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| **Assignment** | **:** |  |
| **Understanding of Hardware and Its Components** | | |

**Section 1: Multiple Choice**

1. Which of the following is NOT a component of the CPU?
   1. 1 and 3 both
2. What is the function of RAM in a computer?
   1. store information that needs to be used quickly.
3. Which of the following is a primary storage device?

Non-of-the above

1. What is the purpose of a GPU?

Graphical Processing unit is to handle graphics-related tasks

**Section 2: True or False**

1. True: The motherboard is the main circuit board of a computer where other components are attached.
2. True: A UPS (Uninterruptible Power Supply) is a hardware device that provides emergency power to a load when the input power source fails.
3. True: An expansion card is a circuit board that enhances the functionality of a component.

**Section 3: Short Answer**

1. Explain the difference between HDD and SSD.

HDD

Define : - Uses spinning magnetic disks to store data.

Access Time : - Slower access times due to mechanical movement.

Cost : - Generally cheaper per unit of storage.

Durability : - More susceptible to damage from physical shocks.

SSD

Define : - Uses flash memory chips to store data.

Access Time : - Faster access times with no mechanical parts.

Cost : - More expensive per unit of storage compared to HDD.

Durability : - Generally, more durable and resistant to physical shocks.

1. Describe the function of BIOS in a computer system.

BIOS (Basic Input/Output System) is responsible for initializing hardware components during startup

1. List and briefly explain three input devices commonly used with computers.

Keyboard: A keyboard is an input device that allows users to enter text, commands, and other data into a computer. It typically consists of a set of keys, including alphanumeric keys, function keys, and special keys like the Enter key and the arrow keys.

Mouse: A mouse is a pointing device that allows users to interact with graphical user interfaces by moving a cursor on the screen. It typically has two or more buttons and may also feature a scroll wheel for navigating documents or web pages.

Joystick: A joystick is an input device that consists of a stick or lever that can be moved in various directions, typically used for controlling the movement of objects in video games or simulations. It often includes buttons or triggers for additional actions, providing a tactile and precise input method for gaming and flight simulation applications.

**Section 4: Practical Application**

1. Identify and label the following components on a diagram of a motherboard:

* CPU
* RAM slots
* SATA connectors
* PCI-E slot

1. Demonstrate how to install a RAM module into a computer.

**Section 5: Essay**

1. Discuss the importance of proper cooling mechanisms in a computer system. Include examples of cooling methods and their effectiveness.

Proper cooling mechanisms are crucial for maintaining the optimal functioning and longevity of a computer system. Here's why they are important:

Preventing Overheating: Components within a computer generate heat during operation. Without adequate cooling, this heat can accumulate, leading to overheating which can cause system instability, performance degradation, and in severe cases, permanent damage to components like the CPU or GPU.

Maintaining Performance: Heat negatively impacts the performance of computer components. When temperatures rise, CPUs and GPUs may throttle down their clock speeds to reduce heat output, resulting in decreased performance. Proper cooling ensures that components can operate at their intended speeds, maximizing system performance.

Extending Lifespan: Excessive heat can reduce the lifespan of computer components. Components subjected to prolonged high temperatures are more prone to degradation and failure over time. Effective cooling helps to keep temperatures within safe operating limits, prolonging the lifespan of the hardware.

Examples of cooling methods commonly used in computer systems include:

a) Air Cooling: This method utilizes fans and heatsinks to dissipate heat away from components. Fans circulate air within the computer case, while heatsinks, typically made of metal, provide a large surface area to transfer heat from components such as the CPU or GPU to the surrounding air. Air cooling is simple, cost-effective, and widely used in most desktop computers.

b) Liquid Cooling (AIO and Custom Loops): Liquid cooling systems use coolant, typically water, to absorb heat from computer components and then transfer it to a radiator where the heat is dissipated into the surrounding air. All-in-One (AIO) liquid coolers come pre-assembled and are easier to install, while custom loops offer more customization options and potentially better cooling performance. Liquid cooling is often preferred for high-performance systems where air cooling may not be sufficient.

c) Thermal Paste: Thermal paste is a compound applied between the CPU/GPU and their respective heatsinks to improve thermal conductivity and fill microscopic gaps, ensuring better heat transfer. Proper application of thermal paste is essential for maximizing cooling efficiency.

d) Case Design and Cable Management: Proper airflow management within the computer case is critical for effective cooling. Cases with good ventilation, strategically placed fans, and cable management options help ensure efficient airflow, reducing hotspots and maintaining lower overall temperatures.

