VOL-1

ENGLISH MEDIUM

01. Computer : General Introduction
02. Development of Computer
03. Input & Output Devices
04. Memory
05. Personal Computer
06. Design Tools & Programming Language
07. Data Representation & Number System

AN ISO 9001:2008 CERTIFIED INSTITUTE

Viva
Technologies

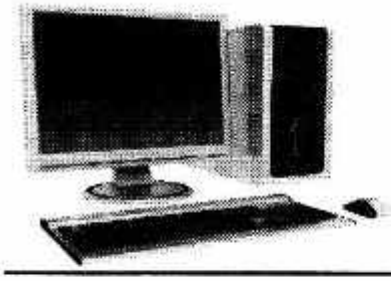
COMPUTER BOOK

CPCT/COMPETITIVE EXAMS/DCA/PGDCA

53, Mayur Market, Thatipur, Gwalior (M.P.) Ph: 0751-4042064 Mob: 94257-03888

DISCLAIMER

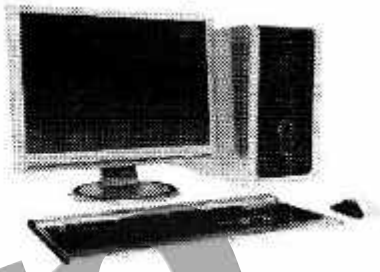
This book has been designed & developed by Viva Technologies for institute purpose only. It is not for sale in any means.



Computer : General Introduction

Introduction

A computer is a man made electronic machine which stores, reads and processes data to produce meaningful information as output. It works very fast and does not make mistakes but its capacity is limited. It is made of English word 'to compute'. It operates under the control of a set of instructions that is stored in its memory unit. A computer accepts data from an input device and processes it into useful information which it displays on its output device.



Actually, a computer is a collection of hardware and software components that helps us to accomplish many different tasks. Hardware consists of the computer itself and includes a CPU, a monitor, a keyboard, a mouse and any equipment connected to it. Software is the set of instructions that the computer follows in performing a task.

Computers and Calculators

A calculator is a small electronic device used for doing mathematical calculations. A calculator cannot be used for writing letters or drawing images, while a computer can be used to calculate, draw images, write letters, and do many other things as well.

Human Being and Computers

Computers cannot work on their own. They do what we want them to do, only we give them the right command. Its memory is better than human memory. It can't forget anything it has saved, so it is also called an *artificial intelligence*.

Comparison between Human beings and Computers

Human being	Computer
Human beings are slow in doing calculations.	Computers can do complex calculations in seconds.
Human beings cannot remember lots of things at one time.	Computers can store and remember a large amount of information at one time.
Human beings can make mistakes.	Computers do not make mistakes.
Human beings have feelings.	Computers do not have feelings.
Human beings can think.	Computers cannot think.
Human beings get tired if they work for long hours.	Computers never get tired .

Elementary words related to computer

- Data : Data is information required by the computer to be able to operate or to put it the other way information we put into the computer is called data. It is gathered from any source but cannot be organized. It cannot be used for decision making. It is a collection of unprocessed items and combination of characters, numbers and symbols collected for a specific purpose. Generally it is divided into three types : *numeric data, alphabetic data* and *alphanumeric data*.
  1. Numeric Data : Numeric data consists of ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. There are different types of number system that are used to represent numeric data. These number systems are decimal number system, binary number system, octal number system and hexadecimal number system. Examples are examination score, bank balance and pin-code etc.
  2. Alphabetic Data : Alphabetic data is used to represent 26 alphabetic. It consist of capital letters from A to Z, small letters from a to z and blank space. Alphabetic data is also called non-numeric data. An example is the address of an employee.
  3. Alphanumeric Data : Alphanumeric data is used to represent alphabetic data, numeric data, special characters and symbols. An example is any password.
- Information : Information is well organized data which we get after processing of data and it helps in decision making. It is processed data that is organized, meaningful, and useful.

Characteristics of a computer

Computers are the foundation of business, travel, and leisure of life today. The common characteristics that make computers of all sizes such a powerful machine are speed, accuracy and reliability, storage capacity, ability to operate automatically, diligence, scientific approach and versatility.

1. Speed : Computers provide the processing speed required by all facets of society. The quick service we expect at the bank, at the grocery store, on the stock exchange, and on the Internet are dependent on the speed of computers. The speed of a computer is measured in the following time units for the access time or instructions per second.

Millisecond [1ms]	A thousandth of a second or 10^{-3}
Micro second [1ms]	A millionth of a second or 10^{-6}
Nano second [1ns]	A thousand millionth of a second or 10^{-9}
Pico second [1ps]	A million millionth of a second or 10^{-12}
KIPS	Kilo Instructions Per Second.
MIPS	Million Instructions Per Second.

1. Accuracy and Reliability : Computers are quite accurate and extremely reliable as well. They are only a machine and do not make errors on their own. Errors are caused by humans, not by computers.

2. High Storage Capacity : Computers are capable of storing enormous amounts of data that must be located and retrieved very quickly. The capability to store and retrieve volumes of data is the core of the Information Age.

3. Automation : Once a process has been initiated, it is capable of functioning automatically. It does not require an operator at each stage of the process.

4. Diligence : It is capable of operating at exactly the same level of speed and accuracy even if it has to carry out the most voluminous and complex operations for a long period of time. It does not suffer from physical and mental fatigue, lack of concentration and laziness.

5. Versatility : The wide use of computers in so many areas such as commerce, scientific applications, education in day to day life is ample evidence of its versatility.

Basic applications/uses of a computer

1. Entertainment or Recreation : Computer is used for playing games, listening to music and watching movies. It is also used for making cartoon movies, animation films and drawing pictures etc.
2. Education: Computer is used in schools for teaching, doing mathematical calculations and completing homework.
3. Banks: Computer is used in banks for storing information about different account holders, keeping a record of cash and providing all kinds of information regarding any account in the bank. It is also used by ATM (Automatic Teller Machine) of a bank which provides cash without any bank staff.
4. Railway stations and Airports : Computer helps in providing information about seat availability, booking tickets and keeping records of all passengers. It helps in providing information about the arrival and departure as well as timing of trains and aeroplanes.
5. Medical Science : Computer helps in keeping records of all the patients in a hospital and doing a number of medical tests. It helps doctors in controlling machines in an operation theatre.
6. Business : Computers are used to type and print documents, letters etc. They help in keeping records of employees and sending e-mails etc.
7. Defence : In defence computer is used to help in building weapons, controlling their functions, launching missiles and keeping record of criminals. It helps in establishing communication links between the soldiers and their commanders through satellites.
8. Designing : Computer helps in designing magazines, newspapers, books and advertisements etc. It also helps in designing buildings, houses etc.
9. Scientific research : Computer is used in scientific research and is handy for all kinds of scientific research.
10. Administration : Computer is used to improve administrative services and their efficiency.
11. Publication : Computer is used in desk-top publication.

12. Communication : Computers are used in communication such as e-mail, chatting etc.

Limitations of a computer

1. Lack of intelligence (Programmed by human/Can't think) : Though computer is programmed to work efficiently, fast and accurately, but it is programmed by human beings to do so. Without a program, computer is nothing. A program is a set of instructions. Computer only follows these instructions. If the instructions are not accurate the working of computer will not be accurate.
2. Prone to virus : The computer sometimes malfunctions and results in loss of data if some virus attacks.
3. Depends on electricity : One of the limitations also includes machine failure in case of some hardware or software problem. The computer sometimes results in loss of data if power fails.

Functions of a computer

1. Data collection : Data collection is a process of preparing and collecting data to obtain information to keep on record, make decisions and pass information on to others. Computers collect or gather data, which means that they allow users to input data.
2. Data storage : Data storage means that it retains digital data used for computing at some interval of time.
3. Data processing : Data processing is a process to convert data into information.
4. Data output : It is a processed data which we get as an output.

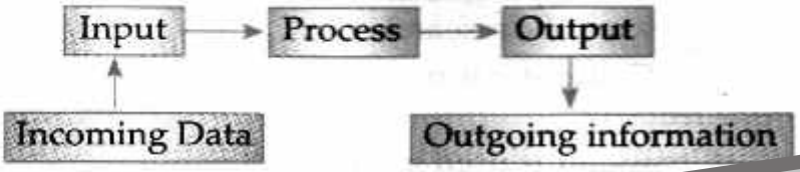
Impact of computerization

(i) Time saving (ii) Errorless work
(iii) Saving of paper (iv) Unemployment

Data Processing and Electronic Data Processing

In the past, manual techniques used for collecting, manipulating and distributing data to achieve certain objectives, were known as Data Processing. As technology advances, computers are used to achieve results accomplished by humans and machines. Example : calculator, typewriter and computer. This is known as Electronic Data Processing (E.D.P).

The major objective of data processing is to get the desired information from any raw data. Data refers to raw facts that are gathered from any source but are not organized. That data cannot be used to make decisions. Information, thus, refers to processed data which is well organized or presented in a meaningful fashion and increase the understanding of the data. This helps in decision making. Processing involves transforming input into output.



Computer System

A group of equipments put together to process a data is called a computer system. A computer system consists of several components to achieve electronic data processing.

1. Input Units : They are devices which accept data from user and transmit it to the central processing unit as electronic pulses. For example ,the ATM (Automatic teller Machine) system, when we want to withdraw, we are required to enter our Personal identification number (PIN). When we enter our PIN, we are using an input device, the keypad.
2. CPU (Central Processing Unit) : It is an abbreviation for central processing unit, and is pronounced as separate letters. The Central Processing Unit is the brain of the computer sometimes referred to simply as the central processor, but commonly called a processor. The Central Processing Unit is the unit where most calculations take place. It is linked with the input units and output units to form the computer system. In terms of computing power, the CPU is the most important component of a computer system. On personal computer (PC) and small workstations, the CPU is housed in a single chip called a microprocessor or microchip.

   The fundamental sequence of steps that a CPU performs is also known as the fetch-execute cycle or instruction cycle. It is the time in which a single instruction is retrieved from memory, decoded (determined what actions the instruction requires) and executed (carried out those actions). The first half of the cycle transfers the instruction from memory to the instruction register and decodes it. The second half executes the instruction. This cycle is repeated continuously by the CPU from Start or boot-up to the time when the computer is shut down.

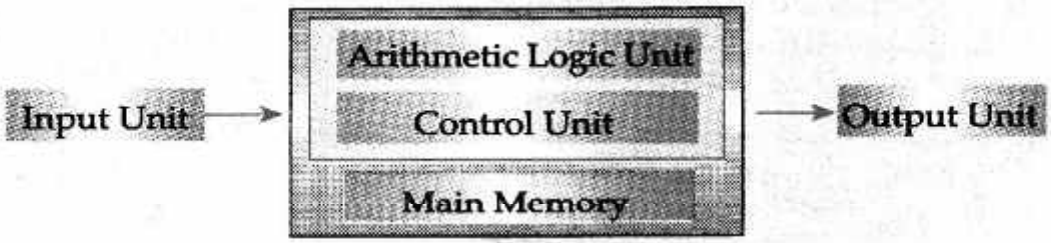
Instruction cycle

Each computer's CPU can have different cycles based on different instruction sets, but will be similar to the following cycle—

1. Fetch the instruction : The CPU fetches the instruction from main memory via the data bus, and it is then placed into the CIR. The Program Counter is instructed to contain the address of the next instruction.
2. Decode the instruction : The instruction decoder interprets instructions. If an instruction has an indirect address, the effective address is read from main memory, and any required data is fetched from main memory to be processed and then placed into data registers.
3. Execute the instruction : The CU passes the decoded information as a sequence of control signals to the relevant function units of the CPU to perform the actions required by the instruction, such as reading values from registers, passing them to the ALU to perform mathematical or logic functions on them, and writing the result back into a register. If the ALU is involved, it sends a condition signal back to the CU.

4. Store results : The result generated by the operation is stored in the main memory, or sent to an output device. Based on the condition of any feedback from the ALU, Program Counter may be updated to a different address from which the next instruction will be fetched. The cycle is then repeated.

There are two main components of a CPU



A. The arithmetic logic unit (ALU) : It performs all arithmetic operations and decision making operations.

Data transfer : Which includes moving of data from one location to another within the computer.

Arithmetic operation : It includes addition, subtraction, multiplication and division etc.

B. Decision making : It is an ability to compare two quantities and perform logical operations such as compare, true or false etc.

The control unit (CU) : It extracts instructions from memory and decodes and executes them, calling on the ALU, when necessary. It controls all functions and coordinates all components of computer. It is in-charge of fetch-execution cycle.

Functions of control unit

1. Control flow of data

- From input devices to memory
- From memory to output devices or secondary storage
- From secondary storage to memory
- From ALU to memory
- From memory to ALU

2. Co-ordinates instructions execution

- Fetch the instruction
- Decode the instruction
- Execute the instruction

More components of a CPU, that are vital to its operation, are the registers which are very small memory locations that are responsible for holding the data that is to be processed.

3. Output Units : Devices which accept information from CPU and convert it to human readable form. For example, when we pay the cashier in the supermarket, he will give a receipt. This receipt is a form of output from the output device known as printer.

- GIGO (Garbage in Garbage Out) : It is a concept of computer science that the quality of output is determined by quality of input, means wrong input will result in wrong output. It is related to accuracy of input and output.

Objective Question

1. What is a computer ?
   (a) Electronic machine (b) Power machine (c) Electric machine
   (d) All of these (e) None of these
2. A ..... is an electronic device that processes data and converts it into information.
   (a) Computer (b) Processor (c) Case
   (d) Styles (e) None of these
3. ..... is processed in information by computer processor ?
   (a) Number (b) Processor (c) Input
   (d) Data (e) None of these
4. What is ATM ?
   (a) Branch of bank (b) Staff counter of bank
   (c) Withdrawal of cash without staff
   (d) All of these (e) None of these
5. Meaning of data processing is—
   (a) Collection of data (b) Working of computer
   (c) Doing calculation
   (d) Preparing information for business use
   (e) None of these
6. Part of CPU which coordinates all functions of computer and other components—
   (a) Mother board (b) Coordination board (c) Control unit
   (d) ALU (e) None of these
7. Data going to computer is called—
   (a) Operate (b) Algorithm (c) Input
   (d) Calculation (e) Flowchart
8. Input is modified into output by—
   (a) Peripherals (b) Memory (c) Storage
   (d) Input output unit (e) CPU
9. Which one of these is not a characteristic or a function of computer—
   (a) Data collection (b) Data storage (c) Data processing
   (d) Data output (e) Data copy
10. Which is called data in computer ?
    (a) Number (b) Symbol
    (c) Information provided
    (d) Information containing number and symbol
    (e) None of these
11. Information in computer is called—
    (a) Data (b) Number (c) Symbol
    (d) Stored data (e) None of these
12. Which is a part of CPU ?
    (a) Key board (b) Printer (c) Tape
    (d) ALU (e) None of these
13. What is E.D.P. ?
    (a) Electronic data part (b) Electronic date personal
    (c) Electronic data power (d) Electronic data processing
    (e) None of these
14. CPU Stands for—
    (a) Cover processing unit (b) Control processing unit
    (c) Central processing unit (d) All
    (e) None of these

15. ALU Stands for—
(a) Arithmetic logic unit (b) Arithmetic large unit
(c) Arithmetic long unit (d) All
(e) None of these

16. Which of these is CPU ?
(a) Chip (b) Box (c) Circuit
(d) Peripheral (e) None of these

17. Basic operation done by computer is—
(a) Arithmetic operation (b) Logical operation
(c) Data storage (d) All
(e) None of these

18. ..... is called brain of computer—
(a) CPU (b) Monitor (c) Modem
(d) Software (e) None of these

19. Which of these establishes link between V.D.U. and Keyboard ?
(a) Printer (b) Mouse (c) C.P.U
(d) Terminal (e) None of these

20. Whcih part of the computer is used for calculating and comparing ?
(a) ALU (b) Control unit (c) Disk unit
(d) Modem (e) None of these

21. Function of CPU is —
(a) Arithmetic calculation
(b) Comparison between the value of two objects
(c) Search of desired data in artificial memory
(d) A & b both (e) None of these

22. Which unit controls the movement of signals between CPU and I/O ?
(a) ALU (b) Control unit (c) Memory unit
(d) Secondary storage (e) None of these

23. Computer is named as ..... intelligence.
(a) pure (b) human (c) artificial
(d) all (e) none of these

24. The three main parts of the processor are .....
(a) ALU, Control unit and Registers
(b) ALU, Control unit and RAM
(c) Cache, Control unit and Registers
(d) Control unit, Registers and RAM
(e) RAM, ROM and CD–ROM

25. What is the function of the Central Processing Unit of a computer ?
(a) Creates invoices (b) Performs calculations and processing
(c) Deletes Data (d) Corrupts the data
(e) None of these

26. Capacity of computer is —
(a) Limited (b) Unlimited (c) Low
(d) High (e) None of these

27. Controlling part of computer is—
(a) Printer (b) Keyboard (c) C.P.U.
(d) Hard disk (e) None of these

28. Computer—
1. A device which is able to store data
2. A device which is able to analyse data
3. A device which is able to maintain full security
4. Sometime attacked by virus

Select a correct answer—
(a) 1 and 2 (b) 1, 2, and 3 (c) 1, 2 and 4
(d) All (e) None and these *[Uttaranchal PCS Pre. 2005]*

29. The basic computer processing cycle consists of .....
(a) Input, processing and ouptut (b) Systems and application
(c) Data, information and applications (d) Hardware, software and storage
(e) None of these *[SBI 2012]*

30. Compare is —
(a) Arithmetic function of ALU (b) Logical function of ALU
(c) Input and output of ALU (d) All
(e) None of these

31. Theory for working of computer is—
(a) Input (b) Output (c) Process
(d) All (e) None of these

32. Main component of CPU is—
(a) Control unit (b) Memory (c) ALU
(d) All (e) None of these

33. Processed data of computer is called—
(a) Input (b) Output (c) Process
(d) All (e) None of these

34. Function of CPU is—
(a) Control input and output device
(b) Immediate storage of data
(c) Read the instruction and give command
(d) All (e) None of these

35. What is output ?
(a) Which is taken by user to processor
(b) Which is get to processer by user
(c) Which is get to user from processor
(d) Which is get to processor by user
(e) None of these *[SBI 2011]*

36. Part of computer which does addition, subtraction, multiplication, division and comparison—
(a) ALU (b) Memory (c) CPU
(d) Control (e) All these

37. General mathematical operation performs for CPU is —
(a) ALU (b) DIMM (c) BUS
(d) Register (e) None of these

38. The basic goal of computer process is to convert data into—
(a) Files (b) Tables (c) Information
(d) Graphs (e) None of these *[SBI 2009]*

39. The information you put into the computer is called—
(a) Facts (b) Data (c) Files
(d) Directory (e) None of these *[SBI 2009]*

40. Arithmetic operations—
(a) Involve matching one data item with another to determine if the first item is greater than or equal to or less than the other item
(b) Sort data items according to standard, predefined criteria in ascending order or descending order
(c) Use conditions with operator such as AND, OR and NOT
(d) Include addition, subtraction, multiplication and division
(e) None of these *[SBI Associates 2009, Unian Bank 2011]*

41. Processing involves—
(a) Inputing data into a computer system
(b) Transforming input into output
(c) Displaying output is a useful manner
(d) Providing relevant answer
(e) None of these *[SBI Associates 2009]*

42. Input, output and processing devices grouped together represent—
(a) Mobile device (b) Information processing cycle
(c) Circuit board (d) Computer system
(e) None of these *[SBI 2009]*

43. The name of the location of a particular piece of data is its—
(a) Address (b) Memory name (c) Storage sits
(d) Data location (e) None of these
[Syndicate Bank P.O. 2010]

44. ..... is the part of the computer that does the arithmetical calculations.
(a) Memory (b) OS (c) CPU
(d) ALU (e) None of these *[Bank of Baroda 2010]*

45. A CPU contains .....
(a) A card reader and a printing device
(b) An analytical engine and a control unit
(c) A control unit and an arithmetic logic unit
(d) An arithmetic logic unit and a card reader
(e) None of these
[Allahabad 2010 , Syndicate 2010, Punjab & Sind 2010, Unian Bank 2011]

46. The benefit of using computer is that—
(a) Computers are very fast and can store huge amounts of data.
(b) Computers provide accurate output even when input is incorrect.
(c) Computers are designed to be inflexible.
(d) All of these (e) None of these *[Allahabad Bank 2010]*

47. Computations and logical operations are performed by the..... .
(a) RAM (b) ALU (c) Register
(d) Control unit (e) None of these *[Allahabad Bank 2010]*

48. The function of CPU is ..... .
(a) To provide external storage of text
(b) To communicate with the operator
(c) To read, interpret and process the information and instruction
(d) Assembler (e) None of these
[Allahabad Bank 2010, Syndicate Bank 2010]

49. Example of non-numeric data is..... .
(a) Employee address (b) Examination score (c) Bank balance
(d) All of these (e) None of these *[Allahabad Bank 2010, 2011]*

50. The information you put into the computer is called ..... .
(a) directory (b) facts (c) data
(d) files (e) output *[Allahabad Bank 2010, 2011]*

51. ..... is data that has been organized or presented in a meaningful fashion.
(a) A process (b) Storage (c) Software
(d) Information (e) None of these *[Syndicate Bank 2010]*

52. The part of a computer that coordinates all its functions is called its ....
(a) ROM program (b) System board
(c) Arithmetic logic unit (d) Control unit
(e) None of these *[Syndicate B...*

53. ..... represents raw facts. Whereas ..... is meaningful data—
(a) Information, reporting (b) Data, information
(c) Information bits (d) Records, bytes
(e) None of these

54. The benefit of using computers is that ..... .
(a) computers are very fast and can store huge amounts of data.
(b) computers provide accurate output even when input is incorrect.
(c) computers are designed to be inflexible.
(d) all of the above
(e) none of these

55. The function of CPU is ..... .
(a) to provide external storage of text
(b) to communicate with the operator
(c) to read, interpret and process the information and instruction
(d) to provide a hard copy'
(e) none of these

56. ..... is the process of carrying out commands.
(a) Fetching (b) Storing (c) Decoding
(d) Executing (e) None of these

57. Computers gather data, which means they allow users to ..... data.
(a) present (b) store (c) output
(d) input (e) none of these

58. Which of the following is not the major function of a computer ?
(a) Processing data into information
(b) Storing data or information (c) Gathering data
(d) Analysing data or information (e) None of these

59. The central processing unit (CPU) ..... .
(a) contains the electronic circuits that cause processing to occur
(b) makes the information resulting from processing available for use
(c) allows data programs, commands, and user responses to be entered into a computer
(d) consists of electronic components that store data
(e) none of these

60. A collection of unprocessed items is ..... .
(a) information (b) data (c) memory
(d) reports (e) none of these

61. The ..... is responsible for performing calculations and contains decision-making mechanisms.
(a) Central Processing Unit (b) Memory unit
(c) Arithmetic and Logic Unit (d) Output Unit
(e) None of these

62. This component is required to process data into information and consists of integrated circuits—
(a) Hard disk (b) RAM (c) CPU
(d) ROM (e) None of these

63. Computers manipulate data in many ways, and this manipulation is called ..... .
(a) utilizing (b) batching (c) upgrading
(d) processing (e) None of these

64. ..... is the result produced by a computer.
(a) data (b) Memory (c) Output
(d) Input (e) None of these

