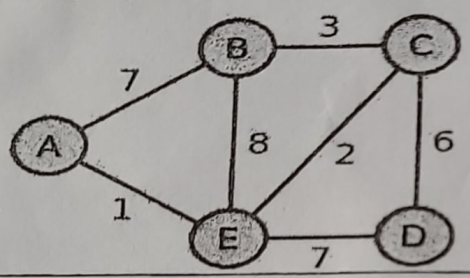
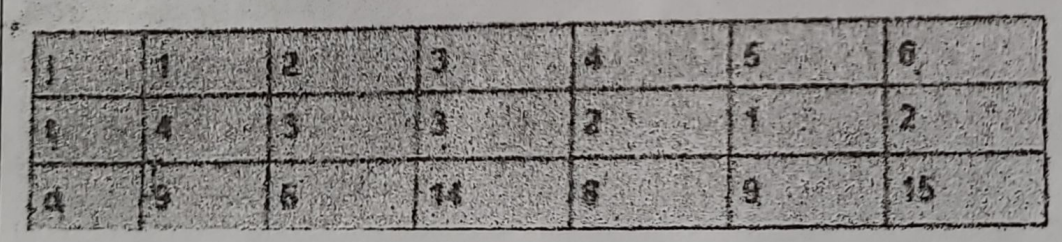
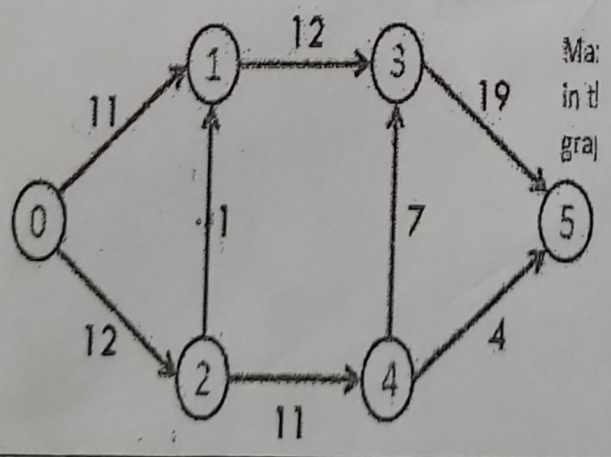
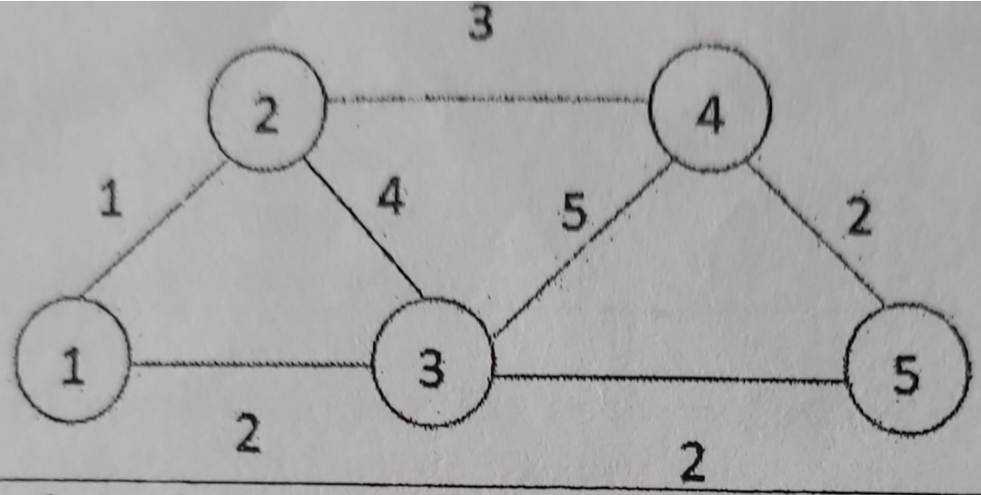
Internal Assessment Question Paper – 2

M.S. Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)
Department of CSE

Programme: B.E
Course: Design & Analysis of Algorithms
Sem: IV
Max Marks: 30
CIE: II
Time: 1Hr
Term: April-**July 2024**
Course Code: CS43
Section: A,B,C
Portions for Test: L18-L42

Instructions to Candidates: Mobiles, smart watches or any electronic gadgets are strictly banned.
1st question is compulsory. Answer any **one** from Question 2 or Question 3.

Sl#		Question	Marks	Bloom's Level	CO Mapping
1	a)	Write the Dijkstra's Algorithm. Evaluate the shortest path from source node A to all other nodes for the following graph using Dijkstra's algorithm. 	6	L3	CO3
	b)	Discuss survey-design problem for a set of customers and products with an algorithm.	5	L2	CO4
	c)	Explain the general strategy to identify whether the problem is NP-Complete.	4	L2	CO5
2	a)	Explain the minimizing the maximum lateness problem with an algorithm and comment on its time efficiency .solve the below problem. 	6	L3	CO3
	b)	Apply the Ford Fulkerson algorithm to find the maximum flow path from S to T in the given flow network. 	5	L3	CO4
	c)	Describe the greedy approach for caching using an algorithm.Given the page frame=3 with initial cache 7 1 2 and page requests 7 0 1 2 0 3 0 4 2 3 0 3 2 1 . Identify the number of cache miss using optimal caching algorithm.	4	L2	CO5
3.	a)	Describe Kruskal's Algorithm. Compute minimum spanning tree for the following graph using Kruskal's algorithm.	6	L3	CO3

			
b)	Write an algorithm for Knapsack problem. Comment on its running time. Solve the same for below given problem instance:Consider the problem having weights and profits are:Weights: {3, 4, 6, 5} Profits: {2, 3, 1, 4}The weight of the knapsack is 8 kg	5	L3
c)	With the state space tree discuss the procedure for solving n-queens problem	4	L2

Course Outcomes meant to be assessed by the IA Test-I:

1. CO3: Illustrate the design techniques for Greedy algorithms and analyze their complexit
2. CO4:Illustrate Dynamic programming paradigm using representative algorithms.
3. CO5: Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem NP-Complete and examine the techniques of proof by contra and recurrence relati