



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.:

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2024-2025

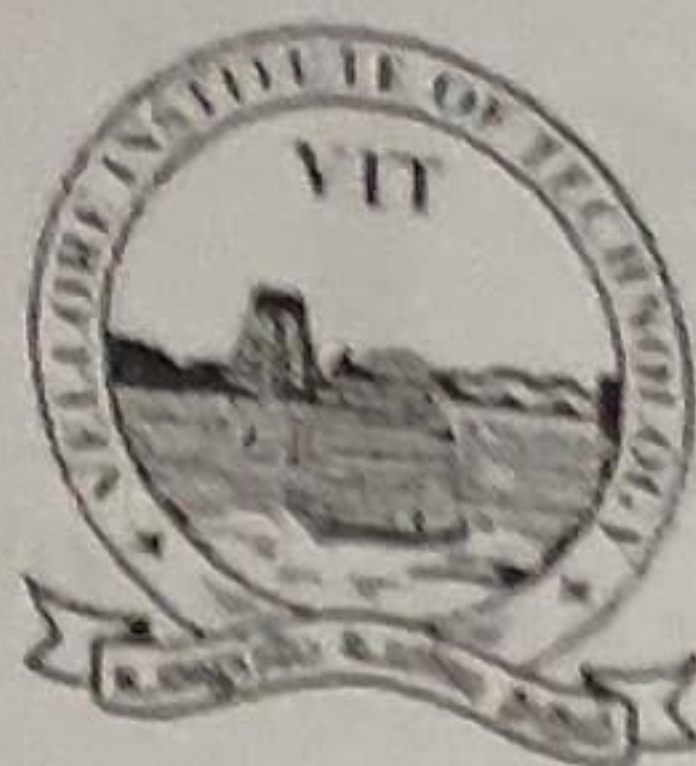
SLOT: E1+TE1

Programme Name & Branch : M. Tech Integrated (CSE & Specializations)
Course Code and Course Name : CSI2007 and Data Communication and Networks
Faculty Name(s) : Common for all
Class Number(s) : Common for all
Date of Examination : 20-03-25
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyze, 5 - Evaluate, 6 - Create)
- CO2- Identify and analyze the different types of network topologies, error and flow control mechanisms
- CO3- Design sub-netting and enhance the performance of routing mechanisms.
- CO4- Compare various congestion control mechanisms and identify suitable Transport layer protocol for real-time applications

Q. No	Question	M	CO	BL
1.	"Consider a network protocol that implements a sliding window mechanism with a buffer size of 5 for reliable data transmission. In this scenario, a sender transmits packets to a receiver over an unreliable network. The sender can send up to 5 packets before requiring an acknowledgment (ACK) from the receiver. If an ACK for a packet is not received within a specific time window, the sender retransmits from the missing packet. Explain how the sliding window mechanism ensures reliable and efficient data transfer. Provide a step-by-step example demonstrating how the window slides forward when acknowledgments are received and how retransmission occurs in case of packet loss." and draw how the sender and receiver manage packets within a buffer size of 5 with 20 frames.	10	CO2	4
2.	The organization has been assigned the IP range 172.16.0.0/19. The administrator wants to create 256 subnets. a. What is the new subnet mask? (1 marks) b. How many IP addresses are available in each subnet? (1 marks) c. What are the first and last addresses for the 0 th subnet? (2 marks) d. What are the network and broadcast addresses for the 10th subnet? (3 marks) e. Find the first and last usable addresses in subnet 100. (3 marks)	10	CO3	3
3.	An IPv4 datagram has arrived with the following information in the header 0x 45 00 00 3C 1C 46 40 00 40 06 B1 E6 C0 A8 01 01 C0 A8 01 02 a. Is the packet corrupted? b. Are there any options? c. Is the packet fragmented? d. What is the size of the data?	10	CO3	2



