**Module -7: Network fundamental –**

1- Which of the following messages in the DHCP process are broadcasted? (Choose two) A. Request B. Offer C. Discover D. Acknowledge

**C. Discover**

**A. Request**  
The DHCP Discover and Request messages are broadcasted to ensure they reach all DHCP servers on the network.

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

**B. permit tcp any any eq 80**  
This command allows TCP traffic from any source to any destination on port 80, which is used for HTTP traffic.

3-Explain Network Topologies

Answer: Here are 7 types of network topologies:

1. **Bus Topology**:
   * All devices are connected to a single central cable (the "bus").
   * Data travels in both directions along the bus.
   * **Advantages**: Easy to set up and requires less cable.
   * **Disadvantages**: A single cable failure can disrupt the network.
2. **Star Topology**:
   * Devices are connected to a central hub or switch.
   * Data passes through the central device to reach other nodes.
   * **Advantages**: Easy to manage, isolate faults, and add/remove devices.
   * **Disadvantages**: If the central device fails, the network goes down.
3. **Ring Topology**:
   * Devices are connected in a circular arrangement where data travels in one or both directions.
   * **Advantages**: Predictable data paths, suitable for small networks.
   * **Disadvantages**: A break in the ring can halt communication.
4. **Mesh Topology**:
   * Every device is connected to every other device, either fully or partially.
   * **Advantages**: Highly reliable and fault-tolerant.
   * **Disadvantages**: Expensive and complex to install.
5. **Tree Topology**:
   * A combination of bus and star topologies. Devices are connected hierarchically to form a tree-like structure.
   * **Advantages**: Scalable and organized for large networks.
   * **Disadvantages**: Central hub failures can affect segments.
6. **Hybrid Topology**:
   * Combines two or more topologies (e.g., star-bus, star-ring).
   * **Advantages**: Flexible and can leverage the strengths of each topology.
   * **Disadvantages**: Complex to design and maintain.

4-Explain TCP/IP Networking Model

The TCP/IP model has four layers:

1. **Application Layer**: Supports user applications (e.g., HTTP, FTP).
2. **Transport Layer**: Ensures reliable data delivery (TCP) or fast, connectionless delivery (UDP).
3. **Internet Layer**: Handles IP addressing and routing (e.g., IPv4, IPv6).
4. **Network Access Layer**: Manages physical transmission and data link protocols.

5-Explain LAN and WAN Network

Answer: **LAN (Local Area Network)**: A network confined to a small area like a home or office; uses Ethernet or Wi-Fi.

**WAN (Wide Area Network)**: A network that spans large areas, connecting multiple LANs; often uses leased lines or the Internet.

6-Explain Operation of Switch

 Operates at Layer 2 (Data Link Layer).

 Forwards data packets based on MAC addresses.

 Learns MAC addresses dynamically and stores them in a MAC table.

 Reduces network congestion by creating dedicated communication paths between devices

7-Describe the purpose and functions of various network devices 7-Make list of the appropriate media, cables, ports, and connectors to 8-

 **Router**: Connects networks and routes traffic between them.

 **Switch**: Connects devices within a LAN and forwards data based on MAC addresses.

 **Hub**: Connects devices but broadcasts data to all ports (less efficient than a switch).

 **Firewall**: Monitors and controls network traffic based on security rules.

 **Access Point**: Provides wireless connectivity in a network.

8 Connect switches to other 9-Define Network devices and hosts

 **Media**: Twisted-pair (Cat5e, Cat6), Fiber-optic cables.

 **Cables**: Straight-through for different devices; crossover for similar devices.

 **Ports**: RJ45 for Ethernet; SFP for fiber-optic connections.

 **Connectors**: RJ45 for Ethernet; LC/SC connectors for fiber.