

UNIT-1

Definition of Computer:

Computer is an Electronic device which receives the data and instruction, processes the data according to instruction, and gives the results or output.

Generations of computers:

According to the time period and technology there are 5 types of computer generations-

- (1) First generation computer
- (2) Second generation computer
- (3) Third generation computer
- (4) Fourth generation computer
- (5) Fifth generation computer

(1) First generation computer: The time period of first generation computers are 1942 to 1955. In first generation computer Vacuum tubes based technology was used.

Features of first generation computer: There are the following features of first generation of computer-

- (I) In first generation computer the speed was limited to the milli seconds range.
- (II) In first generation computer the internal storage capacity was limited up to 20000 characters maximum.
- (III) In first generation computers were extremely large and occupied a large amount of space.
- (IV) In first generation computer Machine language is used to communicate with the computer

- (V) Due to the large size and nature of equipments, system-cost and working-cost was very high.
- (VI) First generation computers were unreliable due to the frequent failure of Vacuum tubes
- (VII) First generation computers generated more heat.
- (VIII) First generation computers were restricted to use in scientific and commercial applications.

Examples: **UNIVAC, EDSAC, EDVAC, ENIAC, IBM-650, etc.**

(2) Second generation computer: The time period of second generation computers are 1955 to 1964. In second generation computers Transistors based technology was used.

Features of second generation computer: There are the following features of second generation of computer-

- (I) In second generation computer operating speed increase up to the micro second range.
- (II) In second generation computer internal storage capacity increases up to 100000 characters maximum.
- (III) In second generation computer size of computers also increased.
- (IV) Second generation computers were more reliable and accurate.
- (V) In second generation computer there was an overall reduction in system cost and operating cost.
- (VI) In second generation computer Assembly languages were used to communicate with the computer.

Example: **IBM 1400, IBM 7000, ATLAS, etc.**

(3)Third generation computer: The time period of third generation computers are 1965 to 1974. In third generation computer IC (Integrated Circuit) based technology was used.

Features of Third generation computer: There are the following features of third generation of computer-

- (I) In third generation computer operating speed was improved up to nano second range.
- (II) In third generation computer internal storage capacity increased up to 500000 (half million) characters.
- (III) In third generation computer the reliability and accuracy also improved.
- (IV) In third generation computer HLL tools were used to communicate with the computer.
- (V) In third generation computer system cost and operating cost were also decreased.
- (VI) In third generation of computer size of computer also reduced.

Example: **IBM 360, PDP – II, Honeywell 200, etc.**

(4)Fourth generation computer: The time periods of fourth generation computers are 1975 up to till date. In fourth generation computer LSIC (Large Scale Integrated Circuit) and MOS (Metal Oxide Semi conductor) based technology are used.

Features of Fourth generation computer: There are the following features of fourth generation computer-

- (I) In Fourth generation computer operating speed are improved up to the range of nano and pico second range.
- (II) In Fourth generation computer internal storage capacity are also increased up to the range of 1 million characters.
- (III) In Fourth generation computer the size of computer also reduced.
- (IV) In Fourth generation computer the reliability and accuracy are also increased.
- (V) In Fourth generation computer system cost and working cost are also decreased.
- (VI) In Fourth generation computer HLL (High Level Language) are used to communicate with the computer.

Example: IBM 370 series, Honeywell 6080 series, APPLE, PENTIUM series.

(5)Fifth generation computer:

The time period of fifth generation computers are not defined. Fifth generation computers are in the development stage. Japan and USA mainly have undertaken the projects to design and develop such type of computers.

These computers will use intelligent programming and knowledge-based problem solving techniques. Fifth generation computers will be able to interpret natural language. In fifth generation computers it will not be necessary to use programming languages.

In fifth generation computers Artificial Intelligence (AI) based software will be used. These AI based software will tell the computer what to do and how to do. About fifth generation Experts are convinced that the concept of `thinking` computers is possible.

Types of Computers:

There are 3 basic types of computers –

- (1) Analog Computer**
- (2) Digital Computer**
- (3) Hybrid Computer**

(1) Analog Computer:

Analog computers represent numbers or data by a physical quantity that is they assign numeric values by physically measuring some actual property, such as the length of an object, an angle created by two lines, or the amount of voltage passing through a point in electronic circuit. Analog computers derive all their data in the form of measurement. The accuracy of the data used in an analog computer is directly related to the accuracy of its measurements. For example: Speedometer, Electronic voltmeter, etc.

