Chapter # 05 Computer Networks

What is a computer network?
Answer: A computer network is a collection of interconnected computers and devices that can communicate and share resources.

Provide examples of how networks are used.
Answer: Networks are used for sharing files, printers, accessing the internet, communication through email, and collaborative work on documents.

Explain hardware sharing in a computer network.
Answer: Hardware sharing involves multiple devices on a network using shared resources, such as printers or storage devices.

Define software sharing in the context of computer networks.
Answer: Software sharing allows users on a network to access and use software applications that are installed on a central server.

What is file sharing, and why is it important in networks?
Answer: File sharing is the ability to access and exchange files between devices on a network, facilitating collaborative work and resource sharing.

Explain internet sharing in a computer network.
Answer: Internet sharing enables multiple devices on a network to access the internet through a common connection, often provided by a router.

Describe the simplex transmission mode.
Answer: In simplex transmission, data flows in only one direction, either from the sender to the receiver or vice versa, without the ability to transmit in both directions simultaneously.

What is the half-duplex transmission mode?
Answer: In half-duplex transmission, data can be transmitted in both directions, but not simultaneously. Devices take turns sending and receiving.

Define full-duplex transmission mode.
Answer: Full-duplex transmission allows simultaneous two-way communication, meaning data can be sent and received at the same time.

Explain the concept of network architecture.
Answer: Network architecture refers to the layout and design of a computer network, including its structure, components, and communication protocols.

List types of network architectures.
Answer: Common types of network architectures include peer-to-peer networks, client/server networks, and hybrid networks.

What is a client/server network?
Answer: In a client/server network, computers (clients) request and receive services or resources from a central server, which manages and controls access to shared resources.

What are the characteristics of server networks?
Answer: Server networks are characterized by a central server that provides services and resources to connected clients. They offer centralized control and management.

Explain the characteristics of peer-to-peer networks.
Answer: Peer-to-peer networks involve devices that have equal status, allowing them to share resources directly without a central server. These networks are decentralized.

Define point-to-point networks.
Answer: Point-to-point networks connect two devices directly, providing a dedicated communication link between them.

List the types of networks.
Answer: Types of networks include local area networks (LAN), wide area networks (WAN), metro area networks (MAN), and personal area networks (PAN).

What is a Local Area Network (LAN)?
Answer: A LAN is a network that covers a small geographic area, such as a single building or campus, connecting computers and devices for local resource sharing.

Describe the characteristics of LAN.
Answer: LANs have high data transfer rates, low latency, and are confined to a limited geographic area. They are commonly used in office or home settings.

Define Wide Area Network (WAN).
Answer: A WAN is a network that spans a large geographic area, connecting LANs across cities, countries, or continents.

Explain the characteristics of WAN.
Answer: WANs have lower data transfer rates compared to LANs, cover larger geographic areas, and often rely on public and private communication links.

What is a Metro Area Network (MAN)?
Answer: A MAN is a network that covers a larger geographic area than a LAN but is smaller than a WAN, typically serving a metropolitan city or region.

Describe the characteristics of MAN.
Answer: MANs have moderate data transfer rates and cover a larger area than LANs but are more localized than WANs.

Define Personal Area Network (PAN).
Answer: A PAN is a network for personal devices, typically covering a very short range, such as the space around an individual.

Explain Bluetooth network and its characteristics.
Answer: A Bluetooth network is a type of PAN that uses short-range wireless communication for connecting devices. It has low power consumption and is suitable for personal devices.

What is the internet?
Answer: The internet is a global network that connects millions of computers and networks worldwide, allowing information exchange and communication.

Define network topology.
Answer: Network topology refers to the physical or logical layout of a network, including how devices are connected and how data is transmitted.

List types of network topologies.
Answer: Types of network topologies include bus, ring, star, mesh, and hybrid topologies.
Bus Topology:

What are the advantages of bus topology?
Answer: Advantages of bus topology include simplicity, ease of installation, and cost-effectiveness. It is suitable for small networks with limited devices.

State a limitation of bus topology.
Answer: The main limitation of bus topology is that if the main cable fails or experiences issues, the entire network can be affected.

Explain ring topology.
Answer: Ring topology connects devices in a circular fashion, where each device is connected to exactly two other devices, forming a closed loop.

Describe star topology.
Answer: In star topology, all devices are connected to a central hub or switch. The central hub acts as a mediator, facilitating communication between devices.

What is mesh topology?
Answer: Mesh topology involves connecting each device to every other device in the network, providing redundancy and reliability.

Explain communication via telephone networks.
Answer: Communication via telephone networks involves transmitting voice and data signals over the public switched telephone network (PSTN).

What is a dial-up line?
Answer: A dial-up line is a type of communication line that establishes a connection by dialing a phone number using a modem.

Define DSL.
Answer: Digital Subscriber Line (DSL) is a broadband technology that provides high-speed internet access over traditional copper telephone lines.

Explain ISDN.
Answer: Integrated Services Digital Network (ISDN) is a digital communication technology that enables the simultaneous transmission of voice and data over telephone lines.

What is CDMA technology used for in communication?
Answer: Code Division Multiple Access (CDMA) technology is used in mobile communication systems to allow multiple users to share the same frequency band simultaneously.

List types of modems.
Answer: Types of modems include dial-up modems, DSL modems, and ISDN modems.

What is a dial-up modem?
Answer: A dial-up modem is a device that connects to the internet through a standard telephone line, establishing a connection by dialing a phone number.

Explain DSL modem.
Answer: A DSL modem is a device that connects to the internet using Digital Subscriber Line (DSL) technology over traditional telephone lines.

Define ISDN modem.
Answer: An ISDN modem is a device that allows the transmission of digital data and voice over Integrated Services Digital Network (ISDN) lines.

Comparison between Data Communication Lines:
Compare dial-up line, DSL, ISDN, and CDMA in terms of speed and availability.

Answer: Dial-up has lower speed and is widely available, DSL offers higher speed but is location-dependent, ISDN provides moderate speed, and CDMA offers high-speed mobile communication.