Computer:-Computer is an electronic machine which store any data as input and processing it .After processing it gives a meaningful result as output.

OR

Computer is an electronic machine which solves any type of arithmetical & logical operations.

OR

Computer is high speed electronic machine, which is capable to perform any type of arithmatical & logical operations

❖ Feature of computers:-

Autometic :- An automatic machine works by itself without human intervention(hastchhep).computers are automatic machine because once started on a job (normally without any human support) until it is finished.

Speed :- A computer is very fast device. it can perform in a few seconds,the amount of work that a human being can do in a entire year - if/he/she worked day and night and did nothing else.

Accuracy :- A computer performs every calculation with same accuracy.A computer never gives any wrong result unless and until the user being does. If number of calculations has to be performed, it will maintain same accuracy as first one.

versatility:- A computer can perform any type of arithmatical and logical operations which when broken down in a computer readable steps.

Diligence:- A computer does not suffer from human traidy or bored. If million of works has to be performed, it will perform the millionth of work with exactly same speed and accuracy as first one.

No feeling :- It can not make judgments based of feeling.

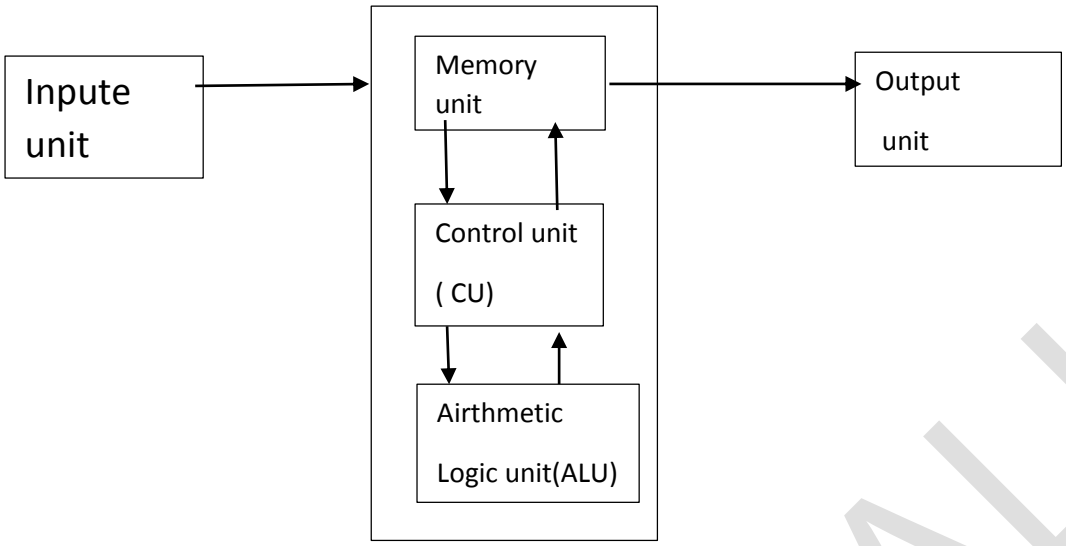
No I.Q :- It can not take its own decisions because it has not I.Q.

Storage:- One of the most important feature of computer is storage .It can store large amount of data and whenever required ,it can be retrieve very easily.

❖ Limitation of computer

- Computer are very powerful machines but can not think and make any decision on its own.
- Computer can not take over all activities because they are less flexible than human.
- Computer can not perform anything outside the defined score.
- Computer do not have the potential to work out alternative solutions.
- The cost of computer is yet, which is limiting their use.

Basic organization of computer



Input Unit :- It is a device which is used to transfering the data and instruction to computer system. Most commonly used input devices are keyboard, mouse, light pen, scanner, joystick etc.

Keyboard :- Keyboard devices are the most commonoly used input devices today. They allow data entry into a computer system by pressing a set of key neatly mounted on a keyboard connected to a computer system . the most popular keyboard used today is the 104 keys QWERTY keyboard.

The keyboard is divided into four main parts:-
Main pad :-A-Z.
Function pad F1-F12.
Numeric Pad :-0-9, +,-,*,/
Special pad:-*, $,#,@, & etc.

❖**Mouse: -** It is also an input device to draw any picture and work quickly. It is an electronical device used as a pointer to select item from on screen.
A scientist " Dugles C angle wart" has invented this equipment in 1997 at "Stand Ford" research laboratory .

There is four types of mouse:-
1). Mechanical mouse
2). Optical mouse
3). Bus mouse
4). Serial mouse

❖ **Joystick : -** A joystick is a pointing device used to move the cursor position on the screen.The joystick can be moved right or left, forward or backward. It is mostly used in video Games.

