

Time Duration: 03Hrs

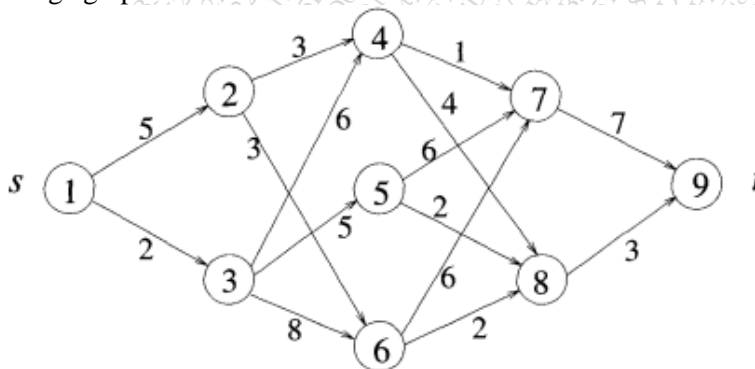
Marks: 80

Note: Question 1 is compulsory.

Attempt any three out of remaining five questions.

Make suitable assumptions whenever necessary.

- Q.1 [a] Explain the Strassen's matrix multiplication concept with an example. [10]  
 Derive its time complexity.
- [b] Apply the quick sort algorithm to sort the list. E,X,A,M,P,L,E in alphabetical order. Analyze the best case, worst case and average case complexities of quick sort. [10]
- Q.2 [a] Solve following problem of sum of subset 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  $m$ .
- [b] What is single source shortest path algorithm. Write an algorithm to find single source shortest path using greedy methods [10]
- Q.3 [a] Prove that vertex cover problem is NP complete. [10]  
 [b] Explain various string matching algorithms. [10]
- Q.4 [a] Find the minimum cost path from  $s$  to  $t$  in the following figure using multistage graph. [10]



- [b] Describe the Travelling sales person problem and discuss how to solve it using dynamic programming with example. [10]
- Q.5 [a] What is longest common subsequence problem? Find the LCS for the following problem. [10]  
 [b] Write a short note on 8 queen problem, Write an algorithm for the same. [10]
- Q.6 Write a short note on (Any two)
1. Branch and Bound Strategy. [10]
  2. Algorithms to find minimum spanning tree. [10]
  3. Recurrences.