*Total No. of Questions :8]*          *[Total No. of Printed Pages :2*

**Roll No** ...................................

# MCA-203
## M.C.A.  II Semester
Examination, June 2020
### Data Structure
*Time : Three Hours*

*Maximum Marks : 70*

*Note:*  i)   Attempt any five questions.

ii)  All questions carry equal marks.

1.  a)   What is Data Structure? List out the areas where Data Structural are applied extensively.

b)   What is recursion? How does it differ from Neration? Write an algorithm to generate first ten fibonacci numbers recursively.

2.  a)   Write a 'C' program to convert infix expression to postfix expression using stack.

b)   Describe circular queue. Write algorithm to add and delete an item from circular queue.

3.  a)   Briefly explain the following:

i)   Single linked list

ii)  Circular linked list

b)   Write an algorithm that swaps (interchanges) two nodes in a linked list storing integers. The two integers which are to be swapped are passed as parameters for swap operation and the algorithm also checks for error conditions.

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4.  a)  The preorder and in-order traversals of a binary tree are given below, draw the binary tree

    Preorder : J C B A D E F I G H

    Inorder : A B C E D F J G I H

    b)  What is binary tree? Mention the properties of a binary tree.

5.  a)  What is heap sort?  Sort gives data using heap sort.

    45, 24, 36, 50, 9, 90, 81, 30

    b)  Write quick sort algorithm for sorting. What is the average case and worst case time complexity of quick-sort?

6.  a)  Write the differences between linear search and binary search.

    b)  What is hashing? What are different methods of hashing? Explain with example.

7.  a)  What is graph? What are the different methods of graph traversing?

    b)  Describe Kruskal's minimum cost spanning tree algorithm.

8.  Write short notes on any three of the following:

    a)  Bt Tree

    b)  Forest

    c)  Doubly linked list

    d)  Representation of graph in memory

    e)  Chaining

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