

INPUT, OUTPUT AND STORAGE DEVICES

CHAPTER OBJECTIVES

- *Computer System – Introduction*
- *Working of a Computer System*
- *Parts of a Computer*
- *Input Devices*
- *Processing Device*
- *Output Devices*
- *Storage Devices*

COMPUTER SYSTEM – INTRODUCTION

A computer is a useful electronic device which is able to do multiple tasks at a time. There are many devices attached to the computer that increases the work efficiency and usefulness of the computer.

A computer system works in three stages. It takes the input, processes that input and finally gives the desired output.

A computer can be used and can be accessed from anywhere in the world via the internet. It is seen at shops, banks, hotels, schools, railway stations, airports, hospitals, restaurants, and other locations. It has become an integral part of human life.



The Desktop Computer

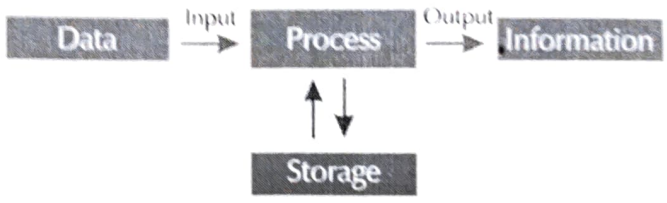
WORKING OF A COMPUTER SYSTEM (INPUT-PROCESS-OUTPUT CYCLE)

The working of a computer system is based on three main functions:

- ❖ **Input:** The data or instructions which we enter into a computer using a keyboard or mouse are called input. We can enter numbers, words, pictures and sounds as input.



❖ **Processing:** After entering the data and instructions in a computer, the CPU works on the input to give us meaningful informations. The processing device of a computer system is known as the CPU (Central Processing Unit).



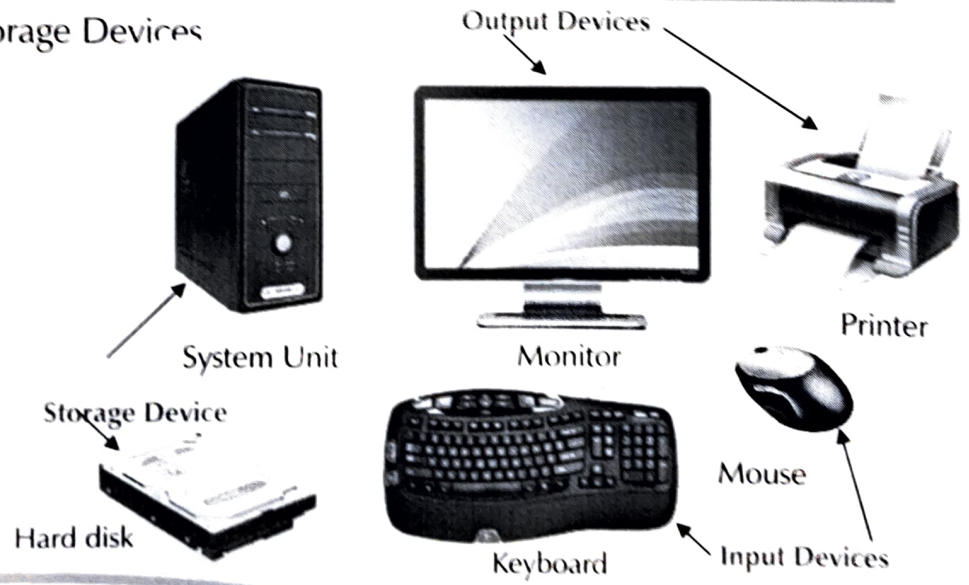
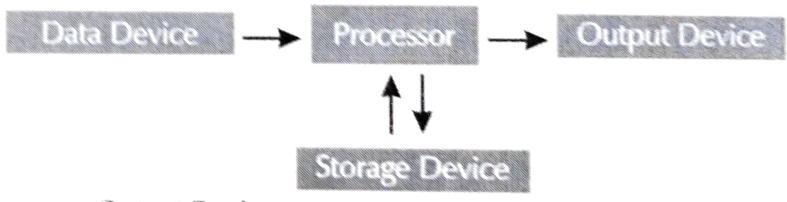
Input-Process-Output Cycle

❖ **Output:** It refers to the meaningful information that we get after processing of data. These results can be presented as a hard copy to the users with the help of output devices.

