UNIT – 2

→ Input Devices

✧ Keyboard :-

⇒ Keyboard is a input device. Keyboard used for normal data entry.
⇒ Standard keyboard has 101 or more keys.
⇒ Keyboard has all types of alphabetic, Characters, numerical and special key.
⇒ Following types of key.

1. Function key
2. Numeric key
3. Alphabetic key
4. Special key

⇒ **Function key :-** F1 and F12 are called function key. There are programmable key and each application use this keys for a specific purpose.
⇒ **Numerica Key :-** 0 to 9 are called Numeric key. There are two sets of Numeric key. Write number used numeric key.
⇒ **Alphabetic key :-** There are 26 (A to Z) letters of English alphabet. Write document or application use alphabetic key.
⇒ **Special Key :-** Following Special key

1. **Enter Key :-** At the end of a line of typing, this key is pressed to go to the next line.
2. **Spacebar key :-** This key space one character between two character or word.
3. **Back Space key :-** The back space key are used to delete cursor left side character.
4. **Delete :-** The delete key are used to delete cursor right side character.
5. **Tab key :-** Tab key used space five character between two character or word.
6. **Caps Lock key :-** The Caps Lock key ON to write capital Letter and Caps Lock key OFF to write Small Letter.
7. **Alt & Ctrl key :-** Alt and Ctrl key used to make shortcut.
8. **Arrow key :-** There are Four Arrow key. UP, DOWN, LEFT and RIGHT. Arrow key use Move the cursor UP, DOWN, LEFT and RIGHT in page or document.
9. **Shift key :-** Caps Lock key ON and write small letter use shift key with alphabetic key. Vice and versa. In some key upper symbol write press shift with symbol key.
10. **Esc Key :-** The Esc key is used to close dialog box.
11. **Insert key :-** Insert key is used to overwrite mode in the keyboard.
12. **Page up and down key :-** Page up key used one screen up to show page. Page Down key used one screen down to show page.
13. **Home :-** Move the cursor First position in particular line.
14. **End :-** Move the cursor Last position in particular line.

✧ Mouse :-

⇒ Mouse is a input device. Mouse is also called pointing device.
⇒ It is very difficult to remember all shortcuts of keyboard. That's why mouse is used.
⇒ It is called mouse because its shape like a mouse.
⇒ The mouse is connected to the serial port of your PC.
⇒ Following Three button in mouse.

1. Left Button 2. Right Button 3. Scroll Button

⇒ **Left Button :-** Use the Left button to select command or options.

⇒ **Right Button :-** Sometime used some program specific function (menu).

⇒ **Scroll Button :-** Used to scroll or move up and down in the pages.

⇒ Mouse perform following operation

1 Clicking 2. Double Clicking 3. Dragging

⇒ **Clicking :-** Clicking is used to select option or object. To select any option or object move the cursor on that option or object and press left key of the mouse and release it.

⇒ **Double Clicking :-** Double Clicking is used to innicate some action like open folder or execute program etc. Move the cursor on that object and click left button twice.

⇒ **Dragging :-** Dragging is used to move selected object on the screen. First move the cursor on that object press the left click but do not release it. After that move that object to destination place and after release the button.

✧ Light Pen :-

⇒ A **light pen** is a computer input device in the form of a light-sensitive wand used in conjunction with a computer's CRT TV set or monitor.

⇒ It allows the user to point to displayed objects or draw on the screen, in a similar way to a touch screen but with greater positional accuracy.

⇒ Light Pens work like you would expect. You simply point the Pen a the screen and press a button to make your selections.

⇒ No special monitors are needed: they work with any PC compatible and its associated monitor.

⇒ Follow the simple hardware and software installation procedures included.

⇒ The Light Pen works just like your mouse.

✧ Joystick :-

⇒ A Joystick is a stick mounted on a spherical ball which moves in a socket.

⇒ The stick can be moved left or right , forward or backward.

⇒ Potentionmeter are used to sense the movement.

⇒ The screen cursor may be rapidly moved to any position by manipulating the Joystick.

✧ Scanner :-

⇒ Scanner is an input device. If you want to input any image to the computer then using mouse and keyboard it is not possible for a special input device is used is called scanner.

⇒ You can use a scanner to convert a photograph or graphics into a computer file.

