Enrolment No/Seat No.: _____

R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT

(An Autonomous Institute U/s UGC Act 1956)

B.Voc. SEMESTER-II, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1SD202 **DATE: 05-01-2026**

SUBJECT NAME: DATA STRUCTURES

TIME: 11:00 AM to 12:00 PM **TOTAL MARKS: 50**

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

			Marks	BL	CO
Q.1	**(a)**	Differentiate between structure and union.	**05**	**U**	**1**
	(b)	Classify Data Structures into Primitive and Non-Primitive types with suitable examples.	**05**	**R**	**2**
Q.2	**(a)**	Explain Infix, Prefix, and Postfix expressions with suitable examples.	**05**	**U**	**2**
	(b)	Write an algorithm for PUSH and POP operations on a stack and explain their working.	**05**	**A**	**2**
		OR			
Q.2	**(a)**	Differentiate between Static and Dynamic Data Structures with examples.	**05**	**U**	**2**
	(b)	Convert the following infix expression into postfix using stack: (A + B) * C	**05**	**A**	**2**
Q.3	**(a)**	Explain the concept of a Linked List.	**05**	**U**	**3**
	(b)	Illustrate deletion of a node from a Doubly Linked List.	**05**	**A**	**3**
		OR			
Q.3	**(a)**	Explain different types of Linked Lists.	**05**	**U**	**3**
	(b)	Demonstrate the insertion of a node at the beginning of a Singly Linked List.	**05**	**A**	**3**

Q.4	**(a)**	Explain inorder, preorder, and postorder traversals of a binary tree with an illustrative example.	**05**	**U**	**4**
	(b)	Insert the following elements into a Binary Search Tree: 45, 30, 60, 20, 40, 50, 70. Draw the BST and explain the insertion process.	**05**	**A**	**4**

OR

Q.4	**(a)**	Explain the concept of Minimum Spanning Tree (MST) and state its applications.	**05**	**U**	**4**
	(b)	Explain the difference between connected and disconnected graphs with examples.	**05**	**A**	**4**
Q.5	**(a)**	Explain Bubble Sort algorithm and discuss its advantages and disadvantages.	**05**	**U**	**5**
	(b)	Sort the following elements using Insertion Sort: 25, 10, 35, 5, 15 Show all intermediate steps.	**05**	**A**	**5**

OR

Q.5	**(a)**	Explain Heap Sort algorithm and the concept of max-heap or min-heap.	**05**	**U**	**5**
	(b)	Apply Quick Sort algorithm to sort the elements: 50, 30, 70, 10, 90, 20 Clearly indicate pivot selection.	**05**	**A**	**5**

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