managed by a single person or organisation.

They also use certain specific connectivity technologies, primarily Ethernet and Token Ring. LAN provides a sharing of peripherals in an efficient or effective way.

Wide Area Network (WAN)

WAN is a geographically dispersed collection of LANs. A WAN like the Internet spans most of the world. A network device called a router connects LANs to a WAN.

Like the Internet, most WANs are not owned by any one organisation, but rather exist under collective or distributed ownership and management. WANs use technology like ATM, Frame Relay and X.25 for connectivity.

Metropolitan Area Network (MAN)

It is a data network designed for a town or city. It connects an area larger than a LAN, but smaller than a WAN.

Its main purpose is to share hardware and software resources by the various users. Cable TV network is an example of metropolitan area network. The computers in a MAN are connected using co-axial cables or fibre optic cables.

Personal Area Network (PAN)

PAN refers to a small network of communication. These are used in a few limited range, which is in reachability of individual person. Few examples of PAN are Bluetooth, wireless USB, Z-wave and Zig Bee.

- ***Server*** *is a system that responds to requests across a computer network to provide a network service. It can be run on a dedicated computer. It is one of the most powerful and typical computer.*
- ***File Server*** *is a type of computer used on network that provides access to files. It allows users to share programs and data over LAN network.*
- ***Protocols*** *are the set of rules used by a network for communication. It is mainly used to connect all the computers to the network.*

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Network Devices

These devices are required to amplify the signal to restore the original strength of signal and to provide an interface to connect multiple computers in a network. There are many types of network devices used in networking.

Some of them are described below

1. **Repeater** Repeaters have two ports and can connect two segments of a LAN. It amplifies the signals when they are transported over a long distance so that the signal can be as strong as the original signal. A repeater boosts the signal back to its correct level.
2. **Hub** It is like a repeater with multiple ports used to connect the network channels. It acts as a centralised connection to several computers with the central node or server. When a hub receives a packet of data at one of its ports from a network channel, it transmits the packet to all of its ports to all other network channel.
3. **Gateway** It is an interconnecting device, which joins two different network protocols together. They are also known as protocol converters. It accepts packet formatted for one protocol and converts the formatted packet into another protocol.

   The gateway is a node in a network which serves as a proxy server and a firewall system and prevents the unauthorised access.
4. **Switch** It is a small hardware device that joins multiple computers together within one LAN. It helps to reduce overall network traffic.

   Switch forwards a data packet to a specific route by establishing a temporary connection between the source and the destination. There is a vast difference between a switch and a hub. A hub forwards each incoming packet (data) to all the hub ports, while a switch forwards each incoming packet to the specified recipient.
5. **Router** It is a hardware device which is designed to take incoming packets, analyse packets, moving and converting packets to the another network interface, dropping the packets, directing packets to the appropriate locations, etc.
6. **Bridge** It serves a similar function as switches. A bridge filters data traffic at a network boundary. Bridges reduce the amount of traffic on a LAN by dividing it into two segments. Traditional bridges support one network boundary, whereas switches usually offer four or more hardware ports. Switches are sometimes called multiport bridges.
7. **Modem** It is a device that converts digital signal to analog signal (modulator) at the sender's end and converts back analog signal to digital signal (demodulator) at the receiver's end, in order to make communication possible *via* telephone lines. A Modem is always placed between a telephone line and a computer.

Network Topology

The term 'topology' refers to the way a network is laid out, either physically or logically. Topology can be referred as the geometric arrangement of a computer system. Each computer system in a topology is known as node.

The most commonly used topology are described below

1. **Bus Topology** It is such that there is a single line to which all nodes are connected. It is usually used when a network installation is small, simple or temporary. In bus topology, all the network components are connected with a same (single) line.
2. **Star Topology** In this network topology, the peripheral nodes are connected to a central node, which rebroadcasts all transmissions received from any peripheral node to all peripheral nodes across the network. A star network can be expanded by placing another star hub.
3. **Ring or Circular Topology** This topology is used in high-performance networks where large bandwidth is necessary.

   The protocols used to implement ring topology are Token Ring and Fiber

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Distributed Data Interface (FDDI). In ring topology, data is transmitted in the form of Token over a network.

4. **Mesh Topology** It is also known as completely interconnected topology. In mesh topology, every node has a dedicated point-to-point link to every other node.
5. **Tree Topology** This is a network topology in which nodes are arranged as a tree. The function of the central node in this topology may be distributed. Its basic structure is like an inverted tree, where the root acts as a server. It allows more devices to be attached to a single hub.

Models of Computer Networking

There are mainly two models of computer networking as follows

1. Peer-to-Peer Network

It is also known as P2P network. This computer network relies on computing power at the edges of a connection rather than in the network itself. P2P network is used for sharing content like audio, video, data or anything in digital format.

In P2P connection, a couple of computers is connected *via* a Universal Serial Bus (USB) to transfer files. In peer-to-peer networking, each or every computer may be worked as server or client.

2. Client-Server Network

The model of interaction between two application programs in which a program at one end (client) requests a service from a program at the other end (server).

It is a network architecture which separates the client from the server. It is scalable architecture, where one computer works as server and others as client. Here, client acts as the active device and server behaves as passively.

OSI Model

Open System Interconnection (OSI) is a standard reference model for communication between two end users in a network. In 1983, the International Standards Organisation (ISO) published a document called Basic Reference Model for Open System Interconnection, which visualises network protocols as a seven layered model.

OSI is a layered framework for the design of network system that allows communication between all types of computer system. It is mainly consists of seven layers across a network.

Seven Layers of OSI Model and their Functions

Name of the Layer	Functions
Application Layer [User-Interface]	Retransferring files of information, login, password checking, packet filtering, etc.
Presentation Layer [Data formatting]	It works as a translating layer, i.e. encryption or decryption.
Session Layer [Establish and maintain connection]	To manage and synchronise conversation between two systems. It controls logging ON and OFF, user identification, billing and session management.
Transport Layer [Transmission Control Protocol (TCP) accurate data]	It decides whether transmission should be parallel or single path, multiplexing, splitting or segmenting the data, to break data into smaller units for efficient handling, packet filtering.
Network Layer [Internet Protocol (IP) routers]	Routing of the signals, divide the outgoing message into packets, to act as network controller for routing data.
Data Link Layer [Media Access Control (MAC) switches]	Synchronisation, error detection and correction. To assemble outgoing messages into frames.
Physical Layer [Signals-cables or operated by repeater]	Make and break connections, define voltages and data rates, convert data bits into electrical signal. Decide whether transmission is simplex, half duplex or full duplex.

In OSI model, physical layer is the lowest layer which is implemented on both hardware and software and application layer is the highest layer.

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Terms Related to Network

1. **Multiplexing** It is a technique used for transmitting signals simultaneously over a common medium. It involves single path and multiple channels for data communication.
2. **Code Division Multiple Access** (CDMA) It is a channel access method used by various radio communication technologies. CDMA employs spread spectrum technology and a special coding scheme, where each transmitter is assigned a code to allow multiple users to be multiplexed over the same physical channel.
3. **Packet Switching** It refers to the method of digital networking communication that combined all transmitted data regardless of content, type or structure into suitable sized blocks, known as packets.
4. **Public Switched Telephone Network** (PSTN) It is designed for telephone, which requires modem for data communication. It is used for FAX machine also.
5. **Integrated Services Digital Network** (ISDN) It is used for voice, video and data services. It uses digital transmission and combines both circuit and packet switching.
6. **Ethernet** It is a widely used technology employing a bus technology. An ethernet LAN consists of a single co-axial cable called Ether. It operates at 10 Mbps and provides a 48-bits address. Fast ethernet operates at 100 Mbps.
7. **Token** It is a small message used to pass between one station to another.

QUESTION BANK

1. ..... is the transmission of data between two or more computers over communication links.
(1) Communication (2) Networking
(3) Data communication (4) Data networking

2. Communication channel having ..... types.
(1) 1 (2) 2 (3) 3 (4) 4

3. In simplex channel, flow of data is
(1) always in one direction
(2) always in both direction
(3) in both direction, but one at a time
(4) All of the above

4. Communication between a computer and a keyboard involves ..... transmission. **[IBPS Clerk Mains 2017]**
(1) automatic (2) half duplex
(3) full-duplex (4) simplex
(5) None of these

5. Mobile phone is an example of which type of communication channel?
(1) Simplex (2) Half duplex
(3) Full duplex (4) None of these

6. Which of the following is not a property of twisted pair cabling?
(1) Twisted pair cabling is a relatively low speed transmission
(2) The wires can be shielded
(3) The wires can be unshielded
(4) Twisted pair cable carries signals as light waves

7. In twisted pair, wires are twisted together, which are surrounded by an insulating material and an outer layer called
(1) frame (2) cover (3) disk (4) block
(5) jacket

8. Which of the following is the greatest advantage of co-axial cabling?
(1) High security (2) Physical dimensions
(3) Long distances (4) Easily tapped

9. Which of the following cables can transmit data at high speeds? **[IBPS Clerk 2014]**
(1) Flat cable (2) Co-axial cable
(3) Optic fibre cable (4) Twisted pair cable
(5) UTP cable

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10. Which of the following is an advantage for using fibre optics data transmission?
(1) Resistance to data theft
(2) Fast data transmission rate
(3) Low noise level (4) All of the above

11. Networking using fibre optic cable is done as **[RBI Grade B 2012]**
(1) it has high bandwidth
(2) it is thin and light
(3) it is not affected by electro magnetic interference/power surges etc
(4) All of the above
(5) None of these

12. Which of the following is not a property of fibre optic cabling? **[IBPS Clerk Mains 2017]**
(1) Transmits at faster speeds than copper cabling
(2) Easier to capture a signal from the copper cabling
(3) Very resistant to interference
(4) Carries signals as light waves
(5) less attenuation

13. A device that connects to a network without the use of cables is said to be **[IBPS Clerk 2012, RBI Grade B 2012]**
(1) distributed (2) cabled
(3) centralised (4) open source
(5) wireless

14. Which of the following is the fastest communication channel?
(1) Radio wave (2) Microwave
(3) Optical fibre
(4) All are operating at nearly the same propagation speed

15. Bandwidth refers to **[RBI Grade B 2013]**
(1) the cost of the cable required to implement a WAN
(2) the cost of the cable required to implement a LAN
(3) the amount of information a peer-to-peer network can store
(4) the amount of information a communication medium can transfer in a given amount of time
(5) None of the above

16. Which of the following represents the fastest data transmission speed? **[SBI Clerk 2012]**
(1) Bandwidth (2) bps
(3) gbps (4) kbps
(5) mbps

17. A(n) ..... is composed of several computers connected together to share resources and data. **[RBI Grade B 2014]**
(1) Internet (2) Network
(3) Backbone (4) Hyperlink
(5) Protocol

18. What do we call for the arrangement when two or more computers physically connected by cables to share information or hardware? **[SBI Clerk 2015]**
(1) URL (2) Network
(3) Server (4) Internet
(5) Modem

19. A combination of hardware and software that allows communication and electronic transfer of information between computers is a **[SBI Clerk 2012]**
(1) network (2) backup system
(3) server (4) peripheral
(5) modem

20. Which of the following terms is associated with networks? **[SBI Clerk 2014]**
(1) MS-Excel (2) Mouse
(3) Word (4) Connectivity
(5) Plotter

21. What type of resource is most likely to be a shared common resource in a computer network? **[Allahabad Bank Clerk 2010]**
(1) Printers (2) Speakers
(3) Floppy disk drives (4) Keyboards
(5) None of these

22. The first network that has planted the seeds of Internet was
(1) ARPANET (2) NSFnet
(3) V-net (4) I-net

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23. Pathways that support communication among the various electronic components on the system board are called **[SBI PO 2014]**
(1) network lines (2) processors
(3) logic paths (4) bus lines
(5) gateway

24. What do we call a network whose elements may be separated by some distance? It usually involves two or more network and dedicated high speed telephone lines. **[SBI Clerk 2015]**
(1) LAN (2) WAN
(3) URL (4) Server
(5) World Wide Web

25. LAN can use ..... architecture.
(1) peer-to-peer (2) client and server
(3) Both '1' and '2' (4) Neither '1' nor '2'

26. Ethernet, token ring and token bus are types of **[SBI Associates 2012, RBI Grade B 2014]**
(1) WAN
(2) LAN
(3) communication channels
(4) physical media
(5) None of the above

27. The advantage of LAN is **[SBI Clerk 2012]**
(1) sharing peripherals
(2) backing up your data
(3) saving all your data
(4) accessing the Web
(5) automatic printing of data

28. Computer connected to a LAN can ..... .
[IBPS Clerk 2013]
(1) run faster
(2) share information and/or share peripheral equipment
(3) go online
(4) E-mail
(5) None of the above

29. ..... allows LAN users to share computer programs and data.
(1) Communication server
(2) Print server
(3) File server
(4) All of the above

30. What is the use of bridge in network?
(1) To connect LANs
(2) To separate LANs
(3) To control network speed
(4) All of the above

31. Which of the following items is not used in Local Area Network (LANs)? **[SSC CGL 2012]**
(1) Interface card (2) Cable
(3) Computer (4) Modem

32. Which type of network would use phone lines? **[SBI Clerk 2012, IBPS Clerk 2015]**
(1) WAN (2) LAN
(3) WWAN (4) Wireless
(5) None of these

33. Which of the following refers to a small, single-site network?
(1) PAN (2) DSL (3) RAM (4) USB
(5) CPU

34. These servers store and manage files for network users.
(1) Authentication (2) Main
(3) Web (4) File

35. ..... is the most important/powerful computer in a typical network. **[SBI PO 2013]**
(1) Desktop (2) Network client
(3) Network server (4) Network station
(5) Network switch

36. A protocol is a set of rules governing a time sequence of events that must take place
(1) between peers (2) between an interface
(3) between modems (4) across an interface

37. A ..... is an agreement between the communication parties on how communication is to proceed. **[SSC CGL 2016]**
(1) path (2) SLA
(3) bond (4) protocol

38. A device operating at the physical layer is called a
(1) bridge (2) router
(3) repeater (4) All of these

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39. Which of the following devices that joins multiple computers together within one LAN?
(1) Repeater (2) Hub
(3) Gateway (4) Switch
(5) Router

40. Which of the following is used for modulation and demodulation?
(1) Modem (2) Protocols
(3) Gateway (4) Multiplexer
(5) None of these

41. What is the name of the derive that links your computer with other computers and information services through telephone lines? **[SBI Clerk 2015]**
(1) Modem (2) LAN (3) URL (4) WAN
(5) Server

42. What is the function of a modem? **[RBI Grade B 2012]**
(1) Encryption and decryption
(2) Converts data to voice and vice- versa
(3) Converts analog signals to digital signals and vice-versa
(4) Serves as a hardware antivirus
(5) None of the above

43. The hardware device or software program that sends messages between network is known as a **[IBPS Clerk 2014]**
(1) bridge (2) backbone (3) router (4) gateway
(5) Other than those given as options

44. Which of the following is not a network device?
(1) Router (2) Switch (3) Bus (4) Bridge

45. Geometric arrangement of devices on the network is called
(1) topology (2) protocols
(3) media (4) LAN

46. Which of the following topologies is not of broadcast type?
(1) Star (2) Bus
(3) Ring (4) All of these

47. Network components are connected to the same cable in the ..... topology.
(1) star (2) ring (3) bus (4) mesh
(5) tree

48. Hub is associated with ..... network. **[SBI Clerk 2011]**
(1) bus (2) ring
(3) star (4) mesh
(5) All of these

49. In a ring topology, the computer in possession of the ..... can transmit data.
(1) packet (2) data
(3) access method (4) token

50. In which topology, every node is connected to two other nodes? **[IBPS RRB PO Mains 2018]**
(1) Bus topology (2) ring topology
(3) Star topology (4) Mesh topology
(5) None of these

51. Which is the name of the network topology in which there are bi-directional links between each possible node? **[SSC CGL 2012]**
(1) Ring (2) Star (3) Tree (4) Mesh

52. An alternate name for the completely interconnected network topology is **[SSC CGL 2012]**
(1) mesh (2) star
(3) tree (4) ring

53. Which is the highest reliability topology? **[IBPS RRB PO Mains 2018]**
(1) Mesh topology (2) Tree topology
(3) Bus topology (4) Star topology
(5) None of these

54. P2P is a ..... application architecture. **[IBPS Clerk 2012]**
(1) client/server (2) distributed
(3) centralised (4) 1-tier
(5) None of these

55. A packet filtering firewall operates at which of the following OSI layers?
(1) At the application layer
(2) At the transport layer
(3) At the network layer
(4) At the gateway layer

56. Encryption and decryption are the functions of
(1) transport layer (2) session layer
(3) presentation layer (4) All of these

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57. Name the fourth layer of OSI model **[SBI PO 2014]**

(1) Application layer
(2) Data link layer
(3) Transport layer
(4) Session layer
(5) None of these

58. In OSI network architecture, the routing is performed by **[IBPS Clerk 2012]**

(1) Network layer (2) Data link layer
(3) Transport layer (4) Session layer
(5) None of these

59. In the following list of devices which device is used in network layer? **[SSC CGL 2016]**

(1) Repeaters
(2) Router
(3) Application Gateway
(4) Switch

60. Switches work on which OSI layer?

(1) Data link layer
(2) Physical layer
(3) Transport layer
(4) Network layer
(5) Application layer

61. In IT networking, which of the following device is used in physical layer? **[SSC CGL 2016]**

(1) Repeater (2) Router
(3) Transport Gateway (4) Bridge

62. Multiplexing involves ..... path(s) and ..... channel(s). **[SBI Clerk 2011]**

(1) one, one (2) one, multiple
(3) multiple, one (4) multiple, multiple
(5) None of these

63. A processor that collects the transmissions from several communication media and send them over a single line that operates at a higher capacity is called **[RBI Grade B 2013]**

(1) multiplexer (2) bridge
(3) hub (4) router
(5) None of these

64. To send data/message to and from computers, the network software puts the message information in a

(1) NIC (2) packet (3) trailer (4) header
(5) None of these

65. How many bits are there in the ethernet address? **[SBI Clerk 2011]**

(1) 64 bits (2) 48 bits (3) 32 bits (4) 16 bits
(5) None of these

66. Ethernet uses

(1) bus topology (2) ring topology
(3) mesh topology (4) All of these

67. In networks, a small message used to pass between one station to another is known as **[SSC CGL 2016]**

(1) Token (2) Byte (3) Word (4) Ring

ANSWERS

1. *(3)*	2. *(3)*	3. *(1)*	4. *(4)*	5. *(3)*	6. *(4)*	7. *(5)*	8. *(2)*	9. *(3)*	10. *(3)*
11. *(4)*	12. *(3)*	13. *(5)*	14. *(2)*	15. *(4)*	16. *(3)*	17. *(2)*	18. *(2)*	19. *(1)*	20. *(4)*
21. *(1)*	22. *(1)*	23. *(2)*	24. *(1)*	25. *(3)*	26. *(2)*	27. *(1)*	28. *(2)*	29. *(3)*	30. *(1)*
31. *(4)*	32. *(1)*	33. *(1)*	34. *(4)*	35. *(3)*	36. *(4)*	37. *(4)*	38. *(3)*	39. *(4)*	40. *(1)*
41. *(1)*	42. *(3)*	43. *(5)*	44. *(3)*	45. *(1)*	46. *(2)*	47. *(3)*	48. *(3)*	49. *(4)*	50. *(2)*
51. *(4)*	52. *(1)*	53. *(1)*	54. *(1)*	55. *(1)*	56. *(3)*	57. *(3)*	58. *(1)*	59. *(2)*	60. *(1)*
61. *(1)*	62. *(2)*	63. *(1)*	64. *(2)*	65. *(2)*	66. *(1)*	67. *(1)*			

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CHAPTER

13

INTERNET AND ITS SERVICES

The Internet has gained popularity and emerged as an important and efficient means of communication. The idea of introducing the Internet was to allow millions of people to share information and ideas, sound, video clips using their computers across the world. The Internet is a world wide network of networked computers those are able to exchange information with each other.

