Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.VOC- SEMESTER–II EXAMINATION – SUMMER 2025

Subject Code:21120201 Date:21-05-2025

Subject Name: Data Structures

Time:10:30 AM TO 12:30 PM Total Marks:50

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Define Flow Chart. Explain various symbols used in Flow Chart.	**05**
	(b)	What is top of stack? Why stack is called LIFO list?	**05**
Q.2	**(a)**	Consider the following queue, where queue is a Circular queue having 6 memory cells. *Front*=2, *Rear*=4. *Queue*: _, A, C, D, _, _ Describe queue as following operation take place: a. F is added to the queue b. Two letters are deleted c. R is added to the queue d. S is added to the queue e. One letter is deleted	**05**
	(b)	Convert Infix Expression A ^ B * C - D + E / F / (G + H) into Postfix expression using stack.	**05**
		OR	
	(b)	Convert following infix expressions into postfix (reverse polish) format showing stack status after every step in tabular form. (a+b^c^d)*(e+f/d).	**05**
Q.3	**(a)**	Explain applications of linked list with suitable example.	**05**
	(b)	Write an algorithm for following operations on a circular linked list. a) Insert a node at beginning b) Insert a node at the end c) Delete a node from beginning d) Delete a node from the end	**05**
		OR	
Q.3	**(a)**	Differentiate between arrays and linked list.	**05**
	(b)	Write an algorithm for following operations on a doubly linked list. a) Insert a node at beginning b) Insert a node at the end c) Delete a node from beginning d) Delete a node from the end	**05**
Q.4	**(a)**	Define Binary Tree. Construct a binary tree from the traversals given below: In-order: E, A, C, K, F, H, D, B, G Pre-order: F, A, E, K, C, D, H, G, B	**05**
	(b)	Explain Prim's algorithm with suitable example.	**05**

OR

Q.4	**(a)**	What is AVL tree? State the different rotations in AVL tree with examples.	**05**
	(b)	Explain different representations of graph.	**05**
Q.5	**(a)**	What do you mean by Hashing? List and explain hashing techniques with example.	**05**
	(b)	Perform Binary Search on following data: 10, 12, 20, 32, 50, 55, 65, 80, 99	**05**

OR

Q.5	**(a)**	Explain Insertion Sort Algorithm with suitable example.	**05**
	(b)	Perform selection sort on the following data: 50, 30, 70, 40, 80, 10	**05**

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