Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-III Examination-Dec.-2011

Subject code: 130702 **Date: 24/12/2011**

Subject Name: Data & File Structure

Time: 2.30 pm -5.00 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)** Answer the following **12**

(i) What is Data Structure? Give the difference between Linear and Non Linear Data Structures.

(ii) Give the difference between Simple Queue and Circular Queue.

(iii) Define the terms with respect to graph: In-degree, Path, Cycle.

(iv) Convert following Infix expression into Postfix and Prefix expression.

a – b / c * d + e * f / g

(b) What do you mean by FIFO and LIFO? **02**

Q.2 **(a)** Write an algorithm to implement PUSH, POP and CHANGE Operations on Stack. **07**

(b) Write short notes on following **07**

(i). Storage representation of 2 Dimensional array

(ii).Advantages and disadvantages of linked list over array.

OR

(b) Write short note on following. **07**

(i) Evaluation of Postfix Expression using Stack.

(ii) Applications of Trees.

Q.3 **(a)** Write an algorithm to insert and delete a node in Doubly Linked List. **08**

(b) Write an algorithm/program to implement Delete operation into a Circular Queue using array representation of Queue. **06**

OR

Q.3 **(a)** Write an algorithm/program to implement following operations in the "Singly Linked List". **08**

(i) Insert the node at end

(ii) Delete the node whose value = Y.

(b) Write an algorithm/program to implement insert operation into a Circular Queue using array representation of Queue. **06**

Q.4 **(a)** Create a Binary Search Tree for the following data and do in-order, Preorder and Post-order traversal of the tree. **06**

50, 60, 25, 40, 30, 70, 35, 10, 55, 65, 5

(b) Answer the following. **08**

(i) What is recursion ? What care should be taken in writing recursive function ? Give example of any one recursive function.

(ii) Compare BFS and DFS traversal methods for Graph.

OR

Q.4 **(a)** What is Binary Search Tree? Write recursive algorithm/program to implement in-order and pre-order traversal of the Binary Search Tree. **06**

(b) How graph can be represented? Write an algorithm for Breadth First Search Traversal of a Graph. **08**

Q.5 **(a)** Write short notes on following **06**

(i) Priority Queue.

(ii)Circular Linked List

(b) What do you mean by Hashing? Explain various methods for hashing. **08**

OR

Q.5 **(a)** Write short notes on following **06**

(i) Height Balanced Tree.

(ii) Dequeue

(b) What is File Structure? Explain Indexed Sequential File Structure in detail. **08**

****