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DEPARTMENT OF COMPUTER APPLICATIONS

NON – MAJOR ELECTIVE-I: OFFICE AUTOMATION

Subject Code: **17UCA3N1**   SEMESTER – **III**

Maximum Marks: **100**   External Mark: **100**

UNIT I

Introduction to computers: What is computer-What's so special about computer- **History of Computers:** Evolution – the first computer-Next Generations- **Basic Anatomy of Computers:** The Basic Components – Functioning of the Components.

What is a computer?

- ✓ A **computer** is an electronic device that manipulates information, or data.
- ✓ It has the ability to **store**, **retrieve**, and **process** data.
- ✓ We use a computer to **type documents**, **send email**, **play games**, and **browse the Web**.
- ✓ We can also use it to edit or create **spreadsheets**, **presentations**, and even **videos**.

What's so special about computer?

- ✓ Computer has become very important nowadays because it is very much **accurate, fast** and can **accomplish many tasks easily**. Otherwise to complete those tasks manually much more time is required.
- ✓ It can do very **big calculations in just a fraction of a second.**
- ✓ Moreover it can **store huge amount of data in it.**
- ✓ We also **get information on different aspects using internet on our computer**.

CHARACTERISTICS OF COMPUTER

- ✓ **SPEED:** In general, no human being can compete to solving the complex computation, faster than computer.
- ✓ **ACCURACY:** Since Computer is programmed, so what ever input we give it gives result with accurately.
- ✓ **STORAGE**: Computer can store mass storage of data with appropriate format.
- ✓ **DILIGENCE**: Computer can work for hours without any break and creating error.
- ✓ **VERSATILITY**: We can use computer to perform completely different type of work at the same time.
- ✓ **POWER OF REMEMBERING**: It can remember data for us.
- ✓ **NO IQ** : Computer does not work without instruction.
- ✓ **NO FEELING**: Computer does not have emotions, knowledge, experience, and feeling.

HARDWARE VS. SOFTWARE

Let's talk about two things all computers have in common: **hardware** and **software**.

- ✓ **Hardware** is any part of your computer that has a **physical structure**, such as the keyboard or mouse. It also includes all of the computer's internal parts.

Following are the different types of hardware components (which have specific functions) −

- ✓ **Monitor** − It displays (visual) the result.
- ✓ **CPU** − It is the Central Processing Unit that controls the computer's functions and transmits data.
- ✓ **Motherboard** − It is mainly accountable to establish communication between components and transmission of information.
- ✓ **RAM** − It is the Random Access Memory and responsible for the storage of programs that are currently running and also stores data temporarily.
- ✓ **Hard Disk Drive** − It is a permanent memory storage device.
- ✓ **Floppy Disk Drive** − It is hardly being used in recent times.
- ✓ **Optical disks** − It is a device that also store data. For example, CD, DVD, etc.

✓ **Software** is any **set of instructions** that tells the hardware **what to do** and **how to do it**.

Examples of software include web browsers, games, and word processors.

HISTORY OF COMPUTERS:

Early History of Computer

Since the evolution of humans, devices have been used for calculations for thousands of years.

One of the earliest and well-known devices was an **abacus**.

Then in 1822, the father of computers, **Charles Babbage** began developing what would be the first mechanical computer.

And then it 1833 he actually designed an Analytical Engine which was a general purpose computer. It contained an ALU, some basic flow chart principles and the concept of integrated memory.

Then more than a century later in the history of computers, we got our first electronic computer for general purpose. It was the **ENIAC,** which stands for **Electronic Numerical Integrator and Computer**. The inventors of this computer were **John W. Mauchly and J.Presper Eckert**.

And with times the technology developed and the computers got smaller and the processing got faster.

We got our **first laptop in 1981** and it was introduced by **Adam Osborne and EPSON**.

CLASSIFICATION OF GENERATIONS OF COMPUTERS

In the history of computers, we often refer to the advancements of modern computers as the generation of computers. We are currently on the fifth generation of computers. So let us look at the important features of these five generations of computers.

1st Generation:

✓ This was from the period of **1940 to 1955.**

✓ This was when **machine language** was developed for the use of computers.

✓ They used **vacuum tubes** for the circuitry.

✓ For the purpose of **memory**, they used **magnetic drums.**

2nd Generation:

✓ Here they advanced from vacuum tubes to **transistors.**

✓ This made the computers smaller, faster and more energy efficient.

✓ And they advanced from binary to **assembly languages**.

3rd Generation:

✓ The hallmark of this period **(1964-1971)** was the development of the integrated circuit.

4th Generation:

✓ The invention of the microprocessors brought along the fourth generation of computers.

✓ This was when we started producing computers for home use.

✓ Another important aspect is the development of higher computer languages like C++ and Java.

