Roll No. ..... Total Pages : 2

OMCAM/D-21 24041

DESIGN AND ANALYSIS OF ALGORITHMS

Paper-MCA-14-33

Time Allowed : 3 Hours] [Maximum Marks : 80

Note : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What is meant by Complexity of algorithms ?

   (b) Comment on the complexity of Radix sort.

   (c) What is a Binary Search Tree ?

   (d) What is meant by Matrix Chain multiplication ?

   (e) What is a Knapsack problem ?

   (f) What is Negative Weight Cycle ?

   (g) What is meant by NP-hard problem ?

   (h) What is Reducibility ? 8×2=16

UNIT–I

2. Write and explain the Quick sort and Radix sort algorithms for sorting. Also analyse the algorithms. 16

3. What is a Recurrence equation ? Explain various methods to solve a recurrence equation using suitable examples. 16

UNIT–II

4. What is Hashing ? Explain various Hash function. How collisions are handled in Hashing ? Explain using suitable examples. 16

5. Discuss various elements of Dynamic programming. How can you solve the problem of Optimal Binary Search Trees using Dynamic Programming ? 16

UNIT–III

6. Discuss various elements in Greedy Technique. How can you solve activity selection problem using Greedy Technique ? Explain. 16

7. Write and explain Dijkstra's and Floyd Warshall's algorithms in detail. 16

UNIT–IV

8. (a) How can you string in Computer memory ? Explain in detail. 8

   (b) How can you solve Bin-Packing problem ? Explain. 8

9. (a) Write and explain Rabin-Karp algorithm for string matching. 8

   (b) Write a short note on approximation algorithms. 8