PARTS OF A COMPUTER

The different peripheral devices of a computer are connected to the CPU with the help of wires and cables. Some of the peripheral devices also have wireless connections with the computer. Various categories of peripheral devices are :

- ❖ Input Devices
- ❖ Processing Devices
- ❖ Output Devices
- ❖ Storage Devices



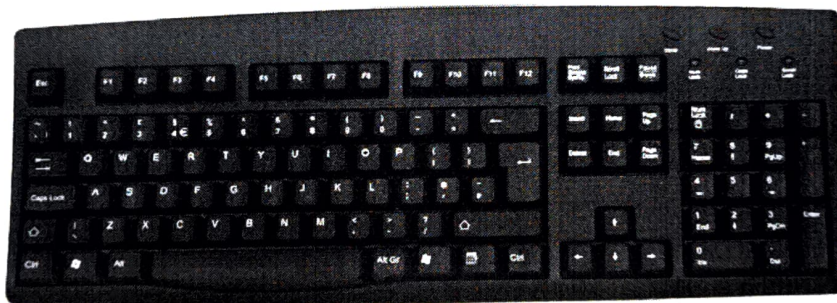
INPUT DEVICES

The devices that help the users to enter data or instructions into the computer as an input are called input devices. These instructions can be typed texts, commands or any other medium that a computer is able to understand. There are a variety of input devices available in the market.

Examples of input devices are keyboard, mouse, microphone, light pen and the like. Some of the input devices have been discussed below:

Keyboard

A keyboard is an input device that allows the users to type in data and instructions into the computer. The different keys on a keyboard are Alphabet keys (A-Z), Number keys (0-9), Function keys (F1 to F12), Control keys (Insert, Delete) and Special purpose keys (Caps Lock, Space Bar). Each key performs a specific function.



The Keyboard

Mouse

A mouse is a pointing device that allows the user to point to a specific position/object on the screen. It controls the movement of the pointer and sends signals to the CPU. It has two buttons namely the left and the right buttons and a wheel in between. It is used to point, select and move any object on the screen. It also helps to draw pictures.



The Mouse

!IMPORTANT FACT

An input device converts incoming data and instructions into a pattern of electrical signals in binary code that are read by a computer.

!IMPORTANT FACT

Traditional keyboards use spring based buttons, though newer variations employ virtual keys or even a projected keyboard.



Microphone

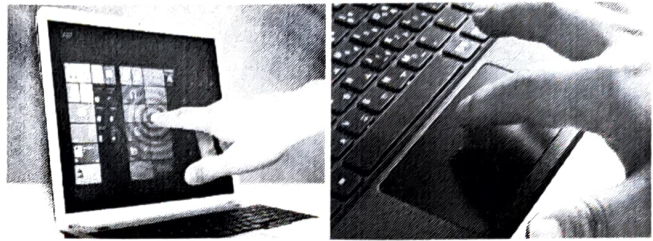
It is a device that is used to record voice and different sounds in a computer. It is connected with a device called a sound card inside the computer that handles audio processing for the computer.



The Microphone

Touchpad

Touchpad, also known as a trackpad, is an input device. It acts as an alternative to a mouse.



The various types of Touchpad

Light Pen

It looks like a pen that is used on a special pad. It is also used for drawing pictures and for directly controlling on-screen operations. Whatever we write or draw on the pad becomes visible on the screen.



