Module -7: Network fundamental

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

 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-:**Bus Topology:**

- All devices are connected to a single cable (backbone).
- If the main cable fails, the entire network goes down.

Star Topology:

- All devices are connected to a central device (like a switch or hub).
- Easy to manage but if the central device fails, the network stops working.

Ring Topology:

- Devices are connected in a circular path.
- Data travels in one direction (unidirectional) or both directions (bidirectional).

- If one device fails, the whole network can fail.

Mesh Topology:

- Every device is directly connected to every other device.
- Provides high reliability but is costly and complex to install.

Tree Topology:

- Combination of bus and star topology.
- Used in large networks like companies or schools.

Hybrid Topology:

- Combination of two or more different topologies.
- Offers high flexibility and scalability.

4-Explain TCP/IP Networking Model

TCP/IP Networking Model is a set of **rules and protocols** used to send and receive data over a network or the Internet. It has **four layers**:

1. **Application Layer:**

   - Provides services like web browsing, email, file transfer, etc.
   - Example: HTTP, FTP, DNS.
2. **Transport Layer:**

   - Ensures data is delivered without errors.

○ Example: TCP (reliable), UDP (fast but no guarantee).

3. **Internet Layer:**

   ○ Handles IP addressing and routing of data.
   ○ Example: IP, ICMP.

4. **Network Access Layer:**

   ○ Connects devices to the network using cables, Wi-Fi, etc.
   ○ Example: Ethernet, Wi-Fi.

5. Explain LAN and WAN Network

   Answer:

1. **LAN (Local Area Network):**

   ○ It connects devices within a **small area** like a home, office, or school.
   ○ It has **high speed** and low cost.
   ○ Example: Wi-Fi in a house, office network.

2. **WAN (Wide Area Network):**

   ○ It connects devices **over large areas** like cities, countries, or globally.
   ○ It has **low speed** and high cost.
   ○ Example: The Internet, Bank networks.

   Difference: LAN is small and fast, while WAN is large and slow.

6-: Explain Operation of Switch-:

Answer:

Operation of Switch:

- A **switch** is a network device used to connect multiple devices in a **Local Area Network (LAN)**.
- It uses **MAC addresses** to identify devices and send data to the correct destination.
- When a device sends data, the switch **receives it, checks the MAC address, and forwards it** to the correct device.
- It helps in **reducing network traffic** and **improving network performance**.

7-Describe the purpose and functions of various network devices-:

Answer:

1. **Router:**

   - Connects **different networks** and forwards data between them.
   - Example: Connects home network to the Internet.
2. **Switch:**

   - Connects multiple devices in a **LAN (Local Area Network)**.
   - Sends data to the **correct device** using MAC addresses.
3. **Hub:**

   - Connects multiple devices but **sends data to all devices**, not specific.
   - Less efficient than a switch.
4. **Access Point (AP):**

   - Provides **wireless connection (Wi-Fi)** to devices.
   - Used in homes, offices, and public places.

5. **Modem:**

   - ○ Converts **digital signals to analog** and vice versa.
   - ○ Connects your network to the Internet.

6. **Firewall:**

   - ○ Protects the network from **unauthorized access**.
   - ○ Monitors incoming and outgoing traffic.

8-Make list of the appropriate media, cables, ports, and connectors to

Answer:

1. **Media Types:**

   - ○ Wired Media (Ethernet, Coaxial, Fiber Optic)
   - ○ Wireless Media (Wi-Fi, Bluetooth)

2. **Cables:**

   - ○ **Twisted Pair Cable (Ethernet Cable)** - Used in LAN.
   - ○ **Coaxial Cable** - Used in TV, CCTV.
   - ○ **Fiber Optic Cable** - Used for high-speed internet.

3. **Ports:**

   - ○ **Ethernet Port (RJ45)** - Used to connect network devices.
   - ○ **USB Port** - Connects external devices like printers, storage.
   - ○ **HDMI Port** - Connects display devices.

4. **Connectors:**

   - ○ **RJ45 Connector** - Used for Ethernet cables.
   - ○ **BNC Connector** - Used for Coaxial cables.

- ○ **SC/ST Connector** - Used for Fiber optic cables.

9-Define Network devices and hosts-:

Answer:

1. **Network Devices:**

   - ○ Devices used to connect and manage network communication.
   - ○ Example: **Router, Switch, Hub, Access Point, Firewall, Modem.**
2. **Hosts:**

   - ○ Devices that send or receive data in a network.
   - ○ Example: **Computers, Laptops, Mobile Phones, Printers, Servers.**

-: **In simple terms:**

- ● **Network devices** help in connecting the network.
- ● **Hosts** are devices that use the network to communicate.