1. Explain the concept of bus width and its significance in computer architecture.

Bus width refers to the number of parallel pathways, or wires, that carry data within a computer's architecture. It's typically measured in bits, and a wider bus can transmit more data at once, thus increasing the amount of information that can be transferred between components in a single cycle.

The significance of bus width in computer architecture lies in its impact on system performance and data transfer capabilities:

Data Transfer Speed: A wider bus allows for faster data transfer between components, as more bits can be transmitted simultaneously. This results in improved system performance, especially in tasks that involve transferring large amounts of data, such as multimedia processing or gaming.

Memory Bandwidth: The bus width between the CPU and memory modules (RAM) directly affects memory bandwidth, which is the rate at which data can be read from or written to memory. A wider bus enables higher memory bandwidth, leading to faster access to data and improved overall system responsiveness.

Peripheral Connectivity: The bus width also affects the speed at which data is transferred between the CPU and peripheral devices, such as graphics cards, storage drives, and network interfaces. A wider bus allows for faster communication with peripherals, reducing latency and improving system performance in tasks involving peripheral I/O operations.

**Assignment: Installation and Maintenance of Hardware and Its Components**

**Section 1: Multiple Choice**

1. Which of the following precautions should be taken before working on computer hardware?
   1. Ensure the computer is plugged in to prevent electrostatic discharge.
   2. Wear an anti-static wrist strap to prevent damage from electrostatic discharge.
2. What is the purpose of thermal paste during CPU installation?

c) To improve thermal conductivity between the CPU and the heat sink.

1. Which tool is used to measure the output voltage of a power supply unit (PSU)?
   1. Multimeter
2. Which component is responsible for storing BIOS settings, such as date and time, even when the computer is powered off?
   1. CMOS battery

**Section 2: True or False**

1. True: When installing a new hard drive, it is essential to formatting before use.
2. True: A POST (Power-On Self-Test) error indicates a problem with the CPU.
3. False: It is safe to remove a USB flash drive from a computer without ejecting it first.

**Section 3: Short Answer**

1. Describe the steps involved in installing a new graphics card on a desktop computer.

Preparation:

Turn off the computer and unplug it from the power source.

Remove any peripherals connected to the computer, such as monitors, keyboard, and mouse.

Open the computer case by removing the side panel. This may involve unscrewing screws or pressing latches, depending on the case design.

Identify PCIe Slot:

Locate an available PCIe (Peripheral Component Interconnect Express) slot on the motherboard. Most graphics cards are installed into PCIe x16 slots.

Remove Existing Graphics Card (if applicable):

If there's already a graphics card installed, unscrew and remove it from the PCIe slot.

Disconnect any power connectors attached to the graphics card.

Prepare the Computer Case:

Check for any dust buildup inside the case and clean it if necessary.

Ensure there's sufficient space for the new graphics card and that it aligns with the PCIe slot.

Install the New Graphics Card:

Carefully align the graphics card with the PCIe slot and firmly push it into place until it's fully seated.

Secure the graphics card to the case using screws or a locking mechanism, if provided.

If the graphics card requires additional power, connect the necessary power cables from the power supply to the graphics card.

Close the Computer Case:

Replace the side panel of the computer case and secure it with screws or latches.

Connect Cables:

Connect the monitor cable (usually HDMI, DisplayPort, or DVI) to the graphics card's video output port.

Power On and Install Drivers:

Plug in the power cable and turn on the computer.

Install the necessary drivers for the new graphics card. This can usually be done by downloading the latest drivers from the manufacturer's website or using the included installation disc.

Test the Graphics Card:

Once the drivers are installed, test the graphics card by launching some graphics-intensive applications or games to ensure its functioning properly.

1. What is RAID, and what are some common RAID configurations?

RAID (Redundant Array of Independent Disks) is a data storage technology that combines multiple physical disk drives into a single logical unit to improve performance, reliability, or both. RAID configurations are defined by the way in which data is distributed, mirrored, or parity is calculated across the disks.

Here are some common RAID configurations:

1. \*\*RAID 0 (Striping)\*\*:

- Data is striped across multiple disks without parity or mirroring.

- Offers increased performance as data can be read from and written to multiple disks simultaneously.

- However, there's no redundancy, so if one disk fails, all data is lost.

2. \*\*RAID 1 (Mirroring)\*\*:

- Data is mirrored across two or more disks.

