SE/comp/semIV/
Analysis of Algorithm & Design

ws Oct-10 Scan 24
Con. 6221–10.

20/12/10
GT–6462

(3 Hours)   [Total Marks : 100]

N.B. : 1) Question No. 1 is compulsory.

2) Attempt any four out of remaining six questions.

3) Assume Suitable data.

4) Figures to right indicate full marks.

1. (a) Explain Big-oh, Omega and Theta Notations with the help of diagram. How do we analyze and measure time complexity of algorithm?   10

   (b) Calculate variable length Huffman Code for the following frequencies:

   A=1   B=2   C=1   D=4   E=8   F=3   G=14   H=22   10

2. (a) Prove that for the Quick Sort,   10
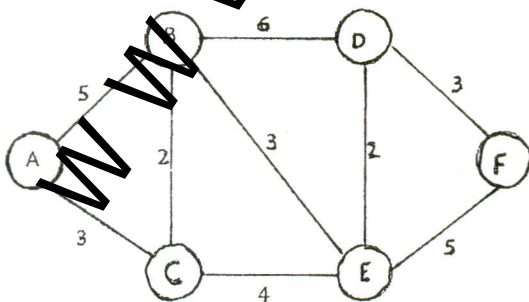   i) Worst Case efficiency is $T(N) = O(N^2)$
   ii) Best Case efficiency is $T(N) = O(N \log N)$

   (b) Explain the strassen's Matrix Multiplication.   10

3. (a) Find MST of following graph using Prim's and Kruskal's Algorithm.   10

   (b) Explain optimal storage on tape with example.   10

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4.(a) Explain Hamiltonian Cycle and give an algorithm to find all   10

   Hamiltonian cycle.

 (b) Consider the following instance of the Knapsack problem: 10
      No. of objects n=3 ,knapsack capacity m=20 , profits
      (p1,p2,p3)=(25,24,15) and weights (w1,w2,w3)=(18,15,10).

      Find out the optimal solution using greedy method.

5.(a) Describe 8 queen Problem .Write an algorithm using backtracking   10

   to solve this problem.

 (b) What is Travelling Salesman problem .How to solve the same   10

   problem using Branch and Bound. Explain with example.

6. (a) Describe the advantages of Dynamic programming . How it differ   10

   from Divide and Conquer.

 (b) Sort the following list of elements in ascending order using merge   10

   sort technique. Give output of each pass.

   90 20 80 89 70 65 85 74

7.(a) Define the Knuth –Morris –Pratt Algorithm for string matching .   10

   Write a function to implement the concept of the same algorithm.

 (b) Write short note on:(Any two).   10

   i) Tries

      ii) Job Sequencing with Deadlines

      iii) Randomized Algorithms.