❖ **Scanner : -** Scanner iis an input device thate translates paper documents into an electronic format for input to a computer.the input documents may be typed text, picture , graphics metarial.

❖ **MICR(Magnetic inkcharacter reader)** Actually this input device are mainly used in Banking industry to reads cheque. An MICR can indenting characters printed with a special ink that contains particles of magnetic materials.

❖ **OMR(Optical Mark Reader):-** OMR is a scanner, which can recognize a pre-specified type of mark made by pencil or pen on spaciallly designed

sheet.These scanner are mostly used in evaluating objective type question.

- **BCR(Bar code Reader) :-** A Bar Code Reader is a device for reading bar-coded data. It scans bar-code image and converts it into an alphanumeric value for input to a computer connected to it. It use bar-codes for unique identification purpose.
- **Touch Screen : -** It enables a user to choose from available options by simply touching with a finger the desired(chaha) icon or menu items displayed on a computer's screen.

Output unit :- An output device is an electromachanical device that accepts data from a computer and translate them into a form suitable for use by outside world(users).

Ex:- Monitors , printers,Screen image projector,Speaker

- **Monitors:-** Monitors are the most popular soft copy output devices used today. Which used to display information on the computer screen.

Printer :- A hardware device that produces text or graphics output on a paper. There are a large variety of printing devices, which can be classified according to print quality and printing speed. Printers group are

broadly classified into either impact or non-impact printer.

Impact printers : - A printer that direct connected with the print medium(usually paper) to create an image. Impact printers use variations of standard type writer. Printing mechanism where a hammer strike through a inked ribbon.

1. Dot-Matrix printers:- Dot-Matrix printers are impact printers beacuse they print by hammering pins on an inked ribbon to leave ink impressions on a paper. Dot-matrix printers are charachter printers that print one character at a time.They form characters and all kinds of image as patterns of dots. Normally, Dot-Matrix printers are slow, having printing speeds in the range of 30 to 600 cps(characters per second).

2. Line printers : - Line printers compose one line at a time that is it known to the printer which character has to be printed in each line. It can print between 300 to 3000 lines per minute.

Non impact printers :- Those printer that not have direct connect with the print medium. Falls under this category(inkjet printer , laser printer). Non impact printer use chemical heat or electrical signals to each or symbols.

1. Inkjet printers : - Inkjet printers are character printers that form characters and images by spraying small drops of ink on a paper. Inkjet printers produce

higher quality output than dot- matrix printers do beacause they form characters by very tiny ink dots.The typical speed range of this printer is 40 CPS to above 300 CPS.

2.Laser printers : - laser printers are non-impact printers. since laser printers produce printed output as patterns generated by the laser beam . Low speed laser printers can print 4 to 12 pages per minute.

Advantage of laser printer :-

1. Very high speed.

2. Low noise level.

3.Low maintenance requirements.

4.Very high image quality.

5.Excellent graphics capabilities.

Memory :- Memory in a computer system is required for storage and retrieval of datas and instructions. Computer system used variety of devices for storing the instructions and datas which are required for its operatons.

There are two types of memory:-

1). Primary memory
2). Secondary memory

Memory sizes(Capacity):

The size of memory is termed in terms KB,MB,GB etc.,

1 Byte = 8 bits
1 Kilo Byte(KB) = 1024 Bytes(2_{10})
1 Mega Byte(MB) = 1024 KB
1 Giga Byte(GB) = 1024 MB
1 Tera Byte(TB) = 1024 GB
1 Peta Byte(PB) = 1024 TB

1 Exa Byte(EB) = 1024 PB
1 Zetta Byte(ZB) = 1024 EB
1 Yotta Byte(YB) = 1024 ZB

Primary Memory:-

This memory is associated with the CPU. Before being actual processing the data is to be stored in some storage area. This area is also known as primary memory. It is also known as " Internal/ Main memory". Primary memory is more expensive than secondary memory.It is also classified into two parts like:-

1). RAM{Random Access Memory}.
2). Rom[Read-Only Memory].

RAM(Random Access Memory):-

It stands for Random Access Memory. Ram is a part of computer where the computer stores all datas and instructions receive from input devices. This memory is volatile in nature. Means our data is lost , when power failure.

RAM is of many types, but some are :-

D-Ram(Dynamic Ram)
S-Ram(Static Ram)
F-Ram(Ferromagnetic Ram)

ROM(Read –Only Memory) :-

As the name suggest information stores in this memory can be only read. This is the permanent memory and it is connected a set of instructions, value of log, trigonometrically function, mathematical process. The instructions stored in the ROM at the time manufacturing by fuse links. Once the information stored in it can not be changed.

