

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

M.Sc. DEGREE EXAMINATION – COMPUTER SCIENCE

FIRST SEMESTER – November 2009

**CS 1810 - DESIGN & ANALYSIS OF ALGORITHM**

Date & Time: 04/11/2009 / 1:00 - 4:00 Dept. No.

Max. : 100 Marks

**PART - A: ANSWER ALL THE QUESTIONS**

**10X2 = 20**

1. Define Algorithm and its characteristics.
2. Write a note on algorithm efficiencies?
3. Write the algorithm to perform Selection sort.
4. What is meant by Optimal Solutions?
5. Compute  $C(7,5)$  by applying Dynamic Programming algorithm.
6. Define Transitive Closure. Give example.
7. How does Branch-and-Bound technique differ from Backtracking?
8. Solve the following instance of the Subset Sum problem.  
 $S=\{1,4,6,7\}$  and  $d=11$
9. What are class P-Problems?
10. Write a note on Approximation algorithms.

**PART - B: ANSWER ALL THE QUESTIONS**

**5X8 = 40**

11. a) Explain the data structures important for designing the algorithms.  
(OR)  
b) Explain how can you compare and Rank the order of Growth of efficiency of the algorithm.
12. a) Explain with an example Quick sort algorithm.  
(OR)  
b) How do you find the Shortest path between two given vertices using Dijkstra's algorithm? Explain.
13. a) Discuss Floyd's algorithm with an example.  
(OR)  
b) Explain how to solve Knapsack problem using Dynamic Programming technique.

14. a) What do you mean by Hamiltonian circuit in a graph? Explain how to apply Backtracking to get a Hamiltonian circuit of a graph.

(OR)

b) Explain with an example solving of Assignment Problem using Branch-and-Bound technique.

15. a) Discuss the concept of Depth First Search algorithm with a suitable example.

(OR)

b) Discuss the use of Approximation algorithm for solving Knapsack problem.

**PART - C: ANSWER ANY TWO QUESTIONS**

**2X20 = 40**

16. a) Explain the tools for analyzing the efficiency of Non-Recursive and Recursive algorithms. (10)

b) Explain with an example the performance of Merge sort algorithm. (10)

17. a) Discuss the Prim's algorithm with an example to construct Minimum Cost Spanning tree. (10)

b) Explain the algorithm to form Optimal Binary Search tree. (10)

18. a) Solve the n queen's problem using backtracking technique and represent the state space tree. (10)

b) Describe the Travelling Salesman Problem and discuss how to solve it using approximation algorithm. (10)

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