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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main 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.

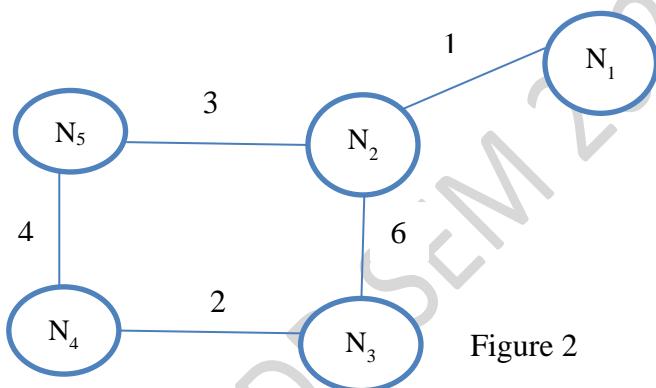|			UNIT - I	CO	PO	Marks
1	a)		Identify key components required for the exchange of data between two or more devices?	CO1	PO 1	**06**
	b)		Discuss the levels of addresses used in an Internet and Show the relationship of layers and addresses in TCP/IP?	CO 1	PO 1	**06**
	c)		Compare the working of a Circuit Switched Network and Packet Switched Network with a neat diagram?	CO 2	PO 2	**08**
			OR			
2	a)		Discuss the fundamental characteristics for effective data communication?	CO 1	PO 1	**08**
	b)		Explain the OSI reference model with neat diagram.	CO 1	PO 1	**08**
	c)		If the bandwidth of the channel is 8kbps, how long does it take to send a frame of 2,00,000bits out of this device?	CO 2	PO 2	**04**
			UNIT - II			
3	a)		Message frame consists of 1101011011 for which the divisor is 1011.The frame after adding 4 zero bits becomes 11010110110000.Calculate CRC and find out transmitted frame.	CO 2	PO 2	**04**
	b)		Discuss the disadvantage of Go-back-N protocol? Show how it is overcome in Selective repeat protocol ? What is the maximum window size of this protocol?	CO 2	PO 2	**08**
	c)		Explain the Stop and Wait ARQ for error and flow control during a) Normal operation b)The frame is lost c) The acknowledgement is lost d) The acknowledgement is delayed. On a wireless link, the probability of packet error is 0.2. A stop and wait protocol is used to transfer data across the link. The channel condition is assumed to be independent from transmission to transmission. What is the average number of transmission attempts required to transfer 100 packets?	CO 2	PO 2	**08**

				CO	PO	
			OR			
4	a)		The following character encoding is used in a data link protocol: A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000 Show the bit sequence transmitted (in binary) for the four-character frame: A B ESC FLAG when each of the following framing methods are used: (a) Character count (b) Flag bytes with byte stuffing. (c) Starting and ending flag bytes, with bit stuffing.	*CO 2*	*PO 2*	**06**
	b)		Explain piggybacking and its usefulness?	*CO 1*	*PO 1*	**06**
	c)		With neat diagram and algorithm discuss stop and wait Protocol	*CO 1*	*PO 1*	**08**
			UNIT - III			
5	a)		Give reasons for the poor channel utilization in ALOHA System? Explain how it is overcome in CSMA?	*CO 2*	*PO 2*	**04**
	b)		List the different connecting devices on the basis of layers they operate ? what are the advantages of bridged ethernet ?	*CO 1*	*PO 1*	**08**
	c)		With a flow diagram explain CSMA/CD ? A CSMA/CD bus spans a distance of 1.5km.If the data rate is 5Mbps. What is the minimum frame Size?	*CO 1*	*PO 1*	**08**
			OR			
6	a)		A backbone network allows several LANs to be connected. Justify with diagram and architecture.	*CO 2*	*PO 2*	**06**
	b)		Discuss about looping problem in transparent bridges ? Show how spanning tree help avoid looping problem?	*CO 1*	*PO 1*	**08**
	c)		Explain the implementation of Fast Ethernet for LANs	*CO 1*	*PO 1*	**06**
			UNIT - IV			
7	a)		With illustration Explain Multicast Routing?	*CO 1*	*PO 1*	**04**
	b)		Differentiate between virtual circuit and Datagram subnet ?	*CO 2*	*PO 2*	**06**
	c)		Given a graph and a source vertex in the graph, find shortest paths from source to all vertices in the given graph as shown in figure 1. Apply Dijkstra's algorithm to find the shortest path from one node to another node. Show the stepwise construction of shortest path. Assume node 1 as the source.	*CO 3*	*PO 3*	**10**

Figure 1
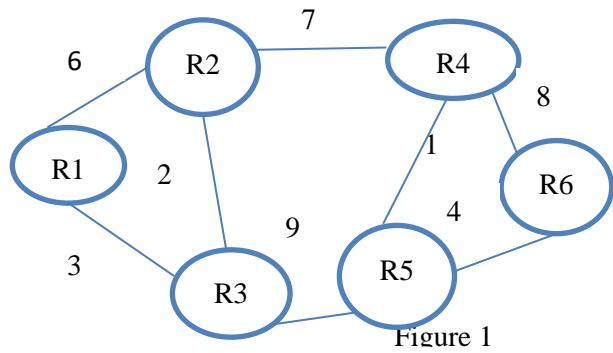
			OR			
8	a)	For the Network shown discuss the data delivery methods, forwarding process and the various forwarding techniques that can be applied clearly showing the routing table contents. Figure 2		CO 3	PO 3	**10**
	b)	Compare IPV4 and IPV6 Headers? How do Systems in the Internet move from IPV4 to IPV6?		CO 2	PO 2	**10**

UNIT - V

9	a)	Analyse Open loop congestion control policies that can prevent congestion?		CO 2	PO 2	**10**
	b)	A TCP machine is sending windows of 65535 B over a 1 Gbps channel that has a 10 msec one way delay. Compute the maximum throughput achievable and the line efficiency?		CO 2	PO 2	**04**
	c)	Explain how a leaky bucket allows bursty traffic Fixed Rate Traffic? Given is a input of burst data at a rate 22Mbps for 5sec. After a halt of 12sec, again data flows at the rate of 15Mbps for 4sec. Compute the rate of flow of output data provided that the bucket functions for 8sec for efficient working of leaky bucket ?		CO 2	PO 2	**06**
			OR			
10	a)	The UDP header in hexadecimal format is as : CB84000D001C001C Obtain the following from it: 1. Source port number 2. Destination port number		CO 2	PO 2	**05**

			3. Total length 4. Length of the data. 5. Name of client process			
		b)	Compare the TCP AND UDP	*CO 2*	*PO 2*	**05**
		c)	Describe the principle of three-way handshaking? TCP opens a connection using an initial sequence number (ISN) of 14,534.The other party opens the connection with an ISN of 21,732.Show the three TCP segments during the connection establishment.	*CO 2*	*PO 2*	**10**

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