

Computer Basics

We will study

- **Basic concept of computer system**
- **Classification of Computer**
- **Concept of Hardware and software and its types**

What is a Computer

- ❖ The Computer is an electronic device which can accept data manipulate the data according to user instruction and produce meaningful information and store the results for future use.
- ❖ Charles Babbage is called the “Father of the Computer” (Analytical Engine)
- ❖ Alan Turing is known as the Father of Modern Computer.

Characteristics of Computer

- ✓ Speed
- ✓ Storage
- ✓ Accuracy
- ✓ Automation
- ✓ Versatility or Multipurpose
- ✓ Consistency

Limitation of Computer

1. Cannot identify logical mistakes
2. Depend on users input
3. Not intellectual or emotional
4. Computers cannot learn from experience
5. Lack of Decision Making
6. If the instructions are incorrect, computers cannot fix it.

Classification Of Computers

Computers can be classified On the Basis of

- Generation
- Operating Principles
- Area of applications
- Size and Capability

Classification based on Generation:

❑ First Generation (1940-1956): ENIAC, UNIVAC-1, EDVAC

- Vacuum Tube based
- Big in size
- Electricity consumption is high
- Programming in machine language

❑ Second Generation (1956-1965): IBM1401, CDC1604, RCA 501

- Transistor based
- Smaller than first generation
- Electricity consumption is lower
- Programming in machine as well as assembly language.

❑ Third Generation (1965-1971): IBM-360, ICL-2900

- Integrated Circuit based
- Smaller, faster and more reliable than second generation
- Power consumption is lower.
- High level languages are used.

❑ Fourth generation (1971-1980): DEC10, STAR1000, PDP11

- VLSI microprocessor based
- Portable computers developed
- Concept of internet was introduced
- High level languages like C, C++ etc were used

❑ Fifth Generation (1980-onwards): Desktop, Laptop, Note Book

- ULSI microprocessor based Artificial Intelligence
- More user friendly with multimedia features
- Development of Natural language processing

Classification based on Operating Principles

- ❖ Analog Computer (uses continuous physical phenomena)
 - ❖ Digital Computer (performs calculations and logical operations with quantities represented as digits, usually in binary number system)
 - ❖ Hybrid Computer (Capable of inputting and outputting in both digital and analog signals)
- **A hybrid computer system offers a cost effective method of performing complex simulations**

Classification based on Area of Application:

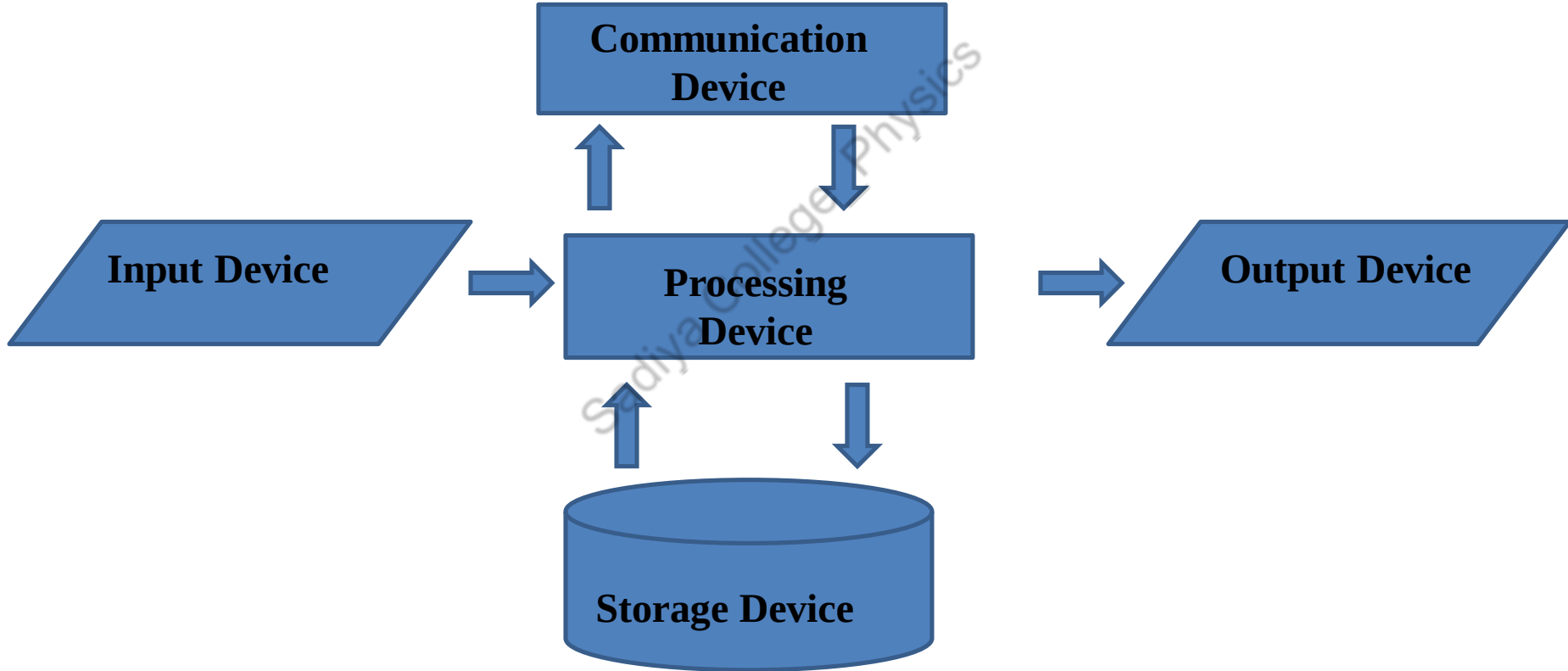
- ❖ Special Purpose Computers
- ❖ General Purpose Computers

