

A) Fundamentals of Computer

1. Introduction: The term 'Computer' is derived from the Latin word 'Computar' which means to calculate.

- C = Commonly
- O = Oriented
- M = Machine
- P = Properly
- U = Used for
- T = Training
- E = Education
- R = Research



Computer is an electronic machine, that process the input data according to the given instruction & gives output as a result. It also saves the result for future use.



2. Input / Output & Processing of the Computer:

INPUT DEVICES

- Keyboard
- Mouse
- Scanner
- Digital Camera
- Joystick
- Pen drive

OUTPUT DEVICES

- Monitor
- Printer
- Plotter

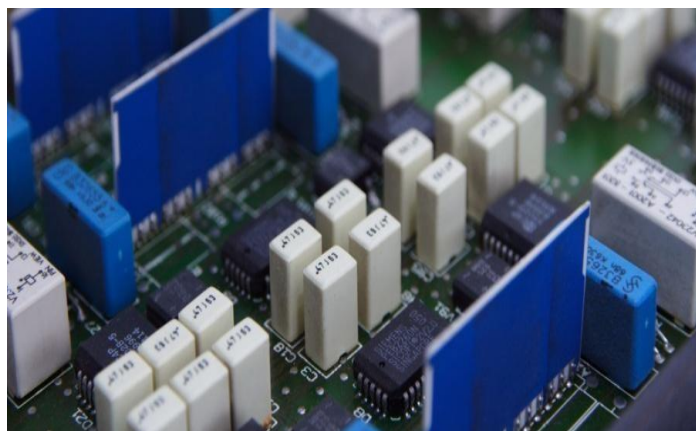
PROCESSING OF THE COMPUTER: (CPU)

The most essential part of the computer that perform the various operations provided. It is also called the brain of the computer. It is mainly divided into three categories:

- Arithmetic & logic Unit: It performs all arithmetical as well as logical operations such as addition, subtraction, multiplication & division. Also it performs the comparison between the entities & thus help in decision making to the computer.
- Control Unit: It controls the flow of instruction within the system. CU gets the program instruction from memory & executes them one after another.
- Memory Unit: It saves the instructions that are being executed for the future use. Each instruction takes certain memory for its proper execution.

Components of the CPU

- | | |
|--------------------------|-----------------|
| ➤ Motherboard | ➤ DVD/CD R-W |
| ➤ Hard disk | ➤ Floppy Drive |
| ➤ RAM | ➤ Modem |
| ➤ ROM | ➤ Graphics Card |
| ➤ Processor | ➤ Sound Card |
| ➤ SMPS & Connecting wire | |
| ➤ UPS | |



3. Memory Device

➔ The storing capacity of computer expressed in bytes. Bytes store one character of data.

0.1	1 bit
4 bits	1 nibble
8 bits	1 byte
1 byte	1 character
1024 bytes	1 Kilobyte (KB)
1024 KB	1 Megabyte (MB)
1024 MB	1 Gigabyte (GB)
1024 GB	1 Terabyte (TB)

There are mainly two types of memory:

Primary Memory: This is the main memory of the computer. This memory is used frequently by the CPU for execution of the instructions. There are again two types of Primary Memory.

- **RAM:** RAM stands for Random Access Memory. Initially every task is stored in RAM & then executed or stored in Hard disk. It is volatile, it stores data temporarily. So no data will remain when the power is switched off. It ranges from 64 MB to 16 GB.
- **ROM:** ROM stands for Read Only Memory. It is a programming chip, where all the system information are recorded & can't be changed. Its types are PROM, EPROM, EEPROM, etc. It is non-volatile.

Secondary Memory: These are the storage devices & are used to save the programs files permanently. There are different types of Secondary Memory. They are:

- Hard disk (ranges from 40 GB to 1 TB)
 - Floppy disk (1.44 MB)
 - CD (720MB), DVD (4.7 GB, 8.5 GB)
 - Blue ray Disc (25 GB, 40 GB)
 - Pen Drive (ranges from 128 MB to 256 GB)
- Magnetic Tapes, Zip disk, etc.

