Total No. of Questions : 8] [Total No. of Printed Pages : 2

Roll No ....

MCA-404

M.C.A. IV Semester

Examination, November 2019

Design and Analysis of Algorithms

Time : *Three Hours*

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What do you mean by worst case, average case and best case of an algorithm? 7

   b) How time complexity of an algorithm can be calculated? Give suitable examples. 7

2. a) Explain quick sort algorithm. What are its advantages and disadvantages? 7

   b) Explain Strassen's matrix multiplication determine its time complexity. 7

3. a) Explain various graph traversal techniques. 7

   b) Explain greedy method. What are the general properties of greedy method? 7

4. a) Explain prims algorithm. Find its complexity. 7

   b) Find an optimal solution to the following knapsack problem. 7

   Number of objects = n = 4

   Knapsack capacity = M = 8

   Profits $(P_1, P_2, P_3, P_4) = (15, 10, 9, 5)$

   Weights $(W_1, W_2, W_3, W_4) = (1, 5, 3, 4)$

5. a) How a travelling sales person problem can be solved by using Least Cost Branch and Bound (LCBB) technique? Explain. 7

   b) Explain Merge sort. What is its complexity? 7

6. a) Differentiate between dynamic programming and divide and conquer method. 7

   b) Explain 8 queens problem and write algorithm to solve this using back tracking. 7

7. a) What factors determine the efficiency of back tracking algorithm? 7

   b) What do you understand by NP, hard and NP, complete classes? 7

8. Write short notes on any two : 14

   a) Minimum spanning tree.

   b) Combinational algorithms

   c) Structure of divide and conquer algorithms.

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