⇒ There are two types of scanner available OCR and OMR.

⇒ OCR means Optical Character Reader and OMR means Optical Mark Reader.

⇒ The cost of scanner depends on its functionality and capacity.

⇒ Shape of the scanner there are main two types of scanner.

1. Hand Hold scanner 2. Flat scanner

⇒ **Hand Hold Scanner** :- It is small in size and inexpensive. It can be used to take in hands.

⇒ **Flat Scanner** :- It is large in size and costly. It provide good quality of scanning. Mostly used for scanning the images and document.

✧ Touch Screen :-

⇒ Touch screen is a input device.

⇒ Touch panel is a new locator device used with Laptop computers which allows a user to point at the screen directly by moving his/her finger on the panel.

⇒ Different technologies are used based on the resolution required electronic circuits are used to detect the touch panel position from the change of the importance across the conductive coating.

⇒ The screen are sensitive to pressure. a user interact with the computer by touching pictures or words on the screen.

✧ Output Devices :-

✧ Monitor :-

⇒ Monitor is a output device.

⇒ Monitor is also called VDU means Visual Display Unit.

⇒ It provides a screen to display programs, data, graphics etc.

⇒ Now , a days display units are capable to display high resolution graphics. Graphics quality depends on resolution.

⇒ High resolution means high quality graphics and lower resolution means low quality graphics.

⇒ Number of pixels in line multiply with number of line(row) 680 X 480.

⇒ SVGA - Super Video Graphics Array.

⇒ VGA –Video Graphics Array.

⇒ EGA – Enhanced Graphics Array.

⇒ CGA – Color Graphics Array.

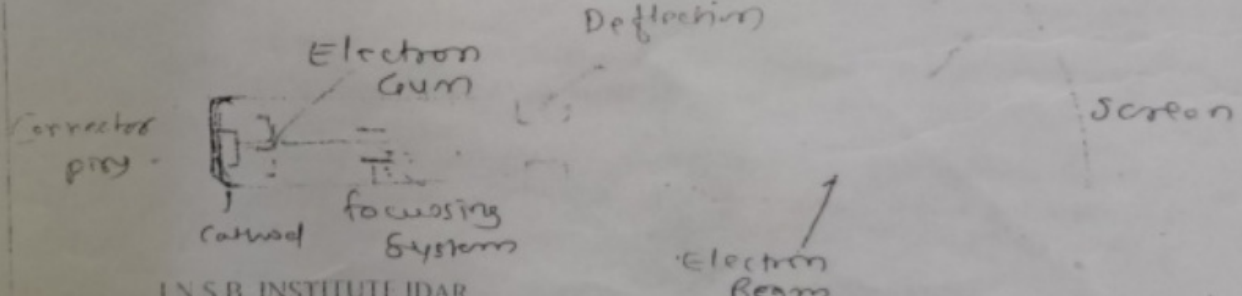
⇒ Four categories of display screen technology.
(1) CRT (Cathode Ray Tube) (2) LCD (Liquid Crystal Display)
(3) Plasma Display (4) Projection Display.

✧ CRT :- (Cathode Ray Tube)

⇒ CRT means Cathode Ray Tube.

⇒ Cathode Ray Tube is the Major technology on which monitor and television have been based.

⇒ CRT whole arrangement is fixed in signle glass tube.Following figure.



⇒ **Cathode** - When CRT is switched on at that time because of heading element cathode emits large number of electron

⇒ **Control grid :-** The electron generated by cathode are very random The main work of control grid to arrange random electron in a single line called electron beam

⇒ **Accelerating Anode :-** Accelerating Anode to control the speed of electron beam. Electron beam very fast on screen then it produces light colours and it is slow then dull colour produce.

⇒ **Deflection system :-** Two deflection system horizontal or vertical deflection sysiem. Horizontal deflection plates deflect the electron beam horizontally.(Right to left). Vertically deflection plates electron beam vertically (Up and Down)

❖ LCD :-

⇒ LCD televisions use liquid crystal compressed between two glass panels. When the electricity is applied to the crystals, an image is produced

⇒ Thin fluorescent tubes of light have a diffusing panel inside of them to distribute the light evenly onto the screen, thus producing the image

⇒ Color can be adjusted easily on LCD, although LED televisions normally have a better brightness source than LCDs.

