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Q1. (a) In your opinion what are the 3 most important characteristics of computers, Explain each characteristic?

**Ans:**

There are many characteristics of a computer but the three most according to my opinion are as follows

**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 to perform 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 the input is correct.
- Accuracy of computer is consistently high and the degree of its accuracy depends upon its design.
- Errors are caused due to incorrect input data.

**3. Storage Capability**

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It forgets or losses data or information when it told to do so
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio, etc.

(b) Write key characteristics of fourth generation of computers?

Key characteristics of fourth generation of computers are as follows

- Fourth generation computers were small, affordable, reliable and were easy to use PCs.

- More powerful and reliable mainframe systems and supercomputers.
- Fourth generation computers were totally general purpose machines.
- They were easier to produce commercially.
- Easier to upgrade
- Rapid software development was possible

Outputs are now more reliable and accurate.

- Processing power or speed has increased enormously.
- With increment in the capacity of the storage systems large programs were started to be in use
- Great improvement in the hardware helped great improvement in the output in screen, paper etc.
- Size of the computer devices became such small that even desktop computers were easily movable along with portable computers such as laptops etc
- Many high-level languages were developed in the fourth generation such as COBOL, FORTRAN, BASIC, PASCAL and C language

Q2. (a) Discuss the importance of Arithmetic logic unit and Control unit of a computer system?

**Ans**

#### **ALU Importance**

ALU stands for Arithmetic logic unit. Its importance was realized when representing and storing numbers were the basic of operation of the computers in earlier times. The real go came when computation, manipulating numbers like adding, multiplying came into picture. These operations are handled by computer's **arithmetic logic unit (ALU)**. The ALU is the mathematical brain of a computer.

The ALU handles arithmetic and logical operations, as the name states it. The CU, Control Unit, passes the operands required into the ALU for being processed, which in turn passes it out to registers in order to be saved

#### **CU Importance**

CU stands for Control Unit. CU is an important part of CPU as it takes care about all you request on the operating system and it engages the ALU if instructions needs arithmetic/logical kind of processing. **Control Unit** is the part of the computer's central processing unit (CPU), which directs the operation of the processor. Without a control unit it's like a Body without a Brain. Control Unit controls all the Parts of the Computer it processes all the Instructions given by us

Example: CU waits for your interaction on the Operating System, if you click on any icons on the screen, CU will take care of it about what to do with that request.

(b) Write a detailed note on importance of RAM (Random Access Memory)

**Ans**

RAM stands for Random Access Memory. For practical purposes, it could be said that the proper functioning of RAM memory is essential in a computer because it is one of the components that most directly affects its good performance, especially in terms of speed.

As we have already seen, RAM is responsible for “helping” the processor in its operations, so that it “holds”, for memory purposes, all the instructions and data that the processor needs to use when running a program.

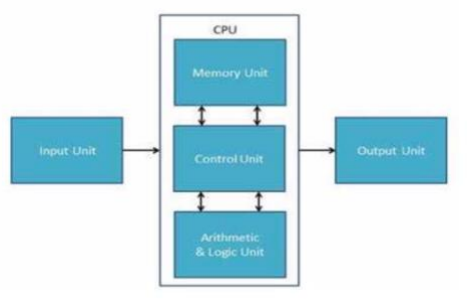
RAM is important and significant . Too little can lead to inactive performance, though smaller devices like tablets and smartphones don’t need as much as high-end gaming desktops. However, installing massive amounts or using the highest MHz rating doesn’t mean a device will run blazingly fast. Remember, RAM is only part of the overall equation.

Q3. Write a detailed note on Basic Organization of a computer System along with the functions of each part.

Ans

### ***Basic Organization of a Computer System***

All types of computers follow the same basic logical structure and perform the following five basic operations for converting raw input data into information useful to their users



### ***Five Basic Operations***

#### ***Inputting***

- The process of entering data and instructions into the computer system.

#### ***Storing.***

- Saving data and instructions to make them readily available for initial or additional processing whenever required.

#### ***Processing.***

- Performing arithmetic operations (add, subtract, multiply, divide, etc.) or logical operations (comparisons like equal to, less than, greater than, etc.) on data to convert them into useful information

#### ***Outputting***

- The process of producing useful information or results for the user such as a printed report or visual display

#### ***Controlling***

- Directing the manner and sequence in which all of the above operations are performed

## ***Input Unit***

Input unit of a computer performs the following functions

1. This unit contains devices with the help of which we enter data into the computer.
2. This unit creates a link between the user and the computer.
3. The input devices translate the information into a form understandable by the computer.