Classification based on size and Capability:

- ❖ Microcomputer – a. Desktop b. Portables (Laptop, Notebook, Palmtop, Wearable computer)
- ❖ Minicomputer
- ❖ Workstation
- ❖ Mainframe
- ❖ Supercomputer

Computer Hardware: (Components of a computer)

Each piece of hardware for a computer can be classified into:



Input Device:

- **Keyboard**
- **Mouse**
- **Joy Stick**
- **Light Pen**
- **Scanner**
- **Microphone**
- **Webcam**
- **Magnetic Ink Card Reader (MICR)**
- **Optical Character Reader (OCR)**
- **Bar Code Reader**
- **Optical Mark Reader (OMR)**

KEYBOARD





MOUSE

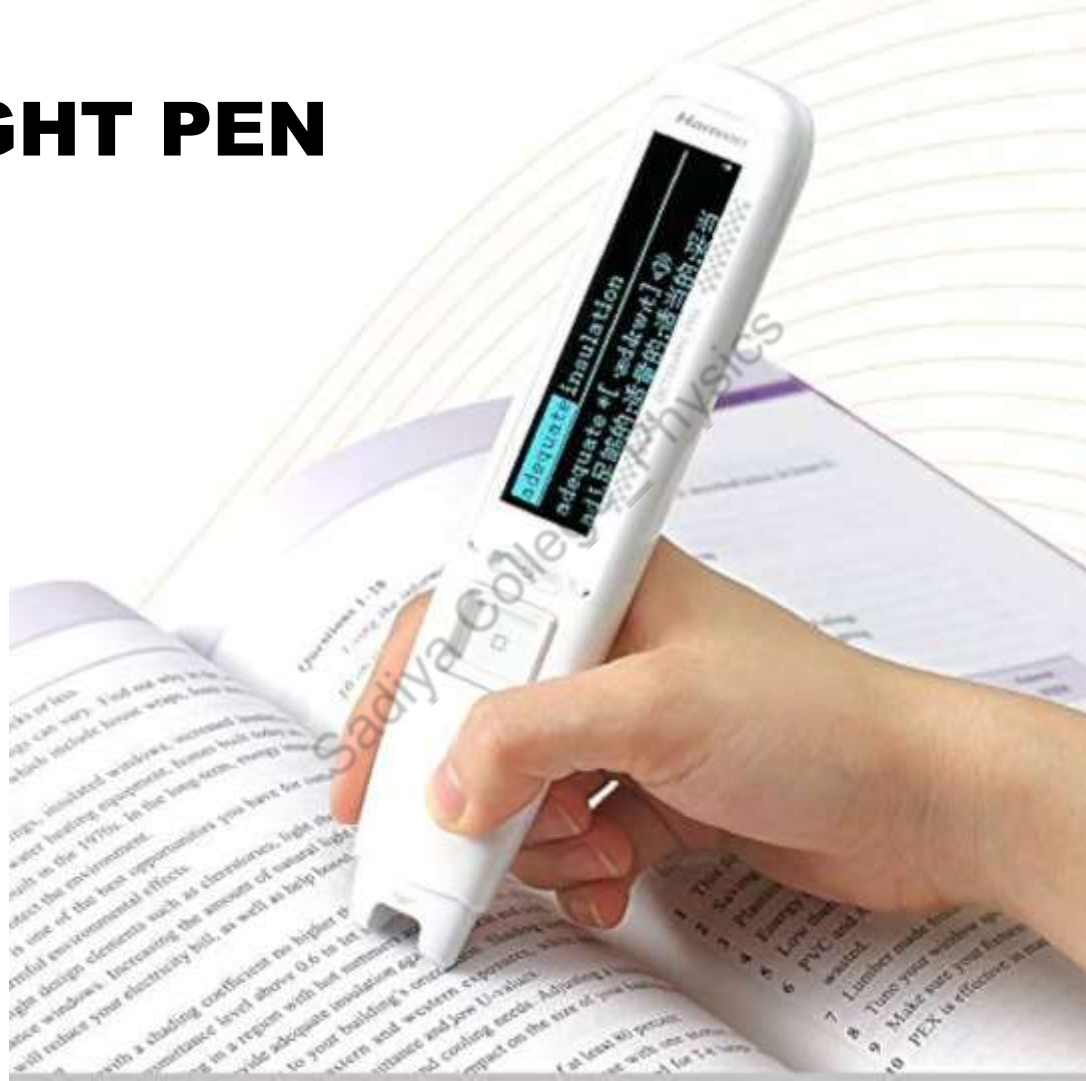
SCANNER



JOY STICK



LIGHT PEN



MICROPHONE



WEBCAM





MAGNETIC INK CARD READER(MICR)

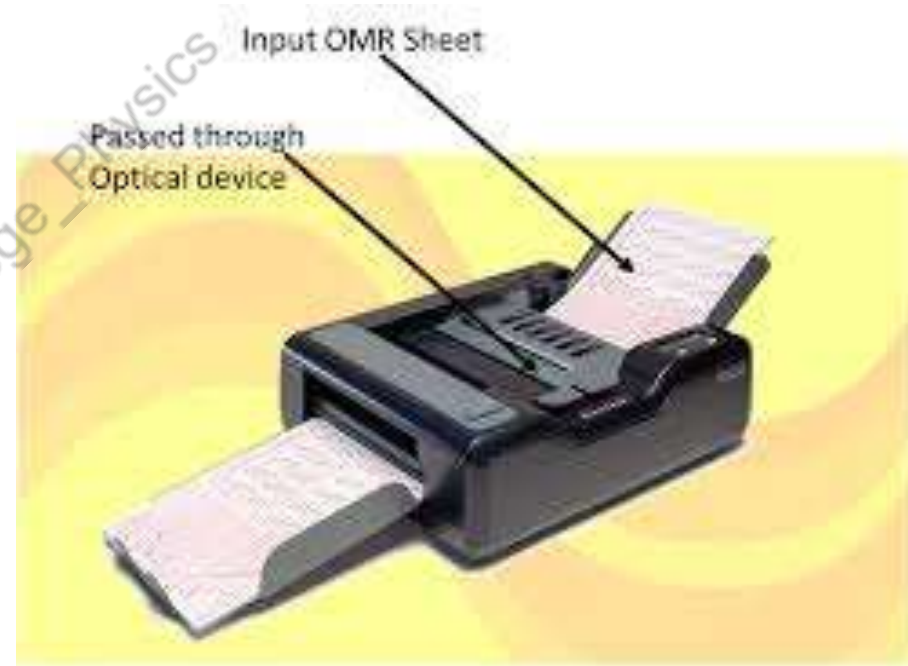
OPTICAL CHARACTER READER(OCR)





**OPTICAL MARK
READER(OMR)**

BAR CODE READER



OMR Scanner

Output devices:

Two types :

✓ Softcopy output devices



MONITOR



PROJECTOR



SPEAKER

✓ Hardcopy output devices:



PRINTER

Plotter



PLOTTER

Software:

Software is a set of programs, which is designed to perform a well-defined function. A program is a sequence of instructions written to solve a particular problem

There are two types of software:

- System Software
- Application Software

System Software:

Collection of many programs designed to operate, control and extend the processing capabilities of the computer itself. Eg. Operating system, Compilers, Interpreter etc.

System software serves as the interface between hardware and the user.

System software is further classified in three categories:

a)Language Translator

b)Utilities

c)Operating System

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Application Software:

Designed to satisfy a particular need of a particular environment. It enables the user to complete tasks such as creating documents, spreadsheets, databases, sending email, designing graphics, running business, playing games etc.

Application software can be classified in to :

- **General –Purpose Software** (word processor)
- **Special-Purpose Software** (Payroll calculation, stock control)
- **Bespoke Software** (written for a single client, not shared among a large number of people)

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Components of a Computers

Hardware - Components of computers having physical structures

Software - Programs and data make up the software

Central Processing Unit (CPU) –

- ‘Brain’ of the computer
- It executes instructions and performing calculations
- It interprets and carries out the commands from software and hardware

Computer Memory- stores data for computer to use

- RAM- Random Access Memory is volatile memory for temporary storage

Components of a Computers (continued)

- ROM- Read Only Memory is a non-volatile memory. It contains instructions needed to boot up the computer system and run programs.
- SSD- Solid-State Drive offers non-volatile, long-term storage for programs and files.