65. In an information system, alphanumeric data normally takes the form of ..... .
    (a) Sentences and paragraphs
    (b) Numbers and alphabetical characters
    (c) Graphic shapes and figures
    (d) Human voices and other sounds
    (e) None of these
66. Memory unit is one part of ...
    (a) Control unit (b) Central Processing Unit
    (c) Input device (d) Output device (e) None of these
67. Computer ..... is whatever is typed, submitted, or transmitted to a computer system—
    (a) input (b) output (c) data
    (d) circuitry (e) None of these
68. Manipulating data to create information is known as..... .
    (a) feedback (b) programming (c) processing
    (d) analysis (e) None of these
69. ..... represents raw facts, whereas ..... is data made meaningful.
    (a) Information, reporting (b) Data, information
    (c) Information, bits (d) Records, bytes (e) Bits, bytes
70. Hardware used to translate words, sounds, images, and actions that people understand into a form that the system unit can process is known as ..... .
    (a) device drivers (b) device readers (c) input devices
    (d) output devices (e) None of these
71. The ..... tells the rest of the computer how to carry out a program's instructions.
    (a) ALU (b) control unit (c) system unit
    (d) motherboard (e) None of these
72. The information processing cycle includes the following processes .....
    (a) input, processing, output, storage
    (b) input, output, manipulation, arithmetic
    (c) data, processing, printing, editing
    (d) storage, display, data, information
    (e) None of these
73. The arithmetic/logic unit performs the following actions ...
    (a) checks data for accuracy
    (b) does calculations using addition, subtraction, multiplication, and division
    (c) does logical comparisons, such as equal to, greater than, less than
    (d) does both calculations and logical comparisons
    (e) None of these
74. The computer's processor consists of the following parts ..... .
    (a) CPU and Main Memory
    (b) Hard Disk and Floppy Drive
    (c) Main Memory and storage
    (d) Operating system and Applications
    (e) Control Unit and ALU

75. A microprocessor is the brain of the computer and is also called a(n) .....
(a) microchip (b) macrochip (c) macroprocessor
(d) calculator (e) software

76. Main memory works in conjunction with ..... .
(a) special function cards (b) RAM
(c) CPU (d) Intel (e) All of these

77. The main job of a CPU is to ..... .
(a) carry out program instructions
(b) store data/information for future use
(c) process data and information (d) both (a) and (c)
(e) None of these

78. When speaking of computer input and output, input refers to ..... .
(a) any data processing that occurs from new data input into the computer
(b) retrieval of data or information that has been input into the computer
(c) data or information that has been entered into the computer
(d) the transmission of data that has been input into the computer
(e) Both (c) and (d) above

79. All of the logic and mathematical calculations done by the computer happen in/on the ..... .
(a) system board (b) central control unit
(c) central processing unit
(d) mother board (e) memory

80. The primary goal of a computer system is to turn data into .....
(a) ideas (b) suggestions (c) information
(d) reports (e) pictures

81. Arithmetic operations ..... .
(a) involve matching one data item to another to determine if the first item is greater than, equal to, or less than the other item.
(b) sort data items according to standard, predefined criteria in ascending order or decending order
(c) use conditions with operators such as AND, OR and NOT
(d) include addition, subtraction, multiplication, and division
(e) None of these

82. Once information is input into a computer it becomes .....
(a) objects (b) data (c) ideas
(d) facts (e) None of these

83. Input, output, and processing devices grouped together represent a(n) ..... .
(a) mobile device (b) information processing cycle
(c) circuit board (d) computer system (e) None of these

84. 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 .....
(a) Input (b) Computer (c) Software
(d) Hardware (e) None of these

85. The CPU comprises of Control Memory, and ..... Units.
(a) Microprocessor (b) Arithmetic/Logic (c) Output
(d) ROM (e) Input

86. To display the contents of a folder in Windows Explorer you should—
(a) Click on it (b) Collapse it (c) Name it
(d) Give it a password (e) Rename it

87. 'C' in CPU denotes .....
(a) Central (b) Common (c) Convenient
(d) Computer (e) Circuitry

88. .....devices convert human-understandable data and programs into a form that the computer.
(a) Printing (b) Output (c) Solid state
(d) Monitor (e) Input

89. The three main components of a computer are—
(a) RAM, Input/Output Devices, Central Processing Unit
(b) Tape, Floppy disk, Monitor
(c) Central Processing Unit, Floppy disk, Monitor
(d) Central Processing Unit Monitor, Printer

90. The octal equivalent of the Binary number $(101001100)_2$ is .....
(a) $(515)_8$ (b) $(514)_8$ (c) $(504)_8$
(d) $(415)_8$

91. Arithmetic & Logic Unit—
I. Perform Arithmetic operations II. Store Data
III. Perform comparisons
IV. Communicate with input devices Which of the following is true ?
(a) I only (b) III only (c) I & II (d) I & III

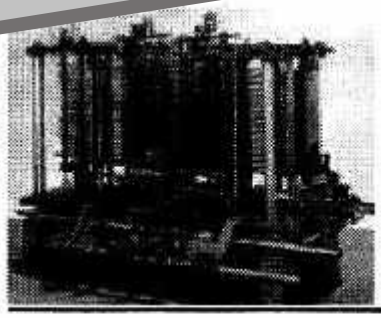
92. The term GIGO is related to
(a) Accuracy (b) Automatic (c) Flexibility
(d) Versatility

93. A Computer executes Programs in the sequence of
(a) Store, Fetch, Execute' (b) Fetch, Decode, Execute
(c) Execute, Fetch, Decode (d) Decode, Fetch, Execute

Answers

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

★★★



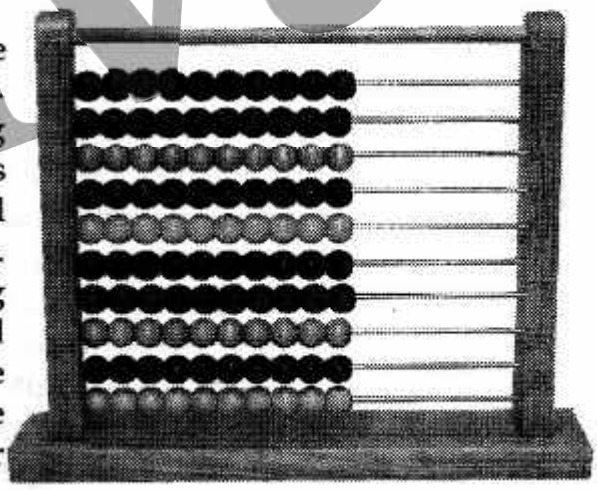
02

Development of Computer

Introduction

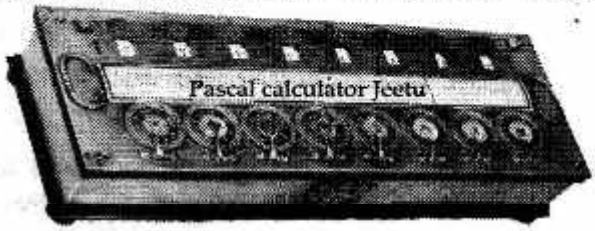
Computer is a man-made electronic machine that changes the way we work, live, and play. A machine that has done all this and more, now exists in nearly every business and one out of every two households. This incredible invention is the computer. The computer is one of the most powerful innovations in human history. The electronic computer has been around for over a half-century, but its ancestor abacus has been around for 2000 years. However, only in the last 40 years it has changed the our lifestyle. From the first wooden abacus to the latest high-speed microprocessor, the computer has changed nearly every aspect of people's lives for the better. With the use of computers, people are suddenly able to perform a large amount of computations at dazzling speed. Information can be crunched, organized, and displayed in the blink of an eye. Things that were only dreams a few years ago are now possible due to computers.

Evolution of computers

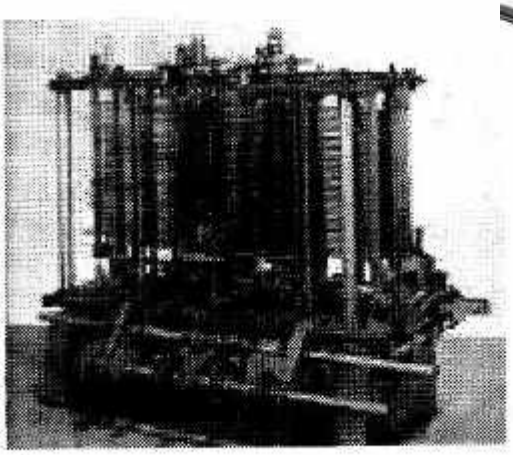


1. Abacus : The abacus is one of the earliest known computation devices. It is a tool that helped in calculating answers of arithmetic problems. It is simply a wooden rack holding parallel wires on which beads are strung. Calculations are done by manipulating the beads. The abacus was developed in China about 5000 years ago. The abacus was so successful that its use spread form China to many other countries.

2. Pascal calculator : The first real mechanical calculator was invented by a French scientist and mathematician Blaise Pascal, around 1645. The device was constructed by interlocking gears representing the number 0 to 9. It was only able to do addition and subtraction, so it is called adding machine.

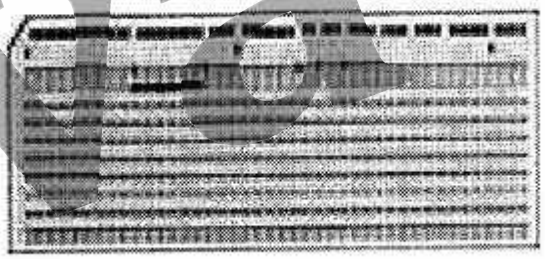


3. Analytical Engine : In 1801, Joseph Marie Jacquard perfected the idea of the automated weaving loom. Using holes punched into a series of connected cards, Jacquard was able to control the weaving of fabrics. The

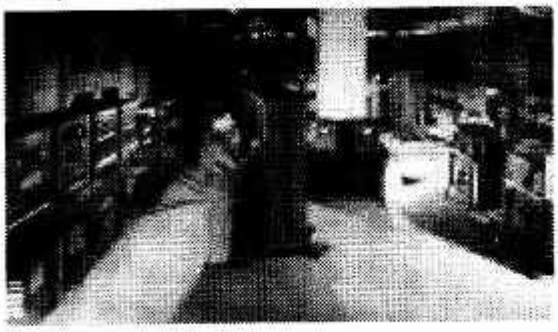


Jacquard loom not only cut back on the amount of human labor, but also allowed for patterns to be stored now on cards and to be utilized over and over again to achieve the same product. In 1820 Charles Babbage, a British mathematician and inventor, designed and built the mechanical calculator and the Difference Engine on principles that anticipated the modern electronic computer. The concept Babbage put forward was eventually used by engineers in the development of the first computer prototype. For this reason Charles Babbage is known as father of computing. Despite ten years of work, Babbage failed to built a fully operational model of Difference or Analytical Engine. In 1842 Lady Lovelace wrote a demonstration program and her contribution to binary arithmetic was later used by John Von Neumann in developing the modern computer. So she is often regarded as the "first computer programmer".

4. Herman Hollerith and Punch cards : In 1890 the United States Census Bureau asked Herman Hollerith to find a way to speed up the processing a census data. Herman Hollerith created punched cards that resemble today's computer cards. He also invented the Hollerith 80 column code and tabulating machine.

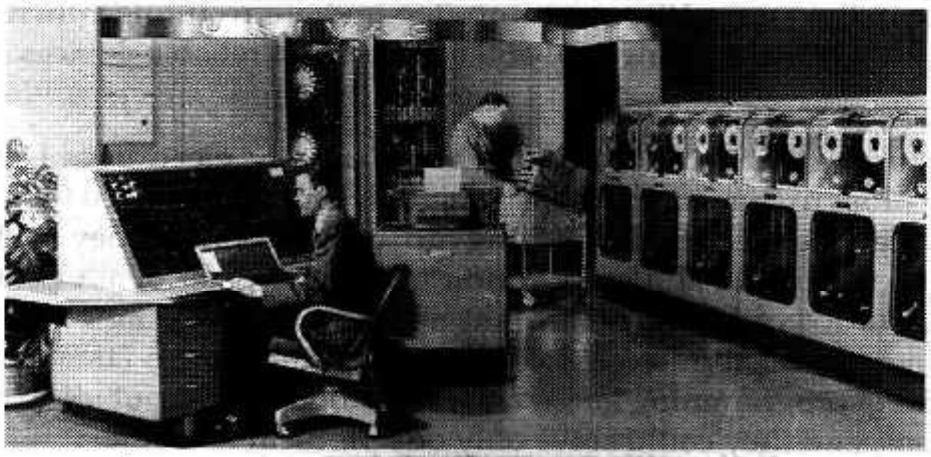


5. First Electronic computer (ENIAC) : Howard Aiken, with his colleagues at Harvard and with some assistance from International Business Machines he had built by 1942 the Mark I, the world's first program-controlled calculator, an early form of a digital computer. In 1944 John Mauchley, an American physicist, and J. Presper Eckert, an American engineer, proposed an electronic digital computer, called the Electronic Numerical Integrator And Computer (ENIAC), and completed it in 1946 which is regarded as the first successful general digital computer.



6. Stored Program concept (EDSAC) : According to John Von Neumann's concept, the operating instructions and data used in processing should be stored inside the computer. Whenever necessary the computer would have the capability to modify these program instructions, during their execution. This concept was incorporated into the EDSAC computer (Electronic Delay Storage Automatic Computer), which was developed at Cambridge University. This computer was capable of storing a sequence of instructions, the equivalent of the first computer program.

7. UNIVAC 1 : It is the short form of Universal Automatic Computer. In 1951 it was introduced and became the first commercially available computer. The UNIVAC 1 was characteristic of the first generation of computers.



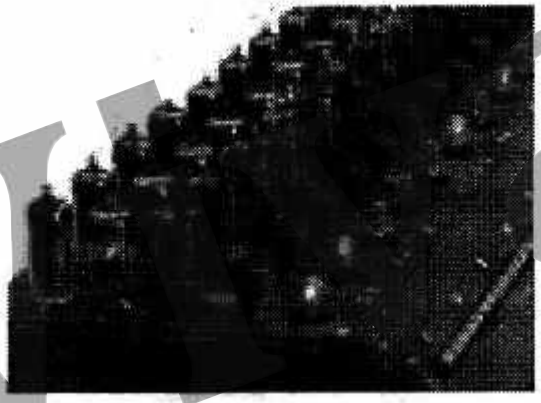
Development	Approximate dates	Important Features
Abacus	2000-3000 B.C.	First mechanical calculator
Pascal's Calculator	1645	First adding machine capable of counting, adding and subtracting
Jacquard's weaving loom	1801	Utilized metal plates with punched holes to control weaving patterns
Babbage Analytical Engine	1834-1871	Intended to be the First general purpose computer. The engine was never constructed in Babbage's lifetime.
Herman Tabulating Machine	1887-1896	Designed a code and device to punch data into card and tabulate collected data. Used in automating the Census of 1980.
Howard Aiken Mark I	1937-1944	The largest electromechanical computer ever built. Utilized punch paper tape to store data.
ENIAC	1943-1950	First electronic computing devices in which program wired into a permanent panel. No significant storage capability.
John Von Neumann's Stored Program concept	1945-1852	Developed the concept of storing program instructions and data in the memory of the computer. Credited with introducing the idea of coding data and instructions in binary.
EDSAC	1946-1952	First computer capable of storing instructions and data in memory.
UNIVAC I	1951-1954	First computer that was commercially available and produced in quantity.

Computer Generation

The history of the development of computer is often referred to in tracing the different generations of computing devices. Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and efficient and reliable devices.

First Generation (1942-1955)

The first generation computers were entirely electronic. They used vacuum tubes to store instructions. Magnetic drums were used for memory. They were often enormous, taking up entire rooms. They were very expensive to operate and, in addition to using a great deal of electricity, generated a lot of heat which often needed expansive air-conditioning. First generation computers relied on machine language (1s and 0s), the lowest-level programming language understood by computers, to perform operations, and they could solve only one problem at a time.



The UNIVAC 1, ENIAC and Mark 1 computers are examples of the first-generation computing devices. The UNIVAC was the first commercial electronic computer. This machine was developed specially for scientific and military purposes but it was dedicated to a business client, the U.S. Census Bureau in 1951.

Second Generation (1955-1964)

In second generation of computers solid state transistors replaced vacuum tubes in computers. It was invented in Bell Laboratories.

The transistor was far superior than the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable. To represent data a magnetic core is used in computer. At about the same time magnetic tape and disks began to be widely used as an auxiliary storage. Magnetic disk was layered by iron oxide. Magnetic disks made possible direct access of data.

As a result of these developments, a significant increase in the speed and processing capability of computers was achieved. Businessmen began to use computers in increasing numbers and new high-level programming languages also developed at this time, such as early versions of COBOL and FORTRAN.

Third Generation (1965-1974)

Further development in electronics brought further reduction in size, greater reliability, speed and lower costs computer. Integrated circuits (IC) replaced the transistors, which was developed by J.S.Kilbi. This was the hallmark of the third generation of computers.

This development is known as LSI (Large Scale Integration) and it refers to the ability to compress large number of integrated circuits on a single silicon chip. There is also VLSI (Very Large Scale Integration).

Another development that changed the way people use computers was time sharing. A time-shared computer allows many users, each working at a separate input/output terminal, to use it at the same time.

Users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory. Computers for the first time became accessible to mass users because they were smaller and cheaper than their predecessors. Users could use software according to their need because Software and hardware were available separately.

Fourth Generation (1975- Up till now)

Fourth Generation computer continued to be characterized by chips that can contain increasing numbers of items. This further miniaturization of components, referred to as ULSI (Ultra Large Scale Integration), resulted in increased speed, greater reliability, and enormous storage capacities for current computers.

By using LSI technology, microprocessor was produced. This microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. Computer of the first generation that filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer from the CPU and memory to input/output controls on a single chip. In 1981 IBM introduced its first computer for the home user, and in 1984 Apple introduced the Macintosh. Microprocessors also moved out of the realm of desktop computers and into many areas of life. Everyday products such as vehicles, microwave oven and electronic games etc. began to use microprocessors more and more.

As these small computers became more powerful, they could be linked together to form a network, which eventually led to the development of the Internet. Fourth generation computers also saw the development of GUIIs, the mouse and handhold devices.

Fifth Generation (Present and Beyond)

Unlike all other generation computers, present generation of computers is characterized by the use of the technique used to reduce complex programming. This technique is known as Artificial intelligence (AI). 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.

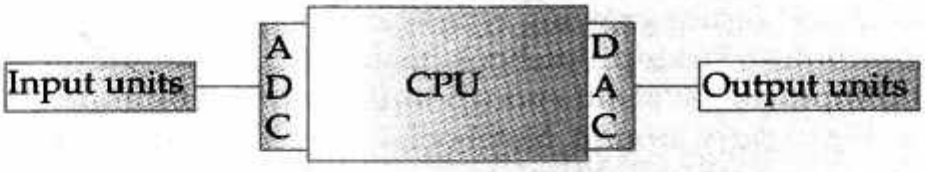
Generations	Characteristics
First Generation	1. Use of vacuum tubes in circuits. 2. Use of magnetic drum as primary internal storage medium. 3. Limited main storage capacity. 4. Slow input/output. 5. Low-level symbolic language programming. 6. Heat and maintenance problem. Applications : Payroll processing and record keeping. Example : ENIAC, IBM 650, UNIVAC 1
Second Generation	1. Use of transistors at the place of vacuum tubes. 2. Use of magnetic core as primary internal storage medium. 3. Increased main storage capacity. 4. Faster input/output. 5. Great reduction in size and heat generation. 6. Increased speed and reliability. 7. High level programming language (COBOL and FORTRAN). Applications : Batch oriented (Billing, Payroll processing and Updating inventory files. Example : IBM 1401, Honeywell 200, CDC 1604.
Third Generations	1. Use of IC (Integrated circuit). 2. Use of magnetic core as primary storage medium. 3. More flexible input/output. 4. Smaller size, better performance and reliability. 5. Increased speed and better performance. 6. Extensive use of high level programming languages. 7. Emergence of minicomputers. Remote processing and time sharing through communication. 8. Availability of operating system software to control input/output. Applications : Airline reservation system, market forecasting and credit card billing. Example : IBM System/360, NCR 395, Burroughs B6500.
Fourth Generation	1. Use of large scale integrated circuit. 2. Increased storage capacity and speed. 3. Modular design and compatibility between hardware provided by different manufacturers. 4. Greater versatility of Input/output devices. 5. Introduction of microprocessors and microcomputers. 6. Increased use of microcomputers. Applications : Electronic fund transfer, computer-aided instruction, home computers and mathematical modeling and simulation. Example : IBM PC-XT (microcomputer), Apple II, Honeywell 6080 series.

Classification of computer by the purpose which they design :

1. Special Purpose Computers : The special purpose computers are used to solve a single and dedicated type of problem. For their specialized use, they are extremely efficient and economical. Example- automatic aircraft landing, computerized traffic control systems.
2. General Purpose Computers : The general purpose computers are flexible and versatile. They can be used to solve a variety of problems by changing the program or instructions .Example – Accounting, Simulation and forecasting.

Classification of computer by the types of data which they are capable of manipulating :

1. Digital computer :In digital computers data are represented as discrete units or electrical pulse, which can be counted and switched. In modern digital computer binary system is used. Digital clock is its good example. Due to fast speed and large storage capacity digital computers are used for business and scientific data processing.
2. Analog computer :In analog computers data are represented as physical quantities. Physical quantities are best measured in a continuous fashion and thus are ideally suited for analog computation. Analog computer is a machine that works on data which is always changeable. Analog form of electricity is used by us. Speed of this kind of computers are slow. Voltmeter, thermometer and barometer are the examples of analog device. Analog computers are most often used for scientific and engineering purposes.
3. Hybrid computer : Hybrid computers have combined features of both digital and analog computers with the input and output in analog form and the processing in digital form. This involves analog to digital converter at the input end and digital to analog converter at the output end.



Classification of computers on the basis of Price, Size and Capabilities

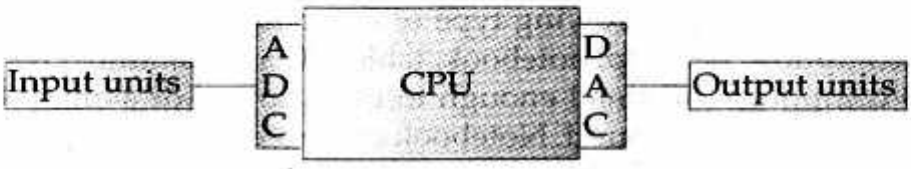
1. Supercomputers :Supercomputers are the most powerful computers as of now. These computers are large in size and memory compared to all other computers. They work with multi-processing and parallel processing facilities. At present, specially in computing speed, these are very fast. So, these are the fastest, biggest and most expansive computers. These machines are special high capacity computers used by very large organizations. They contain thousands of microprocessors. First super computer of world was CRAY – 1 which was developed by Cray research company in 1976. First super computer of India was PARAM which was developed by C-DAC in 1991. It was designed for ultra high performance task such as creating animation, weather forecasting, nuclear energy research, encryption cracking and designing. Examples are CRAY-1 and IBM's Deep Blue.

Classification of computer by the purpose which they design :

1. Special Purpose Computers : The special purpose computers are used to solve a single and dedicated type of problem. For their specialized use, they are extremely efficient and economical. Example- automatic aircraft landing, computerized traffic control systems.
2. General Purpose Computers : The general purpose computers are flexible and versatile. They can be used to solve a variety of problems by changing the program or instructions .Example – Accounting, Simulation and forecasting.

