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**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?**

**Ans :** Filtering and controlling network traffic

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

**Ans :** Denial of Service (DoS)

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

**Ans :** WPA (Wi-Fi Protected Access)

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

**Ans :** A VPN creates a secure, encrypted connection over a less secure network (like the internet), ensuring privacy and data protection while accessing remote networks.

* **Section 2 : True or False**

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

**Ans :** True

1. **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.**

**Ans :** True

1. **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.**

**Ans : True**

* **Section 3 : short answers**

1. **Describe the steps involved in conducting a network vulnerability Assignment.**

**Ans**.

* Collect information about the network and devices (IP addresses, operating systems, and services).
* Use vulnerability scanning tools to identify weaknesses in systems, services, and applications.
* Review results of the scans to identify and assess the possible risks.
* **Section 4 : Practical Application**

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

**Ans.**

* Open a Command Prompt or Terminal on your computer.
* Type the command ping <IP address or domain name> (e.g., ping 8.8.8.8 or ping [www.google.com](http://www.google.com)).
* Press Enter.
* If the ping is successful, you'll receive replies with information about packet loss and round-trip times.
* If it fails, check the following:
* Ensure the device is connected to the network.
* Verify that the IP address or domain name is correct.
* Check if there is a firewall blocking the traffic.
* Run the tracert (Windows) or traceroute (Linux/macOS) command to identify where the issue occurs in the route.
* **Section 5 : Essay**

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

**Ans**. The network, if maintained on a regular basis, runs efficiently, securely, and reliably. Over time, network devices, systems, and applications may succumb to wear and tear, leading to poor performance, security vulnerabilities, or even failures. This involves the major tasks of :

**Network Performance Monitoring**: Continuously monitoring network traffic, server loads, and device performance to ensure everything is running optimally.

**Patching and Updates**: Regular application of patches and software updates to fix known vulnerabilities, improve performance, and prevent security breaches.

**Data Backup and Disaster Recovery:** Making sure backups of important data are regularly carried out and safely stored to ensure that they can be restored in case of data loss or a system failure.

**Security Audits and Threat Detection:** Periodically reviewing the security posture of the network to detect weaknesses and institute countermeasures, such as firewalls, intrusion detection systems, and antivirus software.

**Configuration Management**: Maintaining an inventory of network devices and ensuring that configurations are properly documented and up to date.

**Troubleshooting and Resolving Issues:** Promptly identifying and resolving issues like network downtime, slow performance, or connectivity problems to maintain service levels.

**Capacity Planning:** Analyzing network traffic trends and planning for future growth, including upgrading hardware or adjusting network architecture.