

**BT-4/M-24**

**44154**

**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. All questions carry equal marks.

**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: **15**
- i) Maximum Bipartite Matching
  - ii) Merging network
  - iii) Biotonic sorting network.
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