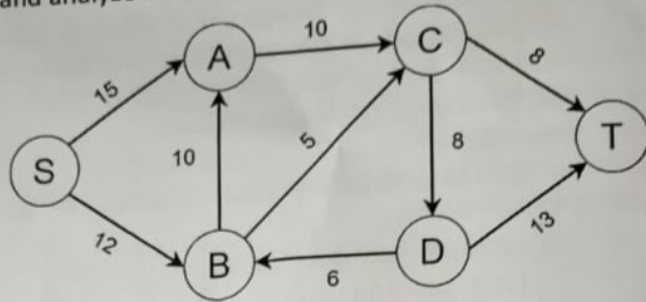


8. Write a Edmonds-Karp's algorithm, and compute the maximum flow in the network N and analyze its complexity.



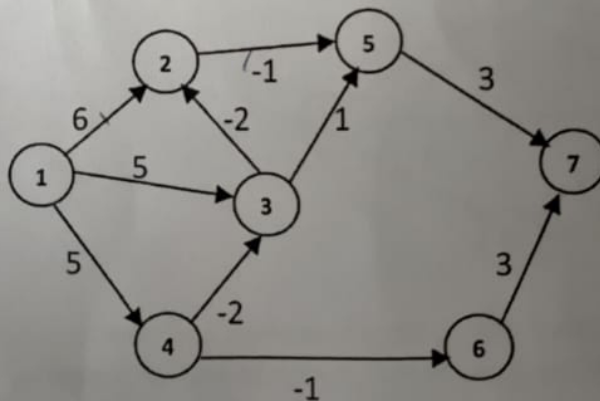
9. Explain N-Queens algorithm and explain with 4 x 4 chessboard and number the rows and column of the chessboard 1 through 4 in a State space Tree using Backtracking (step-by-step checkerboard). Also derive Time complexity of N Queen using backtracking?

10. Define Greedy Knapsack? Find an optimal solution to the knapsack problem $n=7, M=15, (p_1, p_2, p_3, p_4, p_5, p_6, p_7) = (10, 5, 15, 7, 6, 18, 3), (w_1, w_2, w_3, w_4, w_5, w_6, w_7) = (2, 3, 5, 7, 1, 4, 1)$.

11. Solve the following tasks with their deadlines and profits. Schedule the tasks in such a way that they produce maximum profit after being executed

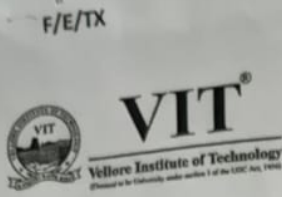
S. No.	1	2	3	4	5
Jobs	J1	J2	J3	J4	J5
Deadlines	2	2	1	3	4
Profits	20	60	40	100	80

12. Solve a Bellman ford single source shortest path computations and analyze its complexity. Consider starting vertex as "1" destination vertex as "7".



⇔⇔⇔F/E/TX⇔⇔⇔

Reg. No: 22BC0597



Final Assessment Test - May 2024

Course: BCSE204L - Design and Analysis of Algorithms

Class NBR(s): 0765/0776/0817/0825/0829/0831/0839

Slot: A1+TA1

/0874/0877/0884/0890/0901/0906/0912/0917/0923

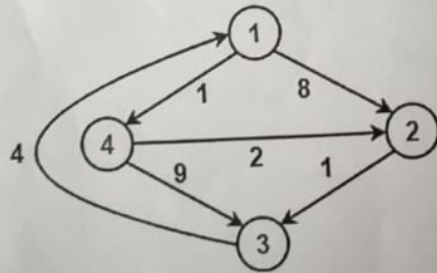
Max. Marks: 100

Time: Three Hours

- > KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- > DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer any **TEN** Questions
(10 X 10 = 100 Marks)

- Design an algorithm for sum of all elements of a matrix using 2D Array and analyze its time complexity. How to prove the correctness of matrix using Induction method.
- Outline important factors of Dynamic Programming and perform Matrix chain multiplication for {4, 10, 3, 12, 20, and 7}. The matrices have size 4 x 10, 10 x 3, 3 x 12, 12 x 20, 20 x 7. Compute $M[i, j]$, $0 \leq i, j \leq 5$. Consider $M[i, i] = 0$ for all i .
- Interpret steps of KMP_next array and the Knuth-Morris-Pratt (KMP) algorithm. Compute the KMP_next array of the Text as ABCDDAEFG and pattern as CDD. [5]
 - Classify between KMP and Rabin-karp algorithm works with strength and weakness of Complexity. [5]
- Perform step-by-step process of find the shortest path distance between every pair of vertices using Floyd warshall algorithm, from the directed weighted graph.



- Relate Graham's Scan and Jarvis March Algorithm steps and how to choose the best practices for computational Convex Hull. Illustrate with an example.
- Narrate how Randomized Quick Sort algorithm differs from Normal Quick Sort. Write an algorithm and solve the randomized quick sort algorithm with an example.
- Compare and Contrast the following terms used in computational complexity such as N, NP and NP-complete problems. Discuss its features with real time examples.