

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. **07**
 Give its complexity.

- 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 $\langle A, B, C, B, D, A, B \rangle$ and $\langle B, D, C, A, B, A \rangle$. **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 $\langle 13, 5, 89, 3, 34 \rangle$ **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**