Internet

Internet stands for International Network, which began in 1950's by Vint Cerf known as the Father of Internet. Internet is a 'network of networks' that consists millions of private and public networks of local to global scope. Basically, network is a group of two or more computer systems linked together.

History of Internet

In 1969, the University of California at Los Angeles, the University of Utah were connected as the beginning of the ARPANET (Advanced Research Projects Agency Network) using 50 kbits circuits. It was the world's first operational packet switching network. The goal of this project was to connect computers at different universities and U.S. defence.

In mid 80's another federal agency, the National Science Foundation, created a new high capacity network called NSFnet, which was more capable than ARPANET. The only drawback of NSFnet was that it allowed only the academic research on its network and not any kind of private business on it. So, private organisations and people started working to build their own networks, which were later interconnected with ARPANET and NSFnet to form the Internet.

Advantages of the Internet

The advantages of the Internet are as follows

(i) Allows you to easily communicate with other people.

(ii) Global reach enables one to connect anyone on the Internet.

(iii) Publishing documents on the Internet saves paper.

(iv) A valuable resource for companies to advertise and conduct business.

(v) Greater access to information reduces research times.

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Disadvantages of the Internet

The disadvantages of the Internet are as follows

(i) It is a major source of computer viruses.

(ii) Messages sent across the Internet can be easily intercepted and are open to abuse by others.

(iii) Much of the information is not checked and may be incorrect or irrelevant.

(iv) Unsuitable and undesirable material available that sometimes are used by notorious people such as terrorists.

(v) Cyber frauds may take place involving Credit/Debit card numbers and details.

Internet Connections

Bandwidth and cost are the two factors that help you in deciding which Internet connection is to use. The speed of Internet access depends on the bandwidth.

Some of the Internet connections available for Internet access are as follows

Dial-Up Connection

A Dial-up is a method of connecting to the Internet using an existing telephone. Dial-up connection uses the telephone line to connect to the Internet. When a user initiates a dial-up connection, the modem dials a phone number of an Internet Service Provider (ISP) that is designated to receive dial-up calls. The ISP then establishes the connection, which usually takes about ten seconds and is accompanied by several beeping and buzzing sounds.

Broadband Connection

The term broadband commonly refers to high speed Internet access that is always on and faster than the traditional dial-up access. It uses a telephone line to connect to the Internet. Broadband access allows users to connect to the Internet at greater speed than a standard 256 KB modem or dial-up access. Broadband includes several high speed transmission technologies such as follows

1. **Digital Subscriber Line** (DSL) It is a popular broadband connection. It provides Internet access by transmitting digital data over the wires of a local telephone network. DSL is the most common type of broadband service. It uses the existing copper telephone lines.
2. **Cable Modem** This service enables cable operators to provide broadband using the same co-axial cables that deliver pictures and sound to your TV set. Most cable modems are external devices that have two connections, one to the cable wall outlet and the other to a computer. They provide transmission speed of 1.5 Mbps or more.
3. **Broadband over Power Line** (BPL) BPL is the delivery of broadband over the existing low and medium voltage electric power distribution network. BPL is good for areas, where there are no other broadband connections, but power infrastructure exists. e.g. Rural areas.

Wireless Connection

Wireless broadband connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. Wireless broadband can be mobile or fixed. Unlike DSL and cable, wireless broadband requires neither a modem nor cables. It can be easily established in areas, where it is not feasible to deploy DSL or cable.

Some ways to connect the Internet wirelessly are as follows

1. **Wireless Fidelity** (Wi-Fi) It is a universal wireless networking technology that utilises radio frequencies to transfer data. Wi-Fi allows high speed Internet connections without the use of cables or wires.
   Wi-Fi networks can be use for public Internet access at 'hotspot' such as restaurants, coffee shops, hotels, airports, convention centers and city parks.
2. **Worldwide Interoperability for Microwave Access** (WiMAX) It is one of the hottest broadband wireless technologies around today. WiMAX systems are expected to deliver broadband access services to residential and enterprise customers in an economical way.

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WiMAX has the ability to provide service even in areas that are difficult for wired infrastructure to reach and the ability to overcome the physical limitations of traditional wired infrastructure.

3. **Mobile Wireless Broadband Services** These services are also becoming available from mobile telephone service providers and others. These services are generally appropriate for mobile customers and require a special PC card with a built-in antenna that plugs into a user's computer. Generally, they provide lower speeds in the range of several hundred kbps.

Intranet is a private network for Internet tools, but available within an organisation. In large organisation, Intranet allows an easy access to corporate information for employees.

Extranet is a private network that uses the Internet protocol and the public telecommunication system to security share part of a business information.

Podcast is a programme either talk numeric that is made available in digital format for automatic download over the Internet.

Interconnecting Protocols

A protocol is a set of rules that govern data communications. A protocol defines what is communicated, how it is communicated and when it is communicated.

Generally, some of protocols used to communicate via an Internet are as follows

1. **Transmission Control Protocol/Internet Protocol** (TCP/IP)

The details of TCP/IP are as follows

(a) **Transmission Control Protocol** (TCP) It provides reliable transport service, i.e. it ensures that message sent from sender to receiver is properly routed. TCP converts messages into a set of packets at the source which are then reassembled back into messages at the destination.

(b) **Internet Protocol** (IP) It allows different computers to communicate by creating a network of networks. IP handles the dispatch of packets over the network. It maintains the addressing of packets with multiple standards. Each IP packet must contain the source and the destination addresses.

Note *An IP address is 32 bit number.*

2. **File Transfer Protocol** (FTP) It can transfer files between any computers that have an Internet connection and also works between computers using totally different operating systems. Some examples of FTP software are FileZilla, Kasablanca, gFTP, konqueror, etc.
3. **HyperText Transfer Protocol** (HTTP) HTTP defines how messages are formatted and transmitted and what actions should be taken by the Web servers and browsers in response to various commands.

HyperText Markup Language (HTML)
It is used for designing Web pages. A markup language is a set of markup (angular bracket, <>) tags which tells the Web browser how to display a Web page's words and images for the user. Each individual markup code is referred to as an element or tag.

4. **Telnet Protocol** Telnet is a program that runs on the computer and connects PC to a server on the network. The protocol used on the Internet or Local Area Network. Telnet session will started by entering valid **username** and **password**.
5. **Usenet Protocol** The usenet service allows a group of Internet users to exchange their views/ideas and information on some common topic that is of interest to all the members belonging to that same group.

   Several such groups exist on the Internet are called newsgroups. Usenet has no central server or administration.
6. **Point-to-Point Protocol** (PPP) PPP is a dial account which puts your computer directly on the Internet. A modem is required for such connection which transmits the data 9600 bits per second.
7. **Simple Mail Transfer Protocol** (SMTP) It is the standard protocol for E-mail services on a TCP/IP network. It provides the ability to send and receive E-mail message.

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8. **Wireless Application Protocol** (WAP) A WAP browser is a commonly used Web browser for small mobile devices such as cell phones.
9. **Voice over Internet Protocol** (VoIP) It allows delivery of voice communication over 'IP' Internet Protocol networks. e.g. IP calls.

Terms Related to Internet

World Wide Web (WWW)

WWW was introduced on 13th March, 1989. The world wide web is a system of Internet servers that supports hypertext and multimedia to access several Internet protocols on a single interface. The world wide web is often abbreviated as the Web or WWW. The world wide web is a way of exchanging information between computers on the Internet.

Web Page

The backbone of the world wide web is made of files, called **pages** or **Web pages**, containing information and links to resources - both text and multimedia - throughout the Internet. It is created using HTML. There are basically two main types of web page as static and dynamic. The main or first page of a Website is known as home page.

Website

A group of Web pages that follow the same theme and are connected together with hyperlinks is called Website. In other words, "A Website is a collection of digital documents, primarily HTML files, that are linked together and that exist on the Web under the same domain."
e.g. http://www.carwale.com is a Website while http://www.carwale.com/new/ is a Web page.

Web Browser

It is a software application that is used to locate, retrieve and also display content on the world wide web, including Web pages. Web browsers are programs used to explore the Internet. We can install more than one Web browsers on a single computer. The user can navigate through files, folders and Websites with the help of a browser.

There are two types of Web browsers as follows

1. **Text Web Browser** A Web browser that displays only text-based information is known as text Web browser. e.g. Lynx, which provides access to the Internet in the text mode only.
2. **Graphical Web Browser** A Web browser that supports both text and graphic information is known as graphical Web browser. e.g. Internet Explorer, Firefox, **Netscape**, Safari, Google Chrome and Opera.

Note *The first graphical Web browser was NCSA Mosaic.*

Web Server

The Web browser is a client that requests HTML files from Web servers. The server computer will deliver those Web pages to the computers that request them and may also do other processing with the Web pages. Every Web server that is connected to the Internet is given a unique address, i.e. IP address made up of a series of four numbers between 0 to 255 separated by periods. e.g. Apache HTTP Server, Internet Information Services (IIS), Lighttpd, etc.

Web Address and URL

A Web address identifies the location of a specific Web page on the Internet, such as http://www.learnyoga.com. On the Web, Web addresses are called URLs. URL stands for Uniform Resource Locator.
It is the Web address for a Website or a Web page. Tim Berners Lee created the first URL in 1991 to allow the publishing of hyperlinks on the world wide web. e.g.
''http://www. google.com/services/index.htm''

http://	–	Protocol identifier
www	–	World Wide Web
google.com	–	Domain name
/services/	–	Directory
index.htm	–	Web page

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Domain Name

Domain is a group of network resources assigned to a group of users. A domain name is a way to identify and locate computers connected to the Internet. A domain name must be unique. It always have two or more parts, separated by period/dot (·). e.g. google.com, yahoo.com, etc.

Domain Abbreviation

Domains are organised by the type of organisations and by country. A three-letter abbreviation indicating the organisation and usually two-letter abbreviation indicating the country name.

Most common domain abbreviations for organisation are as follows

.info	Informational organisation
.com	Commercial
.gov	Government
.edu	Educational
.mil	Military
.net	Network resources
.org	Non-profit organisation

Some domain abbreviations for country are as follows

.in	India
.au	Australia
.fr	France
.nz	New Zealand
.uk	United Kingdom

Domain Name System (DNS)

DNS stores and associates many types of information with domain names, but most importantly, it translates domain names (computers host names) to IP addresses. It also lists mail exchange servers accepting E-mail for each domain. DNS is an essential component of contemporary Internet use.

Blogs

A blog is a Website or Web page in which an individual records opinions, links to other site, on regular basis. A typical blog combines text, images, and links to other blogs, web pages and other media related to its topic.

Most blogs, are primarily textual, although some focus on art, photographs, videos, music and audio. These blogs are referred to as edublogs. The entries of blog is also known as posts.

Newsgroups

An area on a computer network especially the Internet, devoted to the discussion of a specified topic is known as Newsgroup.

Online discussion group that allows interaction through electronic bulletin board system and chat sessions.

Search Engine

It is a Website that provides the required data on specific topics. Search engines turn the Web into a powerful tool for finding information on any topic.

When a search engine returns the links to web pages corresponding to the keywords entered is called a hit, otherwise called a miss. Many search engines also have directories or lists of topics that are organised into categories. Browsing these directories, is also a very efficient way to find information on a given topic.

Here are some of the most popular search engines

Google	http://www.google.com
AltaVista	http://www.altavista.com
Yahoo	http://www.yahoo.com
Hotbot	http://www.hotbot.com
Lycos	http://www.lycos.com
Excite	http://www.excite.com
WebCrawler	http://www.webcrawler.com

Services of Internet

An Internet user can access to a wide variety of services such as electronic mail, file transfer, interest group membership, multimedia displays, real-time broadcasting, shopping, etc.

Some of the important services provided by the Internet are briefed in the following sections

Chatting

It is the online textual or multimedia conversation. It is widely interactive text-based

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communication process that takes place over the Internet. Chatting, i.e. a virtual means of communication that involves the sending and receiving of messages, share audio and video between users located in any part of the world.

e.g. Skype, Yahoo, Messenger, etc.

E-mail (Electronic mail)

E-mail is an electronic version of sending and receiving letter. Electronic mail lets you send and receive messages in electronic form.

E-mail is transmitted between computer systems, which exchange messages or pass them onto other sites according to certain Internet protocols or rules for exchanging E-mail. To use E-mail, a user must have an E-mail address. Emoticons or smileys are used in an E-mail to express emotions or feelings clearly. Storage area for E-mail messages is called mail box.

E-mail address consists of two parts separated by @ symbol – the first part is user name and the second part is host name (domain name). However, spaces are not allowed within the E-mail address.
e.g. arihantbooks@gmail.com

Here, arihantbooks is a username and gmail.com is a host name.

Video Conferencing

It is a communication technology that integrates video and audio to connect users anywhere in the world as if they were in the same room.

This term usually refers to communication between three or more users who are in atleast two locations. Each user or group of users who are participating in a video conference typically must have a computer, a camera, a microphone, a video screen and a sound system.

E-learning

E-learning (Electronic Learning) refers to the electronic mode of delivering learning, training or educational programs to users. It is the mode of acquiring knowledge by means of the Internet and computer based training programs.

E-banking

E-banking (Electronic Banking) is also known as Internet Banking or Online Banking.

E-banking means any user with a personal computer and a browser can get connected to his bank's Website to perform any of the virtual banking functions. All the services that the bank has permitted on the Internet are displayed in menu.

E-shopping

E-shopping (Electronic Shopping) or online shopping is the process of buying goods and services from merchants who sell on the Internet.

Books, clothing, household appliances, toys, hardware, software and health insurance are just some of the hundreds of products, consumers can buy from an online store. Some E-shopping sites are Naaptol, Flipkart, Yebbi, Homeshop 18, etc.

E-reservation

E-reservation (Electronic Reservation) means making a reservation for a service *via* Internet. You need not personally go to an office or a counter to book/reserve railways, airways tickets, hotel rooms, tourist packages, etc.

Examples of E-reservation sites are as follows

(i) www.irctc.com
(ii) www.makemytrip.com
(iii) www.yatra.com
(iv) www.bookingsite.com

Social Networking

It is the use of Internet based social media programs to make connections with friends, family, classmates, customers, clients etc. It can occur for social purposes, business purposes or both.

Social networking has grown to become one of the largest and most influential components of the web. The most popular social networking sites are Facebook, MySpace, Orkut, etc.

Note *Facebook was developed by Mark Zuckerberg.*

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E-commerce

E-commerce (Electronic Commerce) includes sharing business information, maintaining business relationships and conducting business transactions by means of telecommunication networks or process of trading goods over the Internet.

Electronic Data Interchange (EDI) is the electronic transfer of a business transaction between sender or receiver computer.

Note *E-trading is the process of trading the goods and items over the Internet.*

M-commerce

M-commerce (Mobile Commerce) provides the application for buying and selling goods or services through wireless Internet enabled handheld devices. It involves new technologies, services and business models.

Note *Mobile commerce was launched in 1997 by Kevin Duffey.*

Tit-Bits

- **Cluster** is a group of servers that share work and may be able to back each other up if one server fails.
- With the **Webmail interface** E-mails are accessible from anywhere in the world.
- **Rich Text Formatting** helps the sender (of E-mail) format the contents of his/her E-mail message by applying font, size, bold, italic, etc.
- **Cookie** is a small message given to a Web browser by a Web server. It stores information about the user's Web activity.
- **Bookmarks** are links to Web pages that make it easily to get back to your favourite places.

