Module -7: Network fundamental

1. Which of the following messages in the DHCP process are broadcasted? (Choose two) ANS : C. Discover
   1. 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

1. 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
6. 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)*

1. Network Access Layer – Controls how data is sent physically through cables or Wi-Fi. *(Examples: Ethernet, Wi-Fi, MAC Address)*
2. Explain LAN and WAN Network ANS : 1. LAN (Local Area Network)

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

* 1. Example: Wi-Fi at home, college network
  2. Speed: High-speed (up to 1 Gbps)
  3. Range: Small (a few meters to a few kilometers)
  4. 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.

1. Example: The Internet, bank networks
2. Speed: Slower than LAN (depends on connection type)
3. Range: Large (many kilometers)
4. Ownership: Public or private (managed by ISPs, telecom companies) Best for: Global communication, business networks
5. 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.
8. Describe the purpose and functions of various network devices ANS :
9. Router – Connects different networks (e.g., home network to the Internet) and directs data between them using IP addresses.
10. Switch – Connects multiple devices within a LAN and forwards data based on MAC addresses for efficient communication.
11. Hub – A basic device that broadcasts data to all connected devices, causing network congestion.
12. Modem – Converts digital signals from a computer into analog signals for transmission over telephone lines and vice versa.
13. Access Point (AP) – Provides Wi-Fi connectivity by allowing wireless devices to connect to a wired network.
14. Firewall – Protects a network by filtering traffic, blocking unauthorized access, and preventing cyber threats.
15. Repeater – Boosts weak network signals to extend the range of communication.
16. 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.