Roll No. .....

Subject Code—6756-X

P.G.D.C.A./M.C.A. EXAMINATION

(Second Semester)

(MCA 3 Years)

(Re-appear Batch Prior to 2009)

DATA STRUCTURES AND ALGORITHMS

MS-06

Time : 3 Hours *Maximum Marks : 100*

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) Define Stack and write algorithms for operations associated with a stack.

   (b) What is Circular Queue ? What are the advantages of using circular queue ? Write algorithms for insertion and deletion operations in a circular queue.

2. (a) What is Doubly Linked List ? Write algorithms for inserting a node after a given node and deleting a given node from the doubly linked list.

(b) What is Deque ? Discuss various variants of deque.

3. (a) What is Binary Tree ? Discuss its linked representation in memory.

(b) What is Binary Search Tree (BST) ? Write an algorithm to find minimum value in BST.

4. (a) What is threaded binary tree ? How is it represented in memory ? Write algorithms for insertion and deletion of nodes from a threaded binary tree.

(b) What is Balanced Binary Tree ? How can you insert a node into balanced binary tree ?

5. (a) Define Graph. Discuss its adjacency list representation. Write depth-first traversal algorithm.

(b) Discuss any two applications of a Graph.

6. (a) Write the algorithm for Quick Sort and Compute its complexity.

(b) What is Hashing Function ? Discuss various types of hasing functions.

7. (a) What do you mean by Internal Sort ? Write an algorithm for heap sort.

(b) What do you mean by External Sort ? Explain k-way mergesort technique.

8. What are different types of tree traversal algorithms ? Write algorithms for any two tree traversals.