Chapter-1 Introduction to Computer

Q.No. 1: What is Computer? What are the advantages and disadvantage of a computer?

Answer:

A computer is a programmable machine. It responds to the specific set of instructions in a well-defined manner and it can execute a prerecorded list of instructions.

Modern Computers: Modern computers have two parts – an electronic part and a digital part. The hardware consists of wires, transistors, and circuits. The instructions and data are called software.

Advantages of a Computer:

Multitasking: Multitasking makes a job easier and saves time. We can do many

things together in a computer. We can perform multiple tasks, operations and calculate numerical problems within a few seconds.

Speed: A computer is more than a calculating device. It is very fast and allows us to do our tasks very quickly.

Stores Huge Amounts of Data: Computers can store a large amount of data. It can store files, documents, images, and videos.

Accuracy: Computers can solve numerical problems with accuracy.

Data Security: Computers can protect data. They secure us from cyber attackers. In cybercrime and cyber access is reduced.

Increases your Productivity: With the help of a computer, we can do any work with less effort and time. By using a computer we save our energy and time. We can create, store, edit, share and print documents. Without a computer, this may take a lot of time.

Internet Connection: The Internet is the main advantage of a computer. We can derive a lot of information in the form of documents or videos using the internet.

Organizes the Information: When we store a lot of information in a computer, we can arrange or segregate the information alphabetically, which helps us to find any information in no time.

Keeps Everyone Connected: We can stay connected with millions of people using a computer. There are various social media sites such as Facebook and Instagram through which we can share information with many people at the same time.

A Tool for Students: Computers can be a great tool for students. Students can use Google to get information about anything. They can use YouTube to understand a particular concept.

Can Get You Money: By uploading contents on YouTube, you can earn a lot of money if you get enough subscribers. Starting an online store you can earn a lot of money as compared to a local store.

Helps to Automate: A great feature of a computer is to automate a machine. For example, in car manufacturing factories, a robotic arm can be programmed in such a way that it can repeat the steps we want it to do.

Help Physically Challenged: People who cannot talk can communicate through computers. People can also speak using a computer like Stephen Hawking. By installing special software a blind person can read what is on the screen.

Entertainment: Computers can entertain us in various ways. We can now listen to millions of songs via the internet. We can surf social media in our free time. It allows us to download movies or watch them online.

Disadvantages of a Computer:

Cyber Crime: Since the computer is now used all over the world by millions of people to save data, hence there are some people who try to get the data by hacking an account. The illegal way of deriving information by sneaking through other's account is known as cybercrime. People also hack other

people's social media account and do unwanted things to get them into trouble. There are some agencies which try to arrest these kinds of people.

Increases Unemployment: Computers have taken the place of man as computers are very fast and accurate and also save money and time. Due to this, unemployment has increased.

Uses Electricity: Some people are so dependent on a computer that they sit in front of a computer screen for the whole day. This uses a lot of electricity. Since electricity is an exhaustible resource, we must use it wisely.

Dependence: Some people are so addicted and dependent on a computer that they cannot live without it. It creates problems among loved ones and family members.

Makes People Lazy: Due to the convenience of the computer, people deny doing physical activity. This has made people lazy and unhealthy.

Q.No. 2: What are the main components of a PC system? Explain each component?

Answer:

Computers internal architectural design comes in different types and sizes, but the basic structure remains same of all computer systems.

The major components of general-purpose computer system are Input Unit, main/internal Memory or Storage Unit, Output Unit, Central Processing unit. The CPU is further includes Arithmetic logic unit (ALU) and control unit (CU). All the units also referred to as "**The functional units**". Devices that are not integral part of CPU referred to as peripherals.

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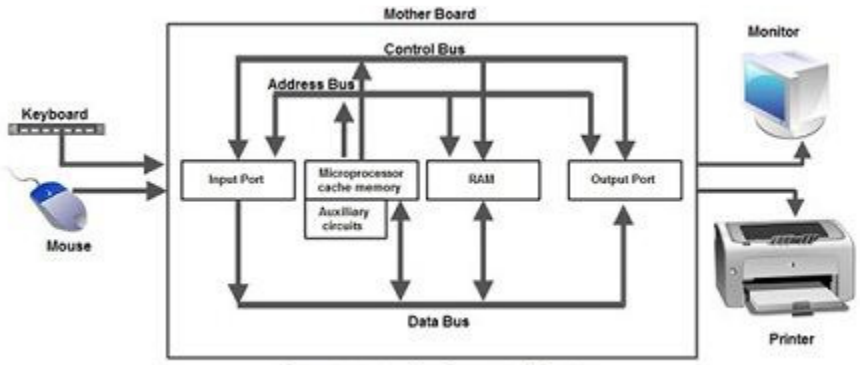


Components of a Computer System

Input Unit

Input unit is used for transfers' raw Data and control signals into the information processing system by the user before processing and computation. All the input unit devices provide the instructions and data are transformed into binary codes that is the primary memory acceptable format.

