Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

MCA DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Third Semester

Master of Computer Applications

PMCVA106 – Basics of Computer Networks

Regulations - 2024

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BTL*	*CO*	*Marks*
1.	Find the network categories for the given statement: Statement 1: A university campus with multiple computer labs connected within one building. Statement 2: An organization's head office and branches spread across different cities connected together.	L3	1	2
2.	Which TCP/IP layer is responsible for addressing? Infer it.	L2	1	2
3.	A student is downloading an e-book. In one case, when a few bits are lost, the system immediately asks the server to resend the file. In another case, the system automatically repairs the missing bits and completes the download without retransmission. Contrast the two approaches used in this scenario.	L4	2	2
4.	Why is a Bridge used in LAN?	L1	2	2
5.	State the function of network layer.	L2	3	2
6.	How the packets are routed using Link State routing protocol.	L1	3	2
7.	List the different categories of transport layer services with suitable example.	L1	4	2
8.	List the congestion prevention policies at transport layer that can affect the congestion.	L1	4	2
9.	List the role of SMTP in email communication and how it works between a sender and receiver.	L2	5	2
10.	Illustrate how URLs help in locating resources on the World Wide Web.	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		Explain the seven layers of the OSI model and state the primary function of each layer with suitable examples.	L2	1	16
			Or			
	b	i	Describe the different categories of computer networks. For each category provide suitable examples and state their key features.	L2	1	8
		ii	Explain the types of transmission media used in network and give key advantage and disadvantage for each.	L2	1	8

12.	a	i	Explain the error detection and error correction process and generate the CRC code for message 1101010101 for the generator polynomial g(x) $=x^4+x^2+1$.	L2	2	16
			Or			
	b	i	Explain the Ethernet frame structure in detail.	L2	2	8
		ii	Explain the wireless LAN in detail.	L2	2	8
13.	a	i	Show the difference between how data finds its way in packet-switched networks and how a path is set up in circuit-switched networks.	L3	3	8
		ii	Illustrate the structure of an IPv6 address and its types.	L3	3	8
			Or			
	b	i	Given a network with routers A, B, C and D and apply the DVR algorithm to update Router A's routing table after receiving neighbor updates. A–B = 1, B–C = 3, C–D = 1, A–D = 7	L3	3	8
		ii	Interpret, two routers exchanging information via BGP protocol. Explain BGP sessions and packet formats in detail between two routers.	L3	3	8
14.	a		Illustrate the mechanisms used in TCP for flow control and congestion control, and how they contribute to reliable data transmission.	L3	4	16
			Or			
	b	i	Illustrate the working principle of UDP.	L3	4	8
		ii	Apply the checksum mechanism to the given 8-bit data words 10011001, 11100010, 00100100, and 10000100. Calculate the checksum and determine whether the receiver has received the data correctly or if an error has occurred.	L3	4	8
15.	a		A user wants to access www.example.com from their browser, but the IP address is unknown. Demonstrate how DNS resolves the domain name to an IP address.	L3	5	16
			Or			
	b		Apply the DES algorithm to a network message to illustrate secure data transmission between two hosts.	L3	5	16