Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- Vth SEMESTER–EXAMINATION – MAY/JUNE - 2012

Subject code: 150703 **Date: 04/06/2012**

Subject Name: Design and Analysis of Algorithms

Time: 02:30 pm – 05:00 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 Answer the following. **14**

(i) Compare Iterative and Recursive algorithm to find out Fibonacci series.

(ii) Explain why analysis of algorithms is important? Explain: Worst Case, Best Case & Average Case Complexity.

(iii) Explain characteristics of Greedy Algorithm.

(iv) What is Principle of Optimality? Explain its use in Dynamic Programming Method.

Q.2 **(a)** Write a program/algorithm of Selection Sort Method. What is Complexity of the method? **07**

(b) Explain Quick Sort Method with example. **07**

OR

(b) What is Divide and Conquer Technique? Give the use of it for Binary Searching Method. **07**

Q.3 **(a)** Define Minimal Spanning Tree(MST). Explain Krushkal's Algorithm to find MST with example. **07**

(b) Solve Making Change problem using Dynamic Programming. (denominations: d1=1,d2=4,d3=6). Give your answer for making change of Rs. 8. **07**

OR

Q.3 **(a)** Explain Dijkstra's algorithm to find minimum distance of all nodes from a given node. (Greedy algorithm) **06**

(b) Solve the following Knapsack Problem using Dynamic Method. Write the equation for solving above problem. **08**

n = 5, W = 100

Object →	1	2	3	4	5
Weight (w) →	10	20	30	40	50
Value (v) →	20	30	66	40	60

Q.4 **(a)** Explain Backtracking Method. What is N-Queens Problem? Give solution of 4-Queens Problem using Backtracking Method. **07**

(b) Explain Breadth First Traversal Method for Graph with algorithm. **07**

OR

Q.4 **(a)** Explain Chained Matrix Multiplication with example. **07**

(b) Define: Acyclic Directed Graph, Articulation Point, Dense Graph, Sparse Graph. **04**

(c) Explain Min Max Principle. **03**

Q.5 **(a)** Explain in Breif: **08**

P Problem, NP Problem, Heap Tree, Travelling Salesman Problem

(b) Explain finite automata for string matching. **06**

OR

Q.5 **(a)** Explain Rabin- carp method for string matching and also give the algorithm. **07**

(b) What is Recursion? Give the implementation of Tower of Hanoi problem using Recursion. **04**

(c) Define :Big Oh, Big Omega and Big Theta Notation. **03**

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