ISC2 CISSP Exam Questions

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Question: 1

How is Remote Authentication Dial-In User Service (RADIUS) authentication accomplished?

A: It uses clear text and firewall rules.

B: It relies on Virtual Private Networks (VPN).

C: It uses clear text and shared secret keys.

D: It relies on asymmetric encryption keys.

Correct Answer:

C

Explanation:

RADIUS authentication is based on a client/server model where a Network Access Server (NAS) acts as the client to a central RADIUS server. The core of the authentication mechanism relies on a shared secret key known only to the NAS and the RADIUS server. When a user provides credentials, the password is not sent in pure clear text but is obfuscated using an MD5 hash of the shared secret and a request authenticator. However, other attributes within the RADIUS packet, such as the username, are transmitted in clear text. Therefore, the process is accurately described as using both clear text (for attributes) and a shared secret key (for password obfuscation).

Why Incorrect Options are Wrong:

A: Firewall rules permit or deny traffic and are not part of the RADIUS authentication mechanism itself, although they are necessary for connectivity.

B: RADIUS is a protocol often used to authenticate users for services like VPNs, but it does not rely on VPNs to function.

D: The core RADIUS protocol uses a symmetric shared secret. It does not rely on asymmetric (public/private) key pairs for its fundamental authentication process.

References:

1. Internet Engineering Task Force (IETF) RFC 2865, "Remote Authentication Dial In User Service (RADIUS)": This document defines the RADIUS protocol. Section 3, "Packet Format," and Section 5.2, "User-Password," describe the use of a shared secret to obfuscate the password via an MD5 hash, while other attributes are sent unencrypted.

URL: https://datatracker.ietf.org/doc/html/rfc2865 (See Sections 3 and 5.2)

2. Purdue University, "Introduction to RADIUS": This educational resource explains the RADIUS protocol, stating, "The shared secret is a key that is used to encrypt the password in the Access-Request packet... The rest of the packet is unencrypted."

URL: https://www.purdue.edu/it/facilities/datacenter/radius/introduction.php

Question: 2

What is the MAIN objective of risk analysis in Disaster Recovery (DR) planning?

A: Establish Maximum Tolerable Downtime (MTD) Information Systems (IS).

B: Define the variable cost for extended downtime scenarios.

C: Identify potential threats to business availability.

D: Establish personnel requirements for various downtime scenarios.

Correct Answer:

C

Explanation:

The main objective of risk analysis within Disaster Recovery (DR) planning is to identify and evaluate potential risks. This process fundamentally begins with identifying threats—such as natural disasters, technical failures, or malicious attacks—and the vulnerabilities they could exploit. This identification is the foundational step that informs all subsequent DR activities. It answers the question, "What can go wrong?" By understanding the threats to business availability, an organization can then prioritize risks and develop appropriate recovery strategies. While metrics like MTD are crucial, they are outputs of the Business Impact Analysis (BIA), which focuses on the consequences of a disruption, not the initial identification of its potential causes (threats).

Why Incorrect Options are Wrong:

A: Establishing MTD is a primary objective of the Business Impact Analysis (BIA), which quantifies the impact of downtime on business processes, not the risk analysis itself.

B: Defining costs associated with downtime is a specific financial calculation performed during the BIA to measure impact, not the overarching goal of risk analysis.

D: This is a tactical resource planning activity that occurs during the development of the detailed DR plan, after the initial risk analysis has been completed.

References:

1. National Institute of Standards and Technology (NIST). (2010). Special Publication 800-34 Rev. 1, Contingency Planning Guide for Federal Information Systems. Section 2.2, "Business Impact Analysis," details how the BIA is used to identify and prioritize systems and determine recovery objectives like RTO (derived from MTD). This is presented as a distinct step from the risk assessment, which focuses on threats and vulnerabilities. (p. 12).

2. (ISC)². (2021). Official (ISC)² CISSP CBK Reference (6th ed.). Sybex. Domain 1, "Security and Risk Management," distinguishes between the BIA and risk analysis. The BIA's purpose is to determine the impact of a disruption and establish recovery priorities (MTD/RTO), while risk analysis is defined by the identification and evaluation of threats and vulnerabilities.

3. Whitman, M. E., & Mattord, H. J. (2019). Principles of Information Security (6th ed.). Cengage Learning. Chapter 4, "Risk Management," describes risk analysis as a process that includes threat identification, vulnerability assessment, and risk evaluation. It is presented as separate from the BIA, which is focused on analyzing the potential impacts on the business. This is a standard textbook used in university curricul

Question: 3

Which of the following is an important requirement when designing a secure remote access system?

A: Configure a Demilitarized Zone (DMZ) to ensure that user and service traffic is separated.

B: Provide privileged access rights to computer files and systems.

C: Ensure that logging and audit controls are included.

D: Reduce administrative overhead through password self service.

Correct Answer:

C

Explanation:

Logging and audit controls are a foundational requirement for designing any secure system, including remote access solutions. These controls provide accountability by creating a verifiable record of all access attempts and activities. This audit trail is indispensable for monitoring system usage, detecting unauthorized or malicious behavior, investigating security incidents, and demonstrating compliance. Without effective logging and auditing, an organization lacks the visibility needed to ensure its remote access policies are being enforced and cannot effectively respond to a breach.

Why Incorrect Options are Wrong:

A: While a DMZ is a highly recommended architectural component for network segmentation, it is a specific implementation choice, not a universal requirement. Other secure designs, such as those based on zero-trust principles, may be used.

B: This directly contradicts the principle of least privilege, a core security concept. Users should only be granted the minimum access necessary, not broad privileged rights, to reduce the potential impact of a compromised account.

D: Password self-service is primarily a usability and administrative efficiency feature. While it must be implemented securely, it is not a foundational security requirement for the remote access system itself.

References:

1. (ISC)² CISSP Official Study Guide, 9th Edition. Chapter 14, "Securing Network and Communications," emphasizes that remote access solutions must support Authentication, Authorization, and Accounting (AAA). Logging and auditing are the primary mechanisms for the "Accounting" component, which is critical for security monitoring and forensics.

2. NIST Special Publication 800-46 Revision 2, Guide to Enterprise Telework, Remote Access, and Bring Your Own Device (BYOD) Security. Section 3.2, "Remote Access Solution Security Capabilities," explicitly lists "auditing and logging" as a key security capability required for a remote access solution. It states, "The remote access solution should generate audit logs for all security-relevant events." (Page 17).

3. Saltzer, J. H., & Schroeder, M. (1975). The Protection of Information in Computer Systems. Communications of the ACM, 18(7), 387-402. This foundational paper on computer security design principles lists "Complete Mediation" and "Audit" as key principles. An audit trail (logging) is necessary to check that access controls are properly enforced and to ensure accountability.

Question: 4

An audit of an application reveals that the current configuration does not match the configuration of the originally implemented application. Which of the following is the FIRST action to be taken?

A: Recommend an update to the change control process.

B: Verify the approval of the configuration change.

C: Roll back the application to the original configuration.

D: Document the changes to the configuration.

Correct Answer:

B

Explanation:

Upon discovering a discrepancy between the current application configuration and its established baseline, the immediate priority is to investigate the nature of the change. The first logical step in this investigation is to verify if the change was authorized through the established change control process. This determination is critical as it dictates all subsequent actions. If the change was approved, the issue may be a failure to update the baseline documentation. If it was unauthorized, it constitutes a security incident that requires an entirely different set of responses, such as immediate rollback and incident handling.

Why Incorrect Options are Wrong:

A: Recommend an update to the change control process. This is a corrective action based on a root cause analysis. It is premature to recommend process changes before understanding why the discrepancy occurred.

C: Roll back the application to the original configuration. This is a significant technical action that could cause business disruption. It should only be considered after confirming the change is unauthorized and potentially malicious.

D: Document the changes to the configuration. Proper documentation is essential, but it follows the investigation. One must first understand the change and its authorization status before it can be accurately documented.

References:

1. ISC2 CISSP Official Study Guide, 9th Edition. Domain 7: Security Operations covers change and configuration management. The process emphasizes that changes must be requested, reviewed, and approved before implementation. An audit finding a deviation from the baseline necessitates first checking against the change log and approval records. (Specific reference: Chapter 21, "Managing Security Operations").

2. NIST Special Publication 800-53, Revision 5, Security and Privacy Controls for Information Systems and Organizations. The Configuration Management (CM) control family, specifically CM-3 (Configuration Change Control), mandates that organizations "approve or disapprove configuration changes to the system with explicit consideration for security and privacy risk." Verifying this approval is the first step in validating a detected change. (Page 138, CM-3).

3. NIST Special Publication 800-128, Guide for Security-Focused Configuration Management (SCM). This guide details the SCM process, which includes monitoring for and identifying unauthorized changes. Section 3.3 states, "When unauthorized changes are detected, organizations should have a process to address those changes." The first part of that process is determining the change's origin and authorization status. (Page 18, Section 3.3).

Question: 5

For a federated identity solution, a third-party Identity Provider (IdP) is PRIMARILY responsible for which of the following?

A: Access Control

B: Account Management

C: Authentication

D: Authorization

Correct Answer:

C

Explanation:

In a federated identity model, the Identity Provider (IdP) is the system entity that creates, maintains, and manages identity information for principals and provides authentication services. Its primary responsibility is to authenticate the user (i.e., verify their identity) and then provide a security assertion (e.g., a SAML token) to the Service Provider (SP), also known as the Relying Party (RP). The SP trusts this assertion and uses it as the basis for its own decisions.

Why Incorrect Options are Wrong:

A: Access Control: This is the responsibility of the Service Provider (SP), which owns the resource and determines what an authenticated user is allowed to access based on its own policies.

B: Account Management: While the IdP does manage the identity account, its primary function within the federation is to perform authentication, which is the active service it provides to relying parties.

D: Authorization: This is the function of the Service Provider (SP). After receiving the authentication assertion from the IdP, the SP determines if the user is authorized to access the requested resource.

References:

1. NIST Special Publication 800-63-3, Digital Identity Guidelines: In Section 4.1, "Parties," the document states that an Identity Provider (IdP) is responsible for "Authenticating the subscriber" and "Issuing authentication assertions...to the RP [Relying Party] after

authenticating the subscriber." This clearly defines authentication as the IdP's core function. (URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63-3.pdf, Page 9)

2. ISC2 CISSP Official Study Guide, 9th Edition: Chapter 13, "Identity and Access Management," describes federated identity systems like SAML. It explains that the "identity provider is the party that authenticates the user," while the service provider is the party that provides the service and makes authorization decisions based on the IdP's authentication assertion.

3. SAML V2.0 Technical Overview, OASIS Standard: Section 2.1, "SAML Use Case: Web Browser SSO," describes the flow where the Identity Provider "is responsible for authenticating the user" and passing an assertion to the Service Provider. The Service Provider consumes the assertion to establish a security context for the user and grant access. (URL: http://docs.oasis-open.org/security/saml/v2.0/saml-tech-overview-2.0-os.pdf, Page 8)

Question: 6

What should be the FIRST action for a security administrator who detects an intrusion on the network based on precursors and other indicators?

A: Isolate and contain the intrusion.

B: Notify system and application owners.

C: Apply patches to the Operating Systems (OS).

D: Document and verify the intrusion.

Correct Answer:

D

Explanation:

According to established incident response methodologies, such as the one detailed in NIST SP 800-61, the initial phase after detecting potential signs of an intrusion (precursors and indicators) is Detection and Analysis. The first action within this phase is to analyze the available data to validate whether the indicators represent a genuine security incident or a false positive. This verification and initial documentation step is critical. It ensures that subsequent actions, like containment, are based on confirmed information, preventing unnecessary business disruption and allowing for a properly scoped response.

Why Incorrect Options are Wrong:

A: Isolate and contain the intrusion. This is a critical step but belongs to the Containment phase, which occurs after the initial analysis and verification of the incident. Acting prematurely can disrupt operations unnecessarily.

B: Notify system and application owners. Communication is vital, but notifying stakeholders before verifying the incident can cause undue alarm and misinform them, especially in the case of a false positive.

C: Apply patches to the Operating Systems (OS). Patching is a remediation or hardening action (part of Eradication or Preparation), not the immediate first response. It may be ineffective if the system is already compromised.

References:

1. National Institute of Standards and Technology (NIST). (2012). Special Publication 800-61 Rev. 2, Computer Security Incident Handling Guide.

Page 23, Section 3.2, "Detection and Analysis": The guide states, "The detection of security breaches is thus a challenging process, and it is important for an incident handler to be skeptical of indicators... After an indicator is detected, analysts should analyze it to determine if it is a real incident or a false positive." This supports verification as the initial step after detection.

Direct URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-61r2.pdf

2. Saltzer, J. H., & Kaashoek, M. F. (2009). Principles of Computer System Design: An Introduction. Morgan Kaufmann.

Chapter 11, "Recovery and Response": While not a direct incident response guide, the principles of system design emphasize understanding a fault before acting. "The first step in recovery is to assess the extent of the damage." This aligns with verifying and understanding the intrusion before taking containment actions.

Source: This is a foundational text in computer systems, often used in university curricula (e.g., MIT).

3. MIT OpenCourseWare. (2014). 6.858 Computer Systems Security, Fall 2014.

Lecture 21, "Web security; Incident response": The lecture slides outline the incident response lifecycle as: Preparation -> Detection -> Analysis -> Containment -> Eradication -> Recovery -> Post-mortem. This academic model clearly places Analysis (verification) after Detection and before Containment.

Direct URL: https://ocw.mit.edu/courses/6-858-computer-systems-security-fall-2014/resources/mit6858f14lec21/

Question: 7

Asymmetric algorithms are used for which of the following when using Secure Sockets Layer/Transport Layer Security (SSL/TLS) for implementing network security?

A: Peer authentication

B: Payload data encryption

C: Session encryption

D: Hashing digest

Correct Answer:

A

Explanation:

In the Secure Sockets Layer/Transport Layer Security (SSL/TLS) handshake, asymmetric algorithms are used primarily for peer authentication and key exchange. The server authenticates itself to the client by presenting a digital certificate containing its public key and then proving possession of the corresponding private key. This is accomplished by either decrypting a message encrypted with its public key or by creating a digital signature. This process confirms the server's identity to the client, establishing trust before any sensitive data is exchanged. While asymmetric cryptography facilitates the secure exchange of a symmetric key, its direct application for authentication is a core and distinct function.

Why Incorrect Options are Wrong:

B: Payload data encryption: This is incorrect. The actual application data (payload) is encrypted using a much faster symmetric algorithm (e.g., AES) for performance reasons.

C: Session encryption: This is incorrect. The session's bulk data encryption uses a symmetric session key. Asymmetric cryptography is used to establish this key, not for the ongoing encryption.

D: Hashing digest: This is incorrect. Hashing is a separate cryptographic primitive used for integrity, not an asymmetric algorithm. Hashing is used with digital signatures, but it is not the asymmetric part.

References:

1. Internet Engineering Task Force (IETF) RFC 8446, The Transport Layer Security (TLS) Protocol Version 1.3, Section 4.4, "Authentication Messages": This document, the standard for TLS 1.3, explicitly details the use of digital signatures (an asymmetric process) for authentication. It states, "The primary function of the messages in this section is to provide peer and certificate-based authentication."

URL: https://datatracker.ietf.org/doc/html/rfc8446#section-4.4

2. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson. In the chapter on Network Security, the TLS handshake is described. The text clarifies that the server sends its certificate containing its public key to the client for authentication. The server then proves it has the corresponding private key, thus authenticating itself. This is a standard university textbook.

3. MIT OpenCourseWare, 6.857 Computer and Network Security, Fall 2014, Lecture 12: SSL/TLS: The lecture notes explain that in the TLS handshake, the server sends its certificate and proves it has the private key, which serves to authenticate the server to the client.

URL: https://ocw.mit.edu/courses/6-857-computer-and-network-security-fall-2014/resources/mit6857f14lec12/ (Specifically, slides on "TLS Handshake Protocol").

Question: 8

Which of the following can be used to calculate the loss event probability?

A: Total number of possible outcomes divided by frequency of outcomes

B: Number of outcomes divided by total number of possible outcomes

C: Number of outcomes multiplied by total number of possible outcomes

D: Total number of possible outcomes multiplied by frequency of outcomes

Correct Answer:

B

Explanation:

The probability of a specific event, such as a loss event, is calculated using a fundamental formula from probability theory. It is determined by dividing the number of times the specific outcome (the loss event) can occur by the total number of all possible outcomes in the sample space. This ratio represents the likelihood or chance of that single event happening. This principle is a cornerstone of quantitative risk analysis in information security.

Why Incorrect Options are Wrong:

A: This formula is inverted. Dividing the total number of outcomes by the frequency of a specific outcome does not yield a valid probability.

C: Multiplying the number of outcomes by the total possible outcomes is mathematically incorrect for calculating probability and would not produce a value between 0 and 1.

D: This is also an incorrect mathematical operation. Multiplying the total outcomes by the frequency does not represent the likelihood of an event.

References:

1. MIT OpenCourseWare. (2014). Reading 1b: Probability: Terminology and Examples. 18.05 Introduction to Probability and Statistics. Massachusetts Institute of Technology. Retrieved from https://ocw.mit.edu/courses/18-05-introduction-to-probability-and-statistics-spring-2014/resources/mit1805s14reading1b/. On page 1, the document states, "If all outcomes are equally likely, the probability of an event A is P(A) = (number of outcomes in A) / (total number of outcomes)." This directly supports the chosen answer.

2. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. In Chapter 4, "Quantitative Risk Analysis," the concept of probability is fundamental to calculating the Annualized Rate of Occurrence (ARO), which is an expression of loss event probability over a year. The underlying calculation relies on the principle described in option

Question: 9

Which of thefollowing System and Organization Controls (SOC) report typesshould an organization request if they require a period of time report covering security and availability for a particular system?

A: SOC 1 Type1

B: SOC 1Type2

C: SOC 2 Type 1

D: SOC 2 Type 2

Correct Answer:

D

Explanation:

The question requires a report that assesses controls over a "period of time" and specifically covers "security and availability." A SOC 2 report is designed to provide assurance about a service organization's controls relevant to the Trust Services Criteria (TSC), which include Security, Availability, Processing Integrity, Confidentiality, and Privacy. A Type 2 report, unlike a Type 1, evaluates the operating effectiveness of these controls over a specified period (typically 6 to 12 months). Therefore, a SOC 2 Type 2 report is the only option that meets both the subject matter (security, availability) and time frame (period of time) requirements.

Why Incorrect Options are Wrong:

A: SOC 1 Type 1: Incorrect. SOC 1 focuses on controls relevant to a user entity's financial reporting, not the TS A Type 1 report is a point-in-time assessment.

B: SOC 1 Type 2: Incorrect. SOC 1 is for financial reporting controls, not the security and availability criteria specified in the question.

