GUJARAT TECHNOLOGICAL UNIVERSITY
MCA– SEMESTER II- EXAMINATION –WINTER-2023

Subject Code:629401   **Date: 21/12/2023**
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.

Q.1	**(a)**	Define the following terms. i. LIFO stands for_____ ii. Null Graph iii. Write down complexity of binary search algorithm. iv. Write two simple hash functions. v. Mixed Graph vi. FIFO stands for_____ vii. List operations performed on a stack.	**07**
	(b)	Explain the storage structure for arrays in detail.	**07**
Q.2	**(a)**	What is KWIC indexing? Write the algorithm to generate the KWIC index listing with example.	**07**
	(b)	Discuss difference between Linear data structure V/s Non-linear data structure.	**07**
		OR	
	(b)	Explain Doubly Linked List with basic operations.	**07**
Q.3	**(a)**	Describe the concept of Queue in data structure with its insertion and deletion Operations.	**07**
	(b)	What is Sparse Matrices? Explain sequential representation of Sparse Matrices with example.	**07**
		OR	
Q.3	**(a)**	What is Tree Node? List the BST Basic Operations and discuss it.	**07**
	(b)	Explain BFS and DFS in detail. Also give the difference between BFS and DFS.	**07**
Q.4	**(a)**	Write an algorithm for deletion of node at the end of singly linked list.	**07**
	(b)	What is binary tree traversal? What are the various traversal methods? Explain any two with suitable example.	**07**
		OR	
Q.4	**(a)**	Explain the application of trees in expression evaluation in details.	**07**
	(b)	Discuss Bubble sort in detail.	**07**
Q.5	**(a)**	Explain Weight-Balanced trees in detail.	**07**
	(b)	Explain Merge-sort algorithm with example.	**07**
		OR	
Q.5	**(a)**	Discuss Quick-sort algorithm with example.	**07**
	(b)	What is Hash-Table Methods? Discuss the Division Method in detail.	**07**

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