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B.N.M. Institute of Technology

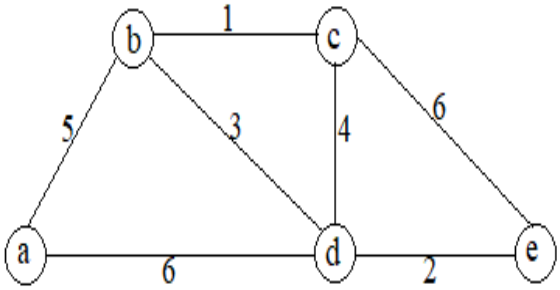
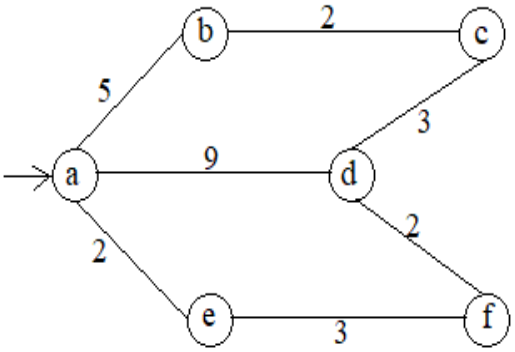
An Autonomous Institution under VTU

Department of Information Science & Engineering

Continuous Internal Assessment - II

Sem: IV **Date: 22/07/2024**
Sub: Design and Analysis of Algorithms **Time: 11:15-12:30PM**
Sub code: 22ISE144 **Max Marks: 30**

Note: Answer FOUR full questions selecting one full question from each part.

		Marks	COs	POs/PSOs	Bloom's Cognitive Levels
	PART A				
1	Make use of the below graph to find an MST using Prims and Kruskal's Algorithms. 	7	CO3	PO1, PO2, PO3, PO4, PSO1	Apply
	(OR)				
2	Construct a Dijkstra's algorithm and find the Single Source Shortest Path (SSSP) for the following graph. 	7	CO3	PO1, PO2, PO3, PO4, PSO1	Apply

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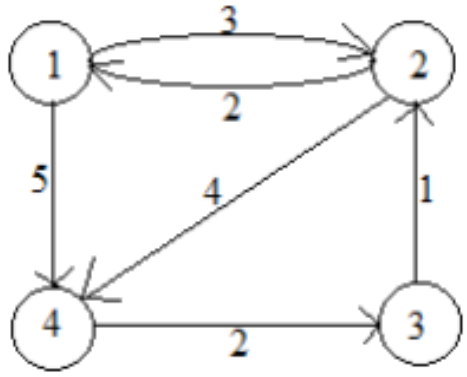
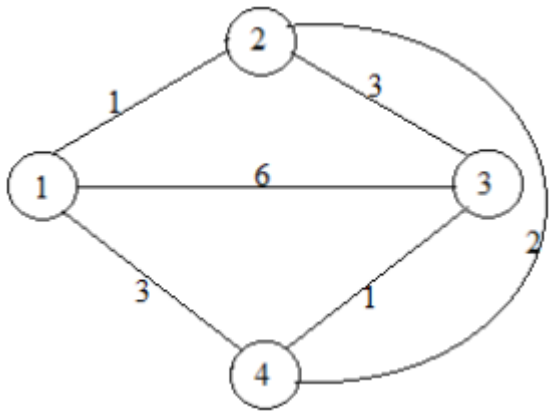
PART B

3	Develop an algorithm to find all pair shortest path. Apply the algorithm to find the all pair shortest path of a below shown graph using dynamic programming.  	8	CO4	PO1, PO2, PO3, PO4, PO12, PSO1	Apply
	(OR)				
4	Solve Travelling Sales Person problem using with 4 cities as shown below in the graph. Develop a solution to find the tour Cost using Dynamic Programming.  	8	CO4	PO1, PO2, PO3, PO4, PO12, PSO1	Apply

PART C

5	Analyze with an example how backtracking technique is used in N-Queens problem for at least 2 different values of N.	7	CO5	PO1, PO2, PO3, PO4, PO12, PSO1	Analyze
	(OR)				
6	Analyze the example for optimal Binary Search tree. **Key** A B C D **Probabilities** 0.4 0.3 0.2 0.1	7	CO5	PO1, PO2, PO3, PO4, PO12, PSO1	Analyze

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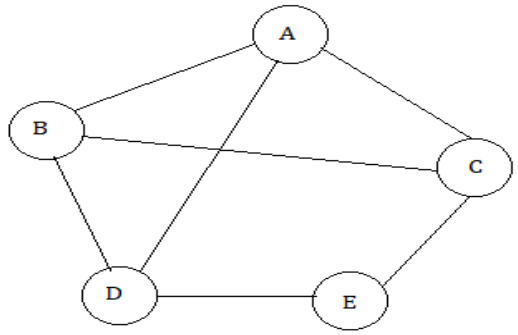
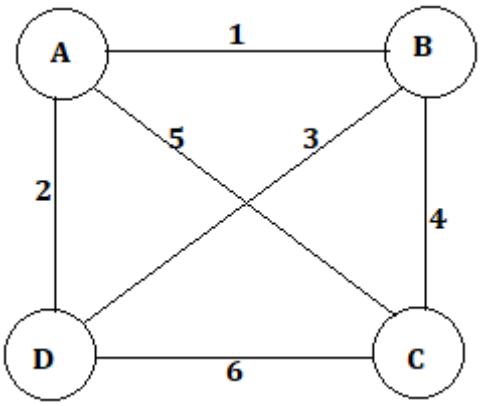
PART D

7	Examine the below shown graph, can the regions be colored in such a way that no two adjacent regions have the same color using 4 colors. Plot one color state space tree. 	8	CO5	PO1, PO2, PO3, PO4, PO12, PSO1	Analyze
	(OR)				
8	Inspect the graph given below and find the min cost tour using branch and bound. 	8	CO5	PO1, PO2, PO3, PO4, PO12, PSO1	Analyze

CO3: Apply various problem-solving methodologies such as greedy, decrease and conquer to solve a given problem

CO4: Apply the dynamic programming to estimate the computational complexity of different algorithms

CO5: Apply and analyze the efficient algorithm design approaches in a problem specific manner in terms of backtracking, space and time complexity