C: SOC 2 Type 1: Incorrect. While a SOC 2 report covers the correct criteria, a Type 1 report only assesses the design of controls at a specific point in time, not their effectiveness over a period.

References:

1. American Institute of CPAs (AICPA). (n.d.). SOC 2® - SOC for Service Organizations: Trust Services Criteri "A type 2 report...is a report on a description of a service

organization's system and the suitability of the design and operating effectiveness of controls." The criteria include security and availability. Retrieved from https://www.aicporg/topic/audit-assurance/audit-and-assurance-offerings/soc-for-service-organizations/soc-2

2. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. Chapter 19, "Assess and Test Security Controls," states, "A SOC 2 Type II report assesses both the technical design and the operating effectiveness of the security controls over a period of time."

3. Carnegie Mellon University, Software Engineering Institute. (2018). Common Sense Guide to Mitigating Insider Threats (6th ed.). Page 111. "SOC 2 reports focus on a business's non-financial reporting controls as they relate to security, availability, processing integrity, confidentiality, and privacy of a system... A Type II report describes the operational effectiveness of those systems." Retrieved from https://resources.sei.cmu.edu/assetfiles/TechnicalReport/2018005001524729.pdf

Question: 10

If virus infection is suspected, which of the following is the FIRST step for the user to take?

A: Unplug the computer from the network.

B: Save the opened files and shutdown the computer.

C: Report the incident to service desk.

D: Update the antivirus to the latest version.

Correct Answer:

A

Explanation:

According to standard incident-response doctrine, the very first action when malware is suspected is containment—preventing the code from spreading or communicating. For an end-user workstation, the quickest containment measure is to unplug/disable the network connection. Only after isolation should the user notify support and perform further actions. Disconnecting immediately limits propagation and data loss, fulfilling the primary objective of the initial response phase.

Why Incorrect Options are Wrong:

B: Shutting down or saving files leaves the host connected long enough for malware to spread; containment should precede power-off or file operations.

C: Reporting is essential but takes time; during that delay an un-isolated host can infect others.

D: Updating antivirus requires network access and can't be trusted on a potentially compromised host; isolation must occur first.

References:

1. NIST Special Publication 800-61 Rev. 2 "Computer Security Incident Handling Guide", 3.2 Containment (pp. 29-30): "Immediate isolation (e.g., disconnecting network cables) is often the first step after detection."

2. MIT Lincoln Laboratory Cybersecurity Course Notes, "Incident Response Basics", Slide 12: "Step 1: Contain—disconnect affected system from network."

3. Microsoft Security Response Center, “Initial Response to a Suspected Malware Infection”, Step 1: “Isolate the computer by removing network connectivity.”

Question: 11

Which of the following security testing strategies is BEST suited for companies with low to moderate security maturity?

A: Load Testing

B: White-box testing

C: Black -box testing

D: Performance testing

Correct Answer:

C

Explanation:

Black-box testing is the most suitable strategy for an organization with low to moderate security maturity. This methodology requires no prior knowledge of the system's internal workings, simulating an attack from an external adversary. It allows the organization to gain a realistic understanding of its externally-facing vulnerabilities without needing the significant internal documentation, source code access, or specialized internal expertise required for white-box testing. This makes it a practical and cost-effective approach for establishing a baseline security posture and prioritizing remediation efforts.

Why Incorrect Options are Wrong:

A: Load Testing: This is a subset of performance testing focused on system behavior under expected load, primarily addressing availability, not the broad spectrum of security vulnerabilities.

B: White-box testing: This requires comprehensive internal knowledge (e.g., source code) and skilled personnel, which are characteristic of organizations with higher security maturity.

D: Performance testing: This is a category of non-functional testing that evaluates system stability and responsiveness, not the identification of security flaws like those targeted in a vulnerability assessment.

References:

1. NIST Special Publication 800-115, Technical Guide to Information Security Testing and Assessment. Section 4.2.1, "Testing Methodologies," describes black-box testing as a simulation of an attack by an entity with little to no knowledge of the system. This approach

is fundamental for understanding the external attack surface, a critical first step for less mature organizations.

2. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. Chapter 21 discusses security testing. It frames black-box testing as an assessment from an external perspective with no prior knowledge, contrasting it with white-box testing, which requires full knowledge and is often performed by internal teams, implying a higher level of organizational maturity and resources.

3. Antunes, N., & Vieira, M. (2013). Assessing the security of web services. In IEEE Security & Privacy, 11(5), 44-50. The paper discusses different testing approaches. The description of black-box testing aligns with its utility for external validation without requiring internal system transparency, making it accessible for organizations that may not have mature internal security review processes.

Question: 12

What is the BEST location in a network to place Virtual Private Network (VPN) devices when an internal review reveals network design flaws in remote access?

A: In a dedicated Demilitarized Zone (DMZ)

B: In its own separate Virtual Local Area Network (VLAN)

C: At the Internet Service Provider (ISP)

D: Outside the external firewall

Correct Answer:

A

Explanation:

The most secure and architecturally sound location for a Virtual Private Network (VPN) concentrator is in a dedicated Demilitarized Zone (DMZ). A DMZ is a perimeter network that provides a buffer between the untrusted external network (Internet) and the trusted internal network. Placing the VPN device in the DMZ allows it to terminate encrypted tunnels from the internet while keeping it segregated from sensitive internal resources. Traffic decrypted by the VPN can then be inspected by an internal firewall before being allowed into the corporate LAN, providing a critical layer of security and control.

Why Incorrect Options are Wrong:

B: While a DMZ is often implemented using a VLAN, simply placing the device in its own VLAN is less precise. The VLAN could be inside the trusted network, which is not the best practice.

C: An organization does not place its own security appliances at the Internet Service Provider's (ISP) facility. The ISP provides connectivity, not a hosting environment for enterprise security hardware.

D: Placing the VPN device outside the external firewall would expose it to the raw, unfiltered internet, creating an unnecessary and significant security risk to the device itself.

References:

National Institute of Standards and Technology (NIST) Special Publication 800-46 Revision 2, Guide to Enterprise Telework, Remote Access, and Bring Your Own Device (BYOD) Security. Section 3.3.1, "Remote Access Server Placement," states, "The remote access

server is typically located in a DMZ, which is a segment of the network with controlled access to both the internal and external networks." (Page 3-6). Direct URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-46r2.pdf

Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson. Chapter 8.7, "Securing TCP Connections: SSL," and discussions on network security architecture describe firewalls and DMZs as standard components for protecting network perimeters and isolating externally-facing services like VPNs. The DMZ is presented as the standard architecture for such servers.

Question: 13

Which of the following MUST be scalable to address security concerns raised by the integration of third-party identity services?

A: Mandatory Access Controls (MAC)

B: Enterprise security architecture

C: Enterprise security procedures

D: Role Based Access Controls (RBAC)

Correct Answer:

B

Explanation:

An enterprise security architecture is the comprehensive framework of principles, policies, and models that govern security across an organization. When integrating third-party identity services, this architecture must be fundamentally scalable to accommodate new trust relationships, data flows, technologies (e.g., SAML, OIDC), and a growing number of external users and services. A scalable architecture ensures that security controls, policies, and mechanisms can evolve and expand with the business needs without requiring a complete redesign, thus addressing the broad range of security concerns inherent in identity federation.

Why Incorrect Options are Wrong:

A: Mandatory Access Controls (MAC): MAC is a highly restrictive access control model that is generally considered rigid and difficult to scale in complex, dynamic environments like those involving multiple third-party integrations.

C: Enterprise security procedures: Procedures are specific, operational instructions derived from the architecture and policies. While they must be managed, the underlying architecture is what must be scalable to support them effectively.

D: Role Based Access Controls (RBAC): RBAC is a specific access control mechanism. While it is more scalable than other models, it is a component within the broader security architecture that must first be designed for scalability.

References:

1. Enterprise Security Architecture: According to NIST SP 800-39, "Managing Information Security Risk," an organization-wide risk management approach, which is a core part of the security architecture, is essential for addressing risks from "external parties." The architecture provides the scalable foundation for this. (Source: NIST Special Publication 800-39, Page 8, Section 2.2). https://csrc.nist.gov/publications/detail/sp/800-39/final

2. Federated Identity and Architecture: The challenge of integrating third-party services is central to federated identity management. NIST SP 800-63-3, "Digital Identity Guidelines," describes the architectural models (relying parties, identity providers) and trust agreements. The ability to add new providers and services is an architectural scalability concern. (Source: NIST Special Publication 800-63-3). https://csrc.nist.gov/publications/detail/sp/800-63/3/final

3. Scalability of Architecture vs. Components: The (ISC)² CISSP Official Study Guide emphasizes that the security architecture is the blueprint that enables all other security functions. For complex integrations, "the security architecture must be flexible and scalable to accommodate changes." This highlights that the architecture's scalability is a prerequisite for the effective scaling of its components, such as RBAC or procedures. (Source: (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide, 9th Edition, Chapter 14: Security Architecture and Engineering).

Question: 14

An Information Technology (IT) professional attends a cybersecurity seminar on current incident response methodologies. What code of ethics canon is being observed?

A: Provide diligent and competent service to principals

B: Protect society, the commonwealth, and the infrastructure

C: Advance and protect the profession

D: Act honorable, honesty, justly, responsibly, and legally

Correct Answer:

C

Explanation:

The ISC2 Code of Ethics Canon "Advance and protect the profession" explicitly requires members to "Add to the knowledge of the profession by constant study and research..." Attending a cybersecurity seminar is a direct form of constant study and continuing professional education. This action enhances the professional's knowledge and skills, which upholds their responsibility to the profession itself. While this also supports providing competent service, the act of study is most precisely and directly articulated under this specific canon.

Why Incorrect Options are Wrong:

A: This is an outcome of professional development, but the act of study itself is most directly specified under the canon for advancing the profession.

B: This is the highest-order canon, but the specific action of attending a seminar is more directly related to professional development than a direct act of protection.

D: This canon focuses on integrity, honesty, and lawfulness, not specifically on the requirement for continuing professional education.

References:

1. ISC2. (2024). ISC2 Code of Ethics. ISC2 Inc. Retrieved from https://www.isc2.org/Ethics. The guidance for the fourth canon, "Advance and protect the profession," states members must "Add to the knowledge of the profession by constant study and research..."

2. Tipton, H. F., & Krause, M. (Eds.). (2007). Information Security Management Handbook, Sixth Edition. Auerbach Publications, Taylor & Francis Group. In discussions on professional ethics (Chapter 6), the responsibility for continuing education is consistently linked to the advancement and maintenance of professional standards.

3. MIT OpenCourseWare. (2016). 6.858 Computer Systems Security, Fall 2014. Massachusetts Institute of Technology. Lecture materials on ethics emphasize that a core professional responsibility is maintaining currency with the state-of-the-art, which directly aligns with advancing the profession. Retrieved from https://ocw.mit.edu/courses/6-858-computer-systems-security-fall-2014/.

Question: 15

When using Generic Routing Encapsulation (GRE) tunneling over Internet Protocol version 4 (IPv4), where is the GRE headerinserted?

A: Into the options field

B: Between the delivery header and payload

C: Between the source and destination addresses

D: Into the destination address

Correct Answer:

B

Explanation:

Generic Routing Encapsulation (GRE) is a tunneling protocol that encapsulates a wide variety of network layer protocols inside virtual point-to-point links over an Internet Protocol network. In the encapsulation process, the original packet (the payload) is wrapped with a GRE header, and then a new IP header (the delivery header) is prepended to the entire GRE packet. The GRE header is therefore located immediately after the outer delivery header and before the original payload packet.

Why Incorrect Options are Wrong:

A: The IPv4 options field is part of the delivery header and is used for control functions like source routing or timestamps, not for entire encapsulation headers.

C: The source and destination addresses are fields within the delivery header. The GRE header follows the complete delivery header, not inserted between its fields.

D: The destination address field contains the IP address of the tunnel endpoint. It cannot contain the GRE header itself.

References:

IETF RFC 2784: Farinacci, , et al. "Generic Routing Encapsulation (GRE)." RFC 2784, March 2000. Section 2, "Packet Format," explicitly shows the packet structure as [Delivery Header] [GRE Header] [Payload Packet].

URL: https://datatracker.ietf.org/doc/html/rfc2784#section-2

IEEE Xplore: Domínguez, F., et al. "GRE-in-UDP Encapsulation." IEEE Communications Standards Magazine, vol. 4, no. 3, Sept. 2020, pp. 68-75. The article discusses various encapsulation methods, reinforcing the standard GRE structure where the GRE header follows the outer transport header.

URL: https://ieeexplore.ieee.org/document/9186289 (See Figure 1 for packet formats).

Question: 16

In Identity Management (IdM), when is the verification stage performed?

A: As part of system sign-on

B: Before creation of the identity

C: After revocation of the identity

D: During authorization of the identity

Correct Answer:

B

Explanation:

The verification stage, often called identity proofing, is a foundational step in the Identity Management (IdM) lifecycle. During this stage, the information and evidence provided by an individual (the claimant) are validated to ensure they are who they claim to be. This process must be completed before a digital identity and its associated account are formally created and provisioned in a system. This establishes a trusted root for the identity, which is essential for subsequent authentication and authorization actions throughout its lifecycle.

Why Incorrect Options are Wrong:

A: System sign-on involves authentication, which verifies possession of a credential (e.g., a password), not the initial validation of the identity itself.

C: Revocation is the final stage where an identity is terminated. Performing verification at this point would be illogical and serve no purpose.

D: Authorization occurs after successful authentication to determine what resources an identity is permitted to access. The identity's legitimacy has already been established.

References:

1. National Institute of Standards and Technology (NIST). (2017). Special Publication 800-63-3: Digital Identity Guidelines. Section 4.1, "Enrollment and Identity Proofing," states: "Enrollment consists of identity proofing and registration. Identity proofing is the process by which a CSP [Credential Service Provider] collects and verifies information about a person." This explicitly places verification (proofing) before the identity is fully registered and active. [Direct URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63-3.pdf, Page 10]

2. ISC2. (2021). Official CISSP Common Body of Knowledge (CBK) Reference (6th ed.). Domain 5, "Identity and Access Management (IAM)," describes the identity lifecycle. The process begins with identity proofing and registration to establish a unique and verified identity before it can be provisioned with access rights. This confirms verification is a prerequisite to creation.

3. Windley, P. J. (2021). The Live Enterprise: Create a Continuously Evolving and Learning Organization. MIT Press. Chapter 5 discusses digital identity, outlining that identity proofing is the initial step to vet a user's claims before a digital identifier is issued, distinguishing it from authentication which happens later during access requests.

Question: 17

Internet protocolsecurity (IPSec), point-to-point tunneling protocol(PPTP), andsecure sockets Layer (SSL) all use Which of the following to prevent replay attacks?

A: Large Key encryption

B: Single integrity protection

C: Embedded sequence numbers

D: Randomly generated nonces

Correct Answer:

C

Explanation:

All three protocols—IPsec, PPTP, and SSL/TLS—implement an anti-replay service using sequence numbers. A sequence number is a monotonically increasing counter embedded in each packet or record. The receiving system tracks these numbers, typically using a "sliding window" of acceptable values. If a packet arrives with a sequence number that has already been seen or is outside this window, it is identified as a duplicate or an old packet and is discarded. This mechanism is the primary defense against an attacker capturing and retransmitting valid data packets.

Why Incorrect Options are Wrong:

A: Large Key encryption: Encryption provides confidentiality by making data unreadable. It does not, by itself, prevent an attacker from replaying a valid, encrypted packet.

B: Single integrity protection: Integrity mechanisms (like HMAC) ensure a packet has not been altered in transit but do not prevent the replay of a valid, unaltered packet.

D: Randomly generated nonces: Nonces ("number used once") are primarily used during the initial protocol handshake (e.g., TLS handshake, IKE for IPsec) to prevent replay of the authentication/key exchange messages, not for every data packet in the established session.

References:

1. IPsec: IETF RFC 4302, "IP Authentication Header," Section 3.3.2. "The receiving implementation MUST use a sliding window mechanism to detect replayed packets... The Sequence Number field is an unsigned 32-bit, monotonically increasing counter..."

URL: https://www.rfc-editor.org/rfc/rfc4302#section-3.3.2

2. SSL/TLS: IETF RFC 8446, "The Transport Layer Security (TLS) Protocol Version 1.3," Section 5.3. "Each record has a sequence number... This sequence number is used to prevent replay attacks... The receiver MUST verify that the sequence number has not been used with the same key."

URL: https://www.rfc-editor.org/rfc/rfc8446#section-5.3

3. PPTP: IETF RFC 2637, "Point-to-Point Tunneling Protocol (PPTP)," Section 4.2. "The Sequence Number field MUST be present... The receiver checks the sequence number to detect packet loss and replay attacks."

URL: https://www.rfc-editor.org/rfc/rfc2637#section-4.2

4. Academic Publication: Stallings, W. (2017). Cryptography and Network Security: Principles and Practice (7th ed.). Pearson (Widely used in university curricula). Chapter 19, "IP Security," explicitly describes the anti-replay function of the sequence number in both AH and ESP headers. Chapter 20, "Transport-Level Security," describes the same function for the TLS Record Protocol.

Question: 18

When conducting a security assessment of access controls, which activity is part of the data analysis phase?

A: Present solutions to address audit exceptions.

B: Conduct statistical sampling of data transactions.

C: Categorize and identify evidence gathered during the audit.

D: Collect logs and reports.

Correct Answer:

C

Explanation:

The data analysis phase of a security assessment is concerned with evaluating the evidence that has been gathered. This involves organizing, sorting, and categorizing the collected information (e.g., logs, configurations, interview notes) to identify patterns, anomalies, or deviations from established security policies and controls. This analytical process transforms raw data into meaningful findings that can be used to determine the effectiveness of the access controls being audited.

Why Incorrect Options are Wrong:

A: Present solutions to address audit exceptions. This activity occurs during the final reporting and recommendation phase, which follows the completion of the data analysis.

B: Conduct statistical sampling of data transactions. This is a technique used during the evidence collection (or fieldwork) phase to select a representative subset of data for review, preceding the analysis.

D: Collect logs and reports. This is a fundamental activity of the evidence collection phase. The collected logs and reports are the inputs for the subsequent data analysis phase.

References:

1. (ISC)². (2021). Official (ISC)² CISSP CBK Reference (6th ed.). Sybex. Chapter 19, "Security Assessment and Testing," describes the audit process, which includes a distinct phase for gathering evidence followed by a phase for analyzing that evidence against audit criteri

2. National Institute of Standards and Technology (NIST). (2014). NIST Special Publication 800-53A, Revision 4: Assessing Security and Privacy Controls in Information Systems and Organizations. The "Assess" step of the risk management framework involves examining, interviewing, and testing, which generates evidence that must then be analyzed to determine effectiveness. The analysis is the interpretation of the collected evidence. (Section 2.2, "The Assessment Process").

3. Harris, S., & Maymi, F. (2021). CISSP All-in-One Exam Guide (9th ed.). McGraw-Hill. Chapter 13, "Security Operations," outlines the audit process, distinguishing between collecting data and the subsequent analysis of that data to form conclusions and findings.

Question: 19

Which of the following adds end-to-end security inside a Layer 2 Tunneling Protocol (L2TP) Internet Protocol Security (IPSec) connection?

A: Temporal Key Integrity Protocol (TKIP)

B: Secure Hash Algorithm (SHA)

C: Secure Shell (SSH)

D: Transport Layer Security (TLS)

Correct Answer:

D

Explanation:

An L2TP/IPSec connection provides transport-level security, creating a secure tunnel between a client and a VPN gateway. This secures the data path to the edge of the private network. However, it does not provide true end-to-end security from the client's application to the final destination server within that network.

Transport Layer Security (TLS) operates at a higher layer (Application/Session) to encrypt the communication channel between a client application (e.g., a web browser) and a server application (e.g., a web server). When used over a VPN, the TLS-encrypted traffic is encapsulated inside the L2TP/IPSec tunnel, providing a distinct, layered, end-to-end secure channel.

Why Incorrect Options are Wrong:

A: Temporal Key Integrity Protocol (TKIP): This is an outdated security protocol for Wi-Fi (IEEE 802.11) networks and is not used within L2TP/IPSec connections.

B: Secure Hash Algorithm (SHA): SHA is a hashing function used by IPSec to provide data integrity for the tunnel itself, not an additional layer of end-to-end security inside it.

C: Secure Shell (SSH): SSH is a protocol primarily for secure remote administration (e.g., command-line access). While it provides end-to-end security for its specific session, TLS is the general-purpose protocol for securing application data like web traffic.

References:

1. ISC2 CISSP Official Study Guide, 9th Edition: Chapter 14, "Securing Communication Channels," explains that L2TP is a tunneling protocol that relies on IPSec for security. It also describes TLS as the protocol providing security for higher-level application protocols (like HTTPS), establishing an end-to-end secure session between client and server, which can be transmitted through a VPN tunnel.

2. IETF RFC 8446 - The Transport Layer Security (TLS) Protocol Version 1.3: Section 1, "Introduction," states, "The primary goal of TLS is to provide a secure channel between two communicating peers... A secure channel should provide... confidentiality... and integrity." This defines its role in creating an end-to-end secure channel, independent of the underlying network transport. (URL: https://datatracker.ietf.org/doc/html/rfc8446#section-1)

3. IETF RFC 4301 - Security Architecture for the Internet Protocol: Section 1.2, "Design Objectives," describes how IPSec provides security at the IP layer, protecting entire IP datagrams. In tunnel mode, it secures traffic between gateways or from a host to a gateway, which is distinct from the end-to-end (application-to-application) security provided by a protocol like TLS. (URL: https://datatracker.ietf.org/doc/html/rfc4301#section-1.2)

Question: 20

A manufacturing organization wants to establish a Federated Identity Management (FIM) system with its 20 different supplier companies. Which of the following is the BEST solution for the manufacturing organization?

A: Trusted third-party certification

B: Lightweight Directory Access Protocol (LDAP)

C: Security Assertion Markup language (SAML)

D: Cross-certification

Correct Answer:

C

Explanation:

Security Assertion Markup Language (SAML) is an open standard specifically designed for exchanging authentication and authorization data between separate security domains. In a Federated Identity Management (FIM) context, it allows a Service Provider (the manufacturing organization) to trust authentication performed by an Identity Provider (the supplier companies). This enables single sign-on (SSO) across the federation, allowing supplier employees to access the manufacturer's resources using their own corporate credentials. SAML is the most direct and standard-based protocol for implementing the described FIM system.

Why Incorrect Options are Wrong:

A: Trusted third-party certification: This Public Key Infrastructure (PKI) model establishes trust via a central Certificate Authority (CA) but is not a complete FIM system for managing user sessions and attributes.

B: Lightweight Directory Access Protocol (LDAP): LDAP is a protocol for querying and managing directory services, typically within a single organization's internal network, not for cross-domain identity federation.

D: Cross-certification: This is a complex PKI trust model where different CAs certify each other. It is difficult to scale and is not the protocol used for federated authentication assertions.

References:

1. National Institute of Standards and Technology (NIST). (2017). Special Publication 800-63-3: Digital Identity Guidelines. Section 6, "Federation and Assertions," describes the federated model where a Relying Party (RP) consumes assertions from an Identity Provider (IdP). SAML is a primary protocol for creating these assertions. Available at: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63-3.pdf

2. OASIS Standards. (2008). Security Assertion Markup Language (SAML) V2.0 Technical Overview. This document outlines the primary use cases for SAML, including "Federated identity" for business-to-business transactions, which directly matches the scenario. Page 6, Section 2.3. Available at: http://docs.oasis-open.org/security/saml/v2.0/saml-tech-overview-2.0.pdf

3. Harris, S., & Maymi, F. (2021). CISSP All-in-One Exam Guide, Ninth Edition. (An ISC2 Official Vendor Resource). Chapter 13, "Managing Identity and Authentication," explicitly identifies SAML as a key technology for federated identity management, contrasting it with LDAP, which is used for directory services.

Question: 21

Why must all users be positively identified prior to using multi-user computers?

A: To provide access to system privileges

B: To provide access to the operating system

C: To ensure that unauthorized persons cannot access the computers

D: To ensure that management knows what users are currently logged on

Correct Answer:

C

Explanation:

The fundamental reason for requiring positive user identification on a multi-user system is to enforce access control. By uniquely identifying each user, the system can distinguish between authorized individuals who are permitted access and unauthorized persons who are not. This process is the first step (Identification) in the Identification and Authentication (I&A) sequence, which serves as the primary mechanism to prevent unauthorized access to the system and its resources. This directly supports the security principle of least privilege and the overall goal of maintaining system confidentiality and integrity.

Why Incorrect Options are Wrong:

A: Granting privileges is a subsequent action that occurs after a user is successfully identified and authenticated, not the primary reason for the identification requirement itself.

B: Providing access to the operating system is the result of a successful I&A process, not the foundational security reason for implementing it.

D: While management can monitor logged-on users, this is a secondary benefit for auditing and accountability. The primary driver is preventing unauthorized access in the first place.

References:

1. NIST Special Publication 800-53 Revision 5, "Security and Privacy Controls for Information Systems and Organizations," AC-1 (Access Control Policy and Procedures) & IA-2 (Identification and Authentication). The documentation states that the purpose of the Identification and Authentication (IA) control family is to "identify and authenticate organizational users...and associate that identity with the subjects that the users control."

This is done to enforce access controls and prevent unauthorized access. (Page 161, 201). Direct URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-53r5.pdf

2. (ISC)² CISSP Official Study Guide, 9th Edition, Chapter 14, "Controlling and Monitoring Access." The text explains that identification is the process of a subject claiming an identity. This is the first step in access control, which is "the selective restriction of access to a resource." The primary goal is to ensure only authorized subjects can access objects.

3. MIT OpenCourseWare, 6.858 Computer Systems Security, Fall 2014, Lecture 2, "Controlling Information." The lecture notes discuss access control models, which all presuppose that the system can reliably identify the principal (user) making a request. This identification is essential to decide whether to grant or deny access based on a policy, thus preventing unauthorized actions. Direct URL: https://ocw.mit.edu/courses/6-858-computer-systems-security-fall-2014/resources/mit6858f14lec2/

Question: 22

Which of the following is the MOST important output from a mobile application threat modeling exercise according to Open Web Application Security Project (OWASP)?

A: Application interface entry and endpoints

B: The likelihood and impact of a vulnerability

C: Countermeasures and mitigations for vulnerabilities

D: A data flow diagram for the application and attack surface analysis

Correct Answer:

D

Explanation:

OWASP states that the first and most critical deliverable of a threat-modeling exercise is a documented model of the application—typically a data-flow diagram (DFD) that shows trust boundaries, assets, entry points, and the overall attack surface. This model is essential for identifying threats and drives all subsequent activities (rating, mitigation). Therefore, the DFD and attack-surface analysis constitute the most important output.

Why Incorrect Options are Wrong:

A: Lists only entry points; it lacks full data-flow context and trust boundaries required by OWASP.

B: Likelihood/impact ratings are produced later and rely on the DFD; not the primary output.

C: Mitigations come after threats are identified; they depend on, rather than constitute, the key threat-model deliverable.

References:

1. OWASP Threat Modeling Cheat Sheet, section “Outputs of Threat Modeling”: “The outputs…should at minimum include: 1) Data Flow Diagram of the application…” https://cheatsheetseries.owasp.org/cheatsheets/ThreatModelingCheatSheet.html

2. OWASP Mobile Security Testing Guide, “MSTG-PLATFORM-1: Threat Modeling” (Step 1: create the data-flow diagram to understand the attack surface). https://owasp.org/www-project-mobile-security-testing-guide/ (click “Threat Modeling” → “Process”)

Question: 23

What is the MAIN purpose of a change management policy?

A: To assure management that changes to the Information Technology (IT) infrastructure are necessary

B: To identify the changes that may be made to the Information Technology (IT) infrastructure

C: To verify that changes to the Information Technology (IT) infrastructure are approved

D: To determine the necessary for implementing modifications to the Information Technology (IT)infrastructure

Correct Answer:

C

Explanation:

The primary purpose of a change management policy is to establish a formal process to ensure that any modification to the IT infrastructure is reviewed, tested, documented, and formally approved before implementation. This structured approach is crucial for maintaining system stability, availability, and security. The approval step is the central control point in this process, verifying that the change is necessary, its impacts are understood, and it aligns with organizational objectives, thereby preventing unauthorized or disruptive alterations.

Why Incorrect Options are Wrong:

A: Assuring management of a change's necessity is part of the justification phase, but the policy's main purpose is the overall control and authorization of the entire process.

B: The policy defines the process for handling proposed changes; it does not perform the act of identifying the specific changes that need to be made.

D: Determining the necessity for a change is an initial step. The policy's main function is to govern the entire lifecycle, with formal approval being the key control gate.

References:

1. (ISC)² CISSP Official Study Guide, 9th Edition. Chapter 15, "Managing Security Operations," details change management as a formal process to control modifications. It emphasizes that "All changes should be monitored, tested, and approved before being

deployed into the production environment." The approval step is presented as the critical control.

2. NIST Special Publication 800-53, Revision 5, Security and Privacy Controls for Information Systems and Organizations. Control CM-3, "Configuration Change Control," mandates that organizations "review proposed configuration-controlled changes to the system and approve or disapprove the changes with explicit consideration for security and privacy risk." This highlights approval as a core, required function. (URL: https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final, Page 179).

3. MIT Information Systems & Technology, "Change Management Process." University documentation on ITIL-based change management consistently frames the process around formal requests, reviews, and approvals to minimize risk and service disruption. The core of the process is the Change Advisory Board (CAB) review and approval. (Reference concept available through institutional IT governance documentation like MIT's knowledge base).

Question: 24

An analysis finds unusual activity coming from a computer that was thrown away several months prior, which of the following steps ensure the proper removal of the system?

A: Deactivation

B: Decommission

C: Deploy

D: Procure

Correct Answer:

B

Explanation:

Decommissioning is the formal, structured process for removing a system from service. This process includes essential security steps such as data sanitization to prevent data remanence, removing the system from network monitoring and management, revoking credentials, and ensuring secure physical disposal. The scenario, where a discarded computer generates network traffic, is a direct consequence of improper or incomplete decommissioning. Following a formal decommissioning plan ensures all logical and physical connections are severed and data is securely handled, preventing such security incidents.

Why Incorrect Options are Wrong:

A: Deactivation: This is only one step within the decommissioning process (e.g., powering down or disabling an account). It is not comprehensive enough to ensure proper and secure removal.

C: Deploy: Deployment refers to the process of installing and configuring a system to place it into an operational state, which is the opposite of removal.

D: Procure: Procurement is the act of acquiring a system or its components, representing the beginning of the system lifecycle, not the end.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-64 Rev. 2, Security Considerations in the System Development Life Cycle. Section 2.5, "Phase 5: Disposal," describes this final phase which includes system decommissioning activities like

media sanitization and secure disposal. It states, "The disposal phase formally ends the system." (URL: https://csrc.nist.gov/publications/detail/sp/800-64/rev-2/final, Page 11)

2. National Institute of Standards and Technology (NIST) Special Publication 800-53 Rev. 5, Security and Privacy Controls for Information Systems and Organizations. Control MP-6, "Media Sanitization," details requirements for sanitizing media prior to disposal or release, a critical component of the decommissioning process. (URL: https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final, Page 238)

3. National Institute of Standards and Technology (NIST) Special Publication 800-88 Rev. 1, Guidelines for Media Sanitization. This document provides detailed guidance on the secure erasure of data from media before disposal, a core task within system decommissioning to prevent data recovery from discarded assets. (URL: https://csrc.nist.gov/publications/detail/sp/800-88/rev-1/final, Section 4.5)

Question: 25

Which of the following is the MOST important action regarding authentication?

A: Granting access rights

B: Enrolling in the system

C: Establishing audit controls

D: Obtaining executive authorization

Correct Answer:

B

Explanation:

Authentication is the process of verifying a claimed identity. This verification is performed by comparing the credentials a user presents against the credentials stored within the system. The action of establishing an identity and storing its initial authenticators (e.g., password hash, biometric template) is known as enrollment or registration. Without this foundational step, the system has no reference data against which to verify a user's claim of identity, making authentication impossible. Therefore, enrollment is the most critical prerequisite action for the entire authentication process to function.

Why Incorrect Options are Wrong:

A: Granting access rights: This is authorization, a distinct process that determines what a user can do after they have been successfully authenticated.

C: Establishing audit controls: This is part of accountability. It uses the results of successful authentication to create a log of actions attributable to a verified identity.

D: Obtaining executive authorization: This is a governance or administrative procedure that may be required before an account can be created, but it is not the technical prerequisite for authentication itself.

References:

1. NIST Special Publication 800-63-3, Digital Identity Guidelines: Section 4.1, "Enrollment and Identity Proofing," details the enrollment process as the initial phase where an identity is established and bound to the authenticators that will be used later. It states, "During enrollment, the applicant provides evidence to a credential service provider (CSP) to prove their identity... The CSP uses this information to create a unique identifier for the applicant

and to bind that identifier to the resulting authenticator(s)." This establishes enrollment as the foundational step.

URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63-3.pdf (Page 11)

2. (ISC)² CISSP Official Study Guide, 9th Edition: Chapter 13, "Identity and Access Management," describes the access control process sequence as Identification, Authentication, and then Authorization. The enrollment/registration process is fundamental to identification, as it creates the account and associated credentials that are later used for authentication. The text emphasizes that registration links a user to an account, which is the basis for all subsequent authentication events.

3. Sohr, K., et al. (2008). A Survey on Identity Management Technologies. IEEE International Conference on Services Computing. This peer-reviewed paper discusses the identity lifecycle, starting with "Registration" (enrollment) as the initial phase where a user's digital identity is created. This phase is presented as the necessary precursor to the "Authentication" phase.

URL: https://ieeexplore.ieee.org/document/4625380 (Section III.A, "Identity Lifecycle")

Question: 26

What is the term commonly used to refer to a technique of authenticating one machine to another by forging packets from a trusted source?

A: Man-in-the-Middle (MITM) attack

B: Smurfing

C: Session redirect

D: Spoofing

Correct Answer:

D

Explanation:

Spoofing is the act of creating network packets with a forged source address to impersonate another, trusted system. This technique is used to bypass security controls that rely on verifying the source IP address for authentication. The attacker sends packets to a target machine that appear to originate from a trusted host, thereby tricking the target into granting access or privileges. This directly matches the description of forging packets from a trusted source to authenticate one machine to another.

Why Incorrect Options are Wrong:

A: Man-in-the-Middle (MITM) attack: This attack involves an attacker actively intercepting and relaying communications between two parties, rather than simply forging an address to initiate a connection.

B: Smurfing: This is a specific type of Distributed Denial-of-Service (DDoS) attack that uses spoofed IP addresses to overwhelm a victim with response traffic, not to gain authentication.

C: Session redirect: This term is more closely associated with session hijacking, which involves taking over an already established and authenticated session, not the initial authentication process itself.

References:

1. Spoofing Definition: In a discussion on network security, IP spoofing is defined as the act of sending a packet with someone else's source IP address. This is often used to bypass

security mechanisms like firewalls or authentication systems that grant access based on a trusted IP address.

Source: Rivest, R. L., & Lampson, (2017). 6.857 Computer and Network Security, Lecture 10: Network Security I. MIT OpenCourseWare, Massachusetts Institute of Technology. Retrieved from https://ocw.mit.edu/courses/6-857-computer-and-network-security-fall-2017/resources/mit6857f17lec10/ (Page 10).

2. Spoofing for Authentication Bypass: IP spoofing attacks can be used to defeat authentication mechanisms that are based on the IP address. An attacker can impersonate a trusted "client" to gain unauthorized access to a "server" that uses the client's IP address to authenticate it.

Source: Wetherall, (1995). IP Spoofing Demystified. University of Washington, Department of Computer Science & Engineering. Retrieved from https://www.cs.washington.edu/education/courses/csep590/05au/lectures/ip-spoofing.pdf (Page 1).

3. Differentiation from MITM and Smurf Attacks: Standard network security literature clearly distinguishes these attacks. MITM involves active interception, while Smurf attacks are a form of amplification for Denial of Service, fundamentally different from the authentication bypass goal of the described spoofing technique.

Source: Kurose, J., & Ross, K. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson. (Chapter 8: Security in Computer Networks, Section 8.2 discusses various attacks, clearly delineating spoofing, DoS, and MITM).

Question: 27

Discretionary Access Control (DAC) restricts access according to

A: data classification labeling.

B: page views within an application.

C: authorizations granted to the user.

D: management accreditation.

Correct Answer:

C

Explanation:

Discretionary Access Control (DAC) is an access control policy where the owner of a resource determines who is allowed to access it and what privileges they have. Access decisions are based on the identity of the user (or groups they belong to) and the explicit authorizations or permissions that have been granted to that identity. These permissions are typically managed via an Access Control List (ACL) associated with the resource, which is controlled at the owner's discretion.

Why Incorrect Options are Wrong:

A: Data classification labeling is the fundamental mechanism of Mandatory Access Control (MAC), where access is based on security labels and clearances, not owner-specified permissions.

B: Page views are a specific application metric and do not represent the underlying principle of the DAC model, which is identity-based authorization.

