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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: Artificial Intelligence and Machine Learning **Duration: 3 hrs.**

Course Code: 24AM5PCCNS **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.

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.

				CO	PO	Marks
			UNIT - I			
1	a)		Detail the Seven-Layer OSI Model, focusing on the purpose and functions of each layer, and analyze how each layer contributes to network communication	*CO1*	*PO1*	**10**
	b)		What is the significance of layering in network architecture? Analyze how protocols interact within and across layers to enable seamless communication.	*CO1*	*PO2*	**10**
			OR			
2	a)		Depict in detail the processes of Encapsulation, Multiplexing, and Demultiplexing, and analyze their roles in ensuring efficient data communication within a network.	*CO1*	*PO1*	**10**
	b)		Analyze how bandwidth and latency impact network performance, and evaluate the significance of the delay × bandwidth product in high-speed networks.	*CO1*	*PO2*	**10**
			UNIT - II			
3	a)		Analyze the purpose of encoding in networking, and discuss common encoding techniques. Evaluate their significance in ensuring reliable data transmission across networks.	*CO1*	*PO2*	**10**
	b)		Examine the principles of error detection in networking. Illustrate how the Internet checksum algorithm and cyclic redundancy check (CRC) operate, and evaluate their limitations in ensuring data integrity.	*CO1*	*PO1*	**10**
			OR			
4	a)		Discuss the Stop-and-Wait protocol and the Sliding Window protocol for reliable transmission. Compare and contrast their efficiency and performance, highlighting the key differences in how they manage data flow.	*CO1*	*PO1*	**10**

		b)	Compare and contrast 802.11 (Wi-Fi) and 802.15.1 (Bluetooth) in terms of performance, bandwidth, and suitability for different applications.	*CO1*	*PO2*	**10**
			UNIT - III			
	5	a)	What are the basic principles behind switching in computer networks? Compare and contrast datagram switching and virtual circuit switching with a neat diagram.	*CO1*	*PO2*	**10**
		b)	Analyze the role of the Border Gateway Protocol (BGP) in the global Internet, focusing on how it facilitates inter-domain routing and ensures connectivity between autonomous systems.	*CO1*	*PO2*	**10**
			OR			
	6	a)	Examine how the Distance-Vector routing algorithm works, using the example of the Routing Information Protocol (RIP).	*CO1*	*PO1*	**10**
		b)	Evaluate the necessity of IPv6, highlighting its key features. Assess the strategies for deploying IPv6 alongside IPv4 in the current networking landscape.	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	Outline the role of the User Datagram Protocol (UDP) in end-to-end communication. Highlight its characteristics and functionality. Why is UDP referred to as a "simple demultiplexer"?	*CO2*	*PO1*	**10**
		b)	Assess how queuing disciplines like FIFO and Fair Queuing address network performance issues, and compare their effectiveness in managing traffic and ensuring fairness.	*CO2*	*PO2*	**10**
			OR			
	8	a)	Detail out on the key mechanisms of TCP congestion control, including slow start, congestion avoidance, and fast retransmit.	*CO2*	*PO1*	**10**
		b)	Evaluate the sliding window mechanism used in TCP, focusing on how it enhances throughput and ensures reliable data delivery in network communication.	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	Illustrate the Diffie–Hellman key exchange algorithm and its role in secure communication.	*CO3*	*PO1*	**10**
		b)	Outline in detail Session Control and Call Control (SDP, SIP, H.323).	*CO3*	*PO1*	**10**
			OR			
	10	a)	Elaborate Traditional Applications in networks.	*CO3*	*PO1*	**10**
		b)	Examine the relationship between trust and threats in network security, and identify the types of threats that can undermine trust within a network environment.	*CO3*	*PO1*	**10**

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