Classification of computer by the types of data which they are capable of manipulating :

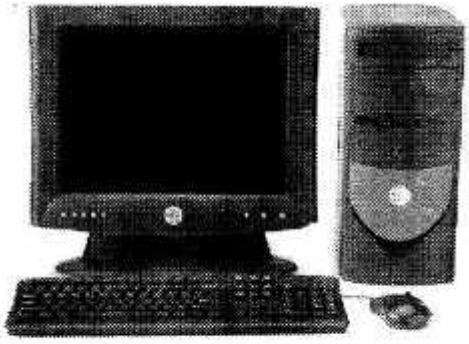
1. Digital computer :In digital computers data are represented as discrete units or electrical pulse, which can be counted and switched. In modern digital computer binary system is used. Digital clock is its good example. Due to fast speed and large storage capacity digital computers are used for business and scientific data processing.
2. Analog computer :In analog computers data are represented as physical quantities. Physical quantities are best measured in a continuous fashion and thus are ideally suited for analog computation. Analog computer is a machine that works on data which is always changeable. Analog form of electricity is used by us. Speed of this kind of computers are slow. Voltmeter, thermometer and barometer are the examples of analog device. Analog computers are most often used for scientific and engineering purposes.
3. Hybrid computer :Hybrid computers have combined features of both digital and analog computers with the input and output in analog form and the processing in digital form. This involves analog to digital converter at the input end and digital to analog converter at the output end.



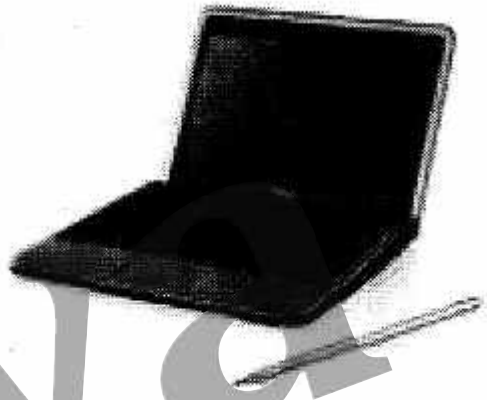
Classification of computers on the basis of Price, Size and Capabilities

1. Supercomputers :Supercomputers are the most powerful computers as of now. These computers are large in size and memory compared to all other computers. They work with multi-processing and parallel processing facilities. At present, specially in computing speed, these are very fast. So, these are the fastest, biggest and most expansive computers. These machines are special high capacity computers used by very large organizations. They contain thousands of microprocessors. First super computer of world was CRAY – 1 which was developed by Cray research company in 1976. First super computer of India was PARAM which was developed by C-DAC in 1991. It was designed for ultra high performance task such as creating animation, weather forecasting, nuclear energy research, encryption cracking and designing. Examples are CRAY-1 and IBM's Deep Blue.

5. Personal computer : A small, relatively inexpensive computer designed for an individual user. It is based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. Businesses use personal computers for word processing, accounting, desktop publishing and for spreadsheet and database management application. At home, the most popular use of personal computers is for playing games, email, chatting etc. Examples are Apple II, IBM PC, Lenovo and HP etc.



6. Laptop : A laptop is a personal computer designed for mobile use. It is small enough to sit on one's lap and fits in to a briefcase. It integrates most of the components of a desktop computer, including a monitor, a keyboard, a pointing device (also known as a track pad), speakers, and other drives. It includes rechargeable battery, so it works anywhere. By using blue tooth and wi-fi we can access the Internet.



7. Notebook computer : An extremely lightweight pesonal computer. It is generally thinner and smaller than laptop.

8. Workstations : Workstations are special single user computers having the same features as personal computer but have the processing speed equivalent to minicomputer or mainframe computer. A workstation computer can be fitted on a desktop. Scientists, engineers, architects and graphic designers mostly use these computers. Workstation computers are expensive and powerful computers. These have advanced processor, more RAM and storage capacity than personal computers. These are usually used as single-user application but are used as servers on computer network and web servers as well.

9. Palmtop : A small computer that literally fits in our palm. Compared to full-size computers, palmtops are severely limited, but they are practical for certain functions such as phone books and calendars. Palmtops that use a pen rather than a keyboard for input. Because of their small size, most palmtop computers do not include disk drives. However, many contain PCMCIA *(Personal Computer Memory Card International Association)* slots in which we can insert disk drives, modems, memory and other devices. Palmtops are also called PDAs, hand-held computers and pocket computers.

Objective Question

1. First calculating device is —
   (a) Clock (b) Difference engine (c) Abacus
   (d) Calculator (e) All
2. First mechanical calculator was invented by —
   (a) Joseph Marie Jacquard (b) John Mauchley
   (c) Blaise Pascal (d) Haward Aiken
   (e) None of these
3. Who invented punch card ?
   (a) Pavrus (b) Jacquard (c) Pascal
   (d) They all (e) None of these
4. Computer that was made before 1st generation computer—
   (a) Mechanical (b) Electro mechanical (c) Electrical
   (d) All these (e) None of these
5. Analog computer is—
   (a) A machine which works on data which is always changeable
   (b) An arithmetic high level language
   (c) Communicate at low level
   (d) All these (e) None of these
6. What is laptop ?
   (a) Computer used in clinical laboratory
   (b) Computer made ley compact
   (c) Small, light weight computer which fits in a suitcase
   (d) All of these (e) None of these
7. Super computer—
   (a) It processes data of more than one user at a time
   (b) It is a fast and costly computer system
   (c) It is used in large organisations
   (d) All of these (e) None of these
8. Computer's basic architecture was developed by—
   (a) John Van Neumann (b) Charles Babbage (c) Blaise Pascal
   (d) Jordan Murn (e) None of these
9. Characteristic of fifth generation computer is—
   (a) Used in home (b) Artificial intelligence
   (c) Very low cost (d) All of these (e) None of these
10. A Computer portable and easy to carry by travellers is—
    (a) Super computer (b) Laptop (c) Mini computer
    (d) File servers (e) None of these
11. In production of I.C. chip of computer what is needed in the following—
    (a) Chromium (b) Silicon (c) Platinum
    (d) Gold (e) None of these
12. In which generation did multiprogramming start ?
    (a) First generation (b) Second generation (c) Third generation
    (d) Fourth generation (e) None of these

13. Multics operating system for mainframe was developed by—
(a) Infuses (b) Micro soft (c) Jerman laboratory
(d) Bell laboratory (e) Rainbow laboratory

14. First mechanical computer of Charles Babbage is known as—
(a) Palmtop (b) Processor (c) Calculator
(d) Punchcard machine (e) None of these

15. First super computer of the world was developed in—
(a) 1978 (b) 1976 (c) 1980
(d) 1981 (e) None of these

16. Computer for personal use is—
(a) Mini computer (b) Super computer (c) Micro computer
(d) Mainframe computer (e) None of the

17. Father of computer is called—
(a) Marconi (b) Adison (c) Charls Babbage
(d) Herman Hallinilt (e) None of these

18. First super computer developed in India is—
(a) Param (b) Aryabhatt (c) Buddha
(d) Ram (e) None of these

19. Faster computer is—
(a) Mini computer (b) Super computer (c) Micro computer
(d) Mainframe (e) None of these

20. Which generation of computer is worked with FORTRAN ?
(a) First (b) Second (c) Third
(d) Fourth (e) None of these

21. In which generation was microprocessor introduced ?
(a) First (b) Second (c) Third
(d) Fourth (e) None of these

22. Remote processing and time sharing was introduced in ... generation :
(a) first (b) second (c) third
(d) fourth (e) none of these

23. Abacus was developed in—
(a) India (b) China (c) America
(d) Unan (e) Malasia

24. Remedy in first generation computer was—
(a) Small size (b) Large size (c) No heat generation
(d) B and C both (e) None of these

25. Types of computer on working style is—
(a) Digital (b) Analog (c) Micro
(d) Mini (e) a and b both

26. Minicomputer is converted into super minicomputer by using the ..... super chip—
(a) 80586 (b) 80386 (c) 70508
(d) 70309 (e) None of these

27. ..... is television size computer—
(a) Optical (b) Micro (c) Super mini
(d) Main frame (e) None of these

28. Processing capacity of microcomputer is ..... per second—
(a) one lac (b) two lac (c) four lac
(d) five lac (e) none of these

29. IMac is a—
(a) Processor (b) Modem (c) Network
(d) Machine (e) None of these

30. Analytical engine was developed by—
(a) Lovelace (b) H. Aiken (c) Charles Babbage
(d) All of these (e) None of these

31. What is a main characteristic of computer in the following options ?
(a) File (b) Game (c) Speed
(d) C.D (e) Floppy

32. Main electronic part in first generation computer was—
(a) Transistor (b) VLSI (c) Vacuum tube
(d) IC (e) None of these

33. Which one is not a type of computer on the basis of size—
(a) Micro computer (b) Mini computer
(c) Super mini computer (d) Mainframe computer
(e) Optical computer

34. ..... is not a micro computer—
(a) Home computer (b) Personal computer (c) Laptop
(d) Atomic computer (e) None of these

35. At first punched card was used by—
(a) Blaise Pascal (b) Haward Aiken (c) John Mauchlay
(d) Joseph Marie (e) None of these

36. The great contribution in the development of computer was by—
(a) H. Hallerilt (b) C. Babbage (c) Blaise Pascal
(d) Van Neumann (e) None of these

37. Great contributor in development of blueprint of rhythmical computer was—
(a) H. Hallerilt (b) C. Babbage (c) Blaise pascal
(d) Willium Buras (e) None of these

38. Modern computer was developed in—
(a) 1946 (b) 1950 (c) 1960
(d) 1965 (e) None of these

39. Who developed integrated chip ?
(a) C.V. Raman (b) Robet Nayak (c) J.S. Kilbi
(d) C. Babbage (e) None of these

40. Which material is layered at magnetic disk ?
(a) Iron oxide (b) Phosphorus bentaoxide
(c) Magnesium oxide (d) Sodimum peroxide
(e) None of these

41. The most powerful computer is—
(a) Super computer (b) Micro computer (c) Mini computer
(d) All of these (e) None of these

42. In a silicon chip of complete electronic circuit with transistors and other the electronic devices is called—
(a) Work station (b) CPU (c) Integrated circuit
(d) Magnetic disk (e) None of these

43. The digital computer is worked on the theory of—
(a) Calculation (b) Measurement (c) Electric
(d) Logical (e) None of these

44. The super computer is distinguish from other computers by—
(a) High cost (b) Problem of airconditiones
(c) Large memory and calculating power
(d) Many uses (e) None of these

45. A modem digital computer uses ..... number system—
(a) binary (b) decimal (c) hexadecimal
(d) all these (e) none of these

46. PARAM was developed by .....
(a) C-DAC (b) IIT Kanpur (c) BARC
(d) IIT Delhi (e) None of these

47. Which generation was developed by the discovery of I.C. —
(a) First generation (b) Second generation (c) Third generation
(d) Fourth generation (e) None of these

48. The main characteristic of 4th generation was—
(a) Transistor (b) VLSI (c) IC
(d) Vacuum Tube (e) None of these

49. CRAY is a—
(a) Mini computer (b) Micro computer (c) Mainframe computer
(d) Super computer (e) None of these

50. Which of following refers to the fastest, biggest and most expansive computer ?
(a) Personal computer (b) Super computer (c) Laptop
(d) Note book (e) None of these

51. Which type of computer could be found in a digital watch ?
(a) Mainframe (b) Super computer (c) Embedded computer
(d) Notebook computer (e) None of these

52. The first computer was programmed using ..... .
(a) Assembly language (b) Machine language
(c) Spaghetti code (d) Source code
(e) None of these

53. Digital computers use a ..... system to encode date and programs.
(a) semiconductor (b) decimal (c) binary
(d) RAM (e) none of these

54. A computer falls into the ..... category if it is, at the time of construction, one of the fastest computers in the world.
(a) minicomputer (b) supercomputer (c) microcomputer
(d) a and b both (e) none of these

55. Microcomputer hardware consists of three basic categories of physical equipment—
(a) Keyboard, monitor, hard drive
(b) System unit, input/output, memory

(c) System unit, input/output, secondary storage
(d) System unit, primary storage, secondary storage
(e) None of these

56. A ..... is a large and expensive computer capable of simultaneously processing data for hundreds or thousands of users.
(a) handheld computer (b) mainframe computer
(c) personal computer (d) tablet computer
(e) None of these

57. Which is the smallest of the following computers ?
(a) Notebook (b) Laptop (c) Desktop
(d) Workstation (e) None of these

58. A ..... computer (also referred to as a laptop), is a small, lightweight personal computer that incorporates the screen, the keyboard, storage, and processing components into a single portable unit.
(a) notebook (b) journal (c) diary
(d) briefcase (e) None of these

59. A personal computer is designed to meet the computing needs of .....
(a) individual (b) department (c) company
(d) city (e) None of these

60. Which device uses a handheld operation system ?
(a) APDA (b) A personal computer (c) A laptop
(d) A mainframe (e) None of these

61. Supercomputers .....
(a) are smaller in size and processing capability than mainframe computers
(b) are common in majority of households
(c) contain thousands of microprocessors
(d) are rarely used by researchers due to their lack of computing capacity
(e) are of the same size as laptops

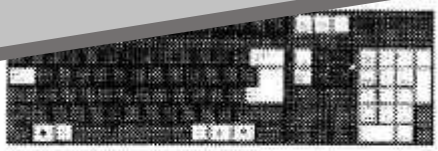
62. Of the following, which is the fastest ?
(a) CD-ROM (b) RAM
(c) Registers (d) Cache

63. Who designed the first electronic computer-ENIAC ?
(a) Van Nuemann (b) Joseph Jacquard
(c) Presper Eckert & John Mauchly (d) Denis Ritchie

Answers

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

★★★



03

Input and Output Device

Introduction

There are a lot of devices that are attached to the computer. Some of them are input devices while others are output devices. These devices are collectively referred to as peripheral devices.

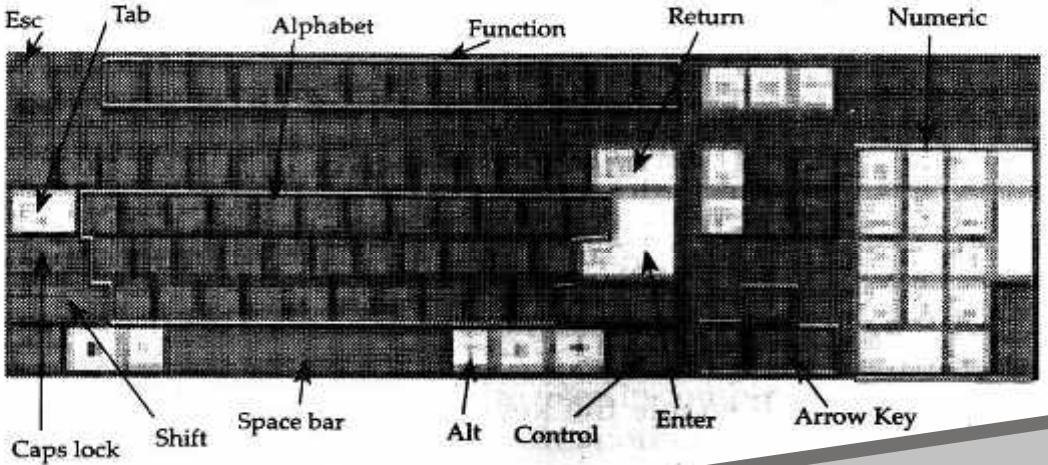
Input Devices : Information or data that is entered into a computer is called input. It can come from an external source and be fed into computer software. It is done by an input device.

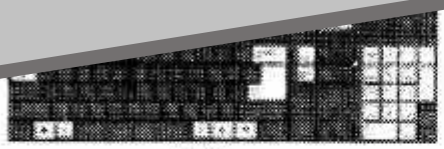
In other words, devices that are used to give instruction to the computer are known as input devices. They send information into the CPU. Without any input device that computer would simply be a display device like a TV.

Some most commonly used input devices are given below

1. Keyboard
2. Mouse
3. Trackball
4. Joystick
5. Scanner
6. Microphone
7. Web Cam
8. Bar Code reader
9. OCR (Optical Character Recognition)
10. MICR (Magnetic Ink Character Reader)
11. OMR (Optical Mark Reader)
12. Kimball tag Reader
13. Speech Recognition System
14. Light Pen
15. Touch Screen

1. Keyboard : The keyboard is one of the main input devices used in a computer. It is used to enter text and numeric data in a computer system. It looks very similar to typewriters, with some additional keys like the function





03

Input and Output Device

Introduction

There are a lot of devices that are attached to the computer. Some of them are input devices while others are output devices. These devices are collectively referred to as peripheral devices.

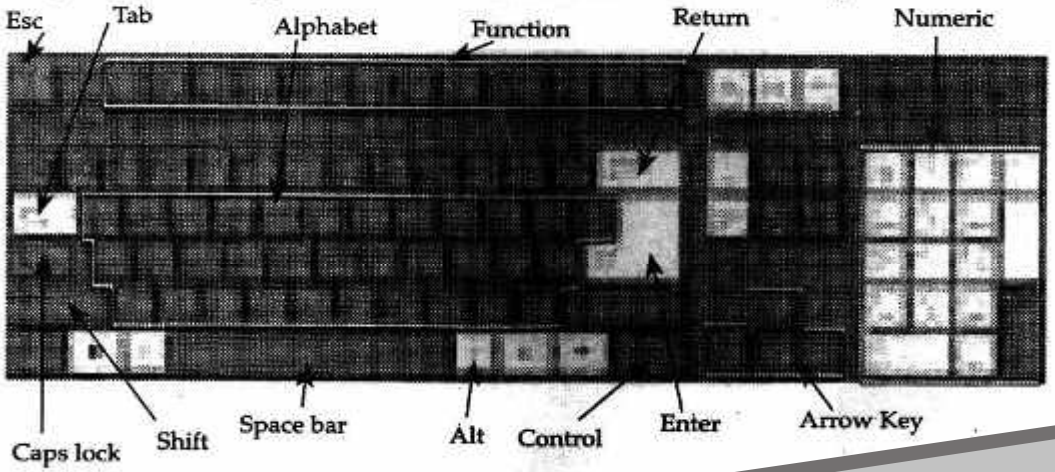
Input Devices : Information or data that is entered into a computer is called input. It can come from an external source and be fed into computer software. It is done by an input device.

In other words, devices that are used to give instruction to the computer are known as input devices. They send information into the CPU. Without any input device that computer would simply be a display device like a TV.

Some most commonly used input devices are given below

1. Keyboard
2. Mouse
3. Trackball
4. Joystick
5. Scanner
6. Microphone
7. Web Cam
8. Bar Code reader
9. OCR (Optical Character Recognition)
10. MICR (Magnetic Ink Character Reader)
11. OMR (Optical Mark Reader)
12. Kimball tag Reader
13. Speech Recognition System
14. Light Pen
15. Touch Screen

1. Keyboard : The keyboard is one of the main input devices used in a computer. It is used to enter text and numeric data in a computer system. It looks very similar to typewriters, with some additional keys like the function



Shift Key : This key is used in combination with other keys, so this is also called combination key. There are two shift keys on a keyboard. Some keys on the keyboard, like numeric keys, have special symbol printed on their upper portion. The shift key is used to print these symbols. When we want to type the symbol printed on the numeric key we press the shift key along with the number key on which that symbol is present. This key allows a user to type characters, either upper or lower case, and numbers to symbols. For example, pressing and holding the shift key while pressing the letter a key would generate a capital A. The shift key is commonly located on both the left and right hands of the keyboard and is commonly located below the caps lock key and the enter key on keyboards. This key is also used as a shortcut key to perform various different shortcuts. For example, holding down the shift key and pressing arrow keys will highlight text in the direction of the arrow key you press.

Enter Key : This key is also known as a return key. This is typically to finish an entry and begin the desired process, and is usually, an alternative to pressing an OK button. We put information into the computer by pressing enter key. It is used to move the cursor to the beginning of the next line. If any instruction or command is given to the computer, it will execute that instruction or command only when the enter Key is pressed. There are two enter keys on a keyboard, one on the keyboard and the other one on the numeric keypad.

Space bar Key : This is the longest key on the keyboard. It is used to insert blank space between two words or anywhere in the text where needed.

Tab Key : Tab key is the abbreviation of tabulator key. It is used to advance the cursor to the next tab stop. This key can also move between selectable items in a dialog box. Spreadsheet and database management applications usually respond to the Tab key by moving the cursor to the next field or cell. In dialog boxes and menus, pressing the Tab key highlights the next button or option. In word document page margin, indent a paragraph and distance between two words is defined by tab setting and by pressing the tab key the cursor moves 1/2 inch across the page.

Escape Key (Esc) : It is a powerful key placed on a keyboard that allows a user to cancel or abort operations, which he is executing at present and lets exit a program when pressed. Such as slide-show in power point, opening animation on web page is stopped by using this key. With the combination of Ctrl key it opens Start Menu.

Back Space Key : This key is used to erase anything typed on the left side of the cursor. It is placed just above the Enter key.

Delete Key : This key is used to erase anything typed on the right side of the cursor. By using this key selected word, line, page, file and drawing can be erased. It is a key that will erase information from the computer's memory and characters on the screen.

Control Key (Ctrl) : This key is also used in combination with other keys. When it is pressed in combination with another key, it performs a special operation.

For example, when Ctrl + Alt + Delete are pressed together they open task manager. Ctrl + C and Ctrl + V performs the cut and paste . Similar to the Shift key, the Ctrl key rarely performs any function when pressed by itself. There are two Ctrl keys on a keyboard. The control key is located below the shift keys.

Print Screen Key (Prt Scr) : When this key is pressed, it either sends the current screen image to the computer clipboard or the computer printer depending on the operating system or software program the key is pressed in.

Scroll Lock Key : This key is placed on a keyboard near the keyboard pause key. This key is intended to temporarily stop the scrolling of text or halt the operation of a program.

Pause Key : This key is commonly placed near the top right of a keyboard. This key allows a user to temporarily halt the action of the program being run. For example, in computer games, the pause key is commonly used to temporarily stop the game while the user steps away from his or her computer and is shared with the break key.

Modifier key : Alt, Ctrl and Shift keys on the keyboard, that are only used in combination with another key, are modifier keys.

2. Mouse : It is an input device that was invented by Douglas Engelbert of the Stanford Research Institute in 1963. It is also called pointing device which is used to point to the things on the monitor screen. There are three types of mouses : two-button mouse, three-button mouse and optical mouse. A two-button mouse has right and left buttons, a three-button mouse has right, left and center buttons and optical mouse has right, left buttons and a scroll wheel at the centre. When we turn the mouse upside down, we see a ball under it. This mouse ball helps to move the mouse on a plane surface. The movement of the ball is reflected by the movement of the mouse pointer on the monitor. A mouse pointer takes different shapes depending on the task we are performing. The mouse is placed on a slate shaped object which is called mouse pad.

There are four mouse actions : Click, Double click, Right click and Drag and Drop.

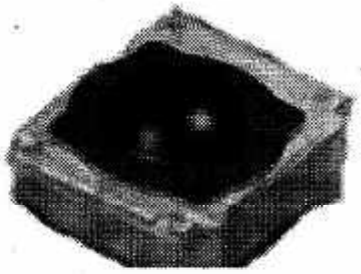
(i) Click : It is a press and release of left mouse button. The mouse makes a clicking sound. A click selects an item on the screen. For example, take the mouse pointer over the My Computer icon and click on it. It will turn blue which means it is selected. Generally it is used for OK.

(ii) Double click : To double click, means to press and release the left mouse button twice in a short interval. It is used to open a document or program. For example, take the mouse pointer over the My Computer icon and double-click on it. The 'My Computer' window will open.