(2) Digital computer:

A digital computer represents data in the form of numbers or separate units. A digital computer operates directly decimal digits that represent either discrete data or symbols. Digital computer takes the input and gives the output in the form of numbers, letters and special characters. Digital computers are generally used for business and scientific data processing. Digital computers also have a unique ability to store the

large quantity of data. In digital computer magnetic media is used as storage device. For example: PC.

(3) Hybrid computer:

Hybrid computer is the combination of analog computer and digital computer. Hybrid computer combine the most desirable features of analog computer and digital computer both. Hybrid computers have the speed of analog computer and the accuracy of digital computer. Hybrid computers are generally used in special problem in which input data derived from measurement and will be converted into digits and processed by computers.

For example, in hospital ICU, analog device may measure a patient heart function, body temperature, blood pressure, pulse rate etc. These measurements will be converted into digits and supplied to a digital device, which may send immediate signals to doctors/nurses if any abnormal readings are detected.

Functions of various blocks/devices of a computer:

(I) Functions of the Input devices:

- a. device accept the data from the user and input that data into the Input computer system
- b. Input device accept instructions from the users
- c. Input devices accept commands for execution or stop the program
- d. With the help of input device we can input online and offline data both.

- (II) Functions of the output devices:
 - a. Output devices are used for transmitting the intermediate result and final result to the users
 - b. Output devices are used for sending the message to the operator
 - c. Output devices are used for writing the data on to the secondary storage device.
- (III) Functions of the control unit (CU):
 - a. CU maintains the order and control the data flow within the various devices of computer
 - b. CU maintains the sequence of operations
 - c. CU interprets instructions and gives the commands
 - d. CU communicates with input and output devices for transfer and receives the data.
- (IV) Function of ALU:
 - a. ALU performs all types of arithmetic functions and logical operations.
- (V) Functions of memory unit (MU):
 - a. Mu holds the data and instructions during processing
 - b. Mu holds intermediate results
 - c. The size of MU affects speed, power and capability of processing
 - d. All I/O instructions are transmitted through main memory.
- (VI) Functions of secondary storage device (SSD):
 - a. SSD is used for holding the backup data and instruction
 - b. SSD is used for data transportation
 - c. SSD is used for bulk data storage.

UNIT2: OPERATING SYSTEM AND INTERNET

UNITS	MEANING
1 Nibble	4 bits
1 Byte	8 bits
1 Kilo Byte (1 kB)	1024 bytes
1 Mega Byte (1 MB)	1024 KB
1 Giga Byte (1 GB)	1024 MB
1 Tera Byte (1 TB)	1024 GB

Internet:

The Internet is a “network of networks”. It is a global collection of high powered computers that are connected to each other with network cables, telephone lines, microwave dishes, satellite etc. Each computer on the internet stores documents, sound files, video clips, program files, electronic shopping centers, animations, pictures, interactive contents and other things that can be stored and presented electronically. All these resources are available to the computer, which connects to the Internet.

Any person who is connected to the internet is connected to your computer. You can communicate with anyone on the internet by sending e-mail, posting the

message in news group, chatting in chat areas, and even telephoning and video-conferencing over the internet.

A Network of Network

The internet is a network of wide area network. In a corporate wide area network, each department has a local area network that allows sharing of files, database, printer and other peripheral devices.

In a network data must be safely transferred from one destination to the other. Each destination will have a specific address. For the safe transfer of data the rules TCP and IP are used. Transfer control Protocol (TCP) is responsible for breaking up large data into little data packets. Internet Protocol (IP) is responsible for packing the destination address information in these little data packets.

Basic terms related to the Internet:

There are some of the following terms related to the Internet –

- (I) Cyberspace
- (II) Website
- (III) Web browser
- (IV) Home page
- (V) HTML
- (VI) Protocol
- (VII) HTTP
- (VIII) E- mail
- (IX) World wide Web (WWW)

- (I) Cyberspace: The computer world is called the cyberspace.
- (II) Website: Website is the electronic storefront where all the data and information are stored electronically.

