Roll No. .....

3031

B. Tech. 3rd Semester (CSE) Examination – December, 2022

DATA STRUCTURES & ALGORITHMS

(Only for Dec.2019 Re-Appear Students)

Paper : PCC-CSE-203-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions. Question no. 1 is ***compulsory*** and ***one*** question from each Unit.

1. (a) What is an algorithm ? Also discuss properties of an algorithm ? 2.5

(b) What are the various operations that can be performed on different data structures ? 2.5

(c) What is linked list and what are its types ? 2.5

(d) Explain complexity of algorithms. 2.5

(e) Discuss applications of Binary Trees. 2.5

(f) How is an array different from Linked List ? 2.5

UNIT – I

2. What is an Array ? Discuss the various operations that are allowed on array data structures. Describe the formula for calculating the address of any element of a two dimensional array. 15

3. (a) What is meant by time and space complexity of an algorithm ? Illustrate with suitable examples. 8

   (b) What is Data structure ? Explain the importance of data structures in computer science. 7

UNIT – II

4. What is Circular queue ? Write an algorithm to implement circular queue using array for enqueue (), dequeue () and display () operations. 15

5. (a) Define "STACK". Explain its typical *three* applications. Also explain its PUSH and POP operations with the help of an algorithm. 9

   (b) What is POSTFIX notation ? Also give the postfix notation of the following : 6

   ((A+B) * C/D + E * F)/G

UNIT – III

6. What is Binary Tree ? Explain its types and operations on binary trees. Also explain about threaded binary tree. 15

7. What is doubly linked list ? Describe the procedure for inserting and deleting nodes from double linked list with example. 15

UNIT – IV

8. (a) Write an algorithm that inserts an edge into an undirected graph represented using an adjacency matrix. 8

   (b) Explain selection sorting by taking suitable example. 7

9. Describe the following :

   (a) Insertion Sort 8

   (b) Merge Sort 7
