*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?*

*Ans: Forwarding data packets between networks*

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

*Ans: 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?*

*Ans: Switch*

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

*Ans: Bus*

*Section 2: True or False*

*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.*

*Ans. True*

*6. 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. 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: Setting up a wireless network for a small office or home office (SOHO) environment involves several steps.*

*1. Choose a router:*

*- Look for a router that supports for faster speeds and range.*

*- Consider features like mesh networking, VPN support, and parental controls.*

*- Make sure the router has a good range and can be placed in an optimal location to cover the area.*

*2. Install the router:*

*- Ensure that the router is properly connected to the power and ethernet cables.*

*3. Set up the router:*

*- Connect to the router's admin panel using a browser and navigate to its IP address (usually 192.168.1.1).*

*- Configure the router's settings, such as SSID (network name), encryption method, and password.*

*- Configure the router's IP address, subnet mask, and default gateway.*

*4. Connect devices to the router:*

*- Plug the ethernet cables from the router to the computers, printers, and other devices.*

*- Ensure that the devices are properly connected to the router's LAN ports.*

*5. Configure wireless security:*

*- Enable the WPA2 or WPA3 encryption for the wireless network.*

*- Set a strong password for the network and update frequently.*

*- Consider using a VPN to encrypt data traveling over the wireless network.*

*6. Configure network settings:*

*- Set up a static IP address for each device to ensure consistent connectivity.*

*- Configure the DNS settings to use a public DNS server for better internet access.*

*- Set up port forwarding if needed to allow external access to certain devices.*

*7. Test and troubleshoot:*

*- Test the network by connecting from multiple devices and verifying speed and reliability.*

*- Check for any error messages or issues in the router's admin panel.*

*- Troubleshoot by resetting the router or changing the router's channel if needed.*

*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 (Dynamic Host Configuration Protocol)*

*1. Log in to the router's admin panel using a web browser.*

*2. Navigate to the "Internet" or "Network" section of the admin panel.*

*3. Locate the "DHCP Server" or "DHCP Settings" option and enable it.*

*4. Configure the DHCP server by specifying the following:*

*- Subnet Mask: The subnet mask determines the network portion of an IP address.*

*- IP Address Range: Specify the range of IP addresses that the DHCP server can assign to clients.*

*- Default Gateway: The IP address of the default gateway for the network.*

*- DNS Servers: The IP addresses of the DNS servers to provide name resolution.*

*5. Save the changes and restart the router to apply the new settings.*

*Section 5: Essay*

*10. Discuss the importance of network documentation in the context of*

*building and managing networks.*

*Ans. Network documentation is crucial for building and managing networks effectively. It provides a comprehensive overview of the network architecture, components, and configurations, ensuring that everyone involved understands the network's purpose and function. Here are some key points on the importance of network documentation:*

*1. Clarity and Consistency: Network documentation helps in maintaining a clear and consistent understanding of the network. It ensures that everyone involved (from network administrators to end-users) has a shared understanding of the network's structure and components. This clarity reduces confusion and minimizes the risk of misconfigurations or misuse of resources.*

*2. Accountability and Compliance: Network documentation facilitates accountability and compliance by providing a documented record of the network's architecture, design, and deployment. This documentation can be used as a reference during audits, compliance checks, and troubleshooting activities. It promotes transparency and helps in demonstrating the network's adherence to security policies and regulations.*

*3. Efficient Collaboration: Network documentation enables efficient collaboration among network administrators, developers, and other stakeholders. It serves as a single source of truth, reducing the need for multiple individuals to maintain separate knowledge bases. This centralized approach enhances communication, reduces duplication of efforts, and promotes a unified approach to network management.*

*4. Faster Problem Resolution: Well-documented networks facilitate faster problem resolution. When an issue arises, network administrators can refer to the documentation to quickly identify the root cause, implement the necessary fixes, and ensure that the issue is resolved in a timely manner. This can be particularly beneficial when dealing with critical incidents or security incidents, as it allows for quick and effective response times.*

*5. Scalability and Maintainability: Network documentation plays a crucial role in maintaining the scalability and maintainability of a network. As the network grows in size and complexity, well-documented practices ensure that the network can be easily managed and updated. This includes adding new devices, updating configurations, or implementing new services. The documentation serves as a reference point, allowing for smooth transitions and adaptations to changing requirements.*