

Enrollment No./Seat No.:

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER - II EXAMINATION - WINTER 2025**

**Subject Code: MC02094011**

**Date: 13-11-2025**

**Subject Name: Data Structure using C**

**Time: 02:30 PM TO 05:00 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.**

	<b>Marks</b>
<b>Q.1 (a)</b> Describe Characteristics of an algorithm.	<b>07</b>
<b>(b)</b> What is the full form of KWIC? Write an algorithm to generate the KWIC Index listing with example.	<b>07</b>
<b>Q.2 (a)</b> Explain the storage structure for array in details with example.	<b>07</b>
<b>(b)</b> Define link list? Write an algorithm to insert at middle position in singly link with example.	<b>07</b>
<b>OR</b>	
<b>(b)</b> what is recursion? Explain how stack is used in recursion with example.	<b>07</b>
<b>Q.3 (a)</b> $A+B*C/D-E$ given an expression to convert infix to postfix expression(Stack based expression).	<b>07</b>
<b>(b)</b> Define the following terms.	<b>07</b>
1. Priority Queue	
2. Leaf Node	
3. Null graph	
4. Graph	
5. Adjacent Node	
6. 2-3 tree	
7. Stack	

**OR**

<b>(a)</b> Write an algorithm to Inorder, Preorder, Postorder tree traversal with example.	<b>07</b>
<b>(b)</b> What is Queue? Explain priority queue with algorithm with example.	<b>07</b>
<b>Q.4 (a)</b> What is graph? Explain bfs algorithm with details with example	<b>07</b>
<b>(b)</b> Explain height balanced tree with example	<b>07</b>
<b>OR</b>	
<b>(a)</b> what is matrix? write a difference between bfs and dfs algorithm	<b>07</b>
<b>(b)</b> what is sorting? explain bubble sort with algorithm with example	<b>07</b>
<b>Q.5 (a)</b> Explain heap sort with Algorithm with example.	<b>07</b>
<b>(b)</b> What is hashing? Explain any two methods with example.	<b>07</b>

**OR**

- (a) Explain Sequential search method with Algorithm with example. **07**
- (b) Explain 2-3 tree with example. **07**

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