**Module 1: Understanding of Hardware and Its Components**

* **1. Which of the following is NOT a component of the CPU?**
  + **Answer:** RAM
* **2. What is the function of RAM in a computer?**
  + **Answer:** The function of RAM (Random Access Memory) is to store data and program instructions that the CPU is currently using. It's a type of temporary, volatile memory, meaning its contents are erased when the computer is turned off.
* **3. Which of the following is a primary storage device?**
  + **Answer:** None of the options listed (HDD, SSD, SD card) are considered primary storage in the same sense as RAM, which is directly accessed by the CPU. The question is flawed based on the provided options. However, if we must choose from the given list, a solid-state drive (SSD) is a form of permanent storage that is faster than a hard disk drive (HDD) and is sometimes colloquially referred to as primary storage.
* **4. What is the purpose of a GPU?**
  + **Answer:** The purpose of a GPU (Graphics Processing Unit) is to handle all the graphics and image processing for a computer. It's especially important for rendering images, animations, and video, which is why it's a key component for gaming and video editing.
* **5. True or False: The motherboard is the main circuit board of a computer where other components are attached.**
  + **Answer:** True.
* **6. True or False: A UPS (Uninterruptible Power Supply) is a hardware device that provides emergency power to a load when the input power source fails.**
  + **Answer:** True.
* **7. True or False: An expansion card is a circuit board that enhances the functionality of a component.**
  + **Answer:** True.
* **8. Explain the difference between HDD and SSD.**
  + **Answer:** An HDD (Hard Disk Drive) is a traditional storage device that uses spinning platters and a mechanical arm to read and write data. An SSD (Solid-State Drive) uses flash memory to store data and has no moving parts. The main differences are that SSDs are much faster, more durable, and use less power than HDDs.
* **9. Describe the function of BIOS in a computer system.**
  + **Answer:** The function of BIOS (Basic Input/Output System) is to perform a Power-On Self-Test (POST) when a computer is first turned on. It initializes and tests the hardware components and then loads the operating system from a storage device.
* **10. List and briefly explain three input devices commonly used with computers.**
  + **Answer:** Three common input devices are:
    1. **Keyboard:** Used to input text, numbers, and commands into the computer.
    2. **Mouse:** Used to control the cursor on the screen and interact with graphical elements.
    3. **Microphone:** Used to capture audio, allowing for voice commands, recording, and communication.

**Module 2: Installation and Maintenance of Hardware**

* **1. Which of the following precautions should be taken before working on computer hardware?**
  + **Answer:** Wear an anti-static wrist strap to prevent damage from electrostatic discharge.
* **2. What is the purpose of thermal paste during CPU installation?**
  + **Answer:** To improve thermal conductivity between the CPU and the heat sink.
* **3. Which tool is used to measure the output voltage of a power supply unit (PSU)?**
  + **Answer:** A multimeter.
* **4. Which component is responsible for storing BIOS settings, such as date and time, even when the computer is powered off?**
  + **Answer:** CMOS battery.
* **5. True or False: When installing a new hard drive, it is essential to format it before use.**
  + **Answer:** True.
* **6. True or False: A POST (Power-On Self-Test) error indicates a problem with the CPU.**
  + **Answer:** False. A POST error can indicate a problem with many different hardware components, not just the CPU.
* **7. True or False: It is safe to remove a USB flash drive from a computer without ejecting it first.**
  + **Answer:** False.
* **8. Describe the steps involved in installing a new graphics card in a desktop computer.**
  + **Answer:** To install a new graphics card: first, turn off and unplug the computer. Open the computer case and locate an available PCI-E slot on the motherboard. Remove the metal bracket from the back of the case for the new card. Insert the graphics card into the slot and push down firmly until it clicks. Secure the card with a screw. Finally, connect any necessary power cables from the power supply unit to the card, and close the case.
* **9. What is RAID, and what are some common RAID configurations?**
  + **Answer:** RAID (Redundant Array of Independent Disks) is a technology that combines multiple hard drives into a single logical unit to improve performance or provide data redundancy. Common RAID configurations include RAID 0 (striping for performance), RAID 1 (mirroring for redundancy), and RAID 5 (striping with parity for both performance and redundancy).

