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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 because it is a networking device that connects different networks and forward data between IP addresses.

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 because when we write website name it converts it into ip address.

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, because all devices connected to central hub or switch.

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 because it is used to share file transfers between client and servers.

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, firewall works as security barriers between internal and external network.

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

Ans: -False, DHCP assigns dynamic ip address automatically to device on a network.

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

Ans: -True, it allows multiple logical networks on the same physical switch.

Section 3: Short Answer

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

Ans: -

|  |  |
| --- | --- |
| HUB | SWITCH |
| 1)It is a networking device on layer 1(Physical layer). | 1)Its is a networking device on layer 2(Datalink layer). |
| 2)Broadcasts data to all ports. | 2)Forwards data to the specific ports. |
| 3)It is slower | 3)It is faster. |
| 4)It is cheaper. | 4)It is costlier than HUB. |
| 5)HUB has 8 ports. | 5)SWITCH has up to 64 ports. |

9. Describe the process of troubleshooting network connectivity issues.

Ans: - 1) Check **Physical Connections**

2) **Verify Device Power & Hardware**

3) **Check Network Adapter Status**

4) **Verify IP Configuration**

* Run ipconfig (Windows) or ifconfig (Linux).

5) **Check DHCP Functionality**

* If IP is 169.254.x.x, it means DHCP failed.

6) **Ping Tests**

7) **Check DNS Configuration**

* Use nslookup www.google.com to test DNS.

8)**Test with Another Device**

* Try connecting another device to the same network.

9) **Check Firewall/Security Settings**

* Ensure firewall or antivirus isn’t blocking connectivity.
* Temporarily disable if needed.

10)**Check Router/ISP Issues**

* Restart router/modem.
* Check if ISP is down (contact ISP support).

Section 4: Practical Application

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

Ans: -

1) **Access the Router’s Admin Page**

* Open a web browser and type the router’s IP address (commonly 192.168.0.1 or 192.168.1.1).

2) **Change the Default Admin Credentials**

* Go to **Administration / System Settings**.
* Change the **default admin username & password** to something strong.

3) **Enable WPA3 or WPA2 Security**

* Navigate to **Wireless Settings > Security**.
* Select **WPA3-Personal** or **WPA2-Personal**

4) **Set a Strong Wi-Fi Password**

* Use a mix of **uppercase, lowercase, numbers, and symbols**.

5) **Change the Default SSID (Wi-Fi Network Name)**

* Rename the SSID to something unique.

6) **Disable WPS**

* Turn it off in the router settings.

7) **Enable Router Firewall**

* Go to **Firewall/Security Settings**.
* Enable **SPI Firewall** or any built-in protection.