1 Computer System Overview

1.1 INTRODUCTION

Computers are the machines that have revolutionised the world around us. The way we used to live around 25-30 years ago is very different from how we live today. A modern age student cannot even imagine life, without email, Internet, print outs, playing music on computers or smartphones, photos just a click away in the form of smartphones and so on. In short, in every aspect of life around us, we see computers play a role directly or indirectly.

Computers deliver so much, diligently and efficiently, all thanks to the wonderful combination of their **hardware** and **software**.

  ⟡ **Hardware.** The physical electronic components of a computer are called hardware, e.g., keyboard, CPU, monitor, printer etc.

  ⟡ **Software.** These are the recorded instructions and programs that govern the working of a computer. Recall that a *program is a set of instructions to carry out a specific task or achieve a special work goal.*

In this chapter, we shall discuss computer's functioning in broad sense by discussing computer system organization and how various types of software aid in computer's overall performance.

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1.2 BASIC COMPUTER ORGANIZATION

Computer organization refers to logical structure of a computer describing how its components are connected to one another ; how they affect one another's functioning, and contribute to overall performance of the computer.

Computers, as you must be knowing, follow the 'IPO' principle i.e., Input → Process → Output (a certain input is processed to generate specific output). So, the computer organization is also like this — these are component(s) dedicated to obtain input in different forms, component(s) dedicated to perform processing part and component(s) to produce output in different forms.

Thus basic computer organization is as shown in Figure 1.1. To see the interconnections and basic working of computer (Computer Organization), scan this QR Code with SIPO app.
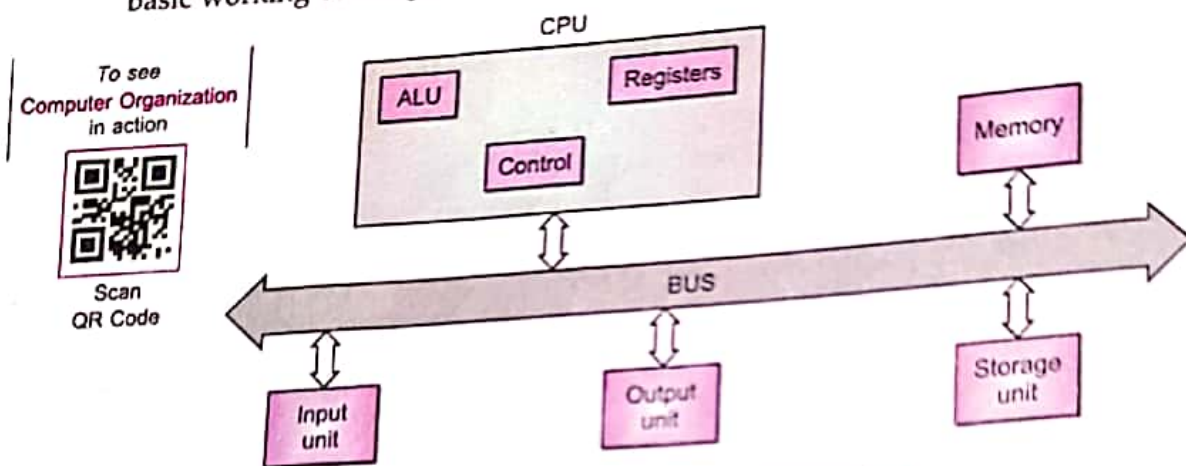

Figure 1.1 Basic Computer Organization.

Let us talk about these functional components of a computer, one by one.

> **NOTE**
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> A computer runs on electricity power.

1.2.1 Input Unit

The input unit is formed by the input devices attached to the computer. Examples of input devices and media are : keyboard, mouse, magnetic ink character reader (MICR), optical mark reader (OMR), optical character reader (OCR), joystick etc.

The input unit is responsible for taking input and converting it into computer understandable form (the binary code). Since a computer operates on electricity, it can understand only the language of electricity i.e., either ON or OFF or high voltage or low voltage. That means a computer can understand two stages ON/OFF or High/Low voltage or the binary language that uses just two symbols : 1 for ON and 0 for OFF.

> **NOTE**
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> An input unit takes the input and converts it into binary form so that it can be understood by the computer.

• All the *inputs* consisted of *data* (on which the action was to be performed) *as well as the instruction* (the action to be taken).

On the same lines, the computer input also consists of data and instructions. For example, if the given input to the computer is Add 2 and 3 then *data* consists of 2 and 3 and *instruction* is Add. Similarly, if the given input is Print "Hello World" then *data* consists of "Hello World" and *instruction* is Print.