University of Engineering & Management, Kolkata

Even Semester Term- II Examination, May, 2021

Course: B.Tech (CSE) **Semester: 4th**

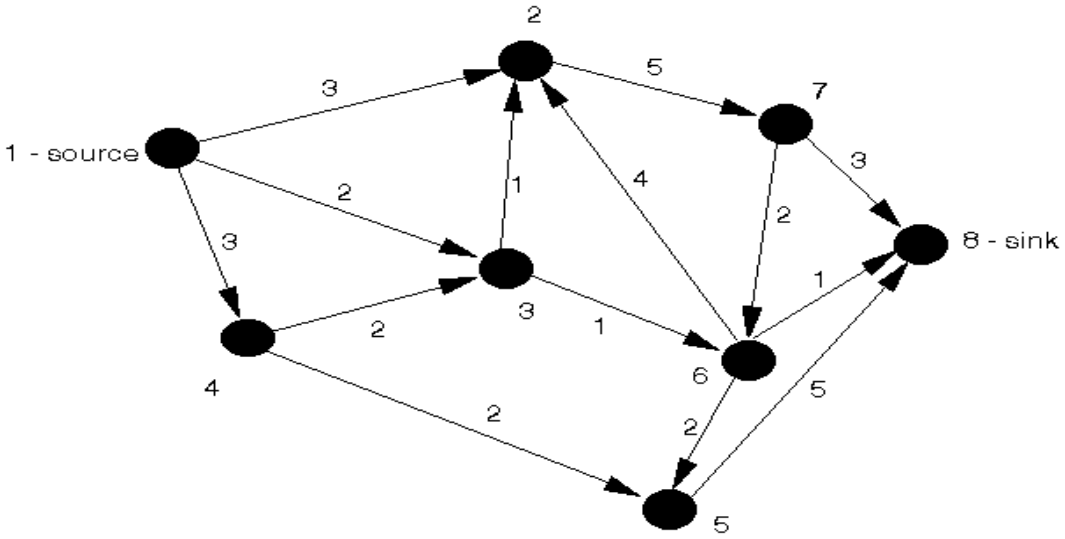
Paper Name: DESIGN & ANALYSIS OF ALGORITHM

Paper Code: PCCCS402

Full Marks: 70 **Time: 2 hours**

Attempt all questions. Each question carries 10 marks

1.A. Find the maximum flow with stepwise approach using Ford-Fulkerson Method.



Identify the minimum number of cut in the above flow network.

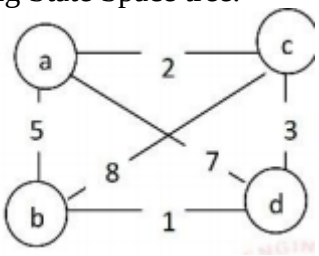
OR

B. The following table shows the distances in km. between six villages in India. Find the minimal spanning tree connected in the six villages applying Kruskal's algorithm:

	A	B	C	D	E
A	-	1	7	10	5
B	1	-	3	-	-
C	7	3	-	4	-

D	10	-	4	-	2
E	5	-	-	2	-

2. A. Color the given graph using 3 colors following backtracking approach. Show all the steps using State Space tree.

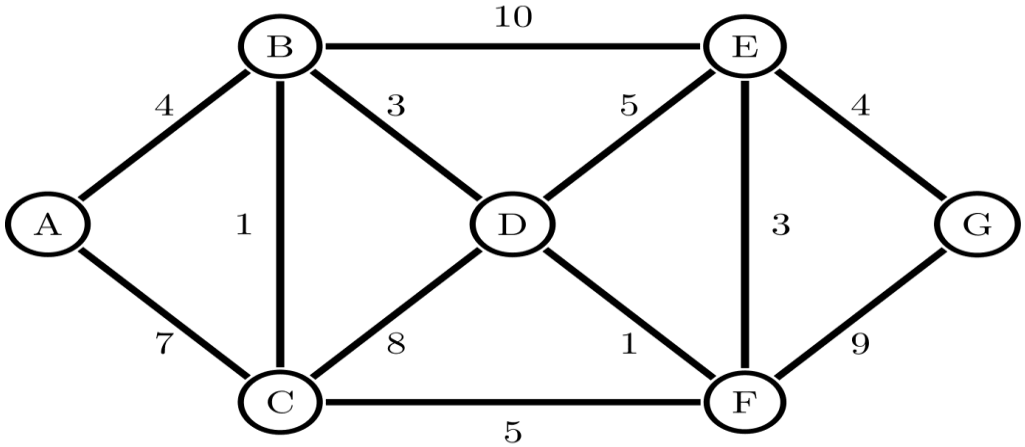


OR

B. Using Branch & Bound solve the following Knapsack problem:

	Object1	Object2	Object3	Object4
Weight	5	9	8	3
Profit	6	8	5	7
Capacity	10			

3. A. A newspaper agent daily drops the newspaper to the area assigned in such a way that he has to cover all the houses in the respective area with minimum travel cost. Identify the minimum travel cost by implementing an appropriate program with efficient algorithmic strategy. The area assigned to the against where he has to drop the newspaper by collecting from office 'A' is shown in the figure below:



OR

B. Using Dynamic programming solve the following Knapsack problem:

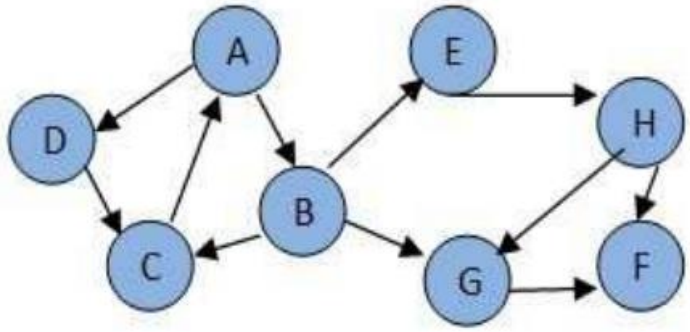
	Object1	Object2	Object3	Object4
Weight	5	9	8	3
Profit	6	8	5	7
Capacity	10			

4. A. Solve the following Job Sequence with deadline problem and find the optimal sequence.

Job	J1	J2	J3	J4	J5	J6	J7
Profit	35	30	25	20	15	12	5
Deadline	3	4	4	2	3	1	2

OR

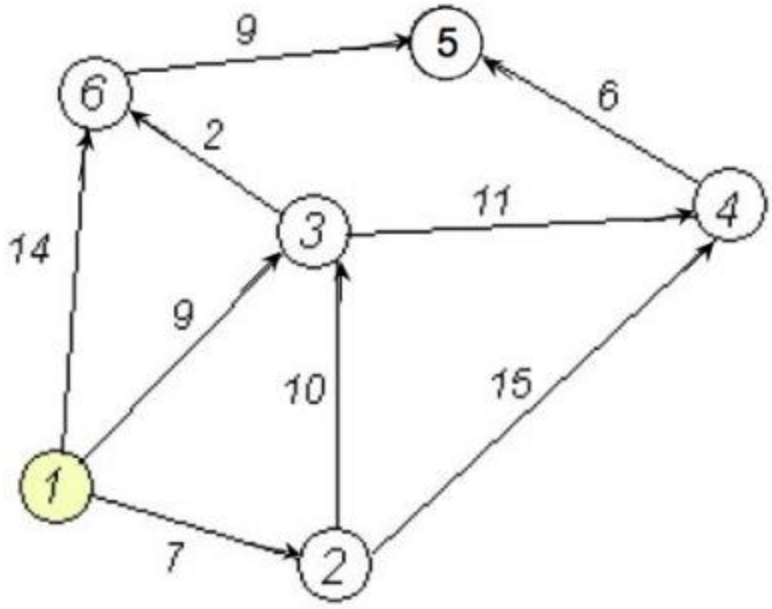
B. Find the Breadth First Search and Depth First search traversal path from the given graph.



5. A. Find the optimal parenthesization of a matrix chain product whose sequence of dimensions are <40,30,20,10>. Find the optimal value of multiplication using tabular approach. (Show all the steps)

OR

B. Find out the shortest path from vector 1 to all other vertices for the following graph using Dijkstra algorithm



6. A. Find the optimal solution for the fractional Knapsack problem given below:

I= {I_1, I_2, I_3, I_4, I_5}
W= {5, 10, 20, 30, 40}
V= {30, 20, 100, 90, 160}
The Knapsack Capacity W= 60.

OR

B. Prove that searching the 2nd largest and 2nd smallest data in a list using divide and conquer approach is better than naive approach.

7. A. Discuss about different class of problem and their relations.

OR

B. Discuss about tractable & intractable problem with example.