BT-4/M-23　　44154

DESIGN AND ANALYSIS OF ALGORITHMS
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 ? Explain all notations in detail. **10**

   (b) Explain the concept of Strassen Multiplication. **5**

2. What do you mean by Recurrence ? Write Master Theorem for solving Recurrence. **15**

Unit II

3. Write Algorithm for Matrix Chain multiplication and explain it with the help of example. **15**

4. What are Red-Black trees ? Write algorithms for insertion and deletion in Red-Black trees. **15**

Unit III

5. (a) What are strongly connected components ? Explain. **7.5**

   (b) Differentiate between Breadth first search and Depth first search. **7.5**

6. (a) Illustrate the concept of NP-hard and NP-complete classes. **5**

   (b) Explain the concept of Relaxation and write Bellman Ford algorithm. **10**

Unit IV

7. Explain the terms Residual networks, Augmenting paths and Cuts and write Ford Fulkerson Algorithm. **15**

8. Explain the following : **15**
   (i) Zero-one principle
   (ii) Comparison network
   (iii) Bitonic sorting network.