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Assignment module 3 : A+ - Understanding And Maintenance Of 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. All of the above

   Note. All of the above

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
   c) Converting domain names to IP addresses
   d) Routing data packets between network segments

   ans. C) converting domain names to IP addresses.

   Note: Converting domain names to IP addresses purpose of domain name system in a computer network.

3. What type of network topology uses a centralized hub or switch to connect all devices?
   a) Star
   b) Bus
   c) Ring
   d) Mesh

   Ans: a) star

   Note: star network topology uses a centralized hub or switch to connect all devices.

4. Which network protocol is commonly used for securely accessing and transferring files over a network?
   a) HTTP
   b) FTP

c) SMTP

d) POP3

Ans: a) http

Note: hyper text transfer protocol network protocol is commonly used for securely accessing and transferring files over a network.

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

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

6. True or False: DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.

Ans: false

Note. DHCP (Dynamic Host Configuration Protocol) assigns *dynamic* IP addresses to network devices automatically.

7. True or False: VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.

Ans: true

Note: yes VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.

Section 3: Short Answer

8. Explain the difference between a hub and a switch in a computer network.

Ans:

Sr no	Hub	switch
1	It is broadcast device.	It is multicast device.

2	Only one device can send data at a time.	Multiple device can send data at same time.
3	Does not store any device information.	Store and uses mac addresses to transfer data.

9. Describe the process of troubleshooting network connectivity issues.

Ans: Troubleshooting network connectivity issues involves systematically identifying and resolving problems that prevent devices from communicating on a network.

1. Identify the problem.
2. Check physical connection.
3. Test basic connectivity.
4. Ip configuration.

Section 4: Practical Application

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

Ans:

1. **Log in to Router Settings**: Use the IP address in a browser (e.g., 192.168.1.1) and enter admin credentials.
2. **Change Admin Password**: Set a unique, strong password for the router's login.
3. **Use WPA3 or WPA2 Encryption**: Select WPA3 or WPA2-PSK (AES) for Wi-Fi security in Wireless Security settings.
4. **Set Strong Wi-Fi Password**: Choose a complex Wi-Fi password.
5. **Disable WPS**: Turn off WPS for added security.
6. **Rename the Network (SSID)**: Avoid using default names; pick something unique and non-identifiable.
7. **Enable Firewall**: Activate the router's firewall if available.
8. **Disable Remote Management**: Prevent external access to router settings.
9. **Update Firmware**: Regularly check for and install firmware updates.
10. **Use Guest Network for Visitors**: Isolate guest traffic from your main network.

Section 5: Essay

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

Ans: Network documentation is crucial for effectively managing and maintaining a network.

Importance of Network Documentation

1. **Streamlined Troubleshooting**: When issues arise, well-maintained documentation enables IT staff to quickly locate devices, identify configurations, and understand data flow, significantly reducing downtime.
2. **Enhanced Security**: Documenting security settings and access controls helps to ensure that best practices are followed and allows for regular audits to identify potential vulnerabilities.
3. **Efficient Network Changes and Upgrades**: With documentation, network changes, expansions, and upgrades are easier to plan and execute, reducing the risk of errors.
4. **Compliance and Audit Readiness**: Many industries have compliance requirements that include secure network design and documentation.
5. **Knowledge Sharing**: Documentation ensures that knowledge about the network isn't isolated to specific individuals, reducing the risk of disruption if a key administrator is unavailable.

Key Information to Document :

1. **Network Topology**:
   - Diagrams that show the layout and structure of the network, including how devices are connected and the types of connections used (e.g., Ethernet, fiber, Wi-Fi).
2. **Device Configurations**:
   - Settings for routers, switches, firewalls, wireless access points, and other devices.
3. **IP Addressing Scheme**:
   - List of all IP addresses in use, including static and dynamic addresses.
4. **Access Controls**:
   - Documentation of user roles, permissions, and access policies for network devices and systems.
5. **Cabling and Physical Connections**:
   - Information on cabling types (e.g., Cat6, fiber optic), lengths, and the physical layout of cables within the network infrastructure.
6. **Network Policies and Procedures**:
   - Documented policies for network usage, security protocols, and backup procedures.

7. **Maintenance and Support Information**:
   - Maintenance schedules, support contacts, and warranty information for network hardware and software.