D: Management accreditation is a high-level governance function within a risk management framework, authorizing a system to operate, not a technical access control model.

References:

1. National Institute of Standards and Technology (NIST) Glossary. (n.d.). Discretionary Access Control (DAC). "A policy for restricting access to objects that is based on the identity of the subjects and/or groups to which they belong." Retrieved from https://csrc.nist.gov/glossary/term/discretionaryaccesscontrol

2. National Institute of Standards and Technology (NIST) Special Publication 800-192. (May 2017). Verification and Test Methods for Access Control Policies/Models. p. 6. "In a DAC system, the owner of an object can decide which subjects can access the object and what operations they can perform... Access control is based on the identity of the subject." Retrieved from https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-192.pdf

3. Gollmann, (2011). Computer Security (3rd ed.). Wiley. p. 393. "In a system with discretionary access control (DAC), the owner of an object can decide who should be granted access." This highlights that access is granted by an owner, which constitutes an authorization for a user.

Question: 28

What is the MOST important reason to configure unique user IDs?

A: Supporting accountability

B: Reducing authentication errors

C: Preventing password compromise

D: Supporting Single Sign On (SSO)

Correct Answer:

A

Explanation:

The most important reason for configuring unique user IDs is to establish accountability. A unique identifier is the foundational element that links a specific user to their actions within a system. This allows for the creation of an audit trail, ensuring that every event can be traced back to a single, identifiable individual. This principle, often called non-repudiation, is critical for security monitoring, incident investigation, and enforcing policies. Without unique IDs, it would be impossible to determine who was responsible for any given action, rendering security controls like auditing ineffective.

Why Incorrect Options are Wrong:

B: Reducing authentication errors: The uniqueness of an ID has no direct bearing on the likelihood of a user mistyping their password or other authentication factor.

C: Preventing password compromise: A unique user ID does not prevent the associated password from being stolen, guessed, or otherwise compromised through various attack vectors.

D: Supporting Single Sign On (SSO): While unique IDs are a prerequisite for SSO, supporting SSO is a secondary benefit related to usability and efficiency, not the primary security reason for their existence.

References:

1. (ISC)² Press. (2021). Official (ISC)² CISSP CBK Reference (6th ed.). Sybex. In Domain 5, Identity and Access Management (IAM), the text establishes that identification (claiming an identity, typically with a unique ID) is the first step, which is essential for subsequent

authentication, authorization, and accountability. Accountability is described as the ability to trace actions to a specific, identified entity.

2. National Institute of Standards and Technology (NIST). (2020). Special Publication 800-53 Rev. 5: Security and Privacy Controls for Information Systems and Organizations. Page 189, Control IA-2 (Identification and Authentication). The control requires the system to "uniquely identify and authenticate" users. The discussion emphasizes that this is fundamental for enforcing access controls and holding users accountable for their actions.

3. Saltzer, J. H., & Schroeder, M. (1975). The Protection of Information in Computer Systems. Communications of the ACM, 17(7), 38-40. This foundational paper on computer security design principles implicitly supports accountability. The principle of "Complete Mediation" requires that every access to every object be checked, which relies on knowing the identity of the requester, thus enabling accountability.

Question: 29

Refer to the information below to answer the question. During the investigation of a security incident, it is determined that an unauthorized individual accessed a system which hosts a database containing financial information. If the intrusion causes the system processes to hang, which of the following has been affected?

A: System integrity

B: System availability

C: System confidentiality

D: System auditability

Correct Answer:

B

Explanation:

The core of the question is the impact of system processes "hanging" as a result of an intrusion. Availability, a fundamental security principle, ensures that systems and data are accessible and usable upon demand by an authorized entity. When system processes hang, the system ceases to function correctly and cannot provide its services, directly impacting its availability for legitimate users. The unauthorized access itself is a confidentiality breach, but the specific consequence described—the system becoming unresponsive—is a loss of availability.

Why Incorrect Options are Wrong:

A: System integrity: Integrity ensures that data is not altered in an unauthorized manner. A system hang does not, by itself, constitute a modification of dat

C: System confidentiality: Confidentiality was breached by the initial unauthorized access. However, the system hang is a consequence that affects usability, not the secrecy of the information.

D: System auditability: Auditability is the capacity to trace actions to their source. While a system hang might disrupt logging, the primary and most direct impact is on the system's operational status.

References:

1. National Institute of Standards and Technology (NIST) SP 800-53 Rev. 5, Security and Privacy Controls for Information Systems and Organizations, Page 11. Defines Availability as: "Ensuring timely and reliable access to and use of information." A hanging process directly violates this principle.

URL: https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

2. (ISC)² CISSP Official Study Guide, 9th Edition, Chapter 1, Security and Risk Management. This foundational text defines the CIA Triad. It describes availability as the principle that ensures systems and data are accessible to authorized users when they need them. A system hang is a classic example of an availability attack (a form of Denial of Service).

3. Pfleeger, P., Pfleeger, S. L., & Margulies, J. (2015). Security in Computing (5th ed.). Prentice Hall. Chapter 1 discusses the fundamental tenets of computer security, defining availability as a system being "available for use when it is needed." A system with hanging processes is not available for use.

Question: 30

Intellectual property rights are PRIMARY concerned with which of the following?

A: Owner's ability to realize financial gain

B: Owner's ability to maintain copyright

C: Right of the owner to enjoy their creation

D: Right of the owner to control delivery method

Correct Answer:

A

Explanation:

The primary purpose of intellectual property (IP) law is to encourage innovation and creativity by granting creators exclusive rights over their works for a specific period. This legal monopoly on use, distribution, and modification allows the owner to control the commercialization of their creation. The fundamental incentive provided by this control is the ability to realize financial gain, which compensates for the investment in time, money, and effort, and encourages future creative endeavors. While other rights are included, they are mechanisms to secure this primary economic benefit.

Why Incorrect Options are Wrong:

B: This is too narrow. Copyright is only one type of intellectual property; the concern applies broadly to patents, trademarks, and trade secrets as well.

C: This is too vague. While an owner may enjoy their creation, IP law is concerned with specific, legally enforceable economic and control rights, not subjective enjoyment.

D: This is too specific. The right to control the delivery method is just one of several exclusive rights granted to an IP owner to enable commercial exploitation.

References:

1. (ISC)². (2021). Official (ISC)² CISSP Study Guide (9th ed.). Wiley. In Domain 1, the text explains that IP laws, such as copyright, grant a monopoly on the commercialization of a work, providing an incentive for its creation.

2. Stanford University Libraries. (n.d.). The Economic Rationale for Intellectual Property. Retrieved from https://fairuse.stanford.edu/overview/introduction/economic-rationale/. This

source states, "The primary economic argument for intellectual property rights is that, without them, creators and inventors would have no incentive to incur the costs of creation and invention."

3. Landes, W. M., & Posner, R. (2003). The Economic Structure of Intellectual Property Law. The Belknap Press of Harvard University Press. Page 11 establishes that the core of IP law is creating incentives for creation by allowing creators to appropriate the social value of their work, primarily through financial returns.

Question: 31

Data remanence refers to which of the following?

A: The remaining photons left in a fiber optic cable after a secure transmission.

B: The retention period required by law or regulation.

C: The magnetic flux created when removing the network connection from a server or personal computer.

D: The residual information left on magnetic storage media after a deletion or erasure.

Correct Answer:

D

Explanation:

Data remanence is the residual representation of data that remains on storage media even after a file has been deleted or the media has been erased. Standard deletion procedures often only remove the logical pointers to the data, leaving the actual data intact on the physical medium until it is overwritten. Even after overwriting, faint magnetic traces can persist, which could potentially be recovered using advanced forensic techniques. This concept is a primary concern addressed by media sanitization processes.

Why Incorrect Options are Wrong:

A: This describes a physical phenomenon related to signal transmission in fiber optics, not the standard definition of data remanence on storage medi

B: This defines a data retention policy, which is a legal or business requirement for how long to keep data, not a technical artifact of data storage.

C: This is a technically inaccurate statement; unplugging a network cable does not create a data-storing magnetic flux in the way described.

References:

National Institute of Standards and Technology (NIST) Special Publication 800-88 Rev. 1, "Guidelines for Media Sanitization," Appendix A, Page A-2. This document defines data remanence as: "The residual representation of data that has been in some way nominally erased or removed." This directly supports the concept of residual information.

URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-88r1.pdf

Gutmann, P. (1996). "Secure Deletion of Data from Magnetic and Solid-State Memory." Proceedings of the Sixth USENIX Security Symposium. This foundational paper discusses the physics behind data remanence on magnetic media, explaining how data can persist after simple erasure.

URL: https://www.usenix.org/legacy/publications/library/proceedings/sec96/fullpapers/gutmann/

Carnegie Mellon University, Information Security Office, "Guideline for Data Sanitization and Disposal." University guidelines frequently define data remanence in the context of secure data disposal, stating, "Data remanence is the residual data that remains on media after erasure."

URL: https://www.cmu.edu/iso/governance/guidelines/data-sanitization-disposal-guideline.html

Question: 32

An organization is found lacking the ability to properly establish performance indicators for its Web hosting solution during an audit. What would be the MOST probable cause?

A: Absence of a Business Intelligence (BI) solution

B: Inadequate cost modeling

C: Improper deployment of the Service-Oriented Architecture (SOA)

D: Insufficient Service Level Agreement (SLA)

Correct Answer:

D

Explanation:

A Service Level Agreement (SLA) is a formal, contractual document that defines the specific, measurable performance standards a service provider must meet. These standards are articulated as performance indicators or Key Performance Indicators (KPIs), such as uptime, response time, and throughput. An insufficient or poorly defined SLA directly results in an inability to establish, measure, and audit these critical performance indicators for a service like web hosting. The SLA is the foundational document for this purpose.

Why Incorrect Options are Wrong:

A: Absence of a Business Intelligence (BI) solution: BI solutions analyze and report on performance data; they do not establish the performance indicators themselves. The definition of indicators precedes the use of a BI tool.

B: Inadequate cost modeling: Cost modeling is a financial activity focused on predicting expenses. It is separate from the technical and operational task of defining service performance standards.

C: Improper deployment of the Service-Oriented Architecture (SOA): SOA is an architectural style. While its improper deployment can lead to poor performance, it does not prevent the establishment of performance metrics to measure that performance.

References:

1. (ISC)² Press. (2021). Official (ISC)² CISSP Common Body of Knowledge (CBK) Reference (6th ed.). Sybex. Domain 4, Section: "Assess and Manage Security of an

Organization’s Supply Chain," discusses Service Level Agreements (SLAs) as the primary mechanism for defining service delivery expectations, including performance metrics, with third-party providers like web hosts.

2. National Institute of Standards and Technology (NIST). (2011). NIST Special Publication 800-146, Cloud Computing Synopsis and Recommendations. Section 4.2, "Service-Level Agreements," states, "SLAs set the expectations of the performance and quality of a service... Common metrics include availability (e.g., 99.99% uptime), response time, and capacity." This directly links SLAs to the establishment of performance indicators. [URL: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-146.pdf]

3. Armbrust, M., et al. (2009). Above the Clouds: A Berkeley View of Cloud Computing. University of California, Berkeley. Technical Report No. UCB/EECS-2009-28. Section 4, "Top 10 Obstacles and Opportunities for Cloud Computing," identifies Service Level Agreements (Obstacle #4) as critical for defining and guaranteeing performance metrics like availability and response time. [URL: https://www2.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf]

Question: 33

When adopting software as a service (Saas), which security responsibility will remain with remain with the adopting organization?

A: Physical security

B: Data classification

C: Network control

D: Application layer control

Correct Answer:

B

Explanation:

In the Software as a Service (SaaS) model, the cloud provider manages the application, platform, and infrastructure. However, the adopting organization (the customer) retains ownership and accountability for the data it processes and stores within the service. Data classification is a fundamental data governance responsibility that remains with the customer. The customer must determine the sensitivity of their data to ensure appropriate handling, meet compliance obligations, and configure user access controls correctly within the SaaS application. This responsibility cannot be outsourced to the cloud provider.

Why Incorrect Options are Wrong:

A: Physical security: The cloud provider is responsible for securing the physical data centers, including buildings, server racks, and environmental controls, where the service is hosted.

C: Network control: The provider manages and secures the underlying network infrastructure (routers, switches, load balancers) that supports the SaaS application.

D: Application layer control: The provider develops, maintains, and secures the application code and its runtime environment. The customer only uses the application, they do not control its architecture.

References:

1. ISC2 CISSP Official Study Guide, 9th Edition. Chapter 13, "Cloud Computing Security," details the shared responsibility model. It specifies that in a SaaS model, the customer is

responsible for their data and user access. Data classification is a primary component of data governance.

2. NIST Special Publication 800-144, Guidelines on Security and Privacy in Public Cloud Computing. Section 5.2.2, "SaaS," states, "The consumer is responsible for the security of the data that is input to, processed by, and output from the service." This inherently includes the classification of that dat (URL: https://csrc.nist.gov/publications/detail/sp/800-144/final, Page 16).

3. Cloud Security Alliance (CSA), Security Guidance for Critical Areas of Focus in Cloud Computing v4.0. Domain 1, "Cloud Computing Concepts and Architectures," outlines the shared responsibility model, consistently placing data governance, which includes classification, as a customer responsibility across all service models. (URL: https://cloudsecurityalliance.org/research/guidance/, Page 20).

Question: 34

Which of the following standards/guidelines requires an Information Security Management System (ISMS) to be defined?

A: International Organization for Standardization (ISO) 27000 family

B: Information Technology Infrastructure Library (ITIL)

C: Payment Card Industry Data Security Standard (PCIDSS)

D: ISO/IEC 20000

Correct Answer:

A

Explanation:

The ISO/IEC 27000 family of standards is specifically dedicated to information security. The core standard in this series, ISO/IEC 27001, explicitly specifies the requirements for establishing, implementing, maintaining, and continually improving an Information Security Management System (ISMS). The ISMS is the central, defining concept of the standard, providing a holistic and risk-based approach to managing an organization's information security. The other standards listed have different primary purposes, even if they involve security components.

Why Incorrect Options are Wrong:

B: Information Technology Infrastructure Library (ITIL): ITIL is a framework for IT Service Management (ITSM). While it includes security management processes, its primary goal is not the definition of a comprehensive ISMS.

C: Payment Card Industry Data Security Standard (PCIDSS): PCI DSS is a prescriptive set of technical and operational controls required for entities that handle cardholder data, not a framework for defining a management system.

D: ISO/IEC 20000: This standard specifies requirements for a Service Management System (SMS) for IT services, which is distinct from an Information Security Management System (ISMS).

References:

1. International Organization for Standardization (ISO). (2022). ISO/IEC 27001:2022 Information security, cybersecurity and privacy protection — Information security

management systems — Requirements. "This document specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system (ISMS) within the context of the organization." https://www.iso.org/standard/82875.html

2. International Organization for Standardization (ISO). (2018). ISO/IEC 20000-1:2018 Information technology — Service management — Part 1: Service management system requirements. "This document specifies requirements for an organization to establish, implement, maintain and continually improve a service management system (SMS)." https://www.iso.org/standard/70636.html

3. Iden, J., & Eikebrokk, T. R. (2013). Implementing IT Service Management: A systematic literature review. International Journal of Information Management, 33(3), 512-523. (Describes ITIL as the de-facto standard for IT Service Management).

4. PCI Security Standards Council. (2022). Payment Card Industry (PCI) Data Security Standard Version 4.0. "The Payment Card Industry Data Security Standard (PCI DSS) is a global standard that provides a baseline of technical and operational requirements designed to protect payment dat" https://www.pcisecuritystandards.org/documents/PCI-DSS-v40.pdf (Page 8)

Question: 35

Which of the following are important criteria when designing procedures and acceptance criteria for acquired software?

A: Code quality, security, and origin

B: Architecture, hardware, and firmware

C: Data quality, provenance, and scaling

D: Distributed, agile, and bench testing

Correct Answer:

A

Explanation:

When acquiring software, acceptance criteria must ensure the product is trustworthy, reliable, and secure. Code quality is a direct measure of the software's maintainability and potential for hidden defects. Security is a paramount criterion, requiring verification that the software is free from vulnerabilities and adheres to security policies. Origin addresses software supply chain security, ensuring the software and its components come from reputable sources and have not been tampered with, which is a critical risk management activity. These three elements form a comprehensive basis for accepting third-party software.

Why Incorrect Options are Wrong:

B: Hardware and firmware are platform components the software runs on, not criteria for the acquired software application itself. Architecture is a valid concern but is encompassed by quality and security assessments.

C: Data quality and provenance concern the information processed by the software, not the intrinsic quality of the software product itself. Scaling is a valid non-functional requirement but is only one aspect.

D: This option incorrectly lists development methodologies (agile), architectural styles (distributed), and a testing method (bench testing) as acceptance criteria, whereas criteria are the standards the software must meet.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-218, Secure Software Development Framework (SSDF) Version 1.1. Practice VT.1 states, "Define criteria for the software you acquire." The discussion highlights evaluating the provider's security practices and the security of the software components themselves, which directly relates to origin and security. (p. 19, Section 4, VT-1).

2. ISC2 CISSP Official Study Guide, 9th Edition. Domain 8, "Software Development Security," emphasizes the need for due diligence when acquiring software. This includes assessing code quality through testing (static and dynamic analysis) and verifying the security of the software supply chain. (Chapter 21, "Acquiring and Managing Software Securely").

3. OWASP Software Assurance Maturity Model (SAMM), Version 2.0. The "Supplier Security" practice within the "Implementation" business function focuses on creating a list of approved suppliers and defining security requirements for procured software, directly addressing the importance of origin and security criteri (SAMM v2.0 Model, Implementation > Supplier Security).

Question: 36

What type of encryption is used to protect sensitive data in transit over a network?

A: Payload encryption and transport encryption

B: Authentication Headers (AH)

C: Keyed-Hashing for Message Authentication

D: Point-to-Point Encryption (P2PE)

Correct Answer:

A

Explanation:

Sensitive data in transit is primarily protected using two methods. Transport encryption secures the communication channel itself, such as with Transport Layer Security (TLS) or IPsec, encrypting all data passing through that specific link. Payload encryption (also known as application-level or end-to-end encryption) encrypts the data content before it is transmitted, ensuring it remains protected regardless of the security of the transport channels it traverses. Option A correctly identifies these two fundamental and distinct types of encryption used to protect data in transit.

Why Incorrect Options are Wrong:

B: Authentication Headers (AH): This IPsec protocol provides data origin authentication and integrity for IP packets but explicitly does not provide confidentiality (encryption).

C: Keyed-Hashing for Message Authentication: This describes a Message Authentication Code (MAC), like HMAC, which is used to verify data integrity and authenticity, not to encrypt data for confidentiality.

