

## **CHAPTER 1**

### **INTRODUCTION TO COMPUTERS**

#### **1.1 Introduction**

Computers are an integral part of our lives. They are found in homes, offices, stores, hospitals, libraries, and many other places. Computers are part of cars and phones, and they enable you to access bank accounts from home, shop online, and quickly communicate with people around the world by means of e-mail and the Internet. It is difficult to find a business or occupation that doesn't rely on computers. Whether it's a truck driver who keeps an electronic travel log or a high-powered stockbroker who needs up-to-the-second market information, computers make these tasks easier, more efficient, and more accurate. Computers are all around us, which makes it important to learn basic computing skills and gain the knowledge to be a responsible computer user. Knowing how to use a computer makes you *computer fluent*.

#### **WHAT IS A COMPUTER?**

*A computer allows users to store and process information quickly and automatically.*

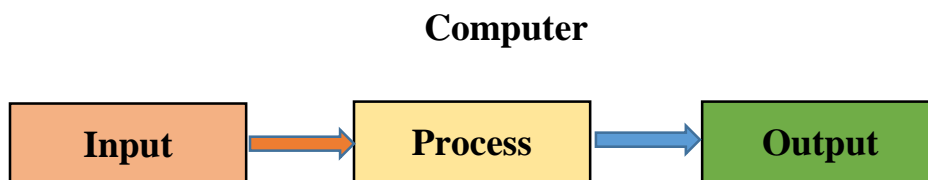
Computer is an advanced electronic device that takes raw data as input from the user and processes it under the control of set of instructions (called program), gives the result (output), and saves for the future use.

## 1.2 Functionalities of a computer

**What are the basic functions of a computer?** A computer is a programmable electronic device that can input, process, output, and store data. A computer takes *data* and converts it into *information*. Many people use the words *data* and *information* interchangeably; however, they are different in computing and it is important to understand the distinction. Each piece of data entered into a computer represents a single fact or idea. Data can be a word, a number, a sound, or a picture. Information is data that has been processed so that it can be presented in an organized and meaningful way

The **four basic computer functions** are also known as the *information processing cycle*. The functions are

- **Input**—The computer gathers data or allows a user to add data.
- **Process**—Data is converted into information.
- **Output**—The processed results are retrieved from the computer.
- **Storage**—Data or information is stored for future use.



## 1.3 Characteristics of computer

The important characteristics (**advantages**) of computer are:

### 1) High Speed

- Computer is a very fast device.
- It is capable of performing calculation of very large amount of data.
- The computer has units of speed in microsecond, nanosecond, and even the picosecond.
- It can perform millions of calculations in a few seconds as compared to man who will spend many months for doing the same task.

### 2) Accuracy

- In addition to being very fast, computers are very accurate.
- The calculations are 100% error free.
- Computers perform all jobs with 100% accuracy provided that correct input has been given.

### 3) Storage Capability

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio and many others.

#### 4) Diligence (Free from fatigue)

- Unlike human beings, a computer is free from monotony, tiredness and lack of concentration.
- It can work continuously without any error and boredom.
- It can do repeated work with same speed and accuracy.

#### 5) Versatility (طلاقة الحركة)

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems related to various fields.
- At one instance, it may be solving a complex scientific problem.

#### 6) Reliability (الموثوقية)

- A computer is a reliable machine.
- Modern electronic components have long lives.
- Computers are designed to make maintenance easy.

#### 7) Automation

- Computer is an automatic machine.
- Automation means ability to perform the given task automatically.
- Once a program is given to computer i.e., stored in computer memory, the program and instruction can control the program execution without human interaction.

## 1.4 LIMITATIONS OF COMPUTER

Some of the major limitations (**disadvantages**) of computer are as follows.

### 1) Dependency

- It functions as per a user's instruction, so it is fully dependent on human being.

### 2) Environment

- The operating environment of computer should be dust free and suitable.

### 3) No Feeling

- Computers have no feelings or emotions.
- It cannot make judgment based on feeling, taste, experience, and knowledge unlike a human being.

## 1.5 Computer generations

Generation in computer terminology is a change in technology a computer is/was being used. Initially, the generation term was used to distinguish between varying hardware technologies. But nowadays, generation includes both hardware and software, which together make up an entire computer system.

There are totally five computer generations known till date. Each generation has been discussed in detail along with their time period and characteristics.

Following are the main five generations of computers

No.	Generation & Discription
1	<u><a href="#">First Generation</a></u> The period of first generation: 1946-1959. <b>Vacuum tube</b> based.
2	<u><a href="#">Second Generation</a></u> The period of second generation: 1959-1965. <b>Transistor</b> based.
3	<u><a href="#">Third Generation</a></u> The period of third generation: 1965-1971. <b>Integrated Circuit</b> based.
4	<u><a href="#">Fourth Generation</a></u> The period of fourth generation: 1971-1980. <b>VLSI microprocessor</b> based.
5	<u><a href="#">Fifth Generation</a></u> The period of fifth generation: 1980-onwards. <b>ULSI microprocessor</b> based

### 1. First Generation (1940-1959) Vacuum Tubes

The first computers used vacuum tubes for circuitry and magnetic drums for memory. These tubes, like electric bulbs, produced a lot of heat and were prone to frequent fusing of the installations, therefore, they were very expensive and could be afforded only by very large organizations.

**First generation computers** based on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts.