

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.
Explain why analysis of algorithms is important? Explain: Worst Case, Best Case & Average Case Complexity.
 - (ii) Explain characteristics of Greedy Algorithm.
 - (iii) 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 Brief:
P Problem, NP Problem, Heap Tree, Travelling Salesman Problem **08**
- (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**
