Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

MCA (2019) (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.**

SECTION-A

Q1 What is data structure? Explain different linear and non linear data structures.

Q2 Write notes on the following:

(a) Memory representation of array

(b) Static and dynamic memory management

SECTION-B

Q3 What is binary tree? Write and explain an algorithm to delete an element from B+ tree.

Q4 Define heap. Write various steps to create a heap of following elements:

16 14 3 4 1 9 10 8 2 7

SECTION-C

Q5 Write and explain Dijkstra's algorithm for finding shortest path.

Q6 What is depth first search? Write an algorithm for DFS. Give example to support your answer.

SECTION-D

Q7 What is hashing? Explain various hashing techniques in detail.

Q8 What is bubble sort? Discuss its working principle. Sort the following list of numbers using bubble sort:

4, 212, 376, 12, 52, 115, 35, 6, 98, 62, 34

SECTION-E

Q9 Answer briefly :

(a) What is space time trade off?

(b) What are various advantages of linked list over an array?

(c) What are merits of priority queues?

(d) Define LIFO and FIFO.

(e) What is significance of recursion?

(f) Differentiate tree and graph.

(g) List various tree traversal techniques.

(h) What are different types of trees?

(i) Write average and worst case complexity of merge sort algorithm.

(j) What are weighted and non weighted graphs?

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.