The Light Pen

Scanner

It is a device that reads text or pictures printed on a paper and translates the information into a form that can be read by a computer. It is similar to a photocopier machine. There are three different types of scanners : Flat Bed scanners, Sheet Fed scanners and Hand Held scanners.



The Scanner

Digital Camera

A digital camera is a high resolution camera that captures images and stores them in a digital format. These pictures and videos are saved in a chip that can be inserted into a computer for transferring the data into it. It has provisions to connect to a computer by a cable.



The Digital Camera

Web Camera

A web camera is an input device that captures both still photographs and live videos. People use this device for professional and personal uses like official meetings and chatting with friends or with near ones.



The Web Camera

PROCESSING DEVICE

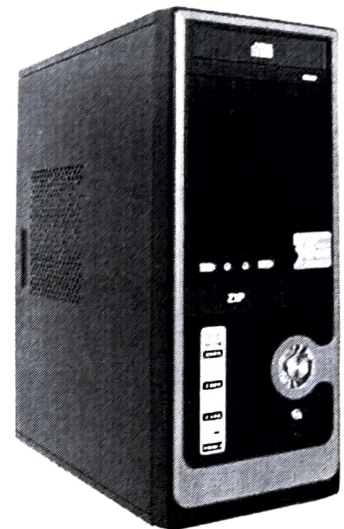
Central Processing Unit

The central processing unit is the brain of a computer that processes all the instructions given to it. It is responsible for each and every action taking place in the computer. It receives the data from input devices, processes it and displays the output with help of output devices.

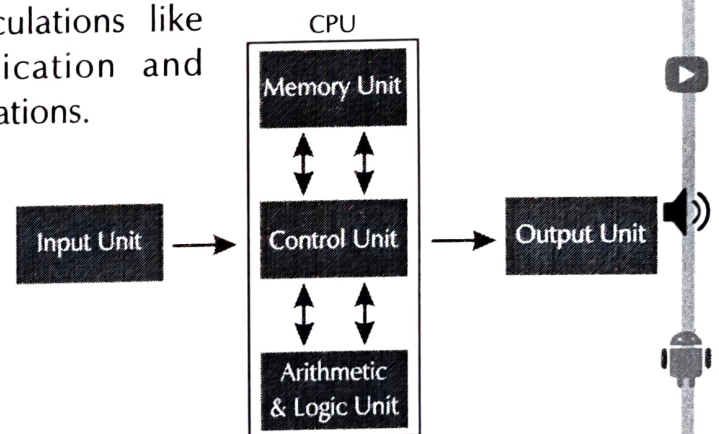
The major components of a CPU are:

- ❖ **Memory Unit (MU):** This unit stores data and instructions which are to be processed and then passed on to the Arithmetic and Logical Unit.
- ❖ **Arithmetic and Logical Unit (ALU):** This unit performs all the arithmetical calculations like additions, subtractions, multiplication and division. It also performs logical operations.
- ❖ **Control Unit (CU):**

This unit works like a traffic policeman. The control unit directs the system to perform all the functions. It does not execute any instructions but only controls and manages the working of all parts of a computer.



The Centre Processing Unit



The Working of the Central Processing unit

!IMPORTANT FACT

In 1814, Joseph Nicéphore Niépce clicked the first photograph.



OUTPUT DEVICES

The devices that give the user, the results of the input entered in the computers as the output are called output devices. The results can be in the form of hard copy or soft copy which is used for future references.

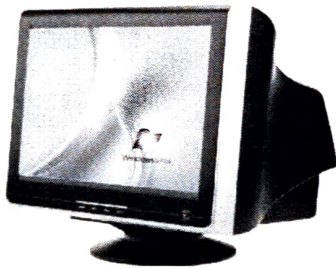
The various output devices are : Monitors, Printers, Speakers, Headphones, Projectors etc.

