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DEEMED TO BE
UNIVERSITY
NAVI MUMBAI

SY/ III /AIDS | **B.Tech.Artificial Intelligence and Data Science** | **QP Code: 38122302**

ADC302 | **Design and Analysis of Algorithm (DAA)**

Date:28/11/2023 | **Time:10:30am to 12:30pm** | **Max Marks : 60**

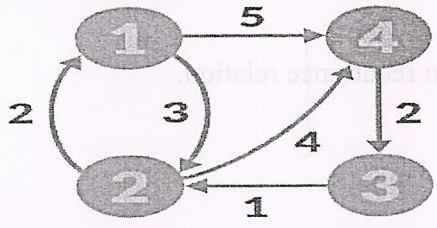
Q.1	**Solve any Four**	**Marks**	**CO**	**BT**
a)	Apply Master theorem to solve the given recurrence relation. a. $T(n) = 4T(n/2) + n!$ b. $T(n) = 9T(n/3) + n^2 \log n$ c. $T(n) = 2T(n/2) + n^3$	5	CO1	BT3
b)	Compare and contrast Divide & Conquer strategy and Greedy approach.	5	CO2	BT2
c)	Apply greedy approach to solve given knapsack problem and find maximum profit. Knapsack Capacity = 12	5	CO3	BT3

Item (i)	Value (Vi)	Weight (Wi)
1	18	3
2	25	4
3	27	4
4	10	3
5	15	6

d)	Find LCS of given two sequences. String 1 : 010011 String 2 : 10101101	5	CO4	BT3
e)	Explain Knuth Morris Pratt algorithm and compare the same with naïve matching algorithm.	5	CO5	BT3
f)	Define P, NP, NP-Hard and NP-Complete class	5	CO6	BT3

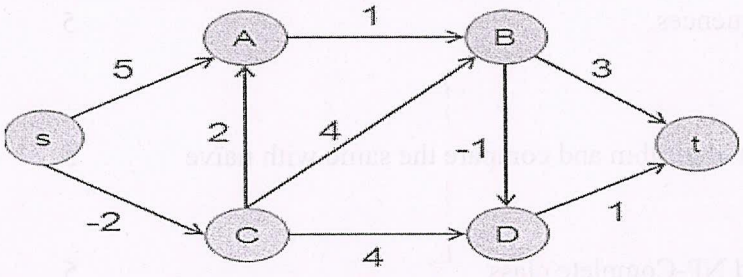
Q.2	**Solve any Four**	**Marks**	**CO**	**BT**
a)	Explain asymptotic notations in detail.	5	CO1	BT3
b)	Sort the following array elements with Quick sort algorithm. { 65, 20, 45, 75, 80, 55, 85, 60 }	5	CO2	BT3

c)	Solve the following Job sequencing problem with the given deadline to find maximum profit gained. N=8 Profits (P1, P2,…..P8)={30, 15,20,18, 10,60,40, 55 } Deadlines (D1, D2, …..D8)={ 1, 3, 4, 3, 2, 1, 2, 1 }	5	CO3	BT3
d)	Apply Floyd's algorithm to calculate all pairs shortest path for the given graph.	5	CO4	BT3

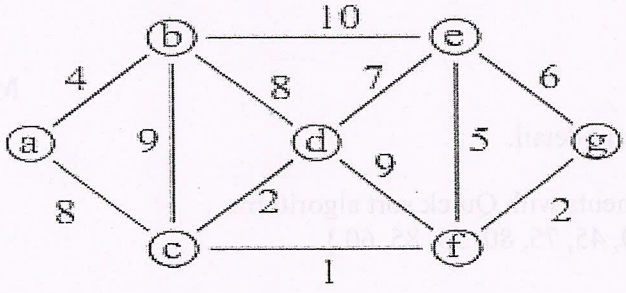


e)	Find the given pattern in the text by applying naïve string matching algorithm and specify the position of the pattern. **Text :**baabaababa **Patten :** ba	5	CO5	BT3
f)	Explain vertex cover problem.	5	CO6	BT3

Q.3	**Solve any Two**	**Marks**	**CO**	**BT**
a)	Apply dynamic programming approach and calculate single source shortest path for the given graph from source vertex 'S'.	10	CO4	BT4



b)	Apply Prim's and Kruskal's algorithm to find minimum spanning tree of the given graph.	10	CO3	BT3



c)	Define 15 Puzzle problem. Explain how branch and bound strategy can be used to solve 15-puzzle problem with example.	10	CO5	BT2