This is a comprehensive set of questions! I'll provide concise answers to each to help you understand these fundamental network concepts.

Advance Question

1. Explain Network Topologies : Network topologies refer to the arrangement of different elements (links, nodes, etc.) in a computer network. Common types include star, bus, ring, mesh, and tree topologies. Each has its unique layout and method of data transmission.

2. Explain TCP/IP Networking Model : The TCP/IP model is a set of communication protocols used for the Internet and similar networks. It has four layers: the Link Layer (physical network hardware), the Internet Layer (IP, routing), the Transport Layer (TCP/UDP, manages data flow), and the Application Layer (HTTP, FTP, etc.).

3. Explain LAN and WAN Network : A Local Area Network (LAN) is a network that spans a relatively small area, often a single building. A Wide Area Network (WAN), in contrast, covers a broad area, like a city, country, or even global connections.

4. Explain Operation of Switch : A network switch is a device that connects devices within a LAN. It uses MAC addresses to forward data only to the intended recipient, reducing network traffic and improving efficiency.

5. Describe the purpose and functions of various network devices : Devices like routers (route data between networks), switches (connect devices within a network), modems (modulate/demodulate signals for communication over phone lines), firewalls (security), and access points (extend wireless coverage) each play a crucial role in network infrastructure.

6. List of media, cables, ports, and connectors for switches : Ethernet cables (Cat5e, Cat6), fiber optic cables, RJ45 connectors, SFP modules for fiber connections, and corresponding ports on switches (Ethernet ports, SFP slots).

7. Define Network devices and hosts : Network devices are hardware used to connect and manage data in a network (switches, routers, etc.). Hosts are computers or other devices that use the network to communicate.

8. Ethernet Standard (802.3) and Frame Formats : The IEEE 802.3 standard defines Ethernet networking, including frame structure. An Ethernet frame contains a preamble, destination and source MAC addresses, type/length field, data/payload, and a frame check sequence (FCS).

Intermediate Question

1. Comparison between UTP, MM and SM Ethernet Cabling : UTP (Unshielded Twisted Pair) is common in LANs, affordable but with limited distance and bandwidth. Multimode fiber (MM) is used for medium distances with higher bandwidth. Single-mode fiber (SM) is used for long distances and has the highest bandwidth.

2. Make Cross cable : To make a crossover cable, wire one end using the T568A standard and the other end using the T568B standard. This swaps the transmit and receive pairs between the ends.

3. Make Straight-Through Cable : Both ends of a straight-through cable follow the same wiring standard, either T568A or T568B.

4. Differentiate between LAN/WAN operation and features : LANs are restricted to a small area, have high transfer speeds, and primarily use Ethernet and Wi-Fi. WANs cover larger areas, have relatively lower speeds, and use technologies like MPLS, ATM, and Frame Relay.

5. Explain ARP, ICMP and Domain name : ARP (Address Resolution Protocol) resolves IP addresses to MAC addresses. ICMP (Internet Control Message Protocol) is used for error messages and operational queries in networks. A domain name is a readable address (like www.example.com) that maps to an IP address.

6. Components for network and Internet communications : Routers, switches, modems, wireless access points, Ethernet cables, fiber optic cables, network interface cards (NICs), and software for network management.

7. Explain Encapsulation and Decapsulation in OSI Reference model : Encapsulation is the process of adding headers and trailers around data as it moves down the OSI layers. Decapsulation is the removal of these headers and trailers as data moves up the layers at the receiving end.

8. Explain network segmentation and basic traffic management concepts : Network segmentation divides a network into smaller parts (subnetworks) for improved performance, security, and manageability. Traffic management involves controlling and prioritizing network traffic to ensure efficient and reliable network performance.

9. What is flow control and acknowledgment? : Flow control is a technique used to avoid overwhelming network resources by regulating the rate of data transmission. Acknowledgment is a signal sent by the receiver to indicate successful receipt of data.

Advance question

1. Use OSI and TCP/IP models to explain data flow in a network : In the OSI model, data flows from the application layer down to the physical layer at the sender's end, and then up from the physical layer to the application layer at the receiver's end, with encapsulation and decapsulation happening along the way. The TCP/IP model follows a similar process but with fewer layers.

2. Identify and explain at layers 1, 2, 3, and 7 using a layered model approach :

- Layer 1 (Physical): Deals with the physical transmission of data over media.

- Layer 2 (Data Link): Handles error detection, MAC addressing, and frame structuring.

- Layer 3 (Network): Manages logical addressing (IP), routing, and packet forwarding.

- Layer 7 (Application): The interface for end-user processes and network services.

3. Explain CSMA/CD and CSMA/CA : CSMA/CD (Carrier Sense Multiple Access with Collision Detection) is used in Ethernet networks to detect collisions and retry transmissions. CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) is used in wireless networks to avoid potential collisions by using acknowledgments and backoff algorithms.

4. Explain this frame and find layer : This question seems incomplete. Generally, analyzing a frame involves identifying its structure (like Ethernet frame) and understanding that it belongs to Layer 2 (Data Link Layer) of the OSI model.

5. Draw and explain Cisco hierarchical model : The Cisco hierarchical model divides a network into three layers: Core (high-speed backbone of the network, focusing on fast data transport), Distribution (aggregates data from access layer switches, routing, filtering), and Access (network entry point for end devices).

6. Drawing of a typical wired and wireless enterprise LAN : A typical enterprise LAN includes switches connected to routers (for wired connections), wireless access points for Wi-Fi, and security devices like firewalls. End-user devices connect either wired to switches or wirelessly.

7. Describe the uses of straight-through and crossover Ethernet cables : Straight-through cables connect different types of devices (e.g., switch to router), while crossover cables are used to connect similar devices (e.g., switch to switch).

8. Explain Layer 2 and Layer 3 Switch : Layer 2 switches operate at the Data Link layer and primarily manage MAC address-based switching. Layer 3 switches operate at the Network layer, handling routing functions based on IP addresses, in addition to Layer 2 switching.

9. Identifying Collision and Broadcast Domains : A collision domain is a network segment where data packets can collide, typically in a hub-based Ethernet segment. A broadcast domain is a logical division of a network where a broadcast frame is forwarded.