*Assignment*

*Module 3: Understanding and maintenance 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 DNS (Domain Name System) in a computer*

*network?*

*Ans: Converting domain names to IP addresses.*

*3. What type of network topology uses a centralized hub or switch to*

*connect all devices?*

*Ans: Star*

*4. Which network protocol is commonly used for securely accessing and*

*transferring files over a network?*

*Ans: FTP*

*Section 2: True or False*

*5. 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*

*6. DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.*

*Ans: False*

*7. VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.*

*Ans: True*

*Section 3: Short Answer*

*8. Explain the difference between a hub and a switch in a computer*

*network.*

*Ans:*

|  |  |
| --- | --- |
| *HUB* | *SWITCH* |
| *Hub is operated on Physical layer of OSI model* | *switch is operated on Data link layer of OSI Model* |
| *Hub have 4/12 ports.* | *switch have 24 to 48 ports.* |
| *Hub is a broadcast type transmission.* | *switch is a Unicast, multicast and broadcast type transmission.* |
| *Cheaper as compared to switch.* | *Expensive as compared to HUB.* |

*9. Describe the process of troubleshooting network connectivity issues.*

*Ans:*

*• Check Physical Connections: make sure cables are securely connected and lights on network devices (routers, switches, etc.) are lit up.*

* *Verify IP Settings: Confirm that the device has a valid IP address or subnet mask, gateway, and DNS server settings configured.*
* *Router/Modem Reset: Restart the router or modem to refresh network connections.*
* *Network Diagnostic Tools: Utilize network diagnostic tools to analyze network traffic for abnormalities.*

*Section 4: Practical Application*

*10. Demonstrate how to configure a wireless router's security settings to*

*enhance network security.*

*Ans.*

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*To setup a wireless router's security settings to enhance network security, follow these steps*

*1. Access the router's web interface by using a web browser.*

*2. Go to the settings menu and find the "Security" or "Network" section.*

*3. Create a secure password for the router's admin panel using a mix of uppercase and lowercase letters, numbers, and special characters.*

*4. Allow WPA2-Personal or WPA3-Personal security for wireless connections and maximum encryption.*

*5. Create a strong password for each wireless network (SSID) that you plan to set up.*

*6. Turn off SSID broadcasting for networks you want to keep hidden.*

*7. Activate MAC address filtering to block unauthorized devices from joining your network.*

*8. Set up the router to automatically update firewall rules from trusted sources such as Cisco Talos Intelligence.*

*9. Switch on the router's VPN server function and set it up with strong encryption and authentication details.*

*10. Install reliable antivirus and malware protection software on the router to safeguard against new threats.*

*Section 5: Essay*

*11. Discuss the importance of network documentation and provide*

*examples of information that should be documented.*

*Ans. Network documentation is a crucial aspect of maintaining and managing a network infrastructure. It serves several purposes, including:*

*1. Network documentation is essential for maintaining and managing a network infrastructure. It provides a complete overview of the network architecture, components, configurations, and connections, ensuring that everyone involved understands the network.*

*2. Documentation allows for tracing the history of network components, configurations, and changes. It creates a record of the network's growth, which is useful for troubleshooting and problem-solving.*

*3. Sharing network documentation among team members encourages knowledge sharing. This reduces the need for repetitive training and improves the efficiency of network operations.*

*4. Documentation is important for meeting regulatory and compliance standards. It provides a clear reference for network policies, procedures, and security measures.*

*5. Network documentation supports the network's scalability by offering a plan for future upgrades and changes. It ensures that the network can adapt to evolving business needs.*

*Example are given below:*

*1. Create a detailed layout of the network, showing how all the devices are connected and the type of cables used. Include the number of switches, routers, servers, and other devices in the network.*

*2. Set up IP address ranges for each section of the network and make sure that the network masks are correct to avoid any conflicts with IP addresses.*

*3. Specify the DNS server addresses and how domain names are resolved for both internal and external domains.*

*4. Record the routing protocols being used, such as OSPF or BGP, and include details like router ID, network statements, and how routes are redistributed.*

*5. Define the rules for the firewall, including the source and destination IP addresses, protocols, and ports to control the flow of traffic through the network.*

*6. Explain the setup of VLANs and subnetting, outlining the purpose of each VLAN and the corresponding IP address ranges.*

*7. Share the specifics of the switch configurations, such as the switch model, firmware version, and port setups like access ports and trunk ports.*

*8. List down the servers in an inventory format, detailing their hostnames, IP addresses, operating systems, and the applications installed on them.*

*9. Outline the backup and disaster recovery plans, covering aspects like backup frequency, retention periods, and the steps for restoration.*

*10. Define the security policies and procedures related to network access control, data encryption, and incident response.*