JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-VI Semester (CSE/IT)

COURSE CODE (CREDITS): 18B11CI611 (3)

MAX. MARKS: 25

COURSE NAME: Computer Networks

COURSE INSTRUCTORS: Hari Singh, Nancy, Parveen Modi, Kuntal, Rakesh Kanji

MAX. TIME: 1 Hour 30 Min

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required

for solving problems

Q.No	Question	CO	Marks

Q1	**(a)** A computer is trying to send a data packet to another computer on the same local area network (LAN), but it does not know the recipient's MAC address. The computer knows the recipient's IP address.
	   i. What protocol will the sender use to resolve the MAC address of the recipient?
	   ii. Briefly describe the process that takes place between the sender and the recipient to obtain the MAC address.
	
	 (b) Consider the set C = {10101,11010,01100,10011}.
	 Calculate the minimum hamming distance for this set of binary strings.
	 For how many bit errors can this hamming distance guarantee to detect errors? Explain with a reason.
		CO3	(1+2)
			
			 (1+1=2)

Q2	Station A needs to send a message consisting of 10 packets to station B using sliding window size 4. All packets are ready and can be transferred immediately. Every 5th packet get lost but Acknowledgment from B never gets lost). What is the number of transmissions that A has to make to ensure safe delivery in the following two protocols? Write a detail answer.
	   (a) Selective-Repeat ARQ
	   (b) Go-Back-N ARQ
		CO3	(2+2=4)

Q3	**(a)** Describe the Polling method of Controlled Access with appropriate figures. **(b)** A network with CSMA/CD protocol in the MAC layer is running at 1Gbps over a 1 KM cable with no repeaters. The signal speed in the cable is 2×10^8 m/s. What is the minimum frame size for this network?	CO3	(2+2=4)

Q4	(a) An Ethernet MAC sublayer receives 42 bytes of data from the upper layer. How many bytes of padding must be added to the data? Support your answer with appropriate explanation. (b) Describe Virtual LANs with a suitable diagram.	CO3	(2+2=4)
Q5	(a) An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets: one subblock of 10 addresses, one subblock of 60 addresses, and one subblock of 120 addresses. Design the subblocks. (b) Describe the IP Header in detail.	CO4	4+4=8