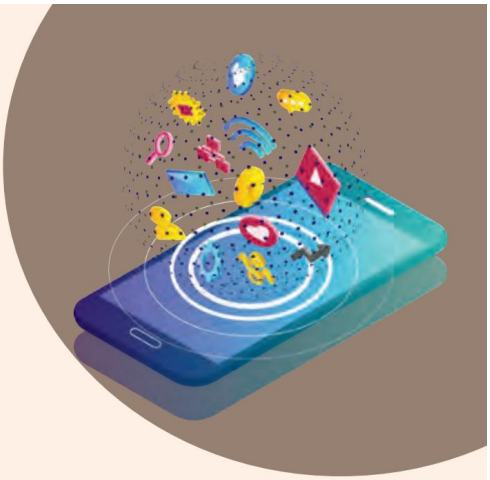
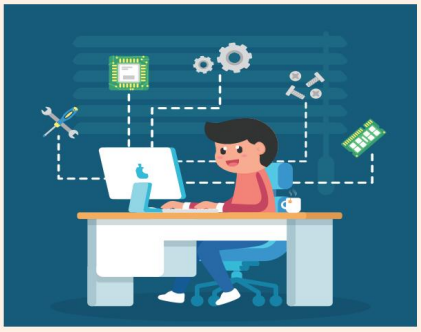


# 10

# Basic Computer Skills

You have learnt about various peripheral devices in the previous chapters that are used for providing input to the computer, store data, and give output. Let us now learn about some basic computer skills that are required to perform operations on the computer in this chapter.

## Primary Operations



Computer systems perform several primary operations, which include input, output, storage, processing, and control. Input involves providing data to the system; processing involves performing calculations on the data; output involves providing data to the user; and storage involves saving data. Together, these operations enable the system to function properly and perform various tasks. Let us learn about these one by one.

## Input Operations

The process of supplying data to a computer system for processing is known as input operation. This can be done through various devices, such as a keyboard, mouse, microphone, web camera, etc. The data is then translated into a format that the computer can understand and process. Input is crucial to the functioning of a computer system, as it allows the users to interact with the system and provide it with the necessary information to perform various tasks.

Keyboard

Mouse

Joystick

Scanner

Web Camera

Microphone

## Input Devices of Computers

There are several types of input devices in a computer system. The most common ones are:

**Keyboard** Typing on the keyboard provides information to the computer. Keyboards come in a variety of sizes and layouts, including standard QWERTY keyboards and ergonomic keyboards designed to reduce hand and wrist strain.

**Mouse** A mouse is used to point and click on the screen. It comes in a variety of shapes and sizes, including wired and wireless models, and can be customised with additional buttons and features.

**Scanner** It is a device that scans an image (such as photographs, printed text, or handwriting) or an object (such as an ornament) and converts it to a digital image. Most scanners today are variations of the desktop (or flatbed) scanner. The flatbed scanner is commonly used in offices. A flatbed scanner functions in a manner somewhat similar to a photostat machine, with the key distinction being that a photocopier produces a physical paper copy, whereas a scanner creates a digital image that is stored on a computer.

**Microphone** A microphone, sometimes referred to as a mike or mic, is a device that converts sound into an electrical signal. They are used in many applications, such as telephones, hearing aids, recording studios, etc. All microphones capture sound waves with a thin, flexible diaphragm. The vibrations of this element are then converted by various methods into an electrical signal, which is an analog of the original sound.

**Web Camera** It is used to capture visual information and feed it into the computer. This information can be processed and used by the computer in a variety of ways, commonly in video conferencing.

**Joystick** A joystick is a pointing device used commonly for playing games. It includes a little handle that you can move in different directions. When you push or pull it, your game character does the same. Some joysticks also have buttons that you can press to make your character jump or do some other action.

### Did You Know?

The touchscreen is both an input and output device. It is used on devices like smartphones and tablets where users interact with the screen directly. Users can swipe, tap, and pinch to zoom, providing input to the computer naturally and intuitively. The display can show visual outputs too.

# Processing Operations

Processing operations are essential for the functioning of a computer system and involve manipulating data and instructions by the CPU. These operations include arithmetic, logical, input/output, control, and data movement operations. They control the flow of data and instructions, transfer data between the computer's memory and external devices, and perform basic mathematical functions. The speed and efficiency of processing operations depend on factors such as the CPU's clock speed, cache size, and number of processing units.

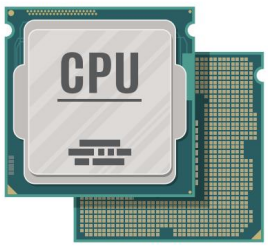
## Processing Devices of a Computer

There are several types of processing devices in a computer system. The most common ones are:

**Central Processing Unit (CPU)** The CPU is the brain of the computer, responsible for executing instructions and managing the system's resources.