Monitor

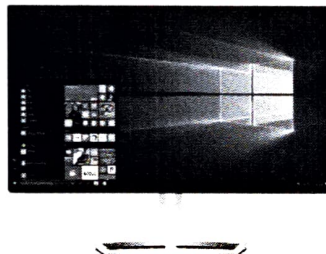
A monitor displays the work that we do on a computer. It displays the soft copy of the results that are obtained after processing. It looks like a television screen.

There are three types of monitors:

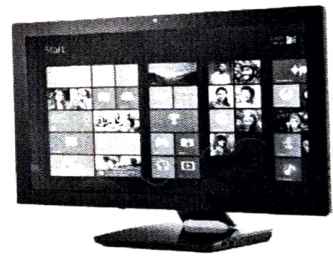
- ❖ **CRT Monitors:** CRT Stands for Cathode Ray Tube.
- ❖ **LED Monitors:** The full form of LED is Light Emitting Diode.
- ❖ **LCD Monitors:** LCD stands for Liquid Crystal Display.



CRT Monitor



LED Monitor



LCD Monitor

SPEAKERS

Speakers are output devices, that are used to listen to music and sound stored in the computer. These can be attached with a wire or may be built into the computer system. They receive audio inputs with the help of a sound card and produces the output in the form of sound.

! IMPORTANT FACT

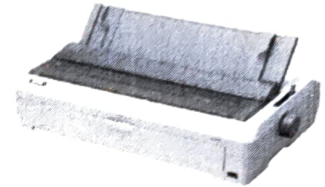
A monochrome monitor is a type of CRT computer display which was very common in the early days of computing from the 1960s and 1980s, before the colour monitor became popular.

PRINTERS

A printer is an output device which is used to produce paper copy or hardcopy for a document, picture, etc. that we see on the computer screen.

Printers are commonly classified as :

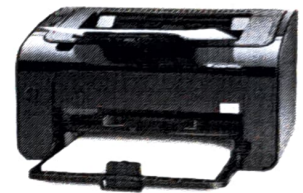
- ❖ **Dot Matrix Printer:** It is a type of printer that uses pins to strike on an ink ribbon to print text on paper. It is not used much nowadays as the output is of low quality. It is cheap but very noisy.
- ❖ **Inkjet Printer:** This printer works on liquid ink technology. An inkjet sprays ink as tiny droplets to form text and graphics. They are low priced and are the most popular type of printers.
- ❖ **Laser Printer:** The technology used in a laser printer to generate printout is a focused beam or light that transfers the text or images on paper. The ink used for printing on paper is in the form of dry powder. These are more expensive and are commonly used these days.



The Dot Matrix Printer



The Inkjet Printer



The Laser Printer

MEMORY

A computer memory is just like a human memory. It is used to store data and instructions. It remembers all the things stored in it and when we give commands to it, it fetches the information from its memory. Computer memory is a storage space in a computer where data is processed and instructions required for processing are stored. When any computer program starts, it is first loaded in the computer memory.

BINARY LANGUAGE

The language that a computer can only understand is called Binary Language. This is because the computer is an electronic machine and can understand only two commands, ON (represented by 1) and OFF (represented by 0). The Binary Language consists of zeroes and ones. These binary digits — 0s and 1s are called Bits.



