

Roll No. 202121821a

Total Pages : 02

BT-5/D-23

45176

ADVANCED ALGORITHMS

PE-CS-T307A

Time : Three Hours]

[Maximum Marks : 75

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

**Unit I**

1. (a) Write algorithm for binary search tree. Write the time complexity of binary search (all cases). 8
- (b) Discuss the various methods for solving Recurrence. 7
2. (a) Explain Master Theorem with suitable example. 7
- (b) Discuss the role of various notations used in algorithm analysis with example. 8

**Unit II**

3. (a) Write short note on activity selection problem. 7
- (b) What is knapsack problem ? How can it be resolved ? 8
4. (a) Write and discuss algorithm for matrix chain multiplication. 7
- (b) Define Hiring Problem. Discuss its probabilistic analysis. 8

### Unit III

5. (a) Write and explain all pair shortest path-Floyd Warshall Algorithm. 7
- (b) Differentiate DFS and BFS with suitable example. 8
6. (a) Write and discuss the significance of Dijkstra's Algorithm 7
- (b) Differentiate Kruskal and Prim algorithms with example. 8

### Unit IV

7. Which string is accepted by the finite automata and which string is not accepted by the finite automata ? Explain with suitable example. Discuss, how can we use a finite automata to search a string ? 15
8. Write and explain the following :  $2 \times 7.5 = 5$
- (i) Knuth-Morris-Pratt Algorithm.
- (ii) Rabin-Karp Algorithm.