Examples are Keyboard, Mouse, Joy Stick, Light pen

## ***Output Unit***

Output unit of a computer performs the following functions.

1. The output unit consists of devices with the help of which we get the information from the computer.
2. This unit is a link between the computer and the users.
3. Output devices translate the computer's output into a form understandable by the users.

Examples are Monitor, Printer , Speaker

## ***CPU***

- A **CPU** (Central Processing Unit), or processor as it is sometimes called, is the main chip in the computer and is located on the Motherboard
- The CPU processes the computer's data and exchanges it with the other components and peripherals.
- CPU's come in different speeds. The speeds are measured in Mega Hertz (MHz) and even Giga Hertz (GHz). Most modern computers have two processors (Intel **Dual** Core Processor).
- The CPU is often referred to as the brain of the computer.
- CPU itself has the following three components:
  1. ALU (Arithmetic Logic Unit)
  2. CU (Control Unit)
  3. Memory Unit

## ***ALU***

This unit consists of two subsections namely, Arithmetic Section and Logic Section

### ***Arithmetic Section***

- Function of arithmetic section is to perform arithmetic operations like addition, subtraction, multiplication, and division. All complex operations are done by making repetitive use of the above operations.

### ***Logic Section***

- Function of logic section is to perform logical operations such as comparing, selecting, matching, and merging of data.

### ***Control Unit***

This unit controls the operations of all parts of the computer but does not carry out any actual data processing operations.

Functions of this unit are –

- It is responsible for controlling the transfer of data and instructions among other units of a computer.
- It manages and coordinates all the units of the computer.
- It obtains the instructions from the memory, interprets them, and directs the operation of the computer.
- It communicates with Input/output devices for transfer of data or results from storage.

### **Memory**

- Memory is required in computers to store data and instructions.
- Computer memory is any physical device capable of storing information temporarily or permanently.
- This unit supplies information to other units of the computer when needed. Its size affects speed, power, and capability.

### **Types**

- *Primary Memory (Main memory)*
- *Secondary Memory*

### **Primary Memory/Storage**

- This is the main memory of the computer. CPU can directly read or write on this memory. It is fixed on the motherboard of the computer.
- Used to hold data, intermediate results, and results of ongoing processing of job(s).
- The main features of primary memory, which distinguish it from secondary memory are –
  - It is accessed directly by the processor
  - It is the fastest memory available i.e. Fast in operation
  - Small Capacity
  - Expensive
  - Volatile (loses data on power dissipation)

### **RAM**

- RAM or **Random Accessing Memory** is the main memory that stores data on the computer.
- RAM is a type of volatile memory which means it requires electricity to store data, so when the computer is powered down all the memory is wiped.
- There are many types of RAM including
  - **SRAM** (Static Random Accessing Memory)
  - **DRAM** (Dynamic Random Accessing Memory).
- All these do similar jobs to the RAM.

### **ROM**

- ROM is an acronym for Read-Only Memory.
- It refers to computer memory chips containing permanent or semi-permanent data.
- Unlike RAM, ROM is non-volatile; even after you turn off your computer, the contents of ROM will remain
- Almost every computer comes with a small amount of ROM containing the boot firmware.

- This consists of a few kilobytes of code that tell the computer what to do when it starts up, e.g., running hardware diagnostics and loading the operating system into RAM. On a PC, the boot firmware is called the BIOS.
- Contemporary versions of ROM allow some limited rewriting, so you can usually upgrade firmware such as the BIOS by using installation software. Rewritable ROM chips include
  - **PROMs** (programmable read-only memory),
  - **EPROMs** (erasable read-only memory),
  - **EEPROMs** (electrically erasable programmable read-only memory) etc.

### ***Secondary Memory/Storage***

- A secondary storage device refers to any non-volatile storage device that is internal or external to the computer.
- It can be any storage device beyond the primary storage that enables permanent data storage.
- A secondary storage device is also known as an auxiliary storage device or external storage.
  - It is used to hold stored program instructions.
  - Used to hold data and information of stored jobs.
  - Slower than primary storage
  - Large Capacity
  - Lot cheaper than primary storage
  - Retains data even without power
- Examples are Hard drive, USB drive, SD card, Floppy Diskette