ROM is mainly divided into three types like:-

1). P-ROM (Programmable ROM)
2). EP-ROM(Erasable Programmable ROM).
3).EEP-ROM(Electronically--Erasable Programmable ROM).

Difference between RAM and ROM

RAM

1). Read/write semi-conductor memory.
2). Volatile memory.
3). Can be used for user and system programs both.

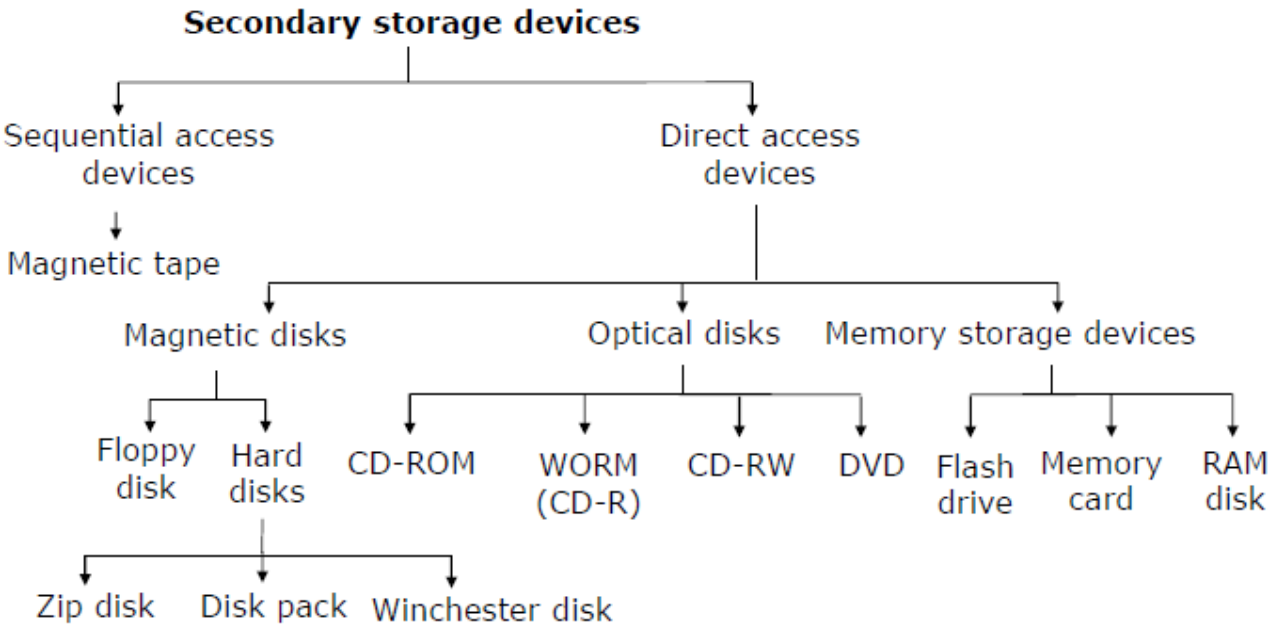
4). Temporary memory

5). Faster memory.

ROM

1. Read-only memory.
2. Non –volatile memory.
3. Can't be used for user programs.
4. Permanent memory.
5. Slower than RAM.

Secondary Memory:- A primary memory attached to the computer system, but it will away from the computer. It is a medium to store large amount of datas & instructions. It is a non volatile memory. It is also known as external memory and auxiliary memory.



Magnetic Tape :- Magnetic tapes are used for large computers like mainframe computers where large volume of data is stored for a

longer time. It can be 12.5 mm to 25 mm wide plastic film-type and 500 meter to 1200 meter long which is coated with magnetic material.

Floppy Disks : - The floppy disks is a direct access storage device although its capacity is much less than a hard disks. the disk is made out of a flexible plastic material with ioran-oxide. the surface is devided into tracks and sector . the size of each sector is fixed (512 bytes). the standerd size available nowdays are 5.25 inch , 3.5 inch.

Size = 3.5 mm
No. of tracks = 125
No. of sectors = 35/track
Storage capacity = 1.44 MB , 1.88 MB , 2.1 MB.
Rotation = 366 RPM [Rotation per minute].

Hard Disks : - Hard disks are the primary on-line secondary storage device for most computer systems today. They are made of rigid metal (frequently aluminium) platters and come many sizes ranging from 1 to 14 inch diameter. The disk track is permanently sealed inside a core to protect it. The rotation speed of a hard disk is 3600 RPM to 7200RPM{ Rotation per minute}.

