

Subject Code—4270

M.C.A. (Second Year) EXAMINATION

(5 Years Integrated Course)

(Re-appear)

MCA-261

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 Structure ? Differentiate between primitive and non-primitive data structure. 10
- (b) Explain the different operations performed on data structures. 10

P.T.O.

$$4270 = \frac{1}{3}$$

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 E P D L 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

$$4270 = \frac{9}{3}$$