**Assignment module 6: Network Security, Maintenance, and Troubleshooting Procedures**

**Section 1: Multiple Choice**

1. What is the primary purpose of a firewall in a network security infrastructure?

⇒ b) Filtering and controlling network traffic

2. What type of attack involves flooding a network with excessive traffic to disrupt normal operation?

=> a) Denial of Service (DoS)

3. Which encryption protocol is commonly used to secure wireless network communications?

⇒ b) WPA (Wi-Fi Protected Access)

4. What is the purpose of a VPN (Virtual Private Network) in a network security context?

⇒ create a secure, encrypted connection (a “tunnel”) over an untrusted network such as the Internet.

**Section 2: True or false**

True or False: Patch management is the process of regularly updating software and firmware to address security vulnerabilities and improve system performance.

⇒ True

True or False: A network administrator should perform regular backups of critical data to prevent data loss in the event of hardware failures, disasters, or security breaches.

⇒ True

True or False: Traceroute is a network diagnostic tool used to identify the route and measure the latency of data packets between a source and destination device.

⇒ True

**Section 3: Short** **answer**

8. Describe the steps involved in conducting a network vulnerability Assignment.

⇒ **Steps in a Network Vulnerability Assessment:**

1. **Planning** – Define scope, objectives, and assets to be tested.
2. **Scanning** – Use tools to scan for open ports, services, and known vulnerabilities.
3. **Analysis** – Review scan results to identify security weaknesses.
4. **Prioritization** – Rank vulnerabilities based on risk and impact.
5. **Remediation** – Apply patches, fixes, or configuration changes.
6. **Reporting** – Document findings and actions taken.
7. **Re-testing** – Verify that vulnerabilities are resolved.

**Section 4: Practical Application**

9. Demonstrate how to troubleshoot network connectivity issues using the ping command.

⇒ **Troubleshooting with ping:**

1. **Ping localhost (127.0.0.1)** → Check if TCP/IP stack is working.
2. **Ping your own IP address** → Verify network card is functioning.
3. **Ping default gateway** → Test connection to local network/router.
4. **Ping external IP (e.g., 8.8.8.8)** → Check internet connectivity.
5. **Ping domain name (e.g., google.com)** → Verify DNS resolution.

**Section 5:**

10. Discuss the importance of regular network maintenance and the key tasks involved in maintaining network infrastructure.

⇒ **Importance of Regular Network Maintenance:**

* Keeps the network **secure, stable, and fast**.
* Prevents **downtime, data loss, and security breaches**.
* Ensures systems run at **optimal performance**.

**Key Tasks Involved:**

1. **Apply updates/patches** to software, firmware, and devices.
2. **Monitor performance** (bandwidth, latency, uptime).
3. **Check logs** for unusual activity.
4. **Backup data** regularly.
5. **Test security** (firewalls, antivirus, vulnerability scans).
6. **Replace faulty hardware** and upgrade when needed.

1. Which of the following best describes the purpose of a VPN (Virtual Private Network)?

⇒ a) Encrypting network traffic to prevent eavesdropping