

Faculty of Engineering  
Prince of Songkla University

Final Examination : Semester 2

Academic year 2004 ( 2547)

Date : 3 มีนาคม 2548

Time : 13:30-16:30 น.

Subject : 225-565 Network Modeling Theory

Room : R300

**ทุจริตในการสอบ โทษขั้นต่ำปรับตกในที่ทุจริตนั้น และ  
พักการเรียน 1 ภาคการศึกษา โทษสูงสุดให้ออก**

Instructions :

1. Total 6 topics, 26 pages, and 100 scores
2. Do you examination in these papers and return all of them
3. Write down your No, Name, Surname, Student code in every page
4. Show all calculation, and assumption
5. All books, notes and calculators are allowed but you are not permitted to borrow anything from the others

	Scores	Your Scores
1	24	
2	21	
3	10	
4	20	
5	12	
6	13	
Total	100	

No.....

( From the number in examination list )

Name .....

Surname.....

Student code.....

Year/Department.....



No.....Name.....Surname.....Student code.....

1. From Figure 1.1 , the number between each node is time (hours) . For example, time travels between node (3) and node (6) is 8 hours.

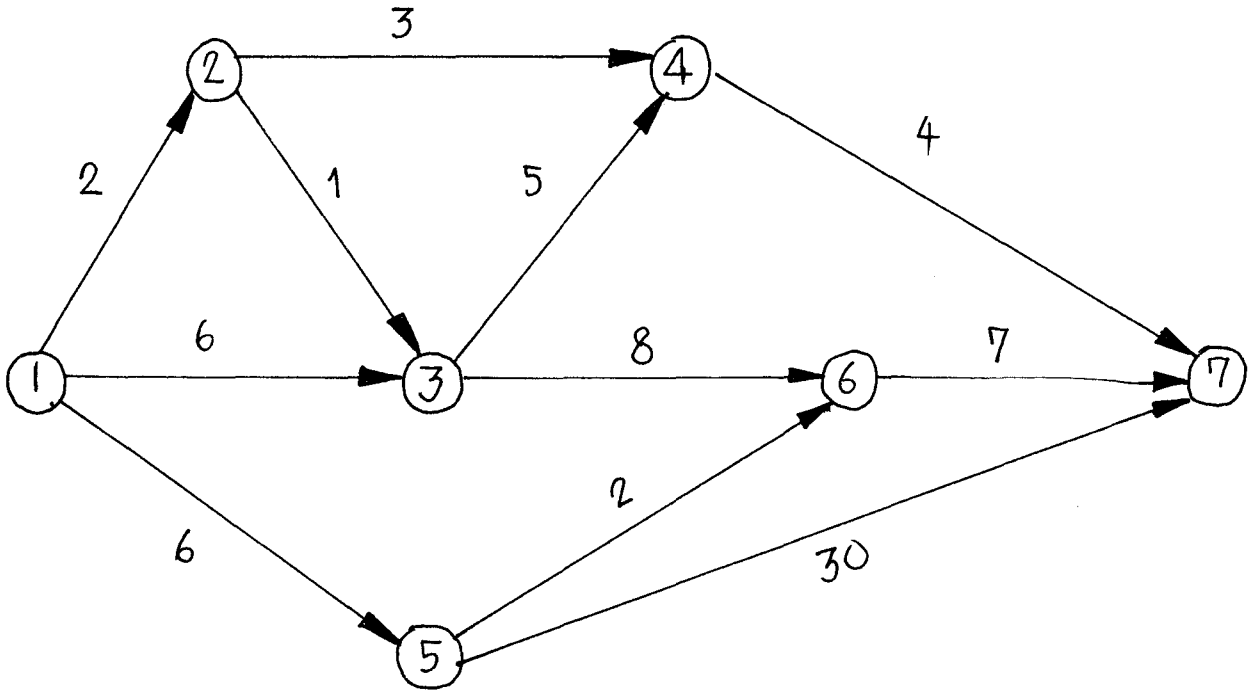


Figure 1.1

Using Network method find

- 1.1 The shortest path level 1 and 2 form node (1) to node (7) . What are the value and the paths ? ( 12 scores )
- 1.2 The longest path level 1 and 2 from node (1) to node (7) . What are the value and the paths ? ( 12 scores )

( Total 24 scores )

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2. From Figure 2.1 , the number between each node is the reliability. For example, the reliability between node ① and node ③ is 0.97