(iii) Right click : To right click, means to press and release the right mouse button. It often displays a list of commands on the screen. For example, take the mouse pointer over the 'My Computer' icon and right- click on it. A shortcut menu will appear. So, right clicking is used to access the properties of any object.

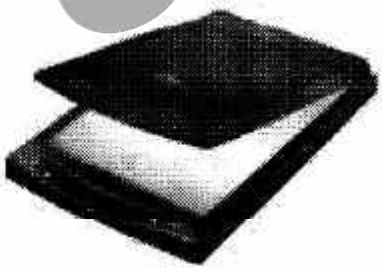
(iv) Drag and drop : Drag and drop are used to move an item on the screen. Drag and drop hold the mouse firmly. Position the pointer over an item on the screen and then press and hold down the left mouse button. Holding down the button, move the pointer to where you want to place the item and then release the button. This way we can drag and drop the item. To select text by shading by drag the mouse arrow over the text is referred to as highlight.

3. Trackball : A trackball is an alternative to a mouse. It has a ball, rotated by the hand to move the pointer in a desired direction. It is mainly used in the CAD , CAM and medical field.



4. Joystick : A joystick is an input device which helps in playing computer but it has stick in the place of ball and video games. It also works as a Trackball.

5. Scanner : A scanner is used to convert a text or an image into its electronic or digital representation, which can be viewed on the screen. These scanned or digital images can be used in different fields. They can be processed, edited and stored in memory or in any storage device. It looks like a photocopy machine. A sales clerk at a checkout counter scanning a tag on an item rather than keying it into the system is using source data automation process by scanning. Digital photos and scanned images are typically stored as bitmap graphics with extension such as .bmp, .png, .jpg, .tif or gif.

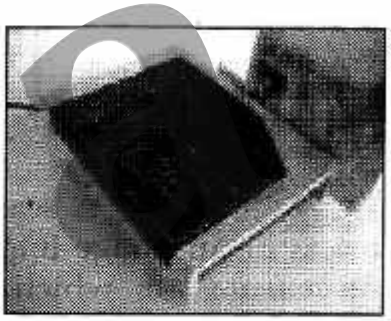


6. Microphone : A microphone is used to record any voice or sound into the computer.

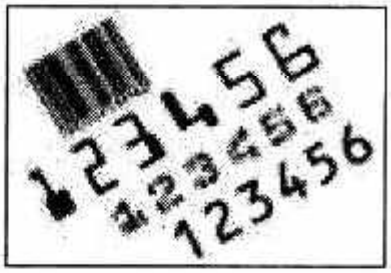
7. Web Camera : A web camera is used to view images on the Internet. Using it with the help of Internet we can view the photo of a far away person, but he should also have a web camera. It is like a digital camera which is used as an input device by adding to the computer. It capture images in digital formate that can be easily transferred into a computer and manipulated using graphics software. A web cam is a video capture device connected to a computer, often using a USB port or, if connected to a network, Ethernet or Wi-Fi.

8. Bar Code reader : A bar code reader is an electronic device for reading information contained in a printed bar code. It is also called a point-of-sale (POS) scanner. Today supermarkets commonly use bar code data for pricing and inventory updating. The black and white lines or bars of varying widths or lengths that we see on a grocery item at supermarket are bar code and read by bar code reader. The bar code reader translates black and white bars of different widths into electrical impulses and sends them to the computer. Now-a-days it is used in supermarkets, libraries, banks and post-offices.

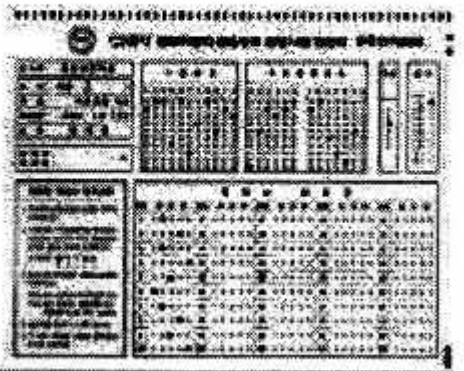
9. OCR (Optical Character Recognition) : Optical Character Recognition devices can read data that has been typed or handwritten on a source document. It is a combination of a scanner and a special software which converts the printed or handwritten data to ASCII. It is used to convert paper record into electric filling and scanned chalan into a spreadsheet.



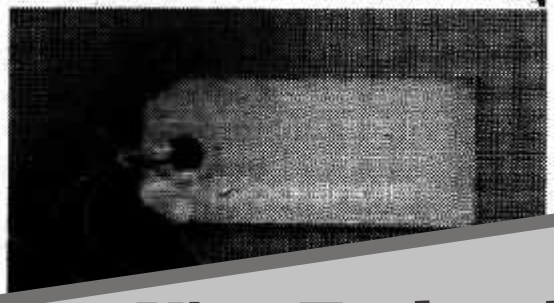
10. MICR (Magnetic Ink Character Reader) : Magnetic Ink Character Recognition machines are capable of reading magnetic ink character on MICR documents. Magnetic Ink Character Recognition is a character recognition technology adopted mainly by the banking industry to facilitate the processing of cheques.

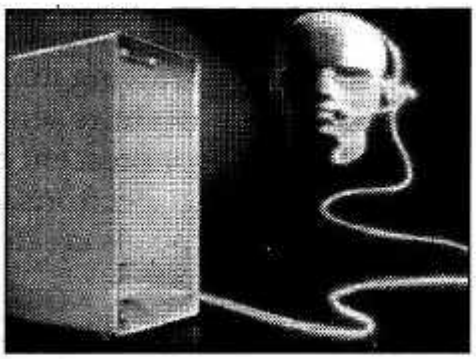


11. OMR (Optical Mark Reader) : Optical Mark Reader, sometimes called a mark sense reader, detects the presence of pencil mark or predetermined grids. OMR devices work with a dedicated scanner device that throws a beam of light on the form paper. It is used to check the objective test mark-sheet, lottery ticket and official form etc.



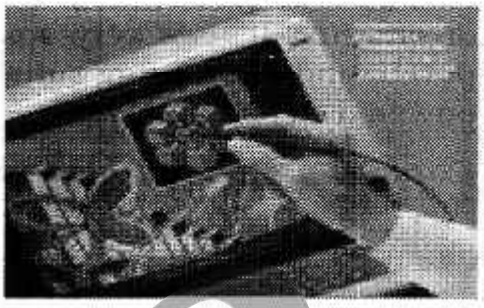
12. Kimball tag Reader : Kimball tag Reader is a popular data capture device. The Kimball tag is a miniature punched card containing the coded description of an item such as a garment or a box of parts.



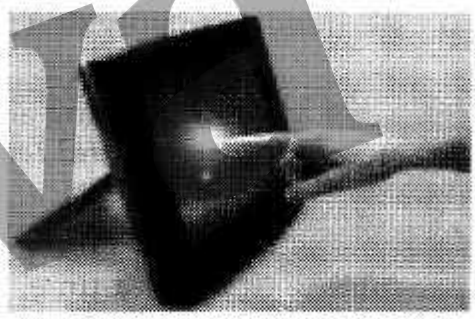


13. Speech Recognition System : Speech recognition converts spoken words to machine-readable input. Speech recognition is a broad term which means it can recognise almost any body's voice- such as a call-center system designed to recognise many voices.

Speech recognition applications include voice dialing, call routing, simple data entry, preparation of structured documents, speech-to-text processing. They are also used in aircraft cockpits.



14. Light Pen : A light pen is an input device, similar to a mouse. It is used to directly write and draw any figure on the computer screen.



15. Touch Screen : A Touch Screen is also an input device. When we touch the screen it can detect the presence and location of a touch within the display area. The term generally refers to touch the screen by a finger. Touch screens can also sense other passive objects, such as a stylus. The ability to interact directly with a display typically indicates the presence of a touchscreen. It is used to listening music and selects the available choices at bank ATM and public information center.

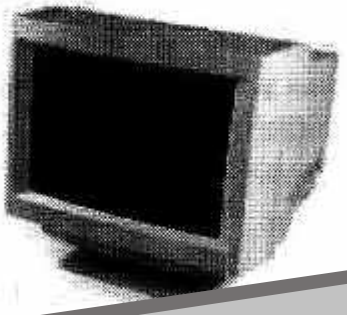
Output devices

Output devices are those devices which display or give the desired results from the computer. We use our hand and mouth to express ourselves. Similarly a computer gives its output with the help of its output devices.

Some of the most commonly used output devices are given below

1. Monitor
2. Printer
3. Speaker
4. Plotter
5. Screen Image Projector

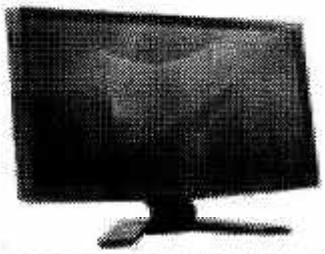
1. Monitor : A monitor is an output device that displays all work done and images on its screen. It is also called a VDU (visual display unit). After processing the input, the result is shown on the monitor. The three most common specifications about quality of monitors are dot pitch, resolution, and the refresh rate.



Mainly two types of monitor technologies available are CRT monitors and LCD.

(a) CRT (Cathode Ray Tube) monitors : A CRT is traditionally used in most computer monitors. A CRT works by moving an electron beam back and forth across the back of the screen. Each time the beam makes a pass across the screen, it lights up

phosphor dots inside the glass tube, thereby illuminating the active portions of the screen. By drawing many such lines from the top to the bottom of the screen, it creates an entire screen full of images. The screen is covered with a fine layer of phosphorescent elements, called phosphors, which emits light by excitation when electrons strike them, creating a lit-up dot called a pixel. These small dots pixels create images on monitor.



(b) LCD (Liquid crystal display) monitors : A Liquid crystal display (LCD) is a thin, flat and lightweight screen made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. It uses very small amount of electric power, and is therefore suitable for use in battery-powered electronic devices.

2. Printer : A printer is the primary output device used to get the printed copy or hard copy of work on paper, slides, clothes etc. It is used to prepare lasting documents.

Types of printer

Printers are mainly divided into three groups.

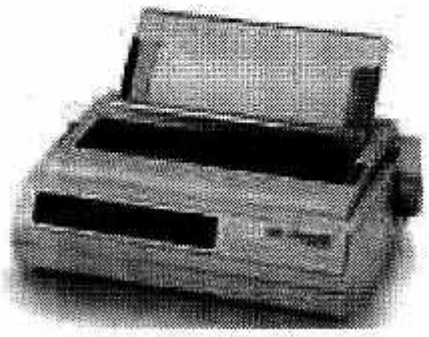
1. Serial Printers (Character Printers) : Serial printers print one character at a time moving across the paper, its speeds ranging from 200 to 400 characters per second (cps), which is about 90 to 180 lines per minute (lpm).

2. Line Printers : Line printers print approximately 400 to 2,000 lines per minute (lpm) at a time, and are commonly used in data centers and industrial environments.

3. Page Printers : Page printers print more than 800 pages per minute (ppm) at a time. It is able to print large data.

Printers are of two types according to the manner of printing

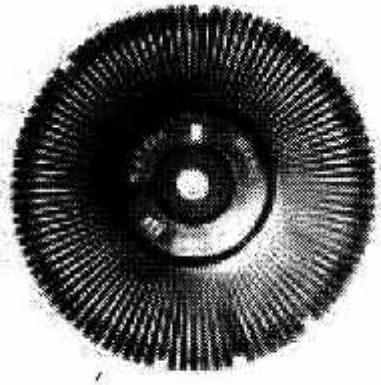
(a) Impact Printer : Impact printing devices transfer the image on paper by striking a paper, ribbon and character together. They include dot-matrix printers and daisy-wheel printers.



(i) Dot-matrix Printer : The term dot matrix refers to the process of placing dots to form an image, the quality of the image being determined by the dots per inch (dpi). A dot matrix printer is a type of printer with a print head that runs to and fro, or up and down, on the page and prints by striking an ink-soaked ribbon against the paper. Dot-matrix printers are relatively expensive and do not produce high-quality output. Quality of output is poor because characters are formed by dots. Printing speed ranges from 180cps to, 240cps, 260cps, 300cps and360 cps.

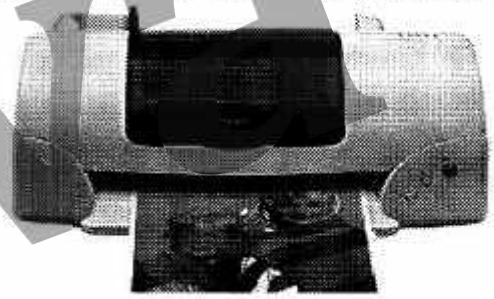
(ii) Daisy-wheel Printer : It is a printer that uses a printing element, called a daisy wheel or print wheel that consists of a disk with a plastic or

metal hub with spokes at the place of the print head. At the end of each spoke is the carved image of a type character. The wheel rotates until the correct character faces the paper, and an image is formed by a hammer striking the character against the paper through an ink-coated ribbon. The mechanism is then moved to the next location. Daisy-wheel printers are relatively slow. Its printing speed ranges from 180cps to 280cps. Daisy-wheel printers cannot print graphics and images and in general they are noisy and slow.

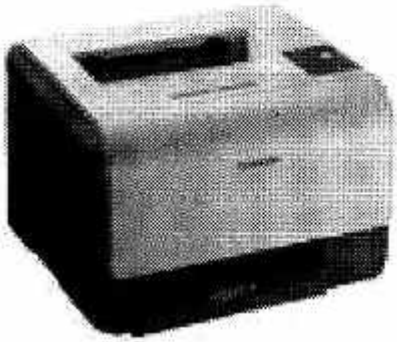


(b) Non-impact Printer : It is a type of printer that does not operate by striking a head against a ribbon. The term non-impact is important primarily in that it distinguishes quiet printers from noisy (impact) printers. Examples of non-impact printers include laser and ink-jet printers.

(i) Ink jet Printer : It is a non impact character printer for home computer users that prints by spraying streams of quick-drying ink on paper. There are two types of ink jet printer called mono and color. The ink is stored in disposable ink cartridges. Often a separate cartridge is used for each of the major colors. These colors are usually Black, Red/Magenta, Green/Cyan, and Yellow. A jet of special ink is ejected from a fine nozzle and produces images and characters. Although ink jet printers are often relatively inexpensive, the ink cartridges used in the printers increase the overall cost of the printer and also increase the printing cost. The print quality is good and printing speed ranges from 360 dpi to 600 dpi.



(ii) Laser Printer : Laser printer is a fast speed page printer. It is a type of printer that utilizes a laser beam to produce an image on a drum. The light of the laser alters the electrical charge on the drum wherever it hits. The drum is then rolled through a reservoir of toner, which is picked up by the charged portions of the drum. Finally, the toner is transferred to the paper through a combination of heat and pressure. Thus we get the print. There are two types of laser printer e.g. mono and color. Its printing speed and quality is better than those of other printers. Its printing speed ranges from 12 to 20 pages per minute.

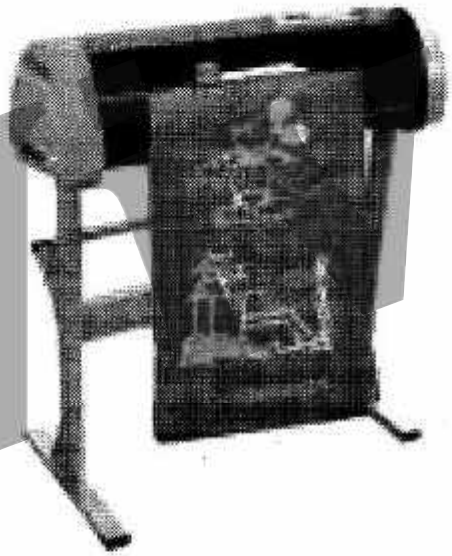


(iii) Thermal Printer (Electro Thermal Printer) : A thermal printer is a type of printer that uses heated pins to burn images onto coated thermo-chromic paper or thermal paper. When the paper passes over the thermal print head the coating turns black in the areas where it is heated producing an image. These

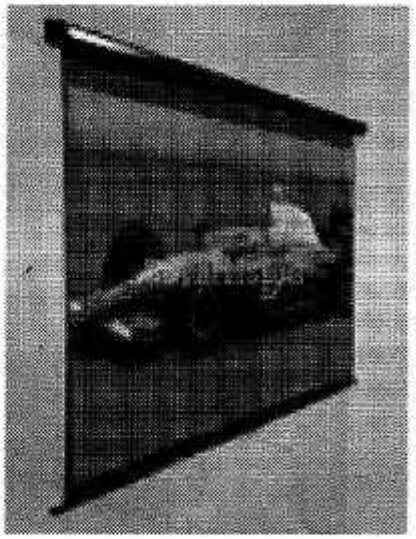
types of printers are commonly used in calculators and fax machines. They produce noiseless high resolution print jobs.

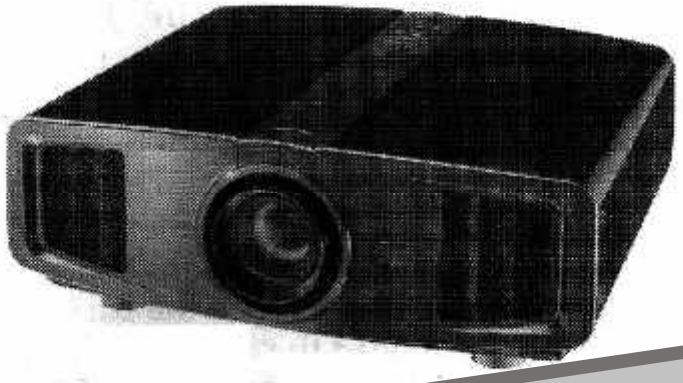
3. **Speaker** : A speaker is an output device which is often used as entertainment to listen to music and sound. It needs a sound card connected to a CPU that generates sounds by the card. The speakers attached to our camputer are used for handling sound and music.

4. Plotter : A plotter is an output device which is used to generate graphical outputs. Plotters differ from printers in that they draw lines using a pen. As a result, they can produce continuous lines, whereas printers can only simulate lines by printing close series of dots. It produces high-quality output. It is mainly used to generate the design required by engineers, doctors, city planners etc.



5. Screen Image Projector : It is an output device that enables an image, such as a computer screen, to be projected on a flat surface. These devices are commonly used in meetings and presentations as they project a large image covering everyone present there.





Objective Question

1. The two types of output devices are—
   (a) Monitor and Printer (b) Floppy disc and CD
   (c) Keyboard and Mouse (d) Windows 2000 and windows NT
   (e) None of these
2. Mouse technique used for access in properties of any object is—
   (a) Dragging (b) Dropping (c) Right clicking
   (d) Shift clicking (e) None of these
3. Dotmatrix is a type of device—
   (a) Scanner (b) Printer (c) Keyboard
   (d) Mouse (e) None of these
4. Tab key is used—
   (a) To move the cursor on screen (b) To indent a paragraph
   (c) To move a cursor (d) Only a and b
   (e) None of these
5. To go to the beginning of a text line press—
   (a) Home (b) Page up
   (c) Enter (d) None of these
6. The most common input devices are—
   (a) Microphone, printer (b) Scanner, monitor
   (c) Digital camera, speaker (d) Keyboard, mouse
   (e) None of these
7. To see all information which device output uses ?
   (a) Monitor (b) Keyboard (c) ALU
   (d) CPU (e) None of these
8. Type of mouse is—
   (a) Mechanical, general (b) Optical, mechanical
   (c) Full duplex (d) Automatic
   (e) None of these
9. The number of function keys in a keyboard is—
   (a) 14 (b) 13 (c) 12
   (d) 15 (e) 16
10. Printing head and paper is touched in—
    (a) Non-impact printer (b) Impact printer (c) Both a and b
    (d) Thermal printer (e) None of these
11. By which printer a character prints in only one stroke ?
    (a) Laser printer (b) Dot matrix printer (c) Line printer
    (d) Plotter (e) None of these
12. Which of following is not an input device ?
    (a) Keyboard (b) Monitor (c) Joystick
    (d) Microphone (e) None of these
13. What is a function of a keyboard in computer ?
    (a) Print (b) Input (c) Type
    (d) In between input and output
    (e) None of these

14. Which of following produces high quality output—
(a) Impact printer (b) Non-impact printer
(c) Plotter (d) a and b
(e) Non plotter

15. The work done by a computer operator is displayed in which part of computer?
(a) CPU (b) VDU (c) ALU
(d) IBM (e) None of these

16. Which of the following is a medium of output ?
(a) Scanner (b) Mouse (c) Printer
(d) Keyboard (e) None of these

17. Which of the following is used to input in computer in digital form ?
(a) Keyboard (b) Monitor (c) Scanner
(d) Mouse (e) None of these

18. When was the computer mouse invented by Douglas Engelbart in Stanford research Laboratory ?
(a) 1977 (b) 1980 (c) 1970
(d) 1952 (e) None of these

19. How many types of printers are there?
(a) One (b) Two (c) Three
(d) Four (e) Five

20. A character printer prints ..... characters per second.
(a) 100 to 200 (b) 5 to 50 (c) 5 to 100
(d) 5 to 75 (e) 200 to 4000

21. A line printer prints ..... lines per minutes.
(a) 100 to 200 (b) 5 to 50 (c) 5 to 100
(d) 20 to 50 (e) 400 to 200

22. A scanner looks like a ..... machine.
(a) Type machine (b) Franking machine (c) Photocopier
(d) Cyclostyle (e) None of these

23. How many arrow keys are there in a computer ?
(a) One (b) Two (c) Three
(d) Four (e) None of these

24. In any current available keyboard, how many times number keys are repeated?
(a) One (b) Two (c) Three
(d) Four (e) None of these

25. The slate shaped object below mouse is called—
(a) Mouse cover (b) Mouse pad (c) Mouse port
(d) Mouse conductor (e) None of these

26. Which of the following is an output device ?
(a) Printer (b) Monitor (c) Mouse
(d) a and b both (e) None of these

27. What can be the form of data ?
(a) Written (b) Unwritten (c) Visual
(d) Unheard (e) a and b both

28. Link between computer an a human is possible by—
(a) Input and output (b) Input (c) Output
(d) CPU (e) None of these

29. Which of the following is not a type of input and output ?
(a) Sound (b) Light (c) Mechanical
(d) Visual (e) None of these

30. Which of the following works as mouse ?
(a) Keyboard (b) Scanner (c) Icon
(d) Track ball (e) None of these

31. Generally which button of the mouse is used for OK ?
(a) Left (b) Right (c) Middle
(d) Wheel (e) None of these

32. ..... is fast speed printer.
(a) Laser printer (b) Jet printer (c) Thermal printer
(d) Daisy wheel printer (e) None of these

33. LCD stands for—
(a) Lead crystal device (b) Light central display
(c) Liquid central display (d) Liquid crystal display
(e) None of these

34. The general method for to input the text and numerical data in computer is by ..... .
(a) Keyboard (b) Scanner (c) Printer
(d) Platter (e) None of these

35. Output devices make it possible to ..... .
(a) View and print a data (b) Scan a data
(c) Input a data (d) Sending a data
(e) None of these

36. Hard copy of a document is ..... .
(a) Printed on printer (b) Stored in floppy (c) Store in CD
(d) Store in hard disk (e) None of these

37. Which of following groups have only input devices ?
(a) Mouse, Keyboard, Monitor (b) Mouse, Keyboard, Printer
(c) Mouse, Keyboard, Plotter (d) Mouse, Keyboard, Scanner
(e) None of these

38. Which of following groups have only output devices ?
(a) Scanner, Printer, Monitor (b) Keyboard, Printer, Monitor
(c) Mouse, Printer, Monitor (d) Platter, Printer, Monitor
(e) None of these

