Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

Mid Semester Examination

October 2022

Max. Marks: 20 Duration: 60 mins.

Class: SE Semester: III

Course code: CE202/DS202/AI202 Branch: CS/DS/AIML

Name of the Course: Data Structures

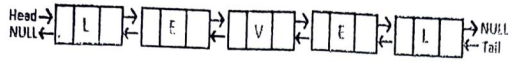
Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q. No.		Max. Marks	CO-BL-PI
1	a. Convert the given expression into postfix and prefix expression: a + b * (c - d) / e + f i. State the appropriate data structure used ii. Draw the status of the data structure used through diagrammatic representation while converting the expression	03	CO1-3-1
	b. State the condition for Circular Queue Full and Circular Queue empty.	01	
	c. What is the limitation with the Circular Queue and how to overcome/solve the limitation.	01	
2	Given a doubly linked list of characters, write a function that returns true if the given doubly linked list is a palindrome, else	05	CO1-4-1

	false.  OR Represent the following polynomial expression using Generalized Linked List. $P(x,y,z)=6x^4y^2z^3+4x^2yz^2+3xyz+56$		
3	a. Can we construct a unique binary tree from preorder and post order traversal? Justify your answer with an example. b. Draw binary search tree by inserting following numbers from left to right 11,6,8,19,4, 10,5,17,43,49,31 c. Construct binary tree from given traversal inorder = g d h b e i a f j c preorder = a b d g h e i c f j d. What is drawback of binary search tree?	02 01 01 01	CO2-3-1 CO2-6-1 CO2-6-1 CO2-3-1
4	a. What order should we insert the elements 1 2 3 4 5 6 and 7 into an empty AVL tree so that we don't have to perform any rotations/balancing on it? b. What is the maximum height of any AVL tree with 20 nodes ? c. Create an AVL tree with following numbers . State the rotations applied 10 , 20 , 30 , 40 , 50 , 60 , 70 , 80 , 90	01 01 03	CO2-3-i CO2-3-1 CO2-6-1