U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

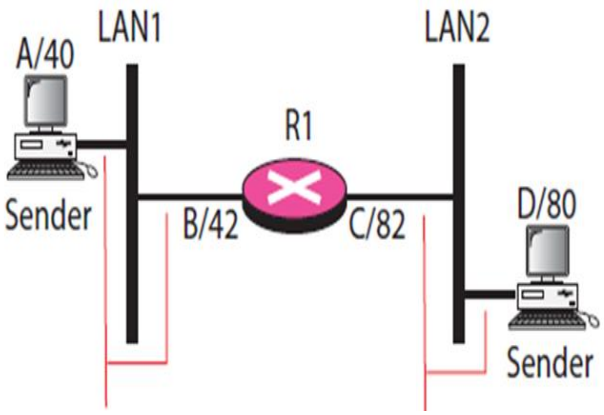
October 2024 Supplementary Examinations

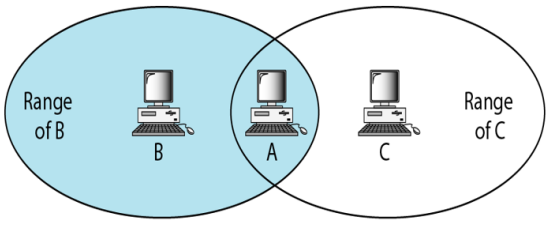
Programme: B.E. **Semester: VI**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 22EC6PCCCN **Max Marks: 100**
Course: Computer Communication Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

SUPPLEMENTARY EXAMS 2024

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT – I	CO	PO	Marks
	1	a)	Design a three-stage space-division switch with N =100. We use 10 crossbars at the first and third stages and 4 crossbars at the middle stage. i) Draw the configuration diagram. ii) Calculate the total number of crosspoints. iii) Find the possible number of simultaneous connections. iv) Find the possible number of simultaneous connections if we use one single crossbar (100 x 100). v) Find the blocking factor, the ratio of the number of connections in (iii) and in (iv)	*CO* 3	*PO3*	**10**
		b)	In Fig 1, computer A sends a message to computer D via LANl, router Rl, and LAN2. Examine the contents of the packets and frames at the network and data link layer for each hop interface.  **Fig 1**	*CO* 1	*PO1*	**6**
		c)	Compare the telephone network and the Internet. What are the similarities? What are the differences?	*CO 2*	*PO2*	**4**

			UNIT – II			
	2	a)	A sender needs to send the four data items Ox3456, OxABCC, Ox02BC, and OxEEEE. Answer the following: i) Find the checksum at the sender site. ii) Find the checksum at the receiver site if there is no error. iii) Find the checksum at the receiver site if the second data item is changed to OxABCE. iv) Find the checksum at the receiver site if the second data item is changed to OxABCE and the third data item is changed to Ox02BA	***CO*** 1	***PO1***	**10**
		b)	Design a bidirectional algorithm for the Go-Back-N ARQ Protocol using piggybacking. Illustrate it with a neat diagram. Note that both parties need to use the same algorithm.	***CO*** 3	***PO3***	**10**
			UNIT - III			
	3	a)	With a neat flow chart, discuss the procedure for Pure ALOHA protocol. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the requirement to make this frame collision-free?	***CO*** 1	***PO1***	**8**
		b)	Compare the four most common standard Ethernet implementations.	***CO*** 2	***PO2***	**8**
		c)	An Ethernet MAC sublayer receives 42 bytes of data from the upper layer. How many bytes of padding must be added to the data?	***CO1***	***PO1***	**4**
			OR			
	4	a)	In the fig 2 shown, assume that station B is sending data to station A. In the middle of this transmission, station C also has data to send to station A. Analyze the problem encountered in this scenario and also, provide a solution to it.  Fig 2	***CO*** 2	***PO2***	**8**

SUPPLEMENTARY EXAMS 2024

		b)	Create a system of three LANs with four bridges. The bridges (B 1 to B4) connect the LANs as follows: a. B1 connects LAN 1 and LAN 2 b. B2 connects LAN 1 and LAN 3 c. B3 connects LAN 2 and LAN 3 d. B4 connects LAN 1, LAN 2, and LAN 3 Choose B1 as the root bridge. Show the forwarding and blocking ports, after applying the spanning tree procedure.	***CO***3	***PO3***	**8**
		c)	Match the layers in Bluetooth and the Internet model and justify.	***CO2***	***PO2***	**4**
			UNIT – IV			
	5	a)	An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows. i) The first group has 200 medium-size businesses; each needs 128 addresses. ii) The second group has 400 small businesses; each needs 16 addresses. iii) The third group has 2000 households; each needs 4 addresses. Design the subblocks and give the slash notation for each block. Find out how many addresses are still available after these allocations.	***CO*** 3	***PO3***	**10**
		b)	With a neat diagram, discuss the various fields of IPv4 datagram. An IPv4 packet has arrived with the first 8 bits as shown: 01000010 The receiver discards the packet. Justify why.	***CO*** 1	***PO1***	**10**
			OR			
	6	a)	With a neat diagram, discuss how ARP is used in address mapping. Is the size of the ARP packet fixed? Justify your answer.	***CO*** 2	***PO2***	**10**
		b)	With illustrations, discuss how distance vector routing updates the routing table. Show a routing table for a host that is totally isolated.	***CO*** 2	***PO2***	**10**
			UNIT – V			
	7	a)	With illustrations, discuss the three way handshaking for connection establishment in TCP with neat diagrams. When does half close occur in TCP connection?	***CO*** 2	***PO2***	**10**
		b)	Compare Leaky bucket and Token bucket with neat diagrams. In a leaky bucket used to control liquid flow, how many gallons of liquid are left in the bucket if the output rate is 5 gal/min, there is an input burst of 100 gal/min for 12 s, and there is no input for 48 s?	***CO*** 2	***PO2***	**10**

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SUPPLEMENTARY EXAMS 2024