QUESTION BANK

1. The vast network of computers that connects millions of people all over the world is called
(1) LAN (2) Web
(3) Hypertext (4) Internet

2. The Internet is a system of
(1) software bundles (2) web page
(3) website
(4) interconnected networks

3. The Internet is
(1) a large network of networks
(2) an internal communication system for a business
(3) a communication system for the Indian government
(4) All of the above

4. The Internet allows to
(1) send electronic mail (2) view Web pages
(3) connect to servers all around the world
(4) All of the above

5. Which of the following is an example of connectivity?
(1) Internet (2) Floppy disk
(3) Power cord (4) Data

6. Internet was developed in the
(1) 1950s (2) 1960s (3) 1970s (4) 1980s
(5) 1990s

7. Which of the following is not a type of broadband Internet connection?
(1) Cable (2) DSL (3) Dial-up (4) BPL

8. What does the acronym ISP stand for?
[IBPS Clerk 2014]
(1) Internal Service Provider
(2) International Service Provider
(3) Internet Service Provider
(4) Internet Service Providing
(5) Internet Service Provision

9. Your business has contracted with another company to have them host and run an application for your company over the Internet. The company providing this service to your business is called an
(1) Internet Service Provider
(2) Internet Access Provider
(3) Application Service Provider
(4) Application Access Provider

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10. DSL is an example of which connection?
(1) Network (2) Wireless
(3) Slow (4) Broadband

11. ..... networks can be used for public internet access at hotspot such as restaurants, coffee shops etc.
(1) Wi-Fi (2) WiMax
(3) DSL (4) BPL

12. A programme, either talk numeric that is made available in digital format for automatic download over the Internet is called ..... . **[IBPS Clerk 2013 Or RRB PO Mains 2018]**
(1) vodcast (2) blog (3) podcast (4) wiki
(5) broadcast

13. A protocol is a set of rules that consists of
(1) TCD/IT (2) TCP/IP
(3) TCP/IT (4) TCT/IP

14. The standard protocol of the Internet is
(1) TCP/IP (2) Java **[SBI PO 2010]**
(3) HTML (4) flash
(5) None of these

15. In computing, IP address means
(1) International Pin (2) Internet Protocol
(3) Invalid Pin (4) Insert Pin

16. Each IP packet must contain
(1) only source address **[IBPS Clerk 2011]**
(2) only destination address
(3) source and destination addresses
(4) source or destination address
(5) None of the above

17. IPv4 address is **[IBPS PO 2013]**

Or

An IP address is ..... bit number **[SSC CGL 2017]**
(1) 8 bit (2) 16 bit (3) 32 bit (4) 64 bit

18. FTP can transfer files between any computers that have an Internet connection. Here, FTP stands for
(1) File Transfer Protocol
(2) Fast Text Processing
(3) File Transmission Program
(4) Fast Transmission Processor

19. Which of the following is the communication protocol that sets the standard used by every computer that accesses Web-based information?
(1) XML (2) DML **[SBI PO 2010]**
(3) HTTP (4) HTML
(5) None of these

20. What is the full form of HTTP? **[IBPS Clerk 2014]**
(1) HyperText Transfer Protocol
(2) HyperText Transition Protocol
(3) HyperText Transfer Program
(4) HyperText Transition Program
(5) HyperText Trivial Protocol

21. An HTTP request contains ..... parts.
(1) 1 (2) 5 **[IBPS Clerk 2012]**
(3) 3 (4) 4
(5) 2

22. Documents converted to ..... can be published to the Web. **[IBPS PO 2015]**
(1) a doc file
(2) http
(3) Other than those given as options
(4) machine language
(5) HTML

23. Documents converted to.....can be published to the Web.
(1) .doc file (2) http
(3) machine language (4) HTML

24. HTML is used for designing Web pages. Here, HTML stands for

Or

The web uses the ..... to request and serve web pages and programs. **[SSC CGL 2017]**
(1) High Transfer Machine Language
(2) High Transmission Markup Language
(3) HyperText Markup Language
(4) Hyper Transfer Markup Language

25. Which of the following is required to create an HTML document? **[IBPS Clerk 2011]**
(1) Browser (2) Internet
(3) Text editor (4) Search engine
(5) None of these

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26. In HTML, tags consists of keywords enclosed within **[SSC CHSL 2013]**
(1) flower brackets
(2) angular brackets <>
(3) parentheses ()
(4) square brackets [ ]

27. Telnet is a **[SSC CHSL 2012]**
(1) search engine (2) browser
(3) protocol (4) gateway

28. Telnet is a ..... based computer protocol. **[IBPS Clerk 2012]**
(1) sound (2) text
(3) image (4) animation
(5) digits

29. Through ....., an administrator or another user can access someone else's computer remotely. **[IBPS Clerk 2012]**
(1) administrator (2) Web server
(3) Web application (4) http
(5) telnet

30. The ..... service allows a group of Internet users to exchange their views on some common topic.
(1) nicnet (2) milnet (3) telnet (4) usenet

31. Which protocol provides E-mail facility among different hosts? **[RBI Grade B 2014]**
(1) SMTP (2) FTP
(3) TELNET (4) SNMP
(5) None of these

32. What is the full form of VolP?
(1) Voice of Internet Power
(2) Voice over Internet Protocol
(3) Voice on Internet Protocol
(4) Very Optimised Internet Protocol

33. The Internet service that provides a multimedia interface to available resources is called
(1) FTP (2) world wide web
(3) telnet (4) gopher

34. WWW stands for **[IBPS Clerk 2013, 2014]**
(1) World Wide Wizard (2) World Wide Web
(3) World Wide Wonder (4) Wide World Web
(5) None of these

35. The ..... uses an addressing scheme known as URL indicate the location of files on the web. **[SSC CGL 2017]**
(1) java script (2) World Wide Web
(3) SQL (4) String

36. The WWW is made up of the set of interconnected ..... that are linked together over the Internet.
(1) electronic documents
(2) Web pages
(3) files
(4) All of these

37. What is a Website? **[RBI Grade B 2014]**
(1) A place from where we can get information in documents and files
(2) A site that is owned by any particular company
(3) A location on the world wide web
(4) A place from where we can access Internet
(5) None of the above

38. A Website address is a unique name that identifies a specific ..... on the Web. **[SBI PO 2010]**
(1) Web browser (2) Website
(3) PDA (4) link
(5) None of these

39. A (n) ..... appearing on a Web page opens another document when clicked.
(1) anchor (2) URL **[SBI PO 2013]**
(3) hyperlink (4) reference
(5) heading

40. A reference to data that reader can directly follow by selecting or hovering is
(1) hypertext (2) hyperlink
(3) hyper media (4) hyper markup

41. A Website is collection of **[IBPS Clerk 2012]**
(1) graphics (2) programs
(3) algorithms (4) Web pages
(5) charts

42. ..... is collection of Web pages and ..... is the very first page that we seen on opening of Website.
(1) Home page, Web page
(2) Website, home page

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(3) Web page, home page
(4) Web page, Website
(5) None of the above

43. A browser is a **[RBI Grade B 2013]**
(1) tool for creating a database
(2) software program to view Web pages on the Internet
(3) printing device
(4) software program to delete a folder
(5) None of the above

44. Conference (Netscape), Netmeeting (Internet Explorer) enables (choose the option that best describes) **[RBI Grade B 2012]**
(1) sharing voice on the net
(2) live textual conferencing
(3) live audio conferencing
(4) live real time conferencing
(5) None of the above

45. To view information on the Web you must have a **[RBI Grade B 2012]**
(1) cable modem (2) Web browser
(3) domain name server (4) hypertext viewer
(5) None of the above

46. A ..... is a software program used to view Web pages. **[SBI Clerk 2011]**
(1) site (2) host (3) link (4) browser
(5) None of these

47. Which one of the following is used to browse and search for information on the Internet?
(1) Eudora (2) Netscape (3) FTP (4) Telnet

48. The ..... which contains billions of documents called Web pages, is one of the more popular services on the Internet. **[SBI Clerk 2014]**
(1) Web server (2) telnet
(3) Web (4) collection
(5) None of these

49. What is URL? **[IBPS PO 2012]**
(1) A computer software program
(2) A type of programming object
(3) The address of a document or 'page' on the world wide web
(4) An acronym for unlimited resource for learning
(5) A piece of hardware

50. Which of the following is used by the browser to connect to the location of the Internet resources? **[IBPS Clerk 2011]**
(1) Linkers (2) Protocol (3) Cable (4) URL
(5) None of these

51. An absolute ..... contains the complete address of a file on the nternet. **[SSC CGL 2017]**
(1) JavaScript (2) URL
(3) SQL (4) String

52. Which of the following must be contained in a URL? **[IBPS PO 2012]**
(1) A protocol identifier
(2) The letters, WWW
(3) The unique registered domain name
(4) WWW and the unique registered domain name
(5) A protocol identifier, WWW and the unique registered domain name

53. URL identifies the location of a specific Web page on the Internet. Here URL stands for
(1) Uniform Read Locator
(2) Uniform Resource Locator
(3) Unicode Research Location
(4) United Research Locator
(5) None of the above

54. Which among the following term means/refers to web address of a page?
(1) SMTP (2) IP (3) HTTP (4) URL
(5) MAC

55. The last three letters of the domain name describes the type of **[SSC FCI 2012]**
(1) organisation (domain name)
(2) connectivity
(3) server
(4) protocol

56. An educational institution would generally have the following in its domain name. **[IBPS Clerk 2011]**
(1) .org (2) .edu (3) .inst (4) .com
(5) .sch

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57. Which of the following domains is used by profit business? **[SBI Clerk 2012]**
(1) .com (2) .edu (3) .mil (4) .net
(5) .org

58. Specialised programs that assist users in locating information on the Web are called **[RBI Grade B 2012]**
(1) information engines
(2) locator engines
(3) Web browsers
(4) resource locators
(5) search engines

59. Which of the following forms a part of a search engine?
(1) Spiders of Web crawlers
(2) Indexing software
(3) Search algorithm (4) All of the above

60. Which among the following is a search engine?
(1) Internet Explorer (2) Flash
(3) Google (4) Firefox

61. A ..... is the term used when a search engine returns a Web page that matches the search criteria. **[IBPS PO 2011]**
(1) blog (2) hit (3) link (4) view
(5) success

62. Which is not the feature of Internet?
(1) E-mail (2) Newsgroup
(3) Chat (4) Designing

63. Which among the following is an area of e-mail that is short description of the message?
(1) Subject (2) Cc
(3) Bcc (4) Attachment
(5) Spam

64. Which of the following is always a part of E-mail address?
(1) Period (.) (2) At sign (@)
(3) Space () (4) Underscore (_)
(5) Angular Bracket (<)

65. An e-mail attachment is referred to as
(1) The body of the e-mail
(2) The address of the sender
(3) A document that is sent with an e-mail.
(4) The address of the receiver
(5) Any document that can be attached and sent with an e-mail

66. Which one of the following is not an e-mail service provider?
(1) Hotmail (2) Gmail
(3) Bing (4) Yahoo mail
(5) Outlook

67. Which of the following fields of an e-mail hides the identity of the recipients?
(1) To (2) From (3) Cc (4) Bcc

68. Sending an E-mail is similar to **[SBI Clerk 2011]**
(1) writing a letter
(2) drawing a picture
(3) talking on the phone
(4) sending a package
(5) None of the above

69. Junk e-mail is also called **[RBI Grade B 2012]**
(1) crap (2) spoof
(3) sniffer script (4) spool
(5) spam

70. What can possible be the drawback of e-mails?
(1) E-mails require being physically delivered to the user
(2) E-mails infect computer
(3) E-mails are very expensive to transmit
(4) E-mails are slow to load
(5) People don't check e-mails regularly

71. Which of the following is a valid e-mail address?
(1) name. Website@info@ed
(2) name. Website@info.in
(3) name. @Website.info.com
(3) Website. name@website.com
(5) Website@info.com

72. What is included in an E-mail address? **[IBPS Clerk 2012]**
(1) Domain name followed by user's name
(2) User's name followed by domain name
(3) User's name followed by postal address
(4) User's name followed by street address
(5) None of the above

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73. Which of the following elements are used in an e-mail to express emotions or feelings clearly?
(1) Acronyms (2) Abbreviations
(3) Rich text (4) Emoticons or smileys

74. If you receive an E-mail from someone you don't know, what should you do?
(1) Forward it to the police immediately
(2) Delete it without opening it
(3) Open it and respond to them saying you don't know them
(4) Reply and ask them for their personal information

75. Which of the following cannot be part of an E-mail address?
(1) Period (.) (2) At Sign (@)
(3) Space () (4) Underscore (_)
(5) None of these

76. Gmail belongs to
(1) great mail (2) yahoo mail
(3) google mail (4) gopher mail
(5) None of these

77. Which of the following is not a term pertaining to E-mail? **[IBPS Clerk 2015]**
(1) PowerPoint (2) Inbox
(3) Sender (4) Receiver
(5) None of the above

78. Storage area for E-mail messages is called
(1) folder (2) file
(3) mail box (4) directory

79. An E-mail address typically consists of a user ID followed by the.....sign and the domain name that manages the user's electronic post office box.
(1) # (2) @ (3) & (4) $

80. Video conferencing is used for
(1) talking each other
(2) communicating purpose
(3) live conversation
(4) All of the above

81. Who is the founder of 'facebook' which is currently the No. 1 social networking Website in India? **[SSC CGL 2013]**
(1) Orkut Buycukkokten (2) Mark Zuckerberg
(3) Bill Gates (4) Martin Cooper

82. What is the full form of EDI? **[IBPS RRB PO Mains 2018]**
(1) Electronic Data Interchange
(2) Easy Data Interchange
(3) Electronic Data Interconnect
(4) Electrical Data Interconnect
(5) None of the above

83. The process of trading goods over the Internet is known as **[IBPS Clerk 2012]**
(1) E-selling n buying
(2) E-trading
(3) E-finance
(4) E-salesmanship
(5) E-commerce

84. Which of the following is a group of servers that share work and may be able to back each other up if one server fails? **[IBPS Clerk 2015]**
(1) Channel bank (2) Cluster
(3) Tiger team (4) Serverless backup
(5) Logical unit

85. A (n) ..... allows you to access your e-mail from anywhere.
(1) Forum (2) Webmail interface
(3) Message Board (4) Weblog
(5) EEPROM

86. Which of the following will be used if a sender of E-mail wants to bold, italics, etc the text message? **[IBPS Clerk 2012]**
(1) Reach signature (2) Rich text
(3) Reach format (4) Plain format
(5) Plain text

87. A cookie **[IBPS Clerk 2012]**
(1) stores information about the user's Web activity
(2) stores software developed by the user
(3) stores the password of the user
(4) stores the commands used by the user
(5) None of the above

88. Which on the following is most commonly used to identify return visitors to a website?
(1) logged-in visitors
(2) digital certificates
(3) electronic time stamping
(4) cookies

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89. Which of the following terms is associated with Internet E-mail? **[SBI Clerk 2014]**

(1) Plotter (2) Slide presentation
(3) Bookmark (4) Pie chart
(5) Microsoft Excel

90. A stored link to a Web page, in order to have a quick and easy access to is later, is called **[RBI Grade B 2014]**

(1) WP-Link (2) Bookmark
(3) Field (4) Length
(5) None of these

91. Which of these is not a means of personal communication on the Internet? **[IBPS PO 2012, IBPS Clerk 2013]**

(1) Chat (2) Instant messaging
(3) Instanotes (4) Electronic-mail
(5) None of these

92. A host on the Internet finds another host by its **[RBI Grade B 2014]**

(1) postal address (2) electronic address
(3) IP address (4) name
(5) None of these

ANSWERS

1. *(4)*	2. *(4)*	3. *(4)*	4. *(4)*	5. *(1)*	6. *(1)*	7. *(3)*	8. *(3)*	9. *(1)*	10. *(4)*
11. *(1)*	12. *(3)*	13. *(2)*	14. *(1)*	15. *(2)*	16. *(3)*	17. *(3)*	18. *(1)*	19. *(3)*	20. *(1)*
21. *(3)*	22. *(5)*	23. *(4)*	24. *(3)*	25. *(3)*	26. *(2)*	27. *(3)*	28. *(2)*	29. *(5)*	30. *(4)*
31. *(1)*	32. *(2)*	33. *(2)*	34. *(2)*	35. *(2)*	36. *(2)*	37. *(3)*	38. *(2)*	39. *(3)*	40. *(2)*
41. *(4)*	42. *(2)*	43. *(2)*	44. *(4)*	45. *(2)*	46. *(4)*	47. *(2)*	48. *(1)*	49. *(3)*	50. *(4)*
51. *(2)*	52. *(5)*	53. *(2)*	54. *(4)*	55. *(1)*	56. *(2)*	57. *(1)*	58. *(5)*	59. *(1)*	60. *(3)*
61. *(2)*	62. *(4)*	63. *(1)*	64. *(2)*	65. *(5)*	66. *(3)*	67. *(4)*	68. *(1)*	69. *(5)*	70. *(2)*
71. *(3)*	72. *(2)*	73. *(4)*	74. *(2)*	75. *(3)*	76. *(3)*	77. *(1)*	78. *(3)*	79. *(2)*	80. *(4)*
81. *(2)*	82. *(1)*	83. *(2)*	84. *(2)*	85. *(2)*	86. *(2)*	87. *(1)*	88. *(4)*	89. *(3)*	90. *(2)*
91. *(3)*	92. *(3)*								

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CHAPTER

14

COMPUTER SECURITY

Computer security is also known as cyber security or IT security. Computer security is a branch of information technology known as information security, which is intended to protect computers. It is the protection of computing systems and the data that they store or access.

Methods to Provide Protection

There are four primary methods to provide protection

1. **System Access Control** It ensures that unauthorised users do not get into the system by encouraging authorised users to be security conscious.
2. **Data Access Control** It monitors who can access the data, and for what purpose. Your system might support mandatory access controls with these. The system determines access rules based on the security levels of the people, the files and the other objects in your system.
3. **System and Security Administration** It performs offline procedures that make or break secure system.
4. **System Design** It takes advantages of basic hardware and software security characteristics.

Components of Computer Security

Computer security is associated with many core areas.

Basic components of computer security system are as follows

1. **Confidentiality** It ensures that data is not accessed by any unauthorised person.
2. **Integrity** It ensures that information is not altered by any unauthorised person in such a way that it is not detectable by authorised users.
3. **Authentication** It ensures that users are the persons they claim to be.
4. **Access Control** It ensures that users access only those resources that they are allowed to access.
5. **Non-Repudiation** It ensures that originators of messages cannot deny they are not sender of the message.
6. **Availability** It ensures that systems work promptly and service is not denied to authorised users.
7. **Privacy** It ensures that individual has the right to use the information and allows another to use that information.

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8. **Stenography** It is an art of hiding the existence of a message. It aids confidentiality and integrity of the data.
9. **Cryptography** It is the science of writing information in a 'hidden' or 'secret' form and an ancient art. It protects the data in transmit and also the data stored on the disk.

   Some terms commonly used in cryptography are as follows

   (i) **Plain text** It is the original message that is an input.

   (ii) **Cipher** It is a bit-by-bit or character-by-character transformation without regard to the meaning of the message.

   (iii) **Cipher Text** It is the coded message or the encrypted data.

   (iv) **Encryption** It is the process of converting plain text to cipher text, using an encryption algorithm.

   (v) **Decryption** It is the reverse of encryption, i.e. converting cipher text to plaint ext.

Sources of Cyber Attack

The most potent and vulnerable threat of computer users is virus attacks. A computer virus is a small software program that spreads from one computer to another and that interferes with computer operation. It is imperative for every computer user to be aware about the software and its programs that can help to protect the personal computers from attacks.

The sources of attack can be follow

1. **Downloadable Programs** Downloadable files are one of the best possible sources of virus. Any type of executable file like games, screen saver are one of the major sources. If you want to download programs from the Internet then it is necessary to scan every program before downloading them.
2. **Cracked Software** These softwares are another source of virus attacks. Such cracked forms of illegal files contain virus and bugs that are difficult to detect as well as to remove. Hence, it is always a preferable option to download software from the appropriate source.
3. **E-mail Attachments** These attachments are the most common source of viruses. You must handle E-mail attachments with extreme care, especially if the E-mail comes from an unknown sender.
4. **Internet** Majority of all computer users are unaware as when viruses attack computer systems. Almost all computer users click or download everything that comes their way and hence unknowingly invites the possibility of virus attacks.
5. **Booting from Unknown CD** When the computer system is not working, it is a good practice to remove the CD. If you do not remove the CD, it may start to boot automatically from the disk which enhances the possibility of virus attacks.

Malware : Threats to Computer Security

Malware stands for malicious software. It is a broad term that refers to a variety of malicious programs that are used to damage computer system, gather sensitive information or gain access to private computer systems. It includes computer viruses, worms, trojan horses, rootkits, spyware, adware, etc.

Some of them are described below

Virus

VIRUS stands for Vital Information Resources Under Siege. Computer viruses or perverse softwares are small programs that can negatively affect the computer. It obtains control of a PC and directs it to perform unusual and often destructive actions. Viruses are copied itself and attached itself to other programs which further spread the infection. The virus can affect or attack any part of the computer software such as the boot block, operating system, system areas, files and application programs. The first computer virus Creeper created in 1971.

