

School of Computer Science and Engineering

Fall Semester 2024-25

Continuous Assessment Test – 1

SLOT: D1+TD1

Programme Name & Branch: B.Tech. Computer Science and Engineering, B.Tech. Computer Science and Engineering (All Specializations)

Course Name & Code: Computer Networks (BCSE308L)

Class Number (s): Common for all

Faculty Name (s): Common for all

Exam Duration: 90 Min.

Maximum Marks: 50

General instruction(s): No printed material should be permitted.

Q.No.	Question	Max Marks
1.	(a) Explain the components of a communications model with the help of a suitable diagram.	5
	(b) A network uses a fully interconnected mesh topology to connect 10 nodes together. Considering full-duplex mode links, calculate the number of total links required and the number of I/O ports required in each node.	5
2.	Consider that the data is packetized before transmission and the endpoint devices do not have any technique to determine if the data is out of order. Which Switching will be suitable in this scenario and why? Explain the entire process for this switching using suitable diagrams.	10
3.	(a) Define Bandwidth and Throughput in terms of Networking. Consider a system generating 20-bit frames and connected through a shared 20kbps channel. Find the throughput if the frame rate is 1000 fps.	5
	(b) 30 Megabits data is sent from a source to destination 10,000 km apart. Bandwidth of the medium is 10Mbps. Propagation speed is $2 \times 10^8$ m/s. Processing time of the router is 0.01s. Determine the latency for the first packet. Calculate the Bandwidth-Delay product.	5
4.	Consider a dataword to be transmitted is 10010001. Determine the sent codewords for (i) even parity scheme (ii) odd parity scheme. During transmission, the codeword is modified to 10110011. Determine the Hamming distance between sent and received codewords for (i) even parity scheme (ii) odd parity scheme. Which parity scheme can detect the error? Justify your answer.	10
5.	The message HELLO WORLD! has to be transferred. At the sender end, determine the internet checksum and the transmitted data. How does the receiver conclude that there is no error in the received message? Show the calculations at the receiver end if there are no errors. [P.T.O for ASCII-Hexadecimal table]	10

Symbol	A	B	C	D	E	F	G	H
Hex Value	41	42	43	44	45	46	47	48
Symbol	I	J	K	L	M	N	O	P
Hex Value	49	4A	4B	4C	4D	4E	4F	50
Symbol	Q	R	S	T	U	V	W	X
Hex Value	51	52	53	54	55	56	57	58
Symbol	Y	Z	<space>	!				
Hex Value	59	5A	20	21				