Introduction to Compurters

Computer: A computer is an electronics or calculating device which can perform the arithmetic or logical operations automatically.

Why do people use computer: Computers are used in most people's everyday life. People use them at work and personal use. People will use computers for socializing, streaming music, videos and movies, researching and providing information.

Importance of computer: computers are important because of their ability to save money, improve efficiency and facilitate communication between people around the world.

Why do people use notebook computer: Because they might want to take some sort of computer around with them, and they are easier than carrying laptops.

History of Computers: The computer as we know it today had its beginning with a 19th century English mathematics professor name Charles Babbage. He designed the Analytical Engine and it was this design that the basic framework of the computers of today are based on.

Generally speaking, computers can be classified into three generations. Each generation lasted for a certain period of time, and each gave us either a new and improved computer or an improvement to the existing computer.

First generation: 1937 – 1946 - In 1937 the first electronic digital computer was built by Dr. John V. Atanasoff and Clifford Berry. It was called the Atanasoff-Berry Computer (ABC). In 1943 an electronic computer name the Colossus was built for the military. Other developments continued until in 1946 the first general– purpose digital computer, the Electronic Numerical Integrator and Computer (ENIAC) was built. It is said that this computer weighed 30 tons, and had 18,000 vacuum tubes which was used for processing. When this computer was turned on for the first time lights dim in sections of Philadelphia. Computers of this generation could only perform single task, and they had no operating system.

Second generation: 1947 – 1962 - This generation of computers used transistors instead of vacuum tubes which were more reliable. In 1951 the first computer for commercial use was introduced to the public; the Universal Automatic Computer (UNIVAC 1). In 1953 the International Business Machine (IBM) 650 and 700 series computers made their mark in the computer world. During this generation of computers over 100 computer programming languages were developed, computers had memory and operating systems. Storage media such as tape and disk were in use also were printers for output.

Third generation: 1963 - present - The invention of integrated circuit brought us the third generation of computers. With this invention computers became smaller, more powerful more reliable and they are able to run many different programs at the same time. In1980 Microsoft Disk Operating System (MS-Dos) was born and in 1981 IBM introduced the personal computer (PC) for home and office use. Three years later Apple gave us the Macintosh computer with its icon driven interface and the 90s gave us Windows operating system.

As a result of the various improvements to the development of the computer we have seen the computer being used in all areas of life. It is a very useful tool that will continue to experience new development as time passes.

Classification of Computers: There are four types of computer according to size which are given below:

1. Micro Computers (Personal Computers),
2. Mini Computers (Midrange computers),
3. Mainframe Computers,
4. Super Computers.

1.Micro Computers (Personal Computers): Microcomputers are the most common kind of computers in use as of 2014. The term "microcomputer" was introduced with the advent of systems based on single chip microprocessors. The best-known early system was the Altair 8800, introduced in 1975. The term "microcomputer" has practically become an anachronism.

These computers include:

- **Desktop computers** – A case and a display, put under and on a desk.
- **In-car computers (carputers)** – Built into a car, for entertainment, navigation, etc.
- **Game consoles** – Fixed computers specialized for entertainment purposes (video games).

Smaller microcomputers are also called mobile devices:

- **Laptops and notebook computers** – Portable and all in one case.
- **Tablet computer** – Like laptops, but with a touch-screen, entirely replacing the physical keyboard.
- **Smart phones, smart books, PDAs and palmtop computers** – Small handheld computers with limited hardware.
- **Programmable calculator**– Like small handhelds, but specialized on mathematical work.
- **Handheld game consoles** – The same as game consoles, but small and portable.

2.Mini Computers: Minicomputers (colloquially, minis) are a class of multi-user computers that lie in the middle range of the computing spectrum, in between the smallest mainframe computers and the largest single-user systems (microcomputers or personal computers). The term superminicomputer or supermini was used to distinguish more powerful minicomputers that approached mainframes in capability. Superminis were usually 32-bit at a time when most minicomputers were 16-bit. The contemporary term for minicomputer is midrange computer, such as the higher-end SPARC, POWER and Itanium-based systems from Oracle Corporation, IBM and Hewlett-Packard.

3.Mainframe Computers: The term mainframe computer was created to distinguish the traditional, large, institutional computer intended to service multiple users from the smaller,

single user machines. These computers are capable of handling and processing very large amounts of data quickly. Mainframe computers are used in large institutions such as government, banks and large corporations. They are measured in MIPS (million instructions per second) and respond to up to 100s of millions of users at a time.

