Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER • 2014

Subject Code: 173205 **Date: 29-11-2014**

Subject Name: Design and Analysis of Algorithm/ Computer Algorithm

Time: 10:30 am - 01:00 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)** What is Asymptotic notation? Explain all asymptotic notations in detail. **07**

(b) Write and explain binary search method using Divide and Conquer Approach. Give its complexity. **07**

Q.2 **(a)** **(1)** Solve the given recurrence equation: **07**

$T(n) = 3T(n/3) + n$

(2) Write recurrence equation for Tower of Hanoi and solve it.

(b) Write and explain Kruskal's algorithm to find out minimum spanning tree with example. **07**

OR

(b) Write and explain Prim's algorithm to find out minimum spanning tree with example. **07**

Q.3 **(a)** Write and Explain with example fractional knapsack problem using greedy approach. **07**

(b) Write and explain Quick Sort with example. Give its complexity. **07**

OR

Q.3 **(a)** Write and Explain with example job scheduling problem with deadline. **07**

(b) Define: Principle of Optimality. Solve making change problem using dynamic programming for denominations $d_1 = 1$, $d_2 = 4$ and $d_3 = 6$. Find out the change of 8 units. **07**

Q.4 **(a)** Determine an LCS of <A, B, C, B, D, A, B> and <B, D, C, A, B, A>. **07**

(b) Write and explain n-queen problem using backtracking. Give the possible solutions for 4-queen. **07**

OR

Q.4 **(a)** Find optimal parenthesization of a matrix chain product whose sequence of dimensions is <13, 5, 89, 3, 34> **07**

(b) Solve the following Knapsack Problem using backtracking. **07**

n = 4, W = 8

i	1	2	3	4
w_i	2	3	4	5
v_i	3	5	6	10

Q.5 **(a)** Write and explain Naive string matching algorithm with example. **07**

(b) Explain P and NP problems with example. **07**

OR

Q.5 **(a)** Write and explain Rabin-Karp string matching algorithm with example. **07**

(b) Write the difference between Divide and Conquer, Greedy and Dynamic approach. **07**

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