- Provides redundancy, as data is duplicated across disks, ensuring that if one disk fails, data remains intact on the other disk(s).

- Offers no performance improvement over a single disk but provides data redundancy.

3. \*\*RAID 5\*\*:

- Data is striped across multiple disks with distributed parity.

- Provides both performance improvement and data redundancy.

- Requires at least three disks and can tolerate the failure of one disk without data loss.

- Read performance is good but write performance can be slower due to parity calculations.

4. \*\*RAID 6\*\*:

- Similar to RAID 5, but with double distributed parity.

- Provides greater fault tolerance than RAID 5, as it can withstand the simultaneous failure of up to two disks without data loss.

- Requires at least four disks and offers better data protection, but may have slightly lower performance than RAID 5 due to additional parity calculations.

5. \*\* RAID 10 (RAID 1+0) \*\*:

- Combines mirroring (RAID 1) and striping (RAID 0).

- Data is mirrored across pairs of disks, and then striped across these mirrored pairs.

- Offers both performance improvement and redundancy, combining the benefits of RAID 0 and RAID 1.

- Requires a minimum of four disks and can tolerate the failure of one disk in each mirrored pair without data loss.

These are just a few examples of common RAID configurations, each offering different trade-offs between performance, data protection, and storage efficiency. The choice of RAID configuration depends on the specific requirements and priorities of the storage system.

**Section 4: Practical Application**

1. Demonstrate how to replace a CPU fan in a desktop computer.

**Section 5: Essay**

1. Discuss the importance of regular maintenance for computer hardware and provide examples of maintenance tasks.

Preventative Maintenance: Regular maintenance helps identify and address potential issues before they escalate into major problems. This proactive approach can prevent unexpected hardware failures and downtime, saving time and money in the long run.

Optimal Performance: Over time, dust and debris can accumulate inside a computer, obstructing airflow and causing components to overheat. Maintenance tasks such as cleaning can help ensure proper ventilation and cooling, allowing hardware to operate at peak performance.

Extend Lifespan: Proper maintenance can extend the lifespan of computer hardware by reducing wear and tear on components. By keeping hardware clean and well-maintained, you can minimize the risk of premature failure and the need for costly repairs or replacements.

Examples of maintenance tasks for computer hardware include:

a) Cleaning: Regularly cleaning the inside and outside of the computer case to remove dust and debris. This includes cleaning fans, heatsinks, vents, and filters to maintain proper airflow and cooling.

b) Checking Connections: Inspecting and tightening cable connections, including power cables, data cables, and peripheral connections, to ensure they are secure and functioning properly.

c) Updating Drivers and Firmware: Keeping device drivers and firmware up to date to ensure compatibility, performance improvements, and security patches.

d) Checking for Software Updates: Installing operating system updates and patches to address security vulnerabilities and improve stability.

e) Testing Hardware: Running diagnostic tests to check the health and performance of hardware components such as the CPU, RAM, hard drives, and graphics card.

f) Backup and Data Management: Regularly backing up important data and files to prevent data loss in case of hardware failure or other unforeseen circumstances.

**Assignment: Understanding and Maintenance of Networks**

**Section 1: Multiple Choice**

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

Forwarding data packets between networks

1. What is the purpose of DNS (Domain Name System) in a computer network?

Converting domain names to IP addresses

1. What type of network topology uses a centralized hub or switch to connect all devices?

Star

1. Which network protocol is commonly used for securely accessing and transferring files over a network?

FTP, SFTP (Secure File Transfer Protocol),No protocol is secure use VPN in case of transitive data state.

**Section 2: True or False**

1. True: A firewall is a hardware or software-based security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.
2. False: DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.
3. True: VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.

**Section 3: Short Answer**

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

Hub:

A hub is a simple networking device that operates at the physical layer (Layer 1) of the OSI model.

It broadcasts incoming data packets to all devices connected to it, regardless of the intended recipient.

As a result, all devices on the network share the available bandwidth, leading to potential congestion and slower network speeds.

Hubs do not have any intelligence to differentiate between devices or manage data traffic.

Switch:

A switch is a more advanced networking device that operates at the data link layer (Layer 2) of the OSI model.

Unlike a hub, a switch forwards data packets only to the device(s) for which the data is intended.

Switches maintain a MAC address table that maps MAC addresses to the physical ports on the switch, allowing them to efficiently route traffic based on destination MAC addresses.

Switches offer improved performance and security compared to hubs, as they reduce network congestion and prevent unnecessary data transmissions.