Example of Input unit devices: keyboard, mouse, scanner, joystick, MICR, Punched cards, Punched paper tape, Magnetic tape etc.

Memory or Storage Unit

Memory or Storage unit is used for storing Data during before and after processing. The capacity of storage is expressed in terms of Bytes.

The two terms Memory or Storage unit are used interchangeably, so it is important to understand what is the difference between memory and storage?

Memory

This unit retains temporarily results till further processing, For example, Random Access Memory (RAM).This memory is volatile, which means data is disappears when the power is lost.

Storage

The storage or "secondary storage" is used for retain digital data after processing for permanently. For example hard drive. The Storage is non-volatile in nature. CPU does not access directly to secondary storage memories, instead they accessed via input-output unit. The contents of secondary storage memories are first transferred to the main memory (RAM) and then CPU access it.

Output Unit

Output Unit receives information from the CPU and then delivers it the external storage or device in the soft or hard processed form. The devices which are used to display output to the user are called output devices. The Monitor or printer is common output device.

Central Processing Unit

The main chip in a computer is the microprocessor chip, which is also known as the CPU (central processing unit). The CPU is mounted on a printed circuit board called the main board or mother board. This chip is considered to be the controlling chip of a computer system since it controls the activities of other chips as well as outside devices connected to the computer, such as monitor and printer. In addition, it can also perform logical and computational tasks. Microprocessors work on a parallel system. Figure shows a typical structure of one of the first-generation microprocessors. The recent ones possess greater complexity, although the basic design concept has not changed much.

Q.No. 3: what are the 5 basic operations performed by a computer?

Answer:

Basic Operations of a Computer System

1. **Inputting**
2. **Processing**
3. **Outputting**
4. **Storing**
5. **Controlling**

Inputting

This is a basic operation of a computer system. This is the act of feeding in the data and instruction to the computer. By inputting you should understand that it is to send data and/or instruction to the computer in the required format. Such as the keyboard, disks, or through other computers via network connections or modems connected to the Internet.

Processing Unit

The task of performing calculations and comparisons are known as processing. The unit in Computer System that is responsible for processing is ALU (Arithmetic and Logical Unit). ALU is the place where actual execution of the instructions takes place during the processing operations. All calculations & comparisons are made in the ALU. The data and instructions stored in the primary storage are transferred to it as when required. ALU may produce Intermediate results and store it in the memory which is also transferred back to the ALU for the final processing. After completion of processing the final results are sending to storage units from ALU.

Outputting Unit

This unit takes care of receiving processed information from processing unit and presents it to the user in the suitable form. A computer produces results in binary form and output unit does decoding to make it usable to the users. The devices that can output information from a computer are known as output unit devices. Monitors, Speakers, Projectors are soft output devices whereas printers, plotters produce hard copy output.

Storage Unit

Before actual processing start, data & instructions entered to the computer must be stored somewhere inside the computer. Similarly, results produced by the computer are required to be stored before it is passed to the output unit. The intermediate result produced by the computer must also be stored for further processing. Thus the importance of storage Unit in a computer system is vital. Based on whether the storage device is inside the main machine or not, it can be internal or external storage. Similarly, looking at whether the storage device works close with CPU or works as backup media, they can be primary storage or secondary storage. Primary storage is also called primary memory. Secondary storage is known by other names such as backup storage or secondary memory. For the storage purpose, a computer system may have different devices such as registers, cache, RAM/ROM, flash, magnetic disks, and optical disks and so on.

Control Unit

ALU dose does not know what should be done with the data likewise, output unit does not know when the result should be displayed. By selecting, interning and seeing to the execution of the program the CU is able to maintain order and direct the operations of the entire system. CU doesn't perform any actual processing on data yet it is known as a central nervous system for the comforts of the computer. It manages and coordinates the entire system.

Q.No. 4: List of different type of computer memory in the computer system. Explain their uses.

Answer:

Computer memory is a generic term for all of the different types of data storage technology that a computer may use, including RAM, ROM, and flash memory.

Some types of computer memory are designed to be very fast, meaning that the central processing unit (CPU) can access data stored there very quickly. Other types are designed to be very low cost, so that large amounts of data can be stored there economically.

Another way that computer memory can vary is that some types are *non-volatile*, which means they can store data on a long term basis even when there is no power. And some types are *volatile*, which are often faster, but which lose all the data stored on them as soon as the power is switched off.

