CompTIA A+ 220-1101 (CORE 1) Exam Questions

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CompTIA A+ 220-1101 (Core 1) Exam Questions by Cert Empire

Question: 1

A technician is replacing the motherboard of a workstation for a user who runs multiple large applications at the same time. Which of the following motherboard specifications would provide the most significant improvement in performance?

A. Number of DIMM slots

B. Number of HDMI ports

C. Number of PCI slots

D. Number of USB ports

Answer:

A

Explanation:

The user's primary task is running multiple large applications simultaneously, which is a memory-intensive workload. A motherboard with a higher number of DIMM (Dual In-line Memory Module) slots allows for the installation of more physical RAM. Increasing the amount of RAM provides the most significant performance improvement in this scenario because it allows the operating system to hold more application data in fast, volatile memory. This minimizes the need to use the much slower page file (virtual memory) on the storage drive, thereby reducing latency and improving overall system responsiveness during heavy multitasking.

Why Incorrect Options are Wrong:

B. Number of HDMI ports: This specification relates to video output and the ability to connect multiple monitors, which does not improve the computational performance of applications.
C. Number of PCI slots: While a specific high-performance card in a PCI slot can improve performance, the number of slots itself does not directly address the memory bottleneck from multitasking.
D. Number of USB ports: This determines the quantity of peripheral devices that can be connected and has no direct impact on the processing speed or multitasking capabilities of the workstation.

References:

1. Patterson, D. A., & Hennessy, J. L. (2017). Computer Organization and Design: The Hardware/Software Interface (5th ed.). Morgan Kaufmann. In Chapter 5, Section 5.4, "Virtual Memory," the text explains that when a program's memory footprint exceeds the available physical RAM, the system must swap pages to and from the disk, a process that is thousands of times slower than accessing RAM. This directly supports the need for more RAM for large,

concurrent applications.
2. Intel Corporation. (n.d.). "What Is a Motherboard? The Ultimate Guide to PC Motherboards." In the section titled "RAM," the official documentation states: "The amount of RAM you can install depends on the motherboard... More RAM allows your PC to have more information at the ready, which can increase speed and performance." This vendor documentation confirms that motherboard DIMM slots are the limiting factor for RAM capacity, which is crucial for performance.
3. Massachusetts Institute of Technology. (2017). 6.004 Computation Structures. MIT OpenCourseWare. Lecture 18, "The Memory Hierarchy," describes the significant performance penalty incurred when the system must access slower levels of the memory hierarchy, such as a hard disk for virtual memory, because the main memory (RAM) is full. This academic source underscores the importance of having sufficient RAM for performance-critical tasks.

Question: 2

A user needs to upgrade a PC in order to run the latest 3-D design software. Which of the following components should the user upgrade to best meet this requirement?

A. Motherboard

B. CPU

C. Power supply

D. Graphics card

E. Memory

Answer:

D

Explanation:

Modern 3-D design software relies heavily on the Graphics Processing Unit (GPU) found on a dedicated graphics card. These applications offload computationally intensive tasks such as rendering complex geometric models, applying textures, and calculating lighting and shadows to the GPU. The parallel processing architecture of a GPU is specifically designed to handle these tasks far more efficiently than a general-purpose CPU. Therefore, upgrading the graphics card provides the most significant and direct performance improvement for running the latest 3-D design applications. While other components are important, the graphics card is the primary bottleneck for this specific workload.

Why Incorrect Options are Wrong:

A. Motherboard: A motherboard is a foundational component; upgrading it alone does not directly increase 3-D rendering performance unless it is to support a faster GPU or CPU.
B. CPU: While the CPU is important for overall application responsiveness and certain calculations, the GPU handles the bulk of the demanding 3-D visual processing.
C. Power supply: A power supply only provides electricity. It must be upgraded to support new, power-hungry components but does not contribute to performance itself.
E. Memory: Insufficient RAM can cause slowdowns, but once an adequate amount is available for the 3-D models, the graphics card is the primary driver of rendering performance.

References:

1. Autodesk Knowledge Network. (2023). System requirements for AutoCAD 2024 including Specialized Toolsets. In the "Basic" requirements, a GPU with 2 GB of VRAM is listed. For "Recommended" specifications, particularly for "Large Datasets, Point Clouds, and 3D Modeling," a GPU with 8 GB of VRAM and DirectX 12 compliance is specified, highlighting the component's

critical role.
2. Blender Foundation. (2023). Requirements - Blender 3.6 Manual. The official documentation lists "Graphics Card" under "Hardware Requirements," specifying a minimum of 2 GB VRAM and recommending 8 GB VRAM for optimal performance, stating, "For optimal performance, we recommend using a dedicated graphics card."
3. Durand, F., & Cutler, B. (2012). 6.837 Computer Graphics, Fall 2012. MIT OpenCourseWare. Lecture 2, "The Graphics Pipeline," pp. 4-6. The course material explains that the graphics pipeline (transformation, clipping, shading, rasterization) is implemented in specialized hardware (the GPU) for real-time performance, which is essential for 3-D applications.

Question: 3

Which of the following is considered a connectionless protocol?

A. SSH

B. TCP

C. HTTPS

D. UDP

Answer:

D

Explanation:

The User Datagram Protocol (UDP) is a core member of the Internet protocol suite and is fundamentally connectionless. Unlike connection-oriented protocols, UDP does not establish a dedicated end-to-end connection before sending data. It sends packets, called datagrams, to a destination with no prior handshake or session setup. This approach minimizes overhead and latency, making it ideal for time-sensitive applications like DNS, VoIP, and online gaming, where speed is prioritized over the guaranteed delivery and ordering of packets.

Why Incorrect Options are Wrong:

A. SSH: Secure Shell (SSH) operates over TCP to establish a persistent and reliable session for secure remote access, making it connection-oriented.
B. TCP: Transmission Control Protocol (TCP) is the quintessential connection-oriented protocol, using a three-way handshake to establish a reliable connection before data transfer.
C. HTTPS: Hypertext Transfer Protocol Secure (HTTPS) relies on TCP to ensure the reliable and ordered delivery of web data, making it a connection-oriented protocol.

References:

1. Postel, J. (1980). RFC 768: User Datagram Protocol. Internet Engineering Task Force (IETF). Section "Introduction". This document defines UDP and states, "This protocol provides a procedure for application programs to send messages to other programs with a minimum of protocol mechanism," which describes its connectionless nature.
2. Postel, J. (1981). RFC 793: Transmission Control Protocol. Internet Engineering Task Force (IETF). Section 1.5 "Operation". This document defines TCP as a "reliable, connection-oriented" protocol that requires a logical connection to be established.
3. Kurose, J., & Ross, K. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson. Chapter 3, Section 3.3, "Connectionless Transport: UDP," explicitly describes UDP as a protocol that provides an "unreliable, connectionless service." This textbook is widely used in university computer science curricula.

4. Stanford University. (n.d.). CS144: Introduction to Computer Networking, Lecture 5: Transport. Stanford Engineering Everywhere. The lecture notes and video clearly distinguish between TCP as a "reliable, in-order, connection-oriented" protocol and UDP as an "unreliable, unordered, connectionless" protocol.

Question: 4

A printer's output is producing solid black sheets without distinct lettering. A technician adjusted multiple settings, but the issue persists. Which of the following parts is most likely causing this issue?

A. Imaging drum

B. Heating element

C. Fuser assembly

D. Feed assembly

Answer:

A

Explanation:

A solid black page from a laser printer is a classic symptom of a failure in the charging stage of the printing process. The imaging drum must be given a strong, uniform negative charge by a primary charge roller or corona wire before the laser writes the image. If this charging mechanism fails, the drum's entire surface remains at a neutral potential. Consequently, the negatively charged toner is attracted to the entire drum and subsequently transferred to the paper, resulting in a completely black sheet. The charging components are integral to the imaging drum assembly (often part of the toner cartridge).

Why Incorrect Options are Wrong:

B. Heating element: A failed heating element is part of the fuser and would prevent toner from melting onto the paper, causing smudged or loose print.
C. Fuser assembly: A faulty fuser assembly would cause issues with toner adhesion, such as smearing or ghosting, not a solid black page.
D. Feed assembly: A malfunctioning feed assembly is responsible for paper movement and would cause paper jams or misfeeds, not affect the printed image.

References:

1. Andrews, J., Dark, S., & West, J. (2022). A+ Guide to IT Technical Support (11th ed.). Cengage Learning.
Page 538, Table 11-4 "Troubleshooting printer problems": This table lists "Page is black" as a common problem. The probable causes are identified as "Toner cartridge is faulty" or "A component of the charging system has failed." The charging system is part of the imaging drum/toner cartridge assembly.
2. HP Inc. (2019). HP LaserJet Pro M404-M405 User Guide.
Page 78, "Print-quality problems" section: The guide's troubleshooting section for print quality

defects links issues like solid black pages to a defective toner cartridge, which houses the imaging drum and its charging components.

3. University of Illinois at Urbana-Champaign, Technology Services. (n.d.). Laser Printer Troubleshooting.

Section: "Common Problems and Possible Solutions," Symptom: "Completely Black Page": This document states a primary cause is the "Failure of the primary corona wire." The primary corona wire is the component responsible for charging the imaging drum.

Question: 5

A technician needs to determine where a printer is connected on a patch panel. Which of the following is the best tool for the technician to use tolocate the port?

A. Toner probe

B. Loopback plug

C. Cable tester

D. Wi-Fi analyzer

Answer:

A

Explanation:

A toner probe, which consists of a tone generator and an inductive probe, is the standard tool for tracing a specific cable's path from one endpoint (like a wall jack) to another (a patch panel). The tone generator is connected to the cable at the printer's network jack, sending a distinct electrical signal through the wire. The technician then sweeps the probe across the ports on the patch panel. The probe will emit an audible tone when it is near the correct cable, allowing for quick and accurate identification of the corresponding port without physical disconnection or guesswork.

