

BT-6/M-23

46216

ANALYSIS AND DESIGN OF ALGORITHMS

Paper-PE-IT-S310A

Time : Three Hours]

[Maximum Marks : 75

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

UNIT-I

1. (a) What is the difference between algorithm and pseudo-code? What are the properties of algorithm? Discuss the time complexity of quick sort.
(b) Write the algorithm for matrix multiplication and determine the time complexity of the algorithm using step count method.
2. (a) What are the advantages and disadvantages of Divide - And - Conquer? Write divide and conquer recursive algorithm of binary search and compute its time complexity.
(b) Give the Big - O notation definition and briefly discuss with suitable example.

UNIT-II

3. (a) What is the difference between Dynamic Programming and divide and conquer method? Discuss the time and

space complexity of dynamic programming algorithm of travelling sales person problem.

- (b) What is Knapsack problem? What is the greedy algorithm? Discuss the use of greedy method for 0/1 Knapsack problem.
4. (a) What is dynamic programming? Write the matrix chain algorithm using dynamic programming.
- (b) Discuss the implementation of Longest Common Subsequence (LCS) using dynamic programming. Also discuss its time complexity.

UNIT-III

5. (a) What is backtracking algorithm? Can Backtracking be used for knapsack problem? Illustrate.
- (b) What is N queen problem? Write the algorithm to solve N queen problem using branch and bound. (6)
6. (a) Write a detailed note on FIFO branch and bound. Use suitable example.
- (b) What is the difference between Least Cost branch and bound and FIFO branch and bound? Explain.

UNIT-IV

7. (a) Define graph. Differentiate between depth first and breadth first algorithm for graph traversal.
- (b) What is B tree? What are its applications? Discuss the insertion and deletion operation in B tree using suitable examples.

8. (a) What do you understand by Binary Search Tree (BST)? What are its applications? Write the algorithm for insertion and deletion of node in BST.
- (b) What is meant by NP hard problem? Is knapsack problem NP hard? Discuss.

