



1 A COMPUTER AND ITS WORKING

CHAPTER

OBJECTIVES

- ✿ *Uses of a Computer*
- ✿ *Flow Diagram of a Computer*
- ✿ *Working of a Computer*
- ✿ *Data and Information*
- ✿ *CPU*
- ✿ *Input Devices*
- ✿ *Output Devices*
- ✿ *Features and Drawbacks of a Computer*

Computer is an electronic machine that works according to the instructions given by us. It is used in almost every sphere of our life. We can see them being used in schools, colleges, universities, hotels, restaurants, hospitals, clinics, airports, railway stations, bus-stands, offices, banks, shops, shopping malls and numerous other places. Wherever we go, we see a computer being used.

USES OF A COMPUTER

A computer plays an important role in our everyday life, Here are some areas where computers are being widely used.

- ◆ **Home:** For drawing pictures, typing letters and assignments, paying bills, booking tickets, searching for information, listening to music, watching movies and so on.
- ◆ **Shops and Malls:** For storing lists of items, making bills and so on.
- ◆ **School :** For typing circulars and test papers, preparing time tables, maintaining fee records of students, teaching new concepts and so on.
- ◆ **Offices and Banks:** For sending and receiving e-mails, storing records, doing calculations and so on.





- ◆ **Railway Stations and Airports:** For keeping track of arrival and departure details, number of seats available in a train or an aeroplane and so on.
- ◆ **Hospitals:** For maintaining the records of patients, testing eyes, preparation of reports and so on.
- ◆ **Scientific Research:** For launching satellites, weather forecasting and so on.



Drawing, using a computer



Making bills in a shop



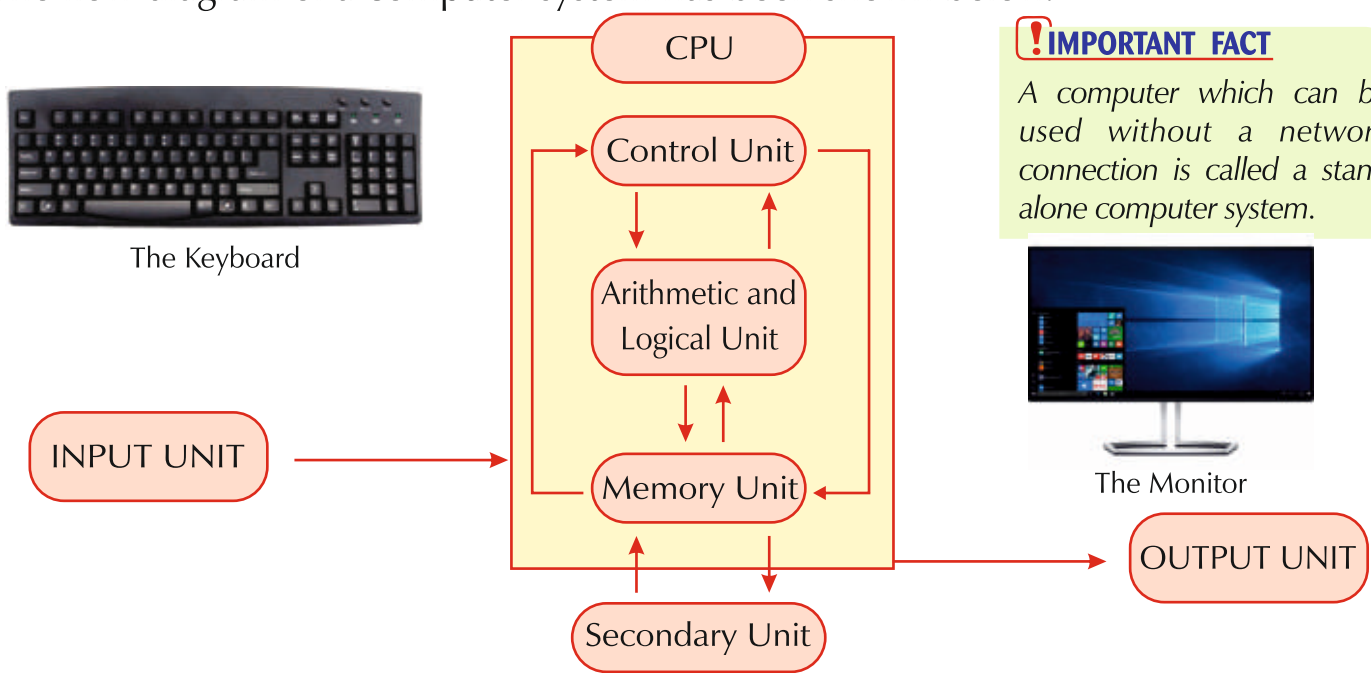
Computers in an office



Keeping track of arrival and departure details at an airport

FLOW DIAGRAM OF A COMPUTER

The flow diagram of a computer system has been shown below.



