Assignment Module-5:

**Network Fundamentals and Building Networks**

**Section-1**

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

🡪 **Forwarding data packets between networks**

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

**🡪 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?

🡪 **Switch**

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

🡪 Bus

**Section-2**

5 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**

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

🡪**False**

7)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-3**

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

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1. **Choose a Wireless Router**:  
   Select a router with good coverage and security features
2. **Place the Router**:  
   Position the router in a central location to ensure even coverage across the office.
3. **Connect the Router to the Modem**:  
   Use an Ethernet cable to connect the router's WAN port to the modem's Ethernet port.
4. **Power On the Router**:  
   Plug in the router and power it on. Wait for it to boot up.
5. **Access Router Settings**:  
   Connect a computer via Ethernet or Wi-Fi, and open a web browser to access the router's admin page
6. **Configure Wireless Settings**:
   * Set up the network name (SSID).
   * Choose the security protocol (WPA2 or WPA3).
   * Set a strong password.
7. **Assign Static IPs (Optional)**:  
   For devices requiring static IPs (like printers or servers), configure them within the router’s settings.
8. **Connect Devices**:  
   Connect computers, smartphones, printers, etc., to the wireless network using the SSID and password.
9. **Test Connectivity**:  
   Ensure devices can access the internet and communicate with each other.
10. **Secure the Network**:  
    Change the default router login password and disable unnecessary services (like WPS) for added security.

**Section 4:**

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

**DONE**

**Section 5:**

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

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**1. Troubleshooting and Issue Resolution**

* Network documentation helps technicians and network admins quickly identify issues by providing a map of the network architecture, device configurations, and IP addressing schemes.

**2. Efficient Network Management**

* Proper documentation ensures network configurations, such as IP addresses, subnets, and VLANs, are tracked and can be managed effectively.

**3. Planning for Network Expansion**

* As the network grows, documentation helps ensure that expansion is smooth and compatible with existing systems.

**4. Security and Compliance**

* Documentation outlines security configurations, including firewall rules, device settings, and access control lists (ACLs), helping maintain compliance with industry standards and best practices.

**5. Network Design and Architecture**

* It provides a clear understanding of the network’s layout and design, including physical and logical topologies.

**6. Onboarding New Staff or Contractors**

* Detailed network documentation speeds up the onboarding process for new team members or contractors by providing them with a clear overview of the network.

**7. Disaster Recovery and Business Continuity**

* In case of a network failure, well-documented systems help administrators recover quickly, minimizing downtime and ensuring business continuity.

**8. Improving Network Performance**

* Network documentation helps monitor performance by providing historical data and trends that can guide optimization.

**9. Legal and Operational Requirements**

* Certain industries require keeping detailed records of network configurations, security measures, and maintenance.

**10. Change Management**

* Documenting changes to the network (such as adding new devices or altering configurations) helps track modifications and their impact.