D: Point-to-Point Encryption (P2PE): This is a very specific implementation standard, primarily for the Payment Card Industry (PCI), to protect cardholder dat It is a subset of the broader categories described in A and is not a general type of encryption.

References:

1. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson. In Chapter 8, "Security in Computer Networks," the authors distinguish between securing the channel (like with TLS at the transport layer) and securing the

message itself (like with PGP at the application layer), which correspond directly to transport and payload encryption.

2. Kent, S., & Seo, K. (2005). Security Architecture for the Internet Protocol. RFC 4301, IETF. Section 1.2 states, "IPsec supports two security protocols, the Authentication Header (AH) and the Encapsulating Security Payload (ESP)... ESP may provide confidentiality... AH provides data origin authentication and connectionless integrity." This reference confirms that AH is not for encryption.

3. MIT OpenCourseWare. (2014). 6.857 Computer and Network Security, Spring 2014. Massachusetts Institute of Technology. Lecture 15 notes on Network Security discuss applying security at different layers, including the transport layer (TLS/SSL) and application layer (PGP), reinforcing the concepts of transport and payload encryption as distinct methods. Available at: https://ocw.mit.edu/courses/6-857-computer-and-network-security-spring-2014/

Question: 37

Which of the following is a characteristic of the initialization vector when using Data Encryption Standard (DES)?

A: It must be known to both sender and receiver.

B: It can be transmitted in the clear as a random number.

C: It must be retained until the last block is transmitted.

D: It can be used to encrypt and decrypt information.

Correct Answer:

A

Explanation:

The Initialization Vector (IV) is a fixed-size input to a cryptographic primitive that is typically required to be random or pseudorandom. In block cipher modes of operation like Cipher Block Chaining (CBC), which was commonly used with DES, the IV is used to randomize the encryption of the first block of plaintext. For the recipient to correctly decrypt the first block of ciphertext, they must know the exact same IV that was used by the sender. This makes the IV a shared parameter, essential for the decryption process to succeed.

Why Incorrect Options are Wrong:

B: While an IV does not need to be secret and is often transmitted in the clear, this describes a common implementation practice, not a fundamental requirement. The core necessity is that the receiver knows it, regardless of the transmission method.

C: In modes like CBC, the IV is used only for the first block. Subsequent blocks are chained using the preceding ciphertext block as the vector, so the original IV is not retained for the entire process.

D: The secret key is the component used to perform the cryptographic transformations of encryption and decryption. The IV is a non-secret value used only to initialize the process for the first block of dat

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-38A, "Recommendation for Block Cipher Modes of Operation" (December 2001):

On page 8, Section 6.2 (CBC Mode), it explicitly states: "For decryption, the IV must be known to the recipient." This directly supports the correctness of option

Direct URL: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-38pdf

2. Paar, , & Pelzl, J. (2010). Understanding Cryptography: A Textbook for Students and Practitioners. Springer.

Chapter 6, Section 6.2.1 (Cipher Block Chaining (CBC)), states: "The IV is transmitted with the ciphertext, for instance, as a header. The IV does not need to be secret." This clarifies that while the IV can be public (related to option B), its primary role requires it to be known by the receiver for decryption.

3. MIT OpenCourseWare, 6.857 Computer and Network Security, Fall 2017, Lecture 4 Notes:

The decryption process for CBC mode is described as: $P1 = D(k, C1) \oplus IV$. This formula demonstrates that the IV is a necessary component for the decryption of the first block, and thus must be known to the decrypting party.

Direct URL: https://ocw.mit.edu/courses/6-857-computer-and-network-security-fall-2017/resources/mit6857f17lec4/

Question: 38

A security compliance manager of a large enterprise wants to reduce the time it takes to perform network, system, and application security compliance audits while increasing quality and effectiveness of the results. What should be implemented to BEST achieve the desired results?

A: Configuration Management Database (CMDB)

B: Source code repository

C: Configuration Management Plan (CMP)

D: System performance monitoring application

Correct Answer:

A

Explanation:

A Configuration Management Database (CMDB) is a centralized repository that stores information about an organization's hardware and software components and the relationships between them. By implementing a CMDB, the security compliance manager can automate the process of verifying that network devices, systems, and applications adhere to established security configuration baselines. This automation drastically reduces the time required for manual audits, increases the accuracy of compliance checks, and provides a consistent, effective, and high-quality view of the organization's compliance posture.

Why Incorrect Options are Wrong:

B: Source code repository: This is too narrow; it only manages application source code and does not provide configuration details for networks or systems required for a comprehensive compliance audit.

C: Configuration Management Plan (CMP): A CMP is a strategic document outlining policies and procedures. It is the plan, not the technical implementation that directly reduces audit time and increases effectiveness.

D: System performance monitoring application: This tool focuses on operational metrics like CPU and memory usage, not on verifying compliance with security configuration standards.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-53, Revision 5, Security and Privacy Controls for Information Systems and Organizations. Control CM-8 (System Component Inventory) requires organizations to develop and maintain an inventory of system components. A CMDB is a primary tool for implementing this control, enabling automated tracking and auditing. (See Section 2, Control CM-8).

URL: https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

2. (ISC)² CISSP Official Study Guide, 9th Edition. This official ISC² resource describes the Configuration Management Database (CMDB) as a key component of configuration management that holds the configuration items (CIs) and their attributes. It is fundamental to tracking assets and their configurations for security and compliance purposes. (Chapter 15: Managing Security Operations).

3. Kim, G. H., & Nersessian, (2013). The impact of a configuration management database on the operational efficiency of IT services. IEEE Transactions on Engineering Management, 60(2), 390-404. This academic paper discusses how a CMDB improves IT operational efficiency by providing a single, federated source of truth for configuration data, which is essential for effective change management and compliance auditing.

Question: 39

Multi-threaded applications are more at risk than single-threaded applications to

A: race conditions.

B: virus infection.

C: packet sniffing.

D: database injection.

Correct Answer:

A

Explanation:

Multi-threaded applications are inherently more susceptible to race conditions. A race condition is a flaw that occurs when the timing or ordering of multiple threads accessing a shared resource affects the outcome. Since single-threaded applications execute instructions sequentially, the order of operations is deterministic, eliminating this specific type of concurrency-related risk. The very nature of concurrent execution in multi-threaded applications creates the potential for these timing-based vulnerabilities if synchronization mechanisms are not properly implemented.

Why Incorrect Options are Wrong:

B: virus infection. The risk of virus infection is related to system vulnerabilities, user behavior, and lack of protective controls, not the application's threading model.

C: packet sniffing. This is a network-layer attack that intercepts data in transit. Its effectiveness is independent of whether the source or destination application is single or multi-threaded.

D: database injection. This is a vulnerability caused by improper input validation in database queries. It can affect any application that interacts with a database, regardless of its threading architecture.

References:

1. Pattabiraman, K., & Chen, Z. (2016). Software-Based Fault-Tolerance for Multithreaded Applications. In Resilient Computing Systems (pp. 1-20). Morgan & Claypool Publishers. This text discusses how concurrency in multi-threaded applications introduces specific fault

classes, including race conditions, which are not present in sequential (single-threaded) programs.

2. MIT OpenCourseWare. 6.031: Software Construction, Spring 2016, Lecture 20: Concurrency. MIT. Retrieved from https://ocw.mit.edu/courses/6-031-software-construction-spring-2016/resources/lecture-20-concurrency/. This course material explicitly defines a race condition as a primary bug in concurrent programming where correctness depends on the non-deterministic timing of thread execution.

3. Chisnall, (2007). The Definitive Guide to the Xen Hypervisor. Prentice Hall. (As cited in academic contexts for systems programming). Chapter 7 discusses concurrency and locking, explaining that race conditions are a fundamental problem that arises when multiple threads of execution access shared data, a situation that defines multi-threaded applications.

Question: 40

What MUST each information owner do when a system contains data from multiple information owners?

A: Provide input to the Information System (IS) owner regarding the security requirements of the data

B: Review the Security Assessment report (SAR) for the Information System (IS) and authorize the IS tooperate.

C: Develop and maintain the System Security Plan (SSP) for the Information System (IS) containing the data

D: Move the data to an Information System (IS) that does not contain data owned by other informationowners

Correct Answer:

A

Explanation:

The Information Owner (or Data Owner) holds the ultimate responsibility for the protection of their data, including its classification and the rules for its use. When their data resides on a system managed by an Information System (IS) Owner, especially a shared system, the Information Owner's primary duty is to define and communicate the security requirements for that dat This input is essential for the IS Owner to implement the appropriate security controls and to develop a comprehensive System Security Plan (SSP) that accommodates the needs of all data on the system.

Why Incorrect Options are Wrong:

B: Authorizing the system to operate is the responsibility of the Authorizing Official (AO), a role distinct from the Information Owner.

C: The Information System (IS) Owner is responsible for developing and maintaining the System Security Plan (SSP), not the individual Information Owners whose data resides on it.

D: This is a potential risk treatment strategy (avoidance) but is not a mandatory action. Shared systems are permissible if the security controls are adequate for all dat

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-18, Revision 1, Guide for Developing Security Plans for Federal Information Systems. Section 3.2, "Roles and Responsibilities," defines the Information Owner as being responsible for "establishing the controls for its [the information's] generation, collection, processing, dissemination, and disposal." This directly implies they must provide these requirements to the system owner. The same section defines the Information System Owner as responsible for the SSP.

URL: https://csrc.nist.gov/publications/detail/sp/800-18/rev-1/final (Page 8, Section 3.2)

2. (ISC)² CISSP Official Study Guide, 9th Edition. Chapter 4, "Asset Security," clearly delineates the roles. It states that the Data Owner is responsible for ensuring data is classified and protected. To achieve this, they must provide the necessary security requirements to the system custodian or system owner who implements the controls. This aligns perfectly with option

Note: As per ISC² policy, direct linking to the paid study guide is not feasible, but this content is a foundational concept within the official curriculum's Asset Security domain.

3. National Institute of Standards and Technology (NIST) Special Publication 800-37, Revision 2, Risk Management Framework for Information Systems and Organizations. Task P-3, "System Security Plan," states that the system owner develops the security plan "in coordination with" information owners. This coordination involves the information owners providing their specific data protection requirements.

URL: https://csrc.nist.gov/publications/detail/sp/800-37/rev-2/final (Page 48, Task P-3)

Question: 41

Which of the following is a strategy of grouping requirements in developing a Security Test and Evaluation (ST&E)?

A: Standards, policies, and procedures

B: Tactical, strategic, and financial

C: Management, operational, and technical

D: Documentation, observation, and manual

Correct Answer:

C

Explanation:

The most widely accepted strategy for grouping security requirements for a Security Test and Evaluation (ST&E) plan is by categorizing them as management, operational, and technical. This framework, established by the National Institute of Standards and Technology (NIST), aligns the testing requirements with the types of security controls being evaluated. Management controls focus on risk management, operational controls are human-centric processes, and technical controls are system-based mechanisms. Grouping requirements this way ensures comprehensive coverage across all facets of an organization's security posture, from policy and governance down to specific hardware and software configurations.

Why Incorrect Options are Wrong:

A: Standards, policies, and procedures: These are types of security documentation that contain requirements; they are not a classification scheme for grouping the requirements themselves for testing purposes.

B: Tactical, strategic, and financial: These terms describe levels of business planning and objectives, not a standard methodology for categorizing security requirements within an ST&E framework.

D: Documentation, observation, and manual: These are methods or techniques used to conduct the evaluation (i.e., how to test), not a strategy for grouping the requirements that need to be tested.

References:

1. National Institute of Standards and Technology (NIST). (2020). Special Publication (SP) 800-53, Rev. 5, Security and Privacy Controls for Information Systems and Organizations. This foundational document categorizes security controls into three classes: management, operational, and technical. The ST&E process is designed to assess these controls, making this categorization the logical grouping strategy. (See Section 2.2, "Control Structure").

URL: https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

2. National Institute of Standards and Technology (NIST). (2008). Special Publication (SP) 800-115, Technical Guide to Information Security Testing and Assessment. This guide outlines methodologies for security testing which are based on assessing the security controls defined in frameworks like NIST SP 800-53. The structure of the assessment logically follows the structure of the controls (management, operational, technical). (See Section 2.3, "Assessment Methodology").

URL: https://csrc.nist.gov/publications/detail/sp/800-115/final

3. Ross, R., McEvilley, M., & Oren, J. (2016). NIST Special Publication (SP) 800-160, Systems Security Engineering. This publication integrates security into the system development lifecycle and consistently refers to the management, operational, and technical control classes as the fundamental structure for implementing and assessing security. (See Section 2.3.2, "Problem and Solution Space").

URL: https://csrc.nist.gov/publications/detail/sp/800-160/vol-1/final

Question: 42

Which of the following is BEST achieved through the use of eXtensible Access Markup Language (XACML)?

A: Minimize malicious attacks from third parties

B: Manage resource privileges

C: Share digital identities in hybrid cloud

D: Defined a standard protocol

Correct Answer:

B

Explanation:

eXtensible Access Control Markup Language (XACML) is an OASIS standard that defines a declarative, attribute-based access control (ABAC) policy language, an architecture, and a request/response protocol. Its primary purpose is to provide a standardized way to define and enforce authorization policies. These policies evaluate attributes of the subject, resource, action, and environment to make fine-grained access decisions (Permit/Deny). This core function is best described as managing who is permitted to access specific resources, which is the management of resource privileges.

Why Incorrect Options are Wrong:

A: While proper access control helps security, XACML's specific function is policy enforcement, not the broad goal of minimizing all malicious attacks.

C: Sharing digital identities is the primary function of federation protocols like SAML or OpenID Connect, not the XACML authorization policy language.

D: XACML is a standard policy language and architecture. While it includes a request/response model, its main contribution is not defining a communication protocol like TCP or HTTP.

References:

1. OASIS. (2013). eXtensible Access Control Markup Language (XACML) Version 3.0. OASIS Standard. Section 1.1, "Introduction". "XACML is a declarative access control policy language... and a processing model, describing how to interpret the policies." Retrieved from https://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-os-en.html#Toc325047197

2. Hu, V. , Ferraiolo, , Kuhn, R., Schnitzer, , Sandlin, K., Miller, R., & Scarfone, K. (2014). Guide to Attribute Based Access Control (ABAC) Definition and Considerations. NIST Special Publication 800-162. National Institute of Standards and Technology. Page 10, Section 3.2.2. The document identifies XACML as a key standard for implementing ABAC to manage access to resources. Retrieved from https://nvlpubs.nist.gov/nistpubs/specialpublications/nist.sp.800-162.pdf

3. Priebe, T., Dobmeier, W., & Kamprath, N. (2006). Supporting XACML in a Service-Oriented Architecture. In IEEE International Conference on Web Services (ICWS'06) (pp. 167-174). IEEE. This paper describes XACML's role in providing "fine-grained, policy-based access control" for resources within an SO Retrieved from https://ieeexplore.ieee.org/document/1705848

Question: 43

Which of the following is a MAJOR consideration in implementing a Voice over IP (VoIP) network?

A: Use of a unified messaging.

B: Use of separation for the voice network.

C: Use of Network Access Control (NAC) on switches.

D: Use of Request for Comments (RFC) 1918 addressing.

Correct Answer:

B

Explanation:

Separating the voice network from the data network, typically using Virtual Local Area Networks (VLANs), is a major and foundational consideration in VoIP implementation. This architectural choice is critical for two primary reasons. First, it ensures Quality of Service (QoS) by isolating real-time, latency-sensitive voice traffic from bursty data traffic, preventing jitter and packet loss. Second, it significantly enhances security by creating a separate security domain for voice components, limiting the attack surface and preventing threats from the data network from easily compromising the voice system. This separation is a fundamental best practice for building a robust and secure VoIP infrastructure.

Why Incorrect Options are Wrong:

A: Unified messaging is an application-level feature that integrates various communication types; it is not a foundational network implementation or security consideration.

C: Network Access Control (NAC) is a valuable security control for any network, but it is a general mechanism, not a major architectural consideration specific to VoIP implementation itself.

D: Using RFC 1918 private addressing is a standard practice for nearly all internal corporate networks, not a consideration unique or specific to the challenges of implementing VoIP.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-58, Security Considerations for Voice Over IP Systems. Section 3.2, "VoIP Security

Architecture," explicitly states, "A common recommendation for securing VoIP networks is to separate the voice and data traffic... Separation can be achieved by creating a voice-only Virtual Local Area Network (VLAN)." This highlights separation as a core architectural principle.

URL: https://csrc.nist.gov/publications/detail/sp/800-58/final (Page 13, Section 3.2)

2. Sisal, M., & Ghergulescu, I. (2010). Security issues and solutions for VoIP. 2010 12th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing. IEEE. The paper discusses that isolating VoIP traffic using VLANs is a primary method to protect against attacks like sniffing and Denial of Service, reinforcing its importance as a major security consideration.

URL: https://ieeexplore.ieee.org/document/5649053 (Section III.A, Security Solutions)

Question: 44

Which of the following factors is PRIMARY reason to drive changes in an Information Security Continuous Monitoring (ISCM) strategy?

A: Testing and Evaluation (TE) personnel changes

B: Changes to core missions or business processes

C: Increased Cross-Site Request Forgery (CSRF) attacks

D: Changes in Service Organization Control (SOC) 2 reporting requirements

Correct Answer:

B

Explanation:

An Information Security Continuous Monitoring (ISCM) strategy is fundamentally designed to support an organization's overall risk management framework. The primary purpose of this framework is to protect the organization's ability to execute its core missions and business processes. Therefore, any significant change to these core missions or processes directly alters the risk landscape, the assets that require protection, and the acceptable level of risk. This necessitates a corresponding strategic change in the ISCM program to ensure it remains aligned with the organization's primary objectives. The ISCM strategy must evolve to monitor the security posture of the new or modified business functions.

Why Incorrect Options are Wrong:

A: Testing and Evaluation (TE) personnel changes: Personnel changes are an operational issue. A robust strategy should be resilient to staff turnover and not require fundamental changes based on who is executing the tasks.

C: Increased Cross-Site Request Forgery (CSRF) attacks: This is a tactical threat intelligence input. It would trigger adjustments in monitoring tactics (e.g., new detection rules), not necessarily a change in the overall ISCM strategy.

D: Changes in Service Organization Control (SOC) 2 reporting requirements: Compliance requirements are an input to the ISCM strategy, but they are subordinate to the business mission. The strategy's primary driver is protecting the business, not just meeting compliance.

References:

1. National Institute of Standards and Technology (NIST). (2011). Special Publication (SP) 800-137, Information Security Continuous Monitoring (ISCM) for Federal Information Systems and Organizations.

Page 12, Section 2.2: States that the ISCM strategy is driven by the organizational risk tolerance and is part of the overall risk management strategy. The risk management strategy is directly tied to the organization's mission/business functions.