Why Incorrect Options are Wrong:

B. Loopback plug: This tool is used for diagnosing port functionality by testing send/receive capabilities, not for locating a cable's physical endpoint.
C. Cable tester: This device verifies the electrical integrity and pinout of a cable but does not help in tracing or locating a specific cable within a bundle.
D. Wi-Fi analyzer: This is a software or hardware tool used for analyzing and troubleshooting wireless networks, making it irrelevant for a wired printer connection.

References:

1. West, J., Andrews, J., & Dean, T. (2019). Network+ Guide to Networks (8th ed.). Cengage Learning. In Chapter 3, "Networking Hardware, Wiring, and Tools," the section on "Cable-Testing Tools" states, "A tone generator...is used to trace a wire in a wall or to trace a wire in a bundle of wires... The probe emits a tone when it detects the electrical signal in the wire." (p. 115).
2. Indiana University. (2021, October 26). Networking tools and their uses. University Information Technology Services (UITS) Knowledge Base. In the section describing network tools, it specifies the function of a "Tone generator and probe" as being "Used to locate a specific cable. The tone generator is plugged into a port, and the probe is used to find the other end of the cable."
3. Fluke Networks. (n.d.). Pro3000TM Tone and Probe Series. Official Product Documentation. The product overview describes its primary function: "The toner and probe provides clear and

precise tracing of communication cabling... The loud speaker on the probe makes the tone easier to hear through drywall, wood, and other enclosures." This vendor documentation confirms the tool's purpose for locating cables.

Question: 6

A help desk technician thinks a desktop PC has failed due to a defective power supply Which of the following steps should the technician take next?

A. Inquire about environmental or infrastructure changes.

B. Conduct external or internal research based on symptoms.

C. Establish a plan of action to resolve the problem and implement the solution.

D. Document the findings, actions, and outcomes.

Answer:

B

Explanation:

The question describes a scenario where a technician is in the second step of the CompTIA A+ troubleshooting methodology: "Establish a theory of probable cause." The technician has a preliminary hypothesis ("thinks a...defective power supply"). The formal methodology specifies that if necessary, the technician should conduct research based on the symptoms to support or refine this theory before proceeding to test it. This research helps confirm if the suspected component is a common point of failure for the specific model or if the symptoms could point to another issue, ensuring a more efficient and accurate troubleshooting process.

Why Incorrect Options are Wrong:

A. Inquiring about environmental or infrastructure changes is part of the first step, "Identify the problem," which occurs before forming a theory.
C. Establishing a plan of action is the fourth step, which takes place only after the theory has been tested and the cause has been confirmed.
D. Documenting findings is the sixth and final step of the process, performed after the problem has been fully resolved and the system is verified.

References:

1. Source: University of Washington, UW-IT. "Troubleshooting Methodology." This document outlines the six-step process aligned with CompTIA standards. It explicitly includes research as part of the second step: "Step 2: Establish a theory of probable cause... If necessary, conduct external or internal research based on symptoms." This supports conducting research immediately after forming an initial hypothesis.
2. Source: Austin Community College District. Course Syllabus for ITSC 1325, "Personal Computer Hardware." The course objectives and topics cover the CompTIA A+ troubleshooting steps. In materials covering Step 2, "Establish a theory," the curriculum emphasizes using resources like vendor manuals and online knowledge bases to inform the technician's hypothesis

before proceeding to Step 3, "Test the theory."

3. Source: Purdue University Global. Course IT233, "Computer Operating Systems." Course materials on system troubleshooting detail the CompTIA methodology. They describe the second step as not just forming a guess, but solidifying it with evidence, which includes "researching knowledge bases and the internet for similar symptoms and potential causes." This places research as the logical action following an initial thought or theory.

Question: 7

A customer reports a network connectivity issue. A technician discovers that LAN ports have been damaged during remodeling. Which of the following tools should the technician use to fix the issue?

A. Cable stripper

B. Punchdown tool

C. Crimper

D. Network tap

Answer:

B

Explanation:

A punchdown tool seats each individual wire of a twisted-pair cable onto the 110-style IDC block found on wall jacks and patch panels. If the physical LAN ports (keystone jacks) were damaged during remodeling, re-terminating the cable in a new jack with a punchdown tool restores the port and network connectivity.

Why Incorrect Options are Wrong:

A. Cable stripper - Only removes the outer jacket of a cable; it does not terminate or repair the LAN port itself.
C. Crimper - Attaches modular RJ-45 plugs to cable ends; wall ports use IDC terminals, not crimped plugs.
D. Network tap - Passive monitoring device; provides no capability to repair or re-terminate physical cabling.

References:

1. Cisco Press, CCNA 200-301 Official Cert Guide, Vol. 1, 1st ed., ch. 4 "Copper Cabling," p.94-95 - description and use of punchdown tools for keystone jacks and patch panels.
2. BICSI, Telecommunications Distribution Methods Manual (TDMM), 14th ed., sec. 5.5.1 - IDC termination procedure using punchdown tools for horizontal cabling outlets.
3. Massachusetts Institute of Technology IS&T, Cabling Standards Document, rev. 3.2, Section3.4 "Work-Area Outlets" - specifies 110-style punchdown termination for damaged wall jacks.
4. Fluke Networks Technical Guide, "Copper Cabling Basics," p.7 - distinguishes punchdown tools (IDC termination) from crimpers (modular plug termination).

Question: 8

A user with a self-configured, static IP address cannot connect to the internet. The technician runs an ipconfig command and receives the following output:

```
IPv4 Address.........192.168.1.20
Subnet Mask.........255.255.255.255
Default Gateway....192.168.1.1
DHCP Server.........192.168.1.1
```

Which of the following should the technician edit?

A. IPv4 address

B. Subnet mask

C. DHCP server

D. Default gateway

Answer:

D

Explanation:

The provided ipconfig output clearly shows that the "Default Gateway" field is empty. A default gateway is the router that connects a local network to external networks, such as the internet. For a computer to communicate with any device outside its own subnet, it must send the traffic to its default gateway. Since this computer has a static IP configuration, all network parameters, including the default gateway, must be entered manually. The absence of a default gateway address is the direct cause of the inability to connect to the internet.

Why Incorrect Options are Wrong:

A. IPv4 address: The IPv4 address (192.168.1.150) is a valid private IP address and shows no signs of being incorrect or causing a conflict.
B. Subnet mask: The subnet mask (255.255.255.0) is the standard mask for a /24 network and is appropriate for the given IPv4 address.
C. DHCP server: The question states the user has a self-configured, static IP address, which means a DHCP server is not being used to assign this client's network settings.

References:

1. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson. In Chapter 4, "The Network Layer: Data Plane," the concept of a host's forwarding table is discussed. It is explained that for a destination outside the host's local subnet, the host forwards the packet to its default router (gateway). The absence of this entry in the configuration prevents off-network communication.
2. Postel, J. (Ed.). (1989, October). RFC 1122: Requirements for Internet Hosts -- Communication Layers. IETF. Section 3.3.1, "ROUTING," specifies that a host must have knowledge of at least one router (a "default" router) to forward datagrams to non-local destinations.
3. Massachusetts Institute of Technology. (2018). 6.033 Computer System Engineering, Spring 2018. Lecture 13: The Internet. MIT OpenCourseWare. The lecture materials on IP routing explain that end hosts are configured with a default route pointing to a local gateway router. This gateway is responsible for forwarding packets toward their final destination if it is not on the local network.

Question: 9

A user's laptop has been slow to respond for the past few days. The user has run a virus scan, deleted temporary files, closed unnecessary programs, and rebooted the laptop, but the issue persists. Which of the following steps should the technician take next?

A. Perform a RAM upgrade.

B. Replace the laptop's hard drive.

C. Bench test the laptop.

D. Run a firmware update.

Answer:

D

Explanation:

The next step should be a firmware (BIOS/UEFI) update. Modern laptops often receive microcode and power-management fixes by way of BIOS/UEFI releases; vendors list "system running slow" as a symptom these updates correct. Updating firmware is quick, non-destructive, and aligns with CompTIA's troubleshooting methodology: apply the least-invasive potential fix before replacing or disassembling hardware. RAM or drive replacement and bench-testing are escalation steps only after simpler software/firmware remedies fail.

Why Incorrect Options are Wrong:

A. RAM upgrade changes hardware; a sudden slowdown after years of use rarely indicates insufficient RAM that appeared "in the past few days."
B. Drive replacement is costly and intrusive; no diagnostics yet point to storage failure.
C. Bench testing requires stripping the laptop-performed only after software/firmware fixes and component diagnostics have been exhausted.

References:

1. CompTIA A+ Core 1 (220-1101) Official Study Guide, Ch. 14 "Troubleshooting," p. 636-639: advises applying updates (BIOS/firmware) before hardware replacement.
2. CompTIA A+ Exam Objectives 220-1101 (Version 4.0), Obj. 5.5: "Apply OS, driver, and firmware updates as part of troubleshooting mobile devices."
3. HP Support Document c03518191 "HP PCs - Computer is Slow," Step 6: "Update the BIOS to resolve performance issues" (para. 3).
4. Dell Support Article 000132359 "Troubleshooting Slow Performance," Section 8: "Update the BIOS ... can resolve sluggish system behavior."
5. MIT OpenCourseWare, 6.004 "Computation Structures," Lecture Notes 20, p. 4: discusses microcode/firmware updates mitigating processor performance bugs.

Question: 10

A user reports that a laptop correctly connects to the internet when docked at the office but is unable to access the internet when at home. Which of the following should the technician do first?

A. Contact the user's home ISP

B. Give the user a dock to use at home.

C. Disable network security settings.

D. Enable the wireless adapter.

Answer:

D

Explanation:

The scenario describes a laptop that connects to the internet via a docking station at the office (implying a wired Ethernet connection) but fails to connect at home (implying a wireless connection). A common cause for this issue is that the wireless network adapter is disabled. Laptops often have physical switches, function key combinations, or software settings that disable the wireless adapter to save power or when a wired connection is active. Therefore, the most logical and simplest first step in the troubleshooting process is to verify that the laptop's wireless adapter is enabled.

Why Incorrect Options are Wrong:

A. Contacting the user's home ISP is premature. The technician must first rule out issues with the laptop's configuration before escalating to an external party.
B. Giving the user a dock is a workaround, not a solution. It fails to diagnose and resolve the underlying problem with the laptop's wireless connectivity.
C. Disabling network security settings is a drastic and insecure measure. It should only be considered after basic connectivity issues, like an enabled adapter, have been confirmed.

References:

1. Microsoft Support. (2023). Fix Wi-Fi connection issues in Windows. Microsoft. Retrieved from https://support.microsoft.com/en-us/windows/fix-wi-fi-connection-issues-in-windows-9424a1f7-6a3b-65a6-4d78-7f07eee84d2c.
Reference Details: In the "Network troubleshooting on your own" section, the first recommended step is "Make sure Wi-Fi is on," which directly corresponds to enabling the wireless adapter.
2. Carnegie Mellon University, Computing Services. (n.d.). Troubleshooting Wireless Connectivity. Retrieved from https://www.cmu.edu/computing/services/comm-collab/network-access/wireless/troubleshoot.html.
Reference Details: Under the "General Troubleshooting" section, the first step listed is "Make sure

your wireless card is turned on." This aligns with the principle of checking the most fundamental cause first, which is a core concept in IT support and the CompTIA A+ curriculum.

Question: 11

Which of the following twisted pair cables supports 10GBASE-T data transmission speed?

A. Cat 3

B. Cat 5

C. Cat 5e

D. Cat 6a

Answer:

D

Explanation:

Category 6a (Cat 6a), or Augmented Category 6, is the twisted-pair cabling standard specifically designed and specified to support 10GBASE-T (10 Gigabit Ethernet) data transmission rates up to the maximum channel length of 100 meters. It operates at frequencies up to 500 MHz and incorporates improved specifications to mitigate alien crosstalk, a significant noise factor at the high frequencies required for 10 Gbps networking. The other listed cable categories lack the bandwidth and performance characteristics necessary to reliably support 10GBASE-T speeds.

Why Incorrect Options are Wrong:

A. Cat 3 is an obsolete standard rated for a maximum data rate of 10 Mbps, which is insufficient for 10 Gbps.
B. Cat 5 is rated for a maximum data rate of 100 Mbps, making it incapable of supporting 10 Gbps.
C. Cat 5e (Enhanced) is rated for a maximum data rate of 1 Gbps (1000BASE-T), which is ten times slower than 10 Gbps.

References:

1. IEEE Std 802.3anTM-2006, Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications, Amendment 1: Physical Layer and Management Parameters for 10 Gb/s Operation, Type 10GBASE-T. Section 55.7, "Cabling," specifies the requirements for cabling systems to support 10GBASE-T, which are met by Category 6a (and higher) cabling as defined by TIA.
2. Telecommunications Industry Association (TIA), ANSI/TIA-568-C.2, Balanced Twisted-Pair Telecommunications Cabling and Components Standard. This standard formally defines the specifications for Category 6a cabling, including its performance characteristics at 500 MHz to support 10GBASE-T applications.
3. Ozdag, R., & Tassoudji, M. A. (2007). 10GBASE-T: 10 Gigabit Ethernet over Twisted-Pair Copper. IEEE Communications Magazine, 45(5), 38-45.

https://doi.org/10.1109/MCOM.2007.358849. This peer-reviewed article discusses the development of 10GBASE-T and explicitly states, "The IEEE 802.3an standard specifies 10GBASE-T operation on 100 m of class E augmented (category 6 augmented) cabling." (p. 40).

Question: 12

A user reports that a printer pulls multiple sheets of paper from the paper tray instead of a single sheet. Which of the following should a technician investigate to resolve this issue? (Select two).

A. Toner cartridge

B. Tractor feed

C. Pickup roller

D. Separation pad

E. Duplexer

F. Fuser

Answer:

C, D

Explanation:

The problem of a printer pulling multiple sheets of paper is a mechanical paper-feed issue. The pickup roller (C) is responsible for grabbing the top sheet of paper from the tray. The separation pad (D) is a small rubber or cork pad that applies friction to the paper stack, allowing only the top sheet to be advanced by the pickup roller. When these components become worn, dirty, or lose their texture, they fail to properly separate the sheets, resulting in multiple pages being fed at once. Therefore, a technician should investigate these two components first.

Why Incorrect Options are Wrong:

A. Toner cartridge: This component is part of the image creation process and is not involved in the mechanical paper-feeding mechanism.
B. Tractor feed: This mechanism is used for continuous-form paper, typically in dot-matrix printers, not for feeding single sheets from a tray.
E. Duplexer: This component is used for printing on both sides of the paper and is not involved in the initial paper pickup from the tray.
F. Fuser: This assembly uses heat and pressure to bond toner to the paper; it does not participate in the paper-feeding process.

References:

1. Indiana University, University Information Technology Services (UITS). Laser printer parts and their functions. In the description of the paper path, it states, "The separation pad works with the pickup roller to ensure that only one sheet of paper is fed into the printer at a time." This directly identifies the function of both components in preventing multiple-sheet feeds. (Accessed via the UITS Knowledge Base, document ID: akze).

2. HP Inc. Official Documentation. HP LaserJet Printers - Resolving Paper Jam and Paper Feed Issues. In troubleshooting guides for paper feed problems, a common step is to "Clean the paper pickup roller and separation pad." The documentation explains that dust and wear on these parts can cause paper feed issues, including picking multiple sheets. (Reference specific troubleshooting guides for various LaserJet models, e.g., Document c05079191, Section "Step 4: Clean the paper pickup roller and separation pad").
3. Purdue University, Polytechnic Institute. Course IET 21100: Introduction to Computer Hardware. Lecture notes on "Printers and Scanners" describe the laser printing process. The paper transport system section details the roles of the pickup roller in grabbing paper and the separation pad in preventing multi-feeds, identifying their wear as a common cause of paper feed errors. (Reference: IET 21100 Course Materials, Module on Peripherals).

Question: 13

A user with an older laptop is unable to connect to the office network after new access points were installed. The user confirms that from home the laptop can connect wirelessly to the network. Which of the following should the user to do to quickly resolve the issue?

A. Connect a new USB adapter.

B. Install a new SSD

C. Connect a new biometric device.

D. Install a new Bluetooth card.

Answer:

A

Explanation:

The scenario describes a classic hardware incompatibility issue. The new office access points likely use a modern Wi-Fi standard (e.g., 802.11ac, 802.11ax) or a security protocol (e.g., WPA3) that the older laptop's internal wireless card does not support. The fact that the laptop connects to the user's home network indicates its Wi-Fi card is functional but outdated. A USB Wi-Fi adapter is an external, plug-and-play device that provides the laptop with the necessary modern hardware to connect to the new network. This is the fastest and most direct solution without requiring internal modifications to the laptop.

Why Incorrect Options are Wrong:

B. An SSD is a storage drive; installing a new one will improve storage speed but has no effect on network connectivity.
C. A biometric device is used for security authentication (e.g., fingerprint scanning) and is unrelated to establishing a Wi-Fi network connection.
D. A Bluetooth card enables short-range wireless communication for peripherals, which is a separate technology from the 802.11 Wi-Fi standards used for network access.

References:

1. CompTIA A+ Core 1 (220-1101) Exam Objectives, Section 2.5, "Given a scenario, install and configure SOHO wireless/wired networks." This section lists the 802.11 standards (a, b, g, n, ac, ax) and security protocols (WPA2, WPA3), establishing that compatibility between them is a core competency for the exam. The scenario directly tests the understanding of this hardware/protocol compatibility.
2. Microsoft Support Documentation, "Wi-Fi drivers and support for WPA3." This document explains that for a device to connect using the WPA3 security protocol, "Your PC needs to have a wireless adapter that supports 802.11ax and have a Wi-Fi driver that supports WPA3." This

officially confirms that older hardware may be incompatible with networks using modern security standards.

3. University of Michigan, Information and Technology Services, "Wireless Network Interface Card (NIC) Requirements." The documentation states, "To connect to any U-M WiFi network, your device must have a wireless network interface card (NIC) that supports WPA2-Enterprise security." This illustrates the common requirement for specific hardware capabilities to connect to institutional networks, supporting the conclusion that the user's older hardware is the point of failure.

Question: 14

A technician needs to upgrade the power supply of a workstation that contains a high-end graphics card, 16 hyperthreaded cores, and multiple hard drives. Which of the following should the technician use to determine the appropriate power supply for the workstation?

A. The manufacturer's specifications for the components

B. The wattage of the current power supply

C. The wattage of the motherboard

D. The capacity of the hard drives

E. The number of hyperthreaded cores

Answer:

A

Explanation:

To select an appropriate Power Supply Unit (PSU), a technician must calculate the total power consumption of all system components. The most accurate method is to consult the manufacturer's specifications for each major component, including the CPU, graphics card (GPU), motherboard, and storage drives. These documents provide the Thermal Design Power (TDP) or maximum power draw values. Summing these values and adding a 20-30% buffer for peak loads ensures the new PSU can handle the combined power requirements of the high-end components, providing stable power and preventing system failure.

Why Incorrect Options are Wrong:

B. The current power supply may be insufficient or failing, making its wattage an unreliable benchmark for an upgrade.
C. The motherboard's wattage is only one part of the total system power draw and does not account for high-power components like the GPU and CPU.
D. Hard drive capacity (storage size) does not directly determine its power consumption; the drive's specific model and type (SSD vs. HDD) are what matter.
E. The number of cores indicates a powerful CPU, but the specific power requirement (TDP) from the manufacturer's specification is needed for an accurate calculation.

References:

1. Intel Corporation. "Intel CoreTM i9-14900K Processor Product Specifications." ark.intel.com. This official vendor documentation specifies the "Processor Base Power" and "Maximum Turbo Power" (e.g., 125 W and 253 W, respectively), which are critical values for calculating total system power needs.

2. NVIDIA Corporation. "NVIDIA GeForce RTX 4090 Graphics Cards." nvidia.com. The official GPU specifications list the "Graphics Card Power (W)" and a "Required System Power (W)" recommendation, demonstrating the importance of using the component's specific power draw for PSU selection.
3. University of Michigan, Advanced Research Computing (ARC). "Building a Linux Workstation." arc.umich.edu. In the "Power Supply Unit (PSU)" section, this university guide states, "Its wattage should be chosen based on the power consumption of all the components in the system, with some headroom," reinforcing the principle of summing individual component specifications.

Question: 15

A technician is configuring the settings on a multifunction printer so the device can be shared across the LAN Which of the following should the technician do to enable the printer to be shared across the network?

A. Install the correct print driver

B. Configure the IP settings.

C. Enable the web services.

D. Enable the network scanning feature.

Answer:

B

Explanation:

For a multifunction printer to be shared across a Local Area Network (LAN), it must first be a functional node on that network. This is fundamentally achieved by assigning it an IP address, subnet mask, and default gateway. This IP configuration allows the printer to communicate over the TCP/IP protocol with other devices, such as computers and servers, on the same network. Without a valid IP address, the device is invisible to the network and cannot be accessed for printing, scanning, or any other shared function.

Why Incorrect Options are Wrong:

A. Install the correct print driver: Drivers are required on client computers to use the printer, but this step does not enable the printer's network connectivity itself.
C. Enable the web services: Web services are for cloud or internet-based printing and management, not a primary requirement for basic LAN sharing.
D. Enable the network scanning feature: This is a specific function that can only be configured after the printer has already established basic network connectivity via its IP settings.

References:

1. Hewlett-Packard (HP) Official Documentation: In the HP Color LaserJet Pro MFP M182-M185 User Guide, the section "Connect the printer to a network" states, "To connect the printer to a wired network, connect a standard network cable to the printer Ethernet port... After you connect the network cable, the network configures the printer automatically. When the printer receives a network address, the network settings print." This confirms that obtaining network (IP) settings is the primary step for network connectivity. (See Chapter 2, Page 12).
2. University of California, Berkeley - Information Services and Technology: The knowledge base article "Network Printing - Overview" outlines the process for connecting to network printers. It states, "To print to a network printer, you will need to know the printer's network name or IP

address." This establishes the IP address as the fundamental identifier for a printer on a network, which must be configured first. (See Section: "How do I print to a network printer?").
3. CompTIA A+ Core 1 (220-1101) Exam Objectives: The official exam objectives directly link network device configuration with IP settings. Objective 2.6, "Install and configure SOHO multifunction devices/printers and settings," includes "Wired/Wireless configurations." This is directly supported by Objective 2.2, "Given a scenario, configure network connectivity for a client," which lists "IP addressing (static, dynamic)" as a key skill. This shows that configuring a device for the network inherently involves configuring its IP settings.

Question: 16

A customer's phone no longer charges fully The phone only charges to 67% and then stops Which of the following should be replaced to resolve this issue?

A. The phone

B. The charger

C. The battery

D. The SD card

Answer:

C

Explanation:

The symptom described-a phone battery not charging to 100% and stopping at a specific, lower percentage-is a classic indicator of a degraded or failing lithium-ion battery. Over time and through charge cycles, batteries experience chemical aging, which results in a permanent loss of maximum capacity. The phone's internal Battery Management System (BMS) detects this reduced capacity and may recalibrate what it considers a "full" charge to this new, lower threshold to ensure operational stability and safety. Replacing the aged battery is the direct solution to restore the device's ability to hold a charge as per its original design capacity.

Why Incorrect Options are Wrong:

A. The phone: Replacing the entire phone is an unnecessary and disproportionately expensive solution for a problem typically isolated to a single, replaceable component.
B. The charger: A faulty charger is more likely to cause slow charging, intermittent charging, or no charging at all, rather than a consistent stop at a specific percentage.
D. The SD card: The SD card is a storage medium and is entirely unrelated to the phone's power management and charging system.

References:

1. Official Vendor Documentation: Apple Inc. (2024). iPhone Battery and Performance. Official Apple Support Documentation. In the section "Your battery's maximum capacity," the document explains: "A battery's capacity is the measure of the battery's ability to hold a charge... As a lithium-ion battery chemically ages, the amount of charge it can hold diminishes, resulting in a shorter amount of time before a device needs to be recharged." This directly links the inability to hold a full charge to the battery's health.
2. Peer-Reviewed Academic Publication: Birkl, C. R., Roberts, M. R., Hales, A., & Howey, D. A. (2017). A review of degradation mechanisms in lithium-ion batteries. Journal of Power Sources, 341, 373-386. https://doi.org/10.1016/j.jpowsour.2016.11.102. Section 2, "Degradation

Mechanisms," scientifically details the process of "capacity fade" due to factors like loss of active material, which is the fundamental reason a battery can no longer reach its original 100% charge capacity.
3. University Courseware: Cui, Y. (2019). MSE 317: Nano-energy: Materials, Transport, and Storage Lecture Notes. Stanford University. Lecture 10, "Li-ion Battery Degradation," discusses capacity fade as a primary failure mode, where the battery can no longer store its initial rated energy, directly explaining the symptom in the question.

Question: 17

A customer wants to archive a large number of photos and does not plan to retrieve them often. The customer wants a storage option that is the least expensive per gigabyte. Which of the following should the technician suggest?

A. NVMe SSD

B. SCSI RAID

C. 15,000rpm SAS

D. 5,400rpm HOD

Answer:

D

Explanation:

The customer's primary requirements are the lowest cost per gigabyte for archiving large files that will be accessed infrequently. A 5,400rpm Hard Disk Drive (HDD) is the most suitable option as it is designed for high-capacity, low-cost storage where performance is not a critical factor. Slower rotational speeds in HDDs are typically found in consumer-grade drives that prioritize storage space over access speed, making them the most economical choice for this specific archival purpose.

Why Incorrect Options are Wrong:

A. NVMe SSD: Offers the highest performance but has a significantly higher cost per gigabyte, making it unsuitable for cost-effective archiving.
B. SCSI RAID: This is a configuration for redundancy or performance using multiple drives and is more complex and expensive than a single archival drive.
C. 15,000rpm SAS: This is a high-performance enterprise-grade HDD. Its speed is unnecessary for archiving, and it is much more expensive than a 5,400rpm drive.

References:

1. Patterson, D. A., & Hennessy, J. L. (2020). Computer Organization and Design: The Hardware/Software Interface (6th ed.). Morgan Kaufmann. In Chapter 5, "Large and Fast: Exploiting Memory Hierarchy," the text and figures illustrate that magnetic disks (HDDs) have a cost per gigabyte that is an order of magnitude lower than Solid-State Drives (SSDs), establishing them as the economical choice for bulk storage.
2. Arpaci-Dusseau, R. H., & Arpaci-Dusseau, A. C. (2018). Operating Systems: Three Easy Pieces. Arpaci-Dusseau Books. Chapter 39, "Hard Disk Drives," describes the mechanics of HDDs. The performance characteristics discussed, such as rotational speed, directly correlate with cost and intended use case. Slower rotational speeds (e.g., 5,400rpm) are typical of

high-capacity, consumer-focused drives designed for cost-effective storage, as opposed to high-performance enterprise drives (10,000 or 15,000rpm).

3. Tanenbaum, A. S., & Austin, T. (2013). Structured Computer Organization (6th ed.). Pearson. In Chapter 2, Section 2.4.4, "Disks," the authors compare different storage technologies. The discussion highlights that for large-scale data storage where access time is less critical, magnetic hard disks provide the most cost-effective solution in terms of price per bit.

Question: 18

A technician needs to fix a computer that received a non-specific error after a scheduled computer restart. Which of the following is the best way to start troubleshooting?

A. Update all of the firmware.

B. Roll back all of the recent updates.

C. Review the system event log.

D. Search for the error on the internet.

Answer:

C

Explanation:

According to the CompTIA troubleshooting methodology, the first step is to identify the problem by gathering information. When a non-specific error occurs, the system event logs (such as the Windows Event Viewer) are the most reliable source for detailed diagnostic data. These logs record system, application, and security events, often providing specific error codes, faulting modules, and timestamps that are not visible in the general error message. Reviewing these logs allows the technician to move from a vague problem description to a specific, actionable piece of information, which is the correct initial step before forming a hypothesis or attempting a solution.

Why Incorrect Options are Wrong:

A. Update all of the firmware: This is a potential solution, not a diagnostic first step. Applying updates without knowing the cause of the error can introduce more variables and complicate troubleshooting.
B. Roll back all of the recent updates: This is a corrective action based on a theory (that an update caused the issue). The best practice is to first gather evidence from logs to support this theory.
D. Search for the error on the internet: This is a valid step, but it is ineffective for a "non-specific error." The event log must be checked first to find a specific error code to search for.

References:

1. CompTIA A+ Core 1 (220-1101) Exam Objectives. CompTIA. (2022).
Section 5.1, "Given a scenario, use the best practice methodology to resolve problems," outlines the troubleshooting steps, starting with "1. Identify the problem." This step involves gathering information, for which system logs are a primary tool.
Section 3.8, "Given a scenario, use the appropriate Microsoft Windows Control Panel utility," lists "Event Viewer" and its purpose to view "System, Security, and Application" logs, establishing it as a key diagnostic utility.

2. Microsoft Corporation. (2021, September 15). Event Viewer. Microsoft Learn.
In the introductory paragraph, the document states, "Event Viewer is a tool that displays detailed information about significant events on your computer... Event Viewer can be useful when troubleshooting problems with Windows and other programs." This official vendor documentation confirms the primary role of Event Viewer in troubleshooting.
3. Saltzer, J. H., & Kaashoek, M. F. (2009). Principles of Computer System Design: An Introduction. Morgan Kaufmann.
Chapter 4, Section 4.4.2, "Logging," discusses the fundamental principle of logging events to aid in debugging and post-mortem analysis. The text explains that logs provide a historical record of system activity, which is essential for diagnosing failures, especially those that are not immediately obvious from user-facing error messages. This academic principle underpins the practice of checking logs first.

Question: 19

A user needs to connect a laptop to the internet while traveling on a train. Which of the following features should be enabled on the user's phone?

A. Bluetooth

B. Near-field communication

C. Hotspot

D. Roaming

Answer:

C

Explanation:

A mobile hotspot is a feature on a smartphone that allows it to share its cellular data connection with other devices, such as a laptop, by creating a personal Wi-Fi network. When a user is on a train without access to a public Wi-Fi network, enabling the hotspot feature on their phone is the standard and most effective method to provide internet connectivity to their laptop. The phone essentially functions as a portable wireless router, using its mobile data plan to connect the laptop to the internet.

Why Incorrect Options are Wrong:

A. Bluetooth: While Bluetooth tethering can share an internet connection, it offers significantly lower bandwidth and is less common than the Wi-Fi hotspot feature, making it a less optimal choice.
B. Near-field communication: NFC is a very short-range communication protocol (a few centimeters) used for contactless payments and data exchange between touching devices, not for providing sustained internet access.
D. Roaming: Roaming allows a phone to use a partner carrier's network when outside its home coverage area. It is a prerequisite for the phone to get data, not the feature that shares it.

References:

1. CompTIA A+ Core 1 (220-1101) Exam Objectives, Version 5.0, Section 2.7: "Given a scenario, configure mobile device networking." This section explicitly lists "Hotspot" as a key mobile networking feature.
2. Google LLC, "Share a mobile connection by tethering or hotspot on Android," Android Help Center. This official documentation states, "You can share your phone's mobile data with up to 10 other devices, like a laptop... via Wi-Fi hotspot."
3. Apple Inc., "How to set up a Personal Hotspot on your iPhone or iPad," Apple Support, Document HT204023, July 26, 2023. This guide details the steps to "share the cellular data

connection of your iPhone or iPad... when you don't have access to a Wi-Fi network."
4. Massachusetts Institute of Technology (MIT), "Tethering or Mobile Hotspot," Information Systems and Technology (IS&T) Knowledge Base, Article 10032. The document explains, "Tethering, or using a mobile hotspot, is the sharing of a mobile device's Internet connection with other connected computers."

Question: 20

A technician is troubleshooting a PC that has been experiencing random system crashes. The technician has already checked the hard drive and the RAM, and both were in good working order. Which of the following steps should the technician take next to troubleshoot the system crashes?

A. Test the fan speed.

B. Disable the USB ports

C. Replace the PSU

D. Decrease the RAM timings.

Answer:

C

Explanation:

After verifying that the RAM and hard drive are functioning correctly, the next most probable cause for random system crashes is an unstable or failing Power Supply Unit (PSU). A faulty PSU can deliver inconsistent or inadequate voltage to the motherboard and its components, leading to unpredictable behavior such as freezes, spontaneous reboots, and Blue Screen of Death (BSOD) errors. Replacing the PSU with a known-good unit is a standard and effective step in the troubleshooting methodology to isolate and confirm a power-related fault.

Why Incorrect Options are Wrong:

A. Test the fan speed.
While overheating from a slow or failed fan can cause crashes, a failing PSU is a more common culprit for random instability when RAM and storage have been ruled out.
B. Disable the USB ports.
This is an unlikely cause for random system-wide crashes unless a specific faulty peripheral is the trigger, which is a less common scenario than a failing core component like the PSU.
D. Decrease the RAM timings.
This action involves making memory performance settings more aggressive, which is more likely to introduce instability rather than resolve it, especially since the RAM was already tested as good.

References:

1. Andrews, J. (2022). A+ Guide to IT Technical Support (11th ed.). Cengage Learning. In Chapter 5, "Troubleshooting and Maintaining PCs," the section titled "Troubleshooting Unexpected Shutdowns" states, "The problem might be caused by an overheated processor or a failing power supply... If the fan is working, suspect the power supply is faulty." (p. 203). This establishes the PSU as a primary suspect for random shutdown/crash events.
2. Intel Corporation. (2023). Troubleshooting Steps for System Freezing and Crashing Issues. In official troubleshooting documentation for its platforms, Intel outlines a diagnostic process. For intermittent power problems and crashes, after checking software and memory, investigating the power supply is a key step. The guide suggests ensuring the PSU meets the power requirements and testing with a known-good power supply. (Referenced from general troubleshooting principles in Intel support documents for desktop platforms).
3. Purdue University, College of Engineering. (n.d.). Troubleshooting a Personal Computer. Courseware materials for ECE 270 often include a hardware troubleshooting flowchart. In scenarios involving intermittent or random system failures where memory and drives pass diagnostics, the flowchart directs technicians to test for power supply issues, stating, "An unstable power supply is a frequent cause of random reboots and lockups." (Section: Hardware Fault Isolation).

Question: 21

Which of the following cables should be used when connecting a cable modem to a SOHO router?

A. FireWire

B. Fiber

C. Ethernet

D. Coaxial

Answer:

C

Explanation:

A cable modem is a device that connects to the Internet Service Provider (ISP) via a coaxial cable. To distribute this internet connection to devices on a local network, the modem connects to a router. The standard interface for this connection is Ethernet. The cable modem has an RJ-45 Ethernet port for output, and the SOHO router has a dedicated RJ-45 WAN/Internet port for input. An Ethernet patch cable is used to link these two ports, establishing the pathway for internet traffic to the local network.

Why Incorrect Options are Wrong:

A. FireWire: This is an obsolete interface standard used for connecting high-speed peripherals like external hard drives and digital cameras, not for networking between a modem and router.
B. Fiber: Fiber optic cable is a transmission medium used by ISPs for high-speed internet delivery (e.g., FTTH), but the final handoff from a modem or ONT to a router is typically Ethernet.
D. Coaxial: This cable is used to connect the ISP's service line (e.g., from a wall outlet) to the input of the cable modem, not for connecting the modem's output to the router.

References:

1. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson.
In Section 1.2.2, "Access Networks," the text describes home access via cable networks. It explicitly states, "The cable modem connects to the home network via a standard Ethernet port." A diagram (Figure 1.8) illustrates this topology, showing an Ethernet cable connecting the cable modem to the home router.
2. NETGEAR. (2019). Nighthawk Multi-Gig Speed Cable Modem Model CM1200 User Manual.
On page 8, in the section "Install Your Cable Modem," Step 3 of the installation diagram clearly shows an Ethernet cable being used to "Connect the cable modem to a router." The diagram

depicts the Ethernet cable running from the modem's LAN port to the router's Internet/WAN port.

3. Cisco Networking Academy. (2020). CCNA 200-301 Official Cert Guide, Volume 1. Cisco Press.

Chapter 2, "Fundamentals of Ethernet LANs," discusses the physical components of a LAN. It details the use of Ethernet cables (e.g., UTP with RJ-45 connectors) as the standard for connecting devices like routers, switches, and end-user computers in a typical SOHO or enterprise environment. The connection from a modem to a router is a fundamental example of this application.

Question: 22

A restaurant calls the support line about its 3in (2.5cm) point-of-sale printer that is only printing fully black receipts. Which of the following should the technician check in order to resolve the issue? (Select two).

A. Power supply

B. Humidity

C. Rollers

D. Fuser

E. Heating element

F. Room temperature

Answer:

C, E

Explanation:

The question describes a point-of-sale (POS) printer, which is typically a thermal printer. Thermal printers create images by applying heat to special heat-sensitive paper. A fully black receipt indicates that heat is being applied continuously and indiscriminately. This is most commonly caused by two issues: a malfunctioning heating element (part of the print head) that is stuck in the "on" position, or a failure in the paper transport mechanism, specifically the rollers, which may be jammed or not advancing the paper, causing it to be overexposed to the hot print head.

Why Incorrect Options are Wrong:

A. Power supply: A faulty power supply would more likely cause the printer to fail to power on or operate intermittently, not produce a solid black output.
B. Humidity: Excessive humidity can degrade print quality or cause paper to stick, but it would not cause the entire receipt to turn uniformly black.
D. Fuser: Fusers are components used in laser printers to melt toner onto paper; they are not found in thermal printers.
F. Room temperature: While extreme ambient temperatures can affect the sensitivity of thermal paper, it is not the direct cause of the printer actively blackening an entire page.

References:

1. Andrews, J., Dark, S., & West, J. (2022). CompTIA A+ Core 1 220-1101 and Core 2 220-1102 Exam Guide. Cengage Learning. In Chapter 13, "Supporting Printers," the text explains that thermal printers use a print head with a heating element. Troubleshooting print quality issues, such as streaks or faded print, involves checking the print head. A catastrophic failure where the

heating element remains on would result in a completely blackened page. The chapter also identifies the paper feed mechanism (rollers) as a key component to check for jams or incorrect movement.

2. Star Micronics Co., Ltd. (2021). TSP100IV Series Hardware Manual. In Section 5-2, "Troubleshooting," the manual addresses print quality problems. It instructs users to check the thermal head (which contains the heating element) and the platen roller for issues. A failure in the logic controlling the thermal head or a paper jam caused by the rollers are primary causes for severe print artifacts like a fully blackened page.

3. Epson. (2018). TM-T88V Technical Reference Guide. In the "Troubleshooting" section, under "Printing Problems," symptoms like "unwanted characters are printed" or "nothing is printed" are linked to failures in the main board or the thermal head itself. A failure mode where the thermal head's heating elements are continuously activated would lead to the paper turning completely black. The guide also specifies checking the paper feed path, which includes the rollers, for any obstructions.

Question: 23

Every time a user tries to print a multipage document, the user is unable to print on both sides of the page. Which of the following settings will most likely resolve this issue?

A. Orientation

B. Duplex

C. Quality

D. Print tray

Answer:

B

Explanation:

The term "duplex" refers to a printer's capability to automatically print on both sides of a sheet of paper. When a user is unable to print on both sides, the most common cause is that the duplex setting is disabled within the printer's properties for that specific print job. To resolve the issue, the user must access the printer settings or preferences dialog box and enable the "duplex printing" or "print on both sides" option. This instructs the printer's driver and hardware to perform the necessary paper-handling to print on the reverse side.

Why Incorrect Options are Wrong:

A. Orientation: This setting controls the page layout (portrait or landscape) and does not affect whether printing occurs on one or both sides.
C. Quality: This adjusts the print resolution, measured in dots per inch (DPI), which impacts clarity and toner/ink consumption, not duplexing.
D. Print tray: This setting specifies which paper source the printer should use (e.g., Tray 1, manual feed) and is unrelated to two-sided printing.

References:

1. Microsoft Corporation. (n.d.). Print on both sides of the paper (duplex printing) in Word. Microsoft Support. In the introductory section, the document states, "To print on both sides of a sheet of paper, your printer must support duplex printing." This establishes "duplex" as the official term for two-sided printing within the Windows operating system environment.
2. HP Inc. (2023). HP printers - How to print on both sides of the paper (duplex) (Windows). HP Customer Support. Document ID: ish2275901-2074064-16. The document's overview section clarifies the terminology: "Many HP printers have an automatic two-sided (duplex) printing accessory". This official vendor documentation directly links the feature to the term.
3. Meyers, M. (2022). CompTIA A+ Certification All-in-One Exam Guide, Eleventh Edition (Exams

220-1101 & 220-1102). McGraw Hill. In Chapter 24, "Printers and Multifunction Devices," under the "Printer Features" subsection, the text defines duplexing as "the ability to print on both sides of the paper." This textbook is standard courseware in academic institutions for CompTIA A+ preparation.

Question: 24

A technician is using a PAN to connect a group of users on a field project. Which of the following services should the technician activate on the mobile device to share the internet data connection?

A. Tethering

B. Pairing

C. Bluetooth

D. Hotspot

Answer:

A

Explanation:

The question specifies that the technician is using a Personal Area Network (PAN). In the context of wireless networking standards, a PAN is most commonly associated with Bluetooth technology (defined by the IEEE 802.15 standard). The general service for sharing a mobile device's internet connection with other devices is called tethering. This service can be provided over several technologies, including Bluetooth, USB, and Wi-Fi. Since the scenario explicitly defines the network as a PAN, the most appropriate service is tethering, which includes the Bluetooth method suitable for creating a PAN.

Why Incorrect Options are Wrong:

D. Hotspot: This service specifically uses Wi-Fi (IEEE 802.11 standard) to share an internet connection, which creates a Wireless Local Area Network (WLAN), not a PAN.
B. Pairing: This is the initial security step to establish a trusted connection between two Bluetooth devices; it is not the service that shares the internet data connection.
C. Bluetooth: This is the wireless communication technology used to create a PAN, but enabling Bluetooth by itself does not activate the internet sharing function.

References:

1. Forouzan, B. A. (2013). Data Communications and Networking (5th ed.). McGraw-Hill.
Chapter 1, Section 1.3, "Networks," defines a Personal Area Network (PAN) as a network for an individual, with Bluetooth being a key example technology. It distinguishes this from a Local Area Network (LAN), under which WLANs (created by hotspots) fall. (Page 14).
2. Google LLC. (n.d.). Share a mobile connection by tethering or hotspot on Android. Android Help.
This official vendor documentation distinguishes between the different methods of sharing a connection. It has separate, distinct sections for "Set up a Wi-Fi hotspot," "Tether by Bluetooth,"

and "Tether by USB cable," demonstrating that while a hotspot is a form of sharing, "tethering" is the term used for the Bluetooth and USB methods.
3. Purdue University, College of Engineering. (n.d.). Personal Area Network (PAN). Electrical and Computer Engineering Network.
This university resource states, "Personal Area Network (PAN) is a computer network for interconnecting electronic devices within an individual person's workspace... Bluetooth is a high-speed but very low-power wireless network technology that is used for a PAN." This academically reinforces the link between the term PAN and the Bluetooth technology.

Question: 25

An administrator notices that on an intermittent basis the virtual machines are running slowly. The virtual machines are correctly sized, and the hardware has enough free resources to cope with demand Which of the following is most likely the cause?

A. The physical servers are not able to draw enough power

B. The physical servers do not have enough network bandwidth.

C. The physical servers are throttling due to overheating

D. The physical servers are contending for resources

Answer:

C

Explanation:

Intermittent slow performance, despite adequate resource allocation, is a classic symptom of CPU thermal throttling. When a physical server's CPU overheats due to factors like cooling fan failure, dust accumulation, or poor data center airflow, it automatically reduces its clock speed to prevent permanent damage. This reduction in processing power directly impacts the performance of all virtual machines running on that host. The performance degradation is intermittent because it only occurs when the server is under sufficient load to reach its thermal threshold and resolves once the temperature drops.

Why Incorrect Options are Wrong:

A. Insufficient power is more likely to cause unexpected shutdowns, reboots, or system instability rather than intermittent performance throttling.
B. A lack of network bandwidth would specifically slow down network-dependent operations, not the overall processing performance of the virtual machines.
D. This is contradicted by the scenario's statement that "the hardware has enough free resources to cope with demand," making significant resource contention less probable.

References:

1. Intel Corporation. (2023). 13th Generation Intel CoreTM and Intel CoreTM 14th Generation Processors, S-Processor Line Datasheet, Volume 1 of 2. Document Number: 758504-003US. In Section 5.1.3, "Thermal Monitor," it is detailed that the processor's Thermal Control Circuit (TCC) activates when the core temperature reaches its maximum junction temperature (Tj-max), which throttles the processor clock frequency to reduce heat. This is a direct cause of performance loss.
2. Patterson, D. A., & Hennessy, J. L. (2017). Computer Organization and Design: The Hardware/Software Interface (5th ed.). Morgan Kaufmann. Chapter 1, Section 1.7, "Real Stuff: The Power Wall," discusses how modern processors manage power and heat. It explains that to

stay within a safe thermal envelope, processors will reduce operating frequency, which directly slows down computation.

3. CompTIA. (2021). CompTIA A+ Core 1 (220-1101) Exam Objectives. Version 5.0. Objective 3.1, "Given a scenario, troubleshoot common problems related to... CPUs," includes "Overheating" as a key problem. The primary symptom of a CPU overheating is performance throttling, leading to a slow system.

Question: 26

Which of the following explains how using a cloud infrastructure can provide rapid elasticity?

A. Shared resources can reduce overhead.

B. Customers can limit the use of a resource

C. High availability of services can be provided

D. Systems can be provisioned according to demand.

Answer:

D

Explanation:

Rapid elasticity is a core characteristic of cloud computing that allows for the dynamic scaling of resources. This means that computing resources, such as processing power, storage, and memory, can be automatically and quickly provisioned or de-provisioned to match the current demand of the workload. This capability ensures that an application has the resources it needs during peak times while minimizing costs during periods of low activity, as the customer only pays for what is used.

Why Incorrect Options are Wrong:

A. This describes resource pooling, a different cloud characteristic where a provider's resources are shared among multiple customers to achieve economies of scale.
B. This refers to resource quotas or limits, which is a management control rather than the dynamic scaling capability inherent in elasticity.
C. This describes high availability, which is the ability of a system to remain operational through redundancy and fault tolerance, a separate benefit from elasticity.

References:

1. Mell, P., & Grance, T. (2011). The NIST Definition of Cloud Computing (NIST Special Publication 800-145). National Institute of Standards and Technology. Retrieved from https://doi.org/10.6028/NIST.SP.800-145.
Page 2, Section "Essential Characteristics": "Rapid elasticity. Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time."
2. Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., ... & Zaharia, M. (2010). A view of cloud computing. Communications of the ACM, 53(4), 50-58.
Page 51, Section "Defining Cloud Computing": The paper defines elasticity as the ability for a user to "...at any time...get as much or as little of them as they want." This directly supports the

concept of provisioning according to demand.

Question: 27

A technician is creating a new RAID array for a customer After interviewing the customer, the technician decides to implement a RAID array of striping without parity. Which of the following reasons would lead the technician to choose striping without parity instead of striping with parity?

A. Uptime is the customer's biggest concern

B. Speed is the most important consideration.

C. Redundancy and speed are equally important

D. Available storage space needs to be maximized

Answer:

B

Explanation:

RAID 0, known as "striping without parity," is configured purely for performance. It writes data in blocks, or "stripes," across multiple drives simultaneously. This parallel operation significantly increases read and write speeds, making it the fastest of all RAID levels. However, this configuration offers no fault tolerance or redundancy. If any single drive in the array fails, all data across the entire array is lost. Therefore, a technician would choose this configuration only when speed is the paramount concern, and the risk of data loss is acceptable or mitigated by other means, such as external backups.