39. Any data and instruction entered in the memory of a computer is —
(a) Storage (b) Output (c) Input
(d) Information (e) None of these

40. To make the number pad act as a directional arrow, we press ..... .
(a) Num lock (b) Caps lock (c) Arrow lock
(d) Shift (e) None of these

41. Which key is used in combination with another key to perform a specific task ?
(a) Function (b) Spacebar (c) Arrow
(d) Control (e) None of these

42. Ctrl, Shift and Alt are called ..... keys.
(a) modifier (b) function (c) alphanumeric
(d) adjustment (e) none of these

43. The pattern of printed lines on most products are called ..... .
(a) prices (b) OCR (c) scanners
(d) bar codes (e) none of these

44. What type of device is a computer printer ?
(a) Input (b) Output (c) Software
(d) Storage (e) None of these

45. A scanner scans ..... .
(a) Pictures (b) Text
(c) Both picture and text (d) Neither picture nor text
(e) None of these

46. What would you do to highlight a word ? You position the cursor next to the word, and then .....
(a) Drag mouse while holding button down
(b) Click mouse once (c) Roll mouse around
(d) Roll and then click mouse (e) None of these

47. A ..... can make it easier to play games.
(a) mouse (b) joystick (c) keyboard
(d) pen (e) none of these

48. In MICR, C stands for ..... .
(a) Code (b) Colour (c) Computer
(d) Character (e) None of these

49. Soft copy is an intangible output, so then what is a hard copy ?
(a) The physical parts of the computer
(b) The printed parts of the computer
(c) The printed output
(d) The physical output device
(e) None of these

50. A printer is this kind of device—
(a) Input (b) Word Processing (c) Processing
(d) Output (e) None of these

51. The most common method of entering text and numerical data into a computer system is through the use of a—
(a) Keyboard (b) Scanner (c) Printer
(d) Pother (e) None of these

52. A keyboard is this kind of device—
(a) Black (b) Input (c) Output
(d) Word Processing (e) None of these

53. Which part of a computer displays the work done ?
(a) RAM (b) Printer (c) Monitor
(d) ROM (e) None of these

54. Codes consisting of bars or lines of varying widths or lengths that are computer readable are known as—
(a) An ASCII code (b) A magnetic tape (c) An OCR scanner
(d) a Bar code (e) None of these

55. Whenever we have to give space between the two words while typing on a PC we have to press a key known as—
(a) Backspace (b) Shift (c) Ctrl
(d) Escape (e) Space Bar

56. The ..... key and the ..... key can be used in combination with other keys to perform shortcuts and special tasks.
(a) Control, Alt (b) Function, toggle (c) Delete, insert
(d) Caps lock, num lock (e) None of these

57. Which type of device is the computer monitor ?
(a) Input (b) Output (c) Processing
(d) Software (e) None of these

58. Which of these keys is not on the number keypad ?
(a) Ctrl (b) Del (c) Enter
(d) Num Lock (e) None of these

59. The primary output device for computers is a ..... .
(a) Video monitor (b) Printer (c) Keyboard
(d) Mouse (e) None of these

60. ..... provides the means to move the pointer on the screen and give information to the computer by clicking its buttons.
(a) Scanner (b) Mouse (c) Keyboard
(d) Program (e) None of these

61. Soft copy refers to ..... .
(a) Printed output (b) Music sounds (c) Screen output
(d) Digitizing (e) None of these

62. Why is the Caps Lock key referred to as a toggle key ?
(a) Because its function goes back and forth every time it is pressed
(b) Because it cannot be used for entering numbers
(c) Because it cannot be used to delete
(d) Because it cannot be used to insert
(e) None of these

63. One puts information into the computer by pressing this key—
(a) Caps lock (b) Tab (c) Enter
(d) Esc (e) None of these

64. The key that must be pressed each time a new command or information is entered—
(a) Esc (b) Return/Enter (c) Delete
(d) Home (e) None of these

65. What term is used to describe using the mouse to move an item on the screen to a new location ?
(a) Click (b) Double-click (c) Drag and drop
(d) Point (e) Right-click

66. To select text by shading as you drag the mouse arrow over the text is referred to as ..... .
(a) Clip art (b) Highlight (c) Fetch
(d) Decode (e) None of these

67. A button that makes characters either upper or lower case and numbers to symbols—
(a) Monitor (b) Shift key (c) Icon
(d) Mouse (e) None of these

68. Pick the odd one—
(a) Mouse (b) Scanner (c) Printer
(d) Keyboard (e) None of these

69. Letters, numbers, and symbols found on a keyboard are ..... .
(a) Icon (b) Screen (c) Keys
(d) Menu (e) None of these

70. A piece of hardware that is used to enter information into the computer by using keys ..... .
(a) Keyboard (b) Monitor (c) Hard disk
(d) Icon (e) None of these

71. Capital letters on a keyboard are referred to as ..... .
(a) Caps lock key (b) Grownups (c) Big guys
(d) Upper case letters (e) None of these

72. Powerful key that lets you exit a program when pushed ..... .
(a) Arrow key (b) Space bar (c) Escape key
(d) Return key (e) None of these

73. Printed information called ..... exists physically and is a more permanent form of output than that presented on a display device—
(a) Soft copy (b) Carbon copy (c) Hard copy
(d) Desk copy (e) None of these

74. Moves the cursor one space to the right or puts spaces in between words ..... .
(a) Control key (b) Space bar (c) Printer
(d) Mouse (e) None of these

75. Use this when you want to make all letters capital without having to use the shift key for each character ..... .
(a) Shifter (b) Upper case (c) Caps lock key
(d) Icon (e) None of these

76. Devices that let the computer communicate with you .....
(a) Input (b) Output (c) Type
(d) Print (e) None of these

77. Devices that allow you to put information into the computer ..... .
(a) Input (b) Output (c) Type
(d) Print (e) None of these

78. Any letter, number, or symbol found on the keyboard that you can type into the computer ..... .
(a) Output (b) Character (c) Type
(d) Print (e) None of these

79. A key that will erase information from the computer's memory and characters on the screen ..... .
(a) Edit (b) Delete key (c) Dummy out
(d) Trust key (e) None of these

performing—
(a) active tab (b) insertion point (c) mouse pointer
(d) ribbon (e) none of these

81. You can use the tab key to ..... .
(a) move a cursor across the screen
(b) indent a paragraph
(c) move the cursor down the screen
(d) only (a) and (b)
(e) none of these

82. Information that comes from an external source and is fed into computer software is called ..... .
(a) Input (b) Output (c) Throughput
(d) Reports (e) None of these

83. Which keys enable the input of numbers quickly ?
(a) Function keys (b) The numeric keypad
(c) Ctrl, shift and alt (d) Arrow kevs
(e) None of these

84. You use a(n) ..., such as a keyboard or mouse, to input information.
(a) storage device (b) processing device (c) input device
(d) output device (e) None of these

85. A(n) ... camera is a peripheral device used to capture still images in a digital format that can be easily transferred into a computer and manipulated using graphics software.
(a) digital (b) analog (c) classic
(d) film (e) None of these

86. Digital photos and scanned images are typically stored as ... graphics with extensions such as .bmp, .png, .jpg, .tif, or .gif.
(a) vector (b) bitmap
(c) either vector or bitmap (d) neither vector nor bitmap
(e) None of these

87. OCR stands for ..... .
(a) Optical Character Recognition (b) Optical CPU Recognition
(c) Optimal Character Rendering (d) Other Character Restoration
(e) None of these

88. Which device is used as the standard pointing device in a Graphical User Enviroment ?
(a) Keyboard (b) Mouse (c) Joystick
(d) Track ball (e) None of these

89. Which of the following is not an output device ?
(a) Plotter (b) Printer (c) Monitor
(d) Touch Screen (e) None of these

90. The arrow keys can be used to .....
(a) delete text
(b) move the cursor in the text that has already been entered
(c) save the document
(d) move the cursor while deleting text
(e) None of these

91. What is a keyboard used for ?
(a) Input text and numbers and send commands to the computer
(b) To create new keys to use with your computer
(c) To open the computer up
(d) To create pictures and images and send them to your computer
(e) None of these

92. What are the speakers attached to your computer used for ?
(a) Displaying images (b) Sending messages (c) Storing messages
(d) Handling sound and music (e) None of these

93. The mouse ... usually appears in the shape of an arrow.
(a) indicator (b) marker (c) meter
(d) pointer (e) None of these

94. The most common storage device for the personal computer is the ...
(a) floppy disk (b) USB thumb drive (c) zip disk
(d) hard disk drive (e) pen drive

95. Which of the following could be digital input devices for computers ?
(a) Digital camcorder (b) Microphone (c) Scanner
(d) All of the above (e) None of these

96. A sales clerk at a checkout counter scanning a tag on an item rather than keying it into the system, is using ...
(a) input automation (b) item data automation
(c) scanning automation (d) source data automation
(e) None of these

97. If you open a menu and then decide you don't want to select an option after all, click the menu title again or press the ... key to close the menu.
(a) Shift (b) Tab (c) F1
(d) Esc (e) None of these

98. A key that will erase information from the computer's memory and characters on the screen ..... .
(a) edit (b) delete key (c) dummy out
(d) trust key (e) esc key

99. A ..... is often used to select or highlight.
(a) icon (b) keyboard (c) hard disk
(d) floppy disk (e) mouse

100. Mr. X has no printer to print his report. He wants to take it to Mr. Y's computer because Mr. Y has a printer. Mr. X could save his report on a ..... .
(a) hard drive (b) piece of paper (c) scanner
(d) monitor (e) floppy disk

101. The most frequently used piece of hardware for inputting data is the ..... .
(a) keyboard (b) floppy disk (c) cursor
(d) software (e) hardware

102. The ..... may also be called the screen or monitor.
(a) printer (b) scanner (c) hard disk
(d) software (e) display

103. In a computer which device is functionally opposite to a keyboard
(a) Joystick (b) Trackball
(c) Mouse (d) Printer

104. Devices that enter information and let you communicate with the computer are called .....
(a) Software (b) Output devices (c) Hardware
(d) Input devices (e) Input/output devices

105. Which of the following does not relate to input unit ?
(a) It accepts data from the outside world
(b) It converts data into binary code that is understandable by the computer
(c) It converts binary data into the human readable form that is understandable to the users
(d) It sends data in binary form to the computer for further processing
(e) None of these

106. Which of these is a point-and-draw device ?
(a) Mouse (b) Scanner (c) Printer
(d) CD-ROM (e) Keyboard

107. Which of the following software could assist someone who cannot use their hands for computer input ?
(a) Video conferencing (b) Speech recognition (c) Audio digitizer
(d) Synthesizer (e) None of these

108. A ..... is used to read handwritten or printed text to make a digital image that is stored in memory.
(a) Printer (b) Laser beam (c) Scanner
(d) Touch pad (e) None of these

109. A joystick is primarily used to/for .....
(a) Print text (b) Computer gaming (c) Enter text
(d) Draw pictures (e) Control sound on the screen

110. The first computer mouse was built by—
(a) Douglas Engelbart (b) William English
(c) Oaniel Coogher (d) Robert Zawacki

Answers

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

★★★

04

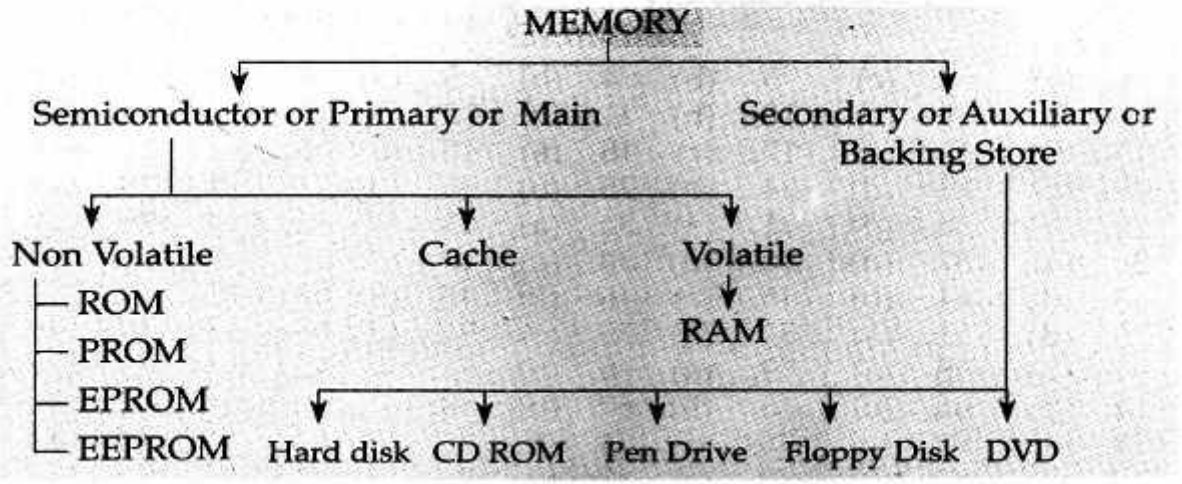
Memory

Computer memory refers to the devices that are used to store data or programs on a temporary or permanent basis for use in a computer. Any data or instruction entered into the memory of a computer is considered as storage. It is one of the fundamental components of all modern computers coupled with a central processing unit. For central processing unit to process the input data, there must be a place for storing the data and instruction. This is provided in the memory unit.

Data representation

The memory unit of the CPU consists of a large number of cells called location. Each location is identified with a unique label called an address, which is used to store data or instruction. The CPU keeps track of all data and program instructions through the use of memory address. Computers represent information in binary code, written as sequences of 0s and 1s. '1' represents an on state and '0' represents an off state in a circuit. To store data in location is called 'Write' and fetch the data in location is called 'Read'. Each location can contain fixed number of bits called word length. Word length can be 8, 16, 32 or 64 bits. Bit is smallest unit of binary digit. A word is an arrangement of binary digits. A byte is the unit of memory which is a group of 8 bits in EBCDIC (Extended Binary Coded Decimal Interchange Code) and 7 bits in ASCII (American Standard Code for Information Interchange).

Types of Memory



Memory usually refers to a form of semi conductor storage known as Random-Access Memory (RAM) and sometimes other forms of fast but temporary storage. It is a place in the computer system where data and programs are temporarily stored in internal storage areas in the computer The term memory identifies data storage that comes in the form of chips

Similarly, storage today more commonly refers to mass storage such as optical discs, forms of magnetic storage such as hard disk drives, and other types slower than RAM, but of a more permanent nature. The primary device that a computer uses to store information is hard drive. Memory and storage were respectively called main memory and secondary storage. The terms internal memory and external memory are also used. Storage and memory differ with respect to price reliability and speed.

Primary or Main Memory or Semi conductor Memory or Internal Memory

Computer memory usually refers to the semi conductor technology that is used to store information in electronic devices. Current primary computer memory makes use of IC consisting of silicon-based transistors.

There are two main types of memory

Volatile and Non-volatile. Volatile memory is computer memory that requires power to maintain the stored information, unlike Non-volatile memory which does not require a maintained power supply.

Volatile Memory

RAM (Random Access Memory) : It is a volatile memory. It is the most common type of memory used in computer. It works with the CPU to hold instructions and data in order to be processed. It is the first place where data and instructions are placed after being input, and processed information is placed in it to be returned to an output device. But it can hold data only temporarily because it requires a continuous flow of electrical current. If current is interrupted, data is lost. It allows data to be read and written randomly not in sequence, so read and write of data is bit quickly. RAM is available in 64 MB, 128 MB, 256MB, 512MB and 1GB capacity.

There are two types of RAM: Dynamic RAM and Static RAM.

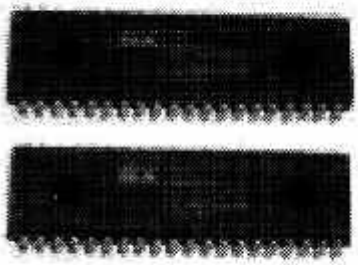
(a) Dynamic RAM : It requires constant refreshing of its contents. It loses its content in a very short period even though computer is working. It is cheapen than static RAM (SRAM).

(b) Static RAM : It does not require refreshing. It retains its content till computer is working. It is fasten than dynamic RAM (DRAM).

Cache Memory : Cache is a faster, costlier and a temporary storage area where frequently accessed data can be stored. Once the data is stored in the cache, it can be used in the future by accessing the cached copy rather than recomputing the original data: The CPU and hard drive frequently use a cache. When the processor needs to read from or write to a location in main memory, it first checks whether a copy of that data is in the cache. If so, the processor immediately reads from or writes to the cache, which is much faster than reading from or writing to main memory.

Main Memory → Cache Memory → CPU

Non Volatile Memory



ROM (Read Only Memory) : It is a non volatile memory. Data and instructions stored in it which can be read, only modified or destroyed. It is commonly used for storing program instructions that are not required to change. It is an internal storage area in the computer. It is a silicon chip on motherboard on which instructions are burned at the time of manufacture. When switched on, the computer instruction stored there is automatically initiated and after switching off instructions do not get lost. These permanent instruction stored in ROM are called BIOS (Basic Input Output System). On computer the BIOS contains all the instruction required to control the keyboard, display screen, disk drives, serial communication and number of miscellaneous functions. The BIOS is copied from ROM to RAM each time the computer is booted. This is known as shadowing.

In computing **firmware** is the combination of read-only memory and program code pre-installed and data stored in it. Firmware is a combination of software and hardware. Typical examples of devices containing firmware are embedded systems, computers, computer peripherals, mobile phones, and digital cameras. The firmware contained in these devices provides the control program for the device. Computer chips that have data or programs recorded on them are firmware. Firmware is held in non-volatile memory devices such as ROM, PROM, EPROM, or flash memory.

PROM (Programmable Read Only Memory) : It is a non volatile memory. In PROM instructions can burn once, then it is unalterable. After that it behaves like ROM.

EPROM (Erasable Programmable Read Only Memory) : It is a non volatile (memory) similar to PROM , but the burning process is reversible by exposure to ultraviolet light. It can be erased by exposure to strong ultraviolet light, then rewritten. It is also called ultraviolet EPROM.

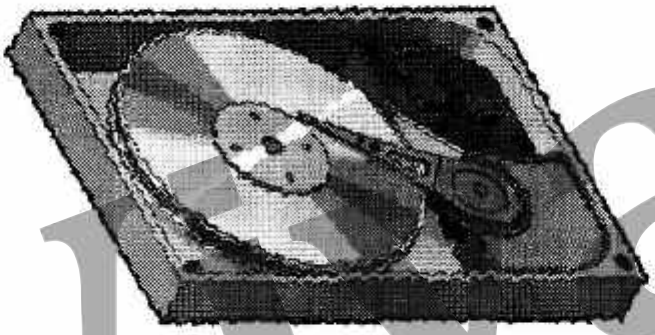
EEPROM (Electrically Erasable Programmable Read Only Memory): It is a non volatile similar to EPROM , but the burning process is reversible by exposure to electric pulses. It can be electrically erased, then rewritten electrically. So that they need not be removed from the computer.

Secondary or Auxiliary Memory

The main memory is volatile and limited in capacity so there is a need to store data in a more permanent and cheaper form. Such kind of storage is known as secondary memory. It is also known as auxiliary or backing store memory. Secondary storage does not loose data when the device is powered off. It is non-volatile. Data that is not currently required by the CPU is kept in backing store and copied into main storage when needed. The operating system retrives data from secondary storage in same block size called pages. The most common storage media used as backing store is magnetic tape and magnetic disk. It differs from primary storage because it is not directly accessible by the CPU.

1. **Hard Disk :** A hard disk is a magnetic disk which stores and provides relatively quick access to large amounts of data. It provides higher capacity and greater reliability than other types of disk drives. A hard disk is really a set of several stacked platters. Each of these looks like an old song record

All platters are mounted on a vertical shaft forming a disk pack. Both surfaces of the platters in a pack are used for recording except for the top and bottom platters. The top and bottom platters have data recorded only on their inner surfaces. Each platter requires two read and write heads, one for each side. Data is recorded on concentric rings on the surface of the platters called tracks. Each platter has the same number of tracks. Each track is subdivided into sectors and each sector stores a fixed amount of data. The process of dividing a disk into tracks and sectors is called formatting. Thus the operating system can store and locate data and information on the disk. Read/write head can read and write data direct to any track, so access or writing of data becomes very fast. It is sealed into a single module with the read/write heads so it is protected from the environment and any scratches. Often it is called C drive in computer. All programs and data of computer are installed in hard disk. Today's computers are available with a hard disk capacity 10 GB, 20 GB, 40 GB, 80 GB.



2. **Floppy Disk :** It is a soft removable magnetic disc that holds information. The disk is enclosed in an envelope to protect it from dust and scratches. Data is retrieved or recorded on the surface of the disk through a slot on the envelope. On most disk drives, the read/write head is in physical contact with the disk surface. After reading and writing the head lifts away to reduce any harm to disk. It is slower to access than hard disks and has less storage capacity, but it is much less expensive. And most important, they are portable and most popular form of backing store. It is an external memory.

Floppy Disks come in three basic sizes :

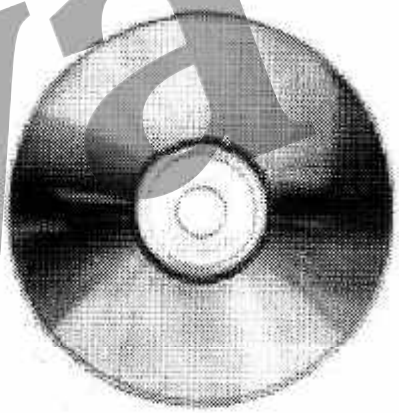
(i) **8-inch** : The first floppy disk design. The typical desktop/laptop computer does not use the 8-inch floppy disk.

(ii) **5¼-inch** : The common size for personal computer and the predecessor to the 8-inch floppy disk. It is generally capable of storing between 100K and 1.2MB of data. The most common sizes are 360K and 1.2MB.

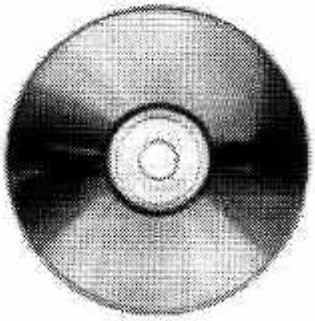
(iii) **3½-inch** : Floppy is encased in a rigid envelope.

3. Magnetic Tape : This is the most successful backup storage media. Storage of data in magnetic tape is similar to the cassette tape that we use for the storage and recording of music. It is made of mylar or polyester. It is generally 2400 to 3600 feet long and half an inch wide. The amount of data that can be stored on magnetic tape is enormous in comparison to punched cards and paper tapes. It can be re-used for storing the data by writing, modifying and erasing the old data. Magnetic tape drive is needed for reading and writing data in magnetic tape. All magnetic tape drives have two tape reels. The one reel containing the tape to be read and write is called file reel and the other is called take up reel.

4. CD-ROM (Compact Disc Read Only Memory) : CD-ROM is also called optical disk capable of storing large amounts of data up to 1GB, although the most common size is 650MB. Data is recorded permanently on the surface of the optical disk through the use of laser. The laser burns the hole on the surface of the disk at the time of manufacture and the content recorded cannot be changed or erased by users. A laser beam of low intensity is used to read the data recorded on the disk. To access the data from the CD, CD-Drive and to write the data on the CD, CD-Writer is needed. It is also called WORM (Write Once Read Many) disk because data can be read many times from CD but any modification is not possible. Erasable optical disks are also available. CD-ROM are particularly well-suited to information that requires large storage capacity. This includes large software applications that support color, graphics, sound, and video.