! IMPORTANT FACT
 A computer which can be used without a network connection is called a stand alone computer system.



The Monitor

As we can see in the flow diagram, a computer consists of three main units:

1. **Input Unit:** Keyboard and Mouse
2. **Processing Unit:** Central Processing Unit (CPU)
3. **Output Unit:** Monitor and Printer

! IMPORTANT FACT
 Charles Babbage was the founder of Computer. He is also known as the "Father of Computer".





WORKING OF A COMPUTER

A computer works on the principle of the IPO cycle, which means Input, Process and the Output cycle. Each part of the computer has its own functions. All the parts combined together makes the computer system work efficiently.

INPUT UNIT

1. The input unit accepts the input or data entered by the user.
2. It forwards the input to the CPU for processing.
3. Input data can be in the form of words, numbers, sentences and paragraphs.
4. Input devices used to enter the data are Keyboard, Mouse, Light Pen, Joystick etc.

PROCESSING UNIT

- ◆ Central Processing Unit (CPU) is an essential part of the computer.
- ◆ It is called the brain of the computer.
- ◆ It accepts data from the input unit and processes it.
- ◆ It produces the output or information and provides them to the output unit.

OUTPUT UNIT

- ◆ The output unit accepts the output from the CPU.
- ◆ It displays the output on the monitor screen.
- ◆ Various types of output devices are: Monitor, Printer, Plotter etc.

DATA AND INFORMATION

Data are the raw facts and figures which needs to be processed. It has no meaning to the user until it is processed. When you process data, it transforms into information. Information is meaningful and useful for any organization because it helps in decision making. This is called **processing**. The user inputs the data in the computer for processing. The computer processes it and produces the output. That output is called **information**.

This Input-Process-Output cycle can be understood with the help of an example.

Suppose, we want to calculate the total marks scored by a student in different subjects on a computer. See, how the processing takes place in a computer.

On the basis of the total marks obtained, the teacher calculates the percentage of the student and finds her/his position in the class.





Input

95, 80, 70, 89, 75, 82
 Data and instruction.
 The first step is to input data and instructions, i.e. Marks and Plus (+) symbol.

Process

$95+80+70+89+75, 82$
 Working on the data on the basis of given instructions.

Output

=491
 Meaningful information or result.

CPU

The CPU is the brain of a computer that processes all the instructions given to the computer. It solves all calculations and displays the results on the screen. It stores a lot of information. It consists of three main parts:

a. **ALU:** ALU is Arithmetic and Logical Unit.

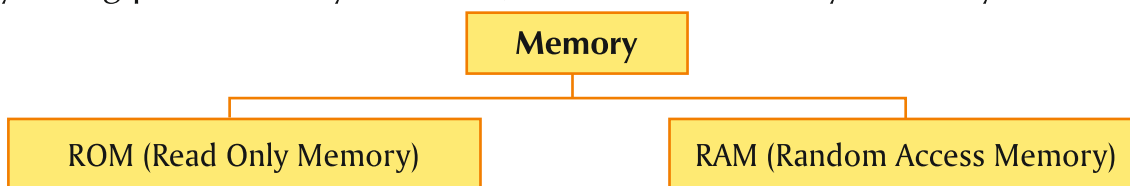
- ❖ It is used to perform Arithmetical calculations.
 - Addition (+)
 - Subtraction (-)
 - Multiplication (x)
 - Division (/)
- ❖ It also performs Logical calculations.
 - Greater than (>)
 - Greater than equal to (>=)
 - Less than (<)
 - Less than equal to (<=)
 - Equal to (=)
 - Not equal to (\neq)

b. **CU:** CU or Control Unit works like a traffic policeman. It controls and manages the overall functioning of the computer system. When to process the data? Where the intermediate results will be stored? When to provide the output? All such tasks are done by the Control Unit.

c. **MU:** MU or Memory Unit is used to store data and instructions which are to be processed and are then passed on to the ALU or CU. Memory is of two types:

Primary Memory

This is the main memory which is directly connected to the CPU. The data which is currently being processed by the CPU, is stored in Primary Memory.



Example: RAM (Random Access Memory), ROM (Read Only Memory)



Secondary Memory

This is the external memory which is connected to the CPU that provides extra space for storing data.

Example: CD, Hard Disk, Pen Drive, DVD etc.

!IMPORTANT FACT

Primary Memory has limited capacity in comparison to secondary memory. However, its Data accessing speed is faster than secondary memory.