5th Generation:

✓ This is the present and the future of the computer world.

✓ The defining aspect of this generation is artificial intelligence.

✓ The use of parallel processing and superconductors are making this a reality and provide a lot of scope for the future.

The evolution of computer technology is often divided into five generations.

Five Generations of Computers

Generations of computers	Generations timeline	Evolving hardware
First generation	1940s-1950s	Vacuum tube based
Second generation	1950s-1960s	Transistor based
Third generation	1960s-1970s	Integrated circuit based

Five Generations of Computers

Generations of computers	Generations timeline	Evolving hardware
Fourth generation	1970s-present	Microprocessor based
Fifth generation	The present and the future	Artificial intelligence based

BLOCK DIAGRAM OF COMPUTER:

Computer Block Diagram System:

    Mainly computer system consists of three parts, that are

- ✓ **Central Processing Unit** (**CPU**),
- ✓ Input Devices, and
- ✓ Output Devices.

    The Central Processing Unit (CPU) is divided into two parts again:

- ✓ **Arithmetic Logic Unit** (**ALU**) and
- ✓ The **Control Unit** (**CU**). The set of instruction is in the form of raw data.
- ✓ A large amount of data is stored in the computer memory with the help of primary and secondary storage devices.
- ✓ The CPU is like the heart/brain of the computer.
- ✓ The user does not get the desired output, without the necessary option taken by the CPU.
- ✓ The Central processing unit (CPU) is responsible for the processing of all the instructions which are given by the user to the computer system.
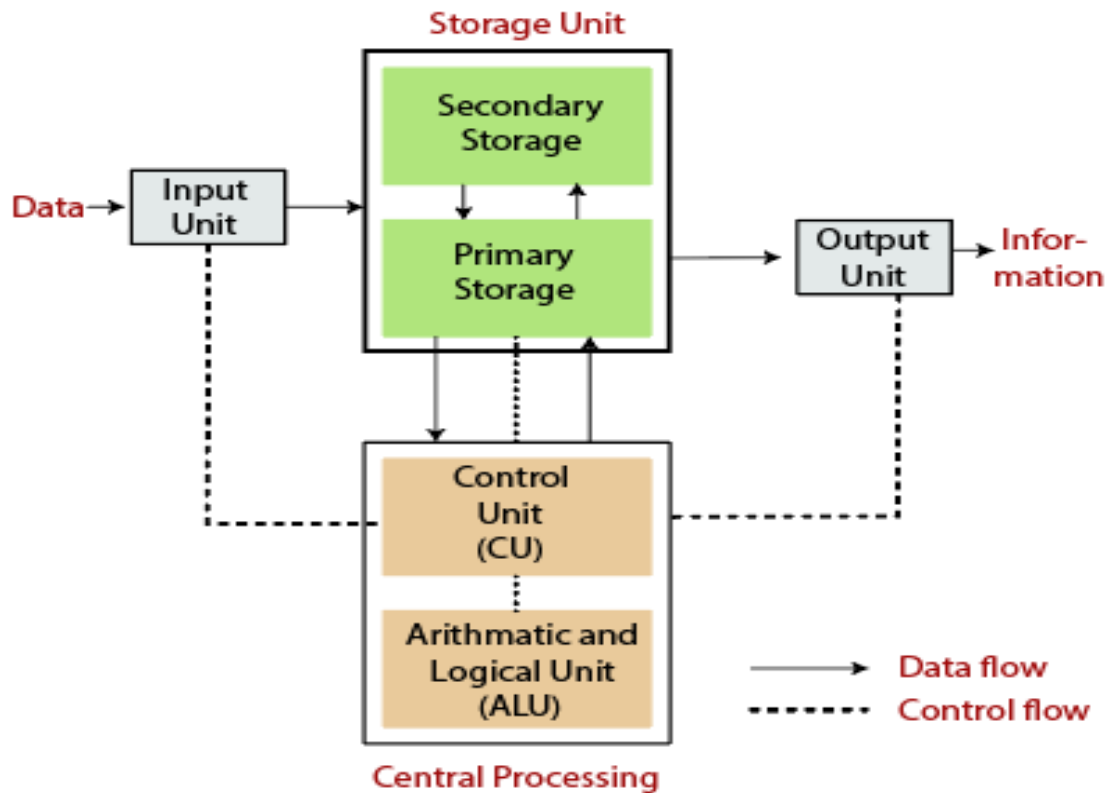
Fig: Block Diagram of the computer.

- ✓ The data is entered through input devices such as the keyboard, mouse, etc.
- ✓ This set of instruction is processed by the CPU after getting the input by the user, and then the computer system produces the output.
- ✓ The computer can show the output with the help of output devices to the user, such as monitor, printer, etc.
- ♦ CPU (Central Processing Unit)
- ♦ Storage Unit
- ♦ ALU(Arithmetic Logic Unit)
- ♦ Control Unit

Central Processing Unit (CPU)

✓ The computer system is nothing without the Central processing Unit so, it is also known as the brain or heat of computer.

