- 1. Which cryptographic technique ensures the integrity and authenticity of a message by appending a unique code generated with a private key?
- a) Message Authentication Code (MAC)
- b) Digital Signature
- c) Hash Function
- d) Key Exchange

Answer: b) Digital Signature

Explanation: Digital signatures use asymmetric cryptography to sign messages with a private key, allowing recipients to verify the authenticity and integrity using the corresponding public key.

- 2. What is the primary purpose of a digital signature?
- a) Encryption
- b) Authentication
- c) Compression
- d) Decryption

Answer: b) Authentication

Explanation: Digital signatures primarily serve to authenticate the sender of a message and ensure the integrity of the transmitted data.

- 3. Which cryptographic technique is used to securely distribute encryption keys between parties?
- a) Message Authentication
- b) Digital Signature
- c) Key Management

d) Key Exchange

Answer: d) Key Exchange

Explanation: Key exchange protocols facilitate the secure distribution of cryptographic keys between communicating parties to establish a shared secret key for encrypted communication.

- 4. Which type of hashing algorithm is designed to minimize the likelihood of collisions by using a randomization technique?
- a) Universal Hashing
- b) Cryptographic Hash Function
- c) MD Hash Function
- d) Secure Hash Algorithm (SHA)

Answer: a) Universal Hashing

Explanation: Universal hashing involves randomly selecting a hash function from a family of hash functions, reducing the probability of collisions.

- 5. Which cryptographic hash function is widely used for its security and resistance to collision attacks?
- a) MD5
- b) SHA-1
- c) SHA-256
- d) SHA-512

Answer: c) SHA-256

Explanation: SHA-256 is part of the SHA-2 family of cryptographic hash functions and is

known for its security and resistance to collision attacks.

- 6. Which cryptographic attack exploits the trade-off between memory and computation to reduce the time complexity of breaking a cipher?
- a) Differential Cryptanalysis
- b) Time-Memory Trade-off Attack
- c) Birthday Attack
- d) Chosen-Plaintext Attack

Answer: b) Time-Memory Trade-off Attack

Explanation: Time-memory trade-off attacks exploit the trade-off between computation and memory usage to reduce the time complexity of cryptographic attacks.

- 7. Which cryptographic standard is used for digital signatures in the US government and other applications requiring high levels of security?
- a) Message Digest (MD)
- b) Digital Signature Standard (DSS)
- c) Data Encryption Standard (DES)
- d) Advanced Encryption Standard (AES)

Answer: b) Digital Signature Standard (DSS)

Explanation: DSS is a standard for digital signatures, specified by the National Institute of Standards and Technology (NIST) in the United States.

- 8. Which cryptographic attack focuses on analyzing the differences in input and output of a cryptographic algorithm to break its security?
- a) Time-Memory Trade-off Attack

- b) Differential Cryptanalysis
- c) Birthday Attack
- d) Meet-in-the-Middle Attack

Answer: b) Differential Cryptanalysis

Explanation: Differential cryptanalysis involves studying the differences in the input and output of a cryptographic algorithm to exploit patterns and break its security.

- 9. Which cryptographic system provides secure authentication for network services by using tickets and a trusted third party?
- a) RSA
- b) AES
- c) Kerberos
- d) SSL/TLS

Answer: c) Kerberos

Explanation: Kerberos is a network authentication protocol that provides secure authentication by using tickets and a trusted third-party authentication server.

- 10. What is the primary function of a hash function in cryptography?
- a) Encryption
- b) Compression
- c) Authentication
- d) Key Exchange

Answer: c) Authentication

Explanation: Hash functions are primarily used for authentication purposes, ensuring the

integrity and authenticity of data by generating fixed-size hash values.

- 11. Which cryptographic algorithm is vulnerable to length extension attacks and is no longer considered secure for cryptographic purposes?
- a) MD5
- b) SHA-1
- c) SHA-256
- d) SHA-512

Answer: a) MD5

Explanation: MD5 is vulnerable to length extension attacks and is no longer considered secure for cryptographic purposes due to its susceptibility to collisions.

- 12. Which cryptographic technique involves the use of symmetric keys to ensure the integrity and authenticity of transmitted data?
- a) Digital Signature
- b) Message Authentication Code (MAC)
- c) Key Exchange
- d) Public Key Infrastructure (PKI)

Answer: b) Message Authentication Code (MAC)

Explanation: MACs use symmetric keys to generate authentication tags for verifying the integrity and authenticity of transmitted data.

- 13. Which cryptographic technique ensures the confidentiality of data by converting it into an unreadable format using a secret key?
- a) Hash Function

- b) Digital Signature
- c) Encryption
- d) Key Exchange

Answer: c) Encryption

Explanation: Encryption involves converting plaintext into ciphertext using a secret key, ensuring the confidentiality of data.

- 14. What is the primary objective of key management in cryptography?
- a) Ensuring message integrity
- b) Facilitating secure communication
- c) Managing cryptographic keys securely
- d) Preventing cryptographic attacks

Answer: c) Managing cryptographic keys securely

Explanation: Key management involves the secure generation, distribution, storage, and destruction of cryptographic keys to ensure the security of cryptographic systems.

- 15. Which cryptographic attack exploits the probability of two different inputs producing the same hash output?
- a) Birthday Attack
- b) Chosen-Plaintext Attack
- c) Differential Cryptanalysis
- d) Side-Channel Attack

Answer: a) Birthday Attack

Explanation: Birthday attacks exploit the probability of collisions in hash functions, where two

different inputs produce the same hash output.

- 16. Which cryptographic standard specifies the use of SHA-2 for secure hash functions?
- a) Digital Signature Standard (DSS)
- b) Data Encryption Standard (DES)
- c) Advanced Encryption Standard (AES)
- d) Secure Hash Algorithm (SHA)

Answer: a) Digital Signature Standard (DSS)

Explanation: DSS specifies the use of SHA-2 (including SHA-256, SHA-384, and SHA-512) for secure hash functions in digital signatures.

- 17. Which cryptographic attack focuses on exploiting weaknesses in the generation of random numbers in cryptographic systems?
- a) Birthday Attack
- b) Differential Cryptanalysis
- c) Side-Channel Attack
- d) Random Number Generation Attack

Answer: d) Random Number Generation Attack

Explanation: Random number generation attacks exploit weaknesses in the generation of random numbers in cryptographic systems to compromise their security.

- 18. Which cryptographic algorithm is widely used for symmetric-key encryption and decryption?
- a) RSA
- b) AES

- c) ECC
- d) Diffie-Hellman

Answer: b) AES

Explanation: Advanced Encryption Standard (AES) is widely used for symmetric-key encryption and decryption due to its efficiency and security.

- 19. Which cryptographic technique involves the use of mathematical functions to convert data into a fixed-size string of bytes?
- a) Digital Signature
- b) Message Authentication Code (MAC)
- c) Hash Function
- d) Key Exchange

Answer: c) Hash Function

Explanation: Hash functions are mathematical functions used to convert data into a fixed-size string of bytes, ensuring data integrity and authenticity.

- 20. Which cryptographic protocol provides secure communication over an insecure network through encryption, authentication, and integrity protection?
- a) SSH
- b) HTTP
- c) FTP
- d) SSL/TLS

Answer: a) SSH

Explanation: Secure Shell (SSH) protocol provides secure communication over an insecure

network through encryption, authentication, and integrity protection.

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