

Roll No.....

BCA-403(O)

B. C. A. (Fourth Semester) EXAMINATION, May, 2013

(Old Course)

Paper Third

DATA STRUCTURE USING "C"

Time : Three Hours]

[Maximum Marks : 75

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

Section - A

1. (a) The preorder and inorder traversal of binary tree are given below. Draw the tree : 5

Inorder : E A C K F H D B G

Preorder : F A E K C D H G B

- (b) Find postfix equivalent of the given infix expression using stack : 5

Q : ((A + B) * D) ↑ (E - F)

2. (a) Evaluate the given postfix expression P using stack : 5

P : 12, 7, 3, -, 1, 2, 1, 5, +, *, +

- (b) Let n denote a positive integer. Suppose a function L is defined recursively as follows : 5

$$L(n) = \begin{cases} 0 & \text{if } n = 1 \\ L(\lfloor n/2 \rfloor) + 1 & \text{if } n > 1 \end{cases}$$

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Here $[k]$ denotes the "floor" of k , that is, the greatest integer which does not exceed k .

(i) Find $[(25)]$

(ii) What does this function do ?

Section - B

3. What is Linked List ? Define the types of linked list and explain each type of linked list in brief. 6
4. What is Markov algorithm and explain each step by taking an example. 6
5. Explain about divide and conquer method and also explain Merge sort using divide and conquer method. 6
6. Write an algorithm for binary search. Apply your algorithm on the given array to find 78. 6

22, 36, 12, 78, 66, 50, 45, 88, 98

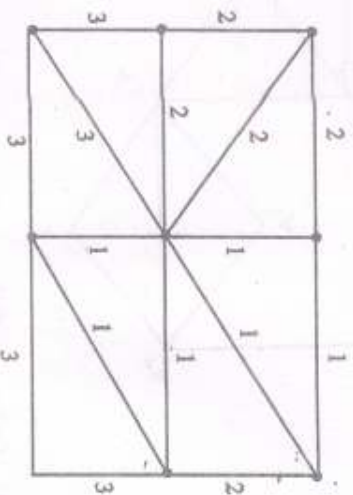
7. Write advantages of circular queue over simple queue implemented as array. Illustrate pictorially. 6
8. What is a descending heap ? Create a descending heap for the following : 6
 $L = \{20, 10, 5, 4, 25, 70, 60, 40\}$
9. What is Hashing ? Give any two methods to resolve collision. 6
10. What do you mean by Binary Search Tree ? Construct a BST with the following values : 6

50, 33, 44, 22, 72, 35, 60, 40

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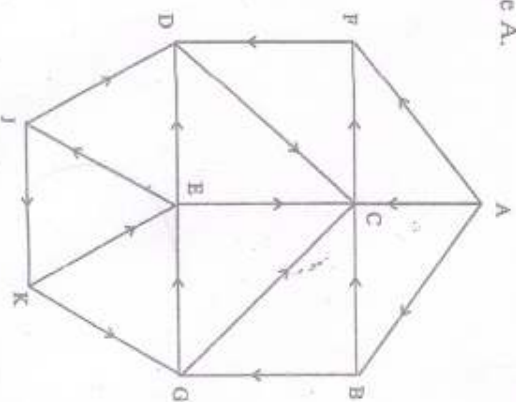
11. What is Minimum Spanning Tree ? Find the minimum spanning tree of the given graph using Kruskal's algorithm. 6



12. Define the following terms : 6
 (a) Circular queue
 (b) Adjacency matrix

Section - C

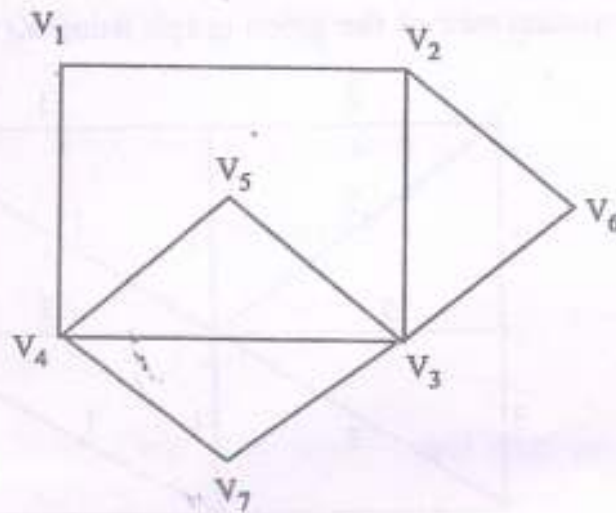
13. Give DFS and BFS of the following directed graph starting with node A. 13



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14. (a) Give the adjacency matrix and adjacency list representation for the following graph : 6



- (b) Define an AVL tree. Create an AVL tree with the following set of inputs : 7

37, 28, 32, 40, 21, 34