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. **07**

- 5 6 2 - * 4 9 3 / + *

**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. **07**

40, 60, 15, 4, 30, 70, 65, 10, 95, 25, 34

**(b)** Define the following with example : **07**

- Strictly binary tree
- Complete binary tree

**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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