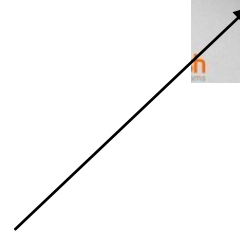
4. Types of Computers:

ON THE BASIS OF WORKING:

- ✓ Analog computer
- ✓ Digital computer
- ✓ Hybrid computer (Digital + Analog)

ON THE BASIS OF SIZE:

- ✓ Mainframe computer
- ✓ Mini computer
- ✓ Super computer
- ✓ Work station
- ✓ Micro computer
 - Desktop computer
 - Laptop computer
 - Palmtop computer
- ✓ Network computer



ON THE BASIS OF BRAND:

- ✓ IBM PC
- ✓ IBM compatible
- ✓ Apple/ Macintosh

ON THE BASIS OF PROCESSING:

- ✓ XT/ 8086 & 8088 processor
- ✓ AT 286
- ✓ AT 386
- ✓ AT 486
- ✓ Pentium I, II, III, IV



5. Characteristics of Computer:

→ SPEED AND ACCURACY

Computer performs complex calculation at a very high speed. Computer takes a few micro/nano second to execute an operation.

Fraction of a second:

1 millisecond= 1/1000 of second

1microsecond= 1/1000000 of a second

1 nanosecond= 1/000000000 of a second

1 Pico second= 1/1000000000000 of a second

Computer always gives 100% actual outputs (result), if the user provides correct Input and Instructions .If any mistake occurs in any calculation they are due to manual error but not of computer. Since it is 100% accurate, it is reliable.

→ STORAGE

Computer can store a huge amount of data for the future use in auxiliary device like floppy disk, hard disk or compact disk. The storing capacity of computer is expressed in bytes. Normally one byte stores one character of data.

0.1	1 bit
4 bits	1 nibble
8 bits	1 byte
1 byte	1 character
1024 bytes	1 Kilobyte (KB)
1024 KB	1 Megabyte (MB)
1024 MB	1 Gigabyte (GB)
1024 GB	1 Terabyte (TB)

→ VERSITALITY:

Computers are being used in different fields such as offices, school, hospital, etc. to perform various tasks. Versatile means ability to perform various tasks & computer can capable to do so. A computer can process any kind of data.

→ DILLIGENCE:

It is a capacity of performing repeated operation without any tiredness & any mistakes. A computer is capable of performing the required tasks continuously with the same speed, accuracy & efficiency without any error.

6. HISTORY & GENERATION OF COMPUTER

It took thousands of years for the computer to develop in to the present state. Earlier the process of computing was done by counting with their own figures, stones & through scratches on the sand or walls. But this idea is only for the counting of small entities. So later, various types of computing devices such as ABACUS, Napier's bone slide rule, difference engine, lady Augusta Ada Lovelace, etc. On the processing of previous calculating machines & continuous development on them, makes modern computer come to this stage.

Generations of Computer

→ First generation of computer (1946 to 1958)

- i. Vacuum tubes are used to electronic circuit
- ii. Storage capacity was limited (1kb to 4kb)
- iii. Slow processing (millisecond)
- iv. High voltage needed up to 150000 volts.
- v. large in size (5100² feet)

→ 2nd generation of computer (1959 to 1964)

- i. Transistor were used
- ii. processing speed was faster
- iii. Smaller in size(51² feet)
- iv. Input and output device were faster

→ 3rd generation of computer (1965 to 1974)

- i. ICs were used in place of transistor

- ii. processing speed is faster than second generation
- iii. minicomputer were in produced during this generation
- iv. Storage capacity in measured in mega byte.

→ 4th generation of computer (1975 to 1990)

- i. VLSI and micro processor are used
- ii. processing speed is very high Giga bytes
- iii. very smaller size
- iv. input and output devices were versatile

→ 5th generation of computer (1990 to incomplete...)

- i. Intelligent processing
- ii. Easy human computing
- iii. computer will understand natural language
- iv. They have artificial intelligence.

7. Applications Of Computer:

Now a days, it is difficult to find the field or the criteria in which there is no use of computer. Directly or indirectly there is vast use of computer. However some of the major fields of Computers are given below:

- | | | |
|------------------------|---|-----------------------------------|
| ● Personal use, | ● | ● Satellites & Networking System, |
| ● School & College | ● | ● Research Center, |
| ● Graphic designing, | ● | ● Hospitals, |
| ● Audio/ Video mixing, | ● | ● Banks & other offices, |
| ● Entertainment, | ● | |
| ● Design & Modeling. | | |