5. CD-R/W (Compact Disc Read / Write) : CD-R/W is also an optical disk. Data is recorded on the surface of the optical disk through the use of laser but it can be erased. To access the data from the CD, CD-R/W drive is needed.



6. DVD : DVD stands for Digital Versatile Disk or Digital Video disk. It's working technique is like a CD-ROM. It is single or double sided and each side can store one or two layers of data. It stores minimum 4.37 GB data or full movie of very good quality DVD-Video, including several audio tracks in formats like stereo, Dolby Digital and also advanced menu systems, subtitles and still pictures . It can be played by DVD Players and most computer DVD-ROM. Double sided and double layered DVD can store 17 GB audio and video.

7. Pen Drive : It looks like small key ring. Most pen drives use a standard USB (Universal Serial Bus) connection allowing plugging into a port on a personal computer. USB pen drive emulates a small disk drive and allows data to be transferred easily from one device to another. The way it works is very simple. It also works very fast. It consists of flash memory data storage device integrated with a USB interface. It is typically removable and rewritable. Since it is a relatively new device, storage capacities can range from 64 MB to 256 GB. It is also called Flash drive. It is an example of EEPROM memory. The common use of USB pen drive is to transport personal data or store personal files such as documents, pictures and video. One can also store medical alert information for emergency use or as preparation against disaster.

8. Flash Memory : It is sometimes called flash RAM. It is a non volatile computer storage that can be electrically erased and reprogrammed. It is used in cellular phone, digital camera and digital set top box etc.

Objective Question

1. Typical acronym of reuseable optical storage will be ..... .
   (a) CD (b) CD–RW (c) DVD
   (d) RPM (e) None of these
2. Storage which stores or retains data after power off is called—
   (a) Volatile storage (b) Non-volatile storage
   (c) Sequential storage (d) Direct storage
   (e) None of these
3. Data gathering in computer means, they allow to use ..... data.
   (a) Present (b) Input (c) Output
   (d) Store (e) None of these
4. A permanent memory, which halls data and instruction for start-up the computer and does not erase data after power off.
   (a) Network interface card (b) CPU
   (c) RAM (d) ROM
   (e) None of these
5. The process to copy the software in hard disk from secondary storage media is called—
   (a) Configuration (b) Download (c) Storage
   (d) Upload (e) Escalation
6. Which of the following memories must be refreshed many times per second ?
   (a) EPROM (b) ROM
   (c) Static RAM (d) Dynamic RAM
7. When we work on any document on PC, it is stored temporarily on—
   (a) RAM (b) ROM (c) CPU
   (d) Flash memory (e) CD-ROM

8. USB – type storage device is—
   (a) Secondary (b) Anxillary
   (c) Tertiary (d) Primary
9. The faster, costlier and relatively small form of storage managed by computer system hardware is :
   (a) Main Memory (b) Flash Memory
   (c) Cache (d) Disk
10. Permanent instructions that the computer uses when it is turned on and that can not be changed by other instructions are contained in—
   (a) ROM (b) RAM
   (c) REM (d) None of these
11. Which of the following medium is used between CPU & RAM to speed up the processing power of a CPU ?
   (a) Virtual Memory (b) D RAM
   (c) Flash Memory (d) Cache Memory
12. Main memory of computer is—
   (a) Internal (b) External (c) (a) and (b) both
   (d) Auxiliary (e) None of these
13. Breaking logical memory into blocks of the same size is called as :
   (a) Frames (b) Segments
   (c) Packets (d) Pages
14. The contents of memory will not loose, when the power goes off in .....
   (a) ROM (b) EPROM
   (c) EEPROM (d) All of above
15. Which one is random access memory—
   (a) RAM (b) ROM (c) P–ROM
   (d) All of these (e) None of these
16. What is the permanent memory built into your computer called ?
   (a) RAM (b) ROM (c) CPU
   (d) CD-ROM (e) None of these
17. Where, data will remain intact even when the computer is turned off ?
   (a) RAM (b) Mother board
   (c) Secondary storage device (d) Primary storage device
   (e) None of these
18. With a CD you can ..... .
   (a) read (b) write (c) read and write
   (d) either read or write (e) none of these
19. For permanent memory in computer objects used are—
   (a) Floppy disc (b) Magnetic tape (c) Hard disc
   (d) Optical disc (e) All of these
20. RAM is a ..... memory—
   (a) external (b) auxiliary (c) internal
   (d) main (e) none of these
21. What is the capacity of super computers floppy disc ?
   (a) 400 M (b) 500 M (c) 600 M
   (d) 700 M (e) None of these
22. Hard disc drives are considered ..... storage—
   (a) Flash (b) Non-volatile (c) Temporary
   (d) Non-permanent (e) None of these

23. Built in memory of computer is ..... .
(a) EROM (b) ROM (c) RAM
(d) PROM (e) E REM

24. Flash is ..... .
(a) Software (b) Hardware (c) ROM
(d) RAM (e) None of these

25. In the following which is not RAM ?
(a) Flash (b) D–RAM (c) S–RAM
(d) P–RAM (e) None of these

26. Internal storage is ..... storage.
(a) Primary (b) Secondary (c) Auxiliary
(d) Virtual (e) None of these

27. In computer dictionary letters CD are used for—
(a) Compact disc (b) Compressed disc (c) Computerised data
(d) Compressed data (e) None of these

28. In which memory is data lost by power off ?
(a) Disc (b) RAM (c) Floppy
(d) CD (e) None of these

29. CD is an ..... memory—
(a) internal (b) external (c) auxiliary
(d) a and b (e) none of these

30. ..... is not a type of RAM—
(a) Megabyte (b) 64 Megabyte (c) 574 Megabyte
(d) 32 Megabyte (e) None of these

31. CD ROM is used—
(a) To read compact disc (b) To listen to music (c) In any software
(d) To central digital information (e) None of these

32. Which computer memory is used for storing programs and data currently being processed by the CPU ?
(a) Mass memory (b) Internal memory (c) Non-volatile memory
(d) PROM (e) None of these

33. Unit of storage capacity—
(a) Byte (b) Bit (c) Bug
(d) Cubic meter (e) None of these

34. By firmware we understand .....
(a) Physical equipment used in a computer system
(b) A set of instructions that causes a computer to perform one or more tasks
(c) The people involved in the computing process
(d) A set of programs that it pre-installed into the read only memory of a computer during the time of manufacturing
(e) None of these

35. Computer hardware which stores large volume of data is called—
(a) Magnetic tape (b) Disc (c) a and b both
(d) All of These (e) None of these

36. The word 'memory' is related to ..... .
(a) Logic (b) Control (c) Input
(d) Storage (e) None of these

37. The content of ..... are lost when the computer is turned off,
(a) Storage (b) Input (c) Output
(d) Memory (e) None of these

38. The most common type of storage devices are—
(a) Persistent (b) Optical (c) Magnetic
(d) Flash (e) None of these

39. A disk's content that is recorded at the time of manufacture and that cannot be changed or erased by the user is—
(a) Memory only (b) Write only (c) Read only
(d) Run only (e) None of these

40. Any data or instructions naturel into memory of a computer is considered as ..... .
(a) storage (b) output (c) input
(d) information (e) none of these

41. CDs are of which shape ?
(a) Square (b) Rectangular (c) Round
(d) information (e) None of these

42. The instructions for starting the computer are housed in—
(a) RAM (b) CD-ROM (c) ROM chip
(d) All of these (e) None of these

43. Where is data saved permanently ?
(a) Memory (b) Storage (c) CPU
(d) Printer (e) None of these

44. A(n) ..... uses laser technology to store large amount of information—
(a) Floppy disk (b) CD-ROM (c) Hard disk
(d) ED–ROM (e) None of these

45. RAM is used as a short memory because it is ..... and ..... .
(a) volatile, temporary (b) nonvolatile, permanent
(c) nonvolatile, temporary (d) volatile, permanent
(e) none of these

46. A CD-ROM disk ..... .
(a) cannot be erased and rewritten
(b) has more storage capacity than a CD-R
(c) holds less data than a floppy disk
(d) can be written only once
(e) none of these

47. How is it possible that both programs and data can be stored on the same floppy disk ?
(a) A floppy disk has two sides, one for data and one for programs
(b) Programs and data are both software, and both can be stored on any memory device
(c) A floppy disk has to be formatted for one or for the other
(d) Floppy disks can only store data, not programs
(e) None of these

48. Secondary storage ..... .
(a) does not require constant power
(b) does not use magnetic media
(c) consists of four main types of devices
(d) does not store information for later retrieval
(e) none of these

49. The place where the computer stores programs and data is called—
(a) Memory (b) Storehouse (c) Storage unit
(d) Backup (e) None of these

50. During processing data, programs, and processed information are held temporality in .....
(a) Secondary storage (b) ROM (c) RAM
(d) CPU (e) None of these

51. A flat metallic disk that contains a large amount of permanently stored information read optically is called a ..... .
(a) Monitor (b) ALU (c) CD-ROM
(d) RAM (e) None of these

52. Which type of memory holds only the program and data that the CPU is presently processing ?
(a) CMOS (b) ROM (c) RAM
(d) ASCII (e) None of these

53. What characteristic of read-only memory (ROM) makes it useful ?
(a) ROM information can be easily updated
(b) Data in ROM is nonvolatile, that is, it remains there even without electrical power
(c) ROM provides very large amounts of inexpensive data storage
(d) ROM chips are easily swapped between different brands of computers
(e) None of these

54. To put information in a file on a magnetic disk, or in a computer's memory, so that it can be used later ..... .
(a) Store (b) Ship (c) Shift
(d) Centre (e) None of these

55. A place in the computer system where data and programs are temporarily stored ..... .
(a) Paste (b) Open (c) Memory
(d) Pocket (e) None of these

56. A removable magnetic disc that holds information ..... .
(a) Floppy disk (b) Hard drive (c) Monitor
(d) Portable (e) None of these

57. The primary device that a computer uses to store information ..... .
(a) TV (b) Storehouse (c) Desk
(d) Hard drive (e) None of these

58. All of the following storage media have read and write capabilities except ..... .
(a) Flash memory cards (b) CD-ROMs (c) Hard disk drives
(d) Floppy disks (e) None of these

59. ..... is the process of dividing the disk into tracks and sectors.
(a) Tracking (b) Formatting (c) Crashing
(d) Allotting (e) None of these

60. Saving is the process of—
(a) Copying a document from memory to a storage medium
(b) Making changes to a document's existing content
(c) Changing the appearance, or overall look, of a document
(d) Developing a document by entering text using a keyboard
(e) None of these

61. The term ... refers to data storage systems that make it possible for a computer or electronic device to store and retrieve data.
(a) retrieval technology (b) input technology
(c) output technology (d) storage technology
(e) None of these

62. ..... is the maximum amount of data that can be stored on a storage medium.
(a) Magnetic storage (b) Optical storage (c) Solid-state storage
(d) Storage capacity (e) None of these

63. Which of the following can only have sequential access ?
(a) Disk (b) Tape (c) CD-ROM
(d) DVD-ROM (e) None of these

64. When you save to ....., your data will remain intact even when the computer is turned off.
(a) RAM (b) mother board
(c) secondary storage device (d) primary storages device
(e) None of these

65. A CD-RW disk ..... .
(a) has a faster access than an internal disk
(b) is a form or optical disk, so it can only be written once
(c) holds less data than a floppy disk
(d) can be erased and rewritten (e) None of these

66. Which device can understand difference between data and programs?
(a) Input device (b) Output device (c) Memory
(d) Microprocessor (e) None of these

67. Which of the following devices have a limitation that we can only read it but can not erase or modify it ?
(a) Tape drive (b) Hard disk (c) Compact disk
(d) Floppy disk (e) None of these

68. Which of the following is the storage area within the computer itself which holds data only temporarily as the computer processes instructions?
(a) the hard disk (b) main memory (c) the control unit
(d) read-only memory (e) None of these

69. If a memory chip is volatile, it will ..... .
(a) explode if exposed to high temperatures
(b) lose its contents if currents it turned off
(c) be used for data storage only
(d) be used to both read and write data
(e) None of these

70. What characteristic of read-only memory (ROM) makes it useful ?
(a) ROM information can be easily updated
(b) Data in ROM is nonvolatile, that is, it remains there even without electrical power
(c) ROM provides very large amounts of inexpensive data storage
(d) ROM chips are easily swapped between different brands of computers
(e) None of these

71. A DVD is an example of a (n) ..... .
(a) hard disk (b) optical disc (c) output device
(d) solid-state storage device (e) None of these

72. Which of the following are advantage of CD-ROM as a storage media ?
(a) CD-ROM is an inexpensive way to store large amount of data and information
(b) CD-ROM disks retrieve data and information more quickly than magnetic disks do
(c) CD-ROMs make less errors than magnetic media
(d) All of these (e) None of these

73. Storage and memory differ with respect to which of the following characteristics ?
(a) Price (b) Reliability (c) Speed
(d) All of these (e) None of these

74. Which media have the ability to have data / information stored (written) on them by users more than once ?
(a) CD-R disks (b) CD-RW disks (c) Zip disks
(d) Optical Disks (e) Both CD-RW disks and Zip disks

75. Storage media such as a CD read and write information using ..... .
(a) a laser beam of red light (b) magnetic dots
(c) magnetic strips (d) All of these (e) None of these

76. Cache and main memory will lose their contents when the power is off. They are ..... .
(a) dynamic (b) static (c) volatile
(d) non-volatile (e) faulty

77. Which of the following is a storage devices that uses rigid, permanently installed magnetic disks to store data / information ..... .
(a) floppy diskette (b) hard disk (c) permanent disk
(d) optical disk (e) None of these

78. Which of the following is an example of storage devices ?
(a) Magnetic disks (b) Tapes (c) DVDs
(d) All of these (e) None of these

79. Which of the following is an example of an optical disk ?
(a) Digital versatile disks (b) Magnetic disks
(c) Memory disks (d) Data bus disks (e) None of these

80. The main memory of a computer can also be called ...
(a) primary storage (b) internal memory (c) primary memory
(d) all of these (e) None of these

81. ..... is the process of dividing the disk into tracks and sectors.
(a) Tracking (b) Formatting (c) Crashing
(d) Allotting (e) Dicing

82. A disk's content that is recorded at the time of manufacture and that cannot be changed or erased by the user is ..... .
(a) memory-only (b) write-only (c) read-only
(d) run-only (e) non-changeable

83. This is a permanent storage device ..... .
(a) floppy disk (b) monitor (c) RAM
(d) cache (e) hard disk

84. The space in your computer that loads and works with data ..... .
(a) cache memory (b) CPU (c) megabyte
(d) RAM memory (e) ROM memory

85. What part of the computer provides only temporary storage of files ?
(a) ROM memory (b) RAM memory (c) hard drive
(d) mother board (e) processor

86. What does RAM stand for ?
(a) Read Access Memory (b) Read Anywhere Memory
(c) Random Anything Memory (d) Random Access Module
(e) Random Access Memory

87. What type of device is a 3½ inch floppy drive ?
(a) Input (b) Output (c) Software
(d) Storage (e) None of these

88. Which of the following memory chip is faster ?
(a) There is no certainty (b) DRAM (c) SRAM
(d) DRAM is faster for larger chips (e) None of these

89. Which is not a storage device ?
(a) A CD (b) A DVD (c) A floppy disk
(d) A printer (e) A Hard disk

90. Which of the following is *not* a secondary storage unit ?
(a) RAM (b) DVD (c) Floppy
(d) Magnetic tape

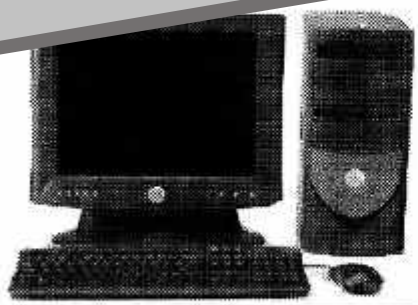
91. The file system resides permanently on ..... storage.
(a) Primary (b) Secondary
(c) Device (d) Direct memory

92. DVD is—
(a) Digital Video Disk (b) Dynamic Versatile Disk
(c) Digital Versatile Disk (d) Dynamic Video Disk

Answers

1.	(b)	2.	(b)	3.	(d)	4.	(d)	5.	(e)	6.	(d)	7.	(a)
8.	(a)	9.	(c)	10.	(a)	11.	(d)	12.	(a)	13.	(d)	14.	(d)
15.	(a)	16.	(b)	17.	(c)	18.	(a)	19.	(e)	20.	(d)	21.	(b)
22.	(b)	23.	(b)	24.	(d)	25.	(d)	26.	(a)	27.	(a)	28.	(b)
29.	(c)	30.	(c)	31.	(a)	32.	(b)	33.	(a)	34.	(d)	35.	(c)
36.	(d)	37.	(d)	38.	(c)	39.	(c)	40.	(a)	41.	(c)	42.	(c)
43.	(b)	44.	(b)	45.	(a)	46.	(a)	47.	(b)	48.	(a)	49.	(c)
50.	(c)	51.	(c)	52.	(c)	53.	(b)	54.	(a)	55.	(c)	56.	(a)
57.	(d)	58.	(b)	59.	(b)	60.	(a)	61.	(d)	62.	(d)	63.	(b)
64.	(c)	65.	(d)	66.	(d)	67.	(c)	68.	(b)	69.	(b)	70.	(b)
71.	(b)	72.	(a)	73.	(d)	74.	(b)	75.	(a)	76.	(c)	77.	(b)
78.	(d)	79.	(a)	80.	(d)	81.	(b)	82.	(c)	83.	(e)	84.	(d)
85.	(b)	86.	(e)	87.	(d)	88.	(c)	89.	(d)	90.	(a)	91.	(b)
92.	(c)												

★★★



05

Personal Computer

Introduction

A personal computer (PC) is a general-purpose computer which is designed for personal uses. Its size, capabilities, and low cost make it useful for individuals. A personal computer may be a desktop, a laptop, tablet or a palmtop. It is based on microprocessor technology. Software applications for personal computers include word processing, accounting, spreadsheet, databases, web browsers and e-mail, games and special-purpose software. Modern personal computers often have high-speed or dial-up connections to the Internet, allowing access to the Internet and a wide range of other resources. A PC may be used at home, or may be found in an office. Personal computers can be connected to a LAN (Local Area Network) either by a cable or wireless.

Development of Personal Computer

Personal Computers were made possible by two technical innovations in the field of microelectronics viz. the integrated circuit (IC), which was developed in 1959 and the microprocessor, which first appeared in 1971. The IC permitted the miniaturization of computer-memory circuits, and the microprocessor reduced the size of a computer's CPU to the size of a single silicon chip. The first complete personal computer was the Commodore PET introduced in January 1977. It was soon followed by the popular Apple II. In 1981, IBM (International Business Machine) introduced its own microcomputer model, the IBM PC. IBM PC was the most popular personal computer.

Parts of A Personal Computer

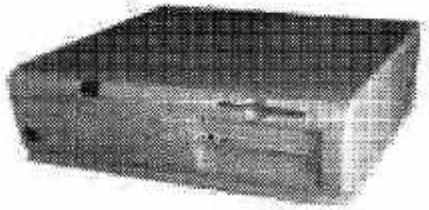
A personal computer isn't a single part called the "computer." A computer is a system that has many parts working together and each part has a special function.

1. System Unit: The system unit is the main part of a computer system. It is a rectangular box placed on or under your desk that houses the important parts of a computer system. It includes the motherboard, microprocessor, main memory, bus, and ports, but does not include the keyboard, monitor, or any peripheral devices. Inside this box are the microprocessor, disc drives and other elements that work together to do the actual computing. The most important of these components is the central processing unit (CPU), or microprocessor, which acts as the "brain" of computer. Another component is random access memory (RAM), which temporarily stores information that the CPU uses while the computer is on. The information stored in RAM is erased when the computer is turned off. All these functions are

controlled by software which makes it possible for us to use computers. Almost every other part of computer such as keyboard, monitor, mouse and printer connects to the system unit using cables. The cables plug into specific ports, typically on the back of the system unit. Hardware that is not part of the system unit is sometimes called a peripheral device.

There are two types of system unit

(a) Desktop Type System unit : The desktop type system unit is a square box shaped structure which can lie flat on the desk or table and the monitor is usually placed on the system unit.



(b) Tower type System unit : This is another type of system unit. This type of system unit is vertically placed on the side of the monitor. The tower models are mostly used at homes and offices.

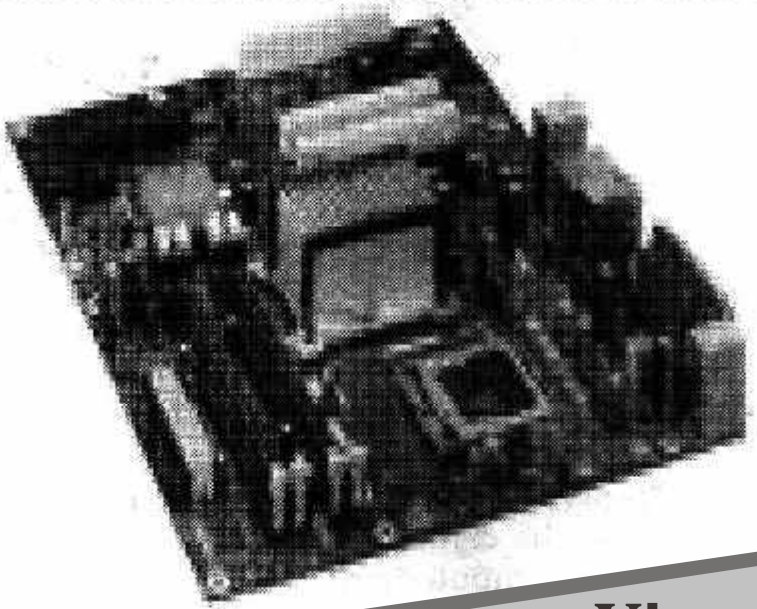
Main Parts of System Unit

(i) CPU : CPU is the most important part of a computer, where actual processing takes place. It is the brain behind all personal computers. It is also referred to as a processor or microprocessor.

Following are the various type of CPU chips

Intel Pentium	AMD Athlon
Intel Pentium Pro	AMD Celeron
Intel Pentium III	AMD Duron
Intel Pentium IV	Cyrix

(ii) Motherboard : The motherboard is a flat circuit board on which fiber like structures of metal connecting pins are mounted. These pins connect components to each other through which data, instruction and informations are transferred. These fiber like structures of metal or electronic path are called bus. The motherboard is the main circuit board of a computer on which the processor, video card, sound card, IDE hard drive, etc. are all



plugged into the various slots and connectors. The CPU also plugs into the motherboard through a Socket or a Slot. On most computers, it is possible to add memory chips directly to the motherboard. We can also upgrade to a faster PC by replacing the CPU chip. To add additional core features, we may need to replace the motherboard entirely.

(iii) RAM : This is where our computer keeps the information it is using at the moment. RAM stands for Random Access Memory, and information is kept here only as long as it is needed by the application running on the computer.

(iv) RAM Chip Slots : These slots are meant to expand the computer's memory by adding RAM Chips.

(v) ROM : It is a silicon chip on motherboard on which instructions are burned at the time of manufacture. When computer is switched on, instruction stored is automatically initiated and after switching it off instructions do not get lost.

(vi) Math Co-processor Slot : Some Personal computers have a slot where Math Co- processor can be inserted. This processor assists the CPU in performing its mathematical operations.

(vii) Video Card : A video card is also called video adapter, graphics-accelerator card, display adapter or graphics adapter or graphics card. Its function is to generate an output image to a display.

