**Module 5:- Networking**

**Section 1: Multiple Choice**

**1. What is the primary function of a router in a computer network?**

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

A router’s primary function is to forward data packets between different networks, directing traffic based on IP addresses.

**2. What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network?**

* **d) Dynamically assigning IP addresses to devices**

DHCP automatically assigns IP addresses to devices on a network, eliminating the need for manual configuration.

**3. Which network device operates at Layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses?**

* **b) Switch**

A switch operates at Layer 2 and forwards data packets based on the MAC addresses of devices in the network.

**4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?**

* **b) Bus**

In a bus topology, all devices are connected to a single central cable or backbone, forming a linear path for data transmission.

**True or False:**

**5. A VLAN (Virtual Local Area Network) allows network administrators to logically segment a single physical network into multiple virtual networks, each with its own broadcast domain.**

* **True**

A VLAN allows administrators to divide a single physical network into several logical networks, providing better management and security.

**6. TCP (Transmission Control Protocol) is a connectionless protocol that provides reliable, ordered, and error-checked delivery of data packets over a network.**

* **False**

TCP is a **connection-oriented** protocol, ensuring reliable, ordered, and error-checked delivery. UDP (User Datagram Protocol) is the connectionless protocol.

**7. A firewall is a hardware or software-based security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.**

* **True**

Firewalls are used to control the flow of network traffic based on predefined security rules, helping protect networks from unauthorized access.

**Section 5: Essay**

**8. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.**

**Answer:**

1. **Select a Router**: Choose a wireless router with the appropriate speed, range, and security features.
2. **Connect the Router to the Internet**: Plug the router into the modem to provide internet access.
3. **Configure the Router Settings**: Access the router’s web interface (usually through a browser) to configure SSID (network name), password, and security settings (WPA2 or WPA3).
4. **Enable Wireless Security**: Set up encryption (WPA2 or WPA3) to secure the wireless network and prevent unauthorized access.
5. **Assign IP Range**: Ensure the router’s DHCP server is enabled to automatically assign IP addresses to devices on the network.
6. **Connect Devices**: Connect devices like computers, smartphones, and printers to the wireless network using the SSID and password.
7. **Test the Network**: Ensure that all devices are connected and that the internet is accessible.

**10. Discuss the importance of network documentation in the context of building and managing networks.**

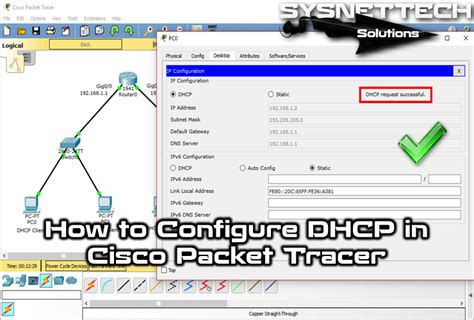
**Answer:** Network documentation is essential for the efficient management and troubleshooting of networks. It helps with:

1. **Network Planning and Design**: Provides a clear understanding of the network layout and helps plan for growth and scalability.
2. **Troubleshooting**: In the event of a problem, accurate documentation allows IT professionals to quickly identify and address issues by understanding the network’s structure.
3. **Security**: Proper documentation helps identify potential security risks and ensures that all devices and network segments are properly secured.
4. **Compliance and Auditing**: It is crucial for regulatory compliance and for auditing purposes. Documentation of network configurations, access controls, and software versions is necessary for industry standards.
5. **Knowledge Sharing**: It ensures that others in the organization can understand and maintain the network, even if the original administrators leave or are unavailable.

**Section 5: Essay**

**9. Demonstrate how to configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol).**

**Answer:**



1. **Connect the Router to the Modem**: Plug the router into the modem using an Ethernet cable. Ensure the modem is connected to the Internet.
2. **Access the Router’s Admin Interface**: Open a web browser and enter the router’s IP address (usually 192.168.1.1 or 192.168.0.1) to access the configuration page.
3. **Log in to the Router**: Enter the router’s default username and password (usually found on the router label or user manual).
4. **Enable DHCP**: Navigate to the DHCP settings and ensure that DHCP is enabled. This allows the router to automatically assign IP addresses to devices on the network.
5. **Set the DHCP Range**: Define the range of IP addresses that the router can assign to devices. For example, you might set it to assign IPs between 192.168.1.100 and 192.168.1.200.
6. **Configure DNS Settings**: The router should use your ISP’s DNS servers by default, or you can specify public DNS servers (such as Google DNS or OpenDNS).
7. **Save and Apply Settings**: Save the changes and restart the router if necessary.
8. **Test the Connection**: Once the router is configured, connect a device (e.g., a laptop or smartphone) to the router. It should automatically receive an IP address and gain Internet access.