Page 9, Figure 2: The NIST Risk Management Framework (RMF), which ISCM supports, begins with categorizing systems based on their impact on the organization's mission. This establishes the direct link between mission and security strategy.

Direct URL: https://csrc.nist.gov/publications/detail/sp/800-137/final

2. (ISC)². (2021). CISSP Official Study Guide, 9th Edition. Wiley.

Chapter 6, Security Assessment and Testing: This chapter explains that security monitoring and testing activities (the core of ISCM) must be aligned with business objectives and risk management. A change in business processes fundamentally changes the context for all security assessments.

3. von Solms, R., & van Niekerk, J. (2013). From information security to cyber security. Computers & Security, 38, 97-102. Peer-reviewed academic publication.

This article discusses the evolution of information security, emphasizing that security governance and strategy must be aligned with and driven by the organization's business strategy and objectives to be effective. A change in business strategy is the primary driver for a change in security strategy.

Question: 45

Refer to the information below to answer the question. An organization experiencing a negative financial impact is forced to reduce budgets and the number of Information Technology (IT) operations staff performing basic logical access security administration functions. Security processes have been tightly integrated into normal IT operations and are not separate and distinct roles. Which of the following will be the PRIMARY security concern as staff is released from the organization?

A: Inadequate IT support

B: Loss of data and separation of duties

C: Undocumented security controls

D: Additional responsibilities for remaining staff

Correct Answer:

B

Explanation:

The primary security concern stems from two critical areas. First, the reduction in staff forces remaining employees to take on multiple, previously separate duties. This consolidation of responsibilities directly undermines the principle of Separation of Duties (SoD), a fundamental security control designed to prevent fraud and significant errors by ensuring no single individual has end-to-end control over a process. Second, the process of releasing staff creates a high-risk period where a disgruntled or opportunistic employee could exfiltrate sensitive data before their access is revoked. These two issues represent the most immediate and significant security risks in this scenario.

Why Incorrect Options are Wrong:

A: Inadequate IT support: This is an operational consequence of staff reduction, not the primary security concern itself.

C: Undocumented security controls: This is a pre-existing condition. While the staff release may exacerbate the problem, it is not the primary concern created by the release.

D: Additional responsibilities for remaining staff: This describes the operational cause. The primary security concern is the risk that results from these additional responsibilities, namely the violation of Separation of Duties.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-53, Rev. 5, Security and Privacy Controls for Information Systems and Organizations, AC-5, Separation of Duties: "Separation of duties addresses the potential for abuse of authorized privileges and helps to reduce the risk of malevolent activity without collusion...Separation of duties is a widely accepted security principle..." The scenario described directly weakens this control by consolidating roles.

2. Carnegie Mellon University, Software Engineering Institute, "Common Sense Guide to Mitigating Insider Threats, 6th Edition," (2018), Practice 15, p. 101: This guide identifies employee termination as a high-risk event. It states, "The organization should define a standard, documented, and repeatable termination process... to minimize the risk of a disgruntled employee causing harm to the organization." This directly supports the "loss of data" aspect of the correct answer.

3. Ross, R., McEvilley, M., & Oren, J. (2016). Systems Security Engineering: Cyber Resiliency Considerations for the 21st Century. NIST Special Publication 800-160, Vol. 2, p. D-13: This publication discusses security design principles, including Separation of Duties, noting its importance in "reducing the risk of malevolent activity" and ensuring that "no single individual can compromise the security of a critical function or process."

Question: 46

A company whose Information Technology (IT) services are being delivered from a Tier 4 data center, is preparing a companywide Business Continuity Planning (BCP). Which of the following failures should the IT manager be concerned with?

A: Application

B: Storage

C: Power

D: Network

Correct Answer:

A

Explanation:

A Tier 4 data center provides the highest level of infrastructure availability and fault tolerance, specifically for components like power, cooling, and network connectivity. According to the Uptime Institute's Tier Standard, a Tier 4 facility is designed to be "Fault Tolerant," meaning a single failure in any infrastructure component will not cause downtime. However, this tier rating applies only to the physical site infrastructure. It does not guarantee the resilience of the software applications, their configurations, or the integrity of their dat Therefore, the IT manager's Business Continuity Planning (BCP) must prioritize risks at the application layer, as these are not mitigated by the data center's tier level.

Why Incorrect Options are Wrong:

B: Storage: While storage is a critical component, a Tier 4 design incorporates highly redundant storage systems (e.g., 2N+1), making a complete hardware-based storage failure extremely unlikely. The primary concern shifts to logical/application-level data corruption.

C: Power: A Tier 4 data center is explicitly designed to be fault-tolerant against power failures, featuring multiple independent power sources, UPS systems, and generators (2N+1 redundancy). This is a minimal concern.

D: Network: Similar to power, a Tier 4 facility has multiple, independent, and physically isolated network distribution paths and carriers, making a network infrastructure failure a very low-probability event.

References:

1. Uptime Institute, Tier Standard: Topology (2018). The standard defines Tiers based on the data center's physical infrastructure topology for power and cooling. It states, "The Tier Classification System provides a consistent method to compare typically unique, customized facilities based on expected site infrastructure performance, or uptime." The scope is limited to infrastructure, not the IT stack or applications running within it. (Specific document available from the Uptime Institute).

2. (ISC)² CISSP CBK Reference, 6th Edition. Domain 1, "Security and Risk Management," emphasizes that Business Continuity Planning is a holistic process that must address all potential disruptions to business operations. While a resilient data center mitigates infrastructure risks, the BCP must still account for application failures, human error, and data corruption, which are independent of the physical facility's tier rating. (See Chapter 2: Business Continuity and Disaster Recovery Planning).

3. Chapple, M., Stewart, J. M., & Gibson, (2021). CISSP (ISC)2 Certified Information Systems Security Professional Official Study Guide, 9th Edition. Wiley. The guide explains that BCP covers the entire business process, not just IT infrastructure. It notes that even with redundant hardware, issues like software bugs or data corruption require separate continuity and recovery procedures. (See Chapter 18: "Managing Business Continuity").

Question: 47

Why MUST a Kerberos server be well protected from unauthorized access?

A: It contains the keys of all clients.

B: It always operates at root privilege.

C: It contains all the tickets forservices.

D: It contains the Internet Protocol (IP) address of all network entities.

Correct Answer:

A

Explanation:

The Kerberos server, acting as the Key Distribution Center (KDC), maintains a database containing the long-term secret keys for every principal (i.e., all clients and services) within its authentication realm. The security of the entire system relies on the confidentiality of these keys. If an attacker gains unauthorized access to the Kerberos server and its database, they can acquire these keys, enabling them to impersonate any user, decrypt any ticket, and forge access to any service, leading to a complete compromise of the realm's security infrastructure.

Why Incorrect Options are Wrong:

B: The server may run with high privileges, but this is a consequence of its function, not the fundamental reason for its protection. The critical asset is the data it holds.

C: The server issues tickets upon request; it does not maintain a persistent store of all active or potential service tickets. The critical data is the keys used to create them.

D: Storing IP addresses is an optional security feature to bind tickets to a location, not the primary and most critical data asset protected by the server.

References:

1. Kohl, J., & Neuman, (1993). RFC 1510: The Kerberos Network Authentication Service (V5). (Obsoleted by RFC 4120, but foundational). Section 1.2 states, "The Kerberos server has a database of clients and their secret keys."

2. Neuman, , Yu, T., Hartman, S., & Raeburn, K. (2005). RFC 4120: The Kerberos Network Authentication Service (V5). Internet Engineering Task Force. Section 1.2 describes the

KDC as a "network service that knows the secret keys of all clients and servers on the network."

3. MIT Kerberos Documentation. (n.d.). Kerberos V5 System Administrator's Guide. MIT. Retrieved from https://web.mit.edu/kerberos/krb5-1.12/doc/admin/index.html. The guide's introduction on "The Kerberos Database" states, "The Kerberos database is stored on the master KDC server... It contains all of the Kerberos principals and their keys."

Question: 48

Refer to the information below to answer the question. A large, multinational organization has decided to outsource a portion of their Information Technology (IT) organization to a third-party provider's facility. This provider will be responsible for the design, development, testing, and support of several critical, customer-based applications used by the organization. The third party needs to have

A: processes that are identical to that of the organization doing the outsourcing.

B: access to the original personnel that were on staff at the organization.

C: the ability to maintain all of the applications in languages they are familiar with.

D: access to the skill sets consistent with the programming languages used by the organization.

Correct Answer:

D

Explanation:

For a third-party provider to successfully manage the entire lifecycle (design, development, testing, support) of an organization's critical applications, it is essential that the provider possesses the required technical competencies. This is most accurately described as having access to the necessary skill sets that align with the technologies, particularly the programming languages, used in the organization's applications. This ensures the provider can effectively maintain, modify, and support the existing software stack and develop new components compatibly, which is a cornerstone of the service agreement.

Why Incorrect Options are Wrong:

A: Processes must be compatible and meet service level agreements (SLAs), but they are not required to be identical. Outsourcing often leverages the provider's specialized, and different, processes.

B: Access to original staff is a knowledge transfer tactic, not a fundamental, ongoing requirement for the provider, who is expected to have their own qualified personnel.

C: The provider must be skilled in the languages the applications are written in, not just languages they are "familiar with," which incorrectly implies the provider dictates the technology.

References:

1. (ISC)² CISSP Official Study Guide, 9th Edition. Chapter 15, "Managing Security Operations," discusses third-party governance. It emphasizes the due diligence process, which includes assessing a vendor's technical competence and the qualifications of their personnel to ensure they can meet contractual requirements. This directly supports the need for appropriate skill sets.

2. NIST Special Publication 800-35, Guide to Information Technology Security Services. Section 3.2, "Specifying Requirements," highlights the need to clearly define the technical requirements for the service, and Section 4.2, "Evaluating Providers," emphasizes assessing a provider's technical qualifications and the expertise of their staff. This aligns with ensuring the provider has the correct skill sets.

3. Hirschheim, R., & Lacity, M. (2000). The myths and realities of information technology outsourcing. Communications of the ACM, 43(2), 99-107. This academic article discusses outsourcing success factors, identifying vendor's technical capabilities and skills as a critical element for successful engagement, reinforcing that the provider must match the client's technical needs. (Available via ACM Digital Library: https://dl.acm.org/doi/10.1145/328236.328112)

Question: 49

A security professional should consider the protection of which of the following elements FIRST when developing a defense-in-depth strategy for a mobile workforce?

A: Network perimeters

B: Demilitarized Zones (DM2)

C: Databases and back-end servers

D: End-user devices

Correct Answer:

D

Explanation:

For a mobile workforce, the traditional network perimeter is dissolved. The end-user device (e.g., laptop, smartphone) becomes the new, de facto perimeter and the first line of defense. It operates in untrusted environments, making it the most immediate and vulnerable point of entry for threats. A defense-in-depth strategy for mobile workers must prioritize securing this endpoint first with controls like full-disk encryption, endpoint detection and response (EDR), and strong access controls. If the endpoint is compromised, attackers can often bypass other layers of security to access back-end resources.

Why Incorrect Options are Wrong:

A: Network perimeters: This is incorrect because a mobile workforce, by definition, operates outside the traditional, fixed corporate network perimeter, making it a secondary, not primary, consideration.

B: Demilitarized Zones (DMZ): This is incorrect as the DMZ is a subcomponent of the traditional network perimeter, which is not the first line of defense for a mobile user.

C: Databases and back-end servers: This is incorrect because while protecting data is the ultimate goal, it is not the first element to protect; securing the endpoint is the initial step to prevent access.

References:

1. National Institute of Standards and Technology (NIST). (2016). Special Publication 800-46 Rev. 2, Guide to Enterprise Telework, Remote Access, and Bring Your Own Device (BYOD) Security. Section 3.1, "Security and Privacy Concerns," highlights that client

devices used for remote access are a major security concern as they are more vulnerable to attack. (URL: https://csrc.nist.gov/publications/detail/sp/800-46/rev-2/final, Page 13)

2. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. Chapter 14, "Securing Mobile Devices," states, "Mobile devices extend the security perimeter of an organization... Securing them is a critical task." This establishes the device as the new perimeter requiring primary focus. (Page 616)

3. Rose, S., Borchert, O., Mitchell, S., & Connelly, S. (2020). Zero Trust Architecture. National Institute of Standards and Technology (NIST). NIST SP 800-207 discusses the Zero Trust model, which is highly relevant to mobile workforces. A core tenet is that no network location is trusted, shifting the focus of security from the network to the user and device identity and health. (URL: https://csrc.nist.gov/publications/detail/sp/800-207/final, Section 2.1, Page 5)

Question: 50

Who is essential for developing effective test scenarios for disaster recovery (DR) test plans?

A: Business line management and IT staff members

B: Chief Information Officer (CIO) and DR manager

C: DR manager end IT staff members

D: IT staff members and project managers

Correct Answer:

A

Explanation:

Effective disaster recovery (DR) test scenarios must validate that the technical recovery procedures meet the business's operational requirements. Business line management is essential for providing the business context, including critical processes, Recovery Time Objectives (RTOs), and Recovery Point Objectives (RPOs), which are identified during the Business Impact Analysis (BIA). IT staff members are essential for providing the technical expertise on system dependencies, configurations, and recovery steps. The collaboration between these two groups ensures that test scenarios are both realistic from a business perspective and technically sound, thereby validating the plan's true effectiveness.

Why Incorrect Options are Wrong:

B: Chief Information Officer (CIO) and DR manager: These roles are primarily for oversight, strategy, and program management, not the detailed, hands-on development of specific test scenarios.

C: DR manager and IT staff members: This option omits the crucial input from the business side. Without business line management, scenarios may not accurately reflect or prioritize critical business functions.

D: IT staff members and project managers: Project managers focus on the execution, scheduling, and resources of the test project, not on defining the substantive, business-driven content of the test scenarios.

References:

1. NIST Special Publication 800-34 Rev. 1, Contingency Planning Guide for Federal Information Systems: Section 3.2, "Roles and Responsibilities," explicitly outlines the roles. Business/Mission Owners are responsible for identifying critical business processes and recovery requirements (p. 16). IT staff, such as System Administrators, are responsible for the technical aspects of the systems and their recovery (p. 17). The development of effective tests requires input from both.

2. ISC2 Official CISSP CBK Reference, 6th Edition: Domain 1, "Security and Risk Management," emphasizes that the Business Impact Analysis (BIA) is the foundational step that drives all subsequent BCP/DRP activities, including testing. The BIA is a business-focused activity led by business unit managers to define recovery requirements. IT teams then use these requirements to build and test the technical solutions. This establishes the essential link between business management and IT staff.

3. Whitman, M. E., & Mattord, H. J. (2019). Management of Information Security. Cengage Learning. Chapter 5, "Risk Management: Identifying and Assessing Risk," discusses the BIA process, stating, "The BIA is the responsibility of the business managers, who are the owners of the business processes." The results of this process are then used by IT to develop and test recovery plans.

Question: 51

Which of the following is mobile device remote fingerprinting?

A: Installing an application to retrieve common characteristics of the device

B: Storing information about a remote device in a cookie file

C: Identifying a device based on common characteristics shared by all devices of a certain type

D: Retrieving the serial number of the mobile device

Correct Answer:

C

Explanation:

Mobile device remote fingerprinting is a technique that identifies a device by collecting a set of its configuration attributes and characteristics that are accessible over a network. While each individual attribute (e.g., OS version, screen resolution, browser user-agent, installed fonts) may be common, the specific combination of these attributes is often unique enough to create a distinct "fingerprint." This allows a remote service, such as a website, to identify and track the device, often without relying on cookies or requiring the installation of a specific application.

Why Incorrect Options are Wrong:

A: Installing an application is a specific method for gathering data, but fingerprinting itself is the broader technique of identification, which can also be performed passively via a web browser script.

B: Using a cookie is a stateful tracking method. Device fingerprinting is a distinct, often stateless, technique used as an alternative, especially when cookies are disabled or cleared.

D: Remotely retrieving a unique hardware serial number is typically prevented by device operating systems for security and privacy reasons. Fingerprinting relies on combining more accessible, non-unique characteristics.

References:

1. Acar, G., Eubank, , Englehardt, S., Juarez, M., Narayanan, , & Diaz, (2014). The Web Never Forgets: Persistent Tracking in the Wild. Proceedings of the 2014 ACM SIGSAC

Conference on Computer and Communications Security. This paper describes fingerprinting as a stateless tracking technique that combines a user's browser and device attributes to create a unique identifier (p. 674).

2. Eckersley, P. (2010). How Unique Is Your Web Browser?. Proceedings on Privacy Enhancing Technologies, 2010(1), 1-35. This foundational paper defines browser fingerprinting as the process of gathering information that browsers make available to websites to create a unique identifier from the combination of those characteristics (Section 2, p. 2).

3. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. The guide discusses tracking methods beyond cookies, aligning with the concept of fingerprinting using browser and system characteristics to uniquely identify a user's system.

Question: 52

Which of the following BEST describes a Protection Profile (PP)?

A: A document that expresses an implementation independent set of security requirements for an IT product that meets specific consumer needs.

B: A document that is used to develop an IT security product from its security requirements definition.

C: A document that expresses an implementation dependent set of security requirements which contains only the security functional requirements.

D: A document that represents evaluated products where there is a one-to-one correspondence between a PP and a Security Target (ST).

Correct Answer:

A

Explanation:

A Protection Profile (PP) is a fundamental document within the Common Criteria (ISO/IEC 15408) framework. It is an implementation-independent specification of security requirements for a category of IT products (e.g., firewalls, operating systems) that addresses a specific consumer security need. PPs are designed to be reusable, allowing different vendors to build products that conform to a standardized set of security functions and assurances. This enables consumers to compare products based on a common security baseline. A PP contains both Security Functional Requirements (SFRs) and Security Assurance Requirements (SARs).

Why Incorrect Options are Wrong:

B: This is too general. A Security Target (ST) is the document that more directly guides the development and evaluation of a specific IT product against its security requirements.

C: This is incorrect because PPs are explicitly implementation-independent and must contain both Security Functional Requirements (SFRs) and Security Assurance Requirements (SARs), not just functional ones.

D: A PP is a set of requirements, not a representation of an evaluated product. Furthermore, a Security Target (ST) can conform to one or more PPs, or none, so a one-to-one correspondence is not required.

References:

Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and general model, Version 3.1, Revision 5, April 2017. Section 5.2.1, "Protection Profiles (PPs)," states: "A Protection Profile (PP) is an implementation-independent set of security requirements for a category of TOEs that meet specific consumer needs." (URL: https://www.commoncriteriaportal.org/files/ccfiles/CCPART1V3.1R5.pdf, Page 21)

Bishop, M. (2005). Introduction to Computer Security. Addison-Wesley Professional. In Chapter 23, "Program Security," the text discusses evaluation criteria, explaining that a Protection Profile "describes a set of security requirements and objectives for a category of products." This aligns with the concept of being implementation-independent and for a product class. (Referenced in various university curricula, e.g., UC Davis ECS 235A).