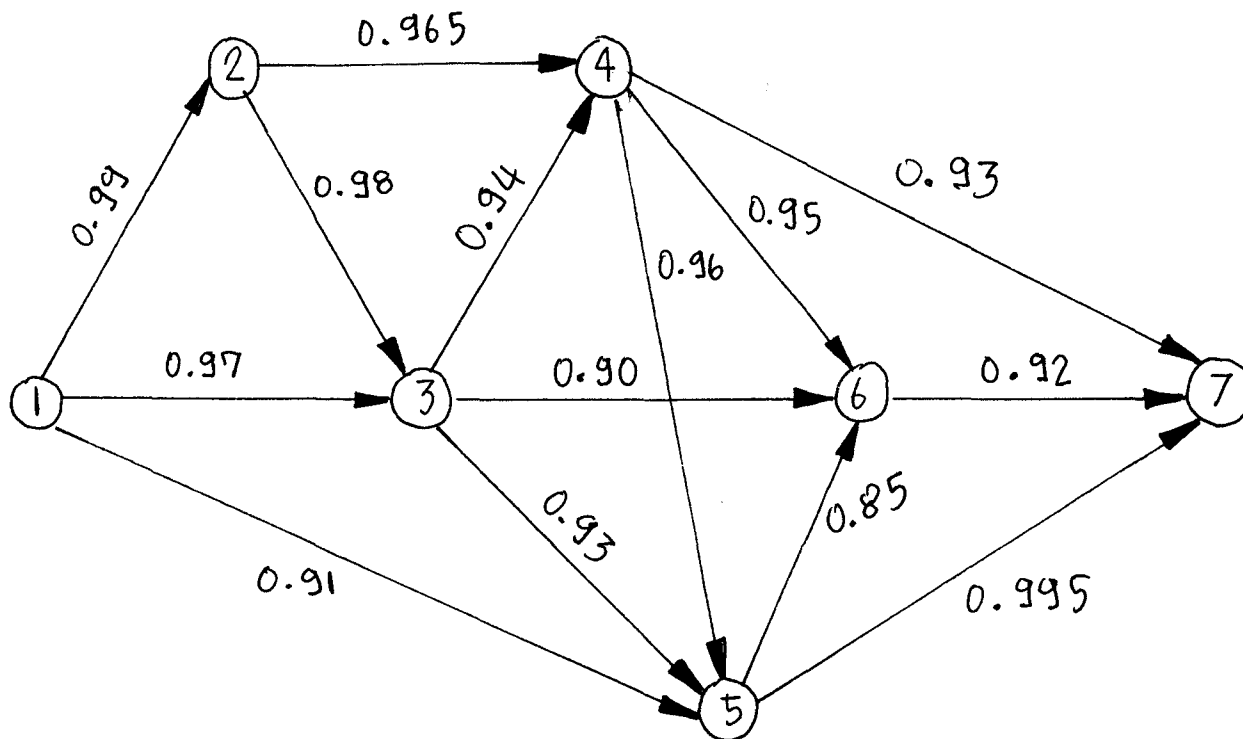


Figure 2.1

- 2.1 Using Dijkstra 's Algorithm to find the maximum reliability and the path from node ① to all nodes. ( 12 scores )
- 2.2 Using Dijkstra 's Algorithm to find the minimum reliability and the path from node ① to all nodes. ( 9 scores )

( Total 21 scores )

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3. From Figure 3.1 , the number between each node is maximum transportation. Unit is gallon per minute.