1. Describe the process of troubleshooting network connectivity issues.

Identify the Issue:

Gather information from the user about the specific symptoms of the connectivity problem, such as error messages, inability to access certain resources, or slow network performance.

Verify Physical Connections:

Check physical connections including cables, connectors, and network ports to ensure they are properly seated and secure. Look for any signs of damage or wear.

Check Network Configuration:

Verify IP addresses, subnet masks, default gateways, and DNS server settings on the affected device(s). Incorrect configuration settings can cause connectivity issues.

Ping Test:

Use the ping command to test connectivity between devices on the network and external resources such as websites or servers. This helps determine if the issue is with the local network or external connectivity.

Check Network Devices:

Verify the status of network devices such as routers, switches, and access points. Check for indicators of hardware failure, software errors, or configuration issues.

Review Network Logs:

Examine network logs on routers, switches, firewalls, and servers for any error messages or unusual activity that could indicate the source of the problem.

Use Diagnostic Tools:

Use network diagnostic tools such as traceroute, nslookup, and netstat to gather additional information about network connectivity and troubleshoot specific issues.

Test Connectivity Across Devices:

Test connectivity between different devices on the network to isolate the source of the problem. Determine if the issue affects all devices or only specific devices or segments of the network.

**Section 4: Practical Application**

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

**Section 5: Essay**

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

Network documentation is crucial for efficiently managing and maintaining a network infrastructure. Here's why it's important:

Troubleshooting: Comprehensive documentation provides valuable reference material for troubleshooting network issues. It helps network administrators quickly identify the location of devices, configurations, and connections, speeding up the resolution process and minimizing downtime.

Change Management: Documenting network configurations and changes ensures that network modifications are planned, tracked, and implemented accurately. It helps prevent configuration errors, conflicts, and unintended consequences that can disrupt network operations.

Knowledge Transfer: Network documentation serves as a knowledge base for sharing information among team members and new hires. It ensures consistency in network management practices and facilitates training and onboarding processes.

Compliance and Auditing: Many industries and organizations have regulatory requirements or auditing standards that mandate documentation of network configurations, policies, and security measures. Comprehensive documentation helps demonstrate compliance and facilitates audits.

Capacity Planning: Documenting network topology, device specifications, and utilization metrics enables network administrators to perform capacity planning and anticipate future growth or resource requirements. It helps ensure that the network infrastructure can support current and future business needs.

Examples of information that should be documented in network documentation include:

Network Topology: Diagrams or maps illustrating the physical layout of network devices, including routers, switches, firewalls, servers, and endpoints. This includes information about connections, interfaces, and logical groupings such as VLANs.

IP Addressing Scheme: Documentation of IP address assignments, subnet masks, default gateways, and DNS server configurations for each subnet or network segment. This helps ensure consistency and avoids IP address conflicts.

Device Configurations: Configuration settings for network devices such as routers, switches, firewalls, and access points. This includes details about interfaces, routing tables, access control lists (ACLs), and security policies.

Network Services: Documentation of network services such as DHCP (Dynamic Host Configuration Protocol), DNS (Domain Name System), NTP (Network Time Protocol), and VPN (Virtual Private Network). This includes configuration settings, server addresses, and service dependencies.

Security Policies: Documentation of network security measures such as firewall rules, intrusion detection/prevention systems (IDS/IPS), VPN configurations, and access control policies. This helps ensure compliance with security standards and protects against unauthorized access or data breaches.

Change History: Records of network changes, updates, and maintenance activities. This includes details about who made the change, when it was made, and the reason for the change.

**Assignment: Troubleshooting and Helpdesk**

**Section 1: Multiple Choice**

1. What is the first step in the troubleshooting process?
   1. Implementing a solution
   2. Identifying the problem
   3. Testing the solution
   4. Documenting the solution
2. Which of the following tools is commonly used to diagnose hardware issues by testing electrical connections?
   1. Loopback plug
   2. Toner probe
   3. Multimeter
   4. Cable tester
3. Which of the following best describes the purpose of a VPN (Virtual Private Network)?
   1. Encrypting network traffic to prevent eavesdropping
   2. Connecting multiple LANs (Local Area Networks) over a wide area network (WAN)
   3. Authenticating users and controlling access to network resources
   4. Reducing latency and improving network performance
4. Which Windows utility can be used to view system logs, monitor performance, and diagnose hardware and software issues?
   1. Task Manager
   2. Device Manager
   3. Event Viewer
   4. Control Panel

**Section 2: True or False**

1. 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.
2. 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.
3. 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.

