



VIT

Vellore Institute of Technology

REG.NO:

SLOT: C1 + TC1

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2026-2027

SESSION: III

Programme Name & Branch : B.Tech – CSE (AI & DE), B.Tech - CSE (Cyber Security)
Course Code & Course Name : BCSE308L - Computer Network
Faculty Name(s) : Dr. VIJAYAN R, Dr. NAVANEETHAN C, Dr. AASEEGHA M D
Class Number(s) : VL2026270102539, VL2026270102535, VL2026270102542
Date of Examination : 29.09.2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

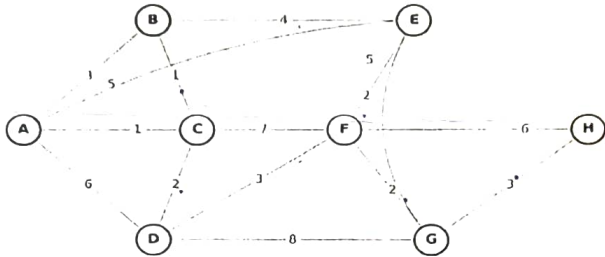
- Answer All Questions
- M – Max mark; CO – Course Outcome; BL – Bloom's Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyze, 5 – Evaluate, 6 – Create)

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.	An even-parity Hamming code corrects errors at the receiver. Sends 'K' (ASCII 1001011). (a) Using the data–redundancy bit relation, find the redundancy bits required here and for a planned 16-bit data word and build the 11-bit codeword for 'K', showing the positions each redundancy bit checks. (b) Noise flips one bit and 10011110110 arrives at the receiver: locate the error, correct it and recover the character, showing the parity check for each redundancy bit.	10	CO3	BL3
2.	~~(a)~~ Station A must send a message of 11 frames to Station B over a noisy link using Stop-and-Wait ARQ with modulo-2 sequence numbers, where each ACK carries the number of the next frame expected. All frames are ready for transmission. Every 4th frame that A transmits is lost, but no ACK from B is ever lost. Construct the sender's state (Sn) and the receiver's state (Rn) by drawing the flow diagram of the exchange, showing each transmission's sequence number, ACK number and the timer events and evaluate the total number of frames A transmits to deliver the message.	5	CO3	BL4
	~~(b)~~ Compare pure ALOHA, slotted ALOHA, CSMA and CSMA/CD on three counts: when a station is allowed to begin a transmission, the vulnerable time of the protocol and what happens after a collision. State which of them can be used on a wireless link and why?	5	CO3	BL4
3.	~~(A)~~ Assume a network with the IP address 205.80.60.0 divided into 5 subnets. Find the following for each subnet: • Total number of hosts per subnet • Subnet Address • First Host ID • Last Host ID • Direct Broadcast Address • Limited Broadcast Address • Subnet mask	5	CO4	BL5
	~~(B)~~ A datagram with this 20-byte header: 45 00 08 34 A5 21 00 00 20 11 FE 38 C8 3C 0D 0A D2 0F 48 09 Tabulate every decoded header field and hence state whether options are present, whether the packet is fragmented with its D and M bits, the data size, the protocol type and the hops it may still travel; For a link of MTU 576 bytes, state whether the router			



	may fragment it, justifying from the flags field and give the number of fragments with the data payload, MF bit and offset of each; state which header fields are identical in every fragment, which differ and how the destination knows all fragments have arrived.	5	CO4	BL5
4.	(a) An ISP is granted a block of addresses starting with 202.48.0.0/16. The ISP needs to distribute these addresses to five groups of customers as follows: - The first group has 120 customers; each need 250 addresses. - The second group has 250 customers; each need 60 addresses. - The third group has 800 customers; each need 6 addresses. - The fourth group has 100 customers; each need 25 addresses. - The fifth group has 512 customers; each need 3 addresses. Design the subblocks and find out how many addresses are still available after these allocations. (b) A host is configured with the address 202.48.157.100. Identify the group it belongs to, the serial number of the customer within that group and that customer's subblock, proving your answer by the AND-with-mask operation.	10	CO4	BL4
5.	A university campus is one autonomous system of eight routers, A to H. A is the data-centre gateway.  Write the Link State Routing content of A, C and F and explain why all eight routers end up with the same picture of the domain though each carries only local information. Run the Dijkstra algorithm with A as root, showing the permanent and tentative lists after every step and marking every replacement of a tentative cost by a smaller one. Finally, draw the shortest path tree rooted at A with each node's cost, list the links absent from it and write A's routing table.	10	CO4	BL5
