Reg No.:_____ Name:_____

0520MCA203122101

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester MCA (2 Year) Degree Examination December 2021

Course Code: 20MCA203
Course Name: DESIGN & ANALYSIS OF ALGORITHMS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1	Differentiate space and time complexity.	(3)
2	Solve the following recurrence equation using iteration method. $T(n)=2T(n/2)+n$	(3)
3	Define the control abstraction of Greedy strategy.	(3)
4	Explain the pseudocode of Bellman ford algorithm for finding the single shortest path.	(3)
5	Describe the working of Backtracking problem with a suitable example	(3)
6	Write a comparison-based sorting algorithm used by lower bound theory technique	(3)
7	Explain Clique problem with an example.	(3)
8	Explain the Bipartite matching problem with an example.	(3)
9	Describe approximation ratio in approximation algorithm.	(3)
10	What are the two different types of Randomized algorithms?	(3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

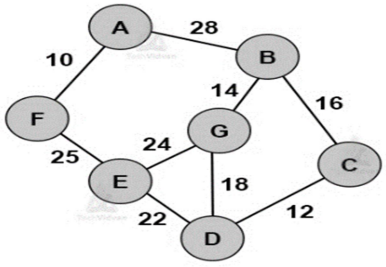
11	Describe different Asymptotic notations used for expressing time complexity of algorithms.	(6)

OR

12	Explain the Merge sort algorithm and give its worst-case analysis	(6)

Module II

13	Explain the different steps used to find the minimum cost spanning tree for the below graph using Prim's algorithm	(6)



OR

14 Give the different steps for finding the shortest path in the all-pair shortest path algorithm with a suitable example. (6)

Module III

15 Discuss the sum of subsets algorithm with the following example (6)

A = {1,2,5,6,8}, Find the all-possible combinations whose sum is equal to the given value M = 9

OR

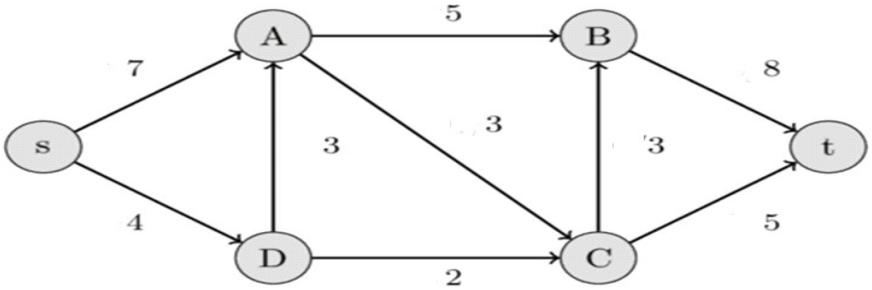
16 Explain the Branch and Bound algorithm used for solving a 8-puzzle problem (6)

Module IV

17 Discuss Complexity classes. Prove that Vector cover problem is NP Complete. (6)

OR

18 Compute the maximum flow in the below network using Ford- Fulkerson algorithm (6)



Module V

19 Explain the 2-Approximation algorithm for vertex cover and justify its approximation ratio (6)

OR

20 What is Randomised Quick sort? Explain its working and why is it used (6)

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