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Types of Virus

Some common types of viruss are as follows

1. **Resident Virus** It fixes themselves into the system's memory and get activated whenever the operating system runs and infects all the files that are opened. It hides in the RAM and stays there even after the malicious code is executed. e.g. Randex, Meve etc.
2. **Direct Action Virus** It comes into action when the file containing the virus is executed. It infects files in the folder that are specified in the AUTOEXEC.bat file path. e.g. Vienna virus.
3. **Overwrite Virus** It deletes the information contained in the files that it infects, rendering them partially or totally useless, once they have been infected. e.g. Way, Trj.Reboot, Trivial.88.D etc.
4. **Boot Sector Virus** It is also called Master Boot Sector virus or Master Boot Record virus. This type of virus affects the boot sector of a hard disk. Brain was the first PC boot sector virus created in 1986. e.g. Polyboot.B, AntiEXE etc.
5. **Macro Virus** It infects files that are created using certain applications or programs that contain macros, like .doc, .xls, .ppt etc. e.g. Melissa.A
6. **File System Virus** It is also called Cluster virus or Directory virus. It infects the directory of the computer by changing the path that indicates the location of a file. e.g. Dir-2 virus
7. **Polymorphic Virus** It encrypts or encodes itself in an encrypted way, every time it infects a system. This virus then goes on to create a large number of copies.
   e.g. Elkern, Tuareg etc.
8. **FAT Virus** It is used to store all the information about the location of files, unusable space, etc.
   e.g. Link virus etc.
9. **Multipartite Virus** It may spread in multiple ways such as the operating system installed or the existence of certain files.
   e.g. Flip.
10. **Web Scripting Virus** Many Websites execute complex code in order to provide interesting content. These sites are sometimes created with purposely infected code.
    e.g. JS Fortnight

Some common viruses are tabulated below

Year	Name
1971	Creeper
1982	Elk Cloner
1988	The Morris Internet Worm
1999	Melissa
2000	I Love You
2001	Code Red
2003	SQL Slammer
2003	Blaster
2004	Sasser
2010	Stuxnet
2011	Trojan
2012	Rootkit
2014	Generic PUP
2014	Net Worm

Effects of Virus

There are many different effects that viruses can have on your computer, depending on the types of virus. *Some viruses can*

(i) monitor what you are doing.
(ii) slow down your computer's performance.
(iii) destroy all data on your local disk.
(iv) affect on computer networks and the connection to Internet.
(v) increase or decrease memory size.
(vi) display different types of error messages.
(vii) decrease partition size.
(viii) alter PC settings.
(ix) display arrays of annoying advertising.
(x) extend boot times.
(xi) create more than one partitions.

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Worms

A computer worm is a standalone malware computer program that replicates itself in order to spread to other computers. Often, it uses a computer network to spread itself, relying on security failures on the target computer to access it. Worms are hard to detect because they are invisible files.

e.g. Bagle, I love you, Morris, Nimda etc.

Trojan

A Trojan, or Trojan horse, is a non-self-replicating type of malware which appears to perform a desirable function but instead facilitates unauthorised access to the user's computer system. Trojans do not attempt to inject themselves into other files like a computer virus. Trojan horses may steal information, or harm their host computer systems. Trojans may use drive by downloads or install *via* online games or Internet driven applications in order to reach target computers. Unlike viruses, Trojan horses do not replicate themselves.
e.g. Beast, Sub7.Zeus, ZeroAccess Rootkit etc.

Spyware

It is a program which is installed on a computer system to spy on the system owner's activity and collects all the information which is misused afterwards. It tracks the user's behaviour and reports back to a central source.

These are used for either legal or illegal purpose. Spyware can transmit personal information to another person's computer over the Internet.

e.g. CoolWeb Search, FinFisher, Zango, Zlob Trojan, Keyloggers etc.

Symptoms of Malware Attack

There is a list of symptoms of malware attack which indicates that your system is infected with a computer malware.

Some primary symptoms of malware attack are as follows

(i) Odd messages are displaying on the screen.
(ii) Some files are missing.
(iii) System runs slower.
(iv) PC crashes and restarts again and again.
(v) Drives are not accessible.
(vi) Antivirus software will not run or installed.
(vii) Unexpected sound or music plays.
(viii) The mouse pointer changes its graphic.
(ix) System receives strange E-mails containing odd attachments or viruses.
(x) PC starts performing functions like opening or closing window, running programs on its own.

Some Other Threats to Computer Security

There are some other threats to computer security which are described below

1. **Spoofing** It is the technique to access the unauthorised data without concerning to the authorised user. It accesses the resources over the network. It is also known as 'Masquerade'. IP spoofing is a process or technique to enter in another computer by accessing its IP address. It pretends to be a legitimate user and access to its computer *via* a network.
2. **Salami Technique** It diverts small amounts of money from a large number of accounts maintained by the system.
3. **Hacking** It is the act of intruding into someone else's computer or network. Hacking may result in a Denial of Service (DoS) attack.
   It prevents authorised users from accessing the resources of the computer. A hacker is someone, who does hacking process.
4. **Cracking** It is the act of breaking into computers. It is a popular, growing subject on Internet. Cracking tools are widely distributed on the Internet. They include password crackers, trojans, viruses, war-dialers, etc.
5. **Phishing** It is characterised by attempting to fraudulently acquire sensitive information such as passwords, credit cards

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details etc. by masquerading as a trustworthy person.

6. **Spam** It is the abuse of messaging systems to send unsolicited bulk messages in the form of E-mails. It is a subset of electronic spam involving nearly identical messages sent to numerous recipients by E-mails.
7. **Adware** It is any software package which automatically renders advertisements in order to generate revenue for its author. The term is sometimes used to refer the software that displays unwanted advertisements.
8. **Rootkit** It is a type of malware that is designed to gain administrative level control over a computer system without being detected.

Solutions to Computer Security Threats

Some safeguards (or solutions) to protect a computer system from accidental access, are described below

Antivirus Software

It is an application software that is designed to prevent, search for, detect and remove viruses and other malicious softwares like worms, trojans, adware and more. It consists of computer programs that attempt to identify threats and eliminate computer viruses and other malware.

Some popular Antiviruses

(i) Avast (ii) Avg
(iii) K7 (iv) Kaspersky
(v) Trend Micro (vi) Quick Heal
(vii) Symantec (viii) Norton
(ix) McAfee

Digital Certificate

It is the attachment to an electronic message used for security purposes. The common use of a digital certificate is to verify that a user sending a message is who he or she claims to be, and to provide the receiver with the means to encode a reply. It provides a means of proving your identity in electronic transactions.

Digital Signature

It is an electronic form of a signature that can be used to authenticate the identity of the sender of a message or the signer of a document, and also ensure that the original content of the message or document that has been sent is unchanged.

Firewall

It can either be software based or hardware based and is used to help in keeping a network secure. Its primary objective is to control the incoming and outgoing network traffic by analysing the data packets and determining whether it should be allowed through or not, based on a predetermined rule set. A network's firewall builds a bridge between an internal network that is assumed to be secure and trusted, and another network, usually an external (inter) network, such as the Internet, that is not assumed to be secure and trusted. A firewall also includes or works with a proxy server that makes network requests on behalf of workstation users.

Password

It is a secret word or a string of characters used for user authentication to prove identity or access approval to gain access to a resource.

A password is typically somewhere between 4 to 16 characters, depending on how the computer system is setup. When a password is entered, the computer system is careful not to display the characters on the display screen, in case others might see it.

There are two common modes of password as follows

(i) **Weak Password** Easily remember just like names, birth dates, phone number etc.
(ii) **Strong Password** Difficult to break and a combination of alphabets and symbols.

File Access Permission

Most current file systems have methods of assigning permissions or access rights to specific user and group of users. These systems control

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the ability of the users to view or make changes to the contents of the file system. File access permission refers to privileges that allow a user to read, write or execute a file.

There are three specific file access permissions as follows

(i) **Read Permission** If you have read permission of a file, you can only see the contents. In case of directory, access means that the user can read the contents.

(ii) **Write Permission** If you have write permission of a file, you can only modify or remove the contents of a file. In case of directory, you can add or delete contents to the files of the directory.

(iii) **Execute Permission** If you have execute permission of a file, you can only execute a file. In case of directory, you must have execute access to the bin directory in order to execute it or cd command.

Terms Related to Security

1. **Eavesdropping** The attacker monitors transmissions for message content.
2. **Masquerading** The attacker impersonates an authorised user and thereby gain certain unauthorised privilege.
3. **Patches** It is a piece of software designed to fix problems with a computer program or its supporting data. This includes fixing security vulnerabilities and other bugs and improving the usability and performance.
4. **Logic Bomb** It is a piece of code intentionally inserted into a computer's memory that will set off a malicious function when specified conditions are met. They are also called slag code and does not replicate itself.
5. **Application Gateway** This applies security mechanisms to specific applications such as File Transfer Protocol (FTP) and Telnet services.
6. **Proxy Server** It can act as a firewall by responding to input packets in the manner of an application while blocking other packets. It hides the true network addresses and used to intercept all messages entering and leaving the network.

Tit-Bits

- **Keylogger** is a software program designed to record every keystroke on the machine on which it runs.
- The legal right to use software based on specific restrictions is granted *via* **Software license**.
- **Payloads** is code in the worm designed to do more than spread the worm. **Bomb virus** has a delayed payload.
- **Software Piracy** means copying of data or computer software without the owner's permission.

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QUESTION BANK

1. ..... is a branch of information technology known as information security.
(1) Computer security (2) Cyber security
(3) IT security
(4) All of these

2. It takes advantages of basic hardware and software security characteristics.
(1) System design
(2) Data access control
(3) System access control
(4) None of these

3. Verification of a login name and password is known as **[IBPS Clerk 2014]**
(1) configuration (2) accessibility
(3) authentication (4) logging in
(5) Other than those given as options

4. If you are allowing a person on the network based on the credentials to maintain the security of your network, then this act refers to the process of **[IBPS PO 2016]**
(1) Authentication (2) Automation
(3) Firewall (4) Encryption
(5) None of these

5. The scrambling of code is known as
(1) Encryption (2) Firewalling
(3) Scrambling (4) Deception
(5) Permuting

6. The main reason to encrypt a file is to
(1) reduce its size
(2) secure it for transmission
(3) prepare it for backup
(4) include it in the start-up sequence

7. Cracked softwares are another source of
(1) E-mail attack (2) Virus attack
(3) Trojan horse (4) All of these

8. A malware is an
(1) program (2) hardware
(3) a person (4) None of these

9. Softwares such as Viruses, Worms and Trojan Horses that have a malicious content, is known as **[IBPS Clerk 2014]**
(1) Malicious software (malware)
(2) adware (3) scareware
(4) spyware (5) firewall

10. Viruses, trojan horses and worms are **[IBPS Clerk 2012]**
(1) able to harm computer system
(2) unable to detect if present on computer
(3) user-friendly applications
(4) harmless applications resident on computer
(5) None of the above

11. It is a self-replicating program that infects computer and spreads by inserting copies of itself into other executable code or documents.
(1) Keylogger (2) Worm
(3) Virus (4) Cracker

12. A computer virus is
(1) deliberately created
(2) created accidently
(3) produced as result of some program error
(4) All of the above

13. ..... are often delivered to a PC through an mail attachment and are often designed to do harm. **[IBPS PO 2015]**
(1) Portals
(2) Spam
(3) Viruses
(4) Other than those given as options
(5) E-mail messages

14. Which of the following refers to dangerous programs that can be 'caught' of opening E-mail attachments and downloading software from the Internet? **[SBI PO 2014]**
(1) Utility (2) Virus
(3) Honey Pot (4) Spam
(5) App

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15. A program designed to destroy data on your computer which can travel to 'infect' other computers is called a **[RBI Grade B 2012]]**
(1) disease (2) torpedo (3) hurricane (4) virus
(5) infector

16. If your computer rebooting itself then it is likely that **[SBI Clerk 2012]**
(1) it has a virus
(2) it does not have enough memory
(3) there is no printer
(4) there has been a power surge
(5) it needs a CD-ROM

17. Computer virus is **[IBPS Clerk 2011]**
(1) a hardware
(2) windows tool
(3) a computer program
(4) a system software
(5) None of the above

18. Which among the following is related to the internet and mail?
(1) Boot-UP (2) Magnetic Tapes
(3) Applications Software
(4) Paging
(5) Virus

19. The first PC virus was developed in
(1) 1980 (2) 1984 (3) 1986 (4) 1988

20. The first computer virus is
(1) creeper (2) PARAM
(3) the famous (4) HARLIE

21. Which virus spreads in application software?
(1) Macro virus (2) Boot virus
(3) File virus (4) Antivirus

22. The ..... of a threat measures its potential impact on a system. **[IBPS Clerk 2011]**
(1) vulnerabilities (2) counter measures
(3) degree of harm (4) susceptibility
(5) None of these

23. Which of the following is the type of software that has self-replicating software that causes damage to files and system?
(1) Viruses (2) Trojan horses
(3) Bots (4) Worms

24. Like a virus, it is also a self-replicating program. The difference between a virus and it is that a worm does not create copies of itself on one system it propagates through computer networks.
(1) Keylogger (2) Worm
(3) Cracker (4) None of these

25. A worm
(1) can automatically move in network
(2) can only be transferred with human intervention
(3) worms are harmless
(4) None of the above

26. Worm is a program that infects computer and spreads by inserting copies of itself into other executable code or documents.
(1) Self attach (2) Self-replicating
(3) Non-self-replicating (4) Hacking

27. A computer virus normally attaches itself to another computer program known as a **[IBPS PO 2015]**
(1) host program (2) target program
(3) backdoor program (4) bluetooth
(5) trojan horse

28. These are program designed as to seem to being or be doing one thing, but actually being or doing another.
(1) Trojan horses (2) Keylogger
(3) Worm (4) Cracker

29. Viruses that fool a user into downloading and/or executing them by pretending to be useful applications are also sometimes called
(1) Trojan horses (2) Keylogger
(3) Worm (4) Cracker

30. A ..... is a small program embedded inside of a GIF image.
(1) Web bug (2) cookie
(3) spyware application (4) spam

31. Hackers often gain entry to a network be pretending to be at a legitimate computer
(1) spoofing (2) forging
(3) IP spoofing (4) All of these

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32. It is a situation in which one person or program successfully masquerades as another by falsifying data and thereby gaining illegitimate access.

(1) Sspoofing attack (2) Vulnerability scanner
(3) Packet sniffer (4) Rootkit

33. Attempt to gain unauthorised access to a user's system or information by pretending to be the user? **[IBPS RRB PO 2018]**

(1) Spoofing (2) Hacker
(3) Cracker (4) Phishing
(5) None of these

34. Which of the following enables to determine how often a user visited a Website? **[IBPS Clerk 2014]**

(1) Hacker (2) Spammer
(3) Phish (4) Identify theft
(5) Cookie

35. A person who uses his or her expertise to gain access to other people computers to get information illegally or do damage is a **[Allahabad Bank PO 2011]**

Or

A person who uses his expertise for software? **[IBPS RRB PO 2018]**

(1) spammer (2) hacker
(3) instant messenger (4) All of these
(5) None of these

36. Hackers

(1) all have the same motive
(2) are another name of users
(3) many legally break into computer as long as they do not do any damage
(4) are people who are allergic to computers
(5) break into other people's computer

37. What is a person called who uses a computer to cause harm to people or destroy critical systems? **[IBPS Clerk 2014]**

(1) Cyber Terrorist
(2) Black-hat-Hacker
(3) Cyber Cracker
(4) Hacktivist
(5) Other than those given as options

38. An act of sending e-mails or creating webpages that are designed to collect and individual's online bank, credit card or other login information?

(1) Phishing (2) Spam
(3) Hacking (4) Cracking

39. ..... are attempts by individuals to obtain confidential information from you by falsifying their identity. **[IBPS PO 2011, IBPS Clerk 2013]**

(1) Phishing trips (2) Computer viruses
(3) Spyware scams (4) Viruses
(5) Phishing scams

40. Which of the following is a criminal activity attempting to acquire sensitive information such as passwords, credit cards, debits by masquerading as a trustworthy person or business in an electronic communication? **[IBPS Clerk 2010]**

(1) Spoofing (2) Phishing
(3) Stalking (4) Hacking
(5) None of these

41. All of the following are examples of real-security and privacy risks except **[SBI PO 2011, IBPS Clerk 2014]**

(1) hackers (2) spam
(3) viruses (4) identify theft
(5) None of these

42. Junk E-mail is also called **[Union Bank of India 2011]**

(1) spam (2) spoof
(3) sniffer script (4) spool
(5) None fo these

43. ..... is a type of electronic spam where unsolicited messages are sent by e-mail.

