**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

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

d) Managing user authentication and access control

**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

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

d) Routing data packets between network segments

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

**Ans: a) Star**

b) Bus

c) Ring

d) Mesh

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

a) HTTP

**Ans: b) FTP**

c) SMTP

d) POP3

**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:**

Here’s difference between a **hub** and a **switch** in a computer network:

| **Feature** | **Hub** | **Switch** |
| --- | --- | --- |
|  |  |  |
| **Function** | Broadcasts data to all devices on the network. | Sends data directly to the intended device. |
| **Efficiency** | Less efficient—creates more network traffic. | More efficient—reduces unnecessary traffic. |
| **Speed** | Slower, as all devices share bandwidth. | Faster, as each device gets dedicated bandwidth. |
| **Data Handling** | Cannot filter or manage data. | Filters and directs data intelligently. |
| **Cost** | Cheaper. | Slightly more expensive. |
| **Use Case** | Small, simple networks. | Larger, more complex networks. |

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

**Ans:**

Here’s a process for troubleshooting network connectivity issues:

1. **Check Physical Connections:**
   * Ensure cables are plugged in and the router or switch is powered on.
2. **Restart Devices:**
   * Restart your computer, router, and modem.
3. **Check Wi-Fi or Network Settings:**
   * Make sure your device is connected to the correct network.
4. **Ping Test:**
   * Use the command ping to test connectivity to a website (e.g., ping google.com).
5. **Check IP Configuration:**
   * Ensure your device has the correct IP address (use ipconfig or ifconfig).
6. **Disable and Re-enable Network Adapter:**
   * Reset the adapter in your computer's network settings.
7. **Check for ISP Issues:**
   * Contact your Internet Service Provider if nothing works.
8. **Test with Another Device:**
   * See if another device can connect to rule out hardware issues.

**Section 4: Practical Application**

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

**Ans:**

Here’s to configure a wireless router’s security settings:

1. **Log In to the Router:**
   * Connect to the router and enter its IP address (e.g., 192.168.1.1) in a browser.
   * Log in using the admin username and password.
2. **Change the Default Password:**
   * Go to the **Admin Settings** and set a strong password for the router.
3. **Enable WPA3 or WPA2 Security:**
   * In **Wireless Settings**, select **WPA3** or **WPA2-PSK** for strong encryption.
   * Set a strong Wi-Fi password.
4. **Disable WPS (Wi-Fi Protected Setup):**
   * Turn off WPS to prevent easy access to the network.
5. **Enable Firewall:**
   * Activate the router’s built-in firewall for added protection.
6. **Hide SSID (Optional):**
   * Hide your network name (SSID) so it's not visible to others.
7. **Update Firmware:**
   * Check for updates in the **Firmware Settings** and install the latest version.
8. **Save and Restart:**
   * Save changes and restart the router.

**Section 5: Essay**

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

### Ans:

### Importance of Network Documentation:

Network documentation is essential for managing, troubleshooting, and scaling a network effectively. It helps:

* **Troubleshooting:** Quickly identify and fix issues.
* **Management:** Keep track of devices and configurations.
* **Planning:** Simplify upgrades or expansions.
* **Collaboration:** Share network details with IT teams.
* **Security:** Identify unauthorized devices or access.

**Examples of Information to Document:**

1. **Network Topology:**
   * Diagram showing how devices (routers, switches, computers) are connected.
2. **IP Addressing:**
   * List of all IP addresses and the devices assigned to them.
3. **Device Details:**
   * Information like device names, models, serial numbers, and locations.
4. **Login Credentials:**
   * Admin usernames and passwords for routers, switches, and firewalls (stored securely).
5. **Configuration Settings:**
   * Current settings for devices (e.g., firewall rules, VLANs, or wireless SSIDs).
6. **Cable Layouts:**
   * Map of physical cable connections between devices.
7. **Backup Information:**
   * Locations of configuration backups and how to restore them.