

LESSON

2

## Functioning of Computer

### Objective of this Chapter

- 2.1 Block Diagram of a CPU
- 2.2 Types of Computer

### Introduction

We have learnt that a Computer is an electronic machine. It can process data, pictures, sound and graphics. It can solve complicated problems quickly and accurately. A computer performs basically five major computer operations. These are :

1. It accepts data or instructions by way of input.
2. It stores data.
3. It processes data as required by the user.
4. It gives results in the form of output.
5. It controls all operations inside a computer.

Before studying about Block Diagram of CPU we need to learn about the functions of a computer in detail. Let us learn about basic functions in detail :

### Basic Functions of Computer :

**1. Input :** This is the process of entering data and programs into the computer system. We know that computer is an electronic machine. It receives data and instructions as input.

**2. Storage :** The process of saving data and instructions permanently is known as storage. We need to feed data into the computer system before the actual processing starts. Because the processing speed of Central Processing Unit (CPU) is so fast. So the data has to be provided to CPU with the same speed. It provides space for storing data and instructions.



The storage unit performs the following major functions :

- All data and instructions are stored here before and after processing.
- Intermediate results of processing are also stored here.

**3. Processing :** After input computer takes action on data. The task of performing operations like arithmetic and logical operations on data is called processing.

**4. Output :** This is the process of producing results from the data for getting useful information. Similarly the output produced by the computer after processing must be kept inside a place in a computer is called Storage.

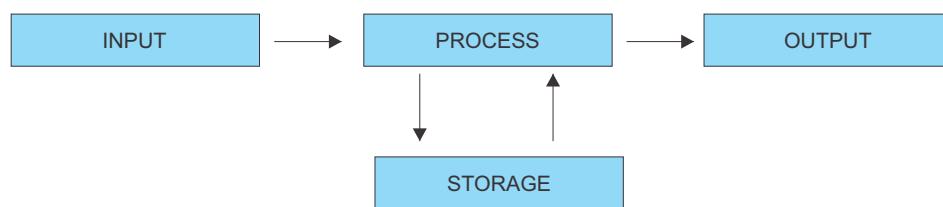
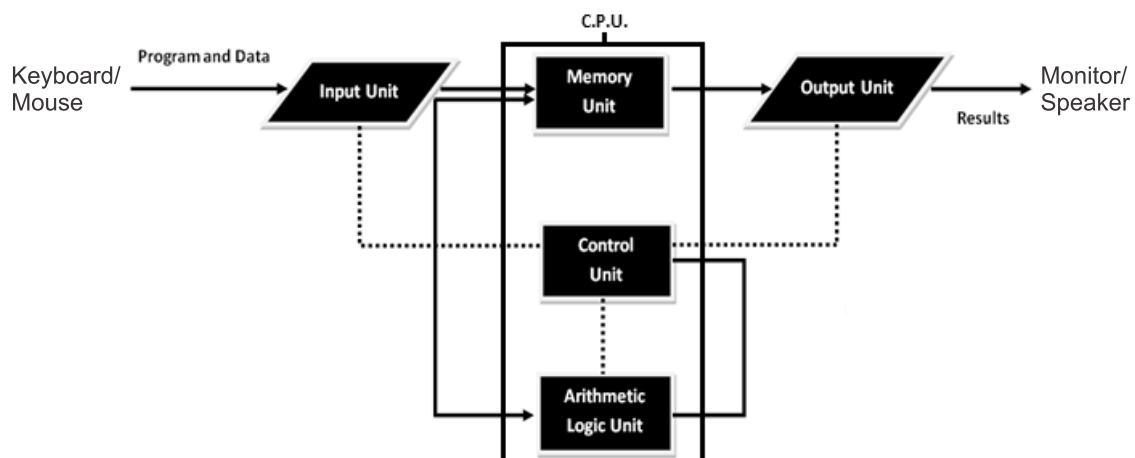


Fig. 2.1 Basic Functions of Computer

## 2.1 Block Diagram of CPU

In this section we will learn about the functioning of a computer system. CPU Stands for Central Processing Unit and it's the most important part of a computer system. As we have learnt that firstly we give Input (data) to Computer System then this data is processed and finally we get Output.



BLOCK DIAGRAM OF CENTRAL PROCESSING UNIT

Fig. 2.2



Basically Central Processing Unit is divided into three separate units for its operation. These are :

- 2.1.1. Memory unit
- 2.1.2. Control Unit
- 2.1.3. Arithmetic logic unit.

Let us learn about the brief detail of Central Processing Unit.

## 2.1.1 Memory Unit

The Memory Unit is the part of the computer that holds data and instructions for processing. Although it is closely associated with the CPU but in actual fact it is separate from it. Memory associated with the CPU is also called primary storage or primary memory. Whatever software we load into a computer system from a floppy disk, hard disk or CD-DVD ROM, firstly it is stored in the Main Memory.

There are two types of computer memory inside the computer:

- 2.1.1.1. Primary Memory
- 2.1.1.2. Secondary Memory.

### 2.1.1.1 Primary Memory

Primary memory is known as main memory. It is of two types: RAM and ROM. It is the only one directly accessible to the CPU. The CPU continuously reads instructions stored there and executes them as required. RAM is used to store data on temporary basis, such as we input a data. As soon as the computer system is switched off or in case of power failure, the information hold in RAM is deleted, that's why it also called Volatile Memory. ROM stores the instructions and information that is required by a computer to start on. In case of Power failure or computer system is switched off the data stored in ROM doesn't get deleted. ROM can be re-programmed. Primary Memory has limited storage capacity. It is very expensive. It is not easily portable.

ROM : Random Access Memory

RAM : Read only Memory

### 2.1.1.2 Secondary Memory

Secondary memory is called auxiliary memory. It contains all data storage that is not currently in a computer's primary storage or memory.