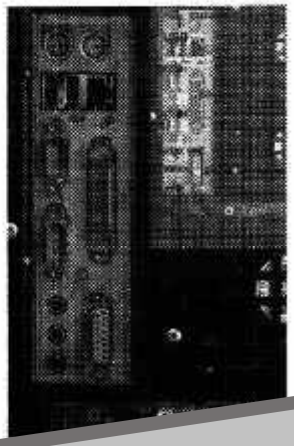
(viii) Sound Card : This card enables us to play sound and music. The sound card converts the digital information into electrical signals.

(ix) Power Supply : A power supply unit (PSU) is the component that supplies power to other components in a computer. A power supply unit is typically designed to convert AC from the mains to DC power for the different components of the computer. Most components require 5 volt while the floppy and hard disk require about 12 volts.

(x) Internal Speaker : It is a speaker on the computer motherboard that is responsible for beeps, beeping noises and other tones. This speaker is very basic and is not a speaker for playing songs, music, or other complex sounds generated in a game.

(xi) Timer : It is an internal clock on the motherboard which is battery operated.

(xii) Expansion Slot : It is a long narrow connector which allow us to plug in expansion card like the sound card, network card etc. The primary purpose of an expansion card is to provide or expand on features not offered by the motherboard. The back side of system unit have ports and jacks to connect different accessories. They are given below.



(1) Power Socket
(2) Keyboard Port
(3) Monitor Port
(4) Serial Port
(5) Parallel Port
(6) Audio Jack
(7) Network Port
(8) USB (Universal Serial Bus Port)
(9) SCSI (Small Computer System Interface) Port

2. Hard Disk : It is a hardware device which stores all programs and data in the computer. So it is referred to as the memory bank of a computer. It is a permanent memory. So programs and data are not lost when the computer is turned off. Larger the hard disk capacity, more the amount of programs and data that can be stored in it. In nearly all cases, it is permanently installed in the system unit and stores both the software the computer uses and the data files the user creates.

3. CD Drive : CD drive is a device that enables us to read and store the information on CD disks. It is usually located on the front of the system unit. CD drives use lasers to read data from a CD.

4. Floppy disk drive : Floppy disk drive is a device that enables us to read and store the information on floppy disks, also called floppies or diskettes. They also retrieve information more slowly and are more prone to damage.

5. Monitor : It is the part of the computer that looks like a small TV and shows you what is going on. Usually it has two cords, one for power and the other for connecting to the system unit. It displays text characters and graphics in gray shed or in colors.

6. Mouse : It is an input device and is used to point and select items on your computer screen. . By sliding the mouse around on a flat surface (usually on mouse pad) the user moves a pointer on the screen. When the tip of the pointer is positioned over the desired item, the user clicks the mouse (a single or double click) to select the item. A single cord connects the mouse to the system unit.

7. Key Board : It is a typewriter which contain keys to feed information into the computer. It is attached to the system unit with a cord. The standard and IBM keyboard have 83 keys but enhanced keyboard has 104 keys.

8. Speaker : It is an output device. When the speaker is connected to the sound card, the output as a sound can be heard on the speaker. Often it is used for entertainment.

10. Printer : It is an output device that produces print of images such as numbers, alphabets, graphs etc. on paper or hard-copy which is called printout.

11. Scanner : It is an input device that transfers typed or handwritten texts, graphs, diagrams and photographs to the computer in digital form.

12. CD-ROM Drive : CD-ROM drive is a device that reads the information stored on CD-ROM. CD-ROM is an abbreviated term for Compact Disks Read Only Memory. The information stored in CD-ROM can neither be changed nor can new information be added to it.

13. CD-Writer : CD-Writer is a device that reads and writes the information from CD.

14. Modem : It is a short form of Modulator-Demodulator. To connect our computer to the Internet, we need a modem .A modem is a device that sends and receives information over a telephone line or high-speed cable.

15. UPS (Uninterruptible Power Supply) : Sudden power cut erases any present data. So a UPS can be used to provide uninterrupted power supply to the computer system and save the data typically for 5 to 15 minutes until an auxiliary power supply can be turned on and utility power restored, or equipment is safely shut down. It is also known as a battery backup.

Objective Question

1. PC Stands for—
   (a) Personal computer (b) Private computer (c) Public computer
   (d) a and b both (e) None of these
2. In motherboard information between components travels by ..... .
   (a) Flash memory (b) CMOS (c) Port
   (d) Bus (e) None of these
3. Main circuit board of a computer is called ..... .
   (a) Father board (b) Mother board (c) Keyboard
   (d) All of these (e) None of these
4. Which part of a computer helps to store information ?
   (a) Disk drive (b) Keyboard (c) Monitor
   (d) Printer (e) None of these
5. Meaning of IBM is —
   (a) Indian business machine
   (b) International business machine
   (c) International banking machine
   (d) International business model (e) None of these
6. Accessories connect the system unit with ..... .
   (a) Port (b) Ring (c) Bus
   (d) Zip (e) None of these
7. What is the short form for 'uninterrupted power supply' in computer?
   (a) Inverter (b) Generator (c) UPS
   (d) Stablizer (e) None of these
8. Which of the following parts has direct connection from a computer motherboard ?
   (a) Hard disk (b) VDU (c) Microprocessor
   (d) Modem (e) None of these
9. To run a CD in a computer we need ..... .
   (a) F D drive (b) CD drive (c) Zip drive
   (d) Pen drive (e) None of these
10. Information from one unit to another unit is carried by ..... .
    (a) Data bus (b) System (c) Control bus
    (d) Address bus (e) None of these
11. Where is the disc put in a computer ?
    (a) In a modem (b) In the hard drive (c) Into the CPU
    (d) In the disk drive (e) None of these
12. The ..... is a box that houses the most important parts of a computer system.
    (a) software (b) hardware (c) input drive
    (d) system unit (e) none of these

13. The main system board of a computer is called the.
(a) integrated circuit (b) mother board (c) processor
(d) microchip (e) None of these

14. Which of the following is a part of the system unit ?
(a) CPU (b) Monitor (c) CD-ROM
(d) Floppy disk (e) None of these

15. The box that contains the central electronic components of the computer is the ..... .
(a) motherboard (b) system unit (c) peripheral
(d) input device (e) none of these

16. Storage device found inside the computer—
(a) CD ROM (b) Zip Disk (c) Super Disk
(d) Hard Disk (e) None of these

17. A device that provides emergency power to your computer, conditions the voltage, and protects against powers surges is called a ..... .
(a) PSU = Power supply unit
(b) USP = Universal Surge Protector
(c) UPPS = Universal Power Protection and Supply
(d) UPS = Uninterruptible Power Supply
(e) None of these

18. Which of the following is a part of the system Unit ?
(a) Monitor (b) CPU (c) CD-ROM
(d) Floppy Disk (e) None of these

19. A UPS ..... .
(a) limits damage caused by fluctuating levels of electricity
(b) provides battery backup for a limited time
(c) delivers electronic messages via a bus
(d) conducts a power-on self test, or POST
(e) none of these

20. A disk on which you store information—
(a) Plate (b) Data disc (c) Paper disk
(d) TV disk (e) None of these

21. A computer's hard disk is ..... .
(a) an arithmetic and logical unit (b) computer software
(c) operating system (d) computer hardware
(e) none of these

22. A... is a device that not only provides surge protection, but also furnishes your computer with battery backup power during a power outage.
(a) surge strip (b) USB (c) UPS
(d) battery strip (e) None of these

23. The motherboard is the ...
(a) circuit board that houses peripheral devices
(b) same as the CPU chip
(c) the first chip that is accessed when the computer is turned on
(d) circuit board that contains a CPU and other chips
(e) None of these

24. Where is the disk put in a computer ?
(a) in the modem (b) in the hard drive (c) into the CPU
(d) in the disk drive (e) None of these

25. The ..... controls communications for the entire computer system.
(a) arithmetic-logic unit (b) semiconductor
(c) motherboard (d) coprocessor
(e) None of these

26. The system component that controls and manipulates data in order to produce information is called the .....
(a) keyboard (b) microprocessor (c) monitor
(d) mouse (e) None of these

27. These provide expansion capability for a computer system
(a) sockets (b) slots (c) bytes
(d) bays (e) None of these

28. An example of a processing device would be ..... .
(a) a magnetic ink reader (b) a tablet PC
(c) Special function cards (d) scanners
(e) keyboards

29. A ..... is hardware used to read disks.
(a) floppy disk (b) hardware (c) software
(d) disk drive (e) CPU

30. The ..... is the box that houses the most important parts of a computer system.
(a) software (b) hardware (c) input device
(d) system unit (e) None of these

31. ..... hard drives are permanently located inside the system unit and are not designed to be removed, unless they need to be repaired or replaced.
(a) Static (b) Internal (c) External
(d) Remove (e) None of these

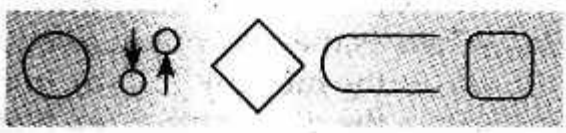
32. What resides on the motherboard and connects the CPU to other components on the motherboard ?
(a) Input unit (b) System bus (c) ALU
(d) Primary memory (e) None of these

33. An electronic path, that connect one part of computer to another is—
(a) Logic gate (b) Serial Port (c) Modem
(d) Bus

Answers

1.	(a)	2.	(d)	3.	(b)	4.	(a)	5.	(b)	6.	(a)	7.	(c)
8.	(c)	9.	(b)	10.	(a)	11.	(d)	12.	(d)	13.	(b)	14.	(a)
15.	(b)	16.	(d)	17.	(d)	18.	(b)	19.	(b)	20.	(b)	21.	(d)
22.	(c)	23.	(d)	24.	(d)	25.	(c)	26.	(b)	27.	(b)	28.	(c)
29.	(d)	30.	(d)	31.	(b)	32.	(b)	33.	(d)				

★★★

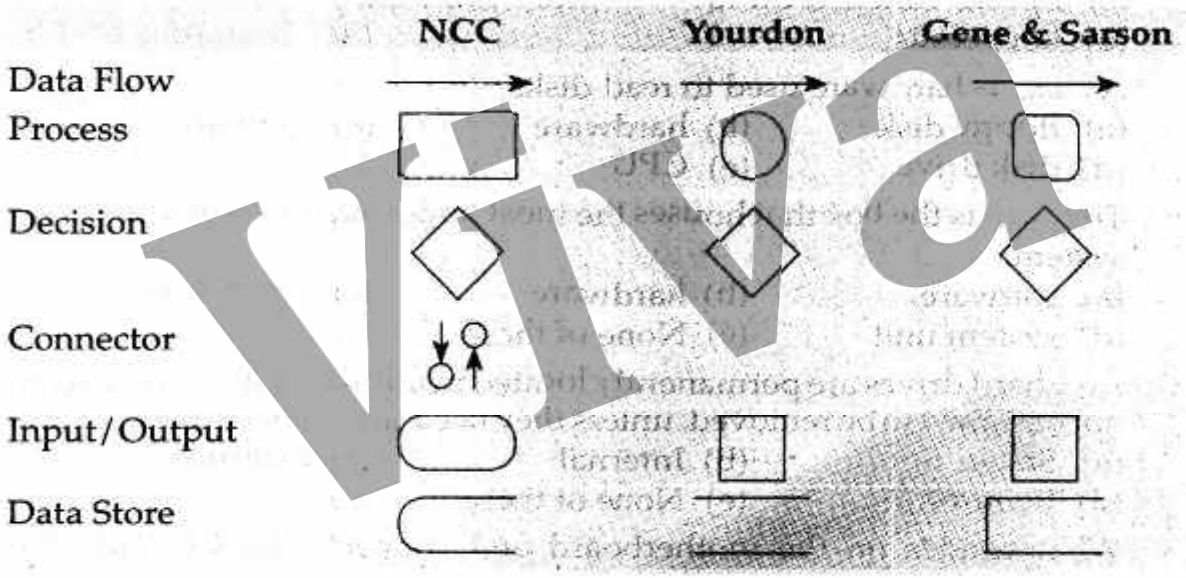


Design Tools and Programming Languages

Introduction

Design Tools : Before any program coding, input, output, flow of data and logic should be defined. For this purpose we need design tools. There are some design tools:

DFD (Data Flow Diagram) : Data flow diagrams are the most commonly used as a pictorial way of showing the flow of data through a system or subsystem. It is easier to understand and grasp. For diagrammatic representation it also uses symbols and notation.



Data Flow : It is represented by line arrow. It shows the direction of flow of data.

Process : It changes the incoming data flow to outgoing data flow.

Decision : It shows the logical process which has resultant Yes or No.

Connector : It connects the flowcharts of more than one page.

Input/Output : It shows input/output in program.

Data Store : It shows storage of data.

Algorithm : To make a computer do something, we need to write a computer program or group of instructions. To write a computer program, we have to tell the computer, step by step, exactly what we want it to do. The computer then executes the program, following each step to find the end goal. When we are telling the computer what to do, we also get to choose how it is going to do it. That's the point where computer algorithms come in. Algorithm is a set of instructions and basic techniques used to get a job done. An algorithm is an effective method for solving a problem using

sequence of instructions. Each algorithm is a list of well defined instructions for completing a task from an initial state to the final state. A mistake in an algorithm that causes incorrect results is called a logical error.

Flowchart : The pictorial representation of a program or the algorithm is known as a flowchart. It is nothing but a diagrammatic representation of the various steps involved in designing a system. The purpose of using flowcharts is to graphically present the logical flow of data in the system and defining major phases of processing. For diagrammatic representation it also uses symbols and notations.

Start & Stop	Output & input	Connector
Decision box	Process	Flow of data

Pseudocode : It is also called Program Design Language (PDL) and is an alternative to flowcharts. Pseudocode allows the programmer to represent logic in English in like manner. It is easy to modify, so many programmers prefer it.

Programming Languages : Programming Languages are the medium used by one to communicate instructions to a computer. A programming language is an artificial language to express computation that can be performed by a computer. It is a set of keywords, symbols, and a system of rules for constructing statements by which humans can communicate instructions to be executed by a computer. Each programming language has its own syntax that is the set of specific rules and words that express the logical steps of an algorithm.

Programming languages are mainly of two types :

(a) Low level language

(b) High level language

Machine Language : It is a low level programming language, also called machine code or object code. It is the only language understood directly by computer's central processing unit because it is a collection of binary digits. It has no need of translator program. At the early era of programming it was used for program coding. While easily understood by computers, machine languages are almost impossible for humans to use because they consist of numbers, that is, series of '0' and '1'. Coding in machine language is very difficult and has more possibilities of error.

Machine language instruction has two parts : one is the operation code or *opcode* that specifies the operation to be performed and the other is operand such as data on which the operation should act.

Assembly Language : Assembly language was developed to make coding easier than machine language. At the place of binary code of machine language mnemonic code and symbolic addresses were developed, that were easy to remember. This symbolic language made program writing easy. But it must be translated into machine codes before being used operationally. The program used to convert or translate programs written in assembly code to machine code is called assembler. Coding in assembly language is simpler than machine language and error detection is easy.

High level language : High level language is a programming language

High level language : High level language is a programming language which is machine independent and uses translator. It is closer to human languages. It is also called a source code. Some commonly used high level languages are C, BASIC, FORTRAN, ALGOL, PASCAL etc.

There are five types of high level languages to solve a wide variety of problems.

1. Scientific language : It is a programing language that was designed for the use of mathematical formulas and matrices. Although all programming languages allow for this kind of processing but scientific language makes easier to express these actions. Examples are FORTRAN, ALGOL etc.

2. Commercial languages : It is a programing language that was designed for solving everyday commercial problems. Examples are COBOL, RPG, etc.

3. Special purpose languages : It is a programing language that was designed for a specific function such as payroll, simulation etc. Examples are ADA, Modula and Modula, SQL, QUEL etc.

4. Multipurpose languages : These are languages intended to cope with a number of different types of application area such as business and scientific. Examples are APL , BASIC, PL1,C and PASCAL

5. Command languages for operating system : These Languages are used to control operation of a computer. Most command languages are specific to the particular manufacturer's operating system. Examples are DCL, SHELL, MS-DOS.

There are some high level languages

1. FORTRAN (Formula Translation) : FORTRAN was the first high level programming language invented by John Backus for IBM 704 in October 1956 but the first FORTRAN compiler delivered in April 1957. The language was widely adopted by scientists and engineers for writing numerically intensive programs, which encouraged compiler writers to produce compilers that could generate faster and more efficient code. Fortran is still used today for programming scientific and mathematical applications such as mathematical calculation, function and formula.

2. ALGOL (Algorithmic Language) : It has originally developed by John Backus in 1958 known as ALGOL 58. It was revised and expanded by Peter Naur in 1960 and known as ALGOL 60. It used for scientific and engineering purpose and has powerful mathematical facilities.

3. COBOL (Common Business Oriented Language) : It was one of the earliest high level programming languages. It was developed in 1959 by Grace Hopper. Its primary domain is business , finance, and administrative systems for companies and governments. Group of sentences in this language is called paragraph. All paragraphs together make a section and all sections make a division. For mathematical terms, COBOL uses ADD, SUBTRACT and MULTIPLY etc. It is English like language and provide much suitable documentation.

4. RPG (Report Program Generator) : It is a high level programming language for business applications, which generates report. It is developed by IBM in 1961 and primary vendor of RPG is also IBM.

5. Modula and Modula 2 : Modula is a descendant of the programming language Pascal. It was developed in Switzerland in the late 1970s by Nicklaus Wirth. The main innovation of Modula over Pascal is a module system, used for grouping sets of related declarations into program units. Modula 2 is a computer programming language invented by Niklaus Wirth around 1978, as a successor to Modula. It is specially suited to computer systems development work.

6. SQL (Structured Query Language), QUEL (Query Language) are examples of database query language.

7. APL (A Programming Language) : It was developed in 1964 by Kenneth E. Iverson. It is an oriented interactive language for algorithmic processing which is available from a number of commercial and non-commercial vendors for most computer platforms. It is a specially powerful language in defining vectors and matrices.

8. BASIC (Beginner's All purpose Symbolic Instruction Code) : It was designed in 1964 by John George Kemeny and Thomas Eugene Kurtz to provide computer access to non-science students. It is simple, powerful and interactive language for beginners and provides clear error message. It allows advanced features to be added for experts so it is used by both scientists and businessmen.

9. PL1 (Programming Language One) : It was developed by IBM in the early 1960s, and is still actively used. It is designed for scientific, engineering, and business applications. It has been used by various academic, commercial and industrial users. It is a very successful language except that its multipurpose facilities made it too large for use on small machines.

10. C : C is a general purpose computer language developed in 1972 by Dennis Ritchie at the Bell Laboratories for use on the Unix Operating System. Although C was designed for implementing system software, it is also widely used for developing portable application software. It is one of the most popular programming language and it is widely used on many different platforms.

11. C++ : It is object oriented general purpose programming language. It is regarded as a middle level language, as it comprises a combination of both high level and low level language features. It is better than C programming language but tough to code.

12. PASCAL : Pascal is a procedure programming language developed in 1970 by Niklaus Wirth. It supports structured programming than many older languages such as COBOL or FORTRAN. It is based on the ALGOL programming language and named in honor of the French mathematician and philosopher Blaise Pascal. Initially, Pascal was developed to teach students structured programming and teaching purpose.

13. COMAL (Common Algorithmic Language) : It was developed by Benedict Lofstedt and Borge Christensen in 1973. It was a mixed form of the prevalent educational programming languages namely BASIC and Pascal. It was designed to educate students.

14. PROLOG (Programming in Logic): It is a general purpose programing language. It has a rich collection of data structure. It is used to develop artificial intelligence.

15. C Sharp : It is a programming language which also expressed as C#. It was developed by Microsoft. It is a simple, modern, general purpose, object oriented programming language.

16. Java : Java is a programming language originally developed by James Gosling at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform. It is object oriented programming language. It derives much of its syntax from C and C++. It is primarily used in the form of client side Java Script, implemented as an integrated component of the web browser, allowing the development of enhanced user interfaces and dynamic web sites.

17. LOGO (Logic Oriented Graphic Oriented) : LOGO was created in 1967 for educational use and constructive teaching. It is known mainly for its turtle. The turtle moves with commands that are relative to its own position. When turtle moves it draw a line. To teach a child to draw a line and shapes we use logo. It is so easy for a child that they can use it to draw shapes and lines.

18. DCL : It is a command language and used on DEC VAX/VMS operating system.

19. SHELL : It is also a command language and used with Unix operating system. Unix is mostly used for and web servers.

20. MS DOS : It is one of the most popular operating systems developed by Microsoft.

Fourth Generation Language (4th GL) : The third generation language needed a large number of codes for typical commercial system. It is time consuming to debug, and the modification of complex system is very difficult. It is a 4th generation language developed by the software vendors in various application tools offering further improvement in productivity in programing. A fourth generation programming language is designed with a specific purpose in mind, such as the development of commercial business software. All 4GLs are designed to reduce programming effort, the time it takes to develop software, and the cost of software development.

