

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- III (NEW) EXAMINATION – SUMMER 2015

Subject Code: 2130702**Date: 09/06/2015****Subject Name: DATA STRUCTURE****Time: 02.30pm-05.00pm****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) Write a 'C' program for insertion sort and discuss its efficiency. **07**
(b) Briefly explain various linear and non-linear data structures along with their applications. **07**

- Q.2** (a) Write 'C' functions to: (1) insert a node at the end (2) delete a node from the beginning of a doubly linked list. **07**
(b) Write an algorithm to reverse a string of characters using stack. **07**

OR

- (b) Compare: (1) Linked-list and Array (2) Circular queue and Simple Queue. **07**

- Q.3** (a) Convert $(A + B) * C - D \wedge E \wedge (F * G)$ infix expression into prefix format showing stack status after every step in tabular form. **07**
(b) Write an algorithm to implement insert and delete operations in a simple queue. **07**

OR

- Q.3** (a) Describe: (1) Recursion (2) Priority Queue (3) Tower of Hanoi **07**
(b) Write 'C' functions to: (1) insert a node at beginning in singly linked list (2) insert an element in circular queue. **07**

- Q.4** (a) With figure, explain the following terms: (1) Depth of a tree (2) Sibling nodes (3) Strictly binary tree (4) Ancestor nodes (5) Graph (6) Minimum spanning tree (7) Degree of a vertex **07**
(b) Generate a binary search tree for following numbers and perform in-order and post-order traversals: 50, 40, 80, 20, 0, 30, 10, 90, 60, 70 **07**

OR

- Q.4** (a) Explain Right-in-threaded, left-in-threaded and full-in-threaded binary trees. **07**
(b) Write Kruskal's algorithm for minimum spanning tree and explain with an example. **07**

- Q.5** (a) Describe various collision resolution techniques in hashing. **07**
(b) Write an algorithm for binary search method and discuss its efficiency. **07**

OR

- Q.5** (a) Explain Sequential, Indexed Sequential and Random file organizations. **07**
(b) Write recursive 'C' functions for (1) in-order (2) pre-order and (3) post-order traversals of binary search tree. **07**
