SUBJECT CODE NO:- K-26
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CSE/IT) Examination Oct/Nov 2016
Design & Analysis of Algorithms
(Revised)

**[Time:Three Hours]**   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B   i) Q1 & Q6 are compulsory.
             ii) Attempt any two questions from the remaining questions from each section.

<u>Section A</u>

Q.1   Attempt any five: 10
       a) What is asymptotic time complexity
       b) Analyze time complexity:
           for (i=1 to n)
               for (j=1to m)
                 sum =sum+ A(i,j)
       c) Explain divide & conquer method-
       d) What are constraints of knapsack problem?
       e) Explain Huffman coding.
       f) What is optimal & feasible solution?
       g) State single source shortest path problem.

Q.2   a) Explain time complexity for successful & unsuccessful searches for binary search.   08
       b) Write merge sort algorithm using DnC   07

Q.3   a) Find the smallest & largest element using DnC. Draw recursive calls tree.   07
       b) Solve the knapsack problem using greedy method N=4 , M=5, profits = (12,10,20,15) , 08
           weights ={2,3,1,4}

Q.4   a) Define optimal storage on tapes problem & solve for n=3,(L1,L2,L3) = (7,12,5)   08
       b) Explain Matrix multiplication Using Dnc.   07

Q.5   a) What is minimum cost spanning tree .write any algorithm to find MCST.   07
       b) Find MCST for given graph.   08

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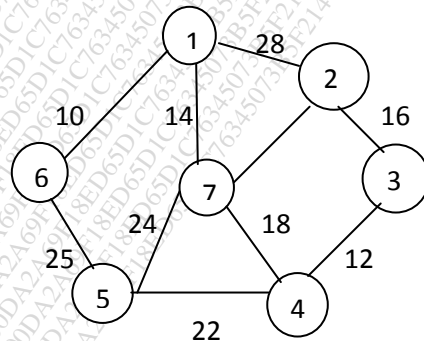
Section-B

Q.6   Attempt any fine:-   10
      a) Define dynamic programming
      b) Define principle of optimality.
      c) Define state shape tree & answer states.
      d) Explain line and dead nodes.
      e) What are the searching methods that are commonly used in branch & bound method
      f) State 8-queen's problem.
      g) What is traveling salesperson problem.

Q.7   a) What is Hamiltonian cycle –solve the given problem using DP.   09

$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

      b) Write an algorithm for all pairs shortest path problem.   06

Q.8   a) Explain graph coloring problem using backtracking. Color the given graph using 3 colors.   08
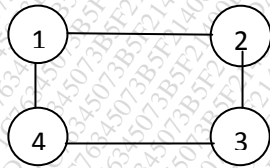
      b) Explain sum of subsets by taking suitable example using backtracking.   07

Q.9   a) Determine optimal binary search tree for n=4 (a1, a2,a3,a4) =(do, if, int, while)   10
         p(1:4) = (3,3,1,1)   q(0:4) = (2,3,1,1,1)
      b) Explain connected & disconnected components.   05

Q.10   a) Solve 4-Queens problem using FIFO branch & bound.   08
      b) Explain 15 –puzzle problem by taking suitable example.   07

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