Objective Question

1. Computer program had been done in early stages by using ..... .
   (a) Assembly language (b) Machine language
   (c) Source code (d) Object code
   (e) Spagatti code
2. BASIC computer language was developed by ..... in 1964.
   (a) Nicol Berlt (b) John G. Kemeny
   (c) Grace Moonie Hoper (d) Jim clark
   (e) None of these

3. Pascal—
   (a) is a computer language (b) is a unit of computer
   (c) is a computer operating system
   (d) is a type of computer (e) None of these
4. The first computer language developed for programming is—
   (a) Cobol (b) Fortran (c) C
   (d) C++ (e) None of these
5. Which of the following is not a computer language ?
   (a) Basic (b) C (c) Fast
   (d) Fortran (e) None of these
6. The pictorial representation of a program or alogrithm is called a .....
   (a) chart (b) salve chart (c) flow chart
   (d) mix chart (e) none of these
7. Which programming language is used to teach graphical shapes to a schoolgoing child ?
   (a) Pailot (b) C (c) LOGO
   (d) COMAL (e) None of these
8. Which of the following is a Scientific computer language ?
   (a) Basic (b) Cobol (c) Fortran
   (d) Pascal (e) None of these
9. Computer language fortran is appropriate for .....
   (a) business (b) graphic (c) science
   (d) commercial (e) none of these
10. Computer language Cobol is appropriate for—
    (a) Commercial purpose (b) Graphic purpose
    (c) Scientific purpose (d) All
    (e) None of these
11. Which of the following computer languages is appropriate for commercial purpose ?
    (a) Fortran (b) Basic (c) Cobol
    (d) Pascal (e) None of these
12. High level computer language like English language is..... .
    (a) fortran (b) pascal (c) cobol
    (d) C++ (e) none of these
13. In which language is the most appropriate documentation possible ?
    (a) Fortran (b) Cobol (c) Pascal
    (d) C++ (e) None of these
14. Which language is used in a complex scientific calculation.
    (a) Basic (b) Fortran (c) Cobol
    (d) Pascal (e) None of these
15. BASIC programming language is used for ..... .
    (a) commercial purpose (b) scientific calculation
    (c) to teach a child (d) simple language for beginners
    (e) none of these

16. The language which is understood by computers is .....
(a) American language (b) Machine language
(c) Secrect language (d) All of these
(e) None of these

17. Computer language JAVA was developed by ..... .
(a) IBM (b) Micro soft (c) Sun micro system
(d) Infosystem (e) None of these

18. Mostly computer can understand—
(a) English like high level instruction
(b) Basic (c) Any language
(d) All of these (e) None of these

19. ..... .is applicable in all computers.
(a) Basic language (b) Cobol language (c) Machine language
(d) Fortran (e) None of these

20. ..... is a set of symbols, keywords and set of rules to construct statement.
(a) Computer program (b) Programming language
(c) Assemble (d) Syntax
(e) None of these

21. Computer language used on the internet is ..... .
(a) Basic (b) Cobol (c) Java
(d) Pascal (e) None of these

22. Computer programs are written in a high level programming language, however the human readable version of a program is called—
(a) Cache (b) Instruction set (c) Source code
(d) Word size (e) None of these

23. A prescribed set of well-defined instructions for solving mathematical problems is called—
(a) A compiler (b) A code (c) A description
(d) An algorithm (e) None of these

24. Which of the following is a popular programming language for developing multimedia web pages.
(a) COBOL (b) Java (c) BASIC
(d) Assembler (e) None of these

25. A ..... contains specific rules and words that express the logical steps of an algorithm.
(a) programming language (b) programming structure
(c) syntax (d) logic chart
(e) None of these

26. A graphic presentation of the sequence of steps needed to solve a programming problem is called a—
(a) program flowchart (b) step chart (c) rule diagram
(d) program graph (e) None of these

27. The operating system called UNIX is typically used for ..... .
(a) desktop computers (b) laptop computers
(c) supercomputers (d) web servers (e) All of these

28. C, BASIC, COBOL, and Java are examples of ..... language.
(a) low-level (b) computer
(c) system programming (d) high-level
(e) None of these

29. A set of rules for telling the computer what operations to performs is called a .....
(a) Procedural language (b) Structures
(c) Natural language (d) Command language
(e) Programming language

30. A mistake in an algorithm that causes **incorrect** results is called a .....
(a) Logical error (b) Syntax error (c) Procedural error
(d) Compiler error (e) Machine error

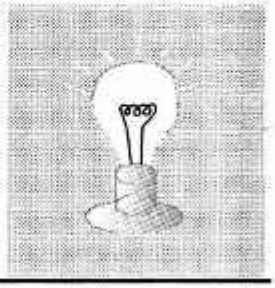
Answers

1.	(b)	2.	(b)	3.	(a)	4.	(b)	5.	(c)	6.	(c)	7.	(c)
8.	(c)	9.	(c)	10.	(a)	11.	(c)	12.	(c)	13.	(b)	14.	(b)
15.	(d)	16.	(b)	17.	(c)	18.	(a)	19.	(c)	20.	(d)	21.	(c)
22.	(c)	23.	(d)	24.	(b)	25.	(c)	26.	(a)	27.	(d)	28.	(d)
29.	(e)	30.	(a)										

★★★

07

Data Representation and Number System



Introduction

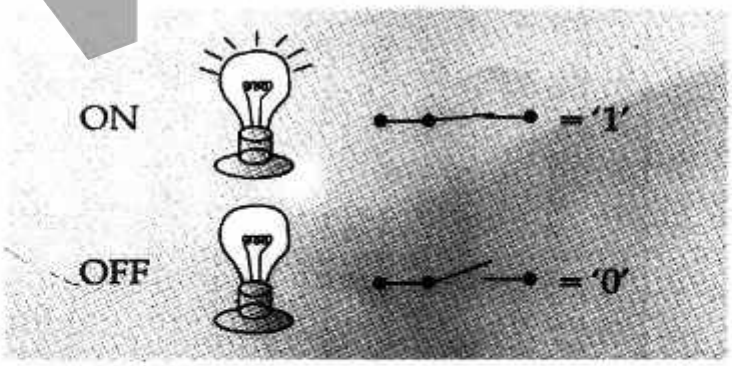
Data representation is a method to represent data in a computer. In computer we enter different forms of data such as number, text, graphics, sound etc. All These data look different, but in the computer process all are in only one form, that is, 0 and 1, binary or digital form. Each information is stored in a computer as a digital data.

Generally, we use the decimal number system which, with the help of 0 to 9, represents any number. But in a computer any number is represented by a combination of 0 and 1.

These are the number systems used in computer

1. Binary Number system
2. Octal Number system
3. Hexadecimal Number system

Binary Number system : In the binary number system, there are only two possible values 0 and 1 which represent the ON and OFF state of electrical pulse in the circuit. These 0 and 1 are binary digits and each is called a bit. This number system is used by computer to data process and storage.



In decimal number system there is a base of 10, because there are 10 possible digits (0 to 9). Each digit in a decimal number has a place and that is called place value. Such as in a decimal number 17, place value of 1 is 10 and 7 is 1. But in a binary number system there is a base of 2 because there are 2 possible digits (0 and 1). Each digit position in a binary number represents a power of two. So, when we write a binary number, each binary digit is multiplied by an appropriate power.

Conversion of Decimal to Binary : To convert decimal to binary we simply divide the decimal value by 2 and then write down the remainder, we repeat this process until we cannot divide it by 2 anymore.

Example : Convert $(35)_{10}$ to its binary equivalent.

2	35	Remainder
2	17	1
2	8	1
2	4	0
2	2	0
	1	0

Read from bottom

$\therefore \quad (35)_{10} = (100011)_2$

Conversion of Binary to Decimal : To convert binary to decimal we simply multiply the digits of binary value by its place value and then add all the values we get from multiplication.

Example : Convert $(100011)_2$ to its decimal equivalent.

Binary number	=	1	0	0	0	1	1
Place	=	5	4	3	2	1	0
Value	=	2^5	2^4	2^3	2^2	2^1	2^0
	=	32	16	8	4	2	1

$1 \times 1 = 1$
$1 \times 2 = 2$
$0 \times 4 = 0$
$0 \times 8 = 0$
$0 \times 16 = 0$
$1 \times 32 = 32$
35

$100011 = 1*2^5 + 0*2^4 + 0*2^3 + 0*2^2 + 1*2^1 + 1*2^0$

$= 32 + 0 + 0 + 0 + 2 + 1 = 35$

$\therefore \quad (100011)_2 = (35)_{10}$

1. Octal Number system : In Octal number system there is a base of 8 because there are 8 possible digits (0 and 7). Each digit position in an octal number represents a power of eight. Each octal digit is thus equivalent to three binary digits.

Octal Number	Equivalent three binary digits
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Conversion of Decimal to Octal : To convert decimal to octal we simply divide the decimal value by 8 and then write down the remainder. We repeat this process until we cannot divide by 8 anymore.

Example : Convert $(385)_{10}$ to its binary equivalent.

8	385	Remainder
8	48	1
	6	0

Read from bottom

$\therefore \quad (385)_{10} = (601)_8$

Conversion of Octal to Decimal : To convert octal to decimal we simply multiply the digits of octal value by its place value and then add the value we get from multiplication.

Example : Convert $(601)_8$ to its decimal equivalent.

$(601)_8 = 6*8^2 + 0*8^1 + 1*8^0 = 384+0+1 = (385)_{10}$

$\therefore \quad (601)_8 = (385)_{10}$

Conversion of Octal to Binary

There are two methods to convert octal to binary

1. To convert octal to binary we simply multiply the digits of octal value by its place value and then add the value we get from multiplication. That is decimal value of octal number. Again we calculate the binary value of this decimal value.

Example : Convert $(601)_8$ to its binary equivalent.

$(601)_8 = 6*8^2 + 0*8^1 + 1*8^0 = 384+0+1 = (385)_{10}$

$\therefore \quad (601)_8 = (385)_{10}$

Again, we calculate the binary value of 385_{10}.

2	385	Remainder
2	192	1
2	96	0
2	48	0
2	24	0
2	12	0
2	6	0
2	3	0
	1	1

Read from bottom

$\therefore \quad (601)_8 = (110000001)_2$

2. Octal number is represented by collection of three digits of binary number, such as octal number 1 is represented by 001 in binary number system.

So, to convert octal to binary we replace each digit of octal by three digit collection of binary number.

Example : Convert 601_8 to its binary equivalent.

$601_8 = 110\ 000\ 001 = 110000001_2$

Conversion of Binary to Octal

There are two methods to convert octal to binary.

1. To convert binary to octal we simply multiply the digits of octal value by its place value and then add the value we get from multiplication. That is decimal value of binary number. Again we calculate the octal value of this decimal value.

Example : Convert 111010101_2 to its octal equivalent.

$111010101_2 = 1*2^8+1*2^7+1*2^6+0*2^5+1*2^4+0*2^3+1*2^2+0*2^1+1*2^0$

$= 256+128+64+16+4+1=469_{10}$

$\therefore \quad 111010101_2 = 469_{10}$

Again, we calculate the octal value of 469_{10}

8	469	Remainder
8	58	5
	7	2

↑ Read from bottom

$\therefore \quad 111010101_2 = 725_8$

To convert binary to octal we replace the three digits group of binary by its octal value.

Example : Convert 111010101_2 to its octal equivalent.

$111010101_2 = 111\ 010\ 101 = 725_8$

2. Hexadecimal Number system : In Hexadecimal number system there is a base of 16 because there are 16 possible digits (0 and 15). Each digit position in a hexadecimal number represents a power of sixteen. In the hexadecimal number system the numbers 0-9 are represented in their normal way, but numbers 10-15 are represented by the letters A-F respectively. Each hexadecimal digit is, thus, equivalent to four binary digits.

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

Conversion of Decimal to Hexadecimal : To convert decimal to hexadecimal we simply divide the decimal value by 16 and then write down the remainder repeat this process until we cannot divide it by 16 anymore.

Example : Convert 382_{10} to its binary equivalent.

16	382	Remainder
16	23	14 = E
	1	7

Read from bottom

$\therefore \quad 382_{10} = 17E_8$

Conversion of Hexadecimal to Decimal : To convert hexadecimal to decimal we simply multiply the digits of hexadecimal value by its place value and then add the value we get from multiplication.

Example : Convert 10_{16} to its decimal equivalent.

$$10_{16} = 1*16^1 + 0*16^0$$

$\therefore \quad 10_{16} = 16_{10}$

Conversion of Hexadecimal to Binary

There are two methods to convert octal to binary.

1. To convert hexadecimal to binary we simply multiply the digits of hexadecimal value by its place value and then add the value we get from multiplication. That is decimal value of hexadecimal number. Again we calculate the binary value of this decimal value.

Example : Convert $B6A_{16}$ to its binary equivalent.

$$B6A_{16} = B*16^2 + 6*16^1 + A*16^0$$
$$= 11*256 + 6*16 + 10*1$$
$$= 2816 + 96 + 10$$
$$= 2922_{10}$$

$\therefore \quad B6A_{16} = 2922_{10}$

Again, we calculate the binary value of 2922_{10}

2	2922	Remainder
2	1461	0
2	730	1
2	365	0
2	182	1
2	91	0
2	45	1
2	22	1
2	11	0
2	5	1
2	2	1
	1	0

Read from bottom

$\therefore \quad B6A_{16} = 101101101010_2$

1. Hexadecimal number is represented by a collection of four digits of binary number, such as hexadecimal number 1 is represented by 0001 in binary number system.

2. So to convert hexadecimal to binary we replace each digit of hexadecimal by four digit collection of binary number.

Example : Convert $B6A_{16}$ to its binary equivalent.

$$B6A_{16} = 1011\ 0110\ 1010 = 101101101010_2$$

Conversion of Binary to Hexadecimal

1. To convert binary to hexadecimal we replace the four digits group of binary by its hexadecimal value.

Example : Convert 101101111_2 to its hexadecimal equivalent.

$$101101111_2 = 0001\ 0110\ 1111_2 = 16F_{16}$$

Place value of digits

Number system	Place Value					Place value after decimal		
	Thousand	Hundred	Tens	Ones	.	− 1	− 2	− 3
Decimal	$10^3 = 1000$	$10^2 = 100$	$10^1 = 10$	$10^0 = 1$	.	$10^{-1} = \frac{1}{10}$	$10^{-2} = \frac{1}{100}$	$10^{-3} = \frac{1}{1000}$
Binary	$2^3 = 8$	$2^2 = 4$	$2^1 = 2$	$2^0 = 1$	.	$2^{-1} = \frac{1}{2}$	$2^{-2} = \frac{1}{4}$	$2^{-3} = \frac{1}{8}$
Octal	$8^3 = 512$	$8^2 = 64$	$8^1 = 8$	$8^0 = 1$	.	$8^{-1} = \frac{1}{8}$	$8^{-2} = \frac{1}{64}$	$8^{-3} = \frac{1}{512}$
Hexadecimal	$16^3 = 4096$	$16^2 = 256$	$16^1 = 16$	$16^0 = 1$	.	$16^{-1} = \frac{1}{16}$	$16^{-2} = \frac{1}{256}$	$16^{-3} = \frac{1}{4096}$

Adding binary numbers

Adding binary numbers is very similar to adding decimal numbers, but it uses only two digits 0 and 1.

There are four basic rules of binary addition

(i) $0 + 0 = 0$

(ii) $0 + 1 = 1$

(iii) $1 + 0 = 1$

(iv) $1 + 1 = 0$ (carry one because $1 + 1 = 10$)

Example : Add $1011011_2 + 100111_2$

$$\begin{array}{r} 1011011 \\ +\ 100111 \\ \hline 10000010 \\ \hline \end{array}$$

Carries — 111111

So, $1011011_2 + 100111_2 = 10000010_2$.

Subtracting binary numbers

Subtracting binary numbers is very similar to subtracting decimal numbers, but it also uses only two digits 0 and 1.

There are four basic rules of binary subtraction :

1. $0 - 0 = 0$
2. $0 - 1 = 1$ (borrow from nearest left side digit)
3. $1 - 0 = 1$
4. $1 - 1 = 0$ 1)

Example : Subtract $1011011_2 + 100111_2$

$$\begin{array}{r} 1011011 \\ -\ 100111 \\ \hline 110100 \end{array}$$

So, $1011011_2 - 100111_2 = 110100_2$

Binary Memory

Memory is a data storage device in a computer system. The data is stored in binary form (0 and 1).

Bit : A bit is the smallest unit of computer memory. There is only one value of a bit either 1 or 0.

Nibble : It is a sequence of four bits.

Byte : It is a sequence of 8 bits and any data can measure in a byte. To store in memory any alphabet, symbol or space etc needs minimum one byte space.

Word : A word is a string of bits stored in computer memory. Word length can vary in different machines.

Memory measurement : Memory or any storage device's capacity is expressed as a quantity of bits or bytes, such as kilobyte, megabytes and gigabyte e.t.c. The total amount of stored information that a storage device or medium can hold is called a capacity of that memory or storage device.

4 bits	1 Nibble
8 bits	1 byte
1024 bytes	1 kilobyte (KB)
1024 kilobytes	1 megabyte (MB)
1024 megabytes	1 gigabyte (GB)
1024 gigabytes	1 terabyte (TB)

A gigabyte, is equal to approximately one billion bytes or a thousand megabytes. A gigabyte is equal to exactly 1,073,741,824 bytes and to 1,024 megabytes. A megabyte, is equal to about one million bytes, or exactly 1,048,576 bytes.

Computer codes

In computer any characters like the alphabet, digit or any special character is represented by collection '1's and '0's in a unique coded pattern. These patterns are of different types, and are called computer codes.

There are two types of coding system

1. Binary Coded Decimal (BCD) : It is also called Packet decimal. Binary Coded Decimal is a number system where four bits are used to represent each decimal digit.

BCD Table

Decimal	BCD	Decimal	BCD
0	0000	5	0101
1	0001	6	0110
2	0010	7	0111
3	0011	8	1000
4	0100	9	1001

1. ASCII Code : It stands for American Standard Code For Information Interchange. In ASCII system a character is represented by seven bits.

2. EBCDIC Code : It stands for Extended Binary Coded Decimal Interchange code. In EBCDIC system a character is represented by eight bits. ASCII and EBCDIC are very popular coding systems.

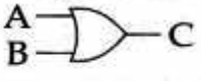
Logic Gate : There are three basic gates in any digital system. They are AND, OR and NOT gate. Gate is an electronic circuit in which we can get output by one or more but input.

AND gate : This is the circuit of AND gate.

Switch A	Switch B	Switch C
Off (0)	Off (0)	Off (0)
Off (0)	Off (1)	Off (0)
Off (1)	Off (0)	Off (0)
Off (1)	Off (1)	Off (1)

Means, C = A * B

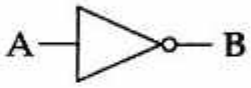
OR gate : This is circuit of OR gate.



Switch A	Switch B	Switch C
Off (0)	Off (0)	Off (0)
Off (0)	Off (1)	Off (1)
Off (1)	Off (0)	Off (1)
Off (1)	Off (1)	Off (1)

Means, C = A + B

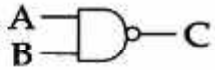
NOT gate : This is circuit of NOT gate.



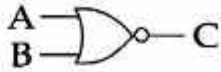
Switch A	Switch B
Off (0)	On (1)
On (1)	Off (0)

Means, $B = \overline{A}$

All other gates can be constructed by using these three gates.

NAND gate 

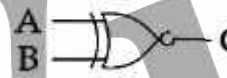
Means, $C = \overline{A \cdot B}$

NOR gate 

Means, $C = \overline{A + B}$

XOR gate 

Means, $C = A \oplus B$

XNOR gate 

Means, $C = \overline{A \oplus B}$

NAND gate and NOR gate are called Universal gates because by using these gates any digital circuit can be constructed.

Objective Question

1. To calculate perform calculation and store data computer user ..... number system.
   (a) Decimal (b) Hexadecimal (c) Octal
   (d) Binary (e) None of these
2. The largest unit of storage is ..... .
   (a) GB (b) KB (c) MB
   (d) TB (e) None of these
3. The time bit is short for ..... .
   (a) Megabyte (b) Binary language (c) Binary digit
   (d) Binary number (e) None of these
4. ..... is approximately one billion bytes.
   (a) Kilobyte (b) Bit (c) Gigabyte
   (d) Megabyte (e) None of these
5. Which of the following is true ?
   (a) Byte is a single digit in binary number.
   (b) Bit represents a group of digital numbers.
   (c) Byte is an eight digit binary number.
   (d) Bit is an eight digit binary number.
   (e) None of these

6. How many choices are there in binary choice ?
   (a) One (b) Two
   (c) It depends upon the amount of memory in a computer.
   (d) It depends upon the speed of the processor of a computer.
   (e) None of these

7. How many bits are represented in one byte?
   (a) 8 (b) 16 (c) 64
   (d) 256 (e) 512

8. One megabyte is equal to approximately ..... .
   (a) 1000 bits (b) 1000 bytes (c) 1 million bytes
   (d) 1 million bits (e) 2000 bytes

9. The smallest unit of computer memory is called ..... .
   (a) Byte (b) Bit (c) Megabyte
   (d) These all (e) None of these

10. One kilobyte makes from .....
   (a) 612 (b) 1024 (c) 2048
   (d) 4096 (e) 8192

11. Which of the following is used for memory measurement ?
   (a) Lb (b) Mg (c) Tb
   (d) GHs (e) Sb

12. In binary number which number system is used ?
   (a) decimal (b) Binary (c) Byte
   (d) Bit (e) None of these

13. How many digits are there in binary number system ?
   (a) One (b) Two (c) Three
   (d) Four (e) None of these

14. What are the two digits of binary system ?
   (a) 1 and 9 (b) 1 and 0 (c) 1 and 4
   (d) 1 and 2 (e) None of these

15. The method to store characters and symbols in bytes is called .....
   (a) Number system (b) Alpha system (c) Byte system
   (d) Coding system (e) None of these

16. Today's mostly used coding system is .....
   (a) ASCII and EBCDIC (b) ASCII (c) EBCDIC
   (d) All of These (e) None of these

17. Series of eight bits is called .....
   (a) Bit (b) Byte (c) Number
   (d) Kilobyte (e) None of these

18. ..... shows 'off' state of current in binary code.
   (a) 1 (b) 0 (c) 3
   (d) 2 (e) 5

19. Group of eight bits 10010110 or 01100101 is called ..... .
   (a) Nibble (b) Byte (c) Bit
   (d) Robote (e) None of these

20. The length of any word in a computer is measured in ..... .
(a) Byte (b) Millimeter (c) meter
(d) Bits (e) None of these

21. 1001, Series of four bits is called ..... .
(a) Byte (b) Nibble (c) Bit
(d) Input (e) None of these

22. What is logic gate ?
(a) A software (b) A type of circuit (c) A special Cd
(d) A computer game (e) None of these

23. ..... measures in megabyte.
(a) Intensity of earthquake
(b) Capacity of power
(c) Memory capacity of computers
(d) None of these

24. One kilobyte is equivalent to ..... .
(a) 1000 byte (b) 1024 byte (c) 10000 byte
(d) 100000 byte (e) None of these

25. Generally a computer's memory represented in kilobyte and megabyte and byte is made of ..... .
(a) Eight binary digit (b) Two binary digit (c) Eight decimal digit
(d) Two decimal digit (e) None of these

26. How many options does a binary choice offer ?
(a) One (b) Two (c) Three
(d) It depends on the amount of memory in the computer
(e) None of these

27. The ..... indicates how much data a particular storage medium can hold.
(a) access (b) capacity (c) memory
(d) storage (e) none of these

28. The smallest unit of information a computer can understand and process is known as a ..... .
(a) digit (b) kilobyte (c) bit
(d) byte (e) none of these

29. A computer works on a ..... number system.
(a) binary (b) octal (c) decimal
(d) hexadecimal (e) none of these

30. Computers use the ..... system to process data.
(a) processing (b) kilobyte (c) binary
(d) representational (e) none of these

31. Information on a computer is stored as ..... .
(a) analog data (b) digital data (c) modem data
(d) watts data (e) none of these

32. In the binary language each letter of the alphabet, each number and each special character is made up of a unique combination of ..... .
(a) eight bytes (b) eight kilobytes (c) eight characters
(d) eight bits (e) none of these

33. A string of eight 0s and 1s is called a ..... .
(a) megabyte (b) kilobyte (c) gigabyte
(d) byte (e) none of these

34. Which of the following is the largest unit of storage ?
(a) GB (b) KB (c) MB
(d) TB (e) None of these

35. A ..... is approximately one billion bytes.
(a) Kilobyte (b) Bit (c) Gigabyte
(d) Megabyte (e) None of these

36. The smallest unit in a digital system is a .....
(a) Byte (b) Kilobyte (c) Word
(d) Character (e) bit

37. The computer abbreviation KB usually means .....
(a) Key Block (b) Kernel Boot (c) Kilo Byte
(d) Kit Bit (e) None of these

38. Information on a computer is stored as what ?
(a) analog data (b) digital data (c) modem data
(d) watts data (e) None of these

39. One thousand bytes is a .....
(a) kilibyte (b) megabyte (c) gigabyte
(d) terabyte (e) None of these

40. Which of the following is the second largest measurement of RAM ?
(a) Terabyte (b) Megabyte (c) Byte
(d) Gigabyte (e) Megahertz

Answers

1.	(d)	2.	(d)	3.	(c)	4.	(c)	5.	(c)	6.	(b)	7.	(a)
8.	(c)	9.	(b)	10.	(b)	11.	(c)	12.	(b)	13.	(b)	14.	(b)
15.	(d)	16.	(a)	17.	(b)	18.	(b)	19.	(b)	20.	(d)	21.	(b)
22.	(b)	23.	(c)	24.	(b)	25.	(a)	26.	(b)	27.	(b)	28.	(c)
29.	(a)	30.	(c)	31.	(b)	32.	(d)	33.	(d)	34.	(d)	35.	(c)
36.	(e)	37.	(c)	38.	(b)	39.	(a)	40.	(d)				

★★★