October-2015

M.C.A. Semester:- 2 Examination

Paper Code: 2911 Paper Title: Data Structure and Algorithms

Time: 2:30 Hours Marks: 70

Q1 Answer any FIVE from the following: [10]

a. What are the basic types of sorting?

b. Define complete binary tree and strict binary tree.

c. List out the disadvantages of radix sort.

d. Convert the following infix notation into the prefix notation
(A $ B $ C) * (D – E + F) * G / H + I

e. Differentiate prim's algorithm and kruskal algorithm.

f. Give the differences between static and dynamic memory allocation.

g. Define data structure.

Q2 Answer any FIVE from the following: [15]

a. Write down the algorithm of PUSH operation on stack.

b. Explain priority queue with example.

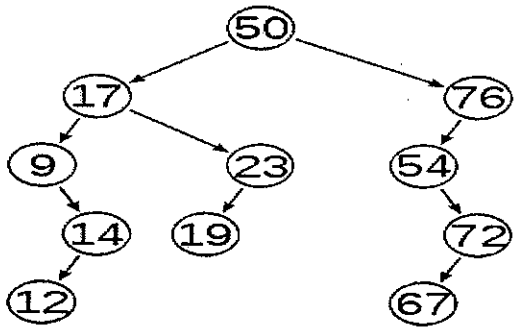
c. Discuss time complexity and space complexity.

d. Give algorithm of bubble sort.

e. What do you mean by implicit and explicit constraints?

f. Apply the maxmin algorithm on given data:
5, 30, 24, 87, 14, 2, 37, 76, 55

g. Give the preorder, postorder and inorder traversal of given binary tree.



Q3 Answer any FIVE from the following: [25]

a. Consider the below given graph, apply graph coloring on it and calculate the chromatic number for the graph.

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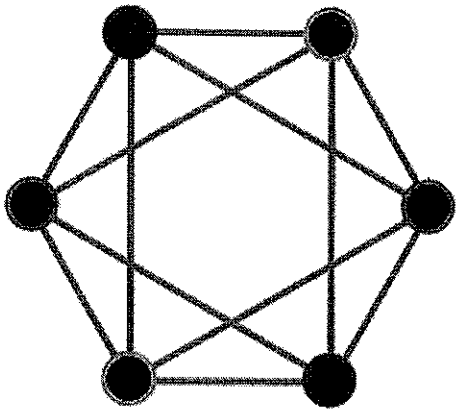

b. Prepare height balanced binary tree using given data.
35, 45, 70, 11, 7, 77, 68, 99

c. Apply the insertion sort on given data elements.
40,10,25,8,3,22

d. Why circular queue is required? Give algorithms of circular queue insertion and deletion operation.

e. Find out optimal as well as feasible solutions for given job sequencing with deadline problem.
N = 6 Profit = (200, 179, 130, 200, 98, 170) Deadline = (2, 1, 3, 1, 2, 4)

f. Given an algorithm of nqueen problem.

g. Write down the algorithm of knapsack problem.

Q4 Answer any TWO from the following: [20]

a. Write a program that creates two singly circular linked lists, after that apply merge operation on them.

b. Apply the prim's algorithm on given graph and then find out the minimum cost spanning tree from it.
(a,b)=16 (a,d)=4 (b,c)=18 (c,d)=8 (c,e)=6 (d,e)=7 (d,f)=8 (e,f)=5 (a,c)=11

c. Discuss the merge sort algorithm.