⇒ LED televisions will cost you more than any LCD model of the same size

⇒ LED monitor can consume up to 40% less power than a LCD monitor of similar size

⇒ LCD monitors use cold cathode fluorescent lamps for backlighting

❖ Plasma display :-

⇒ A **plasma display** panel is a type of flat panel display common to large TV displays 37 inches or larger.

⇒ Plasma display screens are made from glass, which reflects more light than the material used to make an LCD screen.

⇒ Plasma use more electricity, on average, than an LCD monitor

⇒ Generally do not come in smaller sizes than 37 inches

❖ LED :-

⇒ LED means Light Emitting Diode.

⇒ LED televisions also use liquid crystal, but instead use a backlight constructed of hundreds of LED lights, in place of the fluorescent lamp used in LCD TVs

⇒ These LED bulbs can either be spread evenly around the back of the TV panel, or they can be located around the edges of the screen, which create an ultra thin television design

⇒ Color can be adjusted easily on LED, although LED televisions normally have a better brightness source than LCDs.

⇒ LED televisions will cost you more than any LCD model of the same size

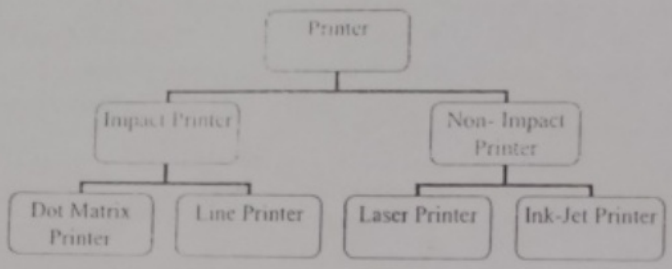
⇒ LED monitor can consume up to 40% less power than a LCD monitor of similar size

⇒ LED monitors use light emitting diodes.

❖ **Printer :-**

⇒ Printer is a output device. It is used to get output on paper.

⇒ There are two types of printer available in market



⇒ **Dot Matrix Printer :-**

⇒ Dot Matrix Printer is a Impact type Printer

⇒ It is a character Printer because it prints documents character by character

⇒ Dot matrix Printer is measure is CPS means Character Per Second

⇒ Dot matrix Printer slow and noisy.

⇒ The output of quality is the lowest of all types of Printer.

⇒ **Line Printer :-**

⇒ Line Printer is a impact type Printer.

⇒ Line Printer Print a Line by Line at a time.

⇒ It's speed is measured in LPM means Line Per Minute.

⇒ **Laser Printer :-**

⇒ Laser Printer is a non-impact type Printer.

⇒ Laser Printer Produce a very high quality output and very fast.

⇒ They are very expensive.

⇒ Laser Printer are page Priter.

⇒ **Ink-Jet Printer :-**

⇒ Int-Jet Printer good print quality and noiseless operation.

⇒ Printer print character and graphics by spraying very tiny drops of ink directly onto paper.

⇒ The quality of Printer is much better compared to Dot matrix Printer.

⇒ Ink-Jet is a non-impact printer.

⇒ Ink-Jet Printer is a characeter printer because it prints document character by character.

❖ **Plotter :-**

⇒ Plotter is a one type of output device. Plotter Produce good quality drawing and graphs have been designed and are available in the market.

⇒ There are two types of Plotter. 1. Drum Plotter 2. Flat bed Plotter

⇒ **Drum Plotter :-**

⇒ In a drum plotter, the paper on which the graph is to be drawn is mounted on a rotating drum.

⇒ The drum can rotate clockwise or anticlockwise .

⇒ A pen which can move direction of drum rotation.A Pan can move Left to Right or Right to Left.

⇒ The pen can also move up or down

⇒ The movement of the pen and drum are controlled by the graph plotting program

⇒ **Flat Bed Plotter :-**

⇒ A Flat bed plotter paper is fixed on a Flat surface . The Pen can moved in either X or Y direction

⇒ The pen can also be moved up or down

❖ Magnetic Storage Device :-

⇒ Magnetic Storage device are used as a secondary storage device

⇒ In magnetic type storage device magnetic material is coited on a plastic or disk.

