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Total No. of Pages: 02

Total No. of Questions: 09

MCA (2015 & Onwards) (Sem. – 2)

DATA STRUCTURES

M Code: 72878

Subject Code: MCA-203

Paper ID: [72878]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks and students have to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION A

1. How two dimensional arrays are stored in memory. Explain with example.
2. What are the various applications of link list? How is it different from array as a data structure? Explain with examples.

SECTION B

3. Design an algorithm to find out if the binary tree is:
 - a) Strictly binary
 - b) Complete
4. Suppose a binary tree T is in the memory. Write a recursive algorithm or C program which finds the number of nodes in T and which finds the depth of T.

SECTION C

5. How minimal spanning tree for a graph is generated? Explain with an algorithm.
6. Write short notes on
 - a) Adjacency Matrix
 - b) Sub Graph and degree of a graph
 - c) Traversal of a Graph

SECTION D

7. Explain the following Sorting algorithm:

- a) Bubble sorting
- b) Radix sorting

8. Suppose a sequence of numbers is given like:

5, 10, 12, 18, 56, 68, 52, 85, 95

- a) What are the various steps in which the number 52 will be found by the Binary search?
- b) In how many steps the number 52 will be found in the linear search.
- c) In How many steps it will be found in the binary search that the number 83 does not exist in this array.

Explain the algorithm involved in each of the problems a, b, c

SECTION E

9. a) What are the front and rear pointers of queue?
- b) What is the best and average case of binary search?
- c) What is a top pointer of stack?
- d) What is need for Garbage collection?
- e) What is a degree of a graph?
- f) How a binary tree can be represented as array structure?
- g) How a heap can be created?
- h) What is breadth first search?
- i) What is traversal method of a threaded binary tree?
- j) How set is represented in memory?