



# Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India  
(Autonomous College Affiliated to University of Mumbai)

Reexamination (2018-19)  
Jan 2020

Max. Marks: 60

Class: S.E.

Course Code: ITC41 / CE41

Name of the Course: Design And Analysis of Algorithm

Duration: 3 Hrs

Semester: IV

Branch: IT/COMP

## Instructions:

- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary.

Question No.	Question	Max. Marks	CO-BL-PI
Q. 1 a)	Define Big O , Big $\Omega$ and explain with diagram.	5	1-1-2.1.3
Q. 1 b)	Solve the given recurrence using Master Method Theorem: i) $T(n) = 4T(n/2) + n^2$ ii) $T(n) = 3T(n/3) + n/2$	5	1-3-2.1.2
Q. 1 c)	Write an algorithm for Binary Search. Explain with example. Comment on its time complexity.	5	2-2-2.1.3
Q. 2 a)	Solve the following 0/1 knapsack problem with dynamic Programming There are 5 Objects O1 ,O2 , O3 , O4 , O5. Their corresponding details are given below. Weights : 2 , 3 , 3 , 4 , 6 Kg Values/profit : 1 , 2 , 5 , 9 , 4 Rs. Knapsack Capacity (M) = 10 Kgs. Calculate Maximum profit and Show which objects will be selected	8	3-3-2.2.3
Q2. b)	Consider the following set of frequencies. A=1, B=2, C=3, D=4, E=5, F=6, G=7 Find the Huffman code for the same.	7	4-3-1.1.2
Q.3 a)	State algorithm for finding Longest common Subsequence. (LCS). Find Longest common subsequence for following problem Str1 = ABBCDEB Str2 = BAABCEB	10	3-3-2.2.3
Q.3 b)	Explain Backtracking approach in general. Write an algorithm for the N queen problem. Apply it to solve 4 queen problems. OR Explain Branch and Bound strategy in general.	5	5-3-2.2.3





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<b>Q4 a)</b>	List the different String Matching Algorithms. And explain naïve string matching algorithm along with example. Comment on time complexity.  <b>OR</b>  Write an algorithm of String matching with Finite Automata. Give one example of it.	<b>8</b>	<b>1-3-2.2.4</b>
<b>Q.4b)</b>	Solve the following linear programming using Simplex Algorithm. Maximize $Z = 4x + y$ . subject to the constraints $x + y \leq 50$ , $3x + y \leq 90$ , $X \geq 0$ , $y \geq 0$	<b>7</b>	<b>6-3-2.2.3</b>