***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

**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

**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

**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

**b) Switch**

***Section 2: True or False***

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.

**True**

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.

**False**

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.

**True**

***Section 4:***

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

**ANS:** Steps to Set Up a SOHO Wireless Network:

1. Plan the Network: Identify the number of devices, coverage area, and internet speed requirements.

2. Choose Hardware Select a modem, router, and optional access points or switches for extended coverage.

3. Connect Devices

- Connect the modem to the ISP line.

- Attach the router to the modem.

- Place the router centrally for optimal signal.

4.Configure the Router:

- Access the router settings via its IP address.

- Set a unique SSID and a strong WPA3/WPA2 password.

- Update firmware and enable security features.

5.Test the Network: Check connectivity, speed, and signal strength. Address any weak spots with extenders if necessary.

6. Secure the Network: Change default admin credentials, enable firewalls, and disable WPS.

7. Connect Devices: Add wired and wireless devices to the network.

8.Monitor and Maintain: Regularly update firmware, monitor usage, and back up configurations.

***Section 4: Practical***

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

ANS: Configuring a Router for Internet Access Using DHCP

1.Connect Hardware:

- Connect the modem to the internet line.

- Connect the router to the modem using an Ethernet cable.

- Power on the modem and router.

2. Access the Router:

- Connect to the router via Wi-Fi or Ethernet.

- Open a browser, enter the router’s IP (e.g., `192.168.1.1`), and log in.

3. Set Internet to DHCP:

- Go to Internet/WAN Settings

- Select DHCP (Dynamic IP) as the connection type and save.

4. Set Up Wi-Fi (Optional):

- Assign a unique SSID and secure it with WPA2/WPA3 encryption and a strong password.

5.Test the Connection:

- Restart devices and ensure internet access.

6. Secure the Router

- Change the default admin password.

- Enable the firewall and save configuration settings.

router is now configured for internet access using DHCP.

***Section 4:***

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

**ANS**: Importance of Network Documentation

1. Simplifies Troubleshooting: Quickly identify and resolve issues with detailed records.

2. Facilitates Changes: Plan upgrades, expansions, or modifications efficiently.

3. Enhances Security: Track vulnerabilities and respond swiftly to incidents.

4. Streamlines Collaboration: Provides a clear reference for team members and new hires.

5. Supports Compliance: Meets regulatory requirements and eases audits.

6. Reduces Downtime: Speeds up recovery during outages with accurate details.

Key Components of Network Documentation

1. Network Topology Maps: Visual diagrams of network layout.
2. Device Inventory: A list of all network devices (routers, switches, servers) with IP addresses and configurations.
3. Connection Details: Information about cabling and wireless connections.
4. Access Controls: Records of passwords, user permissions, and security settings.
5. Change Logs: Documentation of past modifications and their impact.