# Task 1: - Explain the building block and logical processes in a computer

In actuality, a computer is a gadget that accepts input and processes it into utility. The real crux is that the computer has certain functional core sets referred to as the core, which would act together to process information on the basis of the thoughts made. From the points of views of architecture and process requirements, it is necessary to know the basic ways of functioning of the computer because it describes functions, processes, data, and even problem-solving. Such explanations will note the general ideas Apple has regarding the processes and the thinking processes that play a part in the performance of these operations. It provides the transformation of all raw materials.

Central processing unit (CPU): - It is also regarded CPU meaning Central processing unit. It is nicknamed the brain of the computer. It has three types of data from which the data will be processed, these are input, convert them into machine-level languages, and run the program which converted to machine-level language. Arithmetic Logic Unit and Control Unit are two main parts of CPU. There are approved procedures to be implemented for maintenance of the machines as well as proper management of all control operations in systems, which have been typified by statements of its function. Logical operations. Modern CPUs are equipped with several advanced features such as microprocessors with multiple cores, hyper-threading, integrated caching, etc., which tend to enhance the performance of a CPU by carrying out operations in a parallel manner and faster storing of data.

Information Storage All. There are two types of memory:

Primary Memory: - Main memory embodies memory as mainly core, i.e., in a computer, it is attached to the CPU. RAM and ROM make up the entire system.

RAM: - Random Access Memory It is totally volatile; that is, they are temporarily stored by switching on, and once switched off, instantly all data in RAM gets erased. Classification of memory: Dynamic RAM that is popularly called as DRAM. Static RAM also known as SRAM. Hectored detains capacitors to store data. Cheaper than DRAM. Uses circuits. Stores data in circuits. Faster than DRAM.

Secondary Memory: -This is the memory in which users store their data for an extended period. Storage in this regard, HDD, SSD, or even Optical Disk such as CDs and DVDs are all categorized as secondary storage.

Input Devices: -Input devices are devices which feed inputs(work) to a computer. Some common input devices are:

Keyboard: - An input device for typing text; a very different key, having its very different work over another.

Mouse:-It is an input device pointing to an object on the computer screen. It is also used to open files, drag files, etc. It takes less space than a mouse.

Magnetic Ink card reader: - A kind of practical tool for helping us to perform things with magnetic cards. Optical Character Reader: It's an instrument for reading optical characters.

Barcode reader: - This is a device used to read barcode.

Cathode ray tube monitors: - these are the devices which utilize cathode ray tubes to display the images received through video signals on the surface of the monitor screen. Most of these CRTs will make use of an electron gun that generates an electron beam that subsequently strikes phosphorescent material and makes up an image on the screen. The CRT monitor consists of millions of phosphor dots in three collars red, blue, and green. Liquid crystal displays work by allowing light to flow freely so as to create their pixels inside the device. Compared to CRT, flat-panel displays are thus smaller, lighter, and consume less power. Examples panels: calculators, video games, monitors, etc. Flat Panel Display: A flat panel display is an instrument which creates output using liquid crystal technology or plasma. The rays of light from such displays travel through liquid crystals using pixels. Flat Panel Displays are more reduced They are reduced in size, weight, and power consumption as compared to a CRT. It are either wearable on the wrist or can be hung on the wall. Here such devices as flat-panel displays: calculators, video games, and many others, so forth.

Plasma Monitor: - A flat panel display with the plasma display technology is called a plasma monitor. In the plasma monitor, there are plenty of tiny cells sitting between two glass panels. These cells are filled with a solution of noble gases and mercury. Therefore, when you cut the electric supply, the gas converts into plasma and forms UV light, which in turn produces an image. Thus, this is way better than an LCD monitor. It is a high-resolution monitor with utmost quality up to 1920 x 1920. The contrast ratio is good, refresh rate is high, etc.

Impact Printer: To print, first, impact printers imprint the characters onto a ribbon, which then strikes the paper. So we can say Impact Printers have a print head or hammer that is used for printing on paper. The hammer or print head hits an ink ribbon and then strikes the paper, bringing the character to print on it.   
Non-impact printers: Such printers do not strike a hammer or print head against a ribbon to produce output. They do not use the impact method for printing. Instead, they use one of the following methods for printing output: electrostatic, laser, or inkjet technology without ribbon. A non-impact printer is also typically called a Page Printer as it prints one complete page at a time.

