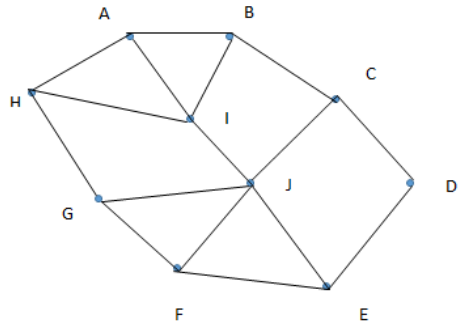
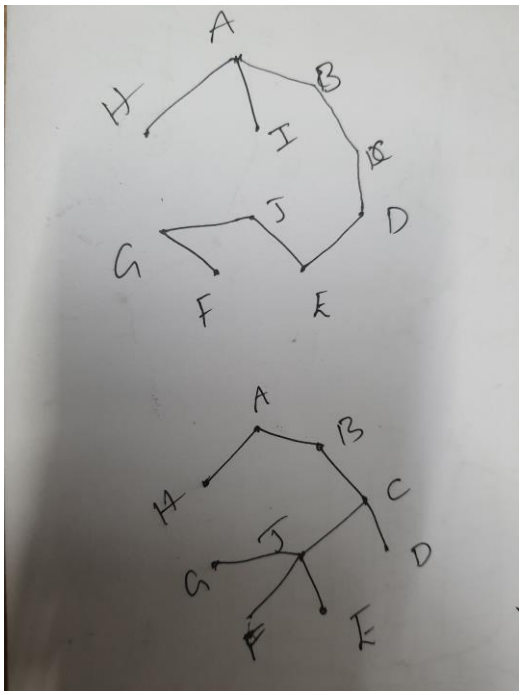
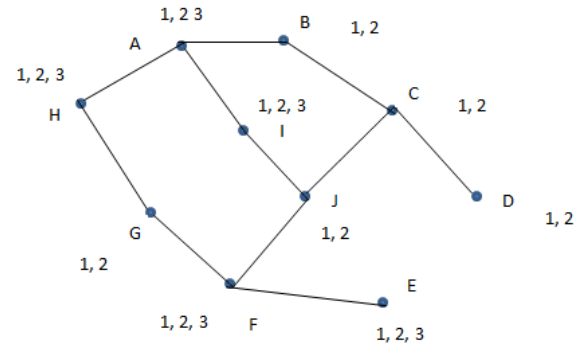
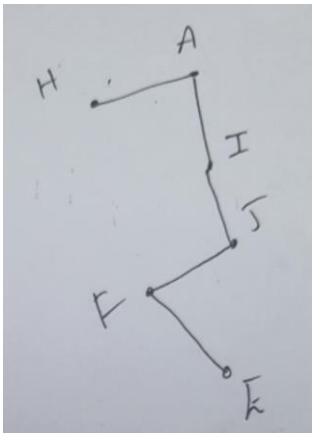
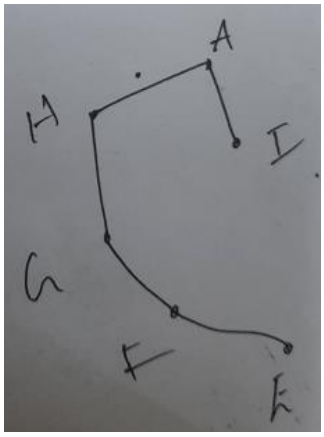
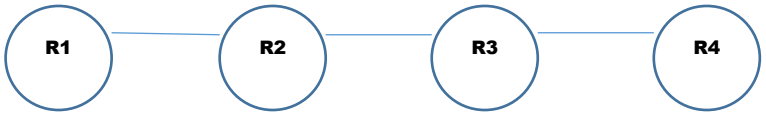
Academic year 2023-2024 (Even Sem)

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

Date	July 2024	**Maximum Marks**	60
Course Code	CY245AT	**Duration**	120 Minutes
Sem	IV		

OPEN BOOK- CIEII- Computer Networks (Common to CS, IS, CD, AI & CY)

Sl. No.		**PART-A (QUIZ)**	**Marks**	**BT**	**CO**
1	a	Write a sink tree for Node G in a given network below. Draw a sing tree for node 'J'. Assume that, Node I crash in sometime. Update the sink tree of J and draw its structure after the node I crashes.  Fig. 1(a) **Two unique trees---2M** 	2	3	3
	b	Draw any 2 unique Spanning trees which includes Group1, 2 and 3 nodes for Multicasting.	2	3	2

