

Assignment Module 3: Understanding and Maintenance of Networks

Section 1: Multiple Choice

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

Answer: Forwarding data packets between networks.

2. What is the purpose of DNS in a computer network?

Answer: Converting domain names to IP addresses.

3. Which network topology uses a centralized hub or switch?

Answer: Star topology.

4. Which network protocol is commonly used for securely accessing and transferring files?

Answer: FTP.

Section 2: True or False

5. A firewall controls incoming and outgoing network traffic based on security rules.

Answer: True.

6. DHCP assigns static IP addresses automatically.

Answer: False.

7. VLANs divide a physical network into multiple logical networks.

Answer: True.

Section 3: Short Answer

8. Explain the difference between a hub and a switch.

A hub sends data to all connected devices, while a switch sends data only to the intended device using MAC addresses.

9. Describe the process of troubleshooting network connectivity issues.

- Check physical connections.
- Verify IP configuration.
- Use ping or ipconfig commands.
- Restart devices.
- Check firewall or antivirus settings.

Section 4: Practical Application

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

- Log in to the router admin panel.

- Change default credentials.
- Enable WPA2/WPA3 encryption.
- Set a strong Wi-Fi password.
- Disable WPS.
- Save and reboot.

Section 5: Essay

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

Importance of Network Documentation:

1. Improves Network Management:

- Provides a clear overview of the entire network infrastructure.
- Helps administrators understand how routers, switches, servers, and clients are interconnected.
- Makes configuration and monitoring more organized and systematic.

2. Reduces Troubleshooting Time:

- Helps quickly identify faulty devices or incorrect configurations.
- Allows easy tracking of IP address assignments and VLAN settings.
- Minimizes downtime by providing ready reference information.

3. Enhances Network Security:

- Maintains records of firewall rules and access control lists.
- Tracks authorized devices and user permissions.
- Helps detect unauthorized access or suspicious changes.

4. Supports Expansion and Upgrades:

- Assists in planning new device installations.
- Prevents IP conflicts and configuration errors during expansion.
- Helps estimate bandwidth and hardware requirements.

5. Assists in Staff Handover:

- Enables new administrators to understand the network quickly.
- Reduces dependency on one individual for network knowledge.
- Ensures smooth transition during role changes.

6. Ensures Compliance and Accountability:

- Maintains audit trails of configuration changes.
- Keeps maintenance and upgrade history records.
- Supports organizational and legal compliance requirements.

Examples of Information to be Documented:

1. Network Diagrams:

- Logical and physical network layouts.
- Connections between routers, switches, and servers.

2. IP Addressing Scheme:

- List of static and dynamic IP addresses.
- Subnet masks, gateways, and DNS settings.

3. Device Configurations:

- Router and switch configuration backups.
- Firewall and security settings.

4. Cabling Layout:

- Type of cables used (Ethernet, fiber optic).
- Port numbers and patch panel details.

5. Access Credentials Records:

- Secure storage of admin usernames.
- Wi-Fi SSID and encryption type details.

6. Maintenance Logs:

- Firmware update dates.
- Troubleshooting records.
- Hardware replacement history.

Conclusion:

Network documentation is essential for effective management, troubleshooting, security, and future planning. Proper documentation ensures smooth network operations, reduces downtime, and improves long-term efficiency and reliability.