



SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS

CAT-II
FALL SEMESTER 2026-2027

SLOT: C2+TC2

Programme Name & Branch : B.Tech-CSE(AI & DE), B.Tech-CSE(Cyber Security)

Course Code and Course Name : BCSE308L - Computer Networks

Faculty Name(s) : Dr. VIJAYAN R, Dr. NAVANEETHAN C

Class Number(s) : VL2026270102540, VL2026270102538

Date of Examination : 29.09.2026

Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Bloom's Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)

Course Outcomes:

CO3 Identify and analyze error and flow control mechanisms in the data link layer.

CO4 Design subnetting and analyze the performance of the network layer with various routing protocols.

Q. No	Question	M	CO	BL
1.	A) Station A needs to send a message consisting of 9 frames to Station B using a sliding window size of 3 and Go-Back-N ARQ error control strategy. All packets are ready and immediately available for transmission. a. Construct a sender window at every step for the transmission of frames and ACK's received, if every 5th frame that A transmits gets lost, but no ACKs from B ever get lost. b. Evaluate the number of frames that A will transmit to send the message to B.	5	CO3	BL4
	B) Using the Hamming code algorithm, a sender wants to send the data by adding a redundancy bit at the respective positions. Data: 1001101. Show the generation of the codeword at the sender site.	5		
2.	Consider the network below. Addr specifies the IP addresses assigned to the router interfaces. Mask specifies the subnet mask of the router interfaces. Addr: 128.14.15.7 Mask: 255.255.255.0 Addr: 128.15.20.10 Mask: 255.255.0.0 Addr: 128.31.208.5 Mask: 255.255.192.0 Addr: 128.15.6.13 Mask: 255.255.0.0 Addr: 128.31.208.15 Mask: 255.255.192.0 Addr: 128.31.225.18 Mask: 255.255.224.0 a) Find the range of addresses and the subnet mask for A, B, C, and D subnets. b) Two hosts h1 and h2 have to be configured with addresses 128.31.200.200 and 128.15.155.15. Which network should be configured for the above hosts (h1 and h2), and which network should be placed among A, B, C, and D?	10	CO4	BL5



VIT

Vellore Institute of Technology
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3.	A block of addresses 165.85.0.0/16 is granted to an organization. They want to distribute these blocks to the groups as follows: a) The first group has 200 medium-sized businesses; each needs 128 nodes. b) The second group has 400 small businesses; each needs 32 nodes. c) The third group has 1000 households; each needs 16 nodes. Design the CIDR subnet address allocation for each group of businesses. Evaluate the number and range of allocations that are still available after these allocations.	10	CO4	BL6
4	a) An IPv4 datagram has arrived with the following information in the header (in hexadecimal): 45 00 05 dc 28 a3 20 00 80 01 93 f2 0a 1f 20 f4 0a 0a 23 6f i. Are there any options? ii. Is the packet fragmented, and what are the D and M flag bits? iii. What is the size of the data part? iv. Find the protocol type of this packet? v. How many more routers can the packet travel to?	5	CO4	BL4
4.	b) Suppose a TCP message that contains 5080 bytes of data and 20 bytes of TCP header is passed to IP for delivery across two networks interconnected by a router. The first network is Ethernet; the second is X.25. Each network's MTU gives the size of the largest IP datagram that can be carried in a data-link-layer frame. Find the identification, total length, D bit, M bit, and offsets of the sequence of fragments delivered to the network layer at the destination host. Assume all IP headers are 20 bytes.	5	CO4	BL5
5.	Consider the network of eight routers below, with edge weights labelled Show how the step-by-step operation of the Distance Vector routing algorithm works for the router R1 by computing an iteration table. Compute the Shortest Path tree for router R1 and the routing table entries in each router.	10	CO4	BL5