⇒ There are two types of Magnetic storage device 1. Magnetic Tap
2. Magnetic Disk

⇒ It can store large amount of data

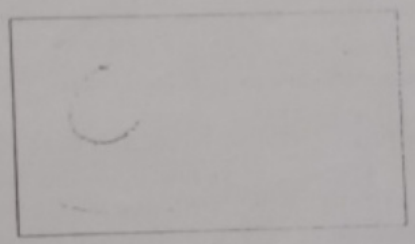
⇒ Digital audio tap is a one type of magnetic tap and floppy disk and hard disk are magnetic disk type of storage device

⇒ **Magnetic Tap:-**

⇒ Magnetic Tap is a one type of magnetic storage device

⇒ It is used as a secondary storage device. Magnetic Tap is a sequential storage device. It is also called external storage device

⇒ In Tap drive read – write head is fixed and magnetic Tap is wounded on wheels.



⇒ To read or write data magnetic Tap is unwounded from one wheel and wounded to another.

⇒ During that time one electric read- write head, read or write data.

⇒ This whole magnetic Tap covered with plastic cover for protection.

⇒ **Magnetic Disk:-**

⇒ Magnetic disk is a disk type storage device. Floppy disk , Hard Disk etc.

⇒ To increase the capacity of storage device multipal disk can be used.

⇒ Disk type of storage devices provide direct access of data

⇒ Magnetic disk are more reliable provides very fast data access.
⇒ It can stored large amount of data because of high density.
⇒ In magnetic disk a disk is cotted with magnetic material.
⇒ Track are devided into small groups which are called sector.
⇒ Because of direct access of data magnetic are faster than magnetic Tap.

✧ Floppy Disk :-

⇒ Floppy Disk is a one type of magnetic disk storage device.
⇒ It is very thin flexible plastic disk cotted with magnetic oxide.
⇒ It is very small removable and portable storage device.
⇒ Disk used is Floppy disk is very thin and flexible that's why it is called floppy disk.
⇒ To protect the magnetic disk there is one outer protection cover is used.
⇒ There are two types of floppy Disk 1) 5.25" Floppy Disk 2) 3.5"Floppy Disk.

⇒ Floppy Disk are available in both version 1 side and double side.
⇒ Types of Floppy Disk. 1). Single side Single density 2). Single side double desity 3). Double side Single density 4). Double side double density.
⇒ Floppy Disk has one split To read or write data to disk.
⇒ This split is covered with one allumminum protection cover.
⇒ Different between 5.25" FD and 3.5 FD.

5.25" Floppy Disk	3.5" Floppy Disk
1) It's size is Lager than 3.5" FD.	1) It's size smaller than 5.25" FD.
2) It's data storage capacity 1.2MB.	2) It's data storage capacity 1.44MB.
3) It is covered with card board cover.	3) It is covered with plastic cover.
4) It is less reliable.	4) It is more reliable.
5) It is life span is less.	5) It's life span is more.

✧ Hard Disk :-

⇒ Hard disk is a one type of magnetic disk storage device.
⇒ It is used as a secondary storage device. It can store large amount of data.
⇒ It is used to store operating system and programs.

⇒ When computer switched OFF them also data remains safe in Hard disk.
⇒ In hard disk cotted with high quality magnetic matireal.
⇒ That magnetic matireal has very high density.
⇒ Hard disk may contain multipal platters.
⇒ For each and every platter two read and write heads are required.
⇒ One is tap side and second is back side.
⇒ To protect this whole arrangement from external environment it is covered with storage alluminum cover.
⇒ That's why life span of hard disk is very long and more reliable.

