

Roll No.

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.**

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.