(1) Trash mail (2) Cram mail
(3) Draft mail (4) Spam mail

44. Adware is something

(1) which is added to your computers
(2) by adding this performance of your computer increases
(3) software that gets different advertisement
(4) None of the above

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45. It is a toolkit for hiding the fact that a computer's security has been compromised, is a general description of a set of programs which work to subvert control of an operating system from its legitimate (in accordance with established rules) operators.
(1) Rootkit (2) Keylogger
(3) Worm (4) Cracker

46. It is a prepared application that takes advantage of a known weakness.
(1) Security exploit
(2) Vulnerability scanner
(3) Packet sniffer
(4) Rootkit

47. It is a tool used to quickly check computers on a network for known weaknesses.
(1) Security exploit (2) Vulnerability scanner
(3) Packet sniffer (4) Rootkit

48. A ..... is anything that can cause harm.
(1) vulnerability (2) phishing
(3) threat (4) spoof

49. An antivirus is a (n)
(1) program code (2) computer
(3) company name (4) application software
(5) None of these

50. Antivirus software is an example of
(1) business software
(2) an operating system
(3) a security
(4) an office suite

51. A digital signature is an **[SBI Clerk 2011]**
(1) scanned signature
(2) signature in binary form
(3) encrypting information
(4) handwritten signature
(5) None of the above

52. To protect yourself from computer hacker intrusions, you should install a **[RBI Grade B 2012]**
(1) firewall (2) mailer
(3) macro (4) script
(5) None of these

53. Which one of the following is a key function of firewall? **[SBI PO 2010]**
(1) Monitoring (2) Deleting
(3) Copying (4) Moving
(5) None of these

54. Mechanism to protect network from outside attack is
(1) firewall (2) antivirus
(3) digital signature (4) formatting

55. A firewall operated by **[SBI Clerk 2010]**
(1) the pre-purchase phase
(2) isolating intranet from extranet
(3) screening packets to/from the network and provide controllable filtering of network traffic
(4) All of the above
(5) None of the above

56. Coded entries which are used to gain access to a computer system are called
(1) Entry codes (2) Passwords
(3) Security commands (4) Codewords

57. Password enables users to
(1) get into the system quickly
(2) make efficient use of time
(3) retain confidentiality of files
(4) simplify file structure

58. Which of the following is the combination of numbers, alphabets along with username used to get access to user account?
(1) Password (2) Username
(3) Titlename (4) Host-Id

59. ..... refers to privileges that allow a user to read, write or execute a file.
(1) Authentication
(2) File access permission
(3) Password
(4) Firewall

60. The unauthorised real-time interception of a private communication such as a phone call, instant message known as
(1) replay (2) eavesdropping
(3) patches (4) payloads
(5) None of these

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61. Vendor created program modifications are called **[Allahabad Bank PO 2011]**

(1) patches (2) antiviruses
(3) hales (4) fixes
(5) overlaps

62. Which of the following a computer's memory, but unlike a virus, it does not replicate itself ? **[SBI PO 2011]**

(1) Trojan horse (2) Logic bomb
(3) Cracker (4) Firewall
(5) None of these

63. Some viruses have a delayed payload, which is sometimes called a

(1) time (2) antivirus
(3) bomb (4) All of these

64. Which was the first PC boot sector virus?

(1) Creeper (2) Payload
(3) Bomb (4) Brain

65. It hides the true network addresses and used to intercept all messages entering and leaving the network.

(1) Logic bomb (2) Firewall
(3) Patches (4) Proxy server

66. It is a software program designed to record (log) every keystroke on the machine on which it runs.

(1) Keylogger (2) Worm
(3) Virus (4) Cracker

67. The legal right to use software based on specific restrictions is granted via a **[RBI Grade B 2012]**

(1) software privacy policy
(2) software license
(3) software password manager
(4) software log
(5) None of the above

68. ..... refers to the unauthorised copying and distribution of software. **[IBPS Clerk 2014]**

OR

Illegal copying and distribution of software is **[IBPS RRB PO 2018]**

(1) Hacking
(2) Software piracy
(3) Software literacy
(4) Cracking
(5) Copyright

ANSWERS

1. *(4)*	2. *(1)*	3. *(3)*	4. *(1)*	5. *(1)*	6. *(2)*	7. *(2)*	8. *(1)*	9. *(1)*	10. *(1)*
11. *(3)*	12. *(1)*	13. *(3)*	14. *(2)*	15. *(4)*	16. *(1)*	17. *(3)*	18. *(5)*	19. *(3)*	20. *(1)*
21. *(1)*	22. *(3)*	23. *(4)*	24. *(2)*	25. *(1)*	26. *(2)*	27. *(5)*	28. *(1)*	29. *(1)*	30. *(3)*
31. *(3)*	32. *(1)*	33. *(1)*	34. *(1)*	35. *(2)*	36. *(5)*	37. *(3)*	38. *(1)*	39. *(1)*	40. *(2)*
41. *(2)*	42. *(1)*	43. *(4)*	44. *(3)*	45. *(1)*	46. *(1)*	47. *(2)*	48. *(1)*	49. *(4)*	50. *(3)*
51. *(3)*	52. *(1)*	53. *(1)*	54. *(1)*	55. *(3)*	56. *(2)*	57. *(3)*	58. *(1)*	59. *(2)*	60. *(2)*
61. *(1)*	62. *(2)*	63. *(3)*	64. *(4)*	65. *(4)*	66. *(1)*	67. *(2)*	68. *(2)*		

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PRACTICE SET 1

FOR COMPUTER AWARENESS

1. Which of the following is an example of non-volatile memory?
(1) ROM (2) RAM
(3) LSI (4) VLSI
(5) None of these

2. Which of the following is a unit of measurement used with computer system?
(1) Byte (2) Megabyte
(3) Gigabyte (4) All of these

3. Which command is used to copy files?
(1) Copy
(2) Disk copy
(3) Type
(4) All of the above

4. What will you insert, when you need to see all the information from two tables on one form?
(1) A page break
(2) A subform
(3) A linked command button
(4) All of the above
(5) None of the above

5. Which is not an advantage of using computerised spreadsheets?
(1) Flexibility moving entries
(2) Speed of calculation
(3) Ability of generate tables
(4) Cost of initial setup
(5) None of the above

6. To select several cells or ranges that are not touching each other, what would you do while selecting?
(1) Hold down the Ctrl key
(2) Hold down the Shift key
(3) Hold down the Alt key
(4) Hold down Ctrl + Shift key
(5) None of the above

7. Which of the following is select in Power Point to play a PowerPoint slide show for previewing?
(1) View, Slide Sorter (2) View, Slide
(3) View, Slide Show (4) View, Outline
(5) None of these

8. Which of the following is used in MS-PowerPoint, in order to see all the slides on one screen?
(1) View, Slide Sorter (2) View, Slide
(3) View, Master (4) View, Slide Show

9. Which of the following is not a property of fibre optic cabling?
(1) Transmits at faster speeds than copper cabling
(2) Easier to capture a signal from than copper cabling
(3) Very resistant to interference
(4) Carries signals as light waves
(5) None of the above

10. What does fibre use to transmit data?
(1) Vibrations (2) Sound
(3) Electrical current (4) Light

11. To cut the selected text, these keys should be pressed.
(1) Ctrl + C
(2) Ctrl + D
(3) Ctrl + V
(4) Ctrl + X
(5) None of the above

12. It is the abuse of messaging systems to send unsolicited bulk messages in the form of e-mails.
(1) Spam (2) Adware
(3) Hacking (4) Cracking
(5) Phishing

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13. ..... is a software that is designed to prevent, detect and remove viruses.
(1) Firewall (2) Digital certificate
(3) Antivirus software (4) Password
(5) None of these

14. The secondary storage devices can only store data, but they cannot perform
(1) arithmetic operations
(2) fetch operations
(3) logic operations (4) All of the above

15. Which of the following statements is false?
(1) Secondary storage is a non-volatile
(2) Primary storage is volatile
(3) When the computer is turned off, data and instructions stored in primary storage are erased
(4) All of the above
(5) None of the above

16. In computer science, by information we mean
(1) any output coming out from computer
(2) processed data put in an intelligent form
(3) a report printed by the computer
(4) plural of data

17. DEL command is used to
(1) delete files (2) delete directory
(3) delete labels (4) delete contents of file
(5) None of these

18. C++ language developed by
(1) Dennis Ritchie (2) Charles Babbage
(3) Niklaus Wirth (4) Bjarne Stroustroup
(5) John Mccharthy

19. The bar which shows your current status in the document is called
(1) status (2) standard
(3) format (4) title
(5) None of these

20. You can delete one character to the left of cursor using ..... key.
(1) backspace (2) delete
(3) edit (4) format

21. You can use ..... alignment to centralise your text.
(1) right (2) centre
(3) left (4) All of these
(5) None of these

22. In MS-word, Spell check is under which menu?
(1) Edit (2) Review
(3) Tool (4) Format

23. Grammatical errors are shown in which colour?
(1) Red (2) Green
(3) Blue (4) Black
(5) None of these

24. This part of operating system manages the essential peripherals, such as the keyboard, screen, disk drives and parallel and serial ports.
(1) Basic input/output system
(2) Secondary input/output system
(3) Peripheral input/output system
(4) Marginal input/output system
(5) None of the above

25. The following are all computing devices, except
(1) notebook computers
(2) cellular telephones
(3) digital scanners
(4) personal digital assistants

26. It performs basic tasks such as controlling input and output devides, processing of instructions, controlling and allocating memory, managing files.
(1) The platform (2) Application software
(3) Operating system (4) The motherboard
(5) None of the above

27. Servers are computers that provide resources to other computers connected to a
(1) mainframe (2) network
(3) supercomputer (4) client
(5) None of these

28. A Database Management System (DBMS) is a
(1) hardware system used to create, maintain and provide controlled access to a database
(2) hardware system used to create, maintain and provide uncontrolled access to a database
(3) software system used to create, maintain and provide uncontrolled access to a database
(4) software system used to create, maintain and provide controlled access to a database
(5) None of the above

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29. When data changes in multiple lists and all lists are not updated, this causes
(1) data redundancy (2) information overload
(3) duplicate data (4) data inconsistency
(5) None of these

30. Words that a programming language has set aside for its own use
(1) control words (2) reserved words
(3) control structures (4) reserved keys
(5) None of these

31. A ..... is a software program used to view web pages.
(1) site (2) host (3) link (4) browser

32. You must install ..... on a network if you want to share a broadband Internet connection.
(1) router (2) modem
(3) node (4) cable

33. Which term identifies a specific computer on the Web and the main page of the entire site?
(1) URL (2) Website address
(3) Hyperlink (4) Domain name
(5) None of these

34. Which one of the following is a valid binary number?
(1) 120 (2) 459 (3) 10101 (4) 10108
(5) None of these

35. Process to verify the username and password is known as
(1) logic (2) checkin
(3) authentication (4) authorisation
(5) None of these

36. The unit of speed used for super computer is
(1) KB (2) FLOPS
(3) GB (4) EB
(5) None of these

37. HTTP stands for
(1) HyperText Transfer Protocol
(2) HighText Transfer Protocol
(3) HyperTechnical Transfer Protocol
(4) HyperText Test Protocol
(5) HyperText Transfer Program

38. 23 will be written in binary as
(1) 10111 (2) 11111
(3) 10011 (4) 11011
(5) 10001

39. Which one of the following is a good password?
(1) My date of birth (2) My school name
(3) My name (4) Timepass_09

40. Memory is also known as temporary memory.
(1) ROM (2) RAM
(3) DVD (4) CD
(5) Hard Disk

41. Which of the following is correct syntax of a URL?
(1) udinra.com (2) .udinra.com
(3) udinra.html.com (4) @udinra.
(5) None of these

42. Which of the following is the communication protocol that sets the standard used by every computer that accesses Web based information?
(1) XML (2) DML (3) HTTP (4) HTML
(5) CSS

43. Which program will you use to write a business letter?
(1) MS-Word (2) MS-Excel
(3) MS-PowerPoint (4) MS-Access

44. An operating system is said to be multitasking if
(1) more than one programs can run simultaneously
(2) more than one users can work simultaneously
(3) Either '1' or '2'
(4) All of the above

45. What is E-commerce?
(1) Buying and selling takes place over Internet
(2) Buying and selling takes place over phone call
(3) Buying and selling takes place over both Internet and phone call
(4) Buying and selling takes place over either Internet or phone call
(5) None of the above

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46. The default extensions of Microsoft Word 2007 and Microsoft Excel 2007 files are

(1) .doc,.xsl (2) .doc,.xml
(3) .docx,. xlsx (4) .docx,.xml

47. 30,000 bytes is nearly equal to

(1) 30 KB (2) 3MB
(3) 3GB (4) 3TB
(5) None of these

48. EDI stands for

(1) Electronic Data Internet
(2) Electronic Data Interchange
(3) Electric Device Internet
(4) Electric Data Interchange

49. Which command is used to permanently delete files or folders?

(1) Shift + Delete
(2) Ctrl + Delete
(3) Alt + Delete
(4) Delete
(5) Shift+All+Delete

50. While working with MS-DOS, which command transfers a specific file from one disk to another?

(1) Copy (2) Diskcopy
(3) Time (4) Rename
(5) Date

ANSWERS

1. *(1)*	2. *(4)*	3. *(1)*	4. *(2)*	5. *(4)*	6. *(1)*	7. *(3)*	8. *(1)*	9. *(2)*	10. *(4)*
11. *(4)*	12. *(1)*	13. *(3)*	14. *(4)*	15. *(5)*	16. *(2)*	17. *(1)*	18. *(4)*	19. *(1)*	20. *(1)*
21. *(2)*	22. *(2)*	23. *(2)*	24. *(1)*	25. *(2)*	26. *(3)*	27. *(2)*	28. *(4)*	29. *(4)*	30. *(2)*
31. *(4)*	32. *(1)*	33. *(1)*	34. *(3)*	35. *(3)*	36. *(2)*	37. *(1)*	38. *(1)*	39. *(4)*	40. *(2)*
41. *(1)*	42. *(3)*	43. *(1)*	44. *(1)*	45. *(1)*	46. *(3)*	47. *(1)*	48. *(2)*	49. *(1)*	50. *(1)*

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PRACTICE SET 2

FOR COMPUTER AWARENESS

1. First supercomputer developed in India is
(1) PARAM (2) Aryabhatta
(3) Buddha (4) CRAY-1
(5) None of these

2. Which of the following is an example of computer software?
(1) Impact printer (2) Console
(3) Device driver (4) OCR
(5) None of these

3. Programmers use a variety of ..... to communicate instructions to the computer.
(1) programming languages
(2) system languages
(3) high level languages
(4) low level languages

4. Which of the following displays the contents of the active cell?
(1) Active cell (2) Formula bar
(3) Menu bar (4) Name box
(5) None of these

5. A software used to convert source program instructions to object instruction is known as
(1) compiler (2) assembler
(3) interpreter
(4) language processor
(5) None of these

6. In computers, IC chip is used which is made of
(1) chromium (2) iron oxide
(3) silica (4) silicon
(5) None of these

7. Example of mainframe computer is
(1) IBM–370 (2) UNIVAC–1110
(3) IBM–S/390 (4) All of these

8. Which of the following is a part of central processing unit?
(1) Printer (2) Keyboard
(3) Mouse (4) ALU

9. Which of the following statements is wrong?
(1) Windows XP is an operating system
(2) Linux is owned and sold by Microsoft
(3) Photoshop is a graphical design tool by adobe
(4) Linux is free and open source software
(5) None of the above

10. Pointing device includes the following except
(1) maouse (2) light pen
(3) trackball (4) keyboard
(5) joystick

11. The term 'operating system' means
(1) a set of programs which controls computer working
(2) the way a user operates the computer system
(3) conversion of high level language to machine language
(4) the way computer operator works
(5) None of the above

12. The physical arrangement of elements on a page is referred to as a document's
(1) features (2) format
(3) pagination (4) grid

13. Most Websites have a main page, the.....which acts as a doorway to the rest of the Website pages.
(1) search engine
(2) home page
(3) browser
(4) URL
(5) None of these

14. Input, output and processing devices grouped together represent a(n)
(1) mobile device
(2) information processing cycle
(3) circuit boards
(4) computer system

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15. What type of computer could be found in a digital watch?
(1) Mainframe computer (2) Supercomputer
(3) Embedded computer
(4) Notebook computer
(5) Microcomputer

16. Which of the following is not true about computer files?
(1) They are collections of data saved to a storage medium
(2) Every file has a file name
(3) A file extension is established by the user to indicate the file's contents
(4) Files usually contain data
(5) None of the above

17. All of the following are examples of real security and privacy risks except
(1) hackers (2) spam
(3) viruses (4) identity theft

18. What type of technology allows you to use your finger, eye or voice print to secure your information resources?
(1) Haptics (2) Caves
(3) Biometrics (4) RFID
(5) All of these

19. Main memory is
(1) Random Access Memory
(2) Random Only Memory
(3) Serial Access Memory
(4) Storage Memory

20. The smallest and fastest computer imitating brain working is
(1) Supercomputer (2) Quantum computer
(3) Param-1000 (4) IBM chips
(5) None of these

21. A Compact Disc (CD) is which type of data storage?
(1) Magnetic (2) Optical
(3) Electrical (4) Electromechanical
(5) None of these

22. Which of the following is not a language for computer programming?
(1) Windows (2) Pascal
(3) Basic (4) Cobol
(5) All of these

23. First computer mouse was built by
(1) Douglas Engelbart
(2) William English
(3) Oaniel Coogher
(4) Robert Zawacki

24. C Language was developed by
(1) Ada Byron (2) Bill Gates
(3) Blaise Pascal (4) Dennis Ritchie
(5) None of these

25. Which of the following is not one of the four major data processing functions of a computer?
(1) Gathering data
(2) Processing data into information
(3) Analysing the data or information
(4) Storing the data or information
(5) None of the above

26. When you connect to this service your computer is communicating with a server at your Internet Service Provider (ISP). What does refer this?
(1) Modem (2) Internet
(3) Intranet (4) Server
(5) Computer

27. A collection of related files is called a
(1) character (2) field
(3) database (4) record
(5) None of these

28. Hard disk drives and CD drives are examples of
(1) backup (2) storing
(3) storage (4) All of these

29. You would use …… software to create spreadsheets, type documents and edit photos.
(1) application (2) utility
(3) system (4) operating
(5) None of these

30. Which of the following are computers that support hundreds or thousands of users simultaneously?
(1) Super (2) Macro
(3) Mini (4) Mainframes
(5) Digital

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31. Which device is a microprocessor-based computing device?
(1) Personal computing (2) Mainframe
(3) Workstation (4) Server
(5) None of these

32. An E-mail account includes a storage area, often called a(n)
(1) attachment (2) hyperlink
(3) mailbox (4) IP address
(5) None of these

33. Data becomes.....when it is presented in a format that people can understand and use it.
(1) processed (2) graphs
(3) information (4) presentation
(5) None of these

34. A set of computer programs that helps a computer monitor itself and function more efficiently is a/an
(1) Windows (2) system software
(3) DBMS (4) application software

35. A ..... converts all the statements in a program in a single batch and the resulting collection of instructions is placed in a new file.
(1) converter (2) compiler
(3) interpreter (4) instruction
(5) None of these

36. One thousand bytes is a
(1) kilobyte (2) megabyte
(3) gigabyte (4) terabyte
(5) None of these

37. Which one of the following is not a broadband communication medium?
(1) Microwave (2) Fibre optic cable
(3) Twisted pair (4) Co-axial cable
(5) None of these

38. Which of the following performs modulation and demodulation?
(1) Co-axial cable (2) Satellite
(3) Modem (4) Optical fibre
(5) None of these

39. The earliest calculating device is
(1) Abacus (2) Difference engine
(3) Clock (4) Pascaline
(5) None of these

40. The function of Esc key is
(1) to end the action
(2) go to last action
(3) to repeat the last action
(4) to begin the action

41. Which of the following is not an advatnage of magnetic disk storage?
(1) The access time of magnetic disk is much less than that of magnetic tape
(2) Disk storage is longer lasting than magnetic tape
(3) Disk storage is less expensive than tape storage
(4) All of the above

42. The memory sizes in mainframe computers and advanced technology micro computers are expressed as
(1) bytes (2) kilobytes
(3) bits (4) megabytes
(5) None of these

43. Computer virus is
(1) hardware
(2) Windows tool
(3) a computer program
(4) a system software
(5) None of these

44. Each model of a computer has a unique
(1) assembly language (2) machine language
(3) high level language (4) All of these

45. A website is a collection of
(1) graphics (2) programs
(3) algorithms (4) web pages
(5) charts

46. To move the cursor to the end of the document, press
(1) Ctrl + Esc (2) Ctrl + End
(3) Ctrl + B (4) Ctrl + C
(5) None of these

47. The shortcut key to print documents is
(1) Ctrl + A (2) Ctrl + B
(3) Ctrl + P (4) Ctrl + C

48. Viruses, Trojan horses and worms are
(1) able to harm computer system
(2) unable to detect if affected on computer
(3) user-friendly applications
(4) harmless applications resident on computer

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49. Which of the following is used to browse Internet?