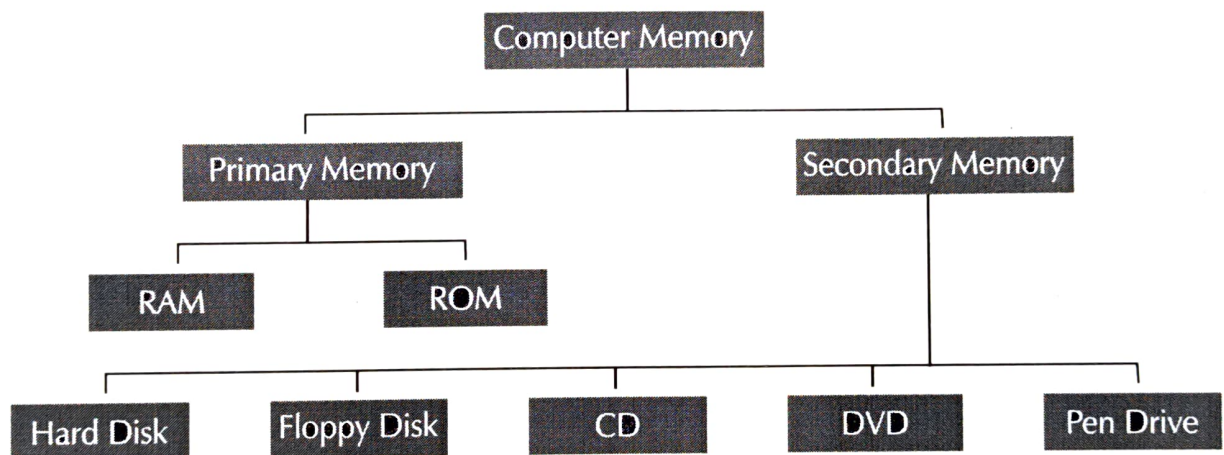
BITS AND BYTES

A bit is the smallest unit of information that can be stored in a computer. It reflects a single unit of information indicating a single zero or one. A byte represents eight bits, and is the most common term used for identifying the amount of information stored within a computer's memory.

1 Byte	Bytes	8 Bits
1024 Bytes	2^{10}	1 Kilobyte
1024 Kilobytes	2^{20}	1 Megabyte
1024 Megabytes	2^{30}	1 Gigabyte
1024 Gigabytes	2^{40}	1 Terabyte
1024 Terabytes	2^{50}	1 Petabyte
1024 Petabytes	2^{60}	1 Exabyte
1024 Exabytes	2^{70}	1 Zettabyte
1024 Zettabytes	2^{80}	1 Yottabyte
1024 Yottabytes	2^{90}	1 Brontobyte
1024 Brontobytes	2^{100}	1 Geopbyte

TYPES OF MEMORY

Computer memory is classified as shown in the table below :



Primary Memory

This memory is also known as the internal memory or main memory of the computer. It holds only those data and instructions on which the computer is currently working. A computer cannot run without primary memory. This memory works faster than secondary memory.

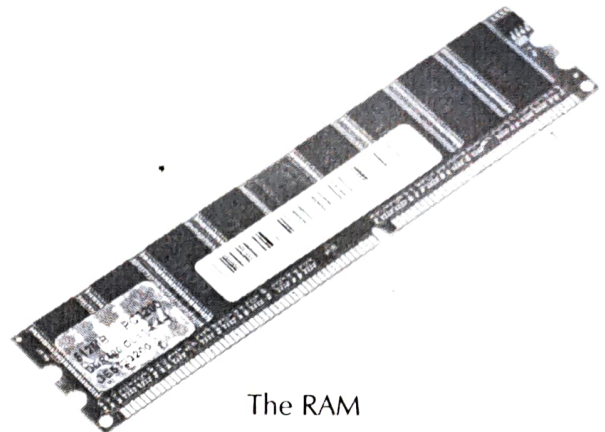
! IMPORTANT FACT

Memory is the faculty of the brain by which data or information is encoded, stored and retrieved when needed.

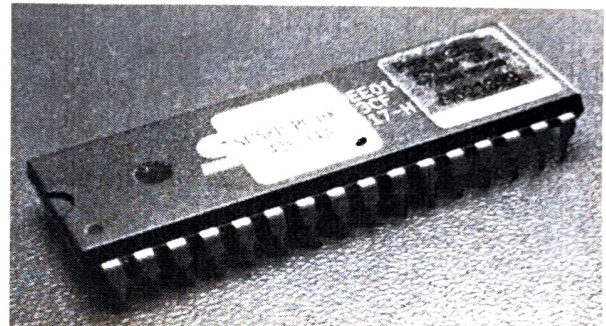


There are two types of primary memories:

- ❖ **RAM (Random Access Memory):** RAM is a read/write memory. It is the main memory of the computer. It allows the data to be executed and stored for a limited amount of time. It is a volatile memory as the data is lost when the power is turned off.
- ❖ **ROM (Read Only Memory):** It stores the data permanently in the computer. It is non-volatile in nature and the data is always retained. It stores essential information which can be read only but not edited. ROM is used for storing a special software called BIOS (Basic Input/Output System).



