

Introduction:

A computer is an electronic device that can solve different problems, process data, store and retrieve data and perform any types of calculation in effective and efficient manner.

Characteristics:

- High Speed:

Computer is a very fast device. It has unit of speed in micro second, nano second and pico second. It can perform millions of calculation in a few second. Speed of computer is measured in Million Instruction Per second (MIPS).

- Accuracy:

In addition to being very fast, computers are very accurate. The calculations are hundred percent (100%) error free. It gives false result when wrong data is entered. This is known as Garbage In Garbage Out (GIGO).

- Storage Capacity:

Storage is a very important characteristics of computer. It can store large amount of data. It can store any type of data such as, images, videos, texts, audio, etc and many more. There are two types of memory in computer system:

→ Primary Memory

→ Secondary Memory

- Versatile:

A computer is a versatile machine capable of performing almost any kind of tasks. This machine can be used to solve the problems related to various fields.

- Diligence:

Unlike human being a computer is free from tiredness and lack of concentration. It can work continuously without any error. In addition, it can do repeated work with the same speed and accuracy.

- Automatic:

Computer is an electronic machine. Automation means ability to perform the given tasks automatically.

cally. Once a data and program is given to a computer, they are stored in a memory, the program and instruction can control the program execution without human interaction. It doesn't require any help from the user to process it.

Applications of computer:

• Science and Engineering:

Computers are widely used in scientific calculation and for engineering purpose. One of the major area is (CAD) Computer Aided Design that Provide certain and modification of MAPS and sketches of Building.

• Education and Research

The computer has provided a lot of facilities in education and research. Computer Based education involves control, delivery and evaluation of learning. It is used to prepare a data base for student university. Even distance learning is made productive and effective through internet and video-based classes.

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- **Business and Industry:**

A computer has a high speed of calculation, diligence, accuracy which makes it useful in all business organization. Computer is used in business organization for payroll calculation, budgeting, sales analysis, financial forecasting, maintenance of stock, etc.

- **Entertainment:**

Computers are now the major entertainers and the primary time pass machine. We can use computer for playing games, watching movies, listening to movies, drawing pictures, etc.

- **Banking:**

Today banking is totally dependent on computer we know well that computers are being used by the financial institutions like Bank for different purpose. It is used for keeping the records of the cashflow, giving the information regarding your account, etc.

- **Health Care:**

Computer has become an important part in hospitals and labs. The computers are being

used in hospitals to keep the records of patients and medicine. For example : ECG, Ultra sound and CT scan, etc. are also done by computer machine.

Types of Computer

There are two types of Computer :

- 1) On the basis of size, speed.
- 2) On the basis of working principle.

1) On the basis of size, speed:

a) Super Computer:

It is a special ^{category of} extremely powerful computer especially designed for high speed and numeric calculation. They are capable of carrying billions of arithmetic calculations operations per second. It has several numbers of processor in a single system. It can handle more than ten thousand work station at a time. So, it can be used as a server. For example of a super computer are; XMP, CYBER 205, CRAY, Param, etc.

Applications:

- ii) Military defence system
- iii) Weather forecasting
- iv) Aircraft Design

b) Main Main frame Computer:

It is smaller and less powerful as compared to the super computer. It is a special type of computer. It has a number of processor which process parallelly. It can handle more than thousands of work stations at a time. It is used as a server or huge organization. For example: IBM 4381, UNIVAC 1100/60, etc.

features:

- i) Have primary large storage capacity.
- ii) Can support more input, output & storage secondary storage devices.
- iii) Large powerful computers than micro and mini.

c) Mini Computer:

They are smaller in size, have lower

processing speed and are cheaper than main frame Computer. These computers are known as mini computer because of their small size. The capabilities of mini computer are between mainframe and Personal Computer. It handles more than 100 work station at a time so it is multi-user or multi-terminal time ^{sharing} saving system. Prime Series and AP3 are the examples of minicomputer.

d) Micro-Computer:

Micro Computers are the smallest but most important category of computer system for user. They are also referred as personal computers.

Types :

- i) Desktop Computer.
- ii) Laptop or Notebook Computer
- iii) Palmtop Computers
- iv) Personal Digital Assistant (PDA)

2) On the basis of working Principle

(a) Digital Computer (—|—|—|—|—)

A computer that perform calculation and logical operation with quantities, represented as digits usually in the Binary number system 0 and 1 is called Binary Digital Computer. Meaning of 0 is "off" and 1 is "on". Some major characteristics of these computers are -

- Digital Computers are normally used for general purpose.
- Digital computers are more reliable and accurate.
- It is programmable.