This is computer memory that is not directly accessible to the processor. It is for storing data not in active use and keeps data even without power. So it is called non-volatile memory. Hard disk is a good example of secondary memory that is fixed in a computer system. CD, DVD or USB Pen Drive also few examples of secondary memory. It is not so costly. Its storage capacity is more than primary memory. It is easily portable.

### **2.1.2 Control Unit**

The control unit is also called a control system or central controller. It directs the various components of a computer, such as receiving input, giving instructions to store data and producing results. It reads and interprets (decodes) instructions in the program one by one decodes each instruction and also control the other parts of the computer. Some of its basic functions are as follows :

1. To read the code for the next instruction.
2. To decode the numerical code for the instruction .
3. To provide the necessary data to an ALU.

### **2.1.3 Arithmetic Logic Unit:**

An arithmetic logic unit (ALU) performs arithmetic and logical operations. The ALU is a building block of the central processing unit (CPU) of a computer because the instructions are executed here. ALUs can perform the following operations :

1. Integer arithmetic operations (for example : addition, subtraction, multiplication and division).
2. Bitwise logic operations (greater than, smaller than, equal to)

## **2.2 Types of Computer**

Types of computers are based upon the purpose, functioning and size of the computer. Accordingly they are classified into four types :

- 2.2.1. Micro Computer (Personal Computer)
- 2.2.2. Mini Computer.
- 2.2.3. Mainframe Computers
- 2.2.4. Super Computer



Let us study in details about these types of Computer:

### 2.2.1 Micro Computer (Personal Computer)

Microcomputers are the most common type of computers used by people nowadays. These Computers are used in a workplace, at school or at home.

These computers include :



Fig. 2.3 Micro Computer (Personal Computer)

#### 2.2.1.1. Laptop

It is a portable personal computer. It is light in weight and small enough that it is easy to operate it on a person's lap. A laptop computer has its own battery and can be charged easily as required. A person can carry a laptop while travelling.



Fig. 2.4 Laptop

#### 2.2.1.2. Notebook

It is a portable computer smaller than a laptop. Likewise Laptop Computer It is light in weight. A notebook computer has its own battery and can be charged easily as required. A Person can carry it while travelling.



Fig. 2.5 Notebook

#### 2.2.1.3. Palmtop

It is a computer that has a small screen and compressed keyboard. It is small enough to be held in the hand. It is often used as a personal organizer and stores message, contacts etc.



Fig. 2.6 Palmtop

#### 2.2.1.4. Tablet

It is a very thin portable computer. It is usually battery-powered. It has a touch screen as the primary interface and input device. It doesn't have a physical keyboard and lid like a laptop.



Fig. 2.7 Tablet

#### 2.2.2. Minicomputer

A minicomputer is a class of multi-user computers. It is a type of computer that possesses most of the features and capabilities of a large computer but is smaller in physical size. Minicomputers are mainly used in scientific applications



Fig. 2.8 Minicomputer

#### 2.2.3 Mainframe Computers

These computers are capable of handling and processing very large amounts of data quickly. These Computers are capable of performing high processing speed and data storage but not powerful as super computers. Mainframe computers are used in large institutions such as government banks and large corporations.



Fig. 2.9 Mainframe Computers

#### 2.2.4 Supercomputer

A super computer is most powerful computer. It has fastest speed and very high processing speed. It has large data storage. Super computer is specifically used for complex applications by big organization. Super computers are costly.



Fig. 2.10 Supercomputer

## Points to Remember

1. Computer accepts data and instructions by way of input.
2. Computer can process data as required by the user,
3. Computer gives results in the form of output.
4. CPU Stands for Central Processing Unit
5. Basically a CPU is divided into three separate units for its operation.  
They are :
  - Memory unit
  - Control unit.
  - Arithmetic logic unit
6. The control unit is often called a control system or central controller.
7. Memory associated with the CPU is also called primary memory.
8. Secondary memory, sometimes called auxiliary memory.
9. Computers are classified into four types :
  - Micro Computer (Personal Computer)
  - Mini Computer
  - Mainframe Computers
  - Super Computer
10. Super Computer is most powerful computer available in the world.

## Exercise

### 1. Fill in the Blanks using the right option :

1. .... is the process of entering Data and Instructions to the computer.  
(1) Input Devices                                  (2) Output Devices  
(3) CPU    (4) None of these
2. The process of saving data and instructions permanently is known as .....  
(1) Input    (2) Storage                                        (3) Processing                                    (4) Output



3. The process of producing results from the data for getting useful information is called .....  
(1) Input      (2) Output      (3) Processing    (4) None of these
4. Primary storage is also known as..... Memory.  
(1) Secondary (2) Main      (3) Auxiliary    (4) All of these
5. Secondary storage is also called..... storage.  
(1) Secondary (2) Main      (3) Auxiliary    (4) all of these

**2. Write down True or False :**

1. A computer is an electronic machine.
2. The Process of entering data and programs into the computer is called Output.
3. Intermediate results of processing are stored in Storage.
4. A super computer is most powerful computer.
5. Memory is of two types : Primary Memory and Secondary Memory.

**3. Short Answer type Questions :**

1. Draw the diagram of basic functions of a Computer.
2. Draw Block Diagram of C.P.U. and name three parts of it.
3. Define memory and name of two types of memory.
4. Differentiate between Primary memory and Secondary memory.
5. Describe about Laptop.
6. What is Tablet?

**4. Long Answer type Questions :**

1. What are the basic functions of a Computer?
2. Difference between Primary Memory and secondary memory?
3. Describe Control Unit.
4. Describe A.L.U.
5. Describe Microcomputer.

