

Name of Course : **CBCS B.Sc. Mathematical Sciences**
 Unique Paper Code : **42353604**
 Name of Paper : **SEC-4: Transportation and Network Flow Problems**
 Semester : **VI**
 Duration : **3 hours**
 Maximum Marks : **55 Marks**

Attempt any four questions. All questions carry equal marks. All Symbols have usual meaning.

1. Consider the transportation model is given in the table. Use Vogel Approximation Method (VAM) to find the starting basic feasible solution. Hence find optimal solution by the method of multipliers.

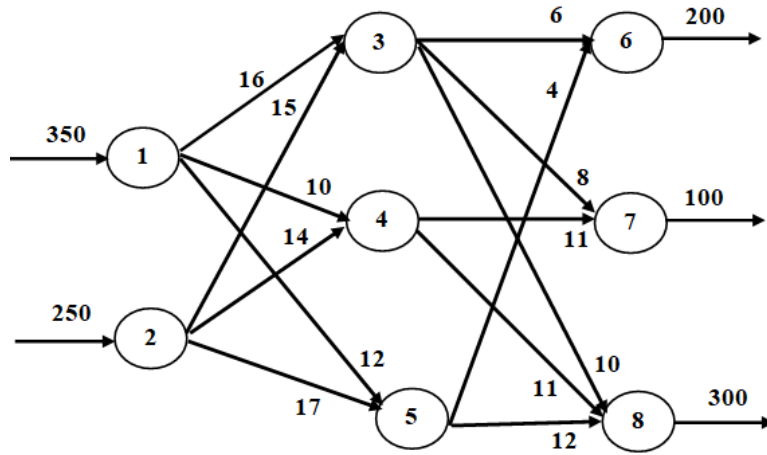
		Destinations						Availability
		D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	
Sources	S ₁	5	3	7	3	8	5	3
	S ₂	5	6	12	5	7	11	4
	S ₃	2	8	3	4	8	2	2
	S ₄	9	6	10	5	10	9	8
Requirement		3	3	6	2	1	2	

2. Consider the following cost matrix of assigning five jobs to four persons:

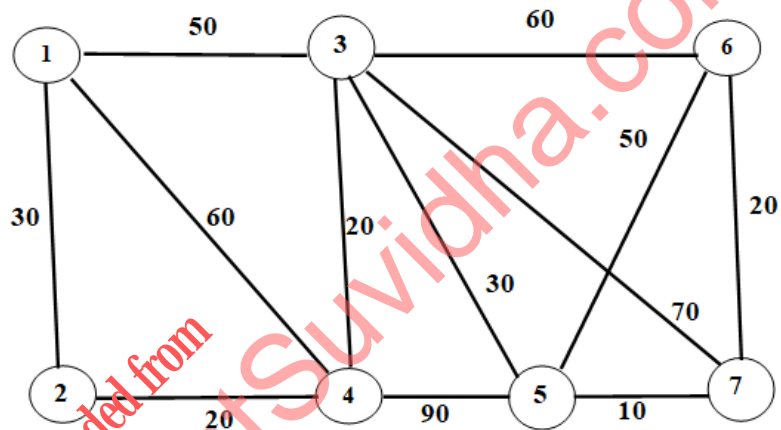
		Jobs				
		J ₁	J ₂	J ₃	J ₄	J ₅
Person	P ₁	8	9	12	11	8
	P ₂	4	3	6	7	5
	P ₃	13	20	17	18	12
	P ₄	23	26	25	33	20

Use Hungarian method to find an optimal assignment of the above problem.

3. Develop the transshipment model for the following network. Also identify pure supply nodes, pure demand nodes, transshipment nodes and the buffer amount.

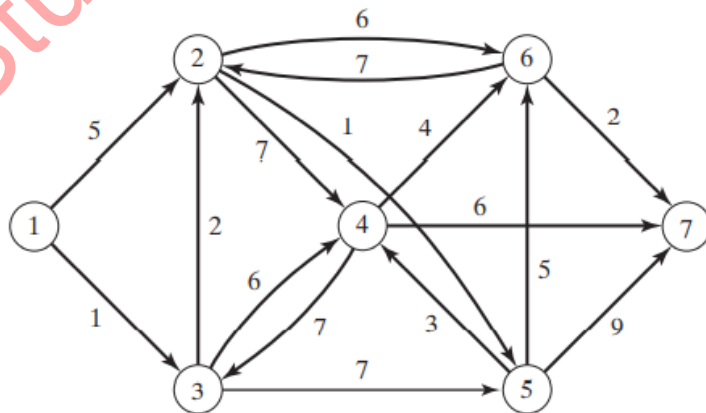


4. Consider the following network:

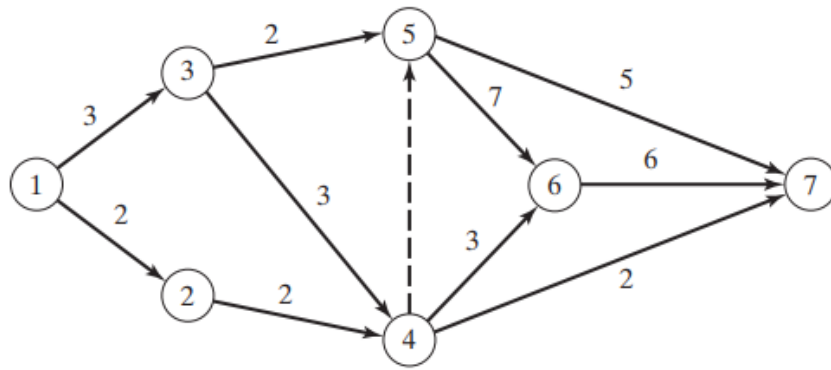


In the above network, Find 2 paths, 2 tree, a spanning tree and the minimal spanning tree.

5. Find the shortest route between node 1 to node 7 using Dijkstra's algorithm.



6. Determine the critical path for the project network:



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