SEIA

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

~~Nov – Dec~~ 2024 Supplementary – Jan/Feb 2025
B. Tech Program: **Artificial Intelligence & Data Science** Scheme **III**
Supplementary/~~Regular~~ Examination: **SY** Semester: **III**
Course Code: **AIC303** and Course Name: **Design and Analysis of Algorithms**
Date of Exam: 29-01-25 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)	What are asymptotic notations?		CO1	Un
b)	Discuss the elements of Dynamic programming		CO4	Un
c)	Compare Rabin Karp and Knutt Morries Patt Algorithm. Give pseudo code for KMP string matching algorithm		CO6	Un
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Write the algorithm for the Merge Sort technique and discuss its time and space complexity in all cases.		CO2	Un
b)	Difference between Backtracking and Branch and Bound Algorithms		CO5	Un
c)	What is Dijkstra's Algorithm?		CO3	Un
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Apply Naïve String-Matching Algorithm on following string String = Examination Pattern = tion		CO6	Ap
b)	Discuss about the 4-Queen problem and illustrate its state space tree. Write an algorithm for the same.		CO5	Ap
c)	Find the shortest path for the following graph using Dijkstra's Technique:		CO3	Ap

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	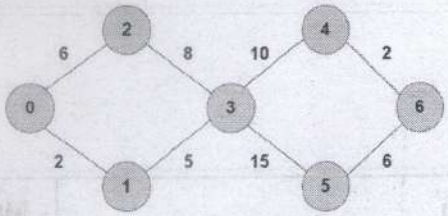			
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	What is the longest Common Sequence Problem? Find LCS for the following. String X=ACBAED ; String Y=ABCABE		CO4	Un,Ap
b)	What is Merge sort? Sort the following elements using merge sort: A= {410, 385, 279, 752, 451, 523, 961, 354, 550, 620}		CO2	Un,Ap
c)	Solve the recurrence formula $T(n) = 2T(n/2) + n$ by using a recurrence tree method.		CO1	Ap

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