**Section 3: Short Answer**

1. Describe the steps involved in troubleshooting a computer that fails to boot into the operating system.

**Section 4: Practical Application**

1. Demonstrate how to troubleshoot network connectivity issues on a Windows computer using the ipconfig command.

**Section 5: Essay**

1. Discuss the importance of effective communication skills in a helpdesk or technical support role.

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| **Assignment: Network Fundamentals and Building Networks** | |  |
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| **Section 1: Multiple Choice** |  | |

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| --- | --- |
| 1. What is the primary function of a router in a computer network? | |
|  | 1. Assigning IP addresses to devices 2. Providing wireless connectivity to devices 3. Forwarding data packets between networks 4. Managing user authentication and access control |
| 2. What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network? | |
|  | 1. Assigning static IP addresses to devices 2. Resolving domain names to IP addresses 3. Managing network traffic and congestion 4. 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? | |
|  | 1. Router 2. Switch 3. Hub 4. Repeater |
| 4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone? | |
|  | 1. Star 2. Bus 3. Ring 4. Mesh |

**Section 2: True or False**

1. 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.
2. 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.
3. 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.

**Section 3: Short Answer**

8. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.

**Section 4: Practical Application**

9. Demonstrate how to configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol).

**Section 5: Essay**

10. Discuss the importance of network documentation in the context of building and managing networks.

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| **Assignment: Network Security, Maintenance, and Troubleshooting Procedures** | |  |
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| **Section 1: Multiple Choice** |  | |

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| 1. What is the primary purpose of a firewall in a network security infrastructure? | |
|  | 1. Encrypting network traffic 2. Filtering and controlling network traffic 3. Assigning IP addresses to devices 4. Authenticating users for network access |
| 2. What type of attack involves flooding a network with excessive traffic to disrupt normal operation? | |
|  | 1. Denial of Service (DoS) 2. Phishing 3. Spoofing 4. Man-in-the-Middle (MitM) |
| 3. Which encryption protocol is commonly used to secure wireless network communications? | |
|  | 1. WEP (Wired Equivalent Privacy) 2. WPA (Wi-Fi Protected Access) 3. SSL/TLS (Secure Sockets Layer/Transport Layer Security) 4. AES (Advanced Encryption Standard) |
| 4. What is the purpose of a VPN (Virtual Private Network) in a network security context? | |



a)

network traffic to prevent eavesdropping

Encrypting

1. Filtering and blocking malicious websites
2. Restricting access to network resources based on user identity
3. Detecting and mitigating network intrusions and attacks

**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.
2. 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.
3. 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.

**Section 3: Short Answer**

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

**Section 4: Practical Application**

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

**Section 5: Essay**

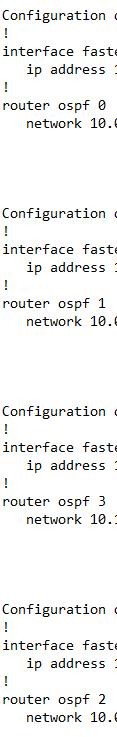
10. Discuss the importance of regular network maintenance and the key tasks involved in maintaining network infrastructure.



**Assignment: CCNA**

1. Which of the following messages in the DHCP process are broadcasted? (Choose two)
2. Request
3. Offer
4. Discover
5. Acknowledge
6. Which command would you use to ensure that an ACL does not block web-based TCP traffic?
7. permit any
8. permit tcp any any eq 80
9. permit tcp any eq 80
10. permit any any eq tcp
11. R1, R2, R3, and R4 have their Fast Ethernet 0/0 interfaces attached to the same VLAN. A network engineer has typed a configuration for each router by using a word processor. He will later copy and paste the configuration into the routers. Examine the following exhibit, which lists configuration for the four routers, as typed by the network engineer. Assuming that all four routers can ping each other’s LAN IP addresses after the configuration has been applied, choose the routers that will be able to form a neighbor relationship with the other routers on the LAN. (You can assume that, if not shown in the exhibit, all other related parameters are still set to their defaults.) (Choose two)





1. R1
2. R2
3. R3
4. R4
5. None of the routers will exchange routing information.



1. enable secret [password] is

hashed using the algorithm.

