

Roll No. 2021218234

Total Pages : 02

BT-4/M-24

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# DESIGN AND ANALYSIS OF ALGORITHMS

Paper : PC-CS-208A

Time : Three Hours]

[Maximum Marks : 75

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

## Unit I

1. (a) What are Asymptotic Notations ? Also explain its types. 10
- (b) Explain the term Time and Space Complexity. 5
2. What do you mean by Analyzing Algorithms ? Analyze any sorting algorithm and find its complexity. 15

## Unit II

3. Write Algorithm for Longest Common Subsequence and explain it with the help of example. 15
4. What are Splay trees and Red-Black trees ? Write algorithms for insertion and deletion in Red-Black trees. 15

### Unit III

5. (a) Explain Topological Sort with the help of example. 7.5
- (b) Write Algorithm for Breadth First Search and explain it. 7.5
6. (a) What are NP-hard and NP-complete classes? Explain. 5
- (b) Explain the concept of Relaxation and write Dijkstra's algorithm. 10

### Unit IV

7. Write Ford Fulkerson algorithm and explain it with the help of example. 15
8. Explain the following terms : 15
- (i) Maximum Bipartite Matching
  - (ii) Merging Network
  - (iii) Bitonic Sorting Network.