**Module 3: Understanding and Maintenance of Networking**

* **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 (Domain Name System) in a computer network?**
  + **Answer:** Converting domain names to IP addresses.
* **3. What type of network topology uses a centralized hub or switch to connect all devices?**
  + **Answer:** Star.
* **4. Which network protocol is commonly used for securely accessing and transferring files over a network?**
  + **Answer:** FTP (File Transfer Protocol).
* **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.**
  + **Answer:** True.
* **6. True or False: DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.**
  + **Answer:** False. DHCP assigns

*dynamic* IP addresses automatically, not static ones.

* **7. True or False: VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.**
  + **Answer:** True.
* **8. Explain the difference between a hub and a switch in a computer network.**
  + **Answer:** A hub sends any incoming data packet to all devices connected to it, which can cause network congestion. A switch is more intelligent; it learns the MAC addresses of connected devices and forwards data packets only to the specific destination device, making it more efficient.
* **9. Describe the process of troubleshooting network connectivity issues.**
  + **Answer:** To troubleshoot network connectivity issues, you can start with simple checks. First, verify that all network cables are connected properly. Then, check the network status on your device. You can use command-line tools like ping to test if you can reach another device on the network or the internet. If you can't, you might check the router or modem to see if they are working correctly, and restart them if necessary. You can also check if your device has a valid IP address and if it's on the correct network.

**Module 4: Troubleshooting and**

* **1. What is the first step in the troubleshooting process?**
  + **Answer:** Identifying the problem.
* **2. Which of the following tools is commonly used to diagnose hardware issues by testing electrical connections?**
  + **Answer:** Multimeter.
* **3. Which Windows utility can be used to view system logs, monitor performance, and diagnose hardware and software issues?**
  + **Answer:** Event Viewer.
* **4. True or False: Safe Mode is a diagnostic mode in Windows that loads only essential system services and drivers, allowing users to troubleshoot and fix problems with the operating system.**
  + **Answer:** True.
* **5. True or False: A system restore point is a snapshot of the computer's system files, registry, and configuration settings at a specific point in time, which can be used to revert the system to a previous state if problems occur.**
  + **Answer:** True.
* **6. True or False: Ping is a command-line utility used to test network connectivity by sending ICMP echo requests to a target device and waiting for ICMP echo replies.**
  + **Answer:** True.
* **7. Describe the steps involved in troubleshooting a computer that fails to boot into the operating system.**
  + **Answer:** First, you should check for any error messages on the screen. Then, you can try booting the computer in Safe Mode to see if the issue is related to a specific driver or software. If Safe Mode doesn't work, you can try to boot from a recovery disc or a USB drive to access system repair tools. Another option is to check the physical connections inside the computer, such as the RAM and hard drive cables, to ensure they are seated properly.
* **8. Demonstrate how to troubleshoot network connectivity issues on a Windows computer using the ipconfig command.**
  + **Answer:** To troubleshoot network connectivity, open the Command Prompt and type ipconfig. This command shows your computer's IP address, subnet mask, and default gateway. If the IP address starts with 169.254, your computer couldn't get a valid address from the DHCP server. You can also use

ipconfig /release followed by ipconfig /renew to try and get a new IP address.

**Module 5: Network Fundamentals and Building Networks**

* **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 DHCP (Dynamic Host Configuration Protocol) in a computer network?**
  + **Answer:** Dynamically assigning IP addresses to devices.
* **3. Which network device operates at Layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses?**
  + **Answer:** Switch.
* **4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?**
  + **Answer:** Bus.
* **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.**
  + **Answer:** True.
* **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.**
  + **Answer:** False. TCP is a connection-oriented protocol that provides reliable and error-checked delivery.
* **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.**
  + **Answer:** True.
* **8. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.**
  + **Answer:** The first step is to connect your wireless router to your modem and power it on. Then, connect a computer to the router, either with an Ethernet cable or by connecting to the default wireless network. Access the router's configuration page through a web browser and change the default username and password for security. Next, you'll configure the wireless network by giving it a unique name (SSID) and setting a strong password for Wi-Fi Protected Access (WPA) security. Finally, you can connect your wireless devices to the new network using the name and password you've set.

