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# **Module:-03**

# **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

* Sending data from one network to another

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 Routing data

d) packets between network segments

Ans :- c) Converting domain names to IP addresses Routing data

* DNS changes names like www.google.com into IPs like 142.250.192.78.

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

* All devices connect to a central hub or switch, and communication passes through this central point.

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 :- **None of this**

* **FTP transfers files but is not secure.**  
  **SFTP or FTPS are secure options.**

# **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

* DHCP automatically assigns dynamic IP addresses to network devices.

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 :-

* “**Switches are preferred in modern networks for efficiency and security.**”

|  |  |  |
| --- | --- | --- |
| **Feature** | **Hub** | **Switch** |
| Functionality | Sends data to **all** connected devices (Broadcast). | Sends data **only** to the intended device (Unicast). |
| Intelligence | **Dumb** device – doesn't learn MAC addresses. | **Smart** device – learns and stores MAC addresses |
| OSI Layer | Works at **Layer 1** – Physical Layer. | Works at **Layer 2** – Data Link Layer. |
| Collision Domain | One large collision domain – more data collisions | Each port has its own domain – fewer collisions. |
| Bandwidth | Bandwidth is **shared** – slower. | Bandwidth is **dedicated** – faster. |
| **Modern Usage** | **Obsolete**, rarely used today. | **Common** in modern networks. |

9. Describe the process of troubleshooting network connectivity issues.

Ans :-

* Check all cables and Wi-Fi connection.
* Restart the computer, modem, and router.
* Use ipconfig to check IP address.
* Ping websites to test internet (e.g., ping google.com).
* Change DNS to 8.8.8.8 if needed.
* Disable and enable the network adapter.
* Turn off firewall or antivirus temporarily.
* Reset network settings using Command Prompt.
* Try connecting with another device.
* If issue continues, contact the Internet Service Provider (ISP).

# **Section 4: Practical Application**

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

Ans :-

1. Login to Router:

* Open a browser and type 192.168.1.1 or 192.168.0.1.
* Enter username and password (usually written on the router).

1. Change Default Login Info:

* Change the default admin username and password to something strong.

1. Set Strong Wi-Fi Password:

* Go to Wireless Settings, set a strong Wi-Fi password (WPA2 or WPA3 security).

1. Enable Network Encryption:

* Use WPA2 or WPA3 encryption (do not use WEP, it's weak).

1. Disable WPS:

* Turn off WPS (Wi-Fi Protected Setup) as it can be easily hacked.

1. Hide SSID (Optional):

* Disable SSID broadcast to hide your network from others.

1. Enable Firewall:

* Turn on the router's built-in firewall for added protection.

1. Update Router Firmware:

* Regularly check and install firmware updates from the router's settings.

# **Section 5: Essay**

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

Ans :-

Network documentation means writing all important details about a computer network.

* Importance:

Helps in fixing problems quickly

Saves time during changes

Easy for new people to understand

Keeps network safe

Useful in emergencies

* What to document:

Network diagram

IP addresses

Device names and locations

Router settings

Usernames and passwords (safe)

Software and backup info