Primary Memory :-

⇒ Primary memory is also known as main memory or internal memory.
⇒ It is used to store the current data or programe temporary.
⇒ This type of memory is very fast. Primary memory is very costly compared to secondary memory.
⇒ There are two type of Primary memory. 1. RAM 2. ROM
⇒ **RAM :-**
⇒ RAM means Random Access Memory.
⇒ It is also known as read-write memory.
⇒ RAM is Volatile memory.
⇒ Volatile means when power is turn OFF than the data will be lost.
⇒ There mainly two type of RAM. 1) SRAM 2) DRAM.
⇒ **SRAM :-**
⇒ SRAM means Static Random Access Memory.
⇒ It is faster then DRAM.
⇒ It is very costly than DRAM.
⇒ Size of SRAM is larger than DRAM.
⇒ Power consumption is less than SRAM.
⇒ **DRAM :-**
⇒ DRAM means Dynamic Random Access Memory.
⇒ DRAM is slower than SRAM.
⇒ Size of DRAM is smaller than SRAM.
⇒ Power consumption DRAM is higher.
⇒ **ROM :-**
⇒ ROM means Read Only Memory.
⇒ ROM is used where there is no need to alter the data.
⇒ ROM is a non-Volatile memory.
⇒ Non-Volatile means when power is turn OFF than data will not be loss.
⇒ Once data written in ROM that can not change.
⇒ There are three type of ROM. 1) PROM 2) EPROM 3)EEPROM
⇒ **PROM :-**
⇒ PROM means Programmable Read Only Memory.
⇒ Once Written data in these type of ROM can not be Erase.
⇒ **EPROM :-**
⇒ EPROM means Erasable Programmable Read Only Memory.
⇒ This type of ROM can be Erase using Ultra Violate Raise Ray.
⇒ **EEPROM :-**
⇒ EEPROM means Electrically Erasable Programmable Read Only Memory.
⇒ Because it can be Erase using electrical Signal.
⇒ This type of ROM is very Popular Today.

❖ **Flash Memory :-**

⇒ EEPROM is called a Flash memory. Flash memories are Random Access memories.

⇒ They use one transistor switch per memory cell and capacities from 32KB to 1GB.

⇒ They are non- volatile. The read time of Flash memories is tens of nano seconds and write time is several microseconds.

⇒ They are various shapes such as pens and flat disks.

⇒ The major advantages of Flash memory Following.

⇒ They are random Access.

⇒ They are non-volatile.

⇒ They are slow write Fast Read memories.

⇒ Their price is rapidly reducing.

⇒ They will become popular removable , Portable memory for data interchange.

❖ **CD- ROM :-**

⇒ CD-ROM means Compact Disk Read Only Memory.

⇒ The latest and the most popular high capacity secondary storage is known as laser disk.

⇒ This technology has envolved electronics market where cassette tapes and long playing records are being replaced by CDs.

⇒ The Disk used for data storage are known as Compact Disk Read Only Memory.

⇒ Information in CDROM is written by Creating pits on the disk. Surface by shining a laser beam.

⇒ As the disk rotates the laser beam traces out a continuous spiral.

⇒ The CDROM with pre-recorded information is read by a CDROM reader which uses a laser beam for reading.

⇒ It is rotated by a motor at a speed of 360 revolutions per minute.

⇒ CDROM can be used for education and entertainment.

❖ **DVD :-**

⇒ DVDROM means Digital versatile Disk Read Only Memory.

⇒ DVDROM uses the same principal as a CDROM for reading and writing .

⇒ However , a smaller wavelength laser beam is used.

⇒ A lens system to focus the laser beam is used which can focus on two different layers on the disk.

⇒ On each layer data is recorded . Thus the capacity can be doubled.

⇒ The recording beam is sharper compared to CDROM and the distance between successive tracks on the surface is smaller.

⇒ The total capacity of DVDROM is 8.5GB with both side recording and with each side storing 8.5GB the total capacity is 17GB

⇒ Double sided DVDROM , should be more carefully as both sides have data, they are thinner , and could be accidentally damaged

⇒ In both CDROM and DVDROM the density of data stored is constant through the spiral track

	CDROM	DVDROM
Pit Length (Micro)	0.834	0.4
Track Pitch(Micro)	1.6	0.74
Laser beam Wavelength (nanometer)	635	780
Capacity		
1 Layer / 1 side	650 KB	4.7 KB
2 layer / 1 side	No	8.5 GB
1 Layer / 2 side	No	9.4 GB
2 Layer / 2 side	No	17 GB
Speed	150 KB	1.38 MB

✧ CD- RAM :-

CD-R/W's are re-writable just like a tape. You can erase and write to them anywhere up to over a hundred times.

✧ Cache Memory :-

⇒ Cache memory is random access memory (RAM) that a computer microprocessor can access more quickly than it can access regular RAM.

⇒ As the microprocessor processes data, it looks first in the cache memory and if it finds the data there (from a previous reading of data), it does not have to do the more time-consuming reading of data from larger memory.