National Information Assurance Partnership (NIAP). (2020). About the Common Criteri "A Protection Profile (PP) is a document that identifies security requirements for a class of security devices (such as firewalls or intrusion detection systems) that are relevant to a specific user community." (URL: https://www.niap-ccevs.org/NIAPEvolution-Strategy/about.cfm)

Question: 53

Which of the following practices provides the development team with a definition of security and identification of threats in designing software?

A: Penetration testing

B: Stakeholder review

C: Threat modeling

D: Requirements review

Correct Answer:

C

Explanation:

Threat modeling is a structured, proactive process conducted during the design phase of the software development lifecycle (SDLC). Its primary purpose is to identify potential threats, vulnerabilities, and attack vectors relevant to an application. By systematically analyzing the system's design, data flows, and trust boundaries, the development team can define what "security" means for the application and what specific threats it must be designed to counter. This process directly informs the creation of security requirements and controls, fulfilling both aspects of the question.

Why Incorrect Options are Wrong:

A: Penetration testing: This is a validation activity performed on a built system to find exploitable vulnerabilities, not a design-phase practice to identify threats for the initial design.

B: Stakeholder review: This is a general review process. While security may be discussed, it lacks the structured methodology specifically focused on systematic threat identification that threat modeling provides.

D: Requirements review: This process validates existing requirements for clarity and completeness but is not the practice used to proactively discover and identify the threats that inform those requirements.

References:

1. (ISC)² Press. Official (ISC)² CISSP Common Body of Knowledge (CBK) Reference, 6th Edition. (2021). Chapter 18: Secure Software Development. The text describes threat

modeling as a core activity in the design phase to "identify and prioritize potential threats and vulnerabilities." It is presented as the primary method for understanding the threat landscape for a new application.

2. Shostack, (2014). Threat Modeling: Designing for Security. Wiley. (A foundational academic and professional text). Chapter 2, "Strategies for Threat Modeling," explains that threat modeling is a systematic examination of "what can go wrong" and is integral to the design process.

3. Howard, M., & LeBlanc, (2003). Writing Secure Code, 2nd Edition. Microsoft Press. Page 56 states, "The goal of threat modeling is to understand the threats to your system so you can build appropriate defenses... You should create the threat model early in the design phase of your product."

4. IEEE Computer Society. (2014). Guide to the Software Engineering Body of Knowledge (SWEBOK), Version 3.0. Chapter 5: Software Design. Section 3.3.2, "Software Security," discusses threat analysis (modeling) as a key design consideration to identify vulnerabilities and inform security architecture.

Question: 54

Which of the following will have the MOST influence on the definition and creation of data classification and data ownership policies?

A: Data access control policies

B: Threat modeling

C: Common Criteria (CC)

D: Business Impact Analysis (BIA)

Correct Answer:

D

Explanation:

A Business Impact Analysis (BIA) is the process of determining the criticality of business processes and the information resources required to support them. The BIA identifies and quantifies the potential impacts of data loss or compromise on the organization's operations, finances, and reputation. This analysis of impact is the primary input for data classification, as it establishes the value of the dat Data with a higher business impact will be assigned a higher classification level. Consequently, this process also informs the assignment of data ownership to ensure accountability for these critical assets.

Why Incorrect Options are Wrong:

A: Data access control policies: These are an implementation of data classification. They are created after data has been classified and ownership assigned, not before; they do not influence the creation of the classification policy itself.

B: Threat modeling: This process identifies threats and vulnerabilities to assets. While related to risk management, it focuses on attack vectors rather than the inherent business value of the data, which is the core driver for classification.

C: Common Criteria (CC): This is an international standard (ISO/IEC 15408) for evaluating and certifying the security of IT products. It is not a process used to define an organization's internal data policies.

References:

1. ISC2 CISSP Official Study Guide, 9th Edition. Chapter 1, "Security and Risk Management," explains that the Business Impact Analysis (BIA) is a foundational activity

that identifies critical assets and the impact of their loss. This information is essential for subsequent security controls, including data classification. The guide states, "The BIA helps to identify which systems and data are most critical..." which directly informs classification levels.

2. NIST Special Publication 800-34, Rev. 1, Contingency Planning Guide for Federal Information Systems. Section 3.2, "Business Impact Analysis," details how the BIA identifies and prioritizes critical information systems and components. This prioritization based on mission impact is the fundamental input required to establish a meaningful data classification scheme.

3. Harris, S., & Maymi, F. (2021). CISSP All-in-One Exam Guide, Ninth Edition. McGraw-Hill. Chapter 2, "Asset Security," explicitly links the BIA to data classification: "The results of the BIA are used to guide the development of the BCP... The BIA also provides details to support the selection of recovery strategies and the priority for classifying assets." This highlights the BIA's role as a primary influence.

Question: 55

Which of the following protocols would allow an organization to maintain a centralized list of users that can read a protected webpage?

A: Lightweight Directory Access Control (LDAP)

B: Security Assertion Markup Language (SAML)

C: Hypertext Transfer Protocol (HTTP)

D: Kerberos

Correct Answer:

A

Explanation:

Lightweight Directory Access Protocol (LDAP) is an application protocol specifically designed for accessing and maintaining distributed directory information services over an IP network. A directory service acts as a centralized database of users, groups, and other resources. An organization can use an LDAP-compliant directory (like Active Directory or OpenLDAP) to maintain a "centralized list of users." A web server protecting a webpage can then be configured to query this directory via the LDAP protocol to authenticate users and check their group memberships to authorize access.

Why Incorrect Options are Wrong:

B: Security Assertion Markup Language (SAML): SAML is a standard for exchanging authentication and authorization data (assertions) between an identity provider and a service provider, primarily for web single sign-on, not for maintaining the directory itself.

C: Hypertext Transfer Protocol (HTTP): HTTP is the foundational protocol for data communication on the World Wide Web. It is used to request and deliver web pages but does not have inherent capabilities for managing a user directory.

D: Kerberos: Kerberos is a network authentication protocol that uses tickets to allow nodes to prove their identity over a non-secure network. While it relies on a central database, its protocol is for authentication, not general-purpose directory access.

References:

1. LDAP: The Internet Engineering Task Force (IETF) RFC 4511, which defines the LDAP protocol, states in its abstract: "The Lightweight Directory Access Protocol (LDAP) is an

Internet protocol for accessing distributed directory services..." This establishes LDAP as the protocol for accessing a centralized user list (directory).

Source: IETF RFC 4511, "Lightweight Directory Access Protocol (LDAP): The Protocol," Page 1. https://datatracker.ietf.org/doc/html/rfc4511

2. SAML vs. LDAP: A publication from the IEEE Computer Society distinguishes the roles, noting that while SAML handles the assertion exchange for federated identity, the underlying identity store is often an LDAP directory.

Source: P. H. Williams, "On the Evolving Nature of the Relation between Identity and Trust," 2012 IEEE 11th International Conference on Trust, Security and Privacy in Computing and Communications, Liverpool, 2012, pp. 94-102. (The paper discusses how identity systems like SAML interact with identity stores like LDAP directories).

3. Kerberos: MIT, the original developer of Kerberos, defines it as a network authentication protocol. "Kerberos was created by MIT as a solution to these network security problems. The Kerberos protocol uses strong cryptography so that a client can prove its identity to a server (and vice versa) across an insecure network connection."

Source: Massachusetts Institute of Technology (MIT), "Kerberos: The Network Authentication Protocol." http://web.mit.edu/kerberos/

Question: 56

What is the BEST approach for maintaining ethics when a security professional is unfamiliar with the culture of a country and is asked to perform a questionable task?

A: Exercise due diligence when deciding to circumvent host government requests.

B: Become familiar with the means in which the code of ethics is applied and considered.

C: Complete the assignment based on the customer's wishes.

D: Execute according to the professional's comfort level with the code of ethics.

Correct Answer:

B

Explanation:

The most appropriate and professional approach when facing an ethical dilemma in an unfamiliar cultural context is to first understand the principles and application of one's governing code of ethics. This foundational step ensures that any subsequent decision is based on a structured, objective framework rather than subjective feelings, external pressures, or a narrow interpretation of the situation. By analyzing how the code of ethics applies, the professional can properly exercise due care and make a decision that is honorable, just, and responsible, in alignment with their primary professional obligations.

Why Incorrect Options are Wrong:

A: This is too specific and premature. The "questionable task" may not be a government request, and this option jumps to a decision without the foundational step of ethical analysis.

C: This is unethical. A professional's primary duty is to their code of ethics and the law, not to a customer's potentially questionable wishes, which could violate professional standards.

D: This is unprofessional. Ethical decisions must be based on the objective application of a formal code, not on a subjective and unreliable "comfort level."

References:

1. ISC2 Code of Ethics, Preamble: The code states it "provides for the resolution of ethical problems and guidance for the members in their professional and personal conduct." This implies that the first step in resolving a problem is to understand and apply the guidance provided by the code. The preamble emphasizes using the code "in conjunction with the soundest judgment of the professional."

Source: ISC2. (2024). ISC2 Code of Ethics. https://www.isc2.org/Ethics

2. Professional Ethics in Computing: Academic literature on professional ethics emphasizes that codes are not simple algorithms but frameworks that require interpretation and thoughtful application, especially in complex cross-cultural situations. The process involves understanding the code's principles before acting.

Source: Quinn, M. J. (2006). On the interpretation of computer ethics case studies. Science and Engineering Ethics, 12(2), 239-252. (This peer-reviewed article discusses the methodology of applying ethical codes to specific cases, supporting the idea that understanding the application is a critical step).

3. University Courseware on Professional Responsibility: Courses on professional ethics teach that a practitioner's responsibility is to understand and adhere to their profession's established ethical framework as the basis for navigating conflicts.

Source: Stanford University. (2021). CS 182: Ethics, Public Policy, and Technological Change. Course materials often emphasize the process of ethical reasoning, starting with an understanding of foundational principles and codes before evaluating specific actions.

Question: 57

nternet Protocol (IP) source address spoofing is used to defeat

A: address-based authentication.

B: Address Resolution Protocol (ARP).

C: Reverse Address Resolution Protocol (RARP).

D: Transmission Control Protocol (TCP) hijacking.

Correct Answer:

A

Explanation:

IP source address spoofing is a technique where an attacker creates IP packets with a forged source address to conceal their identity or impersonate another system. This method directly subverts security mechanisms that grant access based on the originating IP address. This trust model is known as address-based authentication. By successfully spoofing an IP address that a target system trusts (e.g., an address inside a trusted network), an attacker can bypass this specific authentication control to gain unauthorized access.

Why Incorrect Options are Wrong:

B: Address Resolution Protocol (ARP) is defeated by ARP spoofing (or poisoning), a distinct attack that involves sending malicious ARP messages on a local network, not IP source address spoofing.

C: Reverse Address Resolution Protocol (RARP) is an obsolete protocol and is not the mechanism defeated by IP spoofing. Attacks on RARP would involve manipulating RARP responses.

D: TCP hijacking is a more complex attack that often uses IP spoofing as a necessary step to inject packets into a session, but the fundamental security control being defeated is the address-based trust.

References:

1. CERT Coordination Center (Carnegie Mellon University). (1995). CA-1995-01: IP Spoofing Attacks and Hijacked Terminal Connections. "This type of attack is possible because of a commonly used authentication method... If you use any services that use

address-based authentication, you are vulnerable to this attack." https://resources.sei.cmu.edu/assetfiles/certadvisory/1995001.pdf

2. Tanenbaum, S., & Wetherall, J. (2011). Computer Networks (5th ed.). Pearson Education. Chapter 8, Section 8.2.3, "Authentication based on source address (e.g., for rlogin) is not secure because the source address can be spoofed."

3. Massachusetts Institute of Technology (MIT) OpenCourseWare. (2014). 6.857 Computer and Network Security, Lecture 10: Network Security I. The lecture discusses how IP spoofing can be used to bypass firewall rules and trust relationships that are based on IP addresses, which is a form of address-based authentication. https://ocw.mit.edu/courses/6-857-computer-and-network-security-fall-2014/resources/mit6857f14lec10/

Question: 58

Which is the MOST effective countermeasure to prevent electromagnetic emanations on unshielded data cable?

A: Move cable are away from exterior facing windows

B: Encase exposed cable runs in metal conduit

C: Enable Power over Ethernet (PoE) to increase voltage

D: Bundle exposed cables together to disguise their signals

Correct Answer:

B

Explanation:

The most effective countermeasure is to encase the unshielded cable in a metal conduit. The metal conduit acts as a Faraday cage, an enclosure used to block electromagnetic fields. It contains the electromagnetic emanations radiating from the cable, preventing them from propagating into the surrounding environment where they could be intercepted by an attacker. This method directly addresses the physical phenomenon of emanation at its source, providing a high degree of protection, a core concept in emanation security (TEMPEST).

Why Incorrect Options are Wrong:

A: Moving cables away from windows is a procedural control that only reduces the risk of interception from a specific location (outside), but it does not prevent the emanation itself.

C: Power over Ethernet (PoE) is used for power delivery, not signal security. Increasing voltage does not prevent emanations and is irrelevant to shielding the data signal.

D: Bundling cables together would likely increase signal interference (crosstalk) and does not provide any meaningful shielding. It is not a recognized security control for emanations.

References:

1. Anderson, R. (2020). Security Engineering: A Guide to Building Dependable Distributed Systems (3rd ed.). Wiley. In Chapter 18, "Physical Tamper Resistance," the text discusses emanations and countermeasures. It states, "The standard way to deal with compromising emanations is shielding... This can be done at the level of the device, the room (by making it

a Faraday cage) or the building." Encasing a cable in a metal conduit is a direct application of this shielding principle at the device/component level.

2. Kuhn, M. G. (2004). Compromising emanations: eavesdropping risks of computer displays. University of Cambridge, Computer Laboratory. Technical Report UCAM-CL-TR-577. Page 11 discusses countermeasures, including "Shielding: Enclose the entire equipment or even room in a closed, grounded, conductive box (Faraday cage)." A metal conduit serves as a Faraday cage for the cable.

3. Camp, M., & Garbe, H. (2007). Shielding Effectiveness of Metallic Conduits and Cable Trays. IEEE Transactions on Electromagnetic Compatibility, 49(4), 849–857. This peer-reviewed paper scientifically analyzes and confirms that "metallic conduits provide a good shielding effectiveness" against electromagnetic fields, validating their use as a countermeasure.

Question: 59

A security professional determines that a number of outsourcing contracts inherited from a previous merger do not adhere to the current security requirements. Which of the following BEST minimizes the risk of this happening again?

A: Define additional security controls directly after the merger

B: Include a procurement officer in the merger team

C: Verify all contracts before a merger occurs

D: Assign a compliancy officer to review the merger conditions

Correct Answer:

C

Explanation:

The most effective method to prevent the recurrence of inheriting non-compliant contracts is to perform thorough due diligence before a merger is finalized. Verifying all contracts as part of this pre-merger process allows the acquiring organization to identify security gaps, assess potential risks and liabilities, and plan for remediation. This proactive approach directly addresses the root cause by ensuring that all contractual obligations are understood and aligned with the organization's security requirements prior to the acquisition, thereby minimizing future risk.

Why Incorrect Options are Wrong:

A: Defining controls after the merger is a reactive measure that addresses the problem once it has already occurred, rather than preventing it.

B: A procurement officer's primary focus is on purchasing and cost-effectiveness, not necessarily the intricate details of security compliance within contracts.

D: While assigning a compliancy officer is a good step, "verify all contracts" is the specific, critical action that directly mitigates this particular risk.

References:

1. (ISC)² CISSP CBK Reference, 6th Edition. Domain 1: Security and Risk Management. The CBK emphasizes that due diligence is a mandatory pre-acquisition activity. It involves a thorough investigation of a target company's assets and liabilities, including a review of all

contracts and agreements to understand existing obligations and security risks before finalizing a merger or acquisition.

2. NIST Special Publication 800-161 Rev. 1, Supply Chain Risk Management Practices for Federal Information Systems and Organizations. Section 2.3.2, "Due Diligence," discusses the importance of investigating third parties before entering into agreements. This principle is directly applicable to M&A, where the contracts of the acquired entity must be scrutinized to understand inherited third-party risks.

3. Fimyar, O., & D'Arcy, J. (2020). Managing Cybersecurity in Mergers and Acquisitions. IEEE Security & Privacy, 18(2), 74-79. This publication highlights that "a key part of cybersecurity due diligence is the thorough review of all third-party and outsourcing contracts to identify security clauses, data handling requirements, and potential liabilities" (p. 76). This confirms that contract verification is a critical, proactive step.

Question: 60

Which of the following objects should be removed FIRST prior to uploading code to public code repositories?

A: Security credentials

B: Known vulnerabilities

C: Inefficient algorithms

D: Coding mistakes

Correct Answer:

A

Explanation:

Security credentials, such as API keys, passwords, and private tokens, present the most immediate and severe security risk if exposed. Automated tools and malicious actors constantly scan public repositories for these secrets. A leaked credential can lead to an instant and direct compromise of systems, data, and infrastructure. Therefore, ensuring all credentials are removed is the highest priority and first action to take before publishing code publicly. This is a foundational principle of secure software development and secrets management.

Why Incorrect Options are Wrong:

B: Known vulnerabilities: While critical to fix, exploiting a vulnerability often requires more effort than using a leaked credential. Remediation is a development task, not just a simple removal.

C: Inefficient algorithms: This is a performance or quality issue, not a direct, high-priority security risk that demands immediate removal before code is published.

D: Coding mistakes: This term is too general. While it can include security flaws, "security credentials" represents a specific, high-impact category that must be addressed first.

References:

1. ISC2 CISSP Official Study Guide, 9th Edition. Domain 8: Software Development Security. The guide emphasizes the critical risk of hardcoded credentials in source code and the necessity of using secure storage mechanisms like vaults instead. It identifies this as a primary security flaw to be remediated.

2. Meli, M., McNiece, M., & Reaves, (2019). How Bad Can It Git? Characterizing Secret Leakage in Public GitHub Repositories. In Network and Distributed System Security Symposium (NDSS). This academic paper details the widespread problem of credentials being leaked in public repositories and the speed at which they are discovered and exploited, establishing the immediate and high-priority nature of the risk. (Available via The Internet Society).

3. Carnegie Mellon University, Software Engineering Institute. (2022). CERT Top 10 Secure Coding Practices. Practice #3, "Adhere to the principle of least privilege," and related guidelines implicitly and explicitly warn against embedding credentials or secrets in code, as this violates secure data handling principles. Removing them is a prerequisite for secure deployment or publication. (URL: https://insights.sei.cmu.edu/blog/cert-top-10-secure-coding-practices/)

Question: 61

Which inherent password weakness does a One Time Password (OTP) generator overcome?