(1) Skype (2) Facebook
(3) Google (4) Firefox
(5) Yahoo

50. Internet banking is done over

(1) Internet (2) mobile
(3) laptop (4) computer
(5) tab

ANSWERS

1. *(1)*	2. *(3)*	3. *(1)*	4. *(2)*	5. *(4)*	6. *(4)*	7. *(4)*	8. *(4)*	9. *(2)*	10. *(4)*
11. *(1)*	12. *(2)*	13. *(2)*	14. *(4)*	15. *(3)*	16. *(3)*	17. *(2)*	18. *(3)*	19. *(1)*	20. *(2)*
21. *(2)*	22. *(1)*	23. *(1)*	24. *(4)*	25. *(3)*	26. *(2)*	27. *(4)*	28. *(4)*	29. *(1)*	30. *(4)*
31. *(1)*	32. *(3)*	33. *(3)*	34. *(2)*	35. *(2)*	36. *(1)*	37. *(1)*	38. *(3)*	39. *(1)*	40. *(1)*
41. *(4)*	42. *(4)*	43. *(3)*	44. *(2)*	45. *(4)*	46. *(2)*	47. *(3)*	48. *(1)*	49. *(4)*	50. *(1)*

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PRACTICE SET 3

FOR COMPUTER AWARENESS

1. What are the contents that are lost on turning OFF the computer?
(1) Storage (2) Input (3) Output (4) Memory
(5) None of these

2. Assembly language is a
(1) machine language
(2) high level programming language
(3) low level programming language
(4) language for assembling computers

3. The binary system is a number system to the base
(1) 2 (2) 4 (3) 8 (4) 10
(5) 16

4. Which of the following is not an example of hardware?
(1) Scanner (2) Printer (3) Monitor (4) Mouse
(5) Interpreter

5. What happens when we try to delete the files on the floppy?
(1) The files get moved to the recycle bin
(2) Files on a floppy cannot be deleted
(3) The files get deleted and can be restored again from Recycle Bin
(4) The files get deleted and cannot be restored again
(5) The files get copied on the hard disk

6. In a sequence of events that takes place in an instruction cycle, the first cycle is
(1) store cycle (2) execute cycle
(3) fetch cycle (4) decode cycle
(5) code cycle

7. Computer systems are comprised of
(1) hardware, programs, information, people and network
(2) hardware, software, procedures, networks and people
(3) hardware, programs, information, people and procedures
(4) hardware, programs, processors, procedures, networks and people
(5) hardware, programs, processors, procedures and people

8. Press ..... to move the insertion point to the address box or to highlight the URL in the address.
(1) Alt + D (2) Alt + A
(3) Shift + Tab (4) Tab + Ctrl
(5) Ctrl + S

9. In analog computer,
(1) input is first converted to digital form
(2) input is never converted to digital form
(3) output is displayed in digital form
(4) All of the above

10. VGA stands for
(1) Video Graphics Array
(2) Visual Graphics Adapter
(3) Virtual Graphics Access
(4) Volatile Graphics Adapter
(5) None of the above

11. Which of the following memory chips is faster?
(1) There is no certainty
(2) DRAM
(3) SRAM
(4) DRAM is faster for larger chips

12. An improvement on the ENIAC was made possible with the help of the mathematician
(1) John Von Neumann (2) Albert Federer
(3) Lord Smith (4) Tim Shown

13. A person who used his or her expertise to gain access to other people's computers to get information illegally or do damage is a
(1) spammer (2) hacker
(3) instant messanger (4) programmer
(5) analyst

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14. Which of the following is an example of storage devices?
(1) Magnetic disks (2) Tapes
(3) DVDs (4) All of these

15. The basic computer processing cycle consists of
(1) input, processing and output
(2) systems and application
(3) data, information and applications
(4) hardware, software and storage
(5) None of the above

16. Video processor consists of ..... and ....., which store and process images.
(1) CPU and VGA
(2) CPU and memory
(3) VGA and memory
(4) VGI and DVI

17. ..... are specially designed computers that perform complex calculations extremely rapidly.
(1) Servers (2) Supercomputers
(3) Laptops (4) Mainframes

18. Which of the following domains is used by profit business?
(1) .com (2) .edu
(3) .mil (4) .net
(5) .org

19. To reload a Web page, press the ..... button.
(1) redo (2) reload (3) restore (4) ctrl
(5) refresh

20. Where are you likely to find an embedded operating system?
(1) On a desktop operating system
(2) On a networked PC
(3) On a network server
(4) On a PDA
(5) On a mainframe

21. A popular way to learn about computers without ever, going to a classroom is called
(1) I-learning (2) isolated learning
(3) E-learning (4) E-commerce
(5) None of these

22. It ensures that data is not accessed by any unauthorised person.
(1) Integrity (2) Authentication
(3) Confidentiality (4) Access control
(5) Steganography

23. Reusable optical storage will typically have an acronym
(1) CD (2) DVD (3) ROM (4) RW
(5) ROS

24. Mobile commerce is best described as
(1) the use of kiosks in marketing
(2) transporting products
(3) buying and selling goods/services through wireless handheld devices
(4) using notebook PC's in marketing

25. A(n) ..... is composed of several computers connected together to share resources and data.
(1) Internet (2) network
(3) backbone (4) hyperlink
(5) protocol

26. Which of the following is a storage device that uses rigid, permanently installed magnetic disks to store data/information?
(1) Floppy disk (2) Hard disk
(3) Permanent disk (4) Optical disc
(5) None of these

27. Which of the following is contained on chips connected to the system board and is a holding area for data instructions and information?
(1) Program (2) Mouse (3) Internet (4) Memory
(5) Modem

28. The smallest unit of information about a record in a database is called a
(1) cell (2) field (3) record (4) query
(5) None of these

29. A(n) ..... is a special visual and audio effect applied in PowerPoint to text or content.
(1) animation (2) flash
(3) wipe (4) dissolve

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30. Which of the following is a programming language for creating special programs like Applets?
(1) Java (2) Cable
(3) Domain name (4) Net
(5) COBOL

31. The piece of hardware that converts your computer's digital signal to an analog signal that can travel over telephone lines is called a
(1) red wire (2) blue cord
(3) tower (4) modem
(5) None of these

32. Personal computers can be connected together to form a
(1) server (2) supercomputer
(3) network (4) enterprise

33. You can keep your personal files/folders in
(1) My folder (2) My doucments
(3) My files (4) My text
(5) None of these

34. Which of the following is a graphic package?
(1) CorelDraw (2) MS-Word
(3) MS-Excel (4) All of these
(5) None of these

35. Default paper size of Word documents is
(1) letter (2) A4
(3) A3 (4) Both '1' and '3'
(5) None of these

36. Which PowerPoint view displays each slide of the presentation as a thumbnail and is useful for rearranging slides?
(1) Slide Sorter
(2) Slide Show
(3) Slide Master
(4) Notes Page
(5) Slide Design

37. Example of impact printer is
(1) jet printer
(2) thermal printer
(3) laser printer
(4) daisy wheel printer

38. Notification area is found on which side of the desktop?
(1) Left (2) Right
(3) Centre (4) Both '1' and '2'
(5) None of these

39. Which shortcut key is used to search for a file or a folder?
(1) F1 (2) F2 (3) F3 (4) F5
(5) None of these

40. Which of the following is not a layer of OSI model?
(1) Host to network (2) Application
(3) Network (4) Transport
(5) Data link

41. Who invented Linux?
(1) J Presper Eckert and John W Mauchly
(2) Dennis M Ritchie
(3) Seymour Papert (4) Linus Torvalds

42. Which command is used to search all the text files in any drive?
(1) File1.txt (2) *.txt
(3) _*.txt (4) File2.txt
(5) None of these

43. Motherboard is also known as
(1) electronic board
(2) Printed Circuit Board (PCB)
(3) combined device board
(4) Both '1' and '3'

44. The collection of links throughout the Internet creates an interconnected/network called the
(1) WWW (2) Web
(3) World Wide Web (4) All of these

45. Every computer has a(n) ..... many ..... .
(1) operating system, a client system
(2) operating system, instruction sets
(3) application programs, an operating system
(4) application programs, a client system
(5) operating system, application programs

46. ..... are basically questions based on the data available in a database.
(1) Forms (2) Queries (3) Tables (4) Reports

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47. Which number system is used by computers to store data and perfom calculations?

(1) binary (2) octal
(3) decimal (4) hexadecimal
(5) None of these

48. Cache is a

(1) permanent memory (2) temporary memory
(3) storage device
(4) Both '2' and '3'
(5) None of these

49. In which year, IBM made the first electronic computer?

(1) 1950 (2) 1951 (3) 1952 (4) 1953

50. What is 'Quick Heal'?

(1) Antivirus (2) Vaccine
(3) Program (4) Software

ANSWERS

1. *(4)*	2. *(3)*	3. *(1)*	4. *(5)*	5. *(4)*	6. *(3)*	7. *(3)*	8. *(1)*	9. *(2)*	10. *(1)*
11. *(3)*	12. *(1)*	13. *(2)*	14. *(4)*	15. *(1)*	16. *(2)*	17. *(2)*	18. *(1)*	19. *(5)*	20. *(4)*
21. *(3)*	22. *(3)*	23. *(4)*	24. *(3)*	25. *(2)*	26. *(2)*	27. *(4)*	28. *(2)*	29. *(1)*	30. *(1)*
31. *(4)*	32. *(3)*	33. *(2)*	34. *(1)*	35. *(2)*	36. *(1)*	37. *(4)*	38. *(2)*	39. *(3)*	40. *(1)*
41. *(4)*	42. *(2)*	43. *(2)*	44. *(4)*	45. *(5)*	46. *(2)*	47. *(1)*	48. *(2)*	49. *(4)*	50. *(1)*

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PRACTICE SET 4

FOR COMPUTER AWARENESS

1. Devices that enter information and let you communicate with the computer are called
(1) software (2) output devices
(3) hardware (4) input devices
(5) input /output devices

2. Which among the following was the first graphical Web browser?
(1) Mosaic (2) WAIS
(3) CERN (4) Gopher
(5) None of these

3. The free available known repair of software bug on Internet is called
(1) version (2) add on
(3) tutorial (4) FAQ
(5) patch

4. The first computer virus is
(1) creeper (2) PARAM
(3) the famous (4) HARLIE

5. What is the function of the central processing unit of a computer?
(1) Creates invoices
(2) Performs calculations and processing
(3) Deletes data
(4) Corrupts the data
(5) None of the above

6. The feature that keeps track of the right margin is
(1) find and replace (2) wordwrap
(3) right justified (4) left justified
(5) ragged right

7. When a real-time telephone call between people is made over the Internet using computers, it is called
(1) a chat session
(2) an E-mail
(3) an instant message
(4) Internet telephony

8. An electronic device, operating under the control of information, that can accept data, process the data, produce output and store the results for future use, is called
(1) input (2) computer
(3) software (4) hardware
(5) None of these

9. In ER diagram, relationship type is represented by
(1) ellipse (2) dashed ellipse
(3) rectangle (4) diamond

10. Which of the following will be used if a sender of E-mail wants to bold, italics etc the text message?
(1) Rich signature (2) Rich text
(3) Rich format (4) Both '2' and '3'
(5) Plain text

11. It is a set of one or more attributes that can uniquely identify tuples within the relation
(1) Primary key (2) candidate key
(3) Foreign key (4) Alternate key
(5) Super key

12. All of the logic and mathematical calculations done by the computer happen in/on the
(1) system board (2) central control unit
(3) motherboard
(4) central processing unit
(5) memory

13. The operating system called UNIX is typically used for
(1) desktop computers (2) laptop computers
(3) supercomputers (4) Web servers

14. The ..... file format is a method of encoding pictures on a computer.
(1) HTML (2) JPEG (3) FTP (4) URL
(5) DOC

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15. Which of the following is a program that uses a variety of different approaches to identify and eliminate spam?
(1) Directory search
(2) Anti-spam program
(3) Web server
(4) Web storefront creation package
(5) Virus

16. To access properties of an object, the mouse technique to use is
(1) dragging (2) dropping
(3) right-clicking (4) shift-clicking

17. Computers use the ..... number system to store data and perform calculations.
(1) binary (2) octal
(3) decimal (4) hexadecimal

18. ..... are attempts by individuals to obtain confidential information from you by falsifying their identity.
(1) Phishing trips
(2) Computer viruses
(3) Spyware scams
(4) Viruses
(5) Phishing scams

19. Why is it unethical to share copyrighted files with your friends?
(1) It is not unethical, because it is legal
(2) It is unethical because the files are being given for free
(3) Sharing copyrighted files without permission breaks copyright laws
(4) It is not unethical because the files are being given for free
(5) It is not unethical-anyone can access a computer

20. A computer tower is not
(1) a CPU
(2) hardware
(3) the heart of the computer
(4) a peripheral

21. The processor is a ..... chip plugged onto the motherboard in a computer system.
(1) LSI (2) VLSI
(3) ULSI (4) XLSI
(5) WLSI

22. To change selected text to all capital letters, click the Change Case button, then click
(1) Sentence Case
(2) Lowercase
(3) UPPERCASE
(4) Capitalize Each Word
(5) toGGLE cASE

23. An online discussion group that allows direct 'live' communication is known as
(1) WebCrawler (2) chat group
(3) regional service provider
(4) hyperlink
(5) E-mail

24. The cost of a given amount of computing power has.....dramatically with the progress of computer technology.
(1) stayed the same
(2) changed proportionally with the economy
(3) increased
(4) fluctuated
(5) decreased

25. Another name for a pre-programmed formula in Excel is
(1) range (2) graph (3) function (4) cell

26. If your computer keeps rebooting itself, then it is likely that
(1) it has a virus
(2) it does not have enough memory
(3) there is no printer
(4) there has been a power surge
(5) it needs a CD-ROM

27. A program for viewing Web pages is called
(1) Word processor (2) spreadsheet
(3) protocol (4) a browser
(5) database

28. The term used to describe the instructions that tell the computer what to do is ..... .
(1) hardware (2) software
(3) storage (4) input/output

29. Codes consisting of lines of varying widths or lengths that are computer-readable are known as
(1) an ASCII code (2) a magnetic tape
(3) an OCR scanner (4) a bar code
(5) None of these

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30. What type of keys are 'Ctrl' and 'Shift'?
(1) Adjustment (2) Function
(3) Modifier (4) Alphanumeric

31. In Word, you can change page margins by
(1) dragging the scroll box on the scroll bars
(2) deleting the margin boundaries on the ruler
(3) dragging the margin boundaries on the ruler
(4) clicking the right mouse button on the ruler
(5) None of the above

32. Assembly instructions are in the form of
(1) binary digits (2) mnemonics
(3) general english (4) All of these

33. The speed of clock frequency or microprocessor is measured in
(1) hertz (2) baud rate (3) cps
(4) bits (5) bytes

34. In Word, Replace option is available on
(1) File menu (2) View menu
(3) Edit menu (4) Format menu

35. What type of device is a $3\frac{1}{2}$ inch floppy drive?
(1) Input (2) Output
(3) Software (4) Storage
(5) None of these

36. What utility do you use to transfer files and exchange messages?
(1) Web browsers (2) WWW
(3) E-mail (4) Hypertext
(5) Search engines

37. Which unit controls the movement of signals between CPU and I/O?
(1) ALU (2) Control unit
(3) Memory unit (4) Secondary storage

38. What are different views to display a table in MS-Access?
(1) Pivot table (2) Design view
(3) Datasheet view (4) All of these

39. The three main parts of the processor are
(1) ALU, Control Unit and Registers
(2) ALU, Control Unit and RAM
(3) Cache, Control Unit and Registers
(4) Control Unit, Registers and RAM
(5) RAM, ROM and CD-ROM

40. Portable computer, also known as laptop computer, weighing between 4 and 10 pounds is called
(1) PDA
(2) Supercomputer (3) Mainframe computer
(4) Minicomputer (5) notebook computer

41. All the characters, that a device can use are called its
(1) skill set (2) character alphabet
(3) characters codes (4) keyboard characters
(5) character set

42. ..... is a technique that is used to send more than one calls over a single line.
(1) Digital transmission
(2) Infrared transmission
(3) Digitising (4) Streaming
(5) Multiplexing

43. Supercomputers
(1) are smaller in size and processing capability than mainframe computers
(2) are common in majority of households
(3) contain thousands of microprocessors
(4) are rarely used by researchers due to their lack of computing capacity
(5) are of the same size as laptops

44. Which of the following is the second largest measurement of RAM?
(1) Terabyte (2) Megabyte
(3) Byte (4) Gigabyte
(5) Megahertz

45. The system BIOS and ROM chips are called
(1) software (2) firmware
(3) hardware (4) bootware

46. Today, the common form of RAM is built with
(1) transistors
(2) vacuum tubes
(3) semi conductors ICs
(4) super conductors ICs
(5) None of the above

47. A modern electronic computer is a machine that is meant for
(1) doing quick mathematical calculations
(2) input, storage, manipulation and outputing of data

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(3) electronic data processing
(4) performing repetitive tasks accurately

48. Speakers or headphones are devices.
(1) Input
(2) Input/Output
(3) Software
(4) Storage
(5) Output

49. Which type of memory holds the program to start up the computer?
(1) ROM (2) RAM (3) Cache (4) Static
(5) None of these

50. The PC (Personal Computer) and the Apple Macintosh are examples of two different
(1) platforms (2) applications
(3) programs (4) storage devices

ANSWERS

1. *(4)*	2. *(1)*	3. *(5)*	4. *(1)*	5. *(2)*	6. *(3)*	7. *(4)*	8. *(2)*	9. *(4)*	10. *(4)*
11. *(1)*	12. *(4)*	13. *(4)*	14. *(2)*	15. *(2)*	16. *(3)*	17. *(1)*	18. *(1)*	19. *(3)*	20. *(3)*
21. *(2)*	22. *(3)*	23. *(2)*	24. *(5)*	25. *(3)*	26. *(1)*	27. *(4)*	28. *(2)*	29. *(4)*	30. *(3)*
31. *(3)*	32. *(2)*	33. *(1)*	34. *(3)*	35. *(4)*	36. *(3)*	37. *(2)*	38. *(4)*	39. *(1)*	40. *(5)*
41. *(5)*	42. *(5)*	43. *(3)*	44. *(4)*	45. *(2)*	46. *(3)*	47. *(2)*	48. *(5)*	49. *(1)*	50. *(1)*

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PRACTICE SET 5

FOR COMPUTER AWARENESS

1. What is Telnet?
(1) Network or telephones
(2) Television network
(3) Remote login
(4) All of the above

2. In Word, when you indent a paragraph, you
(1) push the text in with respect to the margin
(2) change the margins on the page
(3) move the text up by one line
(4) move the text down by one line
(5) None of the above

