Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(OLD) • EXAMINATION – WINTER 2016

Subject Code:130702 **Date:04/01/2017**

Subject Name:Data and File Structure

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.**

Q.1	**(a)**	What is data structure? Explain different types of data structures with applications.	**07**
	(b)	Derive the formula to calculate address A[i, j] of 2-D array, for a Row-major order storage representation. A 2-D array defined as A[r, c] where $1 \leq r \leq 4$, $5 \leq c \leq 8$, requires 2 bytes of memory for each element. If the array is stored in Row-major order form, calculate the address of A[3,7] given the Base address as 2000.	**07**
Q.2	**(a)**	Discuss and compare array and linked list.	**07**
	(b)	Discuss importance of hashing. Also discuss one of the method of hashing with an example.	**07**
		OR	
	(b)	Discuss the structure of sequential and indexed file organization.	**07**
Q.3	**(a)**	Write algorithm OR code for PUSH, POP and DISPLAY function of the STACK.	**07**
	(b)	Convert the following infix expression to postfix form using Stack. ((A – (B + C)) × D) / (E + F)	**07**
		OR	
Q.3	**(a)**	Write algorithm OR code for INSERT, DELETE and DISPLAY function of the QUEUE.	**07**
	(b)	What is a priority queue? Discuss the array implementation of priority queue.	**07**
Q.4	**(a)**	Write C code to insert a node at the end of a doubly link list.	**07**
	(b)	Write an algorithm to merge two simple link lists having initial address L1 and L2 respectively. Also write algorithm to display the list.	**07**
		OR	
Q.4	**(a)**	Write algorithm OR code for DELETE and DISPLAY functions of Circular Link List.	**07**
	(b)	Write C code for the following operations for a simple link list. i. Reverse : to reverse the link list ii. Max : to find the largest element from the link list.	**07**
Q.5	**(a)**	Write a non-recursive algorithm for Preorder traversal of a binary tree	**07**
	(b)	What is a sparse matrix? Explain memory representation of a sparse matrix.	**07**
		OR	
Q.5	**(a)**	Discuss DFS and BFS.	**07**
	(b)	Discuss Inorder and Postorder traversal of a binary tree.	**07**

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