Module -7: Network fundamental (CCNA – Routing & Switching)

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

A. Request

B. Offer

C. Discover

D. Acknowledge

Answer: A. Request C. Discover

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

A. permit any

B. permit tcp any any eq 80

C. permit tcp any eq 80

D. permit any any eq tcp

Answer: B. permit tcp any any eq 80

Question & Answer

3-Explain Network Topologies

Answer: Network topology refers to the **layout** or **structure** of how devices (like computers, switches, routers) are connected in a network. There are several types:

- **Bus Topology**: All devices share one communication line. Simple but not very reliable.
- **Star Topology**: Devices are connected to a central switch or hub. Most common in LANs.
- **Ring Topology**: Devices form a circle; each device connects to two others. Data goes in one direction.
- **Mesh Topology**: Every device connects to every other device. Very reliable but expensive.
- **Hybrid Topology**: Mix of two or more topologies.

4-Explain TCP/IP Networking Model

Answer: The **TCP/IP model** is a set of rules that allows computers to communicate over a network. It has **four layers**:

1. **Application Layer** – Provides network services to users (e.g., email, web).
2. **Transport Layer** – Ensures reliable data delivery (TCP or UDP).
3. **Internet Layer** – Handles IP addressing and routing (IP, ICMP).
4. **Network Access Layer** – Physical hardware and data transmission (Ethernet, Wi-Fi).

It's like a **postal system**, where each layer has a job to move your data safely to the destination.

5-Explain LAN and WAN Network

Answer: • **LAN (Local Area Network)**: A network that covers a **small area**, like a home, office, or school. Devices are close together. Fast and low-cost.

• **WAN (Wide Area Network)**: A network that spans a **large area**, like across cities or countries. The internet is the biggest example of a WAN. It uses leased lines or satellite links.

6-Explain Operation of Switch

Answer: A **switch** is a device used in LANs to connect multiple devices like PCs, printers, etc. It:

- **Learns MAC addresses** of devices connected to it.
- **Sends data only to the intended device**, not to everyone (unlike a hub).
- **Increases network efficiency** by reducing unnecessary traffic.
- Works at **Layer 2** of the OSI model.

7-Describe the purpose and functions of various network devices

Answer: • **Router**: Connects different networks (like your home to the internet). Finds the best path for data.

- **Switch**: Connects devices within the same network and sends data only to the right device.

- **Hub**: Basic device that sends data to all devices (not smart, rarely used now).

- **Access Point (AP)**: Lets wireless devices connect to a wired network (Wi-Fi).

- **Firewall**: Protects the network by controlling what traffic is allowed in or out.

- **Modem**: Converts digital signals to analog and vice versa (used for internet access via ISPs).

7-Make list of the appropriate media, cables, ports, and connectors.

Answer:

Connection	**Media/Cable**	**Port Type**	**Connector**
Switch to Switch (short distance)	Ethernet Cable (Cat5e/Cat6)	RJ45 port	RJ45 Connector.
Switch to Router	Ethernet Cable (Cat5e/Cat6)	RJ45 port	RJ45 Connector.
Long-distance switch connection,	Fiber Optic Cable,	SFP/GBIC (Fiber ports),	LC, SC, or ST Connectors..
Switch to PC	Ethernet Cable (Cat5e/Cat6)	RJ45 port	RJ45 Connector.

8-connect switches to other.

Answer: **A. Switch to Switch**

- **Cable Type**: Ethernet cable (Cat5e or Cat6)
- **Port**: RJ45 Ethernet port
- **Connector**: RJ45

- **Note**: Use a **crossover cable** for older switches. Modern switches use **auto-MDI/MDIX**, so you can use a regular straight-through cable.

B. Switch to Router

- **Cable Type**: Ethernet cable (Cat5e/Cat6)
- **Port**: RJ45 Ethernet port
- **Connector**: RJ45
- **Purpose**: Routers connect the LAN to the Internet or other networks.

C. Switch to Computer (Host)

- **Cable Type**: Ethernet cable (Cat5e/Cat6)
- **Port**: RJ45
- **Connector**: RJ45
- **Purpose**: Allows the computer to communicate over the LAN.

9-Define Network devices and hosts.

- Answer: **Network Devices** are the tools that help move data around a network. Think of them like traffic signs and roads. Examples include:
    - **Switches**: Traffic managers that send data where it needs to go.
    - **Routers**: Like GPS – they decide the best route for your data.
    - **Firewalls**: Security guards for your network.
    - **Modems**: Translators that connect your home to the internet.
- **Hosts** are devices **that use the network** – like your **computer, smartphone, or printer**. They send and receive data using the help of network devices.