		 Fig. 1(b) **Two unique trees---2M**  			
	c	Identify the general major cause of congestion and solution to control over congestion in a network when adequate resources are provided. **Major cause: More load on the subnet which it cannot handle---1M** **Solution: Reduce the load on network-------1M**	2	3	2
	d	For the following network below, which type of routing scheme is best suitable to route the packets from R1 to R4? Justify your answer.  Fig. 1(d) **Routing scheme: Static Routing------1M** **Path is stored and whenever router is booting, stored path is loaded.----1M**	2	3	3
	e	Can HELLO packet is used for measuring delay? Justify your answer with reason. **No. It is used to only discover neighbor nodes/reachable nodes in a network.----2M**	2	3	2
		PART-B			
2	(a)	Find the Routing table for all the nodes of a network given below using Bellman Ford algorithm for Distance vector routing and show the routing table entries in every step. Assume the following two different scenarios and show the updated routing tables of all the nodes under each scenario: i) There is good news that, Link is established from F to C with distance value 1. ii) There is a bad news where link between C to D of distance value 1 crashes.	10	4	2

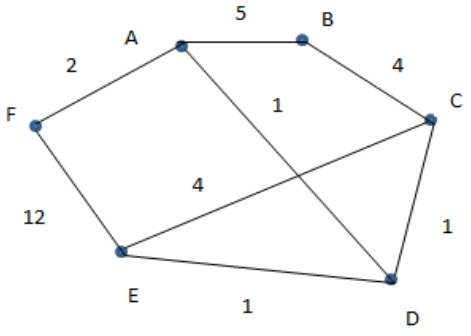
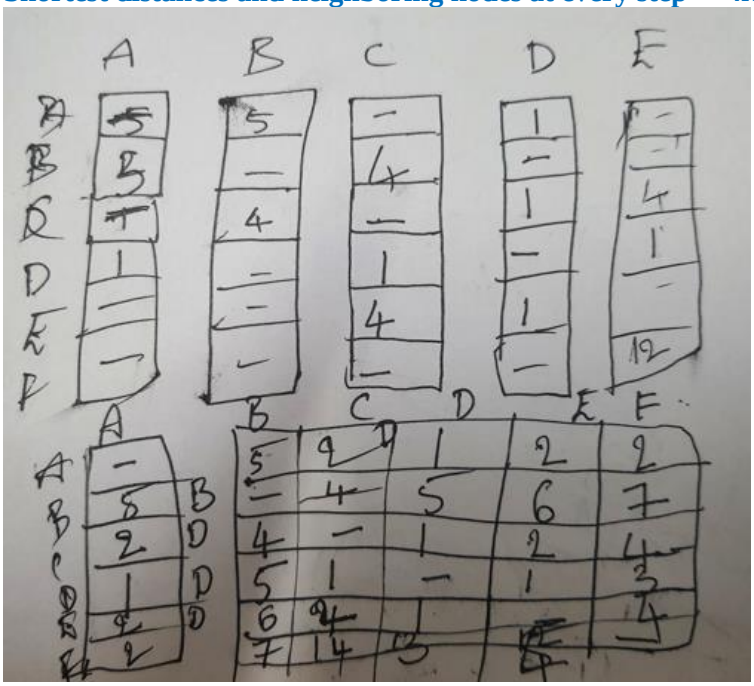
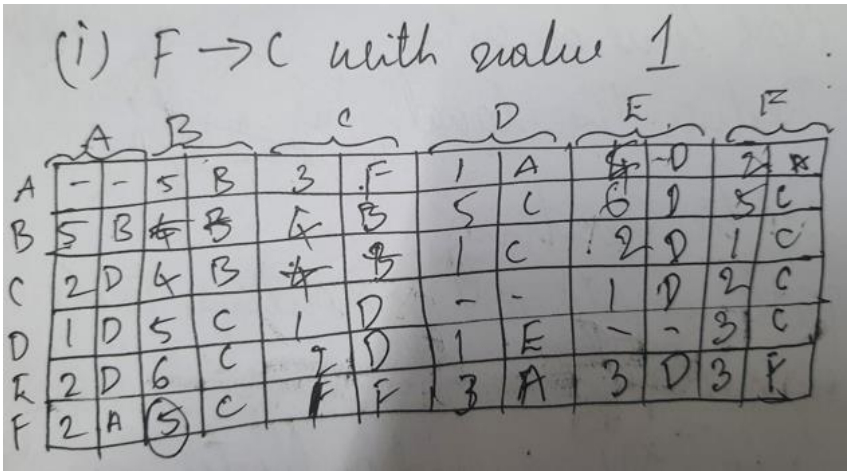


Fig. 2 (a)