INPUT DEVICES

Input devices are used to feed data to the computer. Most common input devices are keyboard and mouse.

Keyboard

A keyboard is used to type data and instructions into the computer. It consists of various keys. A standard keyboard has 104 keys which can be divided into many groups based on their functions.

The various keys on the keyboard are:

- ❖ **Alphabet Keys:** It is a set of twenty six keys marked with A to Z letters. It is used to type words, lines and paragraphs. It is arranged according to the QWERTY layout.



- ❖ **Numeric Keys:** It consists of ten keys from 0 to 9 and arranged in a single row. It appears as a single line just below the function key. A numeric pad is also available on the right side of the keyboard. It is used for entering numbers at a fast speed.





❖ **Function Keys:** These keys are placed on the top row of the keyboard and are labelled as F1 to F12. Each key is assigned a specific task depending on the application used.



❖ **Arrow Keys:** There are four arrow keys on the keyboard which are also known as **Cursor Control Keys**. These keys are used to move the cursor either to the left, right, top or bottom.



❖ **Navigation Keys:** These keys are used to move through documents or web pages and for editing the text. These are the Home, End, Backspace, Delete, PgUp, PgDn, Insert etc keys.

!IMPORTANT FACT
Sir Christopher Latham Sholes is regarded as the inventor of QWERTY keyboard layout.



❖ **Special Keys:** There are some special keys which are used in conjunction with other keys. They are the Alt, Ctrl keys.



Mouse



A mouse is a part of a computer. It has a glowing light under it. It is connected to the CPU by a wire and is used to control the pointer on the screen. It is considered as an input device and helps us to do the following while working on the computer.

!IMPORTANT FACT
Dr. Engelbart is the inventor of the computer mouse.



Basically a mouse performs the following functions:



- ❖ It lets us point and select items on the monitor.
- ❖ It lets us draw and paint
- ❖ It lets us drag an item from one place to another.



An Optical Mouse



Various types of mouse are used these days. The most common of all is a scroll mouse. It usually has two buttons on it- the Left Mouse button and the Right Mouse button. It also has a wheel in the middle of the two buttons. This wheel is called the Scroll Wheel. We can move up and down in a page by moving this wheel. A scroll mouse can be an optical mouse or a wireless mouse.

!IMPORTANT FACT
A magic mouse is a multi-touch mouse, which was designed in 2009.





- ❖ An optical mouse has a red light under it.
- ❖ A wireless mouse is not attached to the computer through a wire.

The various ways of using a mouse.

1. **Clicking:** It means to click the left mouse button once. It is used to select anything on the screen.
2. **Double Clicking:** It means to click the left mouse button, twice, rapidly without giving a pause. It is used to open an application.
3. **Right Click:** It means to press the right mouse button once. It displays a list of options.
4. **Drag and Drop:** This action is used to move an object on the screen from one place to another. Press the left mouse button once, hold it and move the mouse to drag the object. Then, release the mouse.

OUTPUT DEVICES

Output devices are used to produce the output either in the form of a **hard copy** or **soft copy**. The main output devices are the Monitor, the Plotter and the Printer.

Monitor

A monitor is a visual display unit (VDU) that looks like a television screen. It also displays the movement of the mouse pointer on the screen. The information that we see on a monitor is called a soft copy.

TYPES OF MONITORS

There are three different types of monitors.

- ❖ **CRT Monitor:** CRT or Cathode Ray Tube is a monitor which is bulky in size and is not easy to carry. It also consumes more power.
- ❖ **LCD Monitor:** A LCD or Liquid Crystal Display monitor is flat and light weight. It also consumes less power. It has mostly replaced CRT monitors.
- ❖ **LED Monitor:** LED or Light Emitting Diode monitors are commonly used these days. They have better display. They are lighter in weight and thinner in size. They consume much less power as compared to a LCD monitor.





CRT Monitor



LCD Monitor



LED Monitor

Printer

A printer prints the information on a sheet of paper that you see on a monitor. The printed information on the paper is called a **printout** or **hard copy**. Some printers can print only in black and white while others can print in any colour.

Different types of printers are available in the market. They are, Dot Matrix Printers, Inkjet Printers and Laser Printers. Among the three, the Laser Printers are much faster than the others.



Dot-matrix Printer



Inkjet Printer



Laser Printer

Activity Time : Use of Keyboard, Mouse, Monitor and Printer

1. Open Notepad and type a few lines about yourself with the help of the Keyboard.
2. Save the file by clicking on File > Save As. (Using the Mouse)
3. You can see the typed data on the monitor screen.
4. After creating the file, take a printout with the help of a Printer.

