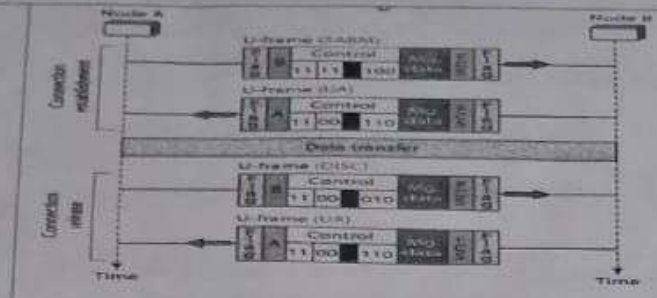
	RV COLLEGE OF ENGINEERING® Department of Computer Science and Engineering CIE-I : Question Paper		
Course : (Code)	COMPUTER NETWORKS (CY245AT))	Semester : IV	
Date : Apr 2025	Duration : 120 minutes	Staff : CSE/ISE/AI-ML	
Name :	USN : 1RV23AI081	Section :	CSE/ISE/AI-ML

Answer all questions

Sl.no	Questions	Marks	L1-L6	CO
1	A system uses a 4-layer protocol hierarchy, where each layer adds a 6-byte header to a 15-byte message. What fraction of the network bandwidth is occupied by headers?	2	3	3
2	A parallel transmission system sends 8 bits simultaneously and operates at 2 MHz. How many bytes can be transmitted in one second?	2	3	3
3	A 20-byte message needs to be transmitted using byte stuffing. If the message contains 4 flag bytes and 3 escape bytes, what will be the final frame length after stuffing?	2	4	5
4	Identifying the OSI model Layer Based on Functionality for the following scenarios: i. A user is trying to access a website, but the request fails due to a DNS resolution error. Which OSI layer is responsible for this issue, and how can it be resolved? ii. A user reports that their laptop is connected to Wi-Fi, but they are unable to browse the Internet. The network adapter shows an IP address conflict. Identify the OSI layer causing the issue and suggest a solution.	2	3	3
5	In a virtual circuit network, a connection setup takes 50 ms, and data transfer takes 200 ms. If the connection is used for 5 packets, calculate the average delay per packet.	2	4	4

Part B

Sl. no	Questions	Marks	L1 - L6	CO
1.	Draw and explain the OSI 7-layer architecture, highlighting the functionality of each layer and the concept of encapsulation.	10	L2	CO2
2 a.	Discuss the features of PPP protocols. Explain the transition phases of PPP.	6	L2	CO3
b.	Identify type of frame and meaning of following HDLC transmission:	04	L4	CO4

				
3 a.	Compare the implementation of connectionless and connection-oriented services in the network layer. Explain with real-world examples where each is preferred.	6	L2	CO4
b.	Explain the working of store-and-forward packet switching with a suitable diagram. Discuss its advantages and disadvantages compared to circuit switching.	4	L2	CO1
4 a.	Identify the type of address for the following addresses" i. principal@rvce.edu.in ii. www.rvce.edu.i iii. 192,17.2.50.4 iv. 1C18 : 1B32 : C450 : 62A5 : 34DC : AE24 : 15BC : 6A5D	4	L4	CO5
b.	Explain Parallel Transmission and Serial Transmission with suitable diagrams. Discuss their advantages and disadvantages in different network applications.	6	L1	CO1
5 a.	Describe a scenario where CSMA/CD fails and CSMA/CA becomes essential. Discuss working principle of CSMA/CA,	10	L1	CO5

Course Outcomes	
CO1:	Apply the algorithms/techniques of routing and congestion control to solve problems related to Computer Networks.
CO2:	Analyse the services provided by various layers of TCP/IP model to build effective solutions.
CO3	Design sustainable networking solutions with societal and environmental concerns by engaging in life long learning for emerging technology.
CO4	Exhibit network configuration, protocol usage and performance evaluation in networks.
CO5	Demonstrate the solutions using various algorithms/protocols available to address networking issues using modern tools by exhibiting team work and effective communication.

	L1	L2	L3	L4	L5	L6	CO1	CO2	CO3	CO4	CO5
Marks	16	26	6	12	-	-	10	10	12	12	14