Shortest distances and neighboring nodes at every step----4M

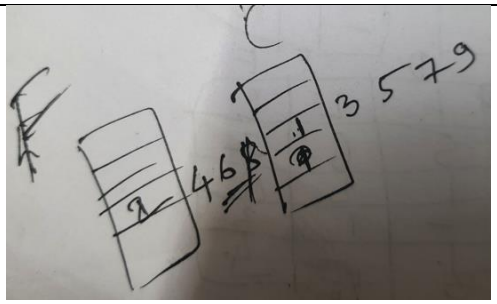


i)After Good news:----------4M



ii)After Bad news

Count to infinity problem between nodes F and C



3	(a)	In the below scenario, find the following using Dijikstra's algorithm: i) Smrithi has to visit all the places identified as nodes in the network, find the best paths for Smrithi to visit all the places starting from her home. ii) Find out that, from which place she can start with to cover all the places at best shortest distances to visit all the places and show the paths.	10	3	3

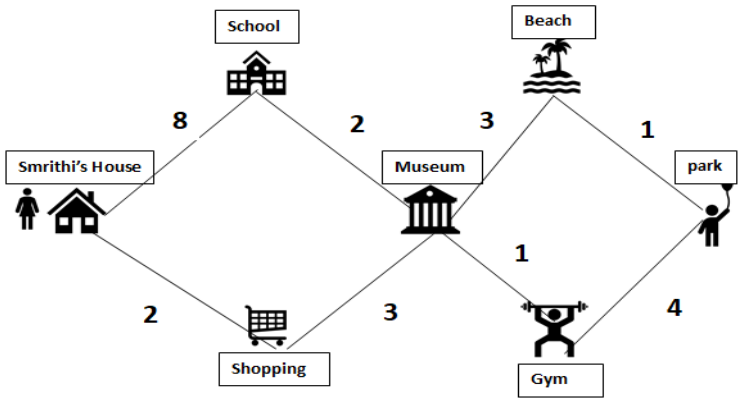
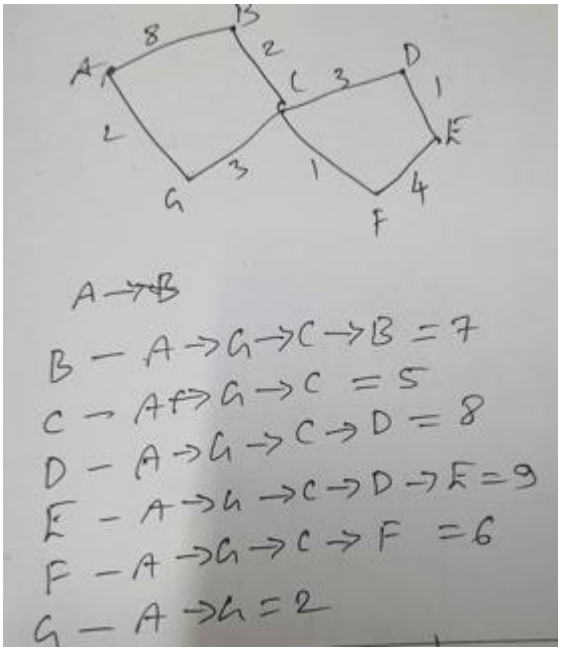
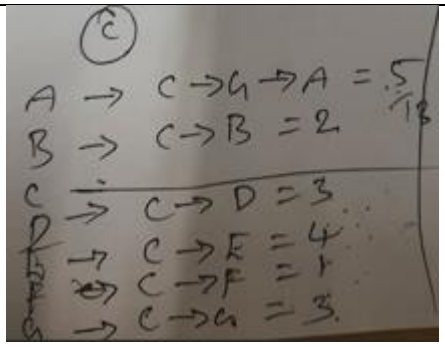
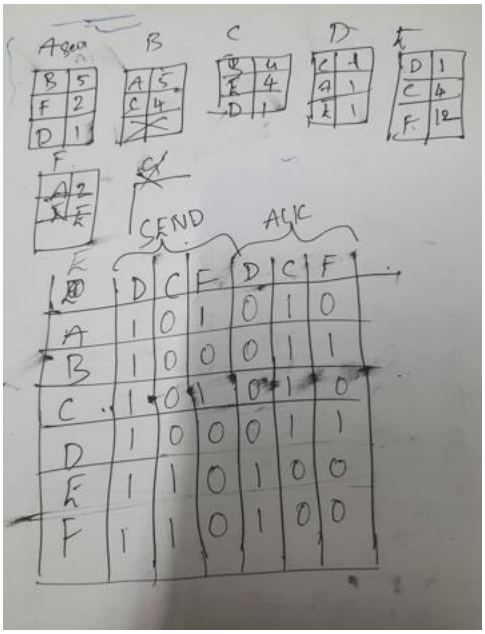
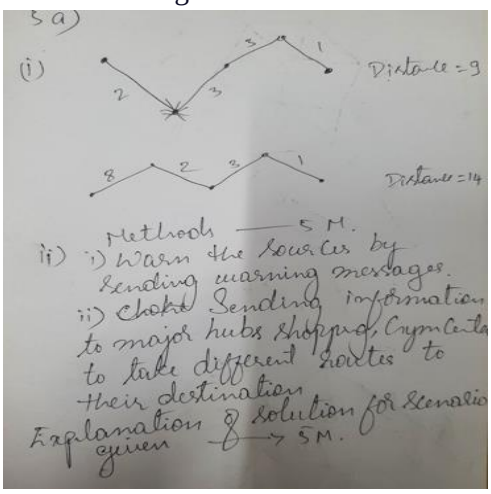