(b) Analog Computer (~~~~~)

An Analog Computer is a form of computer that use continuous physical phenomena such as electrical and mechanical. These computers process continuus values rather than discrete binary values. Normally

Analog computers are special purpose computers, thermometers, speedometers, multimeter, etc are the examples of Analog Computer devices.

Some of the characteristics of Analog computers are:

- Analog computers are based on continuous
- These are measured only in natural or physical values
- These are used for special purpose but accuracy of this computer is very low.

③ Hybrid Computers

A combination of computers those are capable of inputting and outputting of both analog and digital signal is called hybrid computer. It can perform the work done by analog computers as well as by digital computers. Devices used in Hospitals to measure the heartbeat of patient are the example of hybrid computers.

Some of the major characteristics of Hybrid computers are:

- These computers combine the good qualities of Digital as well as Analog Computers.
- These computers normally have high cost.
- Normally these are special purpose machine.

Mobile Computing:

Mobile Computing is the form of human-computer interaction by which a computer is expected to be transported during normal usage. Mobile Computing has three aspects:

- (a) Mobile communication
- (b) Mobile Hardware
- (c) Mobile Software

Mobile Computing is taking a computer and all necessary files and software into the field. Mobile computing being able to use a computing device even when being mobile and therefore changing locations. Portability is one

Aspect of mobile computer.

GENERATION OF COMPUTER :

There are five generation of computer

1) First generation Computer (1949 - 1959) :

* features :

- They were huge in size.
- They use vacuum tube as main component.
- They use machine level language.
- Their operating speed was upto milliseconds.

* Disadvantages / Limitations :

- Very unreliable
- Commercial Production was difficult and costly.
- Thousands of vacuum tubes produced large amount of heat.
- Air condition was huge.

2) Second Generation Computer (1959 - 1965)

In second generation computer vacuum tube were replaced by transistors. Transistors were cheaper, smaller than vacuum tube so one

transistor could replace thousands of vacuum tube IBM1401 and ICL300 are the example of second generation computer.

* features :

- They use transistors as a main component.
- They use magnetic disc as secondary storage.
- Their operating speed was increased upto microsecond.

* Disadvantages / Limitations :

- Air conditioner was still required.
- Assembly language was used so it was difficult for the general users.
- Commercial production was difficult and costly.

3. Third Generation Computer (1965 - 1971)

This generation computer use IC (Integrated Circuit) as a main component. Computers are further reduced in size than second generation. Examples of third generation computer are IBM 360, ICL 2900. This generation computer uses mass storage like floppy disc, hard disk, tape, unit, etc.

* Features :

- They use IC as main component.

- Their operating speed was increased upto nanoseconds.
- They support high level language.
- General people can use this computer.

* Disadvantages / Limitations :

- Air conditioning was required in many cases.
- High sophisticated technology was required for the manufacture of IC chips.

4) Fourth Generation Computer (1971-1980)

Fourth generation computers use microprocessor (VLSI) as the main component. They are very cheaper, smaller and faster than other computers. Intel 4004, IBM PC, Macintosh Apple, etc are the examples.

* Features :

- The size of computers reduced to desktop, laptop and notebook.
- They use object oriented programming language (OOP).
- Their speed has been increased upto pico-second.
- They use Microprocessor (VLSI) as a main component.

* Disadvantages

- Highly sophisticated technology is required for manufacturing VLSI chips.

