

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-V EXAMINATION – WINTER 2018

Subject Code: 3650001

Date: 15/11/2018

Subject Name: Design & Analysis of Algorithms

Time: 10.30 am to 1.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) 1) Give the difference between greedy algorithms and Dynamic Algorithms. **03**
2) Explain how the efficiency of an iterative algorithm can be increased? **02**
3) What do you mean by Decrease and conquer? Give examples **02**
- (b) I) Define the following terms **04**
1) Algorithm
2) Optimal Solution
3) Pruning
4) Space Complexity
II) Define recursion. What are the advantages of using recursion and discuss about its implementation issues. **03**
- Q.2** (a) What do you understand by analysis of algorithm? Write a note on Asymptotic notations. **07**
- (b) Explain the algorithm using D & C method to multiply two large matrices. **07**
- OR**
- (b) Explain the use of D & C technique for Binary Search Method. Give the algorithm for the same. Give its time complexity for its best, average and worst cases. **07**
- Q.3** (a) Define MST. Explain Kruskal's Algorithm. How to solve it using union-find Data structure. **07**
- (b) Using greedy algorithm find an optimal scheduling for the following jobs to be completed in given deadlines. **07**
P(3,5,18,20,6,1,38)
D=(1,3,3,4,1,2,1)
- OR**
- Q.3** (a) Explain Dijkstra's Shortest path Algorithm **07**
- (b) Find Longest common subsequence for the following data **07**
X= ABCBDA
Y=BDCABA
Also discuss the algorithm.
- Q.4** (a) Explain matrix chain multiplication algorithm. Find out minimum number of multiplications required for multiplying matrices A[1 X 5], B[5 X 4], C[4 X 3], D[3 X 2], E[2 X 1]. Also give the optimal parenthesization of matrices **07**
- (b) Write a note on BFS and explain it giving an example. **07**
- OR**

Q.4 (a) Explain Rod Cutting problem. Find the maximum profit for the following data. **07**

Length of the rod = 5

Profit for 4 cuts of unit 1,2,3,4 are 2,5,9,8

Also give the algorithm for the same.

(b) Write a note on DFS and explain it giving an example. **07**

Q.5 (a) Write a note on 8 – puzzle problem **07**

(b) Write a short on TSP. How it can be solved using branch and Bound strategy? **07**
Explain it with an example

OR

Q.5 (a) Explain Branch & Bound strategy to solve a problem and explain 0-1 knapsack problem **07**

(b) Write a note on N, NP-hard and NP complete algorithms. **07**
