Basics of Computer

Definition of Computer

A computer is an electronic device that processes data with the help of programs. It accepts data and instructions (input) from the user, processes the data according to the instructions, and gives the result (output).

The name "computer" comes from the Latin word "Compute", meaning calculation. The first computer used for calculation was the "Abacus", invented by the Chinese.

Characteristics of Computer

The main features of computers are:

- Speed
- Accuracy
- Diligence
- Versatility
- Power of Remembering
- No IQ
- No feelings
- Storage

Speed

Computers can perform tasks in seconds that would take a human an entire year. Powerful computers can perform about 3-4 billion simple arithmetic operations per second.

Accuracy

Computers are always perfect in their work and never make mistakes.

Diligence

Unlike humans, computers don't get tired or lose concentration. They can work for many hours without errors.

Versatility

Computers can do multiple jobs simultaneously, like printing, browsing the internet, and running games.

Power of Remembering

Computers can store and retrieve large amounts of information even after many years.

No IQ

Computers cannot think like humans or make decisions. They cannot find or correct errors in data.

No Feelings

Computers are machines without feelings. They simply perform tasks as commanded.

Storage

Computers store user data in secondary storage devices like hard disks. Storage capacity depends on the device.

Parts of Computer

The main parts of a computer are:

1. Input Unit
2. CPU (Central Processing Unit)
3. Output Unit

Input Unit

Devices that provide input to the computer, such as keyboard, mouse, joystick, light pen, webcam, scanner, and microphone.

CPU (Central Processing Unit)

The data processing device, often called the brain of the computer. It has three main parts:

1. Storage or Memory Unit
2. ALU (Arithmetic Logic Unit)
3. Control Unit

Output Unit

Devices that provide output from the computer, such as monitor (VDU), printer, speaker, and plotter.

Memory

There are two main types of memory:

1. Primary Memory (Main Memory or Internal Memory)
2. Secondary Memory (Auxiliary Memory or External Memory)

Differences between Main Memory and Secondary Memory

Main Memory	Secondary Memory
Works very fast	Comparatively slow
Costly	Cheap
Less storage capacity	High storage capacity
Examples: RAM and ROM	Examples: Disks, Tapes, and Drums

Volatile Memory

Stores information based on power supply. Information is lost when power is cut off. Also known as Temporary Memory.
Example: RAM (Random Access Memory)

Non-volatile Memory

Stores information even without power supply. Also known as permanent memory.
Example: ROM (Read Only Memory)

Actions of Computer

1. Receives the input
2. Processes the input or manipulation
3. Sends the output

Advantages of Computer

1. Works very fast
2. Very efficient, efficiency doesn't decrease with age

Limitations of Computer

1. Cannot think like humans
2. Cannot find or correct errors in data
3. Requires lengthy instructions to process simple data

Data Measurement in Computer

- 1 Bit (Binary Digit) = 0 or 1
- 1 Nibble = 4 Bits
- 1 Byte = 8 Bits / 2 Nibbles
- 1 Kilobyte (KB) = 1024 Bytes
- 1 Megabyte (MB) = 1024 Kilobytes
- 1 Gigabyte (GB) = 1024 Megabytes
- 1 Terabyte (TB) = 1024 Gigabytes
- 1 Petabyte (PB) = 1024 Terabytes
- 1 Exabyte (EB) = 1024 Petabytes

Applications of Computer

- Schools and Colleges: Administration and Management
- Hospitals: Administration and Management, Medical machines
- Transportation: Bus stands, Railways, Airports for booking and reservation
- Banks and offices: Record keeping and account maintenance
- Police stations, courts, and defense departments
- Computer Networks: LAN, WAN, MAN, CAN, and SAN
- Computer Education institutions

Components of Computer

1. Hardware
2. Software

Hardware

Physical components of a computer.

Software

Collections of computer programs. Three main types:

1. Application Software
2. System Software
3. Utility Software

Application Software

Used by users in daily life. Supports the user but not the system.
Examples: MS-Office, DTP, Tally, Nudi, Baraha, Games

System Software

Used by the system to run. The computer doesn't work without it.
Two main types:

1. Operating System
2. Translator programs

Utility Software

Helps hardware devices work and manages the operating system.
Examples: Device drivers, Antivirus software, Disk Utilities

Operating System

Interface between computer and user. Some examples:

- MS-DOS
- OS/2
- MS-Windows (various versions)
- UNIX
- LINUX
- Sun Solaris
- MAC (Apple computers)

Translator Programs

Convert high-level language to machine-level language and vice-versa. Three types:

1. Compiler
2. Assembler
3. Interpreter

Languages of Computer

1. High-Level Language
2. Machine Level Language
3. Assembly Level Language

Generations of Computer

1. First Generation (1940-1956): Vacuum Tubes
2. Second Generation (1956-1963): Transistors
3. Third Generation (1964-1971): Integrated Circuits
4. Fourth Generation (1971-Present): Microprocessors
5. Fifth Generation (Present and Beyond): Artificial Intelligence

Classification of Computers

By Size

- Mainframe Computer
- Mini Computer
- Micro Computer
- Super Computer

By Work

- Analog Computer
- Digital Computer
- Hybrid Computer

Windows Operating System

Windows is a GUI-based, multitasking operating system.

Booting

Process of loading the operating system from permanent memory to temporary memory.
Two types:

1. Warm booting
2. Cold booting

Key Components

- My Computer
- My Documents
- Recycle Bin
- Folder
- Icon
- Taskbar

Web Browser

Software used for internet browsing and opening web page format files.
Examples: Internet Explorer, Mozilla Firefox, Netscape Navigator, Google Chrome

Common File Extensions

- Notepad: .txt
- MS-Paint: .bmp
- Microsoft Word: .docx
- Microsoft Excel: .xlsx
- Microsoft PowerPoint: .pptx
- Adobe Pagemaker: .pmd
- Adobe Photoshop: .psd
- Corel Draw: .cdr
- C-Programming: .c
- C++: .cpp
- HTML: .html
- Wordpad: .rtf

Basic Windows Applications

Notepad

Basic text editor for creating and editing simple documents.

Paint

Drawing application for creating and editing drawings.

Control Panel

Program used to make hardware and software configurations in a computer.