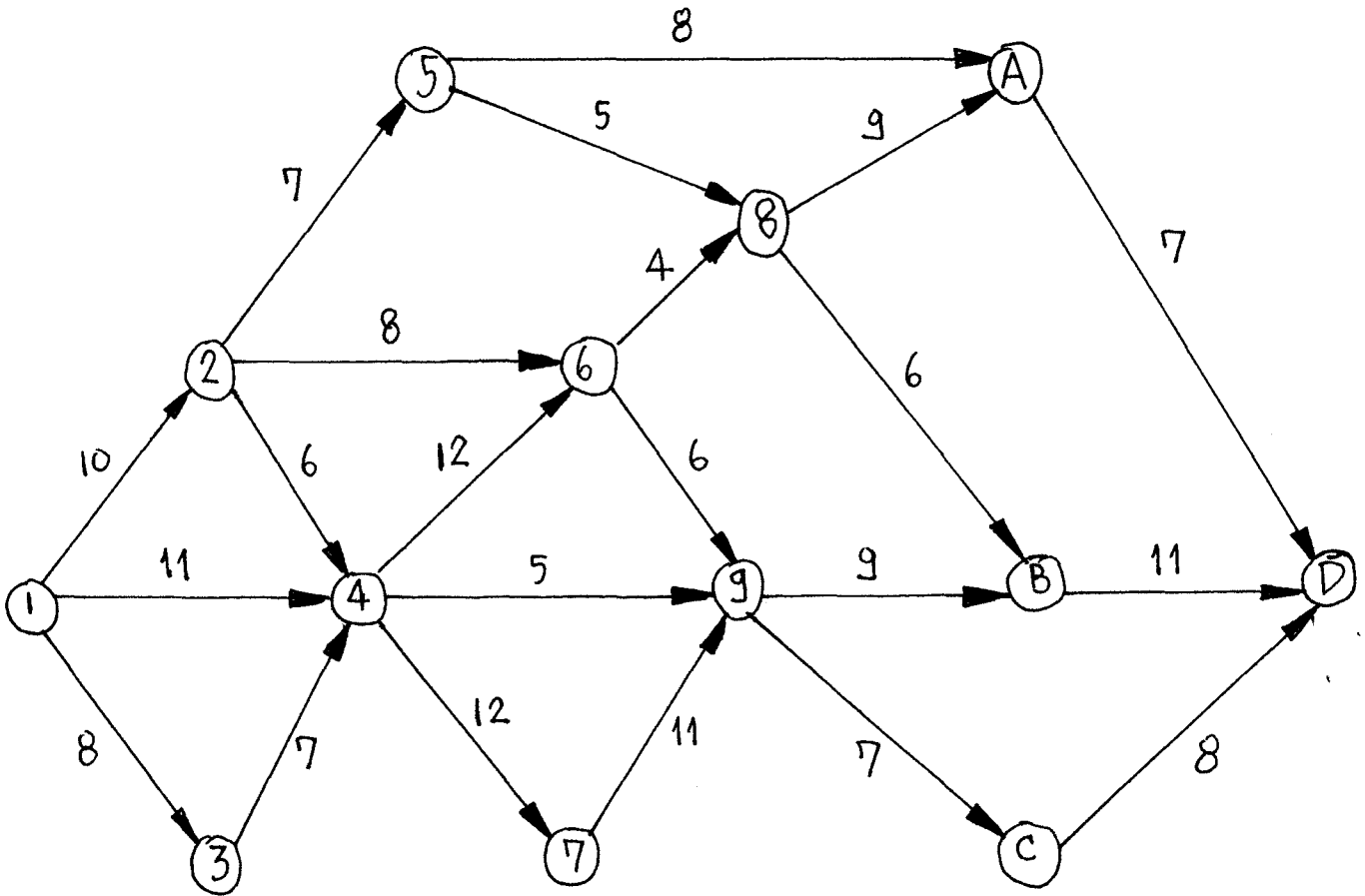


Figure 3.1

Using Linear Programming formulates the objective function and constraint to find the maximum flow between node ① and node ④ . ( Show only objective function and constraint. Do not calculate to solve the problem ) ( 10 scores )

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4. Using labeling procedure. The meaning of numbers in each node is capacity flow. Unit is gallon / per hour