Fig. 3 (a)

i) Finding distances----5M



ii)Need to start from Museum----5M

					
4	(a)	For a Fig. 2(a), show the following stages of link state routing: i) Build the link state packets and show the packet fields for each node ii) Write a Packet buffer for node E with SEND and ACK flag bits **Link state packets ---5M** **Matrix----5M** 	10	4	4
5	(a)	For the Fig.3(a), assume the below scenarios of congestion and provide the solution: i) If network is VC subnet, VC is built from Smrithi's home to Home to Park. Show the path from home to park after congestion occurs at Shopping point----**4M** **ii)** If it is a datagram network, there is huge traffic at Museum from Shopping point and Gym. To reduce the congestion at Museum, identify and describe the measures need to be taken to reduce the congestion.-----**6M** 	10	4	3

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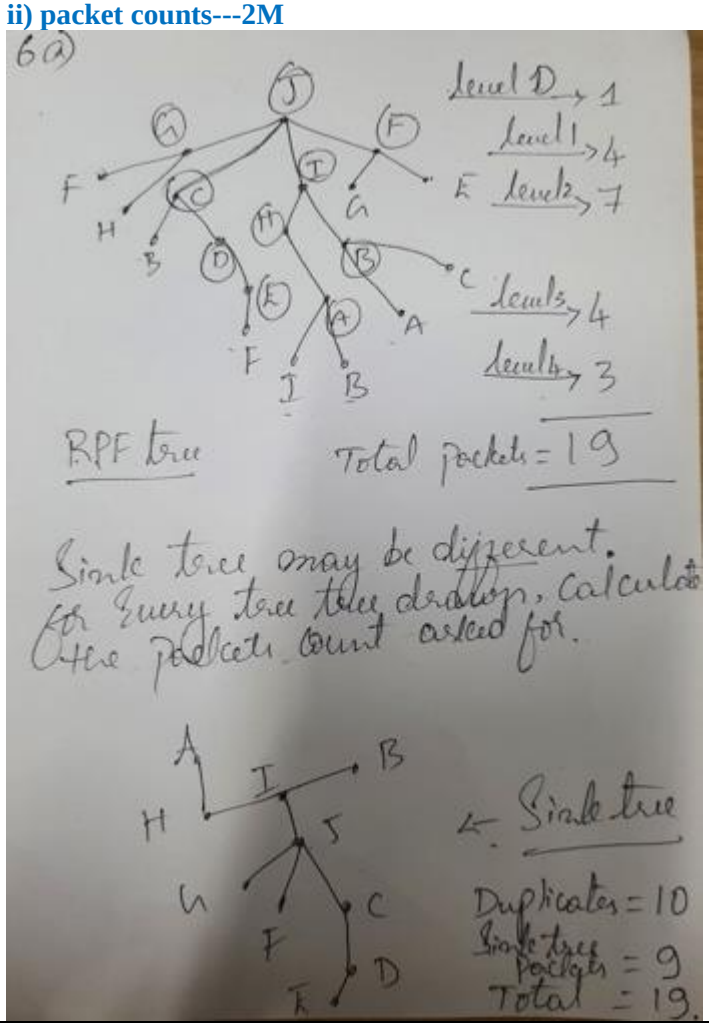
6	(a)	Build a tree for Reverse path Forwarding for node J for network diagram given in Fig. 1(a) and compute the following: i) Mention the number of packets generated at every level of tree ii) Mention total number of packets generated, total number of duplicate packets and total number of packets as part of sink tree. **Reverse path tree---6M** **i)Count of packets ate every level---2M** **ii) packet counts---2M**  	6+ 2+ 2	4	3

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 Lifelong learning for emerging technology.

CO4: Exhibit Demonstrate the solutions using various algorithms/protocols available to address networking issues.

CO5: Using modern tools by exhibiting team work and effective communication network configuration, protocol usage and performance evaluation in networks.

COs/BTL	CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4
Marks	-	16	34	10	10	-	-	20	40