

[3 Hours]

[Total Marks 80]

- N. B:
1. Question No. 1 is Compulsory.
 2. Solve any THREE from Question No. 2 to 6.
 3. Draw neat well labeled diagram wherever necessary.

- Q.1 a) Enlist security goals. Discuss their significance. (05)
- b) Compare AES and DES. Which one is bit oriented? Which one is byte oriented? (05)
- c) What is authentication header(AH)? How does it protect against replay attacks? (05)
- d) List various Software Vulnerabilities. How vulnerabilities are exploited to launch an attack. (05)
- Q.2 a) Encrypt the plaintext message "SECURITY" using affine cipher with the key pair (3, 7). Decrypt to get back original plaintext. (10)
- b) Explain different types of Denial of Service attacks. (10)
- Q.3 a) Users A and B use the Diffie-Hellman key exchange technique with a common prime 71 and primitive root 7. Show that 7 is primitive root of 71. If user A has private key $x=5$, what is A's Public Key R_1 ? If user B has private key $y=12$, what is B's public key R_2 ? What is the shared secret key? (10)
- b) What are traditional ciphers? Discuss any one substitution and transposition cipher with example. List their merits and demerits. (10)
- Q.4 a) Alice chooses public key as (7, 33) and B chooses public key as (13, 221). Calculate their private keys. A wishes to send message $m=5$ to B. Show the message signing and verification using RSA digital signature. (10)
- b) Discuss in detail block cipher modes of operation. (10)
- Q.5 a) What is the need of SSL? Explain all phases of SSL Handshake protocol in detail. (10)
- b) What are the requirements of the cryptographic hash functions? Compare MD5 and SHA Hash functions. State real world applications of hash functions. (10)
- Q. 6 Write short notes on any FOUR: (20)
- a. Kerberos
 - b. Buffer Overflow
 - c. 3DES
 - d. X.509
 - e. IDS

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