4.1 From Figure 3.1 In Page 11, Find the maximum flow between node (1) and node (D)  
( 11 scores )

4.2 From Figure 4.1 , Find the maximum flow between node (1) and node (9) .  
( 9 scores )

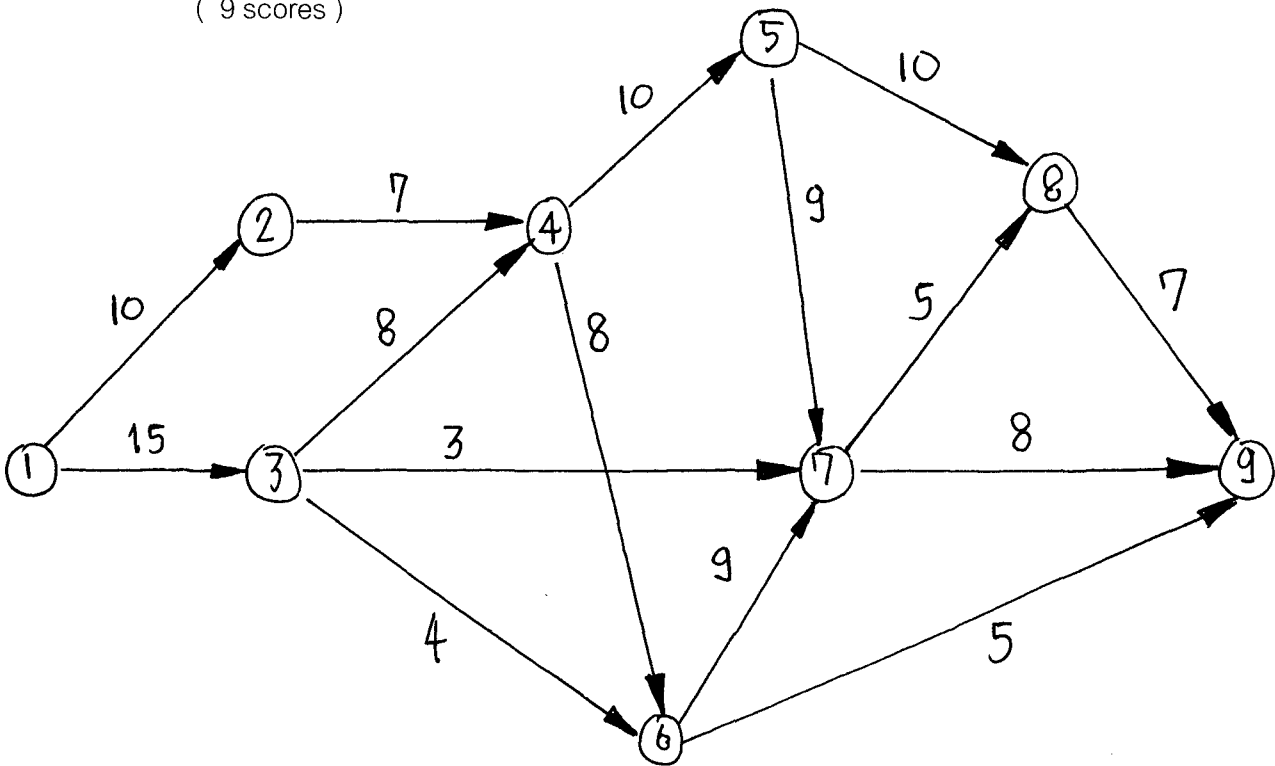
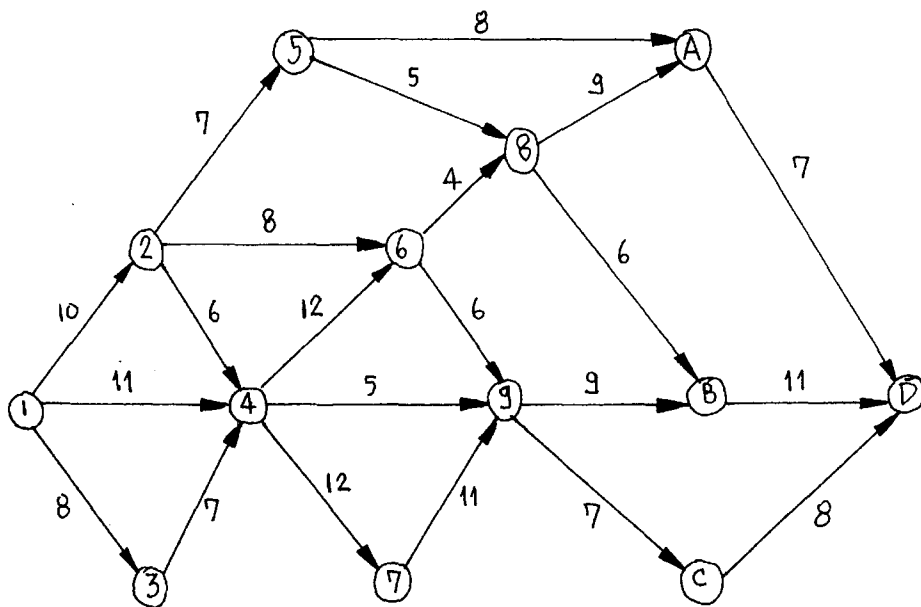
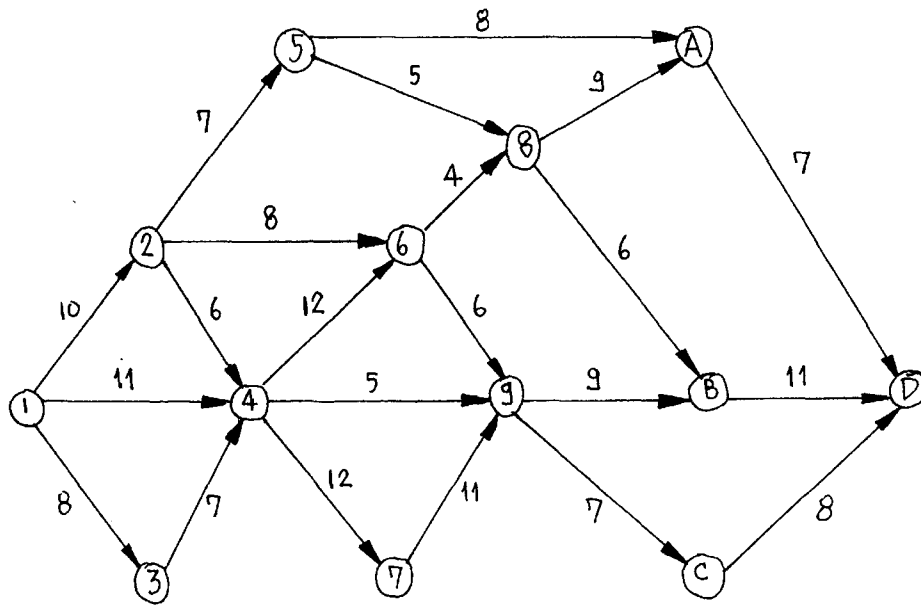


Figure 4.1

( Total 20 scores )

