**Module-7: Networking**

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

* **C. Discover**
* **D. Acknowledge**
* The **Discover** message is broadcasted by the client to locate a DHCP server, and the **Acknowledge** message is broadcasted by the server to confirm the assigned IP address.

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

* **B. permit tcp any any eq 80**
* This command allows TCP traffic on port 80 (HTTP) from any source to any destination. Port 80 is used for web traffic.

**3. Explain Network Topologies**

* **Network topologies** define the arrangement or layout of devices in a network. Common types include:
  + **Star topology**: Devices are connected to a central node (e.g., a switch or router).
  + **Bus topology**: All devices are connected to a single central cable or backbone.
  + **Ring topology**: Devices are connected in a circular manner, with each device connecting to two other devices.
  + **Mesh topology**: Each device is connected to every other device, offering high redundancy and reliability.
  + **Hybrid topology**: A combination of two or more topologies.

**4. Explain TCP/IP Networking Model**

* The **TCP/IP (Transmission Control Protocol/Internet Protocol)** model is the foundation of the Internet. It has four layers:
  1. **Application Layer**: Handles communication for end-user applications (e.g., HTTP, FTP, SMTP).
  2. **Transport Layer**: Ensures reliable data transfer (e.g., TCP, UDP).
  3. **Internet Layer**: Handles logical addressing and routing (e.g., IP).
  4. **Network Access Layer**: Deals with physical network hardware (e.g., Ethernet, Wi-Fi).

**5. Explain LAN and WAN Networks**

* **LAN (Local Area Network)**: A network confined to a small geographical area, such as a home or office. It typically uses Ethernet or Wi-Fi and is faster and more secure.
* **WAN (Wide Area Network)**: A network that spans a large geographic area, often connecting multiple LANs. The Internet is the largest example of a WAN, typically using leased lines, satellites, or public networks.

**6. Explain Operation of Switch**

* A **switch** is a network device that connects multiple devices within a LAN. It operates at Layer 2 (Data Link Layer) and forwards data frames based on MAC addresses. A switch reduces collisions, improves bandwidth, and efficiently directs traffic between devices in the network.

**7. Describe the Purpose and Functions of Various Network Devices**

* **Router**: Directs data between different networks and manages IP addressing.
* **Switch**: Connects devices within a LAN and forwards data based on MAC addresses.
* **Hub**: A basic device that broadcasts data to all devices on the network (less efficient than a switch).
* **Modem**: Modulates and demodulates signals to connect to the Internet via telephone lines.
* **Firewall**: Protects a network from unauthorized access by filtering incoming and outgoing traffic.
* **Access Point (AP)**: Provides wireless connectivity to a LAN.

**8. Make List of the Appropriate Media, Cables, Ports, and Connectors to Connect Switches to Others**

* **Media**: Twisted pair cables (Cat5e, Cat6), fiber optics.
* **Cables**: Ethernet cables (Cat5e, Cat6), fiber optic cables.
* **Ports**: Ethernet ports (RJ45), SFP (Small Form-factor Pluggable) ports for fiber.
* **Connectors**: RJ45 connectors for twisted pair cables, SC/ST connectors for fiber optics.

**9. Define Network Devices and Hosts**

* **Network Devices**: Physical devices that make up the network infrastructure, such as routers, switches, hubs, access points, and firewalls.
* **Hosts**: End devices connected to the network, like computers, smartphones, printers, and servers, that use the network for communication.