13. What is Stack ? What are its various applications ? Explain PUSH and POP operations on stack and write an algorithm for each.

Or

What do you mean by Minimum Spanning Tree ? Write Kruskal algorithm for finding minimum spanning tree.

Roll No. ..... **Exam Code : J-19**

Subject Code—0407

M.C.A. (Second Year) EXAMINATION

(5 Years Integrated Course)

(Batch 2009 Onwards)

DATA STRUCTURE AND ALGORITHMS

MCA-201

Time : 3 *Hours* *Maximum Marks :* 70

Section A

Note : Attempt any *Seven* questions. **7×5=35**

1. What is data structure and explain the classification of data structure ?

2. Write a short note on ADT.

3. What is queue and what are its variations ?

4. Write an algorithm for inserting and deleting an element from an array.

5. What is the difference between one-way linked list and doubly linked list ?

6. Write an algorithm for searching an element in sorted linked list.

7. Describe the representation of trees in memory.

8. Draw a binary search tree using the following elements :

10, 20, 5, 18, 37, 5, 1, 54

9. Write an algorithm to sort elements using insertion sort by taking an example and define the complexity of insertion sort.

10. Construct a Max and Min heap using the following elements :

18, 10, 20, 30, 25, 16, 92

Section B

Note : Attempt all the questions.

11. What is collision and how it occurs in hashing ? Explain various ways of dealing with collision.

Or

What are Graphs ? What are the various types of graphs ? Write a short note on representation of graphs.

12. Explain the term array and how is it represented in memory ? Write an algorithm to insert an element in middle of an array.

Or

What is Searching ? Explain the difference between linear search and binary search by taking suitable example and specify their complexity also.