

**VIT**

Vellore Institute of Technology

Slot : B1+TB1**School of Computer Science Engineering and Information Systems****Fall Semester 2025-2026****Continuous Assessment Test – I****Programme Name & Branch: B.Tech. (IT)****Course Name & code: BITE305L - Computer Networks****Class Number (s): VL2025260103129, 3125, 3122****Faculty Name (s): Dr.M.PRIYA, Dr. USHA DEVI G & Dr. VIJAYAN R****Exam Duration : 90 Min.****Maximum Marks: 50****General instruction(s): Answer All Questions**

CO1. Demonstrate the knowledge of fundamental concepts related to data communication and networks.

CO2. Describe computer transmission media and signalling mechanisms.

CO3. Identify and analyze data link layer error, flow control, and MAC issues.

Q.No.	Question	Max Marks	CO	BL
1.	Imagine you're designing a secure online examination system used across multiple universities. Analyze how each layer of the OSI model contributes to the system's overall functionality and security. Which layers are most critical, and why?	10	1	4
2.	Our rapidly growing company is planning to design a scalable and reliable corporate network. The network must support: • Multiple departments across different floors • Remote branch offices • Critical data centres that require high availability As the network architect, you are tasked with the following: 1. Discuss the various types of network topologies (such as bus, star, ring, mesh, and hybrid) that can be considered for this business environment.	10	1	3

	2. Analyze the advantages and disadvantages of each topology in the context of: Scalability, Reliability, Fault tolerance, Maintenance complexity and Cost-effectiveness. 3. Recommend the most suitable topology or combination (hybrid) for the company, providing a clear justification based on business needs.			
3.	Using the Hamming code algorithm, a sender wants to send the data by adding a redundancy bit at the respective positions. Data: 1001101. a. Show the generation of the codeword at the sender site (4 marks). b. Assume that during transmission, bit position D7 is corrupted. Show the detection and correction of errors at the receiver site (6 marks).	10	3	3
4.	A 5000-byte message needs to be sent over a packet-switched network. Each packet can carry up to 500 bytes of payload and includes a 100-byte header. The transmission rate is 2 Mbps. If the message is divided into 5, 10, 15, or 20 packets, in what case will the total transmission time be minimum?	10	3	3
5.	The datagram and virtual circuit switching need a routing or switching table to find the output port through which the information belonging to the destination should be sent, but in the case of circuit switching no need for such a table. Give a reason for this difference and justify your answer by explaining data transfer in all the switching methods.	10	2	2