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BCA-12

December - Examination 2018

BCA Pt. II Examination

Data Structure and Algorithm

Paper - BCA-12

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 is Asymptotic Notations?

(ii) Define linear and non-linear data structures.

(iii) What is a Stack?

(iv) What is a circular linked list?

(v) Define queues operation.

(vi) What is a bubble sort and how do you perform it?

(vii) Define Searching.

(viii) What is expression tree?

(ix) Define Recursion.

(x) Define Graph. Which methods are used to represent a 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) Define binary search tree. Write an algorithm to implement insertion and deletion operation.

3) Write the difference between DFS and BFS.

4) Explain difference between time Complexity and space complexity.

5) Write a program for implement array based queue? List its applications.

6) What is stack operation? Convert following infix expression into prefix and postfix format

(A + B)*(S (D – E) + F) – G

7) What is priority queue? Give implementation of it.

8) Write functions to implement insert ( ) and traverse ( ) of singly linked list.

9) Explain in brief insertion sort and shell sort.

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) Write merge sort algorithm and derive the expression for its run time complexity in best, average and worst case.

11) What is minimum spanning tree? Constuct the binary tree for the in-order and post order traversal sequence given below.

In order : "INFORMATION"

Post order: "INOFMAINOTR"

12) What is hashing and hashing method? What is the condition for collision? How collision can be resolved?

13) Write short note: (Any two)

(i) Doubly linked list

(ii) Adjacency list and Adjacency matrix

(iii) Quick sort

(iv) Euclid's algorithm