

JULY-2025

BCA- V SEMESTER

Data Communication and Networking (BCA-17-303)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) Mention any two features of the client-server model. (1.5)
- (b) Define bit rate and baud rate. (1.5)
- (c) Mention two advantages of fiber optic cable over coaxial cable. (1.5)
- (d) Differentiate between guided and unguided transmission media. (1.5)
- (e) Distinguish between token passing and random access protocols. (1.5)
- (f) What is the difference between virtual circuits and datagram approach? (1.5)
- (g) Given IP address 192.168.10.0/24, divide it into 4 equal subnets. Calculate the subnet mask and list the subnet address ranges. (1.5)
- (h) If the baud rate is 1000 baud and each signal unit carries 3 bits. What is the bit rate? (1.5)
- (i) Differentiate between symmetric-key and asymmetric-key cryptography. (1.5)
- (j) How does VLAN improve network performance and security? (1.5)

PART -B

- Q2 (a) Compare and contrast connection-oriented and connectionless services with suitable protocol examples. (5)
- (b) Describe the OSI reference model in detail, explaining the function of each layer. (10)
- Q3 (a) Explain five major network devices used in networking and their roles in data communication. (5)
- (b) Discuss various types of modulation techniques and their real-world applications. (10)
- Q4 How does Time Division Multiplexing work? Discuss its types, advantages, and disadvantages with an illustration. (15)
- Q5 (a) Explain the concept of internetworking. How does it help in building global networks? (5)
- (b) Describe the sliding window protocol. Compare Go-Back-N and Selective Repeat ARQ with diagrams. (10)
- Q6 (a) Discuss in detail the Link State Routing algorithm with an example and diagram. (10)
- (b) Use CRC polynomial $x^3 + x + 1$ to compute the CRC for data 1101 0010. Show the binary division and append the CRC to the data. (5)