E- JUN 2006

Subject Code—4270

M.C.A. (Second Year) EXAMINATION

(5 Years Integrated Course) June, 2006

(Re-appear)

MCA-201

DATA STRUCTURE AND ALGORITHM

Time : 3 *Hours* *Maximum Marks :* 100

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

1. (a) What is a Data Structrue ? Differentiate between primitive and non-primitive data structure. 10

   (b) Explain the different operations performed on data structures. 10

P.T.O.

2. (a) What is an Array ? Explain the address calculation in single and multidimensional arrays. 12

(b) Write an algorithm to insert an element in an array. 8

3. What is the difference between sorting and searching ? Explain the searching techniques and their complexity analysis. 20

4. (a) What is the difference between array and linked list ? 5

(b) What is a Doubly Linked List ? How is it represented in memory ? 10

(c) How is a polynomial is represented using a linked list ? 5

5. (a) The following sequences represent preorder and inorder traversals of a tree T respectively :

Preorder : G B Q A C K F P D E R H

Inorder : Q B K C F A G P E D H R

Draw the diagram of tree. 10

(b) How do you represent the binary tree in Computer's Memory ? 10

6. Define with examples the following :

(a) Threaded Binary Tree 4

(b) Height Balanced Tree 4

(c) Heap 4

(d) Tree Traversals. 8

7. Define a Graph. Explain the graph traversals along with examples and write their algorithms. 20

8. (a) Define Minimum Spanning Tree. Explain the methods to draw a minimum spanning tree. 10

(b) What is Hashing ? Explain three techniques often built into hash functions. 10