

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

May-June 2024

B. Tech Program: Computer Engineering Scheme IIB

Supplement Examination: SY Semester: IV Course Code: CEC402 Course Name: Analysis of Algorithm

Date of Exam: 24072024 Duration: 2.5 Hours Max. Marks: 60

(1)A (2)D	ructions: Il questions are compulsory. raw neat diagrams wherever applicable. ssume suitable data, if necessary.			
Q. NO	Question	Max. Marks	СО	BT level
Q1	Solve any six questions out of eight:	12		
i)	Explain any one asymptotic notation with example	2	1	U
ii)	Explain the general method for divide and conquer strategy.	2	2	U
iii)	What is minimum cost spanning tree.	2	3	· U
iv)	What is the difference between dynamic programming and divide and conquer approach.	2	4	An
v)	Differentiate between branch and bound and backtracking approach.	2	5	U
vi)	Solve following problem using master's method $T(n) = 4T(n/2) + n$	2	1	U .
vii)	What is the complexity of following problems  (i) Bellman ford (ii) All pair shortest path	2	4	U
viii)	Enlist all string matching algorithms and explain any one in short.	2	6	U
Q.2	Solve any four questions out of six.	16		
i)	Explain Naïve string algorithm with example.	4	6	U
ii)	Solve the following problem of the sum of subset and draw portion of state space tree. $w = (5, 7, 10, 12, 15, 18, 20)$ and $m = 35$ .	4	5	Áp
iii)	Find the LCS for following strings. String 1- ACBAED String 2- ABCABE	4	4	Ap

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iv)	Solve fractional knapsack problem for the following: n=6, p=(18, 5, 9, 10,	4	3	Ap
	12, 7), w=(7, 2, 3, 5, 3, 2), maximum sack capacity M=13	11		
v)	Explain min- max algorithm with example by using divide and conquer and do its analysis.	4	2	U
vi)	Describe various methods to calculate complexity of recurrence relations.	4	1	U
Q.3	Solve any two questions out of three.	16		
i)	Explain best case, worst case and average case time complexity of Selection Sort and Insertion sort.	8	1	U
ii)	Apply Merge sort algorithm to sort the following numbers and derive it's complexity for 10, 5,7, 6, 1, 4, 8, 3, 2, 9.	8	2	Ap
iii)	Apply job sequencing algorithm and find feasible solution for Let n=5, $\{P1, P2, P3, P4, P5\} = \{20, 15, 10, 5, 3\} & \{d1, d2, d3, d4, d5\} = \{2, 2, 1, 3, 3\}$	8	3	Ap
Q.4	Solve any two questions out of three.	16		
i)	Solve the following using All pair shortest path.	8	4	Ap
	4 9 2 1 2			
			Ŷ	
ii)	What is branch and bound approach? Solve 15-puzzle problem with an example.	8	5	Ap
iii)	Explain Rabin Karp algorithm with an example.	8	6	U