CSN-106: Discrete Structures
(Autumn semester 2022-23)

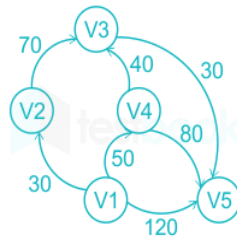|		
Name :	**Tutorial:**	**Date :**
Enrollment No.:		**Programme:**

1. **Question:** Consider the following weighted diagraph. What is the shortest distance between V1 to V5?
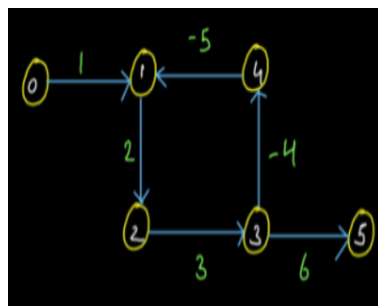

- 120
- 130
- 140
- 110

2. **Question:** If an optimal solution can be created for a problem by constructing optimal solutions for its subproblems, the problem possesses which property?
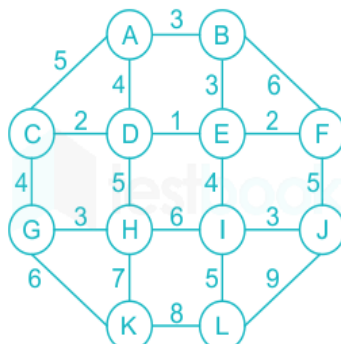
- Overlapping subproblems
- Optimal substructure
- Memorization
- Greedy

3. **Question:** Is negative weight cycle detected or not?

- True
- False

4. **Question:** Consider the following graph:

Apply Dijkstra's Algorithm from vertex S = A. Which of the following statements are true?
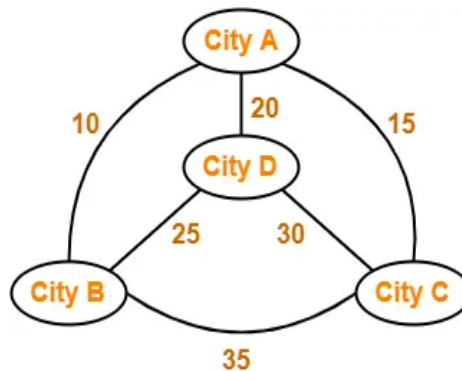
- The 4th vertex added to the S is E.

- The shortest path from A to L is 15.

- There is exactly one shortest path from A to F.

- The cost of the shortest path from A–G, A–H, and A–I is the same.

5. **Question:** Consider the directed graph shown below. There are multiple shortest paths between vertices A and T. Which one will be reported by Dijkstra's shortest path algorithm? Assume that, in any iteration, the shortest path to a vertex v is updated only when a strictly shorter path to v is discovered.
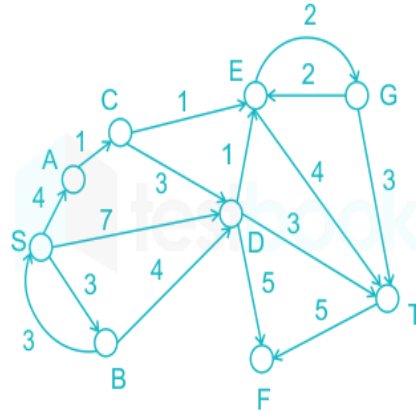
- SDT
- SBDT
- SACDT
- SACET

6. **Question:** Solve the following Travelling salesman problem and compute the cost.

- Cost?