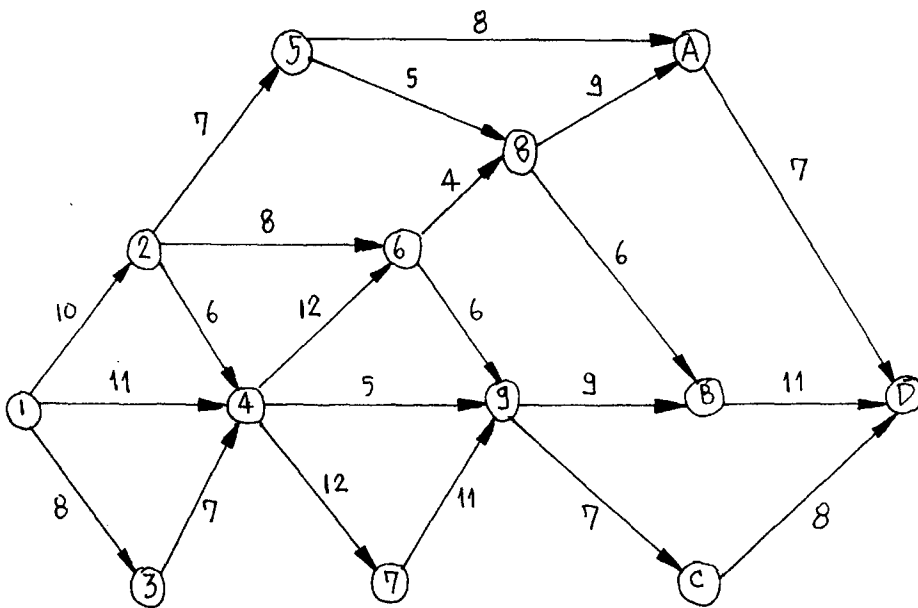
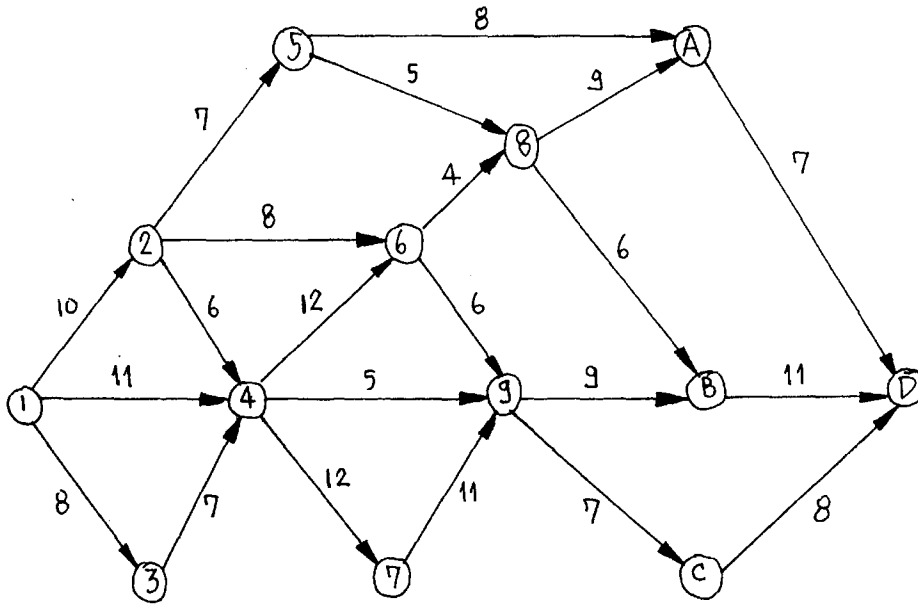
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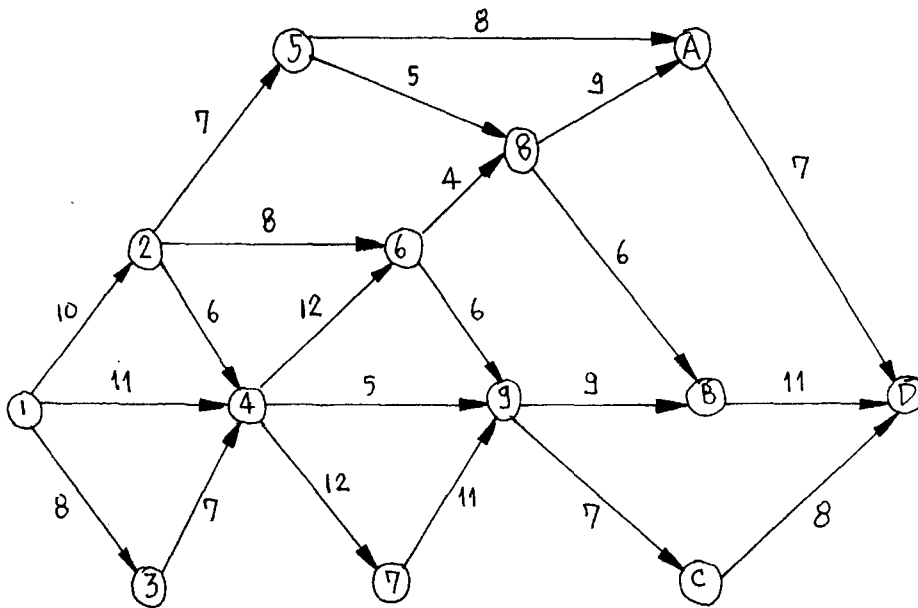
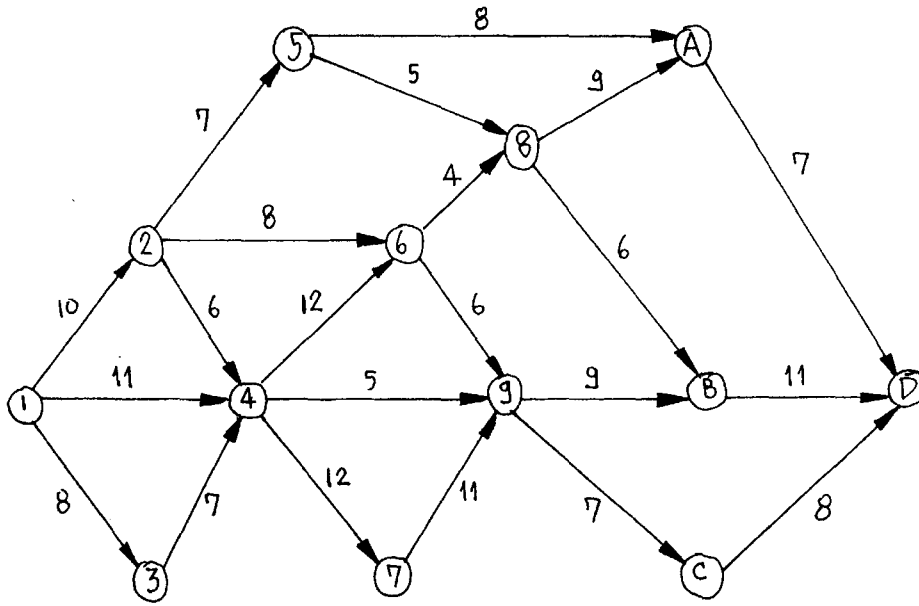
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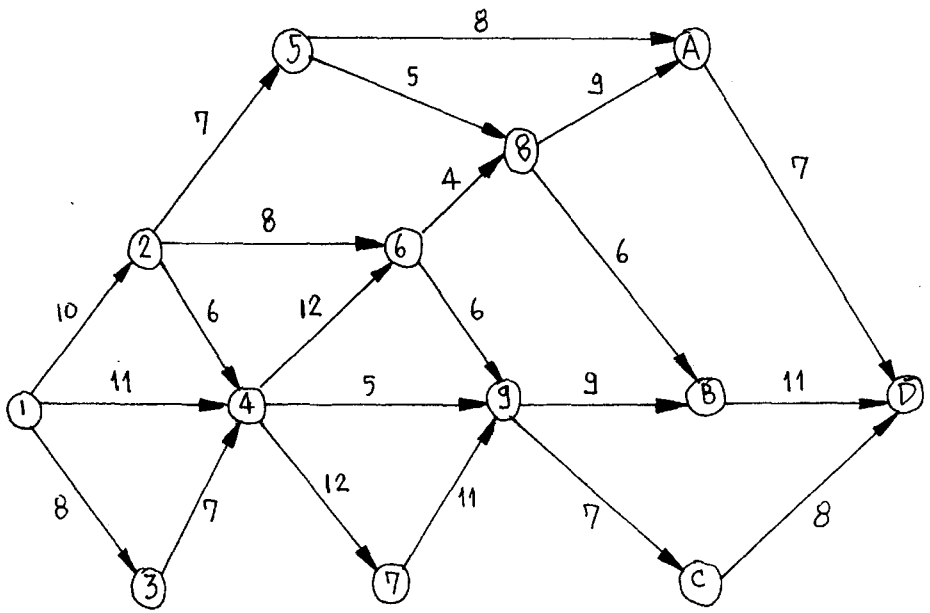
