

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc. (Computer Science) (Sem.-2)

DATA STRUCTURES

Subject Code : MSC-203

M.Code : 71447

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each 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

Q1. Write a note on following :

- a) Big-O Notation
- b) Problem Analysis

Q2. Convert the following infix expressions to postfix expressions :

- a) $a + \left(\frac{b}{c}\right) - d \uparrow e$
- b) $a \uparrow b * d - c \uparrow e$

SECTION-B

Q3. Write the procedure for deletion of an element from a singly linked list.

Q4. a) Why B⁺ Tree is preferred over B-Trees? Justify.

b) Discuss the steps of insertion of an element in a Binary Search Tree.

SECTION-C

Q5. What is min heap? Write an algorithm for deletion of an element from a min-heap.

Q6. Write the steps of depth first search algorithm by taking a suitable example.

SECTION-D

Q7. Write an algorithm for Linear Search. Discuss its complexity.

Q8. Sort the following list using Quick-sort :

25, 20, 35, 5, 15, 85, 95, 45, 55

SECTION-E

Q9. Answer briefly :

- a) What is meant by priority queue?
- b) Describe an application of graph data structure.
- c) How is dequeue operation performed in a queue data structure?
- d) List two benefits of AVL trees over binary trees.
- e) Discuss one application of Binary Search tree.
- f) Explain briefly the term Garbage Collection.
- g) Name two practical uses of heapsort Algorithm.
- h) What is meant by hashing?
- i) Compare the complexities of bubble sort and merge sort.
- j) What is recursion?

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.