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Assignment: Network Fundamentals and Building 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

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

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

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

a) Star

b) Bus

c) Ring

d) Mesh

ANS – [B] Bus

Section 2: 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.

ANS – True

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

ANS – False

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.

ANS – True

Section 3: Short Answer

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.

Section 4: Practical Application

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.

Section 5: Essay

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:

* **Ease of Troubleshooting:-** When issues arise, having detailed documentation allows network administrators to quickly identify the problem area and apply fixes without wasting time.
* **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.
* **Security:-** Proper documentation includes records of security protocols and access controls, helping to ensure that the network remains secure against unauthorized access.
* **Scalability:-** As networks grow, documentation helps in planning and integrating new devices and segments into the existing infrastructure without causing disruptions.
* **Knowledge Transfer:-** In case of staff changes, well-documented networks allow new administrators to quickly understand the network’s setup and continue operations smoothly.