Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Course and semester: B.Tech CSE VI Core Semester
Name of the Paper: *Network System Security*
Paper Code: TCS 619
Time: 1.5 hour Maximum Marks: 50

Note:
(i) Answer all the questions by choosing any one of the sub questions
(ii) Each question carries 10 marks.

Q1. (10 Marks)
a. Explain the key objectives of computer security: Confidentiality, Integrity, and Availability (CIA). Provide real-world examples to illustrate each concept. CO1

OR

b. What is the difference between passive and active security threats? List and briefly define categories of passive and active security attacks. CO1

Q2. (10 Marks)
a. Describe the OSI Security Architecture. What are its major components, and how do they help in securing a network? C01

OR

b. Consider an automated teller machine (ATM) in which users provide a personal identification number (PIN) and a card for account access. Give examples of confidentiality, integrity, and availability requirements associated with the system and, in each case, indicate the degree of importance of the requirement. CO1

Q3. (10 Marks)
a. Briefly define the Playfair cipher. Also mention the difference between a monoalphabetic cipher and a polyalphabetic cipher? CO2

OR

b. Solve the following questions
In an RSA encryption system, two prime numbers p = 17 and q = 23 are chosen. Compute n, which is used as the modulus for encryption and decryption. CO2

Q4. (10 Marks)
a. Explain the principles of symmetric encryption and discuss its advantages and limitations compared to asymmetric encryption. Also solve the following problem:
The AES (Advanced Encryption Standard) algorithm uses different numbers of rounds based on key length. If an AES system uses a 192-bit key, how many rounds does it have? CO2

OR

b. Why are security models essential in network security? Discuss their importance and how organizations implement them to prevent cyber threats. CO1

Q5. (10 Marks)
a. Discuss the role of Key Distribution Centers (KDC) in symmetric encryption and explain how it helps in securely distributing keys. CO2

OR

b. Compare and contrast 1FA, 2FA, and 3FA. How do these authentication methods differ in terms of security and usability? CO2