(IT)

· Definition: IT involves the study, design, development, and management of computer-based information systems.

· Business Context: IT automates processes, aids decision-making, connects businesses with customers, and boosts productivity.

· Academic Context: IT specialists select and manage hardware/software, maintain networks, ensure security, and manage an organization's technology lifecycle.

2. Computer Fundamentals

· Definition: An electronic device programmed to accept input, process it, and produce output.

· Key Hardware Components:

· CPU: The "brain" that executes instructions.

· Memory (RAM): Fast, temporary storage for data and programs in use.

· Mass Storage (HDD/SSD): Slower, permanent storage for data and programs.

· Input/Output Devices: Keyboard, mouse (input); monitor, printer (output).

· Computer Classification (by size & power):

· Personal Computer: Single-user, microprocessor-based.

· Workstation: Powerful single-user computer for specialized tasks (e.g., CAD).

· Minicomputer: Supports up to hundreds of users simultaneously.

· Mainframe: Supports thousands of users; excels at running many programs concurrently.

· Supercomputer: Extremely fast; designed for intense calculations (e.g., weather forecasting).

3. Data Representation & Digital Concepts

· Data vs. Information: Data are raw facts. Information is data that has been processed and given meaning.

· Bit & Byte: A bit is the smallest unit (0 or 1). A byte is 8 bits and represents a single character.

· Number Systems:

· Binary: Base-2 system (0,1). The native language of computers.

· Hexadecimal: Base-16 system (0-9, A-F). A compact way to represent binary.

· Octal: Base-8 system (0-7).

· Analog vs. Digital Signals:

· Analog: Continuous wave, represents real-world data (e.g., human voice). Prone to noise.

· Digital: Discrete on/off signals (0s and 1s). More reliable, easier to store, and error-resistant.

4. Data Organization & Storage

· Data Files: Store data for applications, not instructions.

· Serial/Sequential Files: Records stored in the order they were created. Simple to create but slow to search.

· Random Access Files: Records have a fixed length, allowing direct access to any record without reading all previous ones. Fast but can waste storage space.

· Storage Terms:

· Track: A circular path on a disk.

· Sector: A subdivision of a track.

· Cluster: A group of sectors managed by the operating system.

5. Software

· System Software: Manages hardware and provides a platform for running application software.

· Operating System (OS): Manages resources (CPU, memory), tasks, files, and provides a user interface.

· Utility Software: Tools for system maintenance (e.g., antivirus, backup, disk defragmentation, file compression).

· Application Software: Programs for end-users to perform specific tasks (e.g., word processors, spreadsheets).

6. Programming & Compilation

· Compiler: A program that translates source code into machine-readable object code.

· Logical Operators:

· AND (&&): True only if both conditions are true.

· OR (||): True if at least one condition is true.

· NOT (!): Reverses the logical value.

7. The Internet & World Wide Web

· Internet: The global physical network of connected computers.

· World Wide Web (WWW): A service on the Internet consisting of interlinked hypertext documents.

· Key Components:

· Web Browsers, Servers, Hypertext/Hypermedia.

8. Key Application Software

· Word Processing: Creating and editing text documents.

· Spreadsheets: Managing and calculating data. Includes formulas, functions, and charts.

· Cell References: Relative (A1), Absolute (A1), Mixed (A$1).

9. Computer Networks

· Definition: A collection of interconnected computers and devices.

· Types: LAN, WAN, Internet, Intranet, VPN.

The Role of IT in Society

1. Communication Revolution

2. Economic Driver

3. Access to Information and Education

4. Advancements in Healthcare

5. E-Governance

6. Entertainment and Leisure

Conclusion: IT drives efficiency, connectivity, and innovation despite challenges like security and digital divides.