U.S.N.										

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

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: AI&DS, CSE(Data Science) and CSE(IOT & Cyber Security Including BlockChain) **Duration: 3 hrs.**
Course Code: 23IC4PCCNW / 23DS4PCCON **Max Marks: 100**
Course: Computer 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)	What is data communication? List and explain the five components of a data communication system, with examples.	*CO1*	*PO1*	**10**
	b)	What are Circuit Switched Networks. With proper diagram, explain the phases of Circuit Switched Networks	*CO1*	*PO1*	**10**
		OR			
2	a)	Describe four basic topologies with their architecture diagrams and applications.	*CO1*	*PO1*	**10**
	b)	Define line coding and its characteristics. Draw the line code of the sequence. a) 01010101 b) 00011000 Using Polar (NRZ-L), RZ, Manchester, Differential Manchester scheme.	*CO1*	*PO1*	**10**
		UNIT - II			
3	a)	Explain i) CSMA and its persistent methods ii) CSMA/CD.	*CO1*	*PO1*	**08**
	b)	Prove that a receiving station can get the data sent by a specific sender if it multiplies the entire data on the channel by the sender's chip code and then divides it by the number of stations.	*CO3*	*PO3*	**06**
	c)	What is CRC? Why it is used? Find the code word, using CRC given data word "1001" and generator "1011".	*CO2*	*PO2*	**06**
		OR			
4	a)	Explain the ARP operation with the packet format.	*CO1*	*PO1*	**08**
	b)	Create the W2 and W4 Walsh tables using W1 = [-1]	*CO3*	*PO3*	**06**

		c)	What is the Vulnerable time for pure ALOHA. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system produces 1000 frames per second?	*CO2*	*PO2*	**06**
			UNIT - III			
	5	a)	Describe the general structure of an ICMP message. Explain the different ICMP error-reporting messages and query messages. Provide examples of each.	*CO2*	*PO2*	**10**
		b)	Design distance vector routing algorithm to handle count to infinity problem in routing protocols and discuss possible solutions to this problem.	*CO3*	*PO3*	**10**
			OR			
	6	a)	Illustrate Routing Information Protocol (RIP) with its message format.	*CO2*	*PO2*	**10**
		b)	With neat diagram explain in detail IPv6 datagram format with its extension headers. Mention the significance of each field.	*CO1*	*PO1*	**10**
			UNIT - IV			
	7	a)	Describe the various fields of the UDP segment. Explain how checksum is calculated.	*CO2*	*PO2*	**10**
		b)	Design a protocol with concept of Go Back N ARQ protocol. Explain the send and receive window in detail.	*CO3*	*PO3*	**10**
			OR			
	8	a)	Draw UDP datagram packet format. Elaborate on UDP services and applications. Obtain the following for the content of UDP header in hexadecimal format. BA670D0C0010E217 i. Source port number ii. Destination port number iii. Total length of the user datagram iv. Length of the data	*CO2*	*PO2*	**10**
		b)	Explain three-way handshake mechanism for TCP connection establishment. If the TCP round-trip time, RTT, is currently 30 msec and the following acknowledgements come in after 26, 32, and 24 msec, respectively, what is the new SRTT estimate using the Jacobson algorithm? Use α=0.9.	*CO3*	*PO3*	**10**
			UNIT - V			
	9	a)	Explain the two primary methods used by DNS servers to resolve domain name queries. Illustrate your answer with examples and diagrams where necessary.	*CO1*	*PO1*	**10**
		b)	Explain SNMP concept. Describe the three components of SNMP architecture. How do these components interact with each other?	*CO1*	*PO1*	**10**

			OR			
	10	a)	With a neat diagram discuss various application layer paradigms. Mention their advantages and disadvantages.	*CO1*	*PO1*	**10**
		b)	Explain how SMTP operates when A sends mail to B where mail servers of A and B are different with a neat diagram. Show the sequence of events.	*CO2*	*PO2*	**10**

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