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

Date of Examination : 08-07-22

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 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

1. What do you understand by a Queue? Write an algorithm for inserting anddeleting of a data element from the queue considering all the cases.

2. a) Explain the concept of Big-'O', Notation and time space tradeoff with the help of an example.

   b) Write an algorithm for the conversion of infix expression into postfix expression.

SECTION-B

3. a) Explain the various traversals that can beperformed on Binary search trees with suitable examples.

   b) What are AVL trees and what are their advantages over Binary search trees?

4. a) Write an algorithm to insert and delete an element into a single linked list.

   b) What is the advantage of using a circular linked list over a single linked list. Explain with the help of an example.

SECTION-C

5. Differentiate betweenmax heap and min heap. Also, explain how a node is inserted and deleted from the heap with the help of a suitable example.

6. What is a Graph? Explain various ways in which a graph is represented in the memory.

SECTION-D

7. a) Explain binary search algorithm with the help of an example. Also, compute the complexity of searching an element using Binary search algorithm.

   b) What is hashing? Discuss the various applications of hashing.

8. a) Write an algorithm for Linear search algorithm and compare its performance with the Binary search algorithm.

   b) What is sorting? Explain bubble sort algorithm.

SECTION-E

9. Write briefly :

a) Define Garbage collection.

b) Explain enqueue and dequeue operations.

c) What are priority queues?

d) What are B+ trees?

e) Differentiate betweenbinary trees and binary search trees.

f) Write an application of depth first search.

g) What is the complexity of sorting an array of elements using quicksort algorithm?

h) Define Hash table.

i) Explain the terms Connected graph and Multigraph.

j) Explain recursion with the help of an example.

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.