Projector: - It is an automatic output device, which works on converting images from a computer and providing instantaneous output to the individual who displays output on larger areas such as a wall or screen. One can always deliver a presentation by the projector. A projector makes it possible for a person to see, in an instant, images from a computer on a larger area, such as a wall or overhead view screen. The first thing to occur is the signal from the computer sent to a video card, then transferred to the projector, which throws the signals toward surface areas. Using light and lenses, projectors reproduce, magnify, and throw-out texts, photos, or movies. Thus it offers excellent output for classroom presentations or big audiences.

# Characteristics of Projector:

Projectors are quite portable and can easily be connected and hung on the wall.

The projectors are probably the most economical choices for big screens in video homes.

A small projector can be placed at a rear position on a shelf or bookcase or can be attached to the ceiling and occupies no floor space. It even barely draws attention unless not in use.

# Motherboard and Buses:

In a computer, the motherboard forms the main circuit board that runs the computer. It acts as the backbone of the system and joins together the different elements of that computer, thus allowing it to work in unison. Some features of the motherboard include:

# Main Components:

CPU Socket: Holds the Central Processing Unit (CPU).

RAM Slots: Connect to the memory of system (RAM).

Power Connectors: To give power supply to the motherboard and components.

Storage Connectors: Connections like SATA or M.2 to attach hard drives and SSDs.

Ports and Interfaces:

External connectors USB, audio, video (HDMI, VGA), Ethernet, etc.

Internal headers to accommodate system fans, RGB lights, and additional peripherals.

# BIOS / UEFI:

The firmware initializing the hardware at the boot stage and providing an interface for configuration.

# Buses

Bus is the communication system that transfers data between elements within or outside a computer. The bus forms part of the operations of the motherboard.

# Types of Buses:

Data Bus: Actual data transfers between the CPU, memory, and peripherals.

Address Bus: Carries memory addresses which are used by the CPU for data read or write.Control Bus: Transfers control signals to correlate and coordinate operation. Pivotal Bus Technologies: Front-Side Bus (FSB): It's a bus that connects the CPU with the main memory. Back-Side Bus (BSB): Connects a CPU with its cache. The high-speed peripheral component interconnects express buses, connecting devices like external graphic cards and solid-state drives. The usual standard connection between host computers and peripherals such as keyboards, mice, and storage devices is that of USB peripherals.

Bus Performance Factors:

Width: A bus may transfer a number of bits simultaneously.

Speed: It is the operating frequency of the bus (measured in MHz or GHz).

Relationship Between Motherboard and Buses

The motherboard contains the physical buses (traces and connectors) and manages data flow through integrated chipsets.

The bus on the motherboard communicates with CPU, RAM, storage devices, and peripherals.

Motherboard and buses act as the communication infrastructure of any computer to make its components work in unison.

# Software: -

The computer software is classified into three main types according to functionality and purpose. Here it is:

# 1. System Software

System software acts as a middleware between the user and the computer hardware, handling the functions of the hardware and providing a platform for other software.

# Examples:

Operating Systems (OS):

Windows, macOS, Linux, Android, iOS.

Manage hardware resources, file systems, and user interfaces.

Utility Software:

Disk cleanup tools, antivirus programs, file management systems.

Performs maintenance tasks to optimize the system and make it secure.

# 2. Application Software

Application software is software that is created for the end-user to conveniently carry out specific tasks. The functioning of application software is highly dependent on the system software installed.

# Types:

# Productivity Software:

Word Processors (Microsoft Word), Spreadsheet Applications (Excel), Presentation Programs (PowerPoint).

# Multimedia Software:

Photo editing tools (Adobe Photoshop), video players (VLC), and music applications.

Web Browsers:

Google Chrome, Mozilla Firefox, Safari.

Communication Tools:

Email clients (Outlook), instant messaging applications (Slack), and video conferencing platforms (Zoom).

Gaming Software:

By Fortnite, Minecraft, and The Sims.

3. Development Software: - is a software that enables programmers to write, test, and debug their codes which are necessary for creating applications, system software, or websites.

Examples:

Integrated Development Environment (IDE):

Visual Studio, PyCharm, Eclipse

Text Editors:

Notepad++, Sublime Text, VS Code

Compiler and Interpreter:

GCC (C/C++ compiler), Python interpreter

Version Control Systems:

Git, GitHub

Other Classifications In the distribution and use of software, some include the following specifications:

Open-Source Software:

Code is publicly available for modifications (e.g. Linux, Apache).

Proprietary Software:

Owned, and licensed under a company (e.g. Microsoft Office, Adobe).