- (III) Web browser: The software which is used to open the internet is called the web browser.
- (IV) Home page: The introductory screen of any website is called the home page.
- (V) HTML: Hyper Text Manipulation Language (HTML) is used to develop the home page.
- (VI) Protocol: Protocol is the set of rules which is used for transmission the data over the internet.
- (VII) HTTP: Hyper Text Transfer Protocol (HTTP) is used that how the WWW pages are transferred over the internet.
- (VIII) E-mail: E-mail is the most popular service of the internet. You can use it for anything where paper and telephone would otherwise have been used.
- (IX) World Wide Web (WWW): WWW allows the user to jump from one location on the internet to another.

OPERATING SYSTEM

Operating System (OS) is the interface between user and hardware.

An operating system (OS) is an essential component of a computer system. The primary objective of an OS is to make computer system convenient to use and utilize computer hardware in an efficient manner.

OS is a group of complex programs written in machine language that enables a computer to schedule work in the most efficient way. OS supervises the overall operation of the computer.

Examples: MS- DOS, MS-WINDOWS, LINUX, UNIX, etc.

Functions of Operating System:

There are the following functions of the operating system-

- I. OS communicates with the computer operator by means of the console unit or keyboard.
- II. OS controls the flow of jobs by loading and unloading of programs.
- III. OS under takes the error diagnosis and recovery techniques in case of error condition.
- IV. OS allocates peripherals to programs and checks their availability.
- V. OS gives the warning to the operator when peripheral device required alteration.
- VI. OS supervises operations including compilation and execution of programs.

Components of OS:

- (I) Process management
- (II) Memory management
- (III) I/O management
- (IV) File management
- (V) Device management
- (VI) CPU management / Job scheduling

Goals of OS:

- (I) Reliability
- (II) Accuracy
- (III) Protection
- (IV) Integrity
- (V) Extendibility
- (VI) Flexibility
- (VII) Adaptability

- (VIII) Efficiency
- (IX) Serviceability
- (X) Convenience.

Computer Memory

Type of computer Memories:

Computer memories are classified into two types:

- (1) Primary Memory
- (2) Secondary Memory

(1) Primary memory:

Primary memory may be called as internal memory or Main memory. Primary memory built within the computer that stores the unprocessed data, processed data and programming instructions. It is immediate access memory. It is of a limited in storage capacity and temporary in nature. The information resides in the secondary memory are needed by CPU for current execution is transferred from secondary memory to the main memory.

Functions of Primary memory:

- (1) Primary memory is used to hold the operating system instructions when boot the computer
- (2) Primary memory holds the copy of the programming instructions and input data temporarily.
- (3) Primary memory store the result temporarily until it is transferred to corresponding output device.

Types of primary Memory:

There are two types of primary memory –

1. RAM – Random Access Memory
2. ROM – Read Only Memory

1. RAM:

RAM is identical to core memory in function and it is read and writes memory. Data can be stored in RAM by addressing one RAM cell. The data and instructions input via the keyboard etc. are stored in the RAM, so it may call as user's memory. RAM instructions are temporary in nature and these are present only for the time that the program is being used.

RAM instructions can be updated.

Types of RAM:

There are 2 vital types of RAM –

- I. Static RAM (SRAM)
- II. Dynamic RAM (DRAM)

I. SRAM:

SRAM stored the information till computer is under working.

II. DRAM:

DRAM loses its stored information in a very short period of time even though computer is under working.

2. ROM:

ROM is permanent memory storage, as the name suggest, ROM is that part of memory which is only `Read` by the computer. In ROM instructions are stored related to the operating system of computer. These instructions are

written by machine manufactures and these instructions cannot be updated by the user.

When you turn on the system, the ROM instructions are instantly activated to get activated of all input and output devices.

Differences between RAM and ROM:

There are the following differences between RAM and ROM –

RAM	ROM
1. RAM instructions are temporary in nature.	1. ROM instructions are permanent in nature.
2. In RAM instructions can be updated by user.	2. In ROM instructions cannot be updated by the user.
3. In RAM instruction can be read and write from the memory.	3. In ROM instructions can be only read from the memory.
4. RAM is a Volatile memory.	4. ROM is a Non-volatile memory.

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