

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA– SEMESTER - II EXAMINATION- SUMMER-2023**

**Subject Code: 629401**

**Date: 11/07/2023**

**Subject Name: Data Structures**

**Time: 10:30 AM TO 01:00 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

	Marks
<b>Q.1</b> (a) Describe characteristics of an algorithm.	<b>07</b>
(b) Explain the classification of data structure.	<b>07</b>
<b>Q.2</b> (a) Explain method to calculate the address of any element in one dimensional and two dimensional arrays.	<b>07</b>
(b) Explain Doubly Linked List with its basic operations.	<b>07</b>
<b>OR</b>	
(b) Write the algorithm to convert infix expression to reverse polish expression.	<b>07</b>
<b>Q.3</b> (a) Enlist and explain tree traversal techniques.	<b>07</b>
(b) (i) Define following for tree.	<b>04</b>
1) Sibling	
2) Leaf node	
3) degree	
4) height	
(ii) Explain BST in short.	<b>03</b>
<b>OR</b>	
<b>Q.3</b> (a) Write short note on sparse matrix.	<b>07</b>
(b) Explain complete binary tree with example.	<b>07</b>
<b>Q.4</b> (a) Explain DFS with example.	<b>07</b>
(b) Describe the matrix representation of graphs in detail.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Explain BFS with example.	<b>07</b>
(b) Explain 2-3 tree with example.	<b>07</b>
<b>Q.5</b> (a) Write short note on binary search with example.	<b>07</b>
(b) Describe bubble sort with suitable example.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Enlist different hashing functions. Briefly explain any three.	<b>07</b>
(b) Describe selection sort with suitable example.	<b>07</b>

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