Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SLOT: G1+TG1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

Programme Name & Branch	**: B. TECH- ALL BRANCHES**
Course Code and Course Name	**: BCSE308L – COMPUTER NETWORKS**
Faculty Name(s)	**: Dr. T. Tamizharasi**
Class Number(s)	**: VL2025260502122**
Date of Examination	**: 02-02-26**
Exam Duration	**: 90 minutes** **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- CO1- Interpret the different building blocks of Communication network and its architecture.
- CO2- Contrast different types of switching networks and analyze the performance of network
- CO3-Identify and analyze error and flow control mechanisms in data link layer.

Q. No	Question	Module	Marks	CO	BL
1.	**Corporate Network Cabling Calculation** A corporate building uses a **Hybrid topology** network. • Sales: 10 systems, 8 m from switch • Support: 6 systems, 12 m from switch • R&D: 4 systems, 15 m from switch • Each department uses **Star topology**. • Departmental switches are connected in a **Bus topology**. • Distance between Sales–Support switch = 28 m • Distance between Support–R&D switch = 32 m • Cost of cable = **$1.20 per meter** a. Answer the following: a. Calculate the total cable length required for all the Star topology segments. b. Calculate the total cable length required for the Bus topology segment connecting the switches and router. c. What is the total cable length for the entire network? d. What is the total cost of cabling for the entire network?	1	10	1	2
2.	VIT wants to design a network system that enables communication among all computer systems. For this purpose, a layered architecture is used. Explain the need for layered architecture in computer networks. With the help of a neat diagram, describe how information is passed through the different layers."	1	10	1	2
3.	Six equal-size datagrams belonging to the same message leave for the destination one after another. However, they travel through different paths as shown in Table.	2	10	2	3

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	Datagram Path Length Visited Switches 1 8,000 km 1, 3, 6 2 10,500 km 1, 2, 6 3 12,000 km 1, 2, 4, 6 4 9,200 km 1, 5, 6 5 11,300 km 1, 5, 3, 6 6 9,800 km 1, 4, 6 We assume that the delay for each switch (including waiting and processing) is 5, 12, 8, 15, 10 and 18 ms respectively. Assuming that the propagation speed is 2×10^8 m/s. a. Calculate the propagation delay for each datagram. b. Calculate total switch delay for each datagram. c. Find the total end to end delay for each datagram d. Determine the order in which the datagrams arrive at the destination				
4.	A company is setting up a new wide-area network (WAN) to connect its multiple branch offices. The network engineer is considering different switching techniques for the network. The Requirements are • Some applications require real-time voice and video communication. • Other applications involve email, file transfer, and database access. • Network resources are limited, so efficient use of bandwidth is important a. Explain the three switching techniques briefly and compare and contrast them in terms of delay, reliability, bandwidth utilization, and suitability. b. Suggest and justify which switching technique is most suitable for the following • Real-time voice/video communication • Email and file transfer	2	10	2	4
5.	Given the data word 101110110 and the divisor 10101, a. Show the generation of the codeword at the sender site (using binary division). b. Show the checking of the codeword at the receiver site (assume no error).	3	10	3	3