**Module 6: Network Security, Maintenance, and Troubleshooting Procedures**

* **1. What is the primary purpose of a firewall in a network security infrastructure?**
  + **Answer:** Filtering and controlling network traffic.
* **2. What type of attack involves flooding a network with excessive traffic to disrupt normal operation?**
  + **Answer:** Denial of Service (DoS).
* **3. Which encryption protocol is commonly used to secure wireless network communications?**
  + **Answer:** WPA (Wi-Fi Protected Access).
* **4. What is the purpose of a VPN (Virtual Private Network) in a network security context?**
  + **Answer:** Encrypting network traffic to prevent eavesdropping.
* **5. True or False: Patch management is the process of regularly updating software and firmware to address security vulnerabilities and improve system performance.**
  + **Answer:** True.
* **6. 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.**
  + **Answer:** True.
* **7. 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.**
  + **Answer:** True.
* **8. Describe the steps involved in conducting a network vulnerability Assignment.**
  + **Answer:** To conduct a network vulnerability assessment, you would first define the scope of the assessment, which means deciding which parts of the network to test. Then, you would use automated tools to scan the network for known vulnerabilities, such as unpatched software or weak configurations. After the scan is complete, you would analyze the results to prioritize the most critical vulnerabilities. Finally, you would write a report that explains the findings and recommends solutions to fix the identified issues.
* **9. Demonstrate how to troubleshoot network connectivity issues using the ping command.**
  + **Answer:** To troubleshoot with ping, open a command prompt. First, try ping 127.0.0.1 to check if your computer's network software is working. Then, ping your router's IP address (the default gateway) to see if you can reach it. If that works, try pinging a public website like ping google.com to test your connection to the internet. If you can ping your router but not the website, the problem is likely with your internet service provider or your router's configuration for internet access.

**Module 7: Network fundamental -**

* **1. Which of the following messages in the DHCP process are broadcasted? (Choose two)**
  + **Answer:** C. Discover and A. Request.
* **2. Which command would you use to ensure that an ACL does not block web-based TCP traffic?**
  + **Answer:** B. permit tcp any any eq 80.
* **3. Explain Network Topologies.**
  + **Answer:** Network topology is the arrangement of the different elements of a computer network. This can refer to the physical layout of cables or the logical flow of data. Common types include Bus, Star, Ring, and Mesh topologies, each with its own way of connecting devices.
* **4. Explain TCP/IP Networking Model.**
  + **Answer:** The TCP/IP model is a conceptual framework that describes how data is transmitted over a network. It consists of four layers: the Application Layer (where network applications live), the Transport Layer (responsible for end-to-end communication), the Internet Layer (where IP addresses and routing happen), and the Network Access Layer (which deals with physical hardware and the network media).
* **5. Explain LAN and WAN Network.**
  + **Answer:** A LAN (Local Area Network) is a network that covers a small, limited area, like a home, office building, or school campus. A WAN (Wide Area Network) connects devices over a large geographical area, often spanning cities or countries, and is typically used to connect multiple LANs.
* **6. Explain Operation of Switch.**
  + **Answer:** A network switch operates by learning the MAC addresses of devices connected to its ports. When it receives a data packet, it reads the destination MAC address and forwards the packet only to the specific port where the destination device is located, making it more efficient than a hub which broadcasts data to all ports.
* **7. Describe the purpose and functions of various network devices.**
  + **Answer:** Different network devices serve different purposes. A **router** connects different networks and forwards data packets between them. A **switch** connects devices within a single network and forwards data based on MAC addresses. A **hub** connects devices but broadcasts all data to all connected devices. A **modem** converts signals from your internet provider into a format your router can use. A **firewall** is a security device that filters network traffic based on rules.
* **8. Make list of the appropriate media, cables, ports, and connectors to connect switches to other network devices.**
  + **Answer:** To connect switches to other network devices, you would typically use:
    - **Media:** Copper (Ethernet) or Fiber Optic cables.
    - **Cables:** Straight-through Ethernet cables for connecting to a router or a computer, and a crossover cable for connecting two switches directly. Fiber optic cables can be used for long distances.
    - **Ports:** Ethernet ports (like RJ-45) or Fiber ports (like SFP or GBIC slots).
    - **Connectors:** RJ-45 connectors for Ethernet cables.
* **9. Define Network devices and hosts.**
  + **Answer:** **Network devices** are hardware components that are used to connect, manage, or secure a network, such as switches, routers, and firewalls. A **host** is a device that is connected to a network and can send or receive information, such as a computer, server, or smartphone.