⇒ Cache memory is usually "On Die" which means it is in the processor chip, which allows it to 'talk' with the processor direct at a much higher speed than standard RAM.

⇒ In addition to cache memory, one can think of RAM itself as a cache of memory for hard disk storage since all of RAM's contents come from the hard disk initially when you turn your computer on and load the operating system (you are loading it into RAM) and later as you start new applications and access new data. RAM can also contain a special area called a disk cache that contains the data most recently read in from the hard disk.

✧ Physical & Virtual Memory :-

⇒ Physical and **virtual memory** are forms of **memory** (internal storage of **data**).

⇒ Physical memory exists on chips (RAM memory) and on storage devices such as hard disks.

⇒ Before a process can be executed, it must first load into RAM physical memory (also termed main memory).

⇒ Virtual memory is a process whereby data (e.g. **programming** code.) can be rapidly exchanged between physical memory storage locations and RAM memory.

⇒ The rapid interchanges of data are seamless and transparent to the user. The use of virtual memory allows the use of larger programs and enables those programs to run faster.

⇒ In modern operating systems, data can be constantly exchanged between the hard disk and RAM memory viavirtual memory.

⇒ Physical memory is memory that is stored in the ram, that is your memory chips.

⇒ Virtual memory is space that is reserved on your hard drive for your computer to write to when it runs out of physical memory. It is a lot slower than physical memory.

✧ Communication Devices :-

✧ Modem :-

⇒ There are two types of modems are available.
[1] Internal Modem [2] External Modem

⇒ Internal Modem , which are installed inside the computer.

⇒ External Modem , Which are connected to the computer with serial or USB port.

⇒ The modems are connected to the personal computers to access internal.

⇒ Modem stands for MOdulator – DEModulator.

⇒ A Modulator converts digital signals into analog signals.

⇒ A Demodulator converts Analog signals into digital signals.

⇒ A modem is a device or program that enables a computer to transmit data over telephone line.

⇒ The new personal computers came with 56 Kbps modem as internal modems.

⇒ By using a modem we can transmit several kinds of data like audio,video, picture etc.

⇒ The term modem is refers to the two functional entities that make the device : a signal modulator and a signal demodulator.

✧ NIC :-

⇒ An NIC (network interface card) is an expansion card that provides connectivity between a PC and a network such as a LAN.

⇒ Network Interface Cards are also referred to as ethernet adapters, network adapters, LAN cards, LAN adapters, or NICs (Network Interface Controllers).

⇒ Internal network interface cards (NICs) can be either built-in to the system mainboard, or plugged into an expansion slot inside the device.

⇒ One specification is the transfer rate, which is specified in Mbps (Megabits per second), or Gbps (Gigabits per second).

⇒ Most modern network interface cards support up to 100Mbps, while the more expensive Gigabit ethernet cards support up to 1000Mbps (1 Gbps).

⇒ The example of a network card, a PC Card SMC EZ Card 10/100 wireless network card.

⇒ These cards are used in laptop computers that do not have a built-in wireless network.

✧ Switch :-

⇒ A Switch is a device that provides bridging functionality with higher efficiency.

⇒ A Switch may act as multiport bridge.

⇒ Switch are used to connect a devices or segments in a LAN.

⇒ The Switch has buffer for each link which it is connected.

⇒ When switch receives a packet , it stores the packet in the buffer of the receiving link.

⇒ Then check the address to find the out-going link.

⇒ If the out-going link is free , the switch sends the frame to that particular link.

⇒ Switches are work on two basic strategies [1] Store and forward [2] Cut through.

⇒ A store and forward switch stores the frame in the input buffer the whole packet has arrived.

⇒ A Cut through switch forwards the packet to the output buffer as soon as the destination address is found.

❖ Hub :-

⇒ A hub is a small and simple devices that joins multiple computers together.

⇒ Hub are operating in data link layer of OSI model.

⇒ The hub can be found in many home and small business network.

⇒ Hub is a central device of a network and every computer in a network is directly connected with the hub.

⇒ Hub broadcast the data to all every port.

⇒ If the hub fails to work, the communication between the computers stops till the hub again starts work.

⇒ Some years ago, hubs offered only 10 Mbps speed.

⇒ Newer types of hubs offers 100 Mbps speed.