Printed Pages : 4

EEC012

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131652

Roll No.

B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15

DATA STRUCTURE

Time : **2** Hours]   [Total Marks : **50**

Note :   (1)   Attempt all questions.

(2)   All questions carry equal marks.

1   Attempt any two parts :   **5x2=10**

(a)   Explain the time and space trade-off of algorithm with an example. What do you understand by the efficiency of an algorithm?

(b)   The preorder and inorder traversal of binary tree is given below, construct the tree

preorder : A B F C D E inorder : B F A D C E

(c)   Draw a graph with five vertices each of degree 4.

Define the terms :

(i)   Complete graph

(ii)   Leaf and non-leaf nodes

(iii)   Adjacency matrix.

2 Attempt any two parts : 5x2=10

(a) What are the various tree traversal techniques? Write the recursive C function/algorithm for any two traversal techniques.

(b) Define Digraph. Draw the weighted directed graph which is represented by the adjacency matrix below.

	A	B	C	D	E
A	0	5	8	0	0
B	3	0	6	0	0
C	0	3	4	1	0
D	0	6	7	0	0
E	0	0	0	0	0

(c) Construct an AVL tree with the following keys: 35, 36, 80, 85, 67, 89, 25, 16, 10, 14, 14.

3 Attempt any two parts : 5x2=10

(a) Sort the following numbers using HEAP SORT on the given array

A=<9, 17, 4, 26, 3, 12, 22, 8, 15>

(b)   For the given tree, find the following :

    (i)   Name the ancestors of node J

    (ii)   Name the descendants of node C

    (iii) Height of the entire tree

    (iv) Inorder of the tree

    (v)   Make tree for algebraic expression
a*b/(c+d)*e+f-g/h+x-k
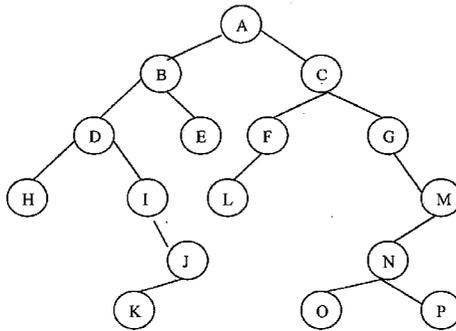
(c)   Define minimum cost spanning tree. Differentiate between Prim's algorithm and Kruskal's Algorithm.

4   Attempt any two parts :   **5×2=10**

(a)   Write an algorithm/C function for sorting a set of integers using quick sort. What is its best case complexity?

(b)   Construct the BST for following insertion in order: 13,25,16,78,56,67,45,44,22,13,50,20,18,7,90. Show the steps.

(c)   Write short notes on any two :
    (i)   Expression Trees.
    (ii)   B Trees.
    (iii) Activity Network.

5   Attempt any two parts :   **5x2=10**

    (a)   Compare the advantages and disadvantages of using array and linked list.

    (b)   Define a queue. How does it differ from a stack? Write two applications of a queue.

    (c)   Write the steps of Warshall's Shortest path algorithm.

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