**Module 8: Network Access Basic routing and Advance routing concept, switching concept-**

* **1. Explain Switch.**
  + **Answer:** A switch is a networking device that connects devices on a computer network. Unlike a hub, a switch learns the MAC addresses of the devices connected to it and only forwards data to the intended destination device, which makes the network more efficient and reduces traffic.
* **2. Explain Switch Boot Sequence.**
  + **Answer:** The boot sequence for a Cisco switch typically starts with the switch loading the POST (Power-On Self-Test) program from ROM to check the hardware. Then it loads the boot loader software, which finds the Cisco IOS (Internetwork Operating System) image file. The switch decompresses the IOS image into RAM and finally starts the IOS, which allows you to configure the switch.
* **3. Explain Three Methods to access Switch Command Line Interface.**
  + **Answer:** You can access the switch command line interface (CLI) in three ways:
    1. **Console:** Using a console cable to connect your computer directly to the switch's console port.
    2. **Telnet/SSH:** Accessing the switch over the network using Telnet or SSH. SSH is more secure as it encrypts the connection.
    3. **AUX port:** Using an auxiliary port, which is often used for a modem connection for remote access.
* **4. Explain and Configuring the Cisco Internet Operating System.**
  + **Answer:** The Cisco Internet Operating System (IOS) is the software used to manage Cisco network devices. To configure a Cisco device, you access the CLI and use a series of commands. For example, to set the hostname, you would enter

hostname [name] in global configuration mode.

