MSCCS-07/MSCCS-201/MCA-201

June - Examination 2018

MSCCS-Final/MCA-IInd Year Examination

Data Structure and Algorithm

Paper - MSCCS-07/MSCCS-201/MCA-201

Time : 3 Hours]   **[Max. Marks :- 100**

Note: The question paper is divided into three sections A, B and C. Write answers as per given instructions.

Section - A $10 \times 2 = 20$
(Very Short Answer Questions)

Note: Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

1) (i) What will be the postfix expression of (2+3)*7?

    (ii) List any two applications of stack.

    (iii) What is perfect binary tree?

    (iv) How many edges are there in a complete graph of 5 vertices?

    (v) How to identify the empty queue?

    (vi) What is 3D array? Give an example.

    (vii) What is the worst case complexity to search an element in a binary tree?

(viii) List any two applications of Queue.

(ix) What is adjacency matrix?

(x) Give two examples of DAG (Directed Acyclic Graph).

Section - B $4 \times 10 = 40$
(Short Answer Questions)

Note: Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 10 marks.

2) Design an algorithm, using stack, to read 5 characters from a keyboard and display them in reverse order. Also explain with suitable example.

3) What is Planarity Testing in graph theory? Discuss the algorithm to find a given graph is Planar graph or not?

4) What is B-tree? How to insert a value in a B-tree? Explain.

5) What is doubly linked list? Discuss the implementation of algorithm to create a doubly linked list?

6) How to concatenate a linked list? Show it through an example.

7) Write an algorithm to find Fibonacci sequence of NH member. Also explain the same algorithm with an example.

8) Explain the concept of NP hard and NP complete problems in detail.

9) What is data structure? Explain the difference between linear and nonlinear data structures.

Section - C $2 \times 20 = 40$

(Long Answer Questions)

Note: Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 20 marks.

10) What is Minimum Spanning Tree? Describe Prim's algorithm for minimum spanning tree. Also apply Prim's Algorithm on the weighted graph of your choice.

11) What is Quicksort algorithm? Apply Quicksort algorithm on the following sequence of data (1, 2, 3, 4, 5, 6, 7, 8) and also explain them.

12) Discuss the single source shortest path algorithm also apply the same algorithm on the graph of your choice.

13) Write short note on:

(i)   Greedy Algorithms

(ii) Travelling Salesman Problem

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