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MASTER OF SCIENCE (M.Sc) in COMPUTER APPLICATIONS
EXAMINATION : JUNE / JULY- 2022
SEMESTER - I
Sub.: Data Structure and Algorithms (MSC – 104-19)

Date : 02/07/2022	Total Marks : 60	Time: 10.00 am to 12.30 pm

Instruction:

1. *All questions are compulsory unless and otherwise stated.*
2. *Bold figures to the right of every question are the maximum marks for that question.*
3. *Candidates are advised to attempt questions in order.*
4. *Answers written illegibly are likely to be marked zero.*
5. *Use of scientific calculators, Log tables, Mollier Charts is allowed.*
6. *Draw neat and labelled diagram wherever necessary.*

Q. 1.   Answer the following in 2-3 lines. (Any 5)   **(10)**

1. What is front and rear in relation to stack?

2. What are non-primitive Data structures?

3. Differentiate between Algorithm and Pseudo code

4. Define the structure of node of Doubly linked list

5. List out the areas in which data structures are applied extensively?

6. Write the applications of Stack.

7. What does abstract data type means?

Q. 2.   Answer the following in short. (Any 4)   **(20)**

1. Write a Binary Search program

2. Make a BST from the following sequence of numbers.
   5,32,90,34,68,72,15,24,30,66,11,50,10

3. What is dynamic memory allocation? Explain malloc function with example.

4. What is the difference between stack and array?

5. Define tree. Illustrate with example different traversal methods of tree.

6. Explain insertion sort algorithm.

Q. 3.   Answer the following in detail. (Any 3)   **(30)**

1. What are circular queues? Write down routines for inserting and deleting elements from a circular queue implemented using arrays.

2. Define a sparse metrics. Explain the representation of a 4X4 matrix using array

3. Write a c function i) to insert an element at the rear end of a queue ii) to delete an element from the front end of the queue.

4. Illustrate with example the concept of Height of the tree, depth of tree and level of the tree

5. Explain call by value and call by reference with example.