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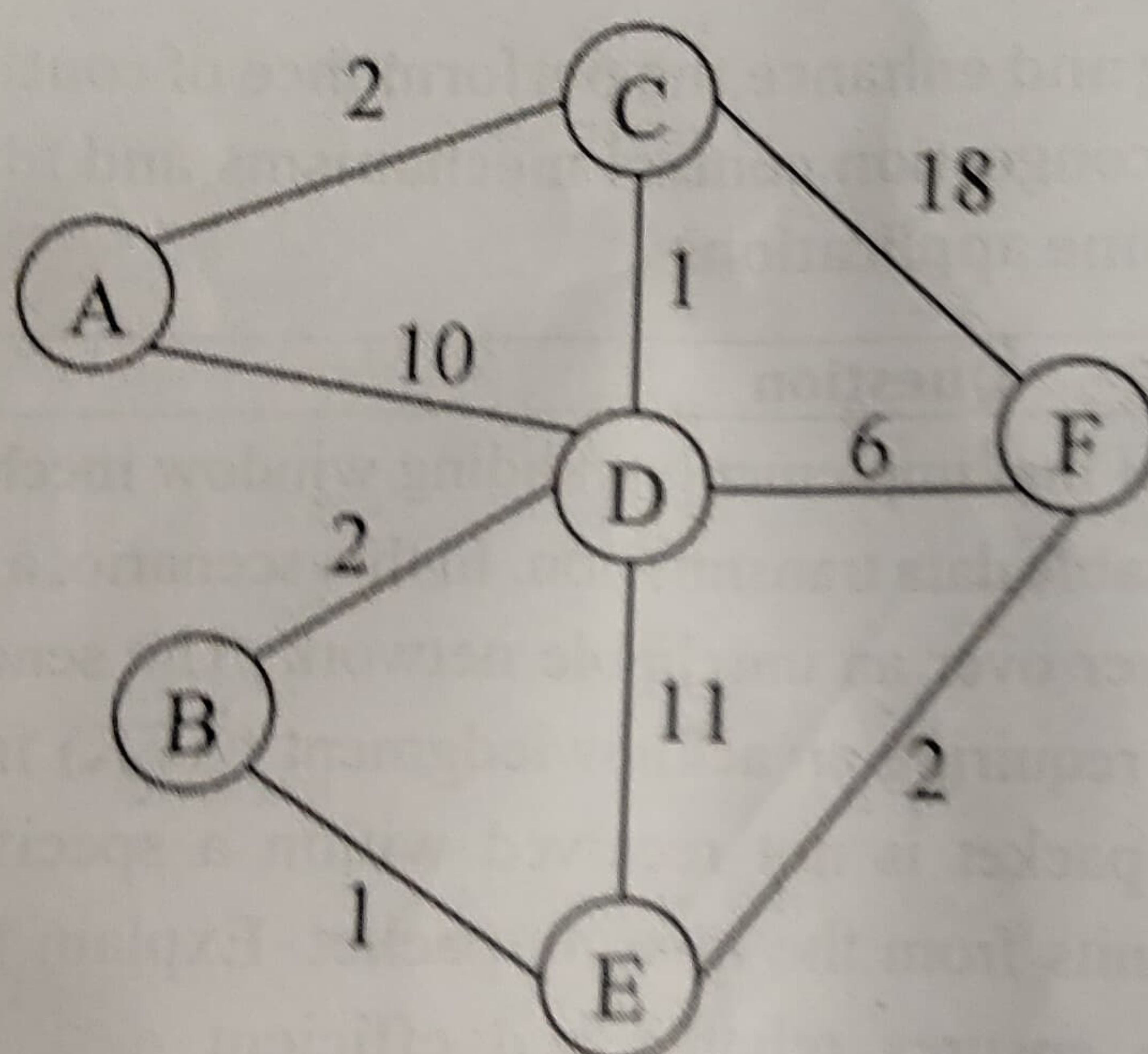
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- e. How many more routers can the packet travel to?
- f. What is the identification number of the packet?
- g. What is the type of service?
- i. What is the Source address?
- j. What is the destination address?
- k. which upper layer protocol is used?

4. Consider the following graph representing a network and apply the **Distance Vector Routing** algorithm to update the routing tables for each node. Show the steps involved for the initial and updated routing tables after the routers exchange their distance vectors for the first time.



10

C03

3

5. a. How does the MAC address play a role in Ethernet communication? How does the IEEE 802.3 standard handle addressing within its frame format?
- b. Describe the structure of header format of reliable transport layer protocol with its key components.

4

C04

2

6