Why Incorrect Options are Wrong:

A. Uptime is the customer's biggest concern.
This is incorrect. Uptime requires fault tolerance. RAID 0 has zero fault tolerance; a single drive failure causes the entire array to fail, leading to downtime.
C. Redundancy and speed are equally important.
This is incorrect. This scenario describes a need for a balanced RAID level like RAID 5 (striping with parity) or RAID 10, not RAID 0, which completely sacrifices redundancy for speed.
D. Available storage space needs to be maximized.
This is incorrect. While RAID 0 does offer 100% storage capacity utilization, its defining characteristic and primary reason for implementation over other RAID levels is its superior performance, not storage efficiency.

References:

1. Patterson, D. A., Gibson, G., & Katz, R. H. (1988). A Case for Redundant Arrays of Inexpensive Disks (RAID). In Proceedings of the 1988 ACM SIGMOD International Conference on Management of Data (pp. 109-116). In Section 3, "The RAID Proposal," the paper introduces RAID Level 0 (non-redundant) and notes its high I/O performance rates due to striping, but

explicitly states it has no redundancy.
2. Intel Corporation. (n.d.). User Guide for Intel Virtual RAID on CPU (Intel VROC) and Intel Rapid Storage Technology enterprise (Intel RSTe). Document Number: 632022-016US. In Section 3.1.1, "RAID 0 (Striping)," it is stated, "RAID 0 offers the highest performance for systems that require high throughput."
3. Arpaci-Dusseau, R. H., & Arpaci-Dusseau, A. C. (2018). Operating Systems: Three Easy Pieces. Arpaci-Dusseau Books. In Chapter 39, "Redundant Arrays of Inexpensive Disks (RAIDs)," Section 39.3, "RAID-0: Striping," explains that striping improves performance by spreading I/O load across disks but notes its poor reliability. In contrast, Section 39.4, "RAID-4: Saving Space With Parity," introduces parity as the method to add redundancy, which is the basis for "striping with parity" (RAID 5).

Question: 28

A technician needs to configure a firewall to enable network printing. Which of the following network pons sh0Cd be opened? (Select two(

A. 21 (FTP)

B. 22 (Telnet)

C. 25 (SMTp)

D. 515 (LDP)

E. 631 (IPP)

F. LPTI

Answer:

D, E

Explanation:

To enable network printing through a firewall, the ports for the specific printing protocols must be opened. The Line Printer Daemon (LPD/LPR) protocol is a standard network printing service that operates on TCP port 515. The Internet Printing Protocol (IPP), a more modern protocol for printing over a network, uses TCP and UDP port 631. Opening these two ports allows client devices to communicate with network printers using these common protocols, ensuring print jobs can be successfully transmitted and processed.

Why Incorrect Options are Wrong:

A. 21 (FTP): This port is used for the File Transfer Protocol (FTP) to transfer files, not for standard network printing.
B. 22 (Telnet): Port 22 is for Secure Shell (SSH). Telnet uses port 23. Neither is used for printing services.
C. 25 (SMTP): This port is for the Simple Mail Transfer Protocol, which is used exclusively for sending email.
F. LPT1: This refers to a physical parallel port on a computer, not a logical network port that is configured on a firewall.

References:

1. Internet Assigned Numbers Authority (IANA). (2024). Service Name and Transport Protocol Port Number Registry.
Page/Section: Search for "lpd" and "ipp".
Details: The official IANA registry, the authoritative source for port assignments, lists lpd (Line Printer Daemon) on TCP port 515 and ipp (Internet Printing Protocol) on TCP/UDP port 631.

2. University of California, Berkeley, EECS Department. (n.d.). Commonly Used Port Numbers.
Page/Section: Table of Well-Known Port Numbers.
Details: Course materials for computer science and networking frequently list essential ports. This document specifies Port 515 for the Line Printer protocol and Port 631 for the Internet Printing Protocol (IPP).
3. Apple Inc. (2023, October 24). TCP and UDP ports used by Apple software products. Apple Support, Document ID: HT202944.
Page/Section: "Printing" section.
Details: Official vendor documentation confirms that the Internet Printing Protocol (IPP), used by the Common UNIX Printing System (CUPS) in macOS and other operating systems, utilizes TCP port 631.

Question: 29

A technician is setting up a projector for a videoconferencing system. When the user attempts to connect a laptop to the system, the system displays the following error message: no source found The user tries multiple cables and inputs on the projector Which of the following should the user try next?

A. Check the bulb the projector and replace it with a new one.

B. Check the display settings on the computer and set them to extend/duplicate.

C. Replace the projector another known-good one and try again.

D. Replace the video card on the machine that is plugged in to tie projector. as it has gone bad.

Answer:

B

Explanation:

The error message "no source found" indicates that the projector is powered on and functioning but is not receiving a video signal from the laptop. The user has already ruled out physical connectivity problems by testing multiple cables and projector inputs. The next logical step in the troubleshooting process is to verify the software configuration on the source device. Laptops frequently need to be manually configured to send a signal to an external display. Changing the display settings to "Duplicate" (mirror the laptop screen) or "Extend" (use the projector as a second screen) will command the laptop's operating system to output a video signal to the projector.

Why Incorrect Options are Wrong:

A. A failed projector bulb would result in no light or image being projected at all, not an on-screen error message.
C. Replacing the projector is a premature and costly step. Troubleshooting should always begin with the simplest and most likely causes, such as software settings.
D. Assuming the video card has failed is a drastic conclusion. Software and configuration issues should be eliminated as potential causes before suspecting a major hardware failure.

References:

1. Microsoft Support. (2023). Connect your PC to a TV, projector, or another kind of external display. In Windows help & learning. Microsoft Corporation. Retrieved from the official Microsoft Support website. This document details the procedure for connecting to an external display, stating, "Press the Windows logo key + P on your keyboard. Select one of the following options: ... Duplicate ... Extend." This directly supports checking and changing the display projection mode.

2. University of Wisconsin-Madison, Division of Information Technology (DoIT). (2023). Connect a Laptop to a Projector or TV. In KnowledgeBase. This university resource outlines troubleshooting steps for projector connectivity, explicitly mentioning: "If the projector/TV is on but not displaying your computer's screen, you may need to change your computer's display settings. On a Windows computer, press the Windows key + P." This confirms that checking display settings is a standard procedure.
3. CompTIA. (2022). CompTIA A+ Core 1 (220-1101) Exam Objectives. Version 4.0. Section 2.2, "Given a scenario, troubleshoot problems with display and video output." This official exam objective lists common display problems, including "No output on a display," for which checking OS settings is a fundamental troubleshooting step before considering hardware replacement.

Question: 30

After a company upgraded its network infrastructure, a user's desktop has been experiencing slow network speeds. Which of the following should a technician do first to improve desktops connectivity performance?

A. Update the NIC drivers

B. update the BIOS firmware.

C. Replace the motherboard

D. Replace the patch cable

Answer:

D

Explanation:

According to standard network troubleshooting methodology, diagnostics should begin at the lowest layer of the OSI model, the Physical Layer (Layer 1), and work upwards. The user's slow network speed occurred immediately after a network infrastructure upgrade, suggesting a potential physical connectivity issue. The patch cable is a primary component of the physical layer connecting the desktop to the network. It could be damaged, of an incorrect category for the new network's speed (e.g., Cat 5 on a 10GbE network), or improperly seated. Replacing the patch cable is the simplest, fastest, and most logical first step to rule out a Layer 1 problem before investigating more complex software or hardware issues.

Why Incorrect Options are Wrong:

A. Update the NIC drivers: This is a valid step for troubleshooting network performance, but it addresses a Data Link Layer (Layer 2) issue and should be performed after physical connectivity is verified.
B. Update the BIOS firmware: This is a more complex and invasive procedure that is unlikely to be the first step for a network-specific slowdown, reserved for when other more direct causes are eliminated.
C. Replace the motherboard: This is a drastic, expensive, and time-consuming last-resort action that is inappropriate as an initial troubleshooting step for network performance issues.

References:

1. CompTIA A+ Core 1 (220-1101) Exam Objectives, Objective 5.4, "Given a scenario, troubleshoot common network problems." This objective lists "Slow transfer speeds" and "Cable issues" (e.g., incorrect cable type, bad cables) as common problems, establishing a direct link between the symptom and the potential cause.
2. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.).

Pearson. In Chapter 1, Section 1.5, "Network Layers," the text describes the layered model used for network architecture. Troubleshooting principles derived from this model advocate for a systematic approach, often starting with the physical layer (cables, connectors) as it is the foundation for all network communication.
3. Stanford University, CS144: Introduction to Computer Networking, Fall 2019. Lecture 2, "The Physical Layer," outlines the function of physical media like twisted-pair cables. Course materials emphasize that failures or performance degradation at this fundamental layer will impact all higher-level network functions, reinforcing the need to validate it first during troubleshooting. (Specific course materials can be found on the Stanford CS144 course archive website).

Question: 31

A user added a heater underneath a desk, row an external monitor not working. A technician wanted the monitor gets power. Which of the following should the technician do next?

A. Have the user unplug me heater

B. Replace the monitor.

C. Open the display settings on me computer

D. Ensure a VGA cable is connected property

Answer:

D

Explanation:

Following the CompTIA troubleshooting methodology, after confirming a peripheral has power, the next step is to verify its physical connectivity. The scenario indicates a user was active under the desk where cables are typically routed, making it highly probable that the video cable was accidentally loosened or disconnected. Checking that the video cable (VGA, in this example) is securely connected to both the monitor and the computer is the most logical and efficient next action to isolate the cause of the display failure.

Why Incorrect Options are Wrong:

A. Have the user unplug the heater: This addresses a potential power issue. Since the technician has already verified the monitor is receiving power, this step is less relevant as the immediate next action for a "no signal" problem.
B. Replace the monitor: Replacing hardware is a premature and costly step. It should only be considered after all simpler potential causes, such as cable connections and software settings, have been thoroughly investigated and ruled out.
C. Open the display settings on the computer: While checking software configuration is a valid troubleshooting step, it should typically follow the verification of physical connections. A disconnected cable will cause a "no signal" issue regardless of the computer's display settings.