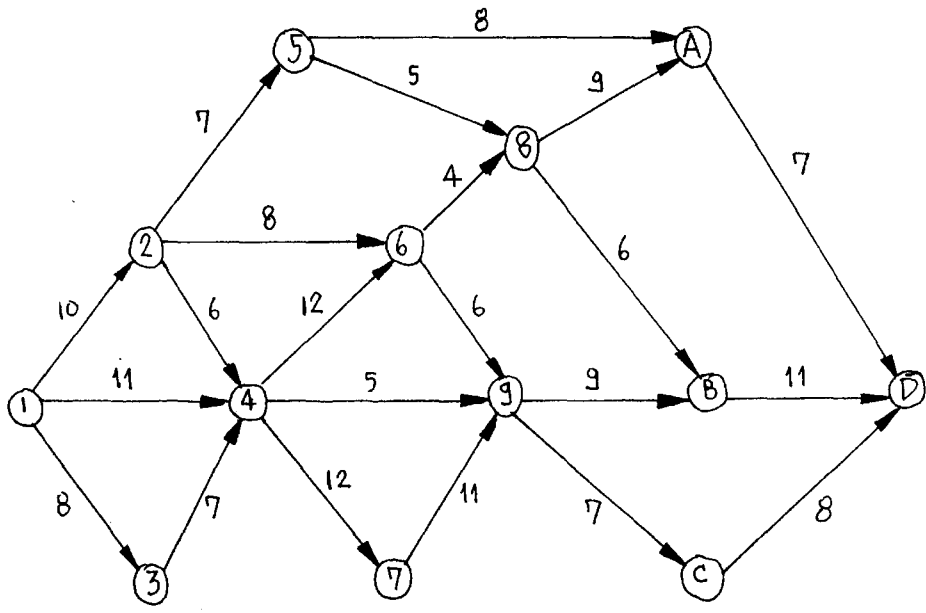
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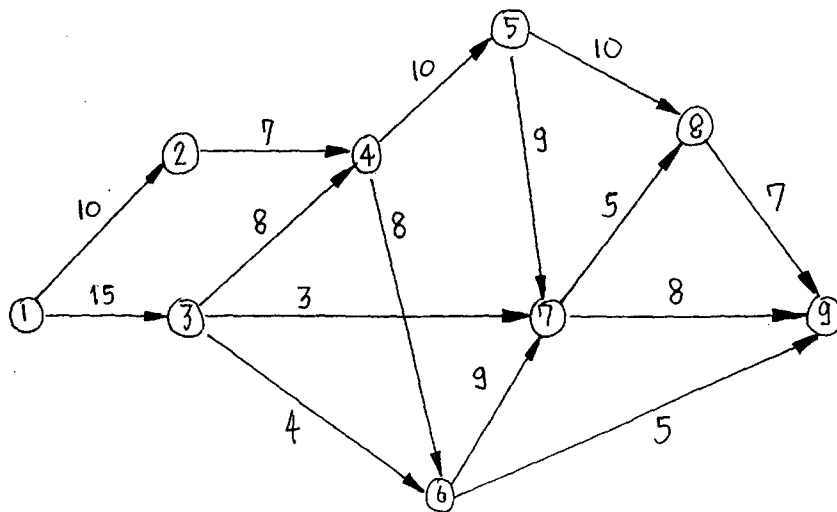
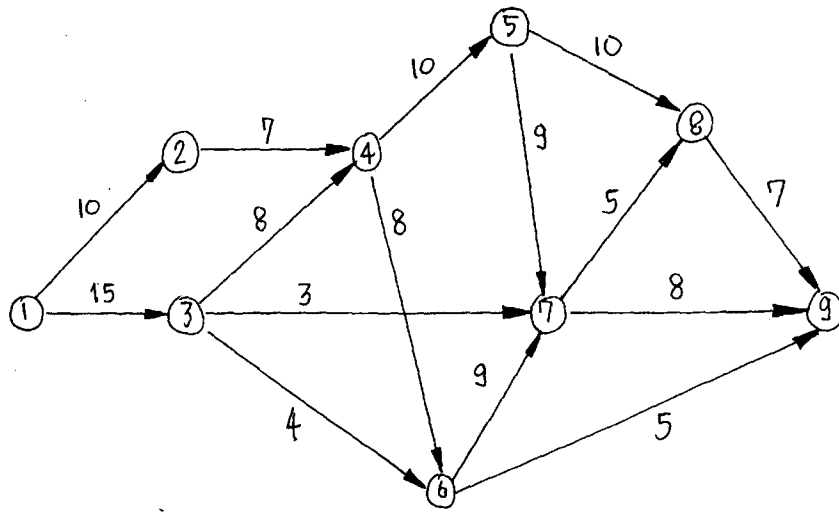
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4.1



