

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII (OLD) EXAMINATION – WINTER 2018****Subject Code: 181604****Date: 26/11/2018****Subject Name: Design And Analysis Of Algorithm****Time: 02:30 PM TO 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** (a) Sort the letters of word “DESIGN” in alphabetical order using Bubble sort algorithm. **07**
- (b) What is algorithm? What do you mean by performance analysis of an algorithm? Explain average case and worst case analysis with the help of suitable example. **07**
- Q.2** (a) Explain how to apply the divide and conquer strategy for sorting the elements using quick sort. **07**
- (b) Explain asymptotic notation with the help of example. **07**
- OR**
- (b) Explain binary search algorithm with divide and conquer strategy and use the recurrence tree to show that the solution to the binary search recurrence relation is  $\Theta(\log n)$ . **07**
- Q.3** (a) Give and explain Prim’s algorithm for Minimum Spanning Tree and compare it with Kruskal’s algorithm. **07**
- (b) Discuss Matrix Chain Multiplication with Suitable example. **07**
- OR**
- Q.3** (a) Compute Longest Common Subsequence for the strings:  
A = <X,Y,Z,Y,T,X,Y>  
B = <Y,T,Z,X,Y,X> **07**
- (b) Explain accounting method of amortized analysis using stack operations. **07**
- Q.4** (a) Discuss how 8-queen problem can be solved using backtracking. **07**
- (b) Give the algorithm with example to solve 0/1 Knapsack Problem using Dynamic Programming **07**
- OR**
- Q.4** (a) Explain assembly line scheduling with example by dynamic programming. **07**
- (b) Explain breadth first search algorithm with example. **07**
- Q.5** (a) Explain Rabin Karp string matching algorithm with an example. **07**
- (b) Explain the following terms: **07**
- A. P  
B. NP  
C. NP-Complete  
D. NP-hard
- OR**
- Q.5** (a) What is finite automata? How it can be used in string matching? **07**
- (b) Give the algorithm for depth first search of a graph. Also define “articulation point of a graph and explain how to find it. **07**

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