Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.VOC - SEMESTER– II EXAMINATION – SUMMER 2024

Subject Code: 21120201 Date:24-05-2024

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)**	What is Asymptotic Notation? List and explain it.	**05**
	(b)	Write an algorithm for PUSH and POP operations on stack.	**05**
Q.2	**(a)**	List & explain types of data structure.	**05**
	(b)	Explain the difference between Stack and Queue with suitable example.	**05**
		OR	
	(b)	Explain Recursion with example.	**05**
Q.3	**(a)**	Explain Circular Queue. What are the benefits of circular queue over Queue?	**05**
	(b)	Evaluate the following postfix expression using stack. Show each step. 5 3 + 6 2 / * 3 5 * +	**05**
		OR	
Q.3	**(a)**	Write and explain an algorithm of singly linked list for delete a node from beginning.	**05**
	(b)	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**
Q.4	**(a)**	What is linked list? Explain types of it.	**05**
	(b)	Create a Binary Search Tree for the following data and do Post-order traversal of the tree. 40, 25, 70, 22, 35, 60, 80, 90, 10, 30	**05**
		OR	
Q.4	**(a)**	Differentiate between arrays and linked list.	**05**
	(b)	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**
Q.5	**(a)**	Explain Prim's algorithm with suitable example.	**05**
	(b)	Explain the trace of bubble sort on following data. 42, 23, 74, 11, 65, 58, 94, 36, 99, 87	**05**
		OR	
Q.5	**(a)**	Explain collision resolution techniques in detail.	**05**
	(b)	Perform Binary Search on following data: 10, 12, 20, 32, 50, 55, 65, 80, 99	**05**

****