3. How do you measure character size?
(1) Text (2) Data
(3) Font (4) File
(5) None of these

4. A key that will erase information from the computer's memory and characters on the screen is
(1) edit key (2) delete key
(3) backspace key (4) shift key
(5) None of these

5. Logic chip is also known as
(1) Program (2) Memory
(3) Microprocessor (4) ROM
(5) RAM

6. A removable magnetic disk that holds information is
(1) floppy disk (2) hard drive
(3) monitor (4) portable
(5) None of these

7. Which keys enable the input of number quickly?
(1) Ctrl, Shift and Alt
(2) Function keys
(3) The numeric keypad
(4) Arrow keys
(5) None of the above

8. To exit the program without leaving the application, what is to be done?
(1) File (2) Edit (3) Copy (4) Close
(5) None of these

9. ..... provides process and memory management services that allow two or more tasks, jobs or programs to run simultaneously.
(1) Multitasking (2) Multithreading
(3) Multiprocessing (4) Multicomputing
(5) None of these

10. Which ports connect special types of music instruments to sound cards?
(1) BUS (2) CPU (3) USB (4) MIDI
(5) MINI

11. To insert a copy of the clipboard contents, whatever was last cutted or copied at the insertion point, what is to be done?
(1) Paste (2) Stick in
(3) Fit in (4) Push in
(5) None of these

12. The contents of ..... are lost when the computer turns OFF.
(1) storage (2) input
(3) output (4) memory
(5) None of these

13. Tangible, physical computer equipment that can be seen and touched, is called
(1) hardware (2) software
(3) storage (4) input/output
(5) None of these

14. The.....enables you to simultaneously keep multiple Web pages open in one browser window.
(1) tab box (2) pop-up helper
(3) tab row (4) address bar
(5) Esc key

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15. The main memory of a computer can also be called
(1) primary storage (2) internal memory
(3) primary memory (4) All of these
(5) None of these

16. Junk e-mail is also called
(1) spam (2) spoof
(3) sniffer script (4) spool
(5) None of these

17. Internet requires
(1) an international agreement to connect computers
(2) a local area network
(3) a commonly agreed set of rules to communicate between computers
(4) a world wide web
(5) None of the above

18. When speaking of computer input and output, input refers to
(1) any data processing that occurs from new data input into the computer
(2) retrieval of data or information that has been input into the computer
(3) data or information that has been entered into the computer
(4) the transmission of data that has been input into the computer
(5) Both '3' and '4'

19. What resides on the motherboard and connects the CPU to other components on the motherboard?
(1) Input unit (2) System bus
(3) ALU (4) Primary memory
(5) None of these

20. Which of the following is billionth of a second?
(1) Gigabyte (2) Terabyte
(3) Nanosecond (4) Microsecond
(5) Terasecond

21. In an ER diagram, attributes are represented by
(1) rectangle (2) square
(3) ellipse (4) triangle
(5) circle

22. The ..... performs simple mathematics for the CPU.
(1) ALU (2) DIMM (3) bus (4) register
(5) CU

23. Connection or link to other documents or Web pages that contain related information is called
(1) dial-up (2) electronic commerce
(3) hyperlink (4) E-cash
(5) domain name

24. A DVD is an example of a(n)
(1) hard disk (2) optical disc
(3) output device
(4) solid-state storage device
(5) None of the above

25. Use this when you want to make all letters capitals without having to use the Shift key for each character. What does this refer here?
(1) Shifter (2) Upper case
(3) Caps lock key (4) Icon
(5) None of these

26. A device that reads the information contained on a disk and transfers it to the computer's memory. What is it?
(1) Monitor (2) Screen
(3) Keyboard (4) Disk drive
(5) None of these

27. Which of the following is not the major function of a computer?
(1) Processing data into information
(2) Storing data or information
(3) Accepting data
(4) Analysing data or information
(5) None of the above

28. The main job of a CPU is to
(1) carry out program instructions
(2) store data/information for future use
(3) process data and information
(4) Both '1' and '3'
(5) None of the above

29. Which of the following is an example of optical disc?
(1) Digital versatile discs
(2) Magnetic disks
(3) Memory disks (4) Data bus disks

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30. The ..... folder retains copies of message that you have started but are not yet ready to send.
(1) inbox (2) outbox
(3) drafts (4) sent items
(5) address book

31. ..... moves the cursor one space to the right or puts spaces in between words.
(1) Control key (2) Space bar
(3) Printer (4) Mouse
(5) None of these

32. In Excel, which one is a prerecorded formula that provides a shortcut for complex calculations?
(1) Value (2) Data Series
(3) Function (4) Field
(5) None of these

33. Which of the following computer's memory is characterised by low cost per bit stored?
(1) Primary (2) Secondary
(3) Magnetic tape (4) All of these

34. To change written work already done, what is to be used?
(1) File (2) Edit (3) Cut (4) Close
(5) None of these

35. ..... is the process of dividing the disk into tracks and sectors.
(1) Tracking (2) Formatting
(3) Crashing (4) Allotting
(5) None of these

36. All of the following terms are related to spreadsheet software except
(1) worksheet (2) cell
(3) formula (4) virus detection
(5) None of these

37. The term used for set of instructions which allow computer to perform more than one tasks, is
(1) hardware (2) software
(3) humanware (4) firmware

38. Which is a shortcut key to insert a new worksheet in MS-Excel?
(1) Ctrl+W (2) Ctrl+N
(3) Ctrl+IW (4) Shift+F11
(5) None of these

39. How many bits are there in ASCII codes?
(1) 8 (2) 10
(3) 12 (4) 16
(5) None of these

40. The basic unit of a worksheet into which you enter data in Excel is called a
(1) tab (2) cell
(3) box (4) range
(5) None of these

41. You can use ..... to copy selected text and ..... to paste it in a document.
(1) Ctrl+C, Ctrl+V (2) Ctrl+C, Ctrl+P
(3) Ctrl+S, Ctrl+S (4) Shift+C, Alt+P
(5) Ctrl+D, Ctrl+A

42. Computer software can be defined as
(1) the computer and its associated equipment
(2) the instructions that tell the computer what to do
(3) computer components that act to accomplish a goal
(4) an interface between the computer and the network
(5) the interaction between the computer and its database

43. Which of the following is not a function category in Excel?
(1) Logical (2) Data series
(3) Financial (4) Text
(5) None of these

44. A search engine is a program to search
(1) for information
(2) Web pages
(3) Web pages for specified index terms
(4) Web pages for information using specified search terms
(5) None of the above

45. A ..... is a set of rules.
(1) resource locator (2) domain
(3) hypertext (4) URL
(5) protocol

46. Data or information used to run the computer is called
(1) software (2) hardware
(3) peripheral (4) CPU
(5) None of the above

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47. The device which helps you to communicate with computer is called
(1) input device (2) output device
(3) software device (4) Both '1' and '2'

48. In order to avoid memorising E-mail address you should use
(1) browser (2) search engine
(3) list of birth date (4) phonebook
(5) address book

49. Computers gather data, which means they allow users to ..... data.
(1) present (2) store (3) output (4) input
(5) None of these

50. To be able to boot, the computer must have a (n)
(1) compiler (2) loader
(3) operating system (4) assembler
(5) None of these

ANSWERS

1. *(3)*	2. *(2)*	3. *(3)*	4. *(2)*	5. *(3)*	6. *(1)*	7. *(3)*	8. *(4)*	9. *(1)*	10. *(4)*
11. *(1)*	12. *(4)*	13. *(1)*	14. *(3)*	15. *(4)*	16. *(1)*	17. *(3)*	18. *(5)*	19. *(2)*	20. *(3)*
21. *(3)*	22. *(1)*	23. *(3)*	24. *(2)*	25. *(3)*	26. *(4)*	27. *(4)*	28. *(4)*	29. *(1)*	30. *(3)*
31. *(2)*	32. *(3)*	33. *(2)*	34. *(2)*	35. *(2)*	36. *(4)*	37. *(2)*	38. *(4)*	39. *(1)*	40. *(2)*
41. *(1)*	42. *(2)*	43. *(2)*	44. *(4)*	45. *(5)*	46. *(1)*	47. *(4)*	48. *(5)*	49. *(4)*	50. *(3)*

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ABBREVIATION

A

AD	Active Directory
ADC	Analog to Digital Convertor
ARP	Address Resolution Protocol
AH	Active Hub
AI	Artificial Intelligence
AL	Active Link
ALGOL	Algorithmic Language
ALU	Arithmetic Logic Unit
AM	Active Monitor
APCI	Application layer Protocol Control Information
API	Application Program Interface
ASCII	American Standard Code for Information Interchange
ATM	Automated Teller Machine
ADF	Automatic Document Feeder

B

BINAC	Binary Automatic Computer
Bcc	Blind Carbon Copy
BMP	Bitmap
BASIC	Beginner's All purpose Symbolic Instruction Code
BCD	Binary Coded Decimal
BCR	Bar Code Reader
BD	Blu-ray Disc
Bin	Binary
BIOS	Basic Input Output System
B2B	Business to Business
Bit	Binary Digit
BLOG	Web Log
BPI	Bytes/Bits Per Inch
BPL	Broadband over Power Line
BPS	Bits Per Second
BSNL	Bharat Sanchar Nigam Limited

C

Cc	Carbon Copy
CMOS	Complementary Metal Oxide Semiconductor
CAD	Computer Aided Design
COBOL	Common Business Oriented Language
CD	Compact Disc
COMAL	Common Algorithmic Language
CPU	Central Processing Unit
CRT	Cathod Ray Tube
CSS	Cascading Style Sheet
CU	Control Unit
CTCP	Client-To-Client Protocol
CD-R	Compact Disc Recordable
CD-ROM	Compact Disc Read Only Memory
CD-RW	Compact Disc Rewritable
CD-R/W	Compact Disc-Read/Write
CG	Computer Graphics
CGI	Common Gateway Interface
COM	Common Object Mode
CLI	Command Line Interface
CLR	Common Language Runtime
CDMA	Code Division Multiple Access

D

DAC	Digital to Analog Convertor
DAP	Directory Access Protocol
DB	Database
DBA	Database Administrator
DBMS	Database Management System
DCC	Direct Client-to-Client
DCL	Data Control Language
DFS	Distributed File System
DHTML	Dynamic HyperText Markup Language
DLL	Dynamic Link Library
DLP	Digital Light Processing
DMA	Direct Memory Access
DNS	Domain Name System

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DPI	Dots Per Inch
DRAM	Dynamic Random Access Memory
DRDO	Defence Research and Development Organisation
DSL	Digital Subscriber Line
DTP	Desktop Publishing
DVD	Digital Video Disc/Digital Versatile Disc
DVD-R	Digital Video Disc-Recordable
DVD-ROM	DVD-Read Only Memory
DVD-RW	DVD-Rewritable
DVR	Digital Video Recorder
DOS	Disk Operating System

E

EBCDIC	Extended Binary Coded Decimal Interchange Code
E-Commerce	Electronic Commerce
EDO	Extended Data Out
EDP	Electronic Data Processing
EDSAC	Electronic Delay Storage Automatic Calculator
EEPROM	Electrically Erasable Programmable Read Only Memory
E-Mail	Electronic Mail
ENIAC	Electronic Numerical Integrator And Computer
EOF	End Of File
EPROM	Erasable Programmable Read Only Memory
EXE	Executable
EDI	Electronic Data Interchange

F

FAT	File Allocation Table
FAX	Facsimile
FDC	Floppy Disk Controller
FDD	Floppy Disk Drive
FIFO	First In First Out
FORTRAN	Formula Translation
FPU	Floating Point Unit
FS	File System
FTP	File Transfer Protocol
FPS	Frame Per Second
FLOPS	Floating Point Operations Per Second
FAQ	Frequently Asked Question

G

Gb	Gigabit
GB	Gigabyte
GIF	Graphics Interchange Format
GIGO	Garbage In Garbage Out
GPU	Graphics Processing Unit
GSM	Global System for Mobile communication
GUI	Graphical User Interface

H

HLL	High Level Language
HPFS	High Performance File System
HDD	Hard Disk Drive
HSM	Hierarchical Storage Management
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol

I

IBM	International Business Machine
IS	Information System
IM	Instant Message
IMAP	Internet Message Access Protocol
iOS	iphone Operating System
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISOC	Internet Society
ISP	Internet Service Provider
ISR	Interrupt Service Routine
IT	Information Technology

J

JPEG	Joint Photographic Experts Group
JRE	Java Runtime Environment
JS	Java Script

K

Kb	Kilobit
KB	Kilobyte
KHz	Kilohertz
Kbps	Kilobit Per Second

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L

LAN	Local Area Network
LCD	Liquid Crystal Display
LDU	Liquid Display Unit
LED	Light Emitting Diode
LIFO	Last In First Out
LPI	Lines Per Inch
LIPS	List Processing

M

MAN	Metropolitan Area Network
Mb	Megabit
MB	Megabyte
MBR	Master Boot Record
MAC	Media Access Control
MPEG	Moving Picture Experts Group
MMS	Multimedia Messaging Service
MIME	Multipurpose Internet Mail Extensions
MSN	Microsoft Network
MDI	Multiple Document Interface
MICR	Magnetic Ink Character Recognition
MIMO	Multiple-Input Multiple-Output
MIPS	Million Instructions Per Second
MIDI	Musical Instrument Digital Interface

N

NFS	Network File System
NIC	Network Interface Card
NOS	Network Operating System

O

OCR	Optical Character Recognition
OMR	Optical Mark Reader
OOP	Object Oriented Programming
OS	Operating System
OSS	Open Source Software
OLE	Object Linking and Embedding

P

P2P	Peer-to-Peer
PAN	Personal Area Network
PAP	Password Authentication Protocol
PC	Personal Computer
PCL	Printed Command Language
PDF	Portable Document Format
PDL	Program Design Language
PIO	Programmed Input/Output
PLA	Programmable Logic Array
PL 1	Programming Language 1
PnP	Plug and Play
POS	Point Of Sales
PPM	Pages Per Minute
PPP	Point-to-Point Protocol
PPTP	Point-to-Point Tunneling Protocol
PROM	Programmable Read Only Memory
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit
POST	Power On Self Test

Q

QDR	Quad Data Rate
QoS	Quality of Service
QBE	Query By Example

R

RAM	Random Access Memory
RARP	Reverse Address Resolution Protocol
RDBMS	Relational Database Management System
RIP	Routing Information Protocol
ROM	Read Only Memory
ROMB	Read Out Motherboard
RPG	Report Program Generator
RTOS	Real Time Operating System
RTF	Rich Text Format

S

SaaS	Software as a Service
SAN	Storage Area Network
SCSI	Small Computer System Interface
SDL	Simple DirectMedia Layer
SMTP	Simple Mail Transfer Protocol
SNOBOL	String Oriented and Symbolic Language
SP	Service Pack
SQL	Structured Query Language
SRAM	Static Random Access Memory
SVD	Structured VLSI Design

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SNMP	Simple Network Management Protocol
SIM	Subscriber Identification Module

T

TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
TTA	True Tap Audio
TTF	True Type Font
TTS	Text-To-Speech
TTY	Tele Type
TFT	Thin-Film Transistor
TB	Terabytes

U

UAC	User Account Control
UI	User Interface
UPS	Uninterruptible Power Supply
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
USB	Universal Serial Bus
ULSI	Ultra Large Scale Integration
UNIVAC	Universal Automatic Computer
UTP	Unshielded Twisted Pair

V

VAR	Variable
VB	Visual Basic
VDD	Virtual Device Driver
VGA	Video Graphics Array
VLAN	Virtual Local Area Network
VM	Virtual Memory
VMS	Video Memory System
VPN	Virtual Private Network
VT	Video Terminal
VSNL	Videsh Sanchar Nigam Limited
VDU	Visual Display Unit
VLSI	Very Large Scale Integration
VRAM	Video Random Access Memory

W

WAN	Wide Area Network
WAP	Wireless Application Protocol
Wi-Fi	Wireless Fidelity
WiMax	Worldwide Interoperability for Microwave Access
WINS	Windows Internet Naming Service
WLAN	Wireless Local Area Network
WMA	Wireless Media Audio
WMV	Wireless Media Video
WPA	Wi-Fi Protected Access
WWAN	Wireless Wide Area Network
WWW	World Wide Web
WLL	Wireless Local Loop
WORM	Write Once Read Many

X

XHTML	eXtensible HyperText Markup Language
XML	eXtensible Markup Language
XNS	Xerox Network Services
XUL	XML User interface Language

Y

YB	Yottabyte

Z

ZIFS	Zero Insertion Force Socket
ZIP	Zone Information Protocol
ZISC	Zone Instruction Set Computer
ZMA	Zone Multicast Address
ZNA	Zone Network Administration
ZB	Zettabyte

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GLOSSARY

Access Time The time interval between the instance at which data is called from a storage device and the instance when delivery begins.

Accumulator A local storage area called a register, in which the result of an arithmetic and logic operation is formed.

Active Cell It refers to the currently selected cell in a spreadsheet. It can be identified by a bold outline that surrounds the cells.

Active Window It is the currently focused window in the current window manager.

Algorithm In computing, an algorithm is a procedure for accomplishing some tasks which given an initial state, will terminate in a defined end-state.

Alphanumeric A character set that contains letters, digits and other special characters such as @, $, +, *, %, etc.

Analog Computer A computer that operates on data which is in the form of continuous variable physical quantities.

Animation It is the process of making the illusion of motion and change by means of the rapid display of a sequence of static image that minimally differ from each other.

Antivirus It consists of computer programs that attempt to identify threat and eliminate computer viruses and other malicious software (malware).

Application Software It is a subclass of computer software that employs the capabilities of a computer directly to a task that the user wishes to perform.

Archive It provides backup storage.

Arithmetic Logic Unit (ALU) It is a part of the execution unit, a core component of all CPUs. ALUs are capable of calculating the results of a wide variety of basic arithmetical and logical computations.

Artificial Intelligence Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today.

ASCII (American Standard Code for Information Interchange) It is a character set and a character encoding based on the Roman alphabet as used in Modern English and other Western European languages.

Assembler A program that translates mnemonic statement into executable instruction.

Attribute The characteristics of an entity are called its attributes.

Authentication Any process by which a system varifies the identity of the user who wants to access it.

Auxiliary Memory It is also known as secondary memory that is not directly addressable by the CPU.

Backspace Key This key is used to delete the text. Backspace will delete the text to the left of the cursor.

Backup A copy of a file or other item of data made in case the original is lost and damaged.

Bandwidth The maximum amount of data that can travel in a communication path in a given time, measured in bits per second (bps).

Bar Code It is a machine-readable representation of information in a visual format on a surface.

Batch File It is a text file that contains a sequence of commands for a computer operating system.

Binary Coded Decimal (BCD) A coding system in which a 4 digit binary number represents each decimal digit from 0 to 9.

Bit It is the most basic information unit used in computing and information theory.

Blog It is a discussion or informational site published on the world wide web.

Bomb A type of virus designed to activate at a specific date and time on your computer.