FEATURES OF A COMPUTER

1. **Speed:** It is a very fast machine. It works very fast and performs calculations in milliseconds or nanoseconds.
2. **Accuracy:** A computer performs calculations with 100% accuracy. Errors may occur due to data inaccuracy or inconsistency.





3. **Versatility:** A computer can perform a variety of tasks at the same time. It is capable of being used in almost every field depending on the type and configuration of the computer.
4. **Reliability:** A computer is reliable as it gives consistent results for a similar set of data i.e. if we give the same set of inputs any number of times, we will always get the same results.
5. **Huge Storage Capacity:** A computer can store huge amounts of data which can be accessed by the user at any point of time.
6. **Diligence:** A computer doesn't feel any fatigue or lack of concentration. It can work for long hours without getting bored or tired.

DRAWBACKS OF A COMPUTER

1. **No IQ.:** A computer lacks IQ. It works on the instructions given to it by the user. If you give the wrong input, it produces the output accordingly.
2. **Costly:** A computer system is a costly device.
3. **Power Failure:** You cannot use a computer in case of a power failure. But these days, you can use laptops or iPads which can be charged. You can work on them for hours without the need for electricity.
4. **Effect on Health:** Sitting in front of the computer and working for long hours can lead to health problems.

Snapshot

- ◆ A computer is a helpful machine. It is useful in almost every sphere of life.
- ◆ Every computer goes through three stages – Input, Processing and the Output cycle.
- ◆ Data are the raw facts and figures which needs to be processed.
- ◆ CPU is also called the Brain of the computer as it is used to process the data.
- ◆ A keyboard consists of various keys that is used to type in data and instructions into the computer.
- ◆ A mouse is a pointing device which is used to control the pointer on the screen.
- ◆ Monitor is an output device which displays the movement of the mouse pointer on the screen.
- ◆ Printer is an output device which produces hard copy of an output.
- ◆ The important features of a computer are : speed, accuracy, storage, capacity, versatility, reliability and diligency.
- ◆ The drawbacks of a computer are, that it can lead to health problems if we work for long hours. It also cannot work during a power failure.





CHECK YOUR KNOWLEDGE



A. Tick (✓) the correct option.

- A CPU is made up of main parts.
 - three
 - four
 - five
- A looks like a TV screen.
 - Monitor
 - Printer
 - Mouse
- Which of the following is known as the brain of a computer ?
 - Mouse
 - CPU
 - Keyboard
- Clicking means to press the left mouse button
 - Once
 - Twice
 - Thrice
- are used for moving through the documents.
 - Control Key
 - Navigation Keys
 - Function Keys

B. Fill in the blanks by choosing the correct words from the given hints :

(Hints: Memory, Control Unit, Input Unit, Clicking, figures, raw facts)

- The accepts the input or data entered by the user.
- Data are the and which needs to be processed.
- controls and manages overall functioning of the computer system.
- is used to store the data.
- means to click the left mouse button once.

C. State True or False :

- A computer works with data and instructions.
- A CPU is made up of AU and CU.
- Functions keys are placed on the right side of the keyboard.
- Information is the processed data.
- The information that we see on a monitor is known as a soft copy.





D. Application based questions :

1. Anamika’s father has asked her to take out twenty copies of her birthday invitation letter. Which device should she use to obtain these hard copies?
2. Eshita wants to do some painting on a computer. Which computer device will you suggest her to use for making a colourful drawing ?
3. David is reading the soft copy of an essay. Which part of the computer is he using ?
4. Suhani wants to listen to a song in the computer. Which input device should she use ?

E. Answer these questions :

1. What is a computer?

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2. Distinguish between data and information. What do you call the information that you can enter into a computer ?

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3. How many types of keys are there on the keyboard ? Name them.

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4. Which output device is used to print words, numbers, or pictures on a sheet of paper? Name its various types.

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5. Give any two features and drawbacks of a computer.

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Activity Time



For Teacher:

- ❖ Take the students to a computer lab.
- ❖ Help them identify the various parts of a computer.
- ❖ Demonstrate the working of a computer.
- ❖ Show the difference between a softcopy and a hardcopy.



For Students:

- ❖ Open MS Word 2016.
- ❖ Type a few lines on "Features of Computer".
- ❖ Save the document with the name "Features".
- ❖ Close the file.



Activity:

A. Your friend tells that there is no difference between her desktop computer and the computer inside a washing machine. Do you agree with your friend ? Explain the reason.

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Handwriting practice lines consisting of a solid top line, a dotted middle line, and a solid bottom line.



B. Tick (✓) the images that are related to a computer system and cross (✗) the ones that are not.