1. MD5
2. AH
3. PSK
4. ESP
5. WPA2
6. An engineer connects to Router R1 and issues a show ip ospf neighbor command. The status of neighbor 2.2.2.2 lists FULL/BDR. What does the BDR mean?
7. R1 is an Area Border Router.
8. R1 is a backup designated router.
9. Router 2.2.2.2 is an Area Border Router.
10. Router 2.2.2.2 is a backup designated router.
11. Which command is used to view the neighbor discovery table on a PC?
12. show ipv6 neighbor
13. show ipv6 neighbors
14. netsh interface ipv6 show neighbor
15. netsh interface ipv6 show neighbors
16. What type of variable is being shown? Routers = [R1,R2,R3]
17. List
18. Dictionary
19. Simple
20. Unsigned integers
21. Identify the fields in an IPv4 header. (Choose three)
22. Host component
23. Time to Live
24. Source address
25. Destination address
26. Network address
27. 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?
28. Discovery of the topology that exists between the two hosts
29. Analysis of the Layer 3 forwarding decisions in the path from Host A to B
30. Analysis of the Layer 2 forwarding decisions in the path from Host A to B
31. Analysis of the impact of ACLs on the packets that would flow from Host A to B
32. Which IPv6 address is the equivalent of the IPv4 interface loopback address 127.0.0.1?

A. ::1

B. ::

C. 2000::/3

D. 0::/10

1. Which command is used to apply an ACL to an interface?
2. access-group
3. ip access-group
4. ip access-list
5. ip access-class
6. access-class
7. access-list
8. Which command and mode will successfully configure a hostname of R1 on a Cisco IOS router?
9. Router(config)#name R1
10. Router# hostname R1
11. Router(config)#hostname R1
12. Router#name R1

E.

Router>hostname R1

F. Router>name R1

1. Which of the following reserved IPv4 addresses has binary 0s in all of the host bit positions?
2. Local broadcast address
3. Loopback address
4. Directed broadcast address
5. Network address
6. All zeros address
7. A Cisco Catalyst switch connects to what should be individual user PCs. Each port has the same port security configuration, configured as follows:

interface range gigabitethernet 0/1 - 24 switchport mode access

switchport port-security

switchport port-security mac-address sticky

Which of the following answers describe the result of the port security configuration created with these commands? (Choose two)

1. Prevents unknown devices with unknown MAC addresses from sending data through the switch ports.
2. If a user connects a switch to the cable, prevents multiple devices from sending data through the port.
3. Will allow any one device to connect to each port, and will save that device’s MAC address into the startup-config
4. Will allow any one device to connect to each port, but will not save that device’s MAC address into the startup-config
5. What is the Administrative Distance of internal EIGRP routes? A. 170
6. 90
7. 20
8. 1

E. 110

F. 120

1. When a subnet mask is presented in binary, what do the binary 1s represent?
2. The network portion of an associated address
3. The host portion of the subnet mask
4. The number of wildcard bits in the subnet mask
5. The number of wildcard bits in the address
6. The network portion of the subnet mask
7. The host portion of an associated address
8. Which switch would STP choose to become the root bridge in the selection process?

A. 32768: 11-22-33-44-55-66

B. 32768: 22-33-44-55-66-77

C. 32769: 11-22-33-44-55-65

D. 32769: 22-33-44-55-66-78

1. Which of the following devices is used by the service provider to provide WAN services?
2. Router
3. Core router
4. WAN switch
5. CSU/DSU



1. 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?

1. show ip dhcp assignments
2. show ip dhcp address
3. show ip dhcp conflicts
4. show ip dhcp bindings
5. show ip dhcp pool
6. 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?

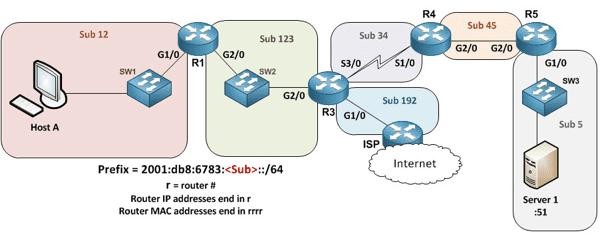
A. network 10.1.1.0 0.0.0.63

B. network 10.1.1.0/63

C. router eigrp 10.1.1.0 0.0.0.63

D. network 10.0.0.0 0.0.0.255

1. 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?



1. The decision to advertise a default route depends on the static route always being present on R3.
2. The default behavior is to redistribute any default IPv6 routes into OSPFv3, so no action is required.
3. Each of the other routers needs a static default route that leads to R3.



1. Use the command

default-information originate always in interface mode for G1/0 on R3.

