Enrolment No. /Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER II- EXAMINATION –WINTER-2025

Subject Code: 629401 **Date: 13/11/2025**

Subject Name: Data Structures

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.**

Q.1 **(a)** Define the following terms **07**

1. Data Structure
2. Priority Queue
3. Adjacent Node
4. Binary Tree
5. Complete Graph
6. Linked List
7. Null Graph

(b) What is the difference between stack and queue? **07**

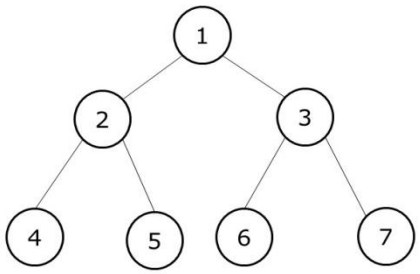
Q.2 **(a)** What is KWIC indexing? Write the algorithm to generate the KWIC index listing with example **07**

(b) Different between Linear Data Structures vs Non Linear Data Structures **07**

OR

(b) Explain the data structure classification. **07**

Q.3 **(a)** Give the processing order of preorder, inorder and postorder of given tree **07**



Also write the algorithm for preorder traversal.

(b) What is recursion? Explain how stack is used in recursion. **07**

OR

Q.3 **(a)** What is Tree Node? List the Binary Search Tree Basic Operations and discuss it. **07**

(b) What is Sparse Matrices? Explain sequential representation of Sparse Matrices with example. **07**

Q.4 **(a)** Compare BFS and DFS. Explain how it works with an example **07**

(b) What is Merge sort? Write its algorithm and state its complexity. **07**

OR

Q.4 **(a)** Explain the selection sort process on following data **07**
14,33,27,10,35,19,42,44

(b) Write algorithms for insertion and deletion of node in doubly linked list **07**

Q.5	**(a)**	What is hashing? List and explain Hashing function in detail.	**07**
	(b)	Write shot notes on (i) Hash-Table Methods (ii) 2-3 tree	**07**
		OR	
Q.5	**(a)**	Arrange following elements in sorted order using heap sort. 4,10,3,5,1	**07**
	(b)	Explain Weight-Balanced Trees in detail.	**07**

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