VIT®
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

School of Computer Science and Engineering

Winter Semester 2022-2023

Continuous Assessment Test – 2

SLOT: G2 + TG2

Programme Name &Branch : B.Tech Computer Science and Engineering
Course Name & code: BCSE204L Design and Analysis of Algorithms

Class Number (s): All

Faculty Name (s): All

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

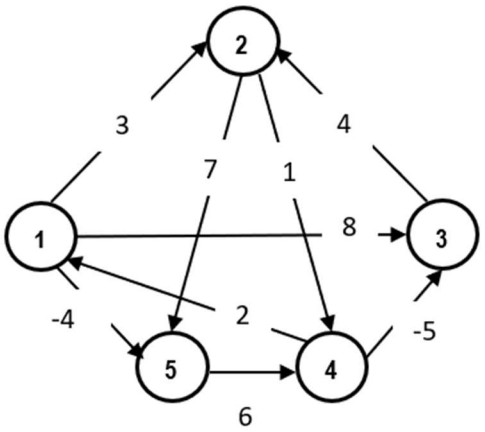
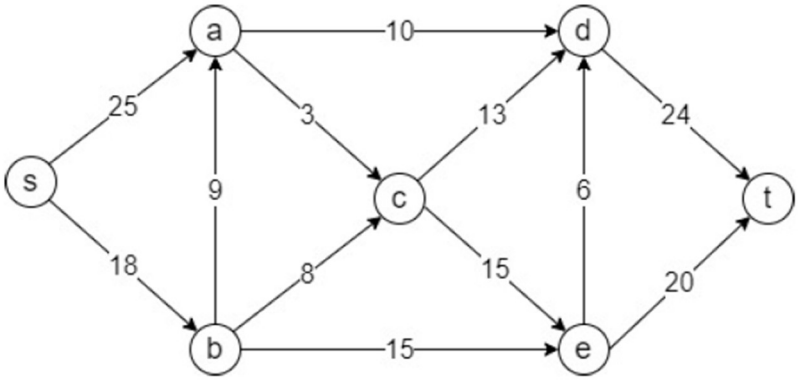
Specify if any printed material may be permitted

Any other specific instruction

<table>
<tr><th>Q.No.</th><th>Question</th><th>Max Marks</th><th>CO</th><th>BL</th></tr>
<tr><td>1.</td><td>Differentiate between FIFO and LIFO batch and bound methods for the following 0-1 Knapsack problem where knapsack capacity is 15 kg:

<table><tr><td>Item</td><td>X1</td><td>X2</td><td>X3</td><td>X4</td><td>X5</td></tr><tr><td>Profit</td><td>5</td><td>7</td><td>9</td><td>10</td><td>12</td></tr><tr><td>Weight (in kg)</td><td>2</td><td>5</td><td>7</td><td>8</td><td>10</td></tr></table>
Illustrate the FIFO and LIFO-based knapsack solution trees.</td><td>10</td><td>CO 2</td><td>BL 5</td></tr>
<tr><td>2.</td><td>Compare the naive string-matching algorithm with the KMP string matching algorithm. What are the drawbacks of the naive string matching algorithm that are overcome by the KMP algorithm? Apply both Naive and KMP algorithms for the following:

String: apphappyaapihappiness
Pattern: appi</td><td>10</td><td>CO 3</td><td>BL 4</td></tr>
</table>

3.	Find the existence of a pattern P in the given string S (using digits 0-9), using Rabin Karp algorithm. S = "3124182284769678922843256" P = "2284" For the hash function, use mod value 997.	10	CO 3	BL 4
4.	Apply the Floyd-Warshall algorithm to the following graph. Show the values after each iteration. List out the final shortest paths. 	10	CO 3	BL 4
5.	Use the Emond Karp method to determine the maximum flow possible in the given flow network. Adequate explanations and neat diagrams are expected in each step. 	10	CO 3	BL 3