1. Have R3 use the command default-information originate always in OSPFv3 router configuration mode.
2. 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?
3. show interfaces
4. show ip route
5. show ip nat translations
6. show ip interface brief
7. show ip interface
8. show ip nat statistics
9. When using the “show EtherChannel summary “command, what does the “u “flag signify?
10. Waiting to be aggregated
11. Suspended
12. In use
13. Unsuitable for bundling
14. Which command could you enter to encrypt passwords?
15. enable secret
16. username {username} secret {password}
17. service password-encryption
18. All of the above
19. None of the above



1. 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?

1. network
2. dns-server
3. default-router
4. ip dhcp excluded-address
5. lease
6. ip dhcp pool
7. domain-name
8. Which of the following statements are true regarding the processing of ACLs that have been applied to router interfaces? (Choose two)
9. Inbound ACLs will be processed before the routing table lookup occurs
10. Inbound ACLs will be processed after the routing table lookup has occurred
11. Outbound ACLs will be processed after the routing table lookup has occurred
12. Outbound ACLs will be processed before the routing table lookup occurs
13. 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)
14. An ACL could be blocking router advertisements.
15. Two neighbouring routers that connect to the same link have been configured with the same OSPF area and with the same IPv4 subnet mask.
16. 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.
17. Two neighboring routers that connect to the same link have been configured with the same OSPF process ID on the router ospf command.
18. Which statements describe neighbor discovery functionality in IPv6? (Choose two)
19. Determines the link layer address of a neighbor
20. Finds neighbor switches on the link
21. Is achieved by using

Dynamic Host Configuration Protocol for IPv6, or DHCPv6 with IPv6 multicast

1. Queries for duplicate addresses
2. Which IPv6 prefix will the typical enterprise network receive from the service provider?

A. /52

B. /56

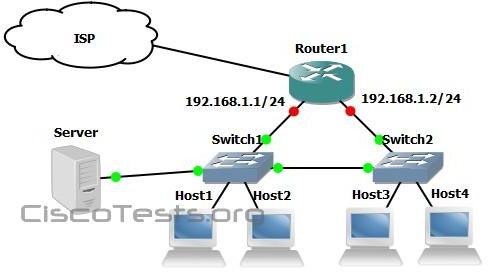
C. /64

D. /32

E. /48

F. /60

1. How should be configured a switch so that it could be accessed remotely?
2. Assign a password and privilege level
3. Apply the access control list, or ACL, to the virtual type terminal, or vty, lines
4. Configure a gateway for the switch
5. Generate a certificate
6. 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?



1. This design will function as intended.
2. Spanning-tree will need to be used.
3. The router will not accept the addressing scheme.
4. The connection

between switches should be a trunk.

1. The router interfaces must be encapsulated with the 802.1Q protocol.

**Assignment: Windows Server**

* 1. What two options are provided in the type of installation window during Windows Server 2016 installation?
  2. Write the step How to configure server step by step?
  3. What are the Pre installation tasks?
  4. What are the Post installation tasks?
  5. What is the standard upgrade path for Windows Server?
  6. What is the Physical structure of AD?
  7. What is the Logical components of Active Directory?
  8. What is the Full form Of LDAP?
  9. What is the location of the AD database?
  10. *What is child DC*?
  11. Explain the term forest in AD
  12. What is Active Directory? Check all that apply.
      + An open-source directory server
      + A Windows-only implementation of a directory server
      + Microsoft's implementation of a directory server
      + An LDAP-compatible directory server
  13. When you create an Active Directory domain, what's the name of the default user account?
      + Superuser
      + Root
      + Username
      + Administrator
  14. AD domain provides which of the following advantages? Check all that apply.
      + Centralized authentication
      + More detailed logging
      + Centralized management with GPOs
      + Better performance
  15. What are the minimum hardware requirements for installing Windows Server 2016?
  16. Explain the different editions of Windows Server 2016 and their features.
  17. Walk through the steps of installing Windows Server 2016 using GUI mode.

1. Describe the steps for installing Windows Server 2016 in Server Core mode.
2. How do you configure network settings during Windows Server 2016 installation?
3. Explain the process of promoting a Windows Server to a domain controller.
4. Discuss the steps involved in upgrading from a previous version of Windows Server to Windows Server 2016.
5. What is Active Directory Domain Services (AD DS), and what are its key components?
6. How do you create a new Active Directory user account in Windows Server ?
7. Explain the process of creating and managing Group Policy Objects (GPOs) in Windows Server 2016 or 2019.
8. What are Organizational Units (OUs) in Active Directory, and how do you use them?
9. Describe the process of delegating administrative privileges in Active Directory.
10. Discuss the role of Windows Firewall in Windows Server and how to configure it.
11. What is Network Address Translation (NAT) in Windows Server, and how do you configure it?
12. Explain the concept of Dynamic Host Configuration Protocol (DHCP) and how to configure it in Windows Server 2016.