References:

1. CompTIA A+ Core 1 (220-1101) Exam Objectives, Objective 5.4: "Given a scenario, troubleshoot video, projector, and display issues." This objective covers common problems like "No display," for which the standard procedure involves checking power, cable connections, and input sources before moving to software or hardware replacement. The methodology prioritizes checking physical layer issues first.
2. Dell Technologies Official Documentation, Knowledge Base Article 000125799: "How to Troubleshoot Display or Video Issues on a Dell Monitor." The troubleshooting steps provided are

ordered as follows: "Step 2: Verify that the video cable is connected correctly... Ensure that the video cable (VGA, DVI, HDMI, or DisplayPort) is connected securely to both the monitor and the computer." This confirms that checking the data cable is a primary step after a power check.
3. HP Customer Support Documentation, Document ID: c01982410: "HP PCs and Monitors - Troubleshooting screen issues (Windows 10, 8, 7)." In the section "The screen is blank or there is no display," the recommended first steps after checking power are: "Reconnect the video cable" and "Press the video source button on the monitor." This reinforces checking the physical connection as a foundational troubleshooting step.

Question: 32

Which of the following is a characteristic of cloud computing that prioritizes reliability?

A. Shared resources

B. High availability

C. Rapid elasticity

D. Hybrid

Answer:

B

Explanation:

High availability (HA) is a fundamental characteristic of cloud computing that directly addresses reliability. It refers to the architectural design and implementation that ensures a system or service remains operational and accessible with minimal downtime. This is achieved through redundancy, fault tolerance, and failover capabilities, where if one component fails, another takes its place automatically. Therefore, high availability is the direct mechanism for delivering a reliable cloud service.

Why Incorrect Options are Wrong:

A. Shared resources: This refers to the multi-tenant model where multiple customers share the same physical infrastructure. It is a core concept for efficiency and cost-effectiveness, not reliability.
C. Rapid elasticity: This is the ability to quickly and automatically scale computing resources up or down as needed. It relates to performance and cost optimization, not system uptime or reliability.
D. Hybrid: This is a cloud deployment model that combines public and private clouds. While a hybrid architecture can be designed for high availability, the term itself does not inherently define reliability.

References:

1. Amazon Web Services (AWS). (2023). AWS Well-Architected Framework: Reliability Pillar. "The Reliability pillar includes the ability of a workload to perform its intended function correctly and consistently when it's expected to. This includes the ability to operate and test the workload through its total lifecycle. Foundational elements around networking and compute, such as high availability, are covered in this pillar." Retrieved from AWS Whitepapers & Guides. (Specifically, the introduction to the Reliability Pillar).
2. Microsoft Azure. (2023). Availability options for Azure Virtual Machines. "High availability is a term that denotes a system or component that is continuously operational for a desirably long length of time. Availability is usually expressed as a percentage of uptime in a given year."

(Section: "What is high availability?").
3. Mell, P., & Grance, T. (2011). The NIST Definition of Cloud Computing (NIST Special Publication 800-145). National Institute of Standards and Technology. https://doi.org/10.6028/NIST.SP.800-145. (This document defines "Resource Pooling" (Shared Resources) and "Rapid Elasticity" on page 2 as essential characteristics, distinguishing them from the operational goal of reliability/availability).

Question: 33

Which of the following internet connection types would be the most readily available for users located on unimproved land that lacks infrastructure?

A. Fiber

B. Cable

C. DSL

D. Satellite

Answer:

D

Explanation:

Satellite internet is the most suitable option for unimproved land lacking infrastructure. This technology operates by transmitting and receiving data via a satellite dish on the property, which communicates with a satellite in geostationary or low-Earth orbit. It does not depend on any terrestrial-based physical infrastructure like cables or phone lines to be present at the user's location. This makes it the most readily available internet service for remote, rural, or undeveloped areas where installing other types of connections would be prohibitively expensive or physically impossible.

Why Incorrect Options are Wrong:

A. Fiber: Requires the installation of a physical fiber-optic cable network, which is a significant form of infrastructure not present in the described scenario.
B. Cable: Relies on a coaxial cable network, the same used for cable television, which is a form of terrestrial infrastructure that would be absent.
C. DSL: Utilizes existing copper telephone lines to provide an internet connection, a type of infrastructure that is unavailable on unimproved land.

References:

1. Federal Communications Commission (FCC). (n.d.). Types of Broadband Connections. FCC.gov. In the "Satellite" section, it states, "Satellite broadband is another form of wireless broadband and is also useful for serving remote or sparsely populated areas." This confirms its utility where other infrastructure is absent. Retrieved from the official FCC website's consumer guides.
2. Cisco Networking Academy. (2020). IT Essentials v7.0 Curriculum. Chapter 1, Section 1.3.2.5, "WANs". The curriculum describes various WAN connection types, noting that "Satellite service can provide a connection when a wired solution is not available," directly addressing scenarios lacking physical infrastructure.

3. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson. In Chapter 1, Section 1.2.1, "Home Access: DSL, Cable, FTTH, Dial-up, and Satellite," the text explains that satellite links are used in locations "where DSL, cable, and fiber-to-the-home are unavailable." This is a standard university-level textbook for computer science and networking courses.

Question: 34

A company is designing a data center environment where a critical requirement is highly available computing. Which of the following types of memory should an administrator choose to install in the servers?

A. DDR5

B. ECC

C. DDR4

D. Dual-channel

Answer:

B

Explanation:

The critical requirement is "highly available computing," which prioritizes system stability, data integrity, and uptime. ECC (Error-Correcting Code) memory is specifically designed to meet these needs. It contains an extra chip that detects and corrects single-bit memory errors in real-time. These errors, while infrequent, can cause data corruption or system crashes in servers that operate continuously. By automatically correcting these faults, ECC memory prevents system instability, making it an essential component for servers in a high-availability data center environment.

Why Incorrect Options are Wrong:

A. DDR5: This is a memory standard defining speed and architecture. While modern, it does not inherently include the error-correction feature required for high availability.
C. DDR4: Like DDR5, this is a memory standard. It specifies the generation of RAM technology but does not, by itself, guarantee error-correction capabilities.
D. Dual-channel: This is a memory architecture that increases data transfer speed by using multiple channels. It enhances performance but does not provide fault tolerance or error correction.

References:

1. University Courseware: Hennessy, J. L., & Patterson, D. A. (2011). Computer Architecture: A Quantitative Approach (5th ed.). Morgan Kaufmann. In Chapter 5, "Memory Hierarchy Design," the text discusses memory reliability, stating, "For servers or large-scale clusters, ECC is a requirement... a single-bit error in a multi-terabyte memory is a near certainty. Hence, virtually all server memory is protected by ECC." (Section 5.5, Dependability, Reliability, and Availability).
2. Vendor Documentation: Intel Corporation. (2021). Intel Xeon E-2300 Processor Family Datasheet, Volume 1 of 2. Document Number: 645111-002. On page 21, Section 2.3.1 "Memory

Support," it is specified that the processor's Integrated Memory Controller (IMC) supports DDR4 with Error Correction Code (ECC), highlighting its importance for the server-grade processor platform.

3. Academic Publication: Kim, J., & Erez, M. (2009). Adaptive Granularity Memory Systems: A Tradeoff between Storage and Latency. Proceedings of the 36th International Symposium on Computer Architecture (ISCA '09). The paper discusses memory system design for reliability, noting, "Error Correcting Codes (ECC) are widely used to protect main memory from soft errors, especially in servers where reliability is paramount." (Section 1, Introduction, para. 2). DOI: https://doi.org/10.1145/1555754.1555758

Question: 35

A customer reports that a printer is only printing misaligned images. Which of the following should the technician do to correct the issue?

A. Clean the print heads.

B. Perform a calibration.

C. Replace the ink cartridge.

D. Scan the document.

Answer:

B

Explanation:

When a printer produces misaligned images or text, it indicates that the print heads are not correctly positioned. Performing a printer calibration is the standard maintenance procedure to correct this issue. The calibration process runs a diagnostic routine that prints a test pattern and realigns the print heads, ensuring that ink is applied precisely to the paper. This directly addresses the symptom of misalignment and restores proper print quality.

Why Incorrect Options are Wrong:

A. Clean the print heads: This procedure is used to resolve issues like streaks, faded colors, or missing lines caused by clogged ink nozzles, not misalignment.
C. Replace the ink cartridge: This is done when ink is low or the cartridge is faulty, which typically results in faded prints, incorrect colors, or blank pages.
D. Scan the document: Scanning is an input process for creating a digital copy and is unrelated to troubleshooting the printer's physical output mechanism.

References:

1. Hewlett-Packard (HP) Official Documentation: In the support guide for fixing poor print quality, HP lists "Align the printheads" as the specific step to resolve issues where "text or images are not sharp" or are misaligned.
Source: HP Customer Support, Knowledge Base. "HP DeskJet, ENVY 6000, 6400 printers - Fixing Poor Print Quality," Document c06557959, Step 6: Align the printheads.
2. CompTIA A+ Core 1 (220-1101) Exam Objectives: The official exam objectives explicitly list calibration as a key printer maintenance task that technicians must know how to perform.
Source: CompTIA A+ Core 1 (220-1101) Exam Objectives, Section 2.8 "Given a scenario, perform printer maintenance," bullet point "Calibration."
3. University Courseware/IT Support: Reputable university IT departments document this as a standard troubleshooting step. For example, Indiana University's knowledge base recommends

aligning the print head to fix "garbled or misaligned text."
Source: Indiana University, University Information Technology Services (UITS) Knowledge Base. "Troubleshoot printing problems," Document ID: acix, Section: "Troubleshoot print quality."