**Graphics Processing Unit (GPU)** The GPU is a specialised processor designed to handle complex calculations related to graphics and video processing.

**Digital Signal Processor (DSP)** A DSP is a microprocessor optimised for processing digital signals, such as audio and video.




Central Processing Unit (CPU)/Processor

**Application-specific Integrated Circuit (ASIC)** An ASIC is a specialised chip designed for a specific application or task, such as encryption or data compression.

**Field-programmable Gate Array (FPGA)** An FPGA is a programmable chip that can be configured to perform a wide range of functions, making it useful for applications that require flexibility and adaptability.

# Output Operations

The process of displaying or producing information in a computer system is known as output operations. The computer produces output in various formats, such as text, graphics, sound, and video. Output is just as important as input because it allows users to see and perceive the information that the computer has processed.

## Output Devices of a Computer

There are several types of output devices in a computer system. The most common ones are:

**Printers** They are used to present text, images, and other information in a physical form, making it easier to read and share. Printing can be performed using a variety of printing technologies, including inkjet, laser, and dot matrix printers.

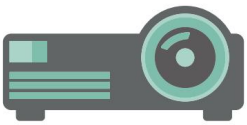
**Monitors** They are used to display text, images, and videos to the user. They are available in a wide range of sizes and resolutions, from small handheld devices to large wall-mounted displays.


Monitor


Printer


Speaker


Headphones


Projector

**Speakers** Speakers serve the purpose of delivering sound to the user, including music, sound effects, and voice recordings. Audio can be played through built-in speakers on a computer or through external speakers or headphones.

**Projectors** They are used to project visual information onto a larger screen or surface. They are commonly used in presentations, movie theatres, and events and come in various types, including LCD projectors and DLP projectors.

**Headphones** They serve the purpose of delivering sound directly to the user's ears. They are commonly used for listening to music, watching videos, and playing games. They come in various types, including earbuds, over-ear headphones, and noise-cancelling headphones.

**Plotter** A plotter is a vector graphics printing device that connects to a computer. Plotters print their output by moving a pen across the surface of a piece of paper. This means that plotters are restricted to line art rather than raster graphics, as with other printers. Because of the mechanical movement of the pens, they can draw complex line art, including text, although they do it slowly.

# Storage Operations

Storage operations are crucial for saving and retrieving data. They involve reading and writing data to and from these storage devices. This is done through input/output operations, which involve transferring data between the storage device and the computer's memory or processor. There are two main types of storage devices: primary storage and secondary storage.

## Primary Storage

It is temporarily used to hold data that is currently being processed by the computer. It includes:

**Random Access Memory (RAM)** The RAM chip provides volatile storage, where programs and data are temporarily saved during processing and permanently deleted when the computer is turned off. RAM allows the CPU to quickly read and write data, which significantly speeds up the computer's performance.

**Read-only Memory (ROM)** The ROM chip retains the stored programs and data even when the computer turns off. So, unlike RAM chips, ROM chips are non-volatile. ROM contains data that is read-only, meaning it can be read but cannot be easily modified by the user. The ROM chip contains microprogrammed control instructions that instruct the machine to perform certain operations. For example, the BIOS (Basic Input/Output System) in a computer is typically stored in the ROM, ensuring that the computer can boot up and initialise its hardware components.

**Cache Memory** It is a high-speed memory. It can be inserted either on a motherboard or as a part of the CPU. It stores information and various instructions that are used repeatedly to execute the programs.
It improves the overall performance of the computer system in terms of the execution of commands. Cache is more expensive than RAM, but the user can also buy a CPU with in-built cache memory. The CPU first examines the cache when it wants certain data.

## Secondary Storage

It is used for the long-term storage of data. It includes devices such as hard disk drives, solid-state drives, CDs, pen drives, memory cards, etc. These devices are used to store files and programs that are not currently being used by the computer.

## Storage Devices of Computers

There are several types of storage devices in a computer system. The most common ones are:

**Hard Disk Drive (HDD)** HDDs are known for their large capacity, making them ideal for storing large files and programs. Hard disks are made up of one or more magnetic disks called platters. These platters store data and spin rapidly while a read/write head moves across them to access or modify data.

Hard Disk Drive

**Solid-state Drives (SSDs)** They are a newer type of storage device that uses flash memory to store data. SSDs are faster and more reliable than HDDs, making them a popular choice for gamers, video editors, and other users who require high-speed access to their data.


Solid-state Drive

**Flash Drives** They are also known as pen drives. They are small, portable storage devices that can be easily connected to a computer's USB port. They are ideal for transferring files between computers or for storing important data that can be easily carried around.

Flash Drive

**Memory Cards** They are small, removable storage devices that are commonly used in cameras and other portable devices. They are available in a range of sizes and capacities, making them a flexible storage option for users who need to store and transfer data on the go.

