**Assignment**

**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?**

**Answer:** Forwarding data packets between networks

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

**Answer:** 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?**

**Answer:** Switch

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

**Answer:** 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.**

**Answer:** 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.**

**Answer:** 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.**

**Answer:** 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.**

**Answer:**

Setting up a wireless network for a small office or home office (SOHO) involves the following steps:

**1. Choose a Wireless Router:**

Select a suitable wireless router that meets your speed and range requirements.

**2. Connect the Router:**

Plug the router into a power source and connect it to your modem using an Ethernet cable.

**3. Access Router Settings:**

Connect a computer to the router via Ethernet or Wi-Fi, and access the router’s web interface using its IP address (usually found in the manual).

**4**. **Configure Network Settings**:

Set up the SSID (network name), choose a security protocol (WPA3 is recommended), and create a strong password.

**5. Adjust Additional Settings:**

Configure other settings such as DHCP, guest networks, and parental controls as needed.

**6. Update Firmware:**

Check for and install any firmware updates for the router to ensure security and performance.

**7.** **Connect Devices**:

Connect your devices (laptops, smartphones, printers) to the new wireless network using the SSID and password.

**8.** **Test the Connection**:

Verify that all devices can connect to the internet and communicate with each other on the network.

**9. Secure the Network**:

Change default admin credentials, disable WPS, and consider enabling network encryption and firewall settings.

**10.** **Document the Setup**: Keep a record of the network configuration, including SSID, password, and any custom settings for future reference.

* **Section 4: Practical**

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

**Answer: Practical Done in Lab**

* **Section 5: Essay**

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

**Answer:**

Network documentation is crucial in building and managing networks for several reasons:

**1. Improved Troubleshooting:** Well-documented networks allow for quicker identification and resolution of issues. Network diagrams, device configurations, and IP address allocations help technicians understand the network layout and pinpoint problems efficiently.

**2. Enhanced Communication:** Documentation serves as a common reference point for team members, ensuring everyone is on the same page regarding network architecture, policies, and procedures. This is especially important in larger teams or organizations.

**3. Change Management:** As networks evolve, documentation helps track changes, such as new devices, configurations, or topology adjustments. This historical record is vital for understanding the impact of changes and for reverting to previous configurations if necessary.

**4. Compliance and Auditing:** Many industries have regulatory requirements for network security and data management. Proper documentation helps organizations demonstrate compliance during audits and ensures that security policies are followed.

**5. Onboarding and Training:** New staff can quickly get up to speed with network documentation. It provides essential information about the network's structure, policies, and procedures, facilitating smoother onboarding and training processes.

**6. Disaster Recovery:** In the event of a network failure or disaster, documentation is critical for recovery efforts. It provides the necessary information to restore services and configurations, minimizing downtime and data loss.

**7. Capacity Planning and Scalability:** Documentation helps in understanding current network usage and performance, which is essential for planning future expansions or upgrades. It allows for informed decision-making regarding resource allocation and network design.

**8. Security Management**: Keeping track of network devices, configurations, and access controls is vital for maintaining security. Documentation helps identify vulnerabilities and ensures that security measures are consistently applied across the network.

**9. Cost Management:** By documenting network resources and configurations, organizations can better manage costs associated with hardware, software, and maintenance, avoiding unnecessary expenditures.

In summary, network documentation is a foundational aspect of effective network management, contributing to operational efficiency, security, compliance, and overall organizational success.