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Total No. of Pages : 02

Total No. of Questions : 09

MCA (2015 & Onward) (Sem.-2)**DATA STRUCTURES****Subject Code : MCA-203****M.Code : 72878****Time : 3 Hrs.****Max. Marks : 60****INSTRUCTIONS TO CANDIDATES :**

1. **SECTIONS-A, B, C & D** contains **TWO** questions each carrying **TEN** marks each and students has to attempt any **ONE** question from each **SECTION**.
2. **SECTION-E** is **COMPULSORY** consisting of **TEN** questions carrying **TWENTY** marks in all.
3. **Use of non-programmable scientific calculator is allowed.**

SECTION-A

1. a) Define stack. Briefly explain the primitives operations on stack. (5)
b) Explain the working of simple queue. (5)
2. Explain a doubly linked list. What are the pros and cons over a singly linked list? (10)

SECTION-B

3. Write an algorithm to traverse a pre-order Threaded Binary Tree. (10)
4. Write an algorithm to construct a binary tree for the inputs
14, 15, 4, 9, 7, 18, 3, 5, 16, 4, 20, 17, 9, 14, 5

Indicating a message for duplicate members. Draw the tree constructed by the above program. (10)

SECTION-C

5. Write an algorithm for Dijkstra's shortest distance algorithm with example. (10)
6. What is adjacency matrix? Discuss the graph representation using matrix and lists. (10)

SECTION-D

7. Write an algorithm to sort a set of elements using address calculation radix sort. (10)
8. What is Hashing? What are the various hash functions? Discuss each with the help of suitable example. (10)

SECTION-E

9. Write briefly :

- a) Define Omega notation for complexity.
- b) Which linear data structure is not conducive for insertion and deletion?
- c) What is a string? How string is initialized and declared?
- d) Explain the working of simple queue.
- e) Give the node structure of an expression tree.
- f) Define complete b-tree.
- g) Define Heap Sort.
- h) Define Trade-off of Algorithm.
- i) Define Array Pointers.
- j) What are Graph operations?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.