**Name:Priyanka Maheshwari**

**Assignment module 3 : Understanding and Maintenance of** **Network**

**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

Answer: c) Forwarding data packets between networks   
Reason: A router is like a traffic police police for the internet.Its helps data go from one network to another for example,from you home WI-FI to the internet.

It reads the IP address on each data packet and sends it in the right direction.

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

Answer:c) Converting domain names to IP addresses

Reason:DNS works like a phonebook for the internet.It change website names like google.com into ip addresses like 142.250.195.14 so computers can find each other.

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

a) Star

b) Bus

c) Ring

d) Mesh

Answer:a)Star

Reason:Devices connect to one hub.Hub controls data.Easy to fix,but if hub fails,network fails.

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

a) HTTP

b) FTP

c) SMTP

d) POP3

Answer:b)FTP

Reason:FTP (File Transfer Protocol) is used to send and receive files over a network.When used securely(like SFTP),it protects data during transfer.

**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.

Answer:True

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

Answer:False

Reason:DHCP automatically gives IP,but not fixed one.It gives changing IP(dynamic),not static IP.

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

Answer:True

**Section 3: Short Answer**

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

|  |  |  |
| --- | --- | --- |
| **POINT** | **HUB** | **SWITCH** |
| OSI Layer | Works on Physical Layer. | Works on Data Link Layer. |
| Data Transmission | Broadcasts to all devices | Sends Data as Unicast,Multicast,or Broadcast |
| Ports | 4 to 12 ports | 24 to 48 ports |
| Cost | Cheap | More expensive |
| Usage | Old tech,rarely used | Modern and widely used |
| Speed | 10-100Mbps | 10-1000Mbps(1Gbps) |

9. Describe the process of troubleshooting network connectivity issues.

Answer:Troubleshooting Network Connectivity Issues

1. Check Physical Connections - Make sure all cable are properly connected.
2. Restart Devices - Restart your computer,modem or router.
3. Check IP Address - Use ipconfig(windows)or ipconfig (linux) to see if the system has a valid IP.
4. Ping the Network - Use ping command to check connection to gateway or internet(eg ping 8.8.8.8).
5. Check Network Settings - Make sure IP settings,DNS and gateway are correct.
6. Check Firewall or Antivirus - Sometimes these block the internet temporarily disable and check.
7. Check Router or Modem Lights - If lights are off or red,there may be hardware or ISP problem.
8. Try Another Device or cable - Check if another device works on the same network if yes ,problem is in your computer.

**Section 4: Practical Application**

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

Answer:1) Login to Router

* Open browser -> type 192.168.1.1
* Enter username & password

2) Change Login Password

* Change router's admin password so no one else can change settings.

3) Set Strong Wi-Fi Password

* Use WPA2 or WPS3 security.
* Put a strong Wi-Fi password

4) Change Wi-Fi Name(SSID)

* Don't use default name.
* Give your own custom name.

5)Turn off WPS

* It make Wi-FIi easy to hack.Better to disable it.

6) Turn On Firewall

* It protects from hackers and unwanted traffic.

7)Update Router Software

* Check for "firmware update" in setting it fixes security bugs.

8)Turn Off Remote Access

* Prevent others from logging into your router from outside.

**Section 5: Essay**

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

Answer:

Important:

* Helps to find and fix problems fast.
* Saves time for new staff to understand network.
* Avoids confusion between team members.
* Makes upgrades and change easy.
* Keeps network secure.

Documentation:

1. IP address list - Which device has which IP.
2. Device details - Models ,serial number ,software version.
3. Network diagram - Picture showing all device and connections.
4. Cable connections - Which cable goes where.
5. Login details - Router/Switch password.
6. VLAN details - VLAN number and device in it.
7. Security settings - Firewall rules,antivirus.
8. Backup details - Where network backup is stored.
9. Change history - Record of what change were made.

Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device Name** | **IP Address** | **Location** | **Model** | **Notes** |
| Router1 | 192.168.1.1 | Server Room | Cisco2901 | Main internet router |
| Switch1 | 192.168.1.2 | Office Floor | Cisco 2960 | Connects 24 office PCs |
| PC1 | 192.168.1.10 | Desk 12 | Dell Opti | Accountant's Pc |