4/6/2012

SEM-IV(R) - Comp - May 2012
Analysis of algorithm & design.

1 : 1st half-12-(Con-4608)JP

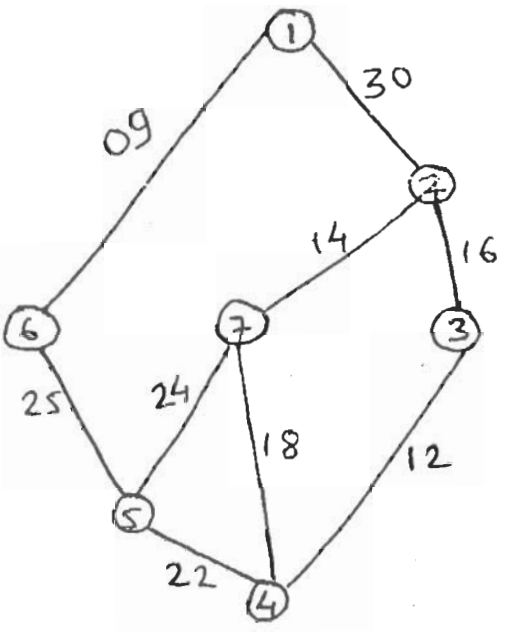
Con. 4608-12. **GN–8795**

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory**.
(2) **Attempt** any **four** questions from remaining **six** questions.
(3) Assumption made should be **clearly** stated.
(4) Assume **suitable** data whenever **required**.

1. (a) Explain Big-oh, Omega and Theta Notations with help of example. How do we analyse and measure time and space complexity of algorithms ? **10**
   (b) Construct the Optimal Binary Search Tree for the identifier set **10**
   (a_1, a_2, a_3, a_4) = (cout, float, if, while).
   with P (1:4) = $\left(\frac{1}{20}, \frac{1}{5}, \frac{1}{10}, \frac{1}{20}\right)$ and q(0 : 4) = $\left(\frac{1}{5}, \frac{1}{10}, \frac{1}{5}, \frac{1}{20}, \frac{1}{20}\right)$.

2. (a) Explain Flow Shop Scheduling with help of suitable examples. **10**
   (b) Write down Prim's Algorithm and solve following problem :— **10**



3. **(a)** Write Randomized Quick Sort Algorithm and explain with help of example. **10**
   (b) Explain 0/1 Knapsack problem using Branch and Bound Method. **10**

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4. (a) Describe Traveling Salesperson Problem. Explain how to solve using Branch and Bound Method. **10**

   (b) Write algorithm of Sum of Subsets. Solve following problem and draw portion of state space tree. **10**

   w = {5, 7, 10, 12, 15, 18, 20} and m = 35. Find all possible subsets of w that sum to m.

5. (a) Explain Strassen's Matrix multiplication and derived its time complexity. **10**

   (b) Write down Knuth-Morris-Pratt Algorithm. **10**

6. (a) Write algorithm of Job Sequencing with Deadlines. Solve the following problem n = 5. **10**

   $(P_1, P_2, P_3, P_4, P_5) = (20, 15, 10, 5, 1)$ and

   $(d_1, d_2, d_3, d_4, d_5) = (2, 2, 1, 3, 3)$.

   (b) Explain Hamiltonian Cycles Algorithm, and draw static space tree. **10**

7. Write short notes on (Any **four**) :— **20**

   (a) Tries

   (b) Randomized Algorithm

   (c) N-Queens Problem

   (d) Bellman and Ford Algorithm

   (e) Optimal Storage on Tapes.