A computer system is built using a combination of these types of computer memory, and the exact configuration can be optimized to produce the maximum data processing speed or the minimum cost, or some compromise between the two.

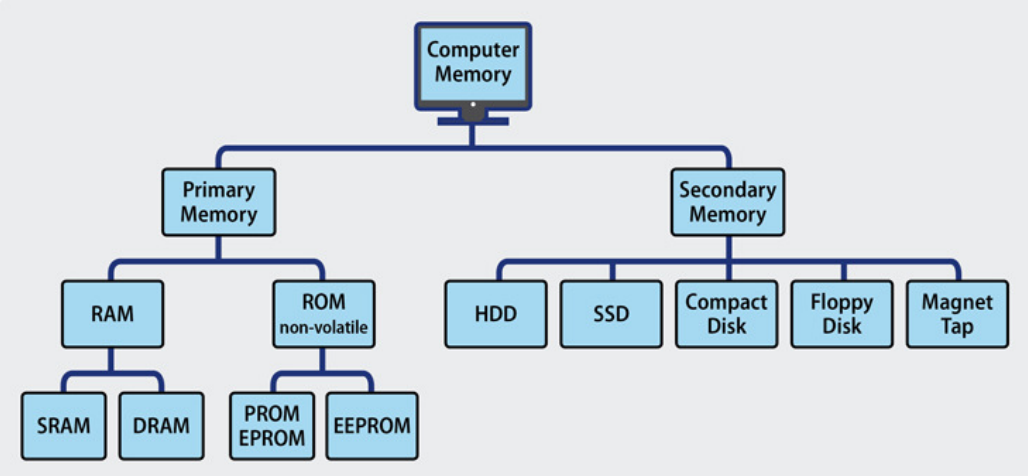
Types of Computer Memory: Primary and Secondary

Although many types of memory in a computer exist, the most basic distinction is between primary memory, often called system memory, and secondary memory, which is more commonly called storage.

The key difference between primary and secondary memory is speed of access.

Primary memory includes ROM and RAM, and is located close to the CPU on the computer motherboard, enabling the CPU to read data from primary memory very quickly indeed. It is used to store data that the CPU needs imminently so that it does not have to wait for it to be delivered.

Secondary memory by contrast, is usually physically located within a separate storage device, such as a hard disk drive or solid state drive (SSD), which is connected to the computer system either directly or over a network. The cost per gigabyte of secondary memory is much lower, but the read and write speeds are significantly slower.



Differences between RAM and ROM

ROM:

1. **Non-volatile**
2. **Fast to read**
3. **Usually used in small quantities**
4. **Cannot be written to quickly**
5. **Used to store boot instructions or firmware**
6. **Relatively expensive per megabyte stored compared to RAM**

RAM:

1. **Volatile**
2. **Fast to read and write**
3. **Used as system memory to store data (including program code) that the CPU needs to process imminently**
4. **Relatively cheap per megabyte stored compared to ROM, but relatively expensive compared to secondary memory**

Q.No. 4: Explain the function of compiler interpreter and assembler?

Answer:

Assembler: It usually converts the assembly code into machine level code. We have assemblers like resident assembler and cross assembler and they're further divided as one pass and two pass assemblers

Ex: NASM, TASM etc

Compiler: Compiler is used for converting the program code or source code to the understanding level of our system which is also called machine code.

Ex : C , C++ Languages

Interpreter: An interpreter is a computer program which executes a statement directly i.e. It translates Single statement of the program at Run Time. It reads only one statement of program, translates it and executes it. Then it reads the next statement of the program again translates it and executes it. In this way it proceeds till all the statements are translated and executed.

Ex: Python, Lisp etc

Q.No. 5: Write short notes on MICR (Magnetic Ink Character Recognition?

Answer:

MICR (magnetic ink character recognition) is a technology used to verify the legitimacy or originality of paper documents, especially checks. Special ink, which is sensitive to magnetic fields, is used in the printing of certain characters on the original documents. Information can be encoded in the magnetic characters.

The use of MICR can enhance security and minimize the losses caused by some types of crime. If a document has been forged - for example, a counterfeit check produced using a color photocopying machine, the magnetic-ink line will either not respond to magnetic fields, or will produce an incorrect code when scanned using a device designed to recover the information in the magnetic characters. Even a legitimate check can be rejected if the MICR reader indicates that the owner of the account has a history of writing bad checks.

Retailers commonly use MICR readers to minimize their exposure to check fraud. Corporations and government agencies also use the technology to speed up the sorting of documents.

Chapter-1 Notes Completed……..

Chapter-2 Continued……..