REG.NO.:

VIT
Vellore Institute of Technology

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

SLOT: D2+TD2

Programme Name & Branch	:	Master of Computer Applications
Course Code and Course Name	:	PMCA505L Data Communication and Networking
Faculty Name(s)	:	Prof.Jayalakshmi P, Prof. Thandeeswaran R, Prof. Asis Kumar Tripathy
Class Number(s)	:	VL2024250103209, VL2024250103149, VL2024250103248
Date of Examination	:	16/10/2024
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 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

  - CO4 – Analyse various error detection and correction techniques and flow control mechanisms
  - CO5 – Understand IP addressing techniques and various routing protocols

Q. No	Question	M	CO	BL
1.	Given the dataword (message) 1010001101 and the divisor (polynomial generator) 110101, show the generation of the CRC codeword at the sender site using binary division. Also check the codeword at receiver side for errors.	10	4	3
2.	A) Find the checksum at the sender and receiver for the following Frame sequence- 10110011 10101011 01011010 11010101. Show how the generator creates the checksum bits and checker creates a new checksum for the acceptance or discard of the message. **(5 Marks)**	10	4	3
	B) The following character encoding is used in a data link protocol: **A: 11010101; B: 10101001; C: 10011001; FLAG: 01111110; ESC: 10100011** Show the bit sequence transmitted (in binary) for the seven - character frame: **A ESC B ESC C ESC FLAG** when each of the following framing methods are used: i) Flag bytes with byte stuffing. ii) Starting and ending flag bytes, with bit stuffing. **(5 Marks)**			
3	Illustrate the protocol with flow diagram and its efficiency for the given scenario.			

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	(i) "A node that finds the channel busy will most likely be the only node waiting for the channel to become clear and it will start transmitting as soon as the current transmission is done and will not waste any time" (ii) The node flip a coin (Pick a random number)……. If coin comes head (random number<p), transmits the message in the next slot….. Otherwise try again from the start.	10	4	2
4	A) Suppose a network with IP Address 221.162.183.0 is divided into 2 subnets. Find the following for each subnet: **(7 Marks)** i. Total number of hosts per subnet ii. Subnet Address iii. First Host ID iv. Last Host ID v. Direct Broadcast Address vi. Limited broadcast address vii. Subnet Mask	10	5	3
	B) A classless address is given as 140.128.128.8/20. Find the following information about the block to which the address belongs: **(3 Marks)** i. Number of addresses in the block ii. First address in the block iii. Last address in the block			
5.	An ISP is granted a block of addresses starting with 175.20.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows: a. The first group has 64 customers; each needs 128 addresses. b. The second group has 128 customers; each needs 64 addresses. c. The third group has 128 customers; each needs 32 addresses. Design the subblocks and find out how many addresses are still available after these allocations.	10	5	3

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