4.Super Computers: A Supercomputer is focused on performing tasks involving intense numerical calculations such as weather forecasting, fluid dynamics, nuclear simulations, theoretical astrophysics, and complex scientific computations. A supercomputer is a computer that is at the front-line of current processing capacity, particularly speed of calculation. The term supercomputer itself is rather fluid, and the speed of today's supercomputers tends to become typical of tomorrow's ordinary computer.

Classification of Functions: There are four types of computer according to their functions which are given below:

1.Servers: Server usually refers to a computer that is dedicated to provide a service. For example, a computer dedicated to a database may be called a "database server". "File servers" manage a large collection of computer files. "Web servers" process web pages and web applications. Many smaller servers are actually personal computers that have been dedicated to provide services for other computers.

2.Workstations: Workstations are computers that are intended to serve one user and may contain special hardware enhancements not found on a personal computer. By the mid 1990s personal computers reached the processing capabilities of mini computers and workstations. Also, with the release of multi-tasking systems such as OS/2, Windows NT and Linux, the operating systems of personal computers could do the job of this class of machines.

3.Information Applications: Information appliances are computers specially designed to perform a specific "user-friendly" function—such as playing music, photography, or editing text. The term is most commonly applied to mobile devices, though there are also portable and desktop devices of this class.

4.Embedded Computers: Embedded computers are computers that are a part of a machine or device. Embedded computers generally execute a program that is stored in non-volatile memory and is only intended to operate a specific machine or device. Embedded computers are very common.

Classification of Usage: There are three types of computer according to usage which are given below:

1.Public Computer: Computers that are open for public uses. They are normally fire walled to prevent abuse. Most are restricted to install software. There are many places one can use them such as cyber cafes, schools and libraries.

2.Personal Computer: Computers that are solely for one user. The user has complete access to any part of the computer.

3.Display Computer: Computers that are displayed in a shop. These computers are mainly for preview. These computers are rarely firewalled but are monitored. They are likely to have internet access.

Components Of Computer: A general purpose computer has four main components:

1.Arithmetic logic unit (ALU),
2.Control unit,
3.Memory and
4.Input and output devices (collectively termed I/O).

These parts are interconnected by buses, often made of groups of wires. Inside each of these parts are thousands to trillions of small electrical circuits which can be turned off or on by means of an electronic switch. Each circuit represents a bit (binary digit) of information so that when the circuit is on it represents a "1", and when off it represents a "0" (in positive logic representation). The circuits are arranged in logic gates so that one or more of the circuits may control the state of one or more of the other circuits.

Question: What are the function of a computer ? Briefly explain.

Answer: The main and also basic function of a computer is to run programs. The programs they run can help to improve humans' everyday lives. But, there are four basic functions of a computer system which are given below:

1. Input: We input data i.e. we provide data; set of instructions . We input data through input devices which are keyboard, mouse, scanner etc .

2. Processing: The computer processes it i.e. it manipulates the data which is done by the C.P.U

3. Output: After processing the data the computer displays the result, it gives an output. Output devices are the monitor, in the case of visual output, speakers, in the case of audio output, printers, etc

4. Storage: We can save your data for future use in the CPU itself which is stored in the computer's ROM. There are several other storage devices also like removable disks, CDs, etc.

The function of a computer is to make every day life easier for the average person. So in a way the function of the computer is to make life easier.

Question: What are the characteristics of a Computer ? Briefly explain.

Answer: There are some characteristics of a computer which are given below:

1. **Speed:** A computer is very fast device. It takes only few seconds for calculations that human being take hours to complete.
2. **Automatic:** A machine is said to be automatic if it works by itself without human intervention.
3. **Accuracy:** The degree of accuracy of computer is very high and every calculation is performed with the same accuracy.
4. **Diligence:** A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error.
5. **Versatility:** It means the capacity to perform completely different type of work. You may use your computer to prepare payroll slips.
6. **No I.Q:** Computer is a dumb machine and it cannot do any work without instruction from the user. It performs the instructions at tremendous speed and with accuracy.
7. **No Feeling:** It does not have feelings or emotion, taste, knowledge and experience. Thus it does not get tired even after long hours of work. It does not distinguish between users.
8. **Storage:** The Computer has an in-built memory where it can store a large amount of data.
9. **Power of remembering:** As a human being acquires new knowledge, the brain subconsciously selects.