Memory Card

**External Hard Drives** They are larger storage devices that connect to a computer via USB or another interface. They are ideal for users who need to store large amounts of data or who require a backup solution for their important files and programs.

External Hard Drive

# Communication Networking of Computer Systems

Communication networking in computer systems refers to the exchange of data and information between two or more computers or devices. Communication networking allows computers and devices to share resources, communicate with each other, and work together regardless of their physical location.

Here are some common types of computer networks used in communication networking:

**Local Area Network (LAN)** A LAN is a network that connects computers and devices within a limited geographical area, such as an office, building, or campus.

**Metropolitan Area Network (MAN)** A MAN typically spans a city or a large campus, connecting multiple LANs within that specific geographic area.

**Wide Area Network (WAN)** A WAN is a network that connects computers and devices over a large geographical area, country, continent, or even the world, using technologies such as the internet.

**Wireless Network** A wireless network uses wireless communication technologies, such as Wi-Fi, to connect computers and devices to the network.

**Bluetooth Network** A Bluetooth network allows devices to communicate wirelessly over short distances, typically within a range of 30 feet.

**Virtual Private Network (VPN)** A VPN is a network that allows users to connect to a private network over the internet. VPNs are commonly used for secure remote access to corporate networks.

## Activity Time

**Activity 1: Group Discussion** *(Group Work)*

Make a group of 3 or 4 students and ask them to discuss input and output operations in class.

**Activity 2: Creating a Chart** *(Individual Work)*

Tell every student to make a chart of their favourite operation of a computer system.

**Activity 3: Research Work** *(Individual Work)*

Ask the students to conduct a research in their neighbourhood and find out about the various types of computer networks that these places use to communicate with each other.

## Chapter Checkup

**A** **Select the correct option.**

1. Which of the following is NOT a primary operation of a computer?
   - a) Input
   - b) Processing
   - c) Storage
   - d) Printing
2. Which of the following is an example of an input device?
   - a) Monitor
   - b) Printer
   - c) Keyboard
   - d) Speaker
3. Which of the following refers to the saving and retrieval of data on a computer?
   - a) Input
   - b) Output
   - c) Storage
   - d) Control

**B** **Fill in the blanks with the most suitable words.**

1. The primary operations of a computer include input, processing, storage, and _____.
2. A joystick is an example of an _____ device.
3. _____ is a type of storage device that uses flash memory to store data.
4. A _____ is a network that connects computers and devices around the globe.

**C** **State whether the following is *True* or *False*. Correct the statements that are false.**

1. Processing refers to the manipulation of data by a computer.
2. A computer network does not allow computers and devices to share resources.
3. Input is the process of entering data and commands into a computer.
4. A webcam is an example of an input device.

**D** **Answer the following questions.** ***(Solved)***

**Q1.** What are storage operations in a computer system?

**A1.** Storage operations are crucial for saving and retrieving data. It involves reading and writing data to and from these storage devices.

**Q2.** What is communication networking?

**A2.** Communication networking in computer systems refers to the exchange of data and information between two or more computers or devices. Communication networking allows computers and devices to share resources, communicate with each other, and work together regardless of their physical location.

**Q3.** Riya wants to backup her files to protect her data from potential loss. Name one device that she can use for this purpose.

**A3.** External hard drive.

## Answer Key

**A** **1.** d **2.** c **3.** c

**B** **1.** Output **2.** Input **3.** SSD **4.** WAN

**C** **1.** True.

**2.** False. A computer network allows computers and devices to share resources.

**3.** True.

**4.** True.

# Unit Reflection

## Key Terms

**ICT:** ICT stands for Information and Communication Technology. It is a broad term that includes a wide range of technologies and tools used for handling, processing, storing, and communicating information.

**Peripheral devices:** Peripheral devices are the tools that expand the capabilities of computing systems. They serve as connectors between the digital and physical worlds, facilitating interaction, communication, and the exchange of information.

**Global Positioning System (GPS):** GPS is a radio-based satellite navigation system that uses radio signals to precisely determine a specific position.

**Solid State Drives (SSDs):** SSDs are storage devices that utilise flash memory for data storage rather than a spinning disk. SSDs have significantly faster speeds, enhanced durability, and reduced vulnerability to mechanical breakdowns compared to hard-disk drives (HDDs).

**Pixels:** Pixels are the smallest element of any image.

**Cache:** It is a high-speed memory. It can be inserted either on a motherboard or as a part of the CPU. It stores various information and instructions that are used repeatedly to execute the programs.

**The Arithmetic and Logic Unit (ALU):** It is a crucial component of the CPU responsible for executing mathematical computations and logical decisions.

**Motherboard:** It is the primary circuit board that connects all the essential components of a computer system. It houses the CPU, memory, and connectors for peripheral devices such as the hard drive, CD/DVD drive, and graphics card.

