

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

July/Aug ~~May/June~~ 2025
 Program: B. Tech Computer Engineering Scheme: III
Supplementary ~~Regular~~ Examination: SY Semester: IV
 Course Code: CEC402 and Course Name: Analysis of Algorithms
 Date of Exam: ~~21/05/2025~~ *30/07/25* Duration: 02.5 Hours Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Sort the given numbers using insertion sort and also show result of each pass <11, 7, 17, 3, 9, 29, 85, 19>.		CO1	Ap
b)	Explain Min-Max algorithm using divide and conquer approach with an example and analyze it.		CO2	U
c)	Solve fractional knapsack problem for the following: n=6, m=20 P = (9,5,9,10,12,7) W=(6,2,3,5,3,2)		CO3	Ap
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Discuss Asymptotic notations with the help of diagram.		CO1	U
b)	Compare Backtracking approach with Branch and Bound technique.		CO5	U
c)	Discuss the time complexity of Naïve String Matching Algorithm. Search the given pattern, P = "STRING" in the text: T= "THIS IS STRING MATCHING ALGORITHM" using Naive String Matching Algorithm.	CO6	Ap	
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	i) What are the key properties a problem must have to be suitable for Dynamic Programming? (4M) ii) Find the longest common subsequence for the following two strings X = "ABACABB" Y = "BABCAB" (6M)		CO4	Ap
b)	Apply merge sort to get ascending order of an array X[0 : 9] = (45, 83, 75, 17, 43, 37, 80, 53, 61, 22) and analyze it.		CO2	Ap
c)	Find the solution of the following Travelling Sales Person problem using branch and bound approach $\begin{bmatrix} \infty & 10 & 15 & 20 \\ 5 & \infty & 9 & 10 \\ 6 & 13 & \infty & 12 \\ 8 & 8 & 9 & \infty \end{bmatrix}$	CO5	Ap	

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Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Solve the following multistage graph using the dynamic programming backward approach 		CO4	Ap
b)	Find MST of the following graph using the following algorithms i) Prim's algorithm (5M) ii) Kruskal's algorithm (5M) 		CO3	Ap
c)	Define recurrences Which are the different methods of solving recurrences? Explain in detail with example.		CO1	U
