Name: Ashish kumar sahni

**Assignment Module 4: 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

**Explain:** A router work like to move data between different network, like our home network and the internet. When we send something online the router takes the data, breaks it into small pieces called packets, and checks where it needs to go. It looks at the packets address, kind of like a mailing address, and figures out the best path to send it on.

**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

**Explain:** The purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network to provide a IP address through DHCP server. The server picks an available one and gives it to the device so it can communicate with others. This process happens automatically, so you don’t have to set up IP addresses manually.

**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

**Explain:** This device work on layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses.

**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

**Explain:** Bus topology that connects all devices in a with a linear fashion with each device connected to a central cable or backbone cable.

**Section 2: True or False**

**5. 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 because this segmentation helps in organizing and managing network traffic more efficiently through 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.

**6. 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

Explain: TCP (Transmission Control Protocol) is connection-oriented, meaning it establishes a connection before sending data. It ensures reliable, ordered delivery by using acknowledgments and retransmissions, and it checks for errors with checksums.

**7. 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

**Explain:** A firewall is a tool, either a piece of hardware or software, that watches and controls the traffic going in and out of a network based on set security rules. It helps protect the network by letting good traffic through and blocking bad traffic.

**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:** Setting up a wireless network for a small office or home office (SOHO) have several steps.

1. Get Equipment: Buy a wireless router and, if needed, a modem.
2. Connect things like modem to router using and Ethernet cable to plug the modem into the router and turn on the modem and router.
3. Access Router connect: Hook up to the router’s default Wi-Fi or use and Ethernet cable.

Login: Type the router’s IP address into a browser and login.

1. Set up wireless by change name through pick a unique network name (SSID) and set password which will be strong password and after selecting security use WPA2 OR WPA3 encryption.
2. Adjust settings through changing admin password updating the default router password and setup DHCP or static IPs.
3. Connect Devices link your devices to the new Wi-Fi network.
4. Test through make sure everything connects and works.
5. Keep the router updated and review security settings.

**Section 4: Practical Application**

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

**Ans:** To configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol)

1. Plug your computer into the router with an Ethernet cable or connect to the router’s Wi-Fi
2. Then open browser and type router’s IP like “192.168.1.1”

After and login with the default username and password

1. Look for “DHCP” or “LAN Setting” in the router settings
2. Make sure that DHCP is enabled so the router can give out IP addresses.
3. Set Internet first go to Internet or WAN settings then choose “Dynamic IP” or “DHCP” for the connection type.
4. Reboot the router to make everything work.
5. Our devices should now get IP addresses and access the Internet.
6. Check for making sure everything is connected and working.

**Section 5: Essay**

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

**and managing networks.**

**Ans:** Network documentation is super important for a few reasons:

1. Planning it helps you plan and design the network by showing how everything should be connected.
2. Fixing problems when something goes wrong documentation helps you figure out what’s wrong and fix it faster.
3. Keeping up it makes it easier to keep everything working well and do upgrades by showing what changes have been made.
4. Following rules good docs make sure you follow any rules or standards you need to.
5. Training new team members can use the docs to learn about the network quickly.
6. Disaster recovery if something bad happens, the docs help you get everything back up and running.
7. Security it helps keep track of security settings and find any weak spots.