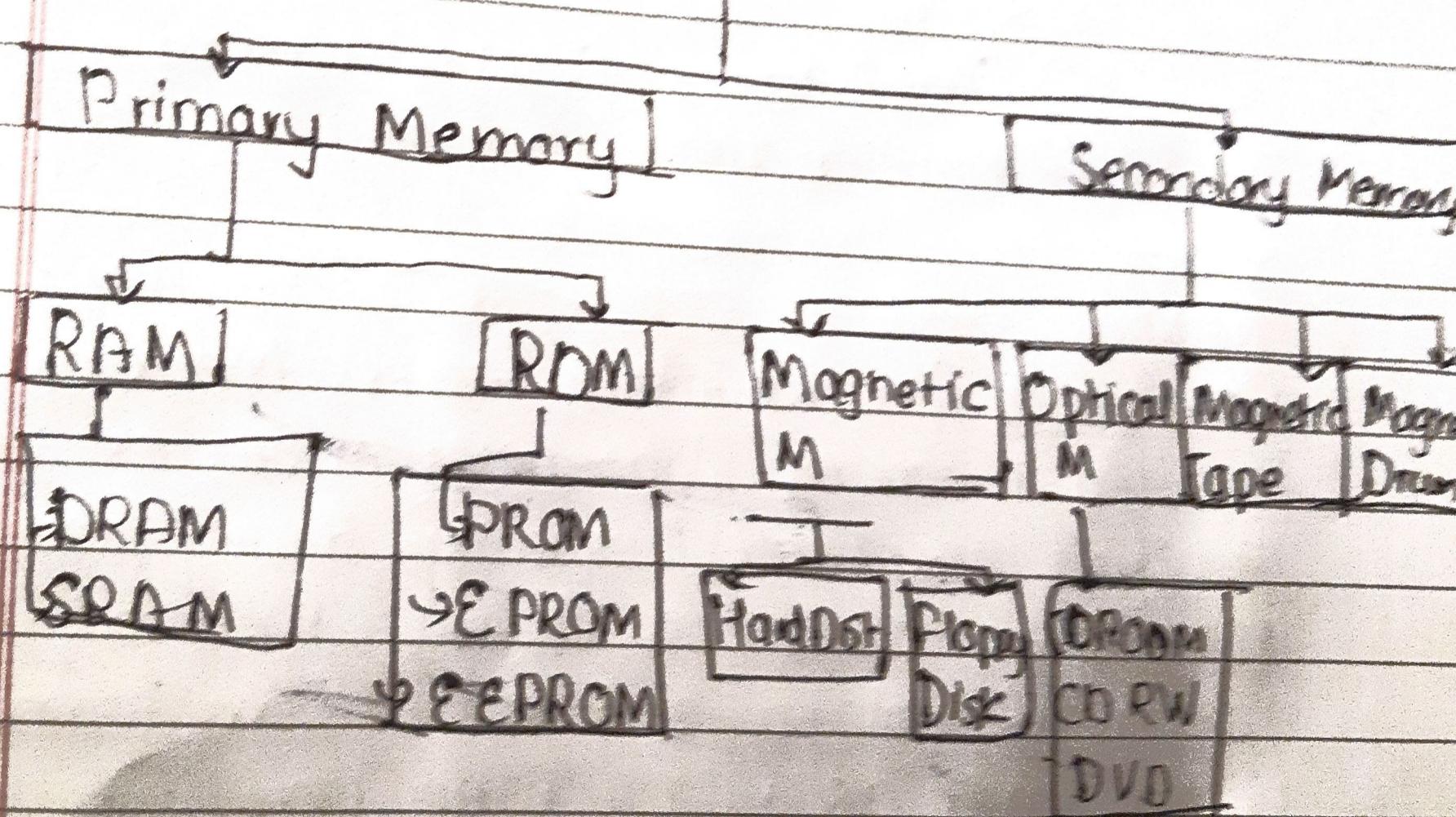
5) fifth Generation Computer (1980-Present)
fifth generation computers are going to use bio-chips. These computers will be able to understand natural languages and will be ~~able~~ have thinking power called Artificial Intelligence (AI).

* Features:

- They will have AI
- They will use multi-parallel processor system.
- Bio chips will be used as a main component.

Memory refers to the electronic place for instruction and data where the computer microprocessor can reach quickly. It is the hardware component used in computer system that is a location or space to store data or instruction and programme temporarily or permanently. Memory can be classified into two categories. They are:

Types of Memory



1 Primary Memory

Primary Memory or main memory is the work space for the CPU processor. It is the main storage area in a computer system where both data and instruction are stored for quickly access by the CPU. CPU continue reads instruction stored and execute from the main memory Or Primary Memory.

There are four types of primary memory:

- a) RAM
- b) ROM
- c) Cache Memory (Cache Memory)
- d) Register

a) RAM:

RAM stands for Random Access Memory. It is the memory that holds instruction and data that are used frequently during processing. RAM is also called Volatile memory because the data and instruction remain there only as a computer has electric power. As soon as the electricity cut off the data and instruction stored in RAM disappears. There are two types

of RAM RAM i.e (SRAM and DRAM).

b) ROM :

~~Read~~ ROM stands for Read Only Memory. It is a primary memory that stores from standard processing programme supplied by the manufacturer to operate the personal computer. ROM is non-volatile memory because it doesn't fail in case of power supply there are 3 types of ROM. They are:

→ PROM

→ EPROM

→ EEPROM

Difference Between RAM and ROM

RAM

RAM Stands for Random Access Memory which is a form of data storage that can be accessed at random at any time.

Ram is volatile. For example its contents are lost when the device is powered off.

ROM

ROM stands for Read Only Memory which is the form of data storage that cannot be erased.

ROM is non-volatile memory. Its contents are returned even when the device is powered off.

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