Assignment: module - 5 Network Fundamentals and Building Networks

Section 1 : Multiple Choice

1. What is the primary function of a router in a computer network?

a) Assigning IP addresses to devices

b) Providing wireless connectivity to devices

c) Forwarding data packets between networks

d) Managing user authentication and access control

Ans :- c) Forwarding data packets between networks

2. What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network?

a) Assigning static IP addresses to devices

b) Resolving domain names to IP addresses

c) Managing network traffic and congestion

d) Dynamically assigning IP addresses to devices

Ans :- d) Dynamically assigning IP addresses to devices

3. Which network device operates at Layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses?

a) Router

b) Switch

c) Hub

d) Repeater

Ans :- b) Switch

4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?

a) Star

b) Bus

c) Ring

d) Mesh

Ans :- b) Bus

Section 2 : True Or False

5. True or False: A VLAN (Virtual Local Area Network) allows network administrators to logically segment a single physical network into multiple virtual networks, each with its own broadcast domain.

Ans :- True

6. True or False: TCP (Transmission Control Protocol) is a connectionless protocol that provides reliable, ordered, and error-checked delivery of data packets over a network.

Ans :- False

7. True or False: A firewall is a hardware or software-based security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.

Ans :- True

Section 3 : Short Answer

8. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.

Ans :-

1. **Select a wireless router:** Choose a router that supports the required speed, range, and security features (like WPA3).
2. **Connect the router to the modem**: Use an Ethernet cable to connect the modem's output port to the router's WAN/Internet port.
3. **Power on the router and modem:** Restart both devices to ensure they establish an internet connection.
4. **Access the router's configuration page:** Open a web browser and enter the router's IP address (e.g., 192.168.1.1) to log in to the admin panel.
5. **Configure wireless settings:**
    - Set the SSID (network name)
    - Choose security type (WPA2/WPA3)
    - Create a strong Wi-Fi password
6. **Set up DHCP or IP settings:** Ensure DHCP is enabled to automatically assign IP addresses to devices.
7. **Update router firmware**: Install the latest firmware for better performance and security.
8. **Position the router properly:** Place it in a central, elevated, open location to maximize coverage.
9. **Connect devices:** Use the SSID and password to connect laptops, phones, and other Wi-Fi devices.

10. **Test the network:** Check internet speed and signal strength to ensure the network is functioning properly.

Section 4 : Practical

9. Demonstrate how to configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol).

Ans :-

To configure a router for Internet access using DHCP, follow these steps:

1. **Connect the router to the modem:**
    - Use an Ethernet cable to connect the modem to the router's WAN/Internet port.
2. **Power on the modem and router:**
    - Wait for both devices to fully boot.
3. **Connect a computer to the router:**
    - Use Wi-Fi or an Ethernet cable to connect your computer to the router.
4. **Open the router's configuration page:**
    - Open a web browser and type the router's default IP (e.g., 192.168.0.1 or 192.168.1.1).
    - Login with the default username and password (e.g., admin/admin or as given on the router).
5. **Navigate to WAN/Internet settings:**
    - Look for Internet Setup, WAN, or Network Settings.
6. **Select WAN Connection Type:**
    - Choose DHCP or Automatic IP as the Internet connection method.
    - This allows the router to automatically receive IP settings from the ISP.
7. **Save or Apply the settings:**
    - The router will restart or refresh the connection.
8. **Verify Internet connectivity:**
    - Check the router's status page to ensure it has received:
        - IP Address
        - Subnet Mask
        - Gateway
        - DNS Servers
          from the ISP via DHCP.

9. **Test with a device:**
    - Connect a phone or laptop to the router and check if the Internet is working.

Section 5 : Essay

10. Discuss the importance of network documentation in the context of building and managing networks.

Ans :-

Network documentation means keeping a clear record of all devices, connections, IP addresses, and settings in a network. It is very important when building and managing networks because it makes work easier and faster.

1. **Helps in planning:** Documentation shows how the network is designed, where devices are placed, and how they are connected. This helps in building the network correctly and planning for future expansion.
2. **Easier troubleshooting:** When there is a problem, administrators can quickly check the documentation to find the issue. This saves time and reduces mistakes.
3. **Better security:** Keeping records of firewall rules, access controls, and device settings helps in making sure the network is secure. It also helps in finding unauthorized changes.
4. **Team collaboration:** Documentation helps everyone understand the network. If a new person joins the team, they can easily understand how the network works.
5. **Supports upgrades and compliance:** When upgrading devices or software, documentation helps to know what changes are needed. It also helps in following rules and audits.

Conclusion:

Network documentation makes managing a network easier, safer, and more efficient. It saves time, reduces errors, and helps keep the network running smoothly.