Module -7: Network fundamental

1- Which of the following messages in the DHCP process are broadcasted? (Choose two)

ANS : C. Discover
A. Request

2- Which command would you use to ensure that an ACL does not block web-based TCP traffic?

ANS : B. permit tcp any any eq 80

3-Explain Network Topologies

ANS : Network topology refers to how devices (computers, routers, switches) are connected in a network. There are five main types of topologies:

1. Bus Topology
2. Ring Topology
3. Star Topology
4. Mesh Topology
5. Hybrid Topology

4-Explain TCP/IP Networking Model

ANS : The TCP/IP model helps computers communicate in a network. It has four layers, each with a specific role:

1. Application Layer – Deals with user applications like web browsing, emails, and file sharing. *(Examples: HTTP, FTP, SMTP)*
2. Transport Layer – Ensures data is sent correctly between devices. *(Examples: TCP for reliability, UDP for speed)*
3. Internet Layer – Handles IP addresses and routing to send data across networks. *(Examples: IP, ICMP)*

4. Network Access Layer – Controls how data is sent physically through cables or Wi-Fi. *(Examples: Ethernet, Wi-Fi, MAC Address)*

5-Explain LAN and WAN Network

ANS : 1. LAN (Local Area Network)

LAN connects computers within a small area, like a home, office, or school.

A. Example: Wi-Fi at home, college network
B. Speed: High-speed (up to 1 Gbps)
C. Range: Small (a few meters to a few kilometers)
D. Ownership: Private (owned by a person or company)

Best for: Offices, schools, and homes

A WAN connects computers over a large area, like cities, countries, or even the world.

A. Example: The Internet, bank networks
B. Speed: Slower than LAN (depends on connection type)
C. Range: Large (many kilometers)
D. Ownership: Public or private (managed by ISPs, telecom companies)

Best for: Global communication, business networks

6-Explain Operation of Switch

ANS : Operations of Switch are as following :

1. Receives Data – The switch gets data from a connected device.
2. Reads MAC Address – It checks the MAC address of the sender and receiver.
3. Finds Destination – It looks up the destination MAC address in its MAC table.
4. Forwards Data – If the address is found, the switch sends data only to the correct device.
5. Flooding (if unknown) – If the MAC address is not in the table, the switch sends data to all devices.
6. Learns MAC Addresses – The switch stores new MAC addresses to improve future communication.
7. Prevents Collisions – Unlike hubs, switches send data efficiently without unnecessary traffic.

7-Describe the purpose and functions of various network devices

ANS :

1. Router – Connects different networks (e.g., home network to the Internet) and directs data between them using IP addresses.
2. Switch – Connects multiple devices within a LAN and forwards data based on MAC addresses for efficient communication.
3. Hub – A basic device that broadcasts data to all connected devices, causing network congestion.
4. Modem – Converts digital signals from a computer into analog signals for transmission over telephone lines and vice versa.
5. Access Point (AP) – Provides Wi-Fi connectivity by allowing wireless devices to connect to a wired network.
6. Firewall – Protects a network by filtering traffic, blocking unauthorized access, and preventing cyber threats.
7. Repeater – Boosts weak network signals to extend the range of communication.
8. Gateway – Acts as a bridge between different network protocols to enable communication between different types of networks.

7-Make list of the appropriate media, cables, ports, and connectors to connect switches to other

ANS :

1) Media: Wired (Copper, Fiber) & Wireless
2) Cables: Ethernet (Cat5e, Cat6, Cat7), Fiber Optic, Coaxial
3) Ports: RJ45 (Ethernet), SFP/SFP+ (Fiber), Console (RJ45/USB-C)
4) Connectors: RJ45 (Ethernet), LC/SC (Fiber), BNC (Coaxial)

9-Define Network devices and hosts

ANS : A network device is hardware that helps in communication and data transfer within a network. Examples include routers, switches, hubs, modems, access points, and firewalls. These devices manage traffic, connect networks, and ensure secure communication.

A host is any device that connects to a network and can send or receive data. Examples include computers, laptops, smartphones, servers, and printers. Hosts have unique IP addresses and play a role in network communication by accessing or providing services.