Reg. No. : E N G G T R E E . C O M

Question Paper Code : 90984

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fourth Semester

Electronics and Communication Engineering

EC 3401 — NETWORKS AND SECURITY

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Point out the fundamental characteristics of Data communication systems.
2. Define the term hamming distance with example.
3. Rewrite the following IP addresses using binary notation: 201.24.44.32.
4. Give the structure of packet format.
5. UDP header in hexadecimal format. CB84000D001C001C is given, find the total length of the user datagram?
6. Expand RED with its mechanism.
7. Specify the two types of security attacks.
8. Give the importance of hash functions.
9. Mention the features of Side-channel attacks.
10. List any three benefits of block chain technology.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the IEEE 802.11 standard for wireless local area networks (WLANs) with its architecture.

Or

(b) Discuss various error detection and correction techniques which ensures data integrity during transmission.

12. (a) Compare and contrast unicast and multicast routing in networking. Explain how data is transmitted in each method.

Or

(b) Describe the roles and functions of the following protocols

(i) IP (4)

(ii) ICMP (4)

(iii) Mobile IP. (5)

13. (a) Explain the various fields of TCP header and the working of the TCP Protocol.

Or

(b) Describe the message format, message transfer and the underlying protocol involved in the working of the electronic mail.

14. (a) What is Digital Signature? Explain how it is created at the sender end and retrieved at receiver end.

Or

(b) Perform encryption and decryption using RSA algorithm for p = 17, q = 11, e = 7, m = 88.

15. (a) Illustrate the steps involved in blockchain technology with an real time example.

Or

(b) Elaborate the issues involved in hardware security. Discuss its attacks and counter measures.

PART C — (1 × 15 = 15 marks)

16. (a) With a neat diagram, explain the steps involved in SHA algorithm for encrypting a message with maximum length of less than 2128 bits and produces as output a 512-bit message digest.

Or

(b) Establish a small network with minimum cost, at least 10 computers and necessary to use the centralized database. Which type of network and topology will prefer in this situation. Justify your answer.