1. Describe the process of

configuring DNS (Domain Name System) in Windows Server.

1. What is Server Manager, and how do you use it to manage servers in Windows Server?
2. Discuss the role of Remote Desktop Services (RDS) in Windows Server 2016 or 2019 and how to configure it.
3. Explain the process of installing and configuring Hyper-V virtualization in Windows Server 2016.
4. How do you monitor server performance and manage event logs in Windows Server?
5. Describe the different types of storage options available in Windows Server.
6. What is the role of File Server in Windows Server, and how do you configure it?
7. Explain the process of implementing and managing Distributed File System (DFS) in Windows Server 2016.
8. Discuss the built-in backup and recovery options available in Windows Server 2016 or 2019.
9. How do you configure Windows Server Backup to back up critical data?
10. Explain the steps for restoring files and folders using Windows Server Backup.
11. What are some common troubleshooting techniques for Windows Server startup issues?
12. How do you troubleshoot network connectivity problems in Windows Server?
13. Discuss common Active Directory-related issues and their troubleshooting steps.
14. Explain how to troubleshoot performance problems on Windows Server 2016 or 2019.



**Assignment: Linux Server**

* 1. What is the minimum number of partitions you need to install Linux?
  2. Explain About Chmod Command
  3. How to check Linux memory utilization
  4. Describe the root account
  5. What is shell?
  6. What is Linux?
  7. What is Bash?
  8. How can you find out how much memory Linux is using?
  9. What is a typical size for a swap partition under a Linux system?
  10. How do you switch from one desktop environment to another, such as switching from KDE to Gnome?
  11. What are the kinds of permissions under Linux
  12. What are the different modes when using vi editor?
  13. How to run Windows Software on Linux operating System?
  14. what is difference between windows and Linux
  15. What is the advantage of Open Source?
  16. Explain File Permission groups in Linux?
  17. Explain different file system types in Linux?
  18. Why LVM is required?
  19. How to exit from vi editors?
  20. How to delete information from a file in vi?



* 1. You have a new,

empty hard drive that you will use for Linux. What is the first step you use.

* 1. Write the Linux command to show the current working directory.
  2. write the Linux command to get help with various options.
  3. Write the linux comman! to display what all users are currently doing.
  4. write the Linux command to get information about the operating system.
  5. Write the Linux command to create a hard link of a file.
  6. Write the Linux command to create a soft link of a file as well as Directory.
  7. Write the Linux command! to search for specific pattern in a file.
  8. Write the Linux command to show the use of basic regular expressions using grep command.
  9. What is the maximum file size on the ext4 file system?
  10. What is the maximum file size on the xfs file system?
  11. What is Difference between LILO And GRUB?
  12. How to Recover Linux Password ?
  13. Which command use for format partition in Linux OS?
  14. How to enable “quota” in Linux ?
  15. How to Mount Partition in Linux ?
  16. What is use of “mdadm” Command ?
  17. How to configure secure Apache web server in Linux ?
  18. How to Set Static IP in Linux?
  19. What is selinux Security?



**Assignment: Cyber security**



1. Explain CIA triad.
2. What is a Firewall and why is it used?
3. What is the difference between VA(Vulnerability Assignment) and PT(Penetration Testing)?
4. What is the difference between HIDS and NIDS?
5. Explain SSL Encryption
6. What is Data Leakage?
7. What is a Brute Force Attack? How can you prevent it?
8. Explain MITM attack and how to prevent it?
9. Explain XSS attack and how to prevent it?
10. What is a Botnet?
11. Explain SSL and TLS
12. Define the terms Virus, Malware, and Ransomware.
13. What is Phishing? Provide an example.
14. Define the terms Encryption and Decryption.
15. What is a DDoS attack and how does it work?
16. What is a zero-day vulnerability?
17. What is network sniffing
18. What is a Security Operations Center (SOC)?
19. What is the importance of forensics in cyber security?
20. Discuss the future trends in cyber security. Which skills are important for cyber security professionals?
21. What is the difference between IDS and IPS?