

Roll No. ....

## BCA-302(N)

**B. C. A. (Third Semester)  
EXAMINATION, Dec., 2012**

(New Course)

Paper Second

**DATA STRUCTURE USING C & C++**

*Time : Three Hours ]*

*[ Maximum Marks : 75*

**Note :** Section A is compulsory. Attempt any *seven* questions from Section B and *one* question from Section C.

### Section - A

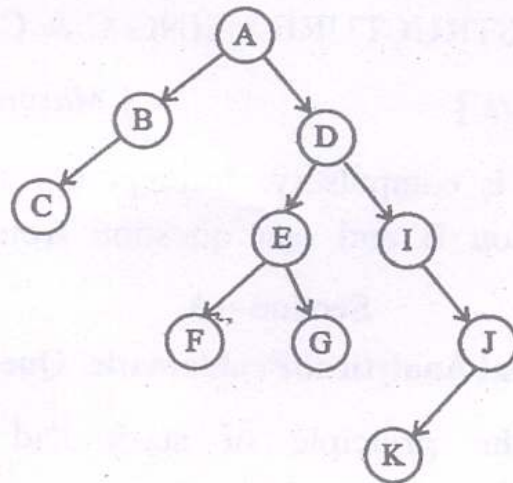
(Numerical/Analytical/Problematic Questions)

1. (i) State the principle of stack and give its two applications. 3
- (ii) Explain two applications of queue and binary tree. 3
- (iii) State different ways of traversing binary tree with example. 3
- (iv) What is the minimum number of nodes in an AVL tree of heights ? 3
- (v) What is Complexity ? Explain with suitable example. 3
- (vi) Merge sort is better than bubble sort. Why ? 3

## Section – B

## (Short Answer Type Questions)

2. Compare the advantage and disadvantage of bubble sort, insertion sort and selection sort. 6
3. Explain the implementation of stack using linked list. 6
4. Write a program to insert and delete an element in a double linked list. 6
5. For a given Binary tree, perform Inorder, Preorder and Post-order traversal. 6



6. Evaluate the following postfix expression using stack : 6  
 $6 \ 10 + 15 \ 7 - * 8 \ 2 - 4 ^ +$
7. What is Heap ? Design an ascending heap from the given array when elements are inserted one by one : 6  
 Array : 31, 97, 20, 71, 83, 62, 51, 41, 12
8. How the following polynomial can be represented using linked list ? Show. 6  
 $8x^3y^3 + 6x^2y - 4xy^2 + 2xy - 2$
9. Explain all the steps of Insertion sort with their complexity. 6

10. What is hash function ? Discuss various techniques of hashing and which one is better. 6

## Section - C

## (Long Answer Type Questions)

11. (a) A binary tree has nine nodes. The inorder and preorder traversal of tree produces the following sequence of nodes : 10  
 Inorder : E A C K F H D B G  
 Preorder : F A E K C D H G B  
 Draw the tree T. 10
- (b) Explain various properties of B tree. How to create an empty B tree ? 5
12. (a) Explain the procedure of Quick sort with example. How can we select a pivot element ? 10
- (b) Discuss the complexity of Merge Sort in all cases. 5