Name:- Meet Nitinkumar Joshi

MODULE 5 - NETWORK FUNDAMENTALS AND BUILDING NETWORKS

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
Explanation:- The router is mainly used to forward data packets between different networks. It does not assign IP addresses or provide wireless connectivity, that is done by other devices or protocols. Also, managing user authentication is not router's primary job, so the correct answer is c.

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

a) Assigning static IP addresses to devices
b) Resolving domain names to IP addresses
c) Managing network traffic and congestion
d) Dynamically assigning IP addresses to devices

Ans:- d) Dynamically assigning IP addresses to devices
Explanation:- DHCP is used for automatically and dynamically assign IP address to devices in a network. It simplifies the management because it automatically give IP to each device when it join the network. It's not for static IP, resolving domain name or network congestion, so option d is correct.

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

a) Router
b) Switch
c) Hub
d) Repeater

Ans:- b) Switch
Explanation:- A switch operates on Layer 2 of the OSI model, meaning it works with MAC addresses to forward data within a network. Routers work on Layer 3 with IP addresses, Hubs are basic devices, and Repeaters just amplify signals, so b is the right choice here.

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

a) Star
b) Bus
c) Ring
d) Mesh

Ans:- b) Bus

Explanation:- Bus topology connects all devices in a line to a single cable, called a backbone. This is a simple setup but if the backbone fails, the whole network can be down. Star has a central hub, Ring connects in a circle and Mesh has many connections, so b is the right one.

Section 2: True OR False

True or False: 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.

Ans: True

Explanation: VLANs are used by network administrators to divide one physical network into several virtual networks. Each VLAN works as if it is a separate network with its own broadcast domain. This makes it easier to manage and secure different parts of the network even though they are on the same physical hardware.

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

Ans: False

Explanation: TCP is actually a connection-oriented protocol, not connectionless. It creates a connection between the sending and receiving devices before any data is sent, ensuring reliable, ordered, and error-checked delivery. The term "connectionless" is more associated with UDP (User Datagram Protocol), which does not establish a connection and does not guarantee reliability.

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

Explanation: A firewall acts as a barrier between your internal network and external networks, like the internet. It monitors the data that comes in and goes out, blocking or allowing traffic based on a set of security rules. This helps protect the network from unauthorized access and cyber threats.

8. Describe the steps involved in setting up a wireless network for a small Office or home Office (SOHO) environment.
Ans:-

1. Choose the Right Equipment:- First, you need a wireless router. Make sure it's suitable for your office size and the number of devices you'll connect.

2. Place the Router:- Put the router in a central location to ensure good coverage throughout the office. Avoid placing it near walls or other electronic devices that could interfere with the signal.

3. Connect the Router to the Modem:- Use an Ethernet cable to connect the router to your modem, which provides the internet connection.

4. Power On and Configure the Router:- Plug in the router, turn it on, and connect a computer to the router via Ethernet cable for the initial configuration.

5. Access Router’s Configuration Interface:- Open a web browser and enter the router's IP address (usually something like 192.168.1.1) to access the configuration page.

6. Set Up the Wireless Network:- In the configuration page, you’ll be able to set the SSID (network name) and the security mode, typically WPA2 for better security. Set a strong password to protect your network.

7. Configure Other Settings:- You can also set up guest networks, change the router's admin password, and configure the DHCP settings if needed.

8. Test the Connection:- Once everything is configured, disconnect the Ethernet cable, connect wirelessly, and make sure you can access the internet. Test with multiple devices to ensure proper setup.

Explanation:- Setting up a wireless network in a SOHO environment is straightforward but requires careful consideration of equipment, placement, and security. Ensuring a strong and secure network setup is vital for both internet access and protecting sensitive business data.

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

Ans:-

1. Access the Router's Interface:- Connect a computer to the router using an Ethernet cable. Open a web browser and type in the router's IP address to access the admin interface.

2. Log In:- Enter the router's username and password. This information is usually provided in the router's manual or printed on the router itself.

3. Navigate to the Internet Setup Section:- Look for a section in the menu that says "Internet," "WAN," or "Internet Setup."

4. Select DHCP (Automatic Configuration):- In the Internet setup, choose the option for "DHCP" or "Automatic Configuration." This setting allows the router to automatically obtain an IP address from your ISP (Internet Service Provider).

5. Save and Apply Settings:- After selecting DHCP, save the settings. The router may restart to apply the changes.

6. Test the Internet Connection:- After the router has rebooted, try accessing a website from a connected device to ensure the Internet connection is working.

Explanation:- Configuring a router using DHCP is one of the easiest methods for getting internet access. DHCP automatically assigns IP addresses, making the process smooth and quick, ideal for users with minimal networking knowledge.

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

Ans:-
Network documentation is crucial for several reasons in building and managing networks:

1. Ease of Troubleshooting:- When issues arise, having detailed documentation allows network administrators to quickly identify the problem area and apply fixes without wasting time.

2. Efficient Management:- Documentation provides a clear overview of the network structure, including IP addresses, device configurations, and connection paths, which makes management more straightforward and organized.

3. Security:- Proper documentation includes records of security protocols and access controls, helping to ensure that the network remains secure against unauthorized access.

4. Scalability:- As networks grow, documentation helps in planning and integrating new devices and segments into the existing infrastructure without causing disruptions.

5. Knowledge Transfer:- In case of staff changes, well-documented networks allow new administrators to quickly understand the network's setup and continue operations smoothly.

Explanation:- Network documentation is like a blueprint for your network. Without it, managing, securing, and expanding a network can become chaotic and risky. It ensures continuity, security, and efficiency in network operations.