Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – WINTER 2015

Subject Code:130702 Date:02/01/2016

Subject Name: Data and File Structure

Time: 2:30pm to 5:00pm 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 does abstract data type means? Briefly explain linear and non linear data structures.	**07**
	(b)	Given a two dimensional array A1(1:8, 7:14) stored in row-major order with base address 100 and size of each element is 4 bytes, find address of the element A1(4, 12).	**07**
Q.2	**(a)**	Write an algorithm to implement PUSH and POP Operations on Stack.	**07**
	(b)	Write an algorithm for evaluation of postfix expression and evaluate the following expression showing every status of stack in tabular form. • 5 6 2 - * 4 9 3 / + *	**07**
		OR	
	(b)	Enlist difference between recursive and iterative algorithms. Write any one recursive function showing the stack contents while function call and return.	**07**
Q.3	**(a)**	Write a program to perform insert and delete routines on a queue.	**07**
	(b)	Write advantages and disadvantages of linked list, doubly linked list and circular linked list with example.	**07**
		OR	
Q.3	**(a)**	Explain priority queue and dequeue. Write an algorithm/program for insert routine in input restricted dequeues.	**07**
	(b)	Write a program to search an element in a linked list.	**07**
Q.4	**(a)**	Create a Binary Search Tree for the following data and do in-order, Preorder and Post-order traversal of the tree. 40, 60, 15, 4, 30, 70, 65, 10, 95, 25, 34	**07**
	(b)	Define the following with example : • Strictly binary tree • Complete binary tree	**07**
		OR	
Q.4	**(a)**	What is Binary Search Tree? Write recursive algorithm/program to implement in-order traversal of the Binary Search Tree.	**07**

(b) Define height balanced tree. Construct a height balanced binary tree (AVL tree) for the following data **07**

32,16,44,52,78,40,12,22,02,23

Q.5 **(a)** What is hashing? Briefly explain various methods of hashing. **07**

(b) Explain with example DFS and BFS traversal of graph. **07**

OR

Q.5 **(a)** What is File Structure? Explain any one File Structure in detail. **07**

(b) Show how graph can be represented using example? How path matrix can be found out using adjacency matrix. **07**

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