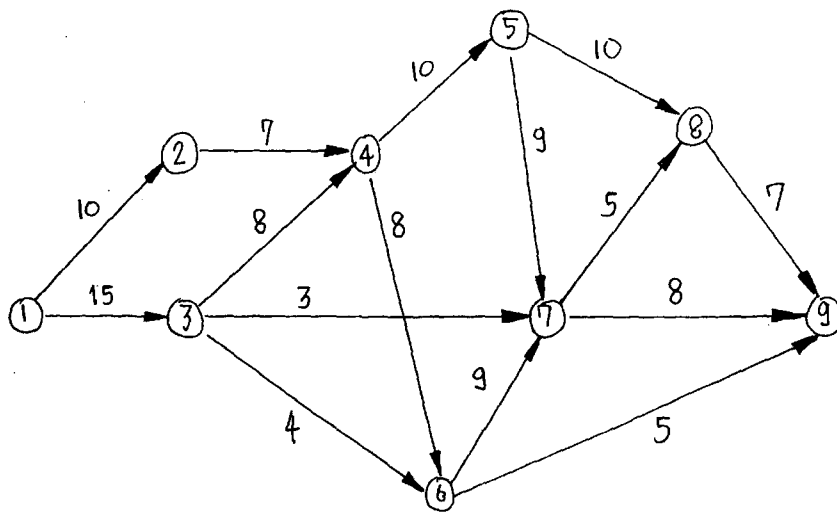
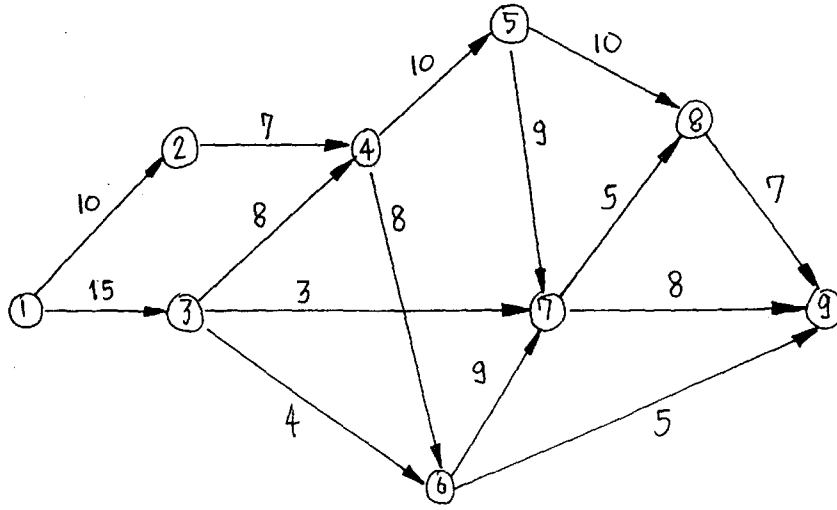
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4.2