## Things to Remember

- ICT has deeply impacted our personal lives. It has made convenience, efficiency, connectivity, and accessibility of information and resources at every doorstep possible.
- Key components of ICT are computers, software, the internet, telecommunications, networking, data storage, information security, and multimedia.
- ICT tools like smartphones, tablets, radio, televisions, laptops, and computers are part and parcel of modern society.
- The clarity of the display, also known as resolution, depends upon the number of pixels present. Higher resolution means more pixels are packed into the display area.
- Hardware refers to the physical components of a computer system. These are physical devices that can be seen or touched.
- A barcode reader is a tool that interprets information represented by light and dark lines in barcoded data. Barcoded data is frequently used for price and product identification, labelling objects, numbering books, etc.
- Software is a set of instructions or programs given to the computer to complete a task. It is a part of a computer that cannot be touched or felt.

- The Central Processing Unit (CPU) interprets and executes instructions and performs tasks such as arithmetic operations, logic comparisons, and data movement.
- The Control Unit, a vital part of the computer's central processing unit, arranges and manages the flow of data to and from the CPU.
- Tablets are portable computing devices that are bigger than smartphones but smaller than laptops.
- An e-newspaper, or electronic newspaper, is a digital version of a traditional print newspaper that is accessible through electronic devices such as computers, tablets, smartphones, and e-readers.
- Registers, a type of temporary memory unit within the CPU, serve the purpose of directly storing data utilised by the processor.
- Peripheral devices are the tools that expand the capabilities of computing systems. They serve as connectors between the digital and physical worlds, facilitating interaction, communication, and the exchange of information.
- Input devices are electronic devices that receive instructions from the external environment and convert that data into a format that the computer can read and interpret.
- An output device is any hardware component that receives information from a computer and then presents it in various forms, such as audio, visual displays, or printed copies.
- Storage devices are integral components in which a computer retains all its data, including files, programs, operating system, etc.
- Communication devices are instrumental in enabling the transmission of data and information between your computer and external networks, devices, or the internet.
- The process of supplying data to a computer system for processing is known as input operation. This can be done through various devices, such as a keyboard, mouse, microphone, web camera, etc.
- Processing operations are essential for the functioning of a computer system and involve manipulating data and instructions by the CPU.
- Storage operations are crucial for saving and retrieving data. They involve reading and writing data to and from these storage devices.
- Communication networking in computer systems refers to the exchange of data and information between two or more computers or devices.

# Test Your Knowledge

## A. Select the correct option.

1. Smartphones have ..... for maps.
   - **a.** GPS ☐ **b.** PGS ☐
   - **c.** SGP ☐ **d.** GSP ☐
2. ..... requires an internet connection and allows users to attach files in the form of images, audio, video, or documents.
   - **a.** E-readers ☐ **b.** E-newspaper ☐
   - **c.** Radio ☐ **d.** Email ☐
3. What type of device is a CRT?
   - **a.** Output ☐ **b.** Input ☐
   - **c.** Storage ☐ **d.** Processing
4. ..... is a device that scans an image (such as photographs, printed texts, or handwritings) or an object (such as an ornament) and converts it to a digital image.
   - **a.** Barcode reader ☐ **b.** Scanner ☐
   - **c.** Printer ☐ **d.** Microphone ☐
5. ..... is the primary memory of the computer that stores data and instructions on which the CPU is currently working.
   - **a.** RAM ☐ **b.** ROM ☐
   - **c.** Cache memory ☐ **d.** None of these ☐

## B. Fill in the blanks with the most suitable words.

1. ..... is called the brightness of the screen.
2. ICT stands for .....
3. A ..... is a device that enables individuals to display their computer or device output on a wall or screen.
4. A ..... is a device that converts sound into an electrical signal.
5. ..... software includes word processors, spreadsheets, and a variety of other task-specific programs.

## C. State whether the following is *True* or *False*. Correct the statements that are false.

1. Google Drive provides a cloud storage service.
2. A light pen enables drawing on the monitor screen or selecting menu items.
3. The motherboard is the primary circuit board that connects all the essential components of a computer system.
4. The CU is known as the brain of the computer.
5. LANs connect computers across larger geographical areas.

## D. Short answer-type questions.

1. What is the use of ICT in banking and finance?
2. What are SD cards?
3. Name the three types of ROM.

## E. Long answer-type questions.

1. What is a modem? What are its various types?
2. What is the role of ICT in personal life?
3. Differentiate between system software and application software.

## F. Competency-based questions.

1. Rani got a new computer. But she does not know how to start it. Help her by telling her the procedure to start her computer.
2. It was Maira's first day at school. During a lecture in the computer lab, she noticed that her teacher was using a device resembling a pen to draw on the monitor screen. Name the device.