



Skilling India in Electronics

Participant Handbook

Sector
Electronics

Sub-Sector
IT - Hardware

Occupation
After Sales Support

Reference ID: **ELE/Q4601**



**Field Technician
Computing & Peripherals**



Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Certificate

**COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARD**

Is hereby issued by the

Electronics Sector Skills Council of India

for

Skilling Content : Field Technician Computing and Peripherals

Complying to National Occupational Standards of

Job Role/QP : Field Technician Computing and Peripherals, QP No : ELE/Q4601 Level 4

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Electronics Sector Skills Council of India

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I would like to take the opportunity to thank everyone who contributed in developing this handbook for the QP Field Technician Computing and Peripherals.

The handbook is the result of tireless pursuit to develop an effective tool for imparting the Skill Based training in the most effective manner.

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CEO

Electronics Sector Skills Council of India

About this Book

This Participant Handbook is designed to enable training for the specific Qualification Pack (QP). Each National Occupational (NOS) is covered across Unit/s.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS. The symbols used in this book are described below.

Symbols Used



Key Learning
Outcomes



Steps



Role Play



Tips



Notes



Unit
Objectives



Activity

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1. Introduction to Computers and its Peripherals

Unit 1.1 – Basics of Computers

Unit 1.2 – Computer Peripherals

Unit 1.3 – Operating Hardware System and Peripherals



Key Learning Outcomes



At the end of this module, you will be able to:

1. Describe the basics of computers
2. Identify computer peripherals
3. Describe the operation of hardware system and peripherals

UNIT 1.1: Basics of Computers

Unit Objectives

At the end of this unit, you will be able to:

1. Define computer and its types
2. Identify computer hardware and software
3. List the different types of computer equipment assembled in a pack

1.1.1 Computer and its Types

A computer is an electronic device which transforms data into meaningful information. The following image shows a computer:



Fig. 1.1.1: A Computer

The basic functionality of computers, irrespective of its size or make, is shown in the following figure:

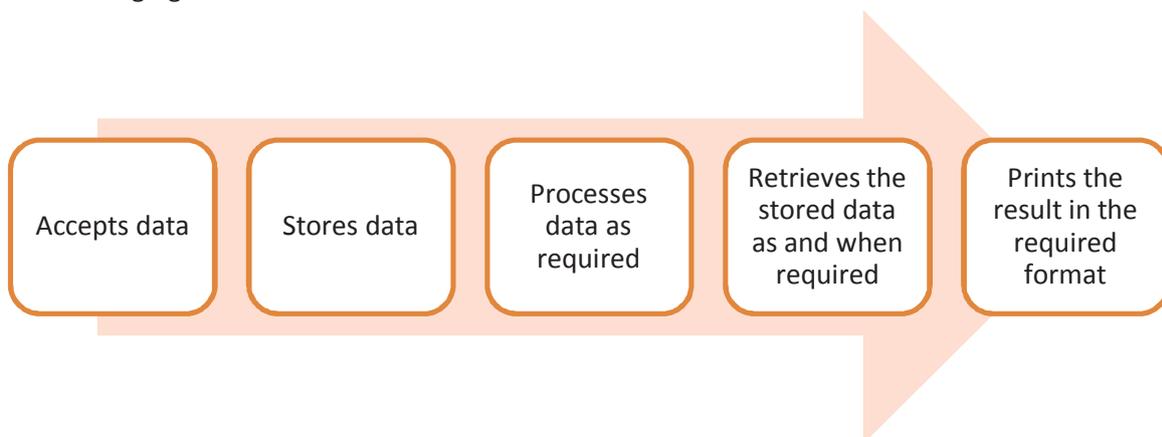


Fig. 1.1.2: Functions of a computer

Some characteristics that have made usage of computers almost a necessity in life are they are fast, accurate, diligent, and adaptable and have good storage capacity.