✓ The CPU is an electronic hardware device which can perform different types of operations such as arithmetic and logical operation.

Central Processing Unit (CPU)
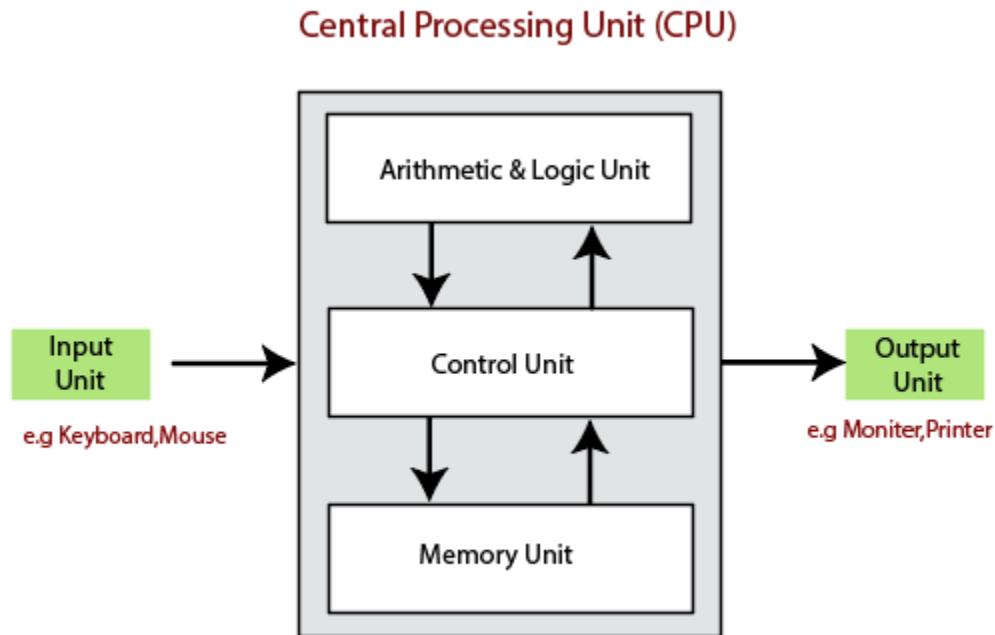
✓ The CPU contains two parts: **the arithmetic logic unit and control unit**.

✓ We have discussed briefly the **arithmetic unit, logical unit, and control unit** which are given below:

Control Unit

✓ The control unit (CU) controls all the activities or operations which are performed inside the computer system.

✓ It receives instructions or information directly from the main memory of the computer.

✓ When the control unit receives an instruction set or information, it converts the instruction set to control signals then; these signals are sent to the central processor for further processing.

✓ The control unit understands which operation to execute, accurately, and in which order.

Arithmetic and Logical Unit

The arithmetic and logical unit is the combinational digital electronic circuit that can perform arithmetic operations on integer binary numbers.

- ✓ It presents the arithmetic and logical operation.
- ✓ The outputs of ALU will change asynchronously in response to the input.
- ✓ The basic arithmetic and bitwise logic functions are supported by ALU.

Storage Unit

- ✓ The information or set of guidelines are stored in the storage unit of the computer system.
- ✓ The storage unit provides the space to store the data or instruction of processed data.
- ✓ The information or data is saved or hold in computer memory or storage device.
- ✓ The data storage is the core function and fundamental of the computer components.

FUNCTIONING OF COMPUTER SYSTEM:

- ✓ The hardware and software exist on the computer.
- ✓ The information which is stored through the device is known as computer software.
- ✓ The hardware components of the computer system are related to electronic and mechanical parts, and the software component is related to data and computer programs.
- ✓ Many elements are connected to the main circuit board of the computer system called a **"Motherboard."**
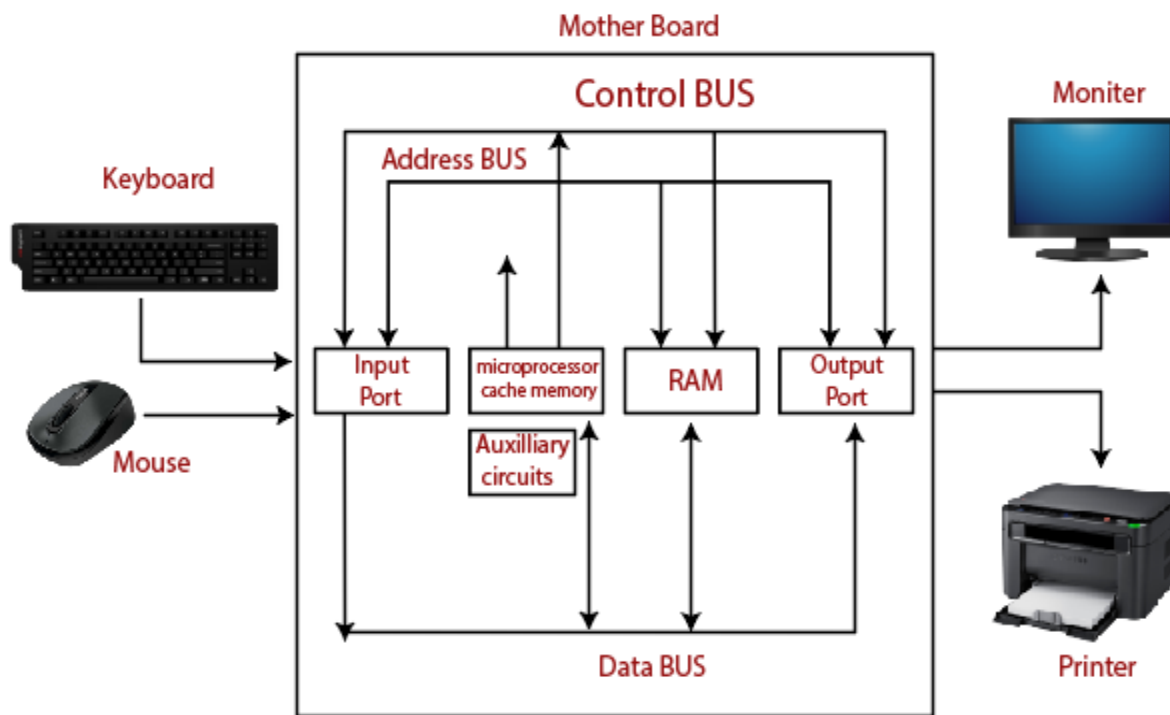
Components of a Computer System

- ✓ Processor.
- ✓ Main Memory.
- ✓ Secondary Memory.
- ✓ Input Devices.
- ✓ Output Devices.

These are mainly five components of the computer system.

Processor

- ✓ The processor is an electric circuitry within the computer system.
- ✓ The Central processing unit is the central processor or main processor of the computer system.
- ✓ The processor carries out the instructions of the computer program with the help of basic arithmetic and logic, input/output operations.

Main Memory

- ✓ The Random Access Memory is the main memory of the computer system, which is known as RAM. The main memory can store the operating system software, application software, and other information.
- ✓ The Ram is one of the fastest memory, and it allows the data to be readable and writeable.

Secondary memory

- ✓ We can store the data and programs on a long-term basis in the secondary memory.
- ✓ The hard disks and the optical disks are the common secondary devices.
- ✓ It is slow and cheap memory as compare to primary memory.
- ✓ This memory is not connected to the processor directly.
- ✓ It has a large capacity to store the data.
- ✓ The hard disk has a capacity of 500 gigabytes.
- ✓ The data and programs on the hard disk are organized into files, and the file is the collection of data on the disk.
- ✓ The secondary storage is direct access by the CPU; that's why it is different from the primary storage.
- ✓ The hard disk is about 100 times the capacity of the main memory.
- ✓ The main difference between primary and secondary storage is speed and capacity.
- ✓ There are several large blocks of data which are copied from the hard disk into the main memory.

Input Devices

- ✓ The user provides the set of instruction or information to the computer system with the help of input devices such as the keyboard, mouse, scanner, etc.
- ✓ The data representation to the computer system is in the form of binary language after that the processor processes the converted data.
- ✓ The input unit implements the data which is instructed by the user to the system.
- ✓ We can enter the data from the outside world into the primary storage as the input through input devices.
- ✓ The input devices are the medium of communication between the outside world and the computer system.

There are some important features of input devices which are given below:

- ♦ The input devices receive or accept the data or instruction from the user, who exist in the outside world.
- ♦ These devices convert the data or instruction into the machine-readable form for further processing.
- ♦ The input device performs like the connection between the outside world and our computer system.
- ♦ The keyboard and mouse are common examples of input devices.
- ♦ When the whole procedure is finished, we get the desired output from the output devices such as monitor, printer, etc.

Output Devices

- ✓ The output devices produce or generate the desired result according to our input, such as a printer, monitor, etc.
- ✓ These devices convert the data into a human-readable form from binary code.
- ✓ The computer system is linked or connected to the outside world with the help of output devices.
- ✓ The primary examples of output devices are a printer, projector, etc.

These devices have various features which are given below:

- ♦ These devices receive or accept the data in the binary form.
- ♦ The output devices convert the binary code into the human-readable form.
- ♦ These devices produce the converted result and show to the user.