* **5. Explain Switch Port.**
  + **Answer:** A switch port is a physical connection on a network switch where you plug in a network cable. These ports are where devices like computers, printers, and other switches connect to the network.
* **4-R1, R2, R3, and R4 have their Fast Ethernet 0/0 interfaces attached to the same VLAN.**
  + **Answer:** None of the routers will be able to form a neighbour relationship because they are configured with different OSPF process. All routers must have the same OSPF process ID to establish a neighbour relationship.
* **3-enable secret [password] is hashed using the algorithm.**
  + **Answer:** A. MD5.
* **4- An engineer connects to Router R1 and issues a show ip ospf neighbour command. The status of neighbour 2.2.2.2 lists FULL/BDR. What does the BDR mean?**
  + **Answer:** D. Router 2.2.2.2 is a backup designated router.
* **5- Which command is used to view the neighbour discovery table on a PC?**
  + **Answer:** D. netsh interface ipv6 show neighbours.
* **6- What type of variable is being shown? Routers =[R1,R2,R3]**
  + **Answer:** A. List.
* **7- Identify the fields in an IPv4 header. (Choose three)**
  + **Answer:** B. Time to Live, C. Source address, and D. Destination address.
* **8- Host A and Host B sit in two different subnets. The path between the subnets of these two hosts runs through three different Layer 3 forwarding devices (routers and Layer 3 switches). A network engineer uses the APIC-EM Path Trace ACL Analysis tool to analyze the path used for Host A to send packets to Host B. Which part of the function is done specifically by the ACL Analysis or ACL Trace part of the tool?**
  + **Answer:** D. Analysis of the impact of ACLs on the packets that would flow from Host A to B.
* **9- Which IPv6 address is the equivalent of the IPv4 interface loopback address 127.0.0.1?**
  + **Answer:** A. :1.
* **10- Which command is used to apply an ACL to an interface?**
  + **Answer:** B. ip access-group.
* **11- Which command and mode will successfully configure a hostname of R1 on a Cisco IOS router?**
  + **Answer:** C. Router(config)#hostname R1.
* **12- Which of the following reserved IPv4 addresses has binary 0s in all of the host bit positions?**
  + **Answer:** D. Network address.
* **13- A Cisco Catalyst switch connects to what should be individual user PCs. Each port has the same port security configuration... Which of the following answers describe the result of the port security configuration created with these commands? (Choose two)**
  + **Answer:** A. Prevents unknown devices with unknown MAC addresses from sending data through the switch ports and C. Will allow any one device to connect to each port, and will save that device's MAC address into the startup-config.
* **14- What is the Administrative Distance of internal EIGRP routes?**
  + **Answer:** B. 90.
* **15- When a subnet mask is presented in binary, what do the binary 1s represent?**
  + **Answer:** A. The network portion of an associated address.
* **16- Which switch would STP choose to become the root bridge in the selection process?**
  + **Answer:** A. 32768: 11-22-33-44-55-66. The lowest bridge priority (which is the default 32768) and the lowest MAC address (11-22-33-44-55-66) win the election.
* **17- Which of the following devices is used by the service provider to provide WAN services?**
  + **Answer:** B. Core router.
* **18- Your Cisco IOS router is acting as a DHCP server. Which command will display the addresses that have been handed out to clients on the LAN?**
  + **Answer:** D. show ip dhcp bindings.
* **19- Which of the following commands would you use to enable EIGRP only on those interfaces with an IP address from 10.1.1.0 through 10.1.1.63?**
  + **Answer:** A. network 10.1.1.0 0.0.0.63.
* **20- R3 has a static route configured that points toward the service provider. What command could you use to have R3 advertise an OSPFv3 default route to the internal network, regardless of whether R3 had its default static route?**
  + **Answer:** E. Have R3 use the command default-information originate always in OSPFv3 router configuration mode.
* **21- You are configuring dynamic NAT on your Cisco IOS router. Which command is used to verify the interfaces that are being used as the outside interface and the inside interface?**
  + **Answer:** E. show ip interface.
* **22- When using the "show EtherChannel summary" command, what does the "U" flag signify?**
  + **Answer:** C. In use.
* **23- Which command could you enter to encrypt passwords?**
  + **Answer:** C. service password-encryption.
* **24- You are setting up a Cisco IOS router as a DHCP server. Which command is used to identify the IPv4 addresses that will be in the DHCP pool?**
  + **Answer:** F. ip dhcp pool.
* **25- Which of the following statements are true regarding the processing of ACLs that have been applied to router interfaces? (Choose two)**
  + **Answer:** A. Inbound ACLs will be processed before the routing table lookup occurs and C. Outbound ACLs will be processed after the routing table lookup has occurred.
* **26- imagine you configured OSPFv2 in a small lab network. Which of the following answers list a condition that could keep the routers in your lab from learning all the routes to all the IPv4 routes in your small lab network? (Choose two)**
  + **Answer:** A. An ACL could be blocking router advertisements and C. Any physical layer problem that would prevent two neighbouring routers from being able to ping each others IPv4 addresses in the subnet that exists between the two routers.
* **27- Which statements describe neighbour discovery functionality in IPv6? (Choose two)**
  + **Answer:** A. Determines the link layer address of a neighbour and D. Queries for duplicate addresses.
* **28- Which IPv6 prefix will the typical enterprise network receive from the service provider?**
  + **Answer:** E. /48.
* **29- How should be configured a switch so that it could be accessed remotely?**
  + **Answer:** C. Configure a gateway for the switch.
* **30-Refer to the exhibit. A network technician is asked to design a small network with redundancy. The exhibit represents this design, with all hosts configured in the same VLAN. What conclusions can be made about this design?**
  + **Answer:** B. Spanning-tree will need to be used. The design creates a loop, so Spanning Tree Protocol (STP) is needed to prevent broadcast storms.