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**Assignment module 3: Understanding and Maintenance of 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.

**Ans**: c) Forwarding data packets between networks

**Reason:** A router’s main job is to send (forward) data packets from one network to another, making sure the data reaches the correct destination.

2. What is the purpose of DNS (Domain Name System) in a computer network?

a) Encrypting data transmissions for security

b) Assigning IP addresses to devices dynamically.

c) Converting domain names to IP addresses.

d) Routing data packets between network segments.

**Ans:** c) Converting domain names to IP addresses.

**Reason:** The main job of DNS is to change website names (like google.com) into IP addresses, so that computers can connect to the correct server.

3. What type of network topology uses a centralized hub or switch to connect all devices?

a) Star

b) Bus

c) Ring

d) Mesh

**Ans:** a) Star

**Reason:** In a star topology, all devices are connected to a central hub or switch. This central point controls the network traffic, making the network easy to manage and repair.

4. Which network protocol is commonly used for securely accessing and transferring files over a network?

a) HTTP

b) FTP

c) SMTP

d) POP3

**Ans:** b) FTP

**Reason:** FTP (File Transfer Protocol) is used to send and receive files between a computer and a server on a network. SFTP (Secure File Transfer Protocol) is safer, but for basic use FTP is the common answer

**Section 2: True or False**

5. 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.

**Ans:** True

6. True or False: DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.

**Ans:** False

7. True or False: 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**: A hub and a switch are both networking devices, but they work differently.

* Hub: A hub is a simple device. When it receives data from one device, it sends that data to all devices connected to the network, whether they need it or not. This can make the network slow and can cause data collisions.
* Switch: A switch is a smarter device. It sends data only to the specific device that the data is meant for. It does this by using the MAC address (a unique address of each device). This makes the network faster, more efficient, and reduces data collisions.

9. Describe the process of troubleshooting network connectivity issues.

**Ans**: Troubleshooting network connectivity means finding and fixing the problem that is stopping the internet or network from working. The process can be done step by step:

1. Check physical connections – Make sure all cables, Wi-Fi, and power connections are properly plugged in and working.
2. Check IP configuration – Use commands like ipconfig (Windows) or ifconfig (Linux/Mac) to see if the device has a proper IP address.
3. Use the ping command – Type ping followed by the website address (ping google.com) to check if the device can reach the network or internet.
4. Restart devices – Sometimes simply restarting the router, modem, or computer can fix the issue.
5. Check firewall and antivirus – Make sure security software is not blocking the connection.
6. Test with another device – Try connecting with another phone or laptop to see if the problem is with the network or with a specific device.

**Section 4: Practical Application**

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

**Ans:** Configuring a wireless router for better security is important to keep your network safe from hackers.

1. Access router settings – Open a web browser and type the router’s IP address (e.g., 192.168.0.1 or 192.168.1.1).
2. Login with admin credentials – Use the username and password provided, then change them to something strong and unique.
3. Change the SSID – Rename your Wi-Fi to something personal but not revealing your identity.
4. Enable strong encryption – Select WPA2 or WPA3 security; avoid WEP because it is weak.
5. Disable WPS – Turn off Wi-Fi Protected Setup (WPS) as it can be easily hacked.
6. Enable MAC address filtering – Allow only specific devices to connect by adding their MAC addresses.

11. Discuss the importance of network documentation and provide examples of information that should be documented.

**Ans**: Network documentation is very important for managing and fixing network problems easily. It is a record of all the details about the network, like how it is set up and which devices are connected. Good documentation saves time and makes the network secure.

Why it is important:

* Helps to quickly solve problems when the network is not working.
* Makes upgrades and changes easier.
* Helps new IT staff understand the network easily.
* Improves network security and efficiency.

Examples of network documentation:

* IP address list – Shows which device has which IP.
* Network topology diagram – A map showing how all devices are connected.
* Device list – Names of routers, switches, servers, and their roles.
* Configuration files – Settings of routers, switches, and firewalls.