Question: Write the definition of following terms:

1.Data: Data is the raw material used as input to data processing.

2.Information: Information is the processed data obtained the output of data processing.

3.Data Processing: The activity of processing data using a computer is called data processing. Data processing consists of three sub activities: capturing the input data, manipulating the data, and managing the output results.

Question: Write the basic operations of a Computer.

Answer: There are five basic operations of a computer which are given below:

1.Inputting: The process of entering data and instructions into the computer system.

2.Storing: Saving data and instructions to make them readily available for initial or additional processing as and when required.

3.Processing: Performing arithmetic operations or logical operations on data to convert them into useful information.

4,Outputting: The process of producing useful information or results for the user such as a printed report or visual display.

5.Controlling: Directing the manner and sequence in which all of the above operations are performed.

Question: Draw the block diagram of a computer. Briefly explain.
Or. Discuss the basic (main) components of a computer systems.
Or. Briefly discuss the basic organization of a computer systems.

Answer: The block diagram of a computer system which are given below:

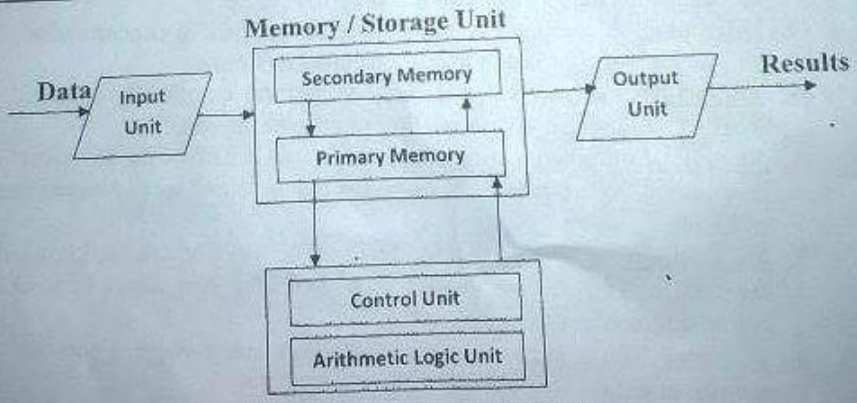

Figure: Block diagram of a computer systems.

1.Input Unit: The input unit allows data and instruction to be fed to the computer system from the outside world, in computer acceptable form.

2.Output Unit: The output unit allows the computer system to supply the information or results, obtained from data processing, to the outside world, in human acceptable form.

3.Memory Unit: The memory unit of a computer system holds the data and instructions to be processed and the intermediate and final results of processing. There are two types of memory device which are given bellow:

I. **Primary Memory:** It is also known as main memory which is used to hold pieces of program instructions and data, intermediate results of processing. It is used for temporarily. It has limited storage capacity, because it is very expensive. Example: RAM (Random Access Memory).

II. **Secondary Memory:** It is also known as auxiliary memory which is used to take care of the limitations of the primary memory. It is used for permanently. It has the large storage capacity & it is very cheaper in cost. Example: ROM (Read Only Memory).

4.Arithmetic Logic Unit: During data processing, the actual execution of the instructions takes place in the arithmetic logic unit of a computer system. Where the arithmetic operations means: add, subtract, multiply, division and the logical operations means: less than, equal to and greater than.

5.Control Unit: The control unit of a computer system manages and co-ordinate the operations of all the other components of the computer system.

6.Central Processing Unit: The control unit and the arithmetic logic unit of a computer systems are jointly known as Central Processing Unit. It serves as the brain of the computer system and is responsible for controlling the operations of all other units of the system.

Question: What are the difference between Volatile & Non-Volatile memory ?

Answer: There are some difference between volatile and non-volatile memory which are given below:

Volatile Memory:

I. When the power supply of a computer system is turn off or reset, then the data or information is losses.

II. It is used for temporarily.

III. It has the limited storage capacity.
IV. It is very expensive in cost.
V. Example: RAM (Random Access Memory).

Non-Volatile Memory:

I. When the power supply of a computer system is turn off or reset, then the data or information does not loss.
II. It is used for permanently.
III. It has the large storage capacity.
IV. It is very cheaper in cost.
V. Example: ROM (Read Only Memory).

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