Bluetooth It permits a wireless exchange of information between computers, cell phones and other electronic devices.

Booting It is a bootstrapping process which starts the operating system when a computer is switched ON.

Browser A special software that enables users to read/view Web pages and jump from one Web page to another.

Buffering The process of storing data in a memory device, allowing the devices to change the data rates, perform error checking and error retransmission.

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Bug It is an error, flaw, failure, or fault in a computer program or system that produces an incorrect or unexpected result.

Bus A circuit that provides a communication path between two or more devices of a digital computer system.

Byte It is commonly used as a unit of storage measurement in computers, regardless of the type of data being stored.

Cell A box in a spreadsheet, in which you can enter a single piece of data.

Central Processing Unit (CPU) It performs the actual processing of data. The CPU is generally called by its generic name 'Processor'. It is also known as the brain of computer.

Channel A communication channel can be a physical link, such as a cable that connects two stations in a network or it can consist of some electromagnetic transmission.

Chatting Typing text into a message box on a screen to engage in dialog with one or more people *via* the Internet or other network.

Chip A tiny wafer of silicon containing miniature electric circuits that can store millions of bits of information.

Client-Server It is a network architecture which separates the client from the server. Each instance of the client software can send requests to a server or application server.

Command It is a directive to a computer program acting as an interpreter of some kind, in order to perform a specific task.

Compile It is the process of converting high level languages to machine language.

Compiler It is a computer program that translates a series of instructions from high level language to machine language.

Cookie A packet of information that travels between a browser and the web server.

Communication Protocol It is a system of rules that allow two or more entities of a communications system to transmit information.

Computer Network It is a system for communication among two or more computers.

Computer Graphics These are visual presentations on a computer screen. Examples are photographs, drawings, line arts, graphs or other images.

Control Panel It is the part of Windows menu, accessible from the Start menu, which allows users to view and manipulate basic system settings and controls.

Computer Worm It is a self-replicating computer program, similar to a computer virus.

Control Unit It is the part of a CPU that directs its operation. The outputs of this unit control the activity of the rest of the device.

Crawler It is an Internet bot that systematically browse the world wide web, typically for the purpose of Web indexing. It is also called a Web spider.

Cryptography The conversion of data into a secret code for transmission over a public network.

Cut To remove an object from a document.

Data It is a collection of facts and figures which are not in directly usable form.

Database It is a collection of logically related information in an organised way so that it can be easily accessed, managed and updated.

Data Entry Direct input of data in the appropriate data fields of a database known as data entry.

Database Management System (DBMS) It is a collection of various programs. It provides a systematic way to create, retrieve, update and manage data.

Data Processing Converting data into information, is called data processing.

Data Redundancy It is a condition created within a database or data storage technology in which the same piece of data is held in two separate places.

Debugging A methodical process of finding and reducing the number of bugs, or defects are known as debugging.

Degree The number of fields associated with the database table or relation.

Desktop Publishing (DTP) It combines a personal computer, page layout software and a printer to create publications on small economic scale.

Display Unit A device with a screen that displays characters or graphics representing data in a computer memory.

Device Driver It is a computer program that enables another program, typically, an operating system to interact with a hardware device.

Dial-up Line A line through which communication established.

Digital Computer A computer that operates with numbers expressed directly as digits.

Direct Access It is the capability of the computer equipment to obtain data from a storage device.

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Directory In computing, a directory is an entity in a file system which contains a group of files and other directories.

Domain Name A unique name that identifies a particular Website and represents the name of the server where the Web pages reside.

Dots Per Inch (DPI) It is defined as the measure of the resolution of a printer, scanner or monitor. It refers to the number of dots in one inch line.

Download It refers to the act of transmitting data from a remote computer on the Internet or other network to one's own computer.

Drag and Drop In computer graphical user interface, drag and drop is the action of clicking on a virtual object and dragging it to a different location or onto another virtual object.

DVD It is an optical disc storage media format that can be used for data storage including movies with high quality video and sound.

Dynamic RAM DRAM is a type of random access memory which stores each bit of data in a separate capacitor.

EBCDIC (Extended Binary Coded Decimal Interchange Code) It is an 8-bit character encoding used on IBM mainframe operating systems, like Z/OS, S/390, AS/400 and i5/OS.

E-Commerce Electronic commerce is a type of industry where buying and selling of products or services is conducted over electronic systems such as the Intranet and other computer network.

Editing The process of changing information by inserting, deleting, replacing, rearranging and reformation.

Electronic Data Processing (EDP) A data processing through equipment that is predominantly electronic such as digital computer.

Electronic mail E-mail is a method of composing, sending, storing and receiving messages over electronic communication systems.

Encryption In cryptography, encryption is the process of encoding messages (or information) in such a way that hackers cannot read it, but the authorised users can access it.

End User Any individual who uses the information generated by a computer based system.

Entity It is something that has certain attributes or properties which may be assigned values.

Error Message It is information displayed when an unexpected condition occurs usually on a computer or other device.

Excel It allows users to create spreadsheets much like paper ledgers that can perform automatic calculations.

Exe (.exe) It is a common filename extension denoting an executable file (a program) in the DOS, MS-Windows.

Execution Time The total time required to execute a program on a particular system.

Expansion Slot It is a socket on the motherboard that is used to insert an expansion card which provides additional features to a computer.

Extranet A technology that permits the users of one organisation's Intranet to enter portions of another organisation's Intranet in order to conduct business transactions or collaborate on joint projects.

Fax It stands for 'Facsimile'. It is used to transmit a copy of a document electronically.

Field The attributes of an entity are written as fields in the table representation.

File A collection of information stored electronically and treated as a unit by a computer. Every file must have its own distinctive name.

File Allocation Table (FAT) It is the name of a computer file system architecture. The FAT file system is a legacy file system which is simple and robust.

File Manager It is an operating system utility that provides a user interface to work with file systems.

Firewall A security system usually consisting of hardware and software that prevents unauthorised persons from accessing certain parts of a program database or network.

Flowcharts These are the means of visually representing the flow of data through an information processing system, the operations performed within the system and the sequence in which they are performed.

Foreign Key A field in a database table, which links it to another related table.

Format To set margins, tabs, font or line spacing in layout of a document.

FORTRAN Its name stands for formula translating system. The language was designed at IBM for scientific computing.

Freeware A form of software distribution where the author retains copyright of the software but makes the program available to others at no cost.

File Transfer Protocol (FTP) This protocol is used to transfer files from one place to another on Internet.

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Function Key A special key on a computer keyboard or a terminal devices keyboard that is used to perform specific functions. Many keyboards have function keys labelled from F1 to F12.

Garbage In Garbage Out (GIGO) It pertains to the fact that most computer errors are not machine errors, they are data errors caused by incorrect input data.

Gateway A device that is used to joint together two networks having different base protocols.

Gigabyte (GB) It is a unit of information or computer storage equal to approximately one billion bytes.

Gigahertz (GHz) A measurement used to identify the speed of the central processing unit. One gigahertz is equal to 1 billion cycles per second.

Graphics Interchange Format (GIF) A simple file format for pictures and photographs, that are compressed so they can be sent quickly.

Graphic Tablet It is an input device which is used to create images, etc.

Graphical User Interface (GUI) It is a method of interacting with a computer through a metaphor of direct manipulating of graphical images and widgets in addition to text.

Hacker A computer criminal who penetrates and tempers with computer programs or systems.

Hang To crash in such a way that the computer does not respond to input from the keyboard or mouse.

Hard Copy It is a printed copy of information from a computer.

Hard Disk It is a non-volatile data storage device that stores data on a magnetic surface layered onto disk platters.

Hardware The mechanical, magnetic, electronic and electrical components that comprises a computer system such as CPU, monitor, keyboard, mouse, etc.

High-Level Programming Language It is a programming language that is more user-friendly, to some extent platform-independent and abstract from low-level computer processor operations such as memory accesses.

Home Page A starting point or a doorway to the Website. It refers to the Web page that identifies a Website and contains the hyperlink to other Web pages in the Website.

Host Computer A computer that provides information or a service to other computers on the Internet. Every host computer has its own unique host name.

Hub A network device that connects multiple computers on a LAN, so that they can communicate with one another.

Hybrid Computer These computers are made by taking the best features of the analog computer and digital computer.

Hyperlink An image or portion of text on a Web page that is linked to another Web page.

HyperText Markup Language It stands for HTML. It is mainly used for designing Websites.

HyperText Transfer Protocol (HTTP) It is an important protocol used on the world wide web for moving hypertext files across the Internet.

Icon A symbol (such as picture or a folder) that represents a certain function on your computer. When the user clicks on the icon, the appropriate function is executed.

Information It is the summarisation of data according to a certain pre-defined purpose.

Input In order to give instructions to a computer, the information has to be supplied to it.

Instant Messaging (IM) A chat program that lets people communicate over the Internet in real time.

Instruction A command or order given to a computer to perform a task.

Interface A device or program that helps a user to communicate with a computer.

Interpreter A program that converts and executes the source code into machine code line by line.

Internet A vast computer network linking smaller computer networks worldwide.

Internet Surfing To search something on Internet is called Internet surfing.

Internet Service Provider (ISP) It is a business organisation that offers users to access the Internet and related services.

Integrated Circuits Multiple electronic components combined on a silicon chip.

Java A programming language, used to create mobile applications, softwares, etc.

Javascript It is an object oriented programming language used to create interactive effects in a Web browser.

JPEG (Joint Photographic Experts Group) It is a commonly used method of lossy compression for digital photography.

Joystick It is a computer peripheral or general control device consisting of a handheld stick that pivots about one end and transmits its angle in two or three dimensions to a computer.

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Kernel It is the fundamental part of a program, such as an operating system, that resides in memory at all times.

Keyboard This is the standard input device attached to all computers. The layout of keyboard is just like the traditional typewriter of the type QWERTY.

Key Stroke It is the process of pressing button in keyboard.

Kilobyte (KB) It is a unit of information or computer storage equal to 1024 bytes.

LAN (Local Area Network) In LAN, the connected computers are geographically close together. They are either in the same building or within a smaller area.

Laptop It is a small, lightweight and portable battery-powered computers that can fit onto your lap. They each have a thin, flat and liquid crystal display screen.

Light Pen A light sensitive style for forming graphics by touching coordinates on a display screen, thereby seeming to draw directly on the screen.

Link A communication path between two nodes or channels.

LINUX It is an open source operating system, meaning that the source code of the operating system is freely available to the public.

List Processing (LISP) A high level programming language suitable for handling logical operations and non-numeric applications.

Log In It is the process by which an individual gains access to a computer system by identifying and authenticating themselves.

Log Off It is a process of withdrawal from function after performing program.

Low Level Language It is a assembly language which is used in computer. It was mostly used in first generation computers.

Machine Language The language of computer also called binary language. Instructions in this language are written as a sequence of 0's and 1's.

Main Memory A volatile and speedy memory. It is divided into two parts RAM and ROM.

Malware It is a software that disrupts normal computers functions or sends a users personal data without the user authorisation.

Mass Storage It is referred to storage where large volumes of backup/data is stored.

Megabyte (MB) 1 Megabyte is equal to 1048576 bytes, usually rounded off to one million bytes. It is also called a 'meg'.

Memory Temporary storage for information, including applications and documents.

Menu Bar The horizontal strip across the top of an application's window. Each word on the strip has a context sensitive drop-down menu containing features and actions that are available for the application in use.

Merge Combining two or more files into a single file.

Microcomputer A microprocessor-based computer, consisting of an CPU, internal semiconductor memory, input and output sections and a system bus, all on one, or several monolithic IC chips inserted into one or several PC boards.

Microprocessor A complete Central Processing Unit (CPU) contained on a single silicon chip.

MIDI (Music Instrument Digital Interface) It allows a computer to store and replay a musical instrument's output.

Minicomputer Considered to be more capable than a microcomputer but less powerful than a mainframe.

Mnemonic A symbolic label or code remainder that assists the user in remembering a specific operation or command in assembly language.

Modem (Modulator/Demodulator) It refers to specific equipment that provides a means of communication between two computer systems over conventional telephone lines.

Monitor The visual readout device of a computer system. A monitor can be in several forms; a Cathode Ray Tube (CRT), a Liquid Crystal Display (LCD), or a flat-panel, full-color display.

Multitasking It can simultaneously work with several programs or interrelated tasks that share memories, codes, buffers and files.

Multithreading It is a facility available in an operating system that allows multiple functions from the same application packages.

Multimedia Software programs that combine text and graphics with sound, video and animation. A multimedia PC contains the hardware to support these capabilities.

Network It is an interconnection of two or more than two computers.

Network Interface Card (NIC) This is a part of the computer that allows it to talk to other computers *via* a network protocol like TCP/IP.

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Nibble A sequence of four adjacent bits, or a half-byte. A hexadecimal or BCD coded digit can be represented by a nibble.

Node The endpoint of a network branch or the junction of two or more branches.

Non-Volatile Memory A memory where stored data remain undisturbed by the removal of electrical power.

Notebook A portable computer, that can fit into a briefcase. It is used as personal computer. It is also called laptop.

Object Something that contains both the data and the application that operate on that data.

Offline It refers to the state in which a computer is temporarily or permanently unable to communicate with another computer.

Online It refers to the state of being connected to the networked computer system or the Internet.

Operating System A set of instructions that tells a computer on how to operate when it is turned ON. It sets up a filing system to store files and tells the computer how to display information on a video display.

Output Data that come out of a computer device.

Patch A small program that improves an existing piece of software or corrects an error in it.

Personal Computer (PC) A single-user computer containing a Central Processing Unit (CPU) and one or more memory circuits.

Piracy The illegal copying of software or other creative works.

Pixels An acronym derived from picture element. The smallest element (a dot) on a display screen.

Plug-In This is a program that your browser uses to manipulate a downloaded file.

Portrait A term that designates the position of conventional printing across the width of a page.

Post Office Protocol (POP) A protocol that specifies how a personal computer can connect to a mail server on the Internet and download E-mail.

Primary Key It is a key that uniquely identifies each tuple or row in a table.

Process A collection of code, data and other system resources including at least one thread of execution that performs a data processing task.

Program A set of instructions to perform a specific task.

Programming Language A vocabulary and set of grammatical rules for instructing a computer to perform specific tasks.

Printer A mechanical device for printing a computer's output on paper.

Protocol A set of rules that defines exactly how information is to be exchanged between two systems over Internet.

Pseudocode It is a short hand way of describing a computer program.

Query A request for information from a database.

Random Access Memory (RAM) A volatile, semiconductor storage structure that accesses temporary data with a random or direct accessing method. Data in this memory can be read by the CPU directly.

Read Only Memory (ROM) A semiconductor memory whose data cannot be erased, or overwritten; it can only be accessed (read) for use by the CPU.

Record A collection of all the information pertaining to a particular entity instance.

Register A temporary storage unit for quick, direct accessibility of a small amount of data for processing.

Remote Server A network computer that allows a user on the network from a distant location to access information.

Router A network device that enables the network to reroute messages it receives that are intended for other networks. The network with the router receives the message and sends it on its way exactly as received.

Routing The process of choosing the best path throughout the LAN.

Scanner An electronic device that uses light-sensing equipment to scan paper images such as text, photos, illustrations and translate the images into signals that the computer can then store, modify, or distribute.

Search Engine Software that makes it possible to look for and retrieve information on the Internet, particularly the Web. Some popular search engines are AltaVista, Google, HotBot, Yahoo!, Web Crawler and Lycos.

Sector A section of a recording track on a magnetic disk.

Sequential Access It is a class of data storage device that reads stored data in a sequence.

Server A computer that shares its resources and information with other computers on a network.

Shareware A software that is not free but is available for a free trial period.

Simplex Transmission of data in one direction only.

Software The set of computer programs, procedures and associated documentation related to the effective operation.

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Source Code (Source Program) A set of computer instructions in hard-copy or stored form.

Spam Irrelevant or unsolicited messages sent over Internet, typically to large numbers of users, for the purpose of advertising, phishing, spreading malwares, etc.

Spreadsheet Software that allows one to calculate numbers in a format that is similar to pages in a conventional ledger.

Static RAM It is a type of RAM, that contains its contents only whenever current supply is ON.

Sub Program A particular part of a program that complete the special work.

Supercomputer The largest mainframe computer featuring exceptionally high speed operation while manipulating huge amounts of information.

TCP/IP (Transmission Control Protocol/Internet Protocol) This is a large grouping of programs and standards that govern how information moves round the Internet.

Terabyte (TB) It is about a trillion bytes. Actually, it's 2^{40} or 10095111627776 bytes.

Terminal This is what you look at when you are on the Internet. It's your computer screen.

Time Sharing It refers to the allocation of computer resources in a time dependent fashion to run several programs simultaneously.

Topology The structure of the network including physical connection such as wiring schemes and logical interactions between network devices.

Trackball Input device that controls the position of the cursor on the screen.

Uniform Resource Locator (URL) The specific Internet address for a resource such as an individual or an organisation.

Unix This is an operating system developed by AT & T. It is a big push that it allows one server to serve many different end users at one time.

Upgrade The process of improve hardware and software functionality.

Upload The processes of transferring information from a computer to a Website (or other remote location on a network).

UPS (Universal Power Supply or Uninterruptible Power Supply) An electrical power supply that includes a battery to provide enough power to a computer during an outage to back-up data and properly shut down.

User A person who uses or operates something.

User-Friendly A software program that has been designed to easily direct the user through the operation or application of a program.

Validation The process of making sure that the forms and documents from a particular transaction are correct.

Video Teleconferencing A remote 'face-to-face chat,' when two or more people using a webcam and an Internet telephone connection chat online. The webcam enables both live voice and video.

Virus A piece of computer code designed as a prank or malicious act to spread from one computer to another by attaching itself to other programs.

Volatile Memory A memory whose contents are irretrievably lost when power is removed. If data in RAM must be saved after power shutdown, back-up in non-volatile memory (magnetic disk, tape, or CD-R) is essential.

Website A collection of web pages or hyperlinked webpages which onwned by an individual, company or organisation.

Window A portion of a computer display used in a graphical interface that enables users to select commands by pointing to illustrations or symbols with a mouse.

Wide Area Network (WAN) It is a telecommunication network or computer network that extends over a large geographical distance.

Word Processor A computer system or program for setting, editing, revising, correcting, storing and printing text.

World Wide Web ('WWW' or 'The Web') A network of servers on the Internet that use hypertext-linked databases and files. It was developed in 1989 by Tim Berners-Lee, a British computer scientist and is now the primary platform of the Internet.

Workgroup Persons sharing files and data between themselves.

Workstation The work area and/or equipment used for computer operations, including Computer-Aided Design (CAD). The equipment generally consists of a monitor, keyboard, printer and/or plotter and other output devices.

X-Y Plotter A computer-driven printing mechanism that draws coordinate points in graph form.

ZOOM The enlarging or reducing an image displayed on a computer process of proportionately monitor.

ZIP (Zone Information Protocol) This is an application that allows for the compression of application files.

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