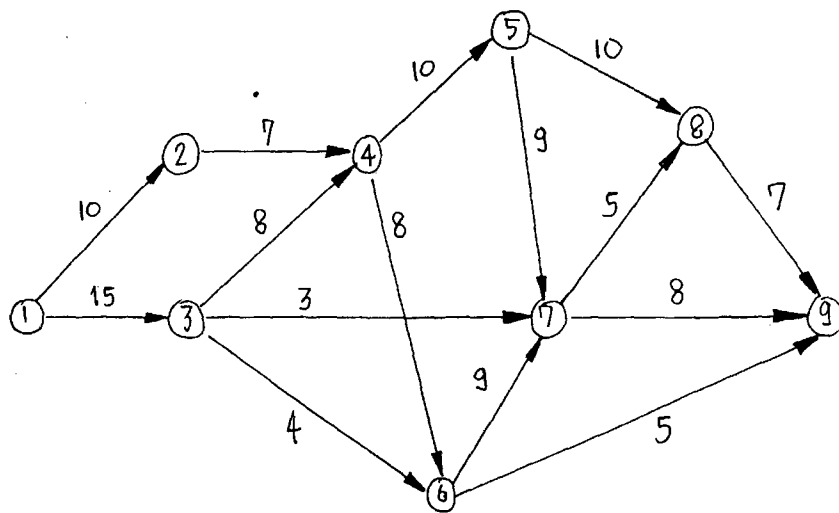
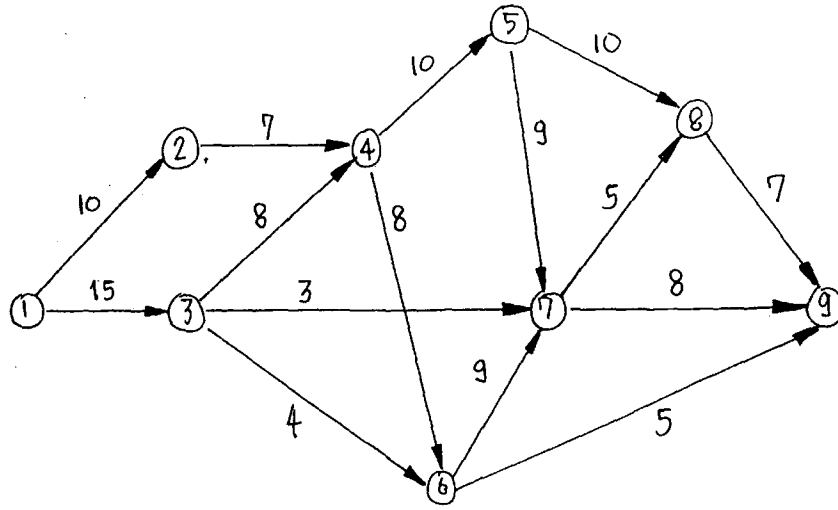
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5. Write down the relation among all variables from the Flowgraph in figure 5.1 and 5.2

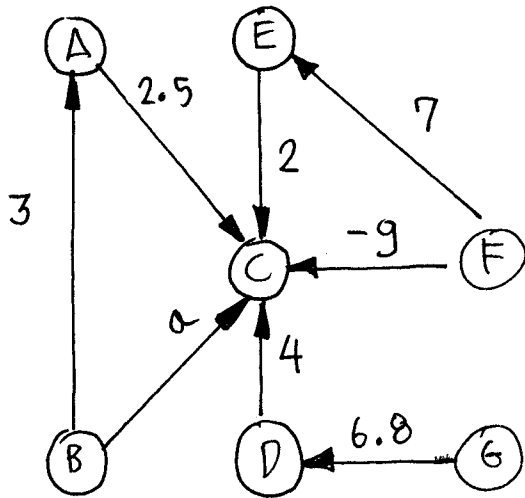


Figure 5.1

( 6 scores )