A computer consists of various units or parts that enables it to perform its functions. The following figure shows a block diagram of the functional units of a computer:

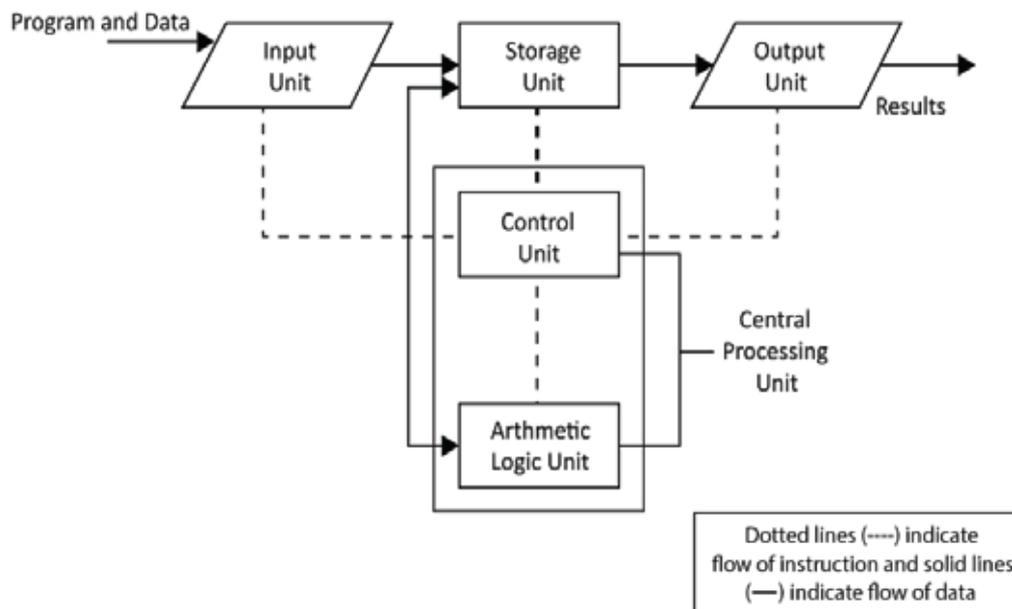


Fig. 1.1.3: Functional units of a computer

The four main functional units in a computer are described in the following figure:

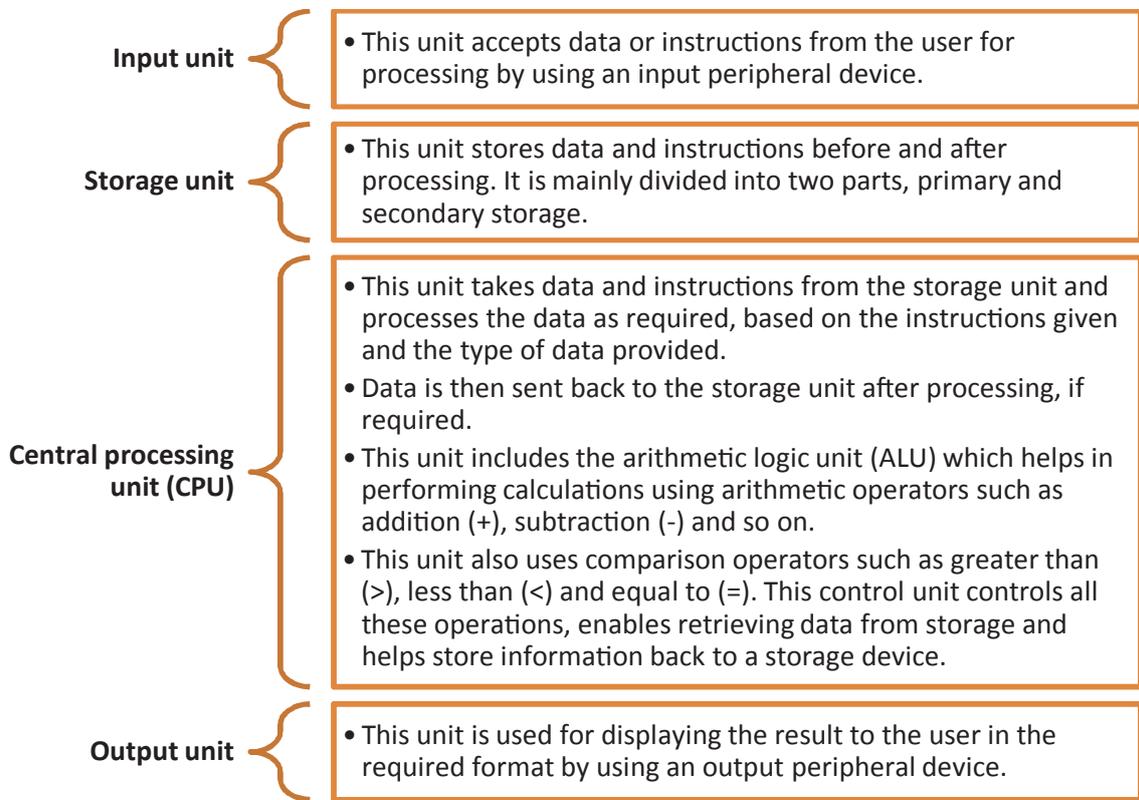


Fig. 1.1.4: Functional units of a computer

Types of Computers

Computers can be classified based on their size, speed and computing power. The following table lists the different types of computers:

Type	Description	Image
Microcomputer	<p>It is a single user computer system with a single chip and moderately powerful microprocessor. The different types of microcomputers are:</p> <ul style="list-style-type: none"> Desktop Computer Laptop Computer Notebook Tablet 	

<p>Mini Computer</p>	<p>It is a computer which can support hundreds of users simultaneously and has more powerful processors than a microcomputer. It is also called mid-range computer.</p>	
<p>Main Frame</p>	<p>It is a multi-user system, like a minicomputer but the technology is different than that of a minicomputer. It is used to handle and process large amount of data such as in banks and government offices.</p>	
<p>Super Computer</p>	<p>It is the fastest and most expensive computer system. It is used for complex scientific computations and numerical calculations such as weather forecasting, nuclear simulations and astrophysics.</p>	

Computers are commonly classified as:

- Laptop
- Desktop
- Server

Laptop

Laptop is a battery or alternate current (AC)-powered, portable, wireless personal computer (PC), generally smaller than the size of a briefcase. It is a small personal computer with a "clamshell" form factor, a thin Liquid Crystal Display (LCD) or Light Emitting Diode (LED) computer screen on the upper portion and a keyboard on the lower part of the "clamshell".

The following image shows a laptop and internal view of the laptop:

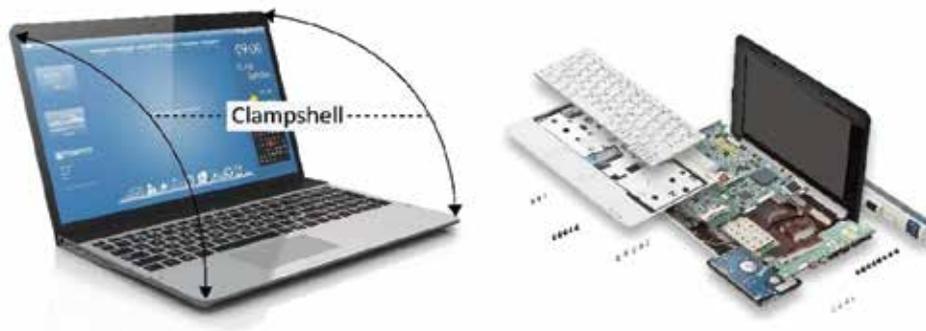


Fig. 1.1.5 Exterior and interior of a laptop computer

Desktop

A desktop is a PC that is made to be used on or near a desk or a table, and is not portable. A desktop PC has a mouse, a keyboard and a base unit which includes the computer's components. Some newer models have the base unit within the monitor to save space. The following image shows a desktop computer along with its system unit or CPU and peripherals:



Fig. 1.1.6. A desktop computer along with its CPU and peripherals

Server

A server computer is a central computer, which comprises of collection of data and programs. It is also known as a network server as it allows all the connected systems to share and store data and applications. File servers and application servers are the two main types of servers. The following image shows a server computer connected to various other computers:

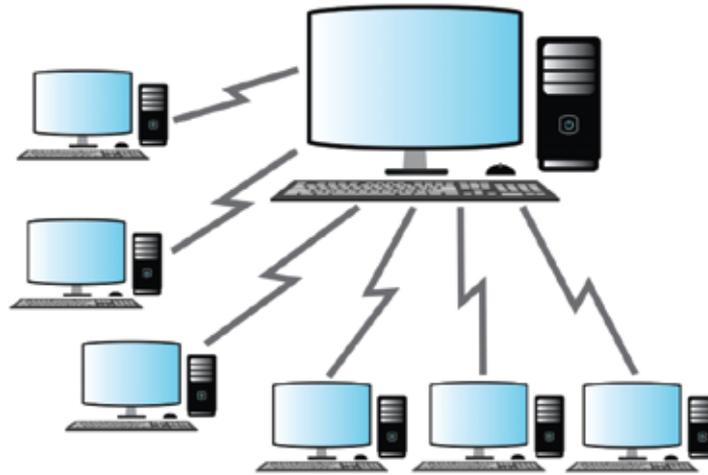


Fig. 1.1.7: A server computer linked to other computers

1.1.2 Computer Hardware and Software

Computer hardware refers to the physical parts of a computer, outside and inside the system unit. The internal parts of a system are known as components, while external parts are typically called peripherals such as the keyboard, mouse, speakers and printers.

The following image shows the basic components of computer hardware:

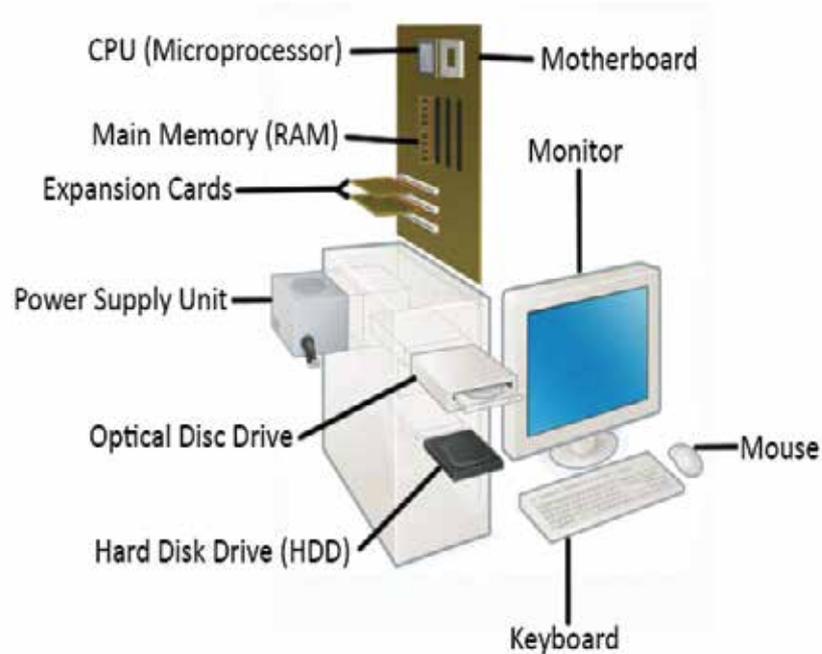


Fig. 1.1.8: Basic components of computer hardware

When a new desktop is bought, some hardware components and devices, shown in the following figure, come along with it:

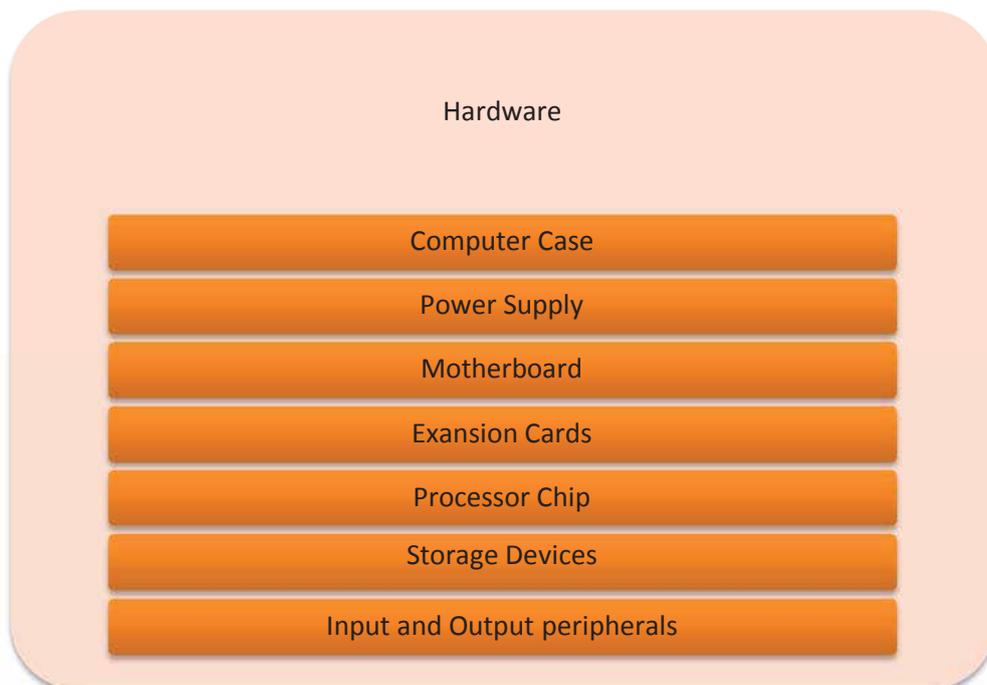


Fig. 1.1.9: Components and devices of a computer hardware

Computer Case

A computer case is a steel, aluminium or plastic enclosure which contains most of the components of a computer. It is also known as a tower, cabinet, system unit or base unit. It is available in different sizes and shapes. It has points, slots and screws for various components to be fit into. A typical tower is shown in the following figure:



Fig. 1.1.10: A typical tower

Scan Image To View Mobile Video

Motherboard

The main printed circuit board, or PCB, in a computer that holds the microprocessor, provides sockets and slots to connect/hold the other peripherals/parts of the computer and connects the power supply to various other electronic parts. It is also called as a system board or main board, and allows the components to communicate with each other, making it a complete working unit. It also has a provision for initial set up of computer after power is turned on, which is the Basic Input/Output System (BIOS) or boot firmware. The motherboard also contains slots and provision for expansion cards. Sometimes, another board, called a daughter board, is connected to the main motherboard for providing further expandability.

The following image shows a labelled motherboard:

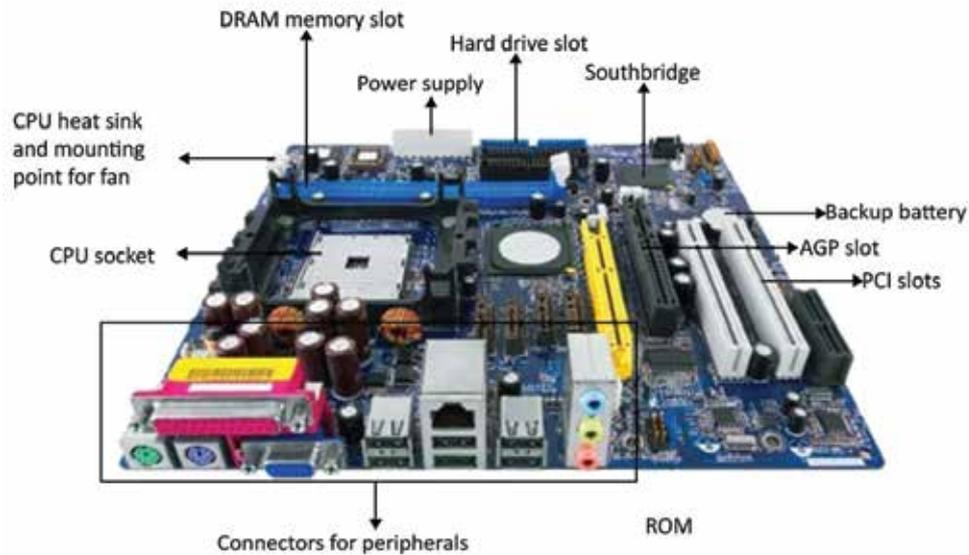


Fig. 1.1.11: Motherboard

Scan Image To View Mobile Video

There are several types of chips found on a motherboard of a CPU as shown in the following table:

CPU chip	Input	Processing Unit	Output
8088 CPU	Inputs 8 bits of data	Processes 8 bits of data	Outputs 8 bits of data
80286 CPU	Inputs 16 bits of data	Processes 16 bits of data	Outputs 16 bits of data
80386SX CPU	Inputs 16 bits of data	Processes 32 bits of data	Outputs 16 bits of data
80386DX CPU	Inputs 32 bits of data	Processes 32 bits of data	Outputs 32 bits of data
80486SX CPU	Inputs 32 bits of data	Processes 32 bits of data	Outputs 32 bits of data
80486DX CPU	Inputs 32 bits of data	Processes 32 bits of data	Outputs 32 bits of data
586 CPU	Inputs 32 bits of data	Processes 32 bits of data	Outputs 32 bits of data

Pentium/P6/K5 CPU	Inputs 64 bits of data	Processes 64 bits of data	Outputs 64 bits of data
Pentium Pro CPU	Inputs 64 bits of data	Processes 64 bits of data	Outputs 64 bits of data

Slots (or Expansion Slots)

An expansion slot is a slot in the motherboard used to add an expansion card (or additional circuit board). The extra expansion card provides extra features to a computer such as video, sound, advanced graphics, Ethernet or memory.

The number of expansion slots that a system can have depends on the physical arrangement of the case and motherboard. Some of such slots are:

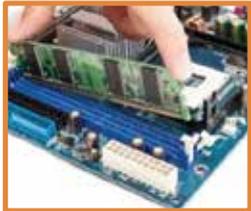
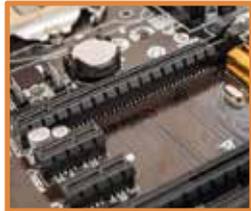
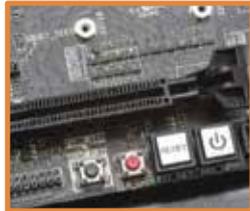
CPU Slot	RAM Slot	Peripheral Component Interconnect (PCI) Slot	PCI Express Slot
			
<ul style="list-style-type: none"> • Also known as a CPU socket • Is where the processor or the CPU chips are inserted on a computer's motherboard. 	<ul style="list-style-type: none"> • Provide slots or placement for inserting RAM chips. • These can be easily removed and replaced. 	<p>Used for expansion devices such as modems, network cards, television tuners, radio tuners, video cards and sound cards.</p>	<ul style="list-style-type: none"> • Used for expansion cards. • However, PCI express slot is used for higher transfer speeds and is typically used for graphics cards.

Fig. 1.1.12: Types of expansion slots