CD-ROM : - CD-ROM stands for compact Disk-Read only memory. CD-ROM disk is a shiny, silver color metal disk usually of 5.24 inch or (12 cm) diameter. it has storage capacity 650 mb to 700 mb.

DVD : - It stands for digital video(or versatile) disk . it is in genre of optical disk with same overall dimension of CDs but much higher capacity . These can store at least 7 times more data than CD-ROM.Dual layer DVD disk have 8.5 Gb capacity on single side, using both sides capacity comes up ti 17 Gb.It was developed by sony,samsung and Panasonic in 1995.

Flash drive: Flash drives have many names — thumb drives, and pen drive. Nowadays flash drives can store several gigabytes of information. Since they are small in size but have large storage capacities. Flash drives are typically no more than two to three inches in length andless than an inch in width. Their size and shape may resemble a thumb or a small pen (which is where the names "thumb drive" and "pen drive" come from).

CPU :- it stands for "central processing unit " .the CPU is the primary component of the computer system that processes instructions. It runs the operating system and application constantly receiving input from the user or activate software programs. It processes the data and produces output.it is also known as brain of computer system.

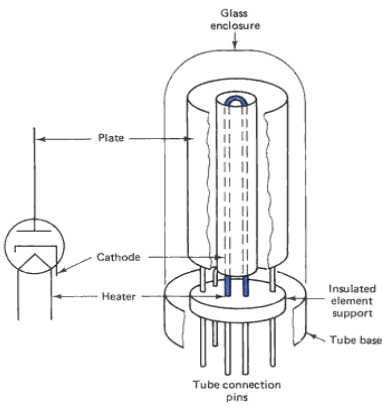
Control unit (CU) :- Control Unit of a computer system manages and co-ordinates the operation of all other components of computer system.

Arithmetic Logical Unit (ALU) :- The actual processing of the data and instruction are performed by Arithmetic Logical Unit. The major operations performed by the ALU are addition, subtraction, multiplication, division, logic and comparison. Data is transferred to ALU from storage unit when required. After processing the output is returned back to storage unit for further processing or getting stored.

Generation of Computer

First generation (1942-1954):-

- ✓ Vacuum tube technology
- ✓ Unreliable
- ✓ Supported Machine language only
- ✓ Very costly
- ✓ Generate lot of heat



- ✓ Slow Input/output device
- ✓ Huge size
- ✓ Need of A.C.
- ✓ Non portable
- ✓ Consumed lot of electricity
- ✓ Some computer of this generation were:

  ENIAC (Electronic Numerical Integrator And Computer)

  EDVAC (Electronic Discrete Variable Automatic Computer)

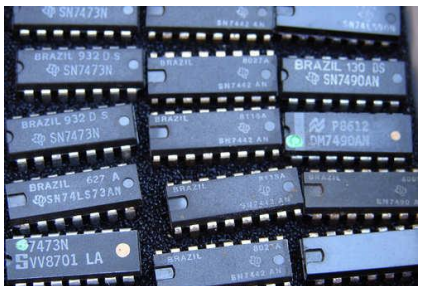
  UNIVAC (Universal Automatic Computer)

Second generation (1954-1964):

- ✓ Use of transistors
- ✓ Reliable as compared to First generation computers
- ✓ Smaller size as compared to First generation computers
- ✓ Generate less heat as compared to First generation computers
- ✓ Consumed less electricity as compared to First generation computers
- ✓ Faster than first generation computers
- ✓ Still very costly
- ✓ A.C. needed
- ✓ Some computer of this generation were:(IBM 1660,IBM 7090,CDC1604)

Third generation (1964-1972):

- ✓ IC used (I.C was invented by Jack Kilby.)
- ✓ More reliable
- ✓ Smaller size
- ✓ Generate less heat
- ✓ Faster



- ✓ Lesser maintenance
- ✓ Still costly
- ✓ A.C needed
- ✓ Consumed lesser electricity
- ✓ Support high level language
- ✓ Some computer of this generation were:

IBM-360 series

Honeywell-6000 series

Fourth generation (1972-1990):

- ✓ VLSI technology used (very large scale integration)
- ✓ Very cheap
- ✓ Portable and reliable
- ✓ Use of PC's
- ✓ Very small size
- ✓ No A.C. needed
- ✓ Great developments in the fields of networks
- ✓ Computers became easily available
- ✓ Some computer of this generation were:

    PDP 11

    CRAY-1(Super Computer)

    CRAY-X-MP(Super Computer)

Fifth generation (1990-Till date):

In this generation computing devices, based on artificial intelligence, The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.