

Roll No. ....

Total No. of Pages : 2

BT-5/D05

8919

**Design and Analysis of Algorithms**

Paper : CSE-301

Time : Three Hours]

[Maximum Marks : 100

**Note :—** Attempt any **FIVE** questions, selecting at least **ONE** question from each unit.

**UNIT-I**

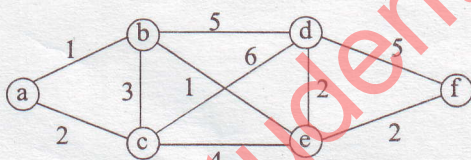
1. (a) Explain divide and conquer technique. How can this technique be used to find the minimum and maximum element out of  $n$  given elements ? 12
- (b) Explain the use of asymptotic notations in the analysis of algorithms with the help of examples. 8
2. (a) What is recurrence ? Explain the different methods for solving a recurrence relation. 8
- (b) Write a procedure to implement stack using linked-list. Show that PUSH and POP takes  $O(1)$  time. 12

**UNIT-II**

3. (a) Compare and contrast Binomial heap and Fibonacci heap. 10
- (b) Discuss the task scheduling problem. 10
4. (a) What are the different operations that can be performed on disjoint sets ? Explain with the help of examples. 10
- (b) Discuss the 0/1 knapsack problem. 10

**UNIT-III**

5. What is the minimum spanning tree ? Explain the Krushkal algorithm to find the minimum spanning tree for the below given fig. 20



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(Contd.)



6. (a) Write and discuss the Dijkstra algorithm to find shortest path. 10
- (b) Compare and contrast Depth first search and Breadth first search algorithms. 10

#### UNIT-IV

7. Write and explain Ford-Fulkerson algorithm with the help of suitable example. 20
8. Discuss the following :
- (a) Zero-one principle 5
- (b) Maximum Bipartite Matching 5
- (c) Merging networks 5
- (d) Flow networks. 5

