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. Introduction to Information Technology (IT)

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

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 (like a cassette tape).

· 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. Key functions include resource, task, and file management.

  · 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 (written by humans) 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 of a condition.

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 (web pages) accessed via browsers.

· Key Components:

  · Web Browsers: Software to access and view web pages (e.g., Chrome, Firefox).

  · Servers: Computers that provide services (e.g., Web, Email, FTP servers).

· Hypermedia/Hypertext: Non-linear information linking text, graphics, audio, and video via hyperlinks.

8. Key Application Software

· Word Processing:

· Used for creating, editing, and formatting text documents.

· Key features: insert/delete, copy/paste, spell check, fonts, headers/footers.

· Spreadsheets:

· A grid of rows and columns for managing and calculating data.

· Key elements: Cell (intersection of row/column), Formula (calculation), Function (predefined formula like SUM).

· Cell Reference Types:

· Relative: Adjusts when copied (e.g., A1).

· Absolute: Remains fixed when copied (e.g., $A$1).

· Mixed: Combination (e.g., A$1 or $A1).

· Charts: Visual representations of data (Bar, Line, Pie, Scatter).

9. Computer Networks

· Definition: A collection of interconnected computers and devices that can communicate and share resources.

· Purposes: Facilitate communication, share hardware, files, data, and software.

· Types of Networks:

· LAN (Local Area Network): Covers a small geographic area (e.g., a building).

· WAN (Wide Area Network): Spans a large geographic area (e.g., a country), often connecting multiple LANs.

· Internet: A global network of networks.

· Intranet: A private network within an organization that uses Internet technologies.

· VPN (Virtual Private Network): A secure connection over a public network (like the Internet) to a private network.