Arithmetic Logic Unit: An ALU is a part of CPU and performs all arithmetic and logic operations , enabling the CPU to execute tasks.

Input Devices- (already given in details)

Output Devices- (already given in details)

Components of a Computers (continued)

Motherboard: A motherboard acts as the central hub, connecting all the computer components. It houses the CPU, memory modules, expansion slots, and connectors, facilitating communication and data transfer between different parts of the system.

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Basics of operating system

Operating system: An operating system is a program that controls the execution of application programs and acts as an interface between the user of a computer and the computer hardware.

Some commonly used operating systems are-

UNIX- It is a multi user operating system, which was first developed in 1990s. First OS written in C programming

Windows OS- Microsoft developed Windows Operating System. It was the first graphical user interface (GUI) operating system, released in 1985.

Basics of operating system (continued)

Linux- It is a unix like operating system that was designed to provide personal computer users a low-cost alternative.

Mac OS- The Macintosh Operating System is the operating system that was introduced by Apple Inc for Mac computers in the year 1984.

Google android- In 2003, Google released the Android mobile operating system for mainly touch-screen gadgets like tablets and smart phones.

Apple iOS- The iPhone OS was created by Apple in 2007 and is compatible with the iPad and other Apple mobile devices.

Functions of operating system

Device Management: The operating system keeps track of all the devices. So, it is also called the input/output controller that decides which process gets the device, when, and for how much time.

File Management: It allocates and de-allocates the resources.

Memory management: It keeps track of the primary memory, like what part of it is in use by whom. It also allocates memory when a process or program requires it.

Processor management: It allocates the processor to a process and then de-allocates the processor when it is no longer required.

Functions of operating system

Error detecting Aids: These contain methods that include the production of dumps, traces, error messages, and other debugging and error-detecting methods.

Job accounting: It keeps track of time and resources used by various jobs or users.

Security: It prevents unauthorized access to programs and data using passwords and other protection techniques.

File Management in Operating System

In an operating system, a **file** is a collection of correlated information that is recorded on secondary or non-volatile storage like hard drive, solid state drive (SSD), or USB flash drive.

File management in operating system refers to the set of processes and techniques involved in creating, organizing, accessing, manipulating, and controlling files stored on storage devices such as hard drives, solid state drives, or network storage.

Functions of File Management in Operating System

File creation: Create and allocate storage for new files

File Access: Read, write, and execute files, and enforce access permissions.

File modification: Edit, update, or delete files.

File organization: Maintain file hierarchy and provide directory management.

File system: The way an operating system stores and organizes files and their information on a hard disk.

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Internet and web browsing

Internet is an interconnected system of computer networks that uses the internet protocol suite (IP) to communicate between networks and devices.

Vinton Gray Cerf is the father of the Internet.

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Important terminology in web browsing

Domain name: A domain name is a unique name that identifies a website.

Some common domain names are:

- .com for commercial organizations
- .edu for educational institute
- .ac for academic organizations
- .in for country India
- .net is for network infrastructure machines and organizations
- .org is for miscellaneous purposes

URL- Universal Resource Locator includes the protocol (like http), the domain name, and additional path information (folder/file)

Example: <https://www.apple.com>

Important terminology in web browsing

World Wide Web (www): It is a system that allows users to access and share information over the internet. It is made up of public websites and pages that are connected by hyperlinks, which allow users to click to find related information.

The world wide web uses hypertext which allows users to link related piece of information.

Hypertext documents are written in Hypertext Markup Language (HTML) and have a uniform resource locator (URL) that serves as their online address

Uses of internet

Research: Internet helps in data collection, information access, collaboration, communication, e-journal access, etc.

Education: Internet provides access to a large amount of information, e-books, educational applications, online learning tools.

Training and information: Internet allows access to resources like tutorial videos for learning skills. It also helps in communicating with online tutors.

Communication: Internet has greatly simplified the process of communication. It has also massively reduced the time of sending an information from one location to another. We can readily send and receive messages through email, video conferencing, social networks and chat facilities.

Uses of internet

Leisure and entertainment: Internet provides access to different movies, games, etc. In addition, one may also learn new crafts from readily available online tutorials.

Business: Internet has broad range uses in business, from worldwide advertising, the undertaking of transactions, and making payments through internet banking. Business communications also benefit through e-mail, direct access to companies via websites, chat based customer service facilities and online marketing.

Web browser

A web browser is an interface that helps a computer user gain access to all the content that is on the internet.

Examples of web browsers are

Google chrome

Microsoft Edge

Internet Explorer

Opera

Firefox

Netscape

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