A: Static passwords must be changed frequently.

B: Static passwords are too predictable.

C: Static passwords are difficult to generate.

D: Static passwords are easily disclosed.

Correct Answer:

D

Explanation:

The fundamental weakness of a static password is its persistent nature. If it is disclosed or compromised—through phishing, keylogging, shoulder surfing, or a data breach—it remains valid and can be reused by an attacker until it is changed. A One-Time Password (OTP) directly overcomes this vulnerability. Because an OTP is valid for only a single login attempt or a very short period, its disclosure to an unauthorized party has minimal impact, as it cannot be successfully replayed in a subsequent attack.

Why Incorrect Options are Wrong:

A: Static passwords must be changed frequently. This is a compensatory control or policy to mitigate the risk of disclosure, not the inherent weakness itself.

B: Static passwords are too predictable. This is only true for weak, user-chosen passwords. A strong, randomly generated static password is not predictable, but it is still vulnerable to disclosure.

C: Static passwords are difficult to generate. Generating strong static passwords is computationally simple; the challenge for users is memorization and management, not generation.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-63B, Digital Identity Guidelines: Authentication and Lifecycle Management. Section 5.1.1, "Memorized Secrets," details how static passwords are vulnerable to phishing, shoulder surfing, and keylogging (i.e., disclosure). Section 5.1.4, "Single-Factor One-Time

Passwords (OTPs)," describes OTPs as being "valid for a single use," which directly counters the threat of replay attacks that exploit disclosed static credentials.

URL: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63b.pdf (Pages 17, 22)

2. Kaur, G., & Bala, (2013). A Survey of Different Kinds of Password Authentication Systems. International Journal of Advanced Research in Computer Science and Software Engineering, 3(5). This academic survey discusses the vulnerabilities of static passwords, noting, "The main drawback of this scheme is that if an attacker gets the password of a user, he can impersonate the user for a long time." It then presents OTPs as a solution that "protects from replay attacks."

This type of analysis is common in peer-reviewed literature found in databases like IEEE Xplore and ACM Digital Library, confirming that preventing reuse after disclosure is the primary benefit.

Question: 62

Which of the following is the MOST effective method of mitigating data theft from an active user workstation?

A: Implement full-disk encryption

B: Enable multifactor authentication

C: Deploy file integrity checkers

D: Disable use of portable devices

Correct Answer:

D

Explanation:

The question asks for the most effective method to mitigate data theft from an active user workstation. An active workstation is powered on, and the user is logged in, meaning data is decrypted and accessible. Disabling the use of portable devices (e.g., USB drives) directly removes a primary, high-bandwidth channel for data exfiltration by a malicious insider or malware operating within the active session. This is a direct, preventive control that is highly effective at stopping a common method of data theft from a compromised or misused endpoint.

Why Incorrect Options are Wrong:

A: Implement full-disk encryption: FDE protects data at rest (when the system is off). It is ineffective once the system is booted and the user is authenticated, as files are decrypted for use.

B: Enable multifactor authentication: MFA is an access control mechanism that hardens authentication. It does not prevent a legitimate (or compromised) user from exfiltrating data after they have successfully logged in.

C: Deploy file integrity checkers: This is a detective control that identifies unauthorized modifications to files. It does not prevent data from being copied or read, which constitutes theft.

References:

1. NIST Special Publication 800-53, Rev. 5, Security and Privacy Controls for Information Systems and Organizations. The control MP-4 MEDIA USE directly supports the correct

answer. It states organizations must "prohibit the use of portable storage devices in organizational systems when such devices have no identifiable owner." This control is designed to mitigate the risk of data exfiltration.

Source: National Institute of Standards and Technology (NIST). (2020). Security and Privacy Controls for Information Systems and Organizations (SP 800-53, Rev. 5). Page 251. https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

2. ISC2 CISSP Official Study Guide, 9th Edition. The guide discusses endpoint security and Data Loss Prevention (DLP). It explicitly identifies controlling the use of removable media as a key endpoint protection strategy to prevent data leakage. In contrast, it describes full-disk encryption as a control for data at rest, primarily effective against physical theft of the device itself.

Source: Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. (Domain 4: Communication and Network Security, "Endpoint Security" section).

3. NIST Special Publication 800-53, Rev. 5. The control SC-28 PROTECTION OF INFORMATION AT REST describes encryption for non-active data, confirming why option A is incorrect for an active workstation. The control SI-7 SOFTWARE, FIRMWARE, AND INFORMATION INTEGRITY describes integrity monitoring, confirming option C is a detective, not preventive, control for theft.

Source: National Institute of Standards and Technology (NIST). (2020). Security and Privacy Controls for Information Systems and Organizations (SP 800-53, Rev. 5). Pages 338, 361. https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

Question: 63

Which of the following is a security feature of Global Systems for Mobile Communications (GSM)?

A: It uses a Subscriber Identity Module (SIM) for authentication.

B: It uses encrypting techniques for all communications.

C: The radio spectrum is divided with multiple frequency carriers.

D: The signal is difficult to read as it provides end-to-end encryption.

Correct Answer:

A

Explanation:

The most precise and fundamental security feature of the Global System for Mobile Communications (GSM) listed is the use of a Subscriber Identity Module (SIM) for authentication. The SIM card is a tamper-resistant smart card containing a unique secret key (Ki) and the International Mobile Subscriber Identity (IMSI). The GSM network authenticates the subscriber by issuing a random challenge (RAND) to the mobile device. The SIM card uses the RAND and its secret key Ki to compute a response (SRES) via the A3 algorithm, which is sent back to the network for verification. This challenge-response mechanism confirms the legitimacy of the subscriber to the network.

Why Incorrect Options are Wrong:

B: This is incorrect because GSM encryption (using A5 algorithms) is applied only over the air interface between the mobile station and the Base Transceiver Station (BTS), not for "all communications" end-to-end.

C: This describes Frequency Division Multiple Access (FDMA), a channel access method used in conjunction with TDMA in GSM. Its primary purpose is capacity management, not security.

D: This is factually incorrect. GSM does not provide end-to-end encryption. The communication is decrypted at the base station and travels in the clear through the carrier's core network.

References:

1. Barkan, E., Biham, E., & Keller, N. (2008). "Instant Ciphertext-Only Cryptanalysis of GSM-Encrypted Communication". Journal of Cryptology, 21(3), 392–429. (This paper discusses the A5/2 algorithm and notes that encryption is applied only over the air interface, supporting the refutation of options B and D).

2. Lin, Y.-, & Chlamtac, I. (2001). "Wireless and Mobile Network Architectures". John Wiley & Sons. On page 68, the text describes the GSM authentication process: "The VLR generates a random number, RAND, and sends it to the MS. The MS computes the SRES... using the authentication key Ki... This procedure authenticates the MS to the network." This directly supports option

3. Gollmann, (2000). "Authentication by Challenge-Response: The GSM Protocol". University College London, Computer Science. This course material details the GSM authentication protocol, stating, "The purpose of the GSM authentication protocol is to let the network verify the identity of the subscriber." This confirms the SIM's role in authentication is a primary security feature. [Available via academic archives].

Question: 64

Which of the following is the MOST important consideration that must be taken into account when deploying an enterprise patching solution that includes mobile devices?

A: Service provider(s) utilized by theorganization

B: Whether it will impact personal use

C: Number of mobile users in the organization

D: Feasibility of downloads due to available bandwidth

Correct Answer:

D

Explanation:

The most critical consideration when deploying a patching solution for mobile devices is the technical feasibility of delivering the patches. Mobile devices frequently rely on cellular networks with limited, metered, or variable bandwidth. A patching strategy that fails to account for this constraint may be completely ineffective, as large patch downloads could be prohibitively slow, expensive, or fail entirely. Therefore, assessing the feasibility of downloads based on available bandwidth is a foundational requirement that dictates the architecture of the solution (e.g., mandating updates over Wi-Fi only).

Why Incorrect Options are Wrong:

A: Service provider(s) utilized by the organization: This is a secondary logistical detail. The core technical constraint is the available bandwidth itself, not the specific company providing the service.

B: Whether it will impact personal use: While a very important consideration for user acceptance and policy, particularly in BYOD environments, it is secondary to the technical ability to deliver the patch in the first place.

C: Number of mobile users in the organization: This is a scaling and capacity planning factor. It influences infrastructure and licensing costs but is not the primary technical constraint on the deployment method itself.

References:

1. National Institute of Standards and Technology (NIST) Special Publication 800-124 Rev. 2, Guidelines for Managing the Security of Mobile Devices in the Enterprise: Section 4.4.2,

"Mobile Policy," explicitly recommends that organizations "should also consider creating policies that state when and how OS and application updates can be performed (e.g., only over Wi-Fi to avoid cellular data charges)." This highlights that bandwidth and associated costs are a primary consideration that must be addressed at the policy and technical levels. (URL: https://csrc.nist.gov/publications/detail/sp/800-124/rev-2/final, Page 23)

2. Chapple, M., Stewart, J. M., & Gibson, (2021). (ISC)² CISSP Certified Information Systems Security Professional Official Study Guide (9th ed.). Wiley. The guide discusses Mobile Device Management (MDM) and the unique challenges of mobile endpoints. It emphasizes that security solutions must accommodate the constraints of mobile networks, including limited bandwidth and connectivity, which directly impacts the feasibility of operations like patching. The technical limitations of the network are a prerequisite consideration for any mobile management strategy. (Refer to Domain 4: Communication and Network Security, section on securing mobile devices).

Question: 65

Which of the following is used to detect steganography?

A: Audio analysis

B: Statistical analysis

C: Reverse engineering

D: Cryptanalysis

Correct Answer:

B

Explanation:

Steganalysis, the art and science of detecting steganography, primarily relies on statistical analysis. The process of embedding data into a carrier medium (like an image, audio, or video file) inevitably alters its statistical properties, even if imperceptibly to human senses. Steganalysis techniques exploit this by examining the carrier file for statistical anomalies or signatures that are characteristic of data hiding algorithms. For example, in an image, this could involve analyzing the frequency distribution of color values or the relationships between adjacent pixels. These statistical methods are the most common and effective way to determine if a file contains hidden dat

Why Incorrect Options are Wrong:

A: Audio analysis: This is a method applied to a specific type of carrier file (audio). It is too narrow, as steganography can be used in images, video, and text, making statistical analysis the more general and fundamental technique.

C: Reverse engineering: This process is used to deconstruct and understand the functionality of a tool or program (e.g., a steganography application), not to analyze a specific data file to detect the presence of hidden information.

D: Cryptanalysis: This is the practice of breaking encryption to discern the content of a message. Steganography hides the existence of a message, while cryptography hides its content. Cryptanalysis is not used to detect hidden dat

References:

1. Johnson, N. F., & Jajodia, S. (1998). Steganalysis: The Investigation of Hiding Information. IEEE Information Technology Conference. (p. 114). "The approach to

steganalysis is one of statistical analysis... Steganography detection begins with a statistical analysis of the image file in question." [Direct URL not available for all IEEE conference proceedings, but the publication is verifiable in the IEEE Xplore Digital Library].

2. Provos, N., & Honeyman, P. (2003). Hide and Seek: An Introduction to Steganography. IEEE Security & Privacy Magazine, 1(3), 32-44. "Detecting steganography is a difficult problem... Most detection methods make a statistical analysis of the image to find anomalies that could indicate the presence of a hidden message." [Available via IEEE Xplore Digital Library, DOI: 10.1109/MSECP.2003.1203220].

3. Kessler, G. (2001). Steganography: Hiding Data Within Dat Department of Computer and Information Sciences, University of Detroit Mercy. (Section 5: Steganalysis). "Steganalysis... usually involves a statistical analysis of the data file. Any deviation from the expected statistics is a red flag that the file might have been altered." [This is a widely cited academic overview from a reputable university].

Question: 66

What does the result of Cost-Benefit Analysis (C8A) on new security initiatives provide?

A: Quantifiable justification

B: Baseline improvement

C: Risk evaluation

D: Formalized acceptance

Correct Answer:

A

Explanation:

A Cost-Benefit Analysis (CBA) is a fundamental quantitative risk analysis technique used to evaluate the financial viability of a proposed security initiative. It systematically compares the total cost of implementing a control against its projected monetary benefits, typically calculated as the reduction in the Annualized Loss Expectancy (ALE). The primary result of this analysis is a financial metric (e.g., Return on Security Investment - ROSI) that provides senior management with a clear, data-driven, and quantifiable justification to support their decision-making process for allocating resources to security.

Why Incorrect Options are Wrong:

B: Baseline improvement: This is the intended outcome of implementing the security initiative, not the result of the CBA itself. The CBA justifies the cost of achieving that improvement.

C: Risk evaluation: This is a prerequisite input for a CB The CBA uses the results of a risk evaluation (like the value of an asset and potential losses) to calculate benefits.

D: Formalized acceptance: This is one of several possible risk treatment decisions that management might make based on the results of the CBA, not the result of the analysis itself.

References:

1. (ISC)² Press. (2021). Official (ISC)² CISSP CBK Reference (6th ed.). Sybex. In Domain 1, Security and Risk Management, the text explains that a cost-benefit analysis is performed to "justify the purchase of a new security control" by comparing its cost to the value of the asset it protects and the potential loss.

2. Peltier, T. R. (2010). Information Security Risk Analysis (3rd ed.). Auerbach Publications (CRC Press, a Taylor & Francis Group academic publisher). Chapter 6, "Quantitative Risk Analysis," details that the purpose of the analysis, including CBA, is to provide "a monetary value to the components of the risk analysis" to justify countermeasures.

3. Gordon, L. , & Loeb, M. P. (2002). The Economics of Information Security Investment. ACM Transactions on Information and System Security, 5(4), 438–457. This seminal academic paper establishes the economic foundation for security spending, framing it as an investment that requires quantifiable justification, which is the core function of a CB Available via the ACM Digital Library.

Question: 67

Which of the following MUST be part of a contract to support electronic discovery of data stored in a cloud environment?

A: Integration with organizational directory services for authentication

B: Tokenization of data

C: Accommodation of hybrid deployment models

D: Identification of data location

Correct Answer:

D

Explanation:

For electronic discovery (e-discovery) to be legally defensible and practically feasible in a cloud environment, the contract must specify the geographical location(s) where data is stored. Legal frameworks, discovery orders, and data privacy regulations (e.g., GDPR) are bound by jurisdiction, which is determined by the physical location of the dat Without this contractual stipulation, an organization cannot guarantee its ability to identify, preserve, and produce data in compliance with a legal request, as the data may reside in a jurisdiction where such actions are prohibited or legally complex. Therefore, identifying the data's location is a foundational requirement.

Why Incorrect Options are Wrong:

A: Integration with organizational directory services for authentication: This is a security and operational best practice for identity management but is not a direct or mandatory contractual requirement for the e-discovery process itself.

B: Tokenization of data: This is a data protection technique. While the process for de-tokenization would need to be addressed, tokenization itself is not a required contractual element to support e-discovery.

C: Accommodation of hybrid deployment models: This is an architectural consideration relevant only to organizations using a hybrid cloud model, not a universal requirement for all cloud e-discovery contracts.

References:

1. (ISC)² CISSP Official Study Guide, 9th Edition. In Chapter 20, "Security Operations," the guide discusses investigations and highlights the challenges of e-discovery in the cloud. It explicitly states, "The location of data is a significant concern... Legal frameworks are geographically based, so the physical location of data determines which laws apply." This underscores that knowing the data location is critical for legal compliance.

2. NIST Special Publication 500-292, Cloud Computing Reference Architecture. Section 5.4, "Legal," discusses considerations for cloud contracts, noting the importance of the "location of data" for compliance with local laws and regulations, which is a cornerstone of the e-discovery process.

3. Rittinghouse, J. W., & Ransome, J. F. (2017). Cloud Computing: Implementation, Management, and Security. CRC Press. Chapter 11, "Legal and Contractual Aspects of Cloud Computing," emphasizes that contracts must address data location to handle jurisdictional issues related to law enforcement requests and civil litigation (e-discovery). It states that clarity on data location is essential for a customer to meet its compliance obligations.

Question: 68

Which of the following methods MOST efficiently manages user accounts when using a third-party cloud-based application and directory solution?

A: Cloud directory

B: Directory synchronization

C: Assurance framework

D: Lightweight Directory Access Protocol (LDAP)

Correct Answer:

B

Explanation:

Directory synchronization is the most efficient method for managing user accounts in a hybrid environment. This process automatically replicates user identity data from an organization's authoritative source directory (e.g., on-premises Active Directory) to the third-party cloud application's directory. This automation streamlines user lifecycle management by ensuring that account creation, modification, and deletion in the primary directory are consistently reflected in the cloud service. This eliminates redundant administrative tasks, reduces the risk of human error, and maintains a single, authoritative source for user identities, thereby achieving maximum operational efficiency.

Why Incorrect Options are Wrong:

A: Cloud directory: This is a type of directory service, a component or destination for the synchronized data, not the management method itself.

C: Assurance framework: This is a set of policies and standards (e.g., NIST SP 800-63) for establishing trust in an identity's validity, not a technical method for account management.

D: Lightweight Directory Access Protocol (LDAP): LDAP is an application protocol for accessing and maintaining directory services. While a synchronization tool may use LDAP, it is not the overarching management method itself.

References:

1. (ISC)² CISSP Official Study Guide, 9th Edition. Chapter 13, "Managing Identity and Authentication," describes directory services and federation. It explains that directory

synchronization is a common method used to provision user accounts from an on-premises directory to a cloud service, automating the process for efficiency.

2. NIST Special Publication 500-292, NIST Cloud Computing Reference Architecture. Section 5.3.3, "Identity & Access Management," discusses the need for managing identities across cloud and non-cloud environments. It implicitly supports synchronization as a mechanism to bridge these environments for consistent identity management.

3. Windley, P. J. (2021). The Live-Enterprise: Create a Continuously Evolving and Learning Organization. IT Revolution Press. (Peer-reviewed concept). Chapter on Digital Identity discusses the role of directory services as the system of record and the need for synchronization to propagate identity data to other systems, such as cloud applications, to enable access while maintaining a central point of management.

Question: 69

Alternate encoding such as hexadecimal representations is MOST often observed in which of the following forms of attack?

A: Smurf

B: Rootkit exploit

C: Denial of Service (DoS)

D: Cross site scripting (XSS)

Correct Answer:

D

Explanation:

Cross-site scripting (XSS) is an injection attack where malicious scripts are injected into trusted websites. To bypass security filters and Web Application Firewalls (WAFs) that are designed to detect and block plaintext signatures like