

Roll No.

Total Pages : 03

BT-6/M-19

36017

ANALYSIS AND DESIGN OF ALGORITHM

IT-352

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

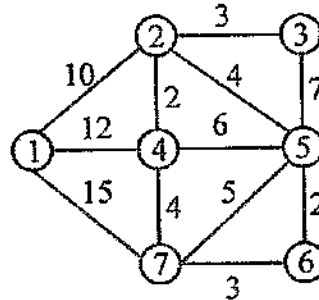
1. (a) Write an algorithm for binary search and analyse the algorithm for its time complexity. 10
- (b) Elaborate on Asymptotic Notations with examples. 10
2. (a) What is divide and conquer strategy and analyse quick sort algorithm for best, average and worst case. 10
- (b) Briefly explain the steps in mathematical analysis of recursive algorithms. 10

Unit II

3. (a) Explain how dynamic programming is applied to solve travelling salesman problem. Explain with sample graph. 10

- (b) List the characteristics of greedy algorithm. Solve knapsack problem where :
 $m = 10$, $n = 4$, $p = (40, 42, 25, 12)$,
 $w = (4, 7, 5, 3)$

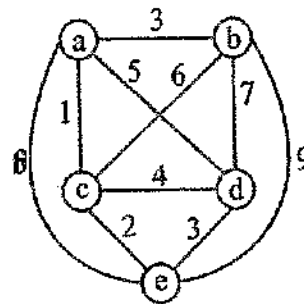
4. (a) Compute minimum cost spanning tree for following graph : 10



- (b) Explain chain matrix multiplication with example. 10

Unit III

5. (a) Solve the travelling salesman problem of following figure using branch and bound algorithm. 10



- (b) Explain back tracking concept. Illustrate N queens problem using back tracking to solve 8-queens problem. **10**
6. (a) Explain LC Branch and bound and FIFO branch and bound. **10**
- (b) Let $n = 4$ and $m = 15$. The profits for instances are $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$ and the weights are $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$. Explain 0/1 knapsack problem using LC branch and bound technique on above example. **10**

Unit IV

7. (a) Explain in detail the graph traversals. **10**
- (b) What is Binary search tree ? Write algorithm for insertion in BST. **10**
8. (a) Explain the need for approximation algorithms and show they can be used for MP hard problems. **10**
- (b) Explain various basic operations on B-Trees. **10**