The RAM



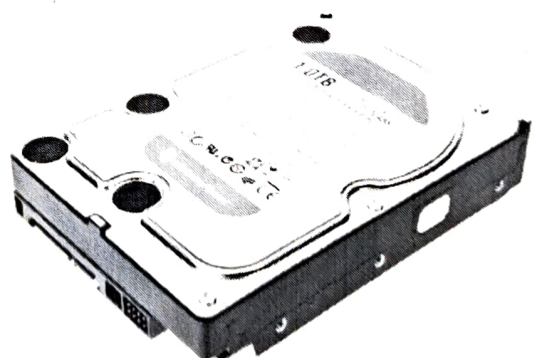
The ROM

Secondary Memory

This is also known as the external memory of a computer system. This memory is non-volatile in nature and stores data permanently. As the primary memory has less storage capacity, these are more useful for storing data. It is a non-volatile memory. It is also known as an auxiliary storage. The contents of secondary memory are transferred to the main memory from where the CPU can access it.

Some of the secondary storage devices are:

- ❖ **Hard Disk:** It is a data storage device with huge capacity that stores and retrieves the data with the help of magnetic disks. It is installed inside the CPU box. Portable hard disks are also available for storing and transferring data.

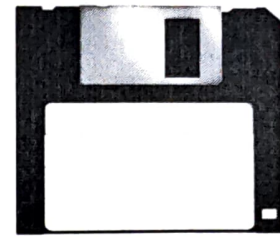


The Hard Disk

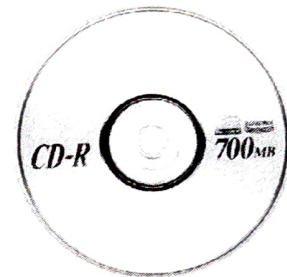




- ❖ **Floppy Disk:** It is a lower capacity removable storage device. It is made of flexible plastic material. It is very useful in transferring data from one computer to another. Nowadays floppy disks are no more used.
- ❖ **CD:** The full form of CD is Compact Disk. It is a portable storage device with a medium storage capacity of upto 700 MB. These look like thin shiny disks and can be used to store texts, graphics, pictures, audios and videos in both readable and re-writable format. CDs can be carried easily from one place to another for transferring data.
- ❖ **DVD:** The full form of DVD is Digital Versatile Disc or Digital Video Disc. It is an optical storage disc almost the same as a CD but with a higher storage capacity. A standard DVD can store 4.7 GB of data. DVD's can be single or double-sided and can have two layers on each side. A double-sided, two-layered DVD can hold up to 17 GB of data (texts, graphics, audio and videos).
- ❖ **Pen drive:** A Pen drive or USB Flash Drive or thumb drive is a light weight portable storage device that has a minimum storage capacity of 4 GB for storing any type of data including texts, pictures, audios and videos. These are now available in storage capacities of upto 512 GB, to store huge amounts of data.



The Floppy Disk



The Compact Disk



The DVD



The Pen Drive

!IMPORTANT FACT

The first USB flash drive came in the market in late 2000, with a storage capacity of 8 MB.

!IMPORTANT FACT

Always provide a cool working environment for your computer as it becomes heated when it runs for a long period of time.



Snapshot

- ◆ A computer is a machine that works with the data and instructions given to it by the user.
- ◆ A computer works on the principle of Input-Process-Output cycle.
- ◆ A keyboard and a mouse are used to enter data and instructions in a computer.
- ◆ A CPU does all the calculations and displays the results on a computer screen.
- ◆ Input is the data and instructions that are entered into a computer.
- ◆ Pen drive is a portable storage medium which stores data in it.
- ◆ Parts of a computer that we can touch are called hardware.

CHECK YOUR KNOWLEDGE

A. Tick (✓) the correct option:

1. A computer displays the after processing the data.

a. Input <input type="checkbox"/>	b. Process <input type="checkbox"/>	c. Output <input type="checkbox"/>
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2. It acts like an alternative to a mouse.

a. Touch screen <input type="checkbox"/>	b. Pointer <input type="checkbox"/>	c. Touch Pad <input type="checkbox"/>
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3. It controls and manages all parts of a computer.

a. Memory Unit <input type="checkbox"/>	b. Control Unit <input type="checkbox"/>	c. Arithmetic Unit <input type="checkbox"/>
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4. This type of printer is used to spray ink on the paper to generate an output.

a. Dot Matrix <input type="checkbox"/>	b. Laser <input type="checkbox"/>	c. Inkjet <input type="checkbox"/>
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5. It is a storage device that has a huge capacity.

a. Hard Disk <input type="checkbox"/>	b. CD <input type="checkbox"/>	c. Floppy Disk <input type="checkbox"/>
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B. Fill in the blanks with the hints given in the brackets:

1. (Output/Input) refers to data or instructions that we enter in a computer.
2. (Touch Screen/Light Pen) is a touch sensitive display device.
3. CRT stands for cathode (Ray/Rom) Tube.
4. A laser printer uses a combination of xerox and (laser/dot) technology.





C. State whether True or False:

- 1. A monitor displays all the work that we do on a computer.
- 2. A computer has four main parts.
- 3. A computer always understands the binary language.
- 4. A CPU is made of AU and LU.
- 5. A printer is an output device.



D. Write the expanded form of:

- 1. CPU
- 2. ALU
- 3. LED
- 4. CRT
- 5. ROM



E. Answer in brief:

- 1. Name the three stages of a computer.
.....
- 2. What are the categories of peripheral devices ?
.....
- 3. Name some input devices.
.....
- 4. What are the different types of scanners ?
.....
- 5. What is a Memory Unit ?
.....
- 6. What is a Control Unit ?
.....





E. Answer in detail:

1. Write a short note on Mouse.

.....
.....

2. What is the purpose of CPU ?

.....
.....

3. Define the following terms:

a) Touch pad

.....
.....

b) Light pen

.....
.....

4. What is the difference between RAM and ROM?

.....
.....

5. Explain the different types of monitors.

.....
.....

6. What is an Inkjet Printer ?

.....
.....

7. Write a short note on Pen drive.

.....
.....





in



Activity Time

Lab Activity:

For Students : Find words from the word grid with the help of the given hints:

f

My Activity

Complete the table:

D	K	P	C	W	J	O	Y	S	T	I	C	K
K	E	Y	B	O	A	R	D	H	N	E	S	Q
C	A	S	Z	A	N	M	O	H	G	C	P	U
T	H	C	M	E	M	O	R	Y	U	N	I	T
O	R	A	O	Q	N	R	X	S	F	E	A	W
U	P	N	S	P	E	A	K	E	R	S	T	Y
T	U	N	F	W	T	C	N	C	E	W	A	B
P	I	E	Z	M	H	A	R	D	D	I	S	K
U	S	R	N	X	R	S	T	O	R	A	G	E
T	B	H	F	A	S	O	F	T	C	O	P	Y

1. A device used to type numbers, letters or words.
2. A machine that can scan information
3. A unit that stores information.
4. Part of the computer that processes all instructions.
5. Information that we see on a monitor.
6. Device used to store huge amounts of data and information.
7. A device used to hear sounds and music stored in a computer.

1 Byte = Bits
..... KB =	1 MB
1024 GB =	1
..... TB =	1 PB
1024 PB = EB
1024 EB =	1