MSCCS-07/MSCCS-201/MCA-201

December - 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 do you understand by data structure?

     (ii)   Define Tree.

     (iii)   What do you mean by worst case of complexity of an algorithm?

     (iv)   Give an example of B+ Tree.

     (v)   What is abstract Data Type?

     (vi)   What is Minimum Spanning Tree? Give an example.

     (vii)   What is the worst case complexity of Matrix Multiplication?

     (P.T.O.)

(viii) List any two parameters by which algorithms are optimized.

(ix) Define Graph.

(x) List the two advantages of Quick Sort.

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, to search a number using binary search. Also explain with suitable example.

3) What is Sparse Matrix? Discuss different forms of Sparse Matrix with suitable example.

4) What is queue? Explain the basic operations on queue with example.

5) Convert infix expression X into postfix from showing stack status after every step in tabular form:
X: A + (B * (C – D))

6) How address are calculated using row and column major order of an array? Show it through an example.

7) Write an algorithm to insert a new node at 3rd position in circular linked list. Also explain the same algorithm with an example.

8) Explain the concept Asymptotic Notations in detail.

9) Describe the vertex cover problem with suitable example.

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) Describe the Breath Frist search and Depth Frist search traversal of graph with suitable example.

11) Give the following array : 40, 55, 20, 30, 50, 15, 25 Show the contents of array after each sort listed below:
    (i) Insertion Sort (after 4th iteration).
    (ii) Bubble Sort (after 3rd iteration).
    (iii) Selection Sort (after 4th iteration).

12) Write an algorithm for in order, post order and pre order traversal of a binary tree stored in an array. Test your result with the given array elements values:

    71, 27, 55, 143, 77, 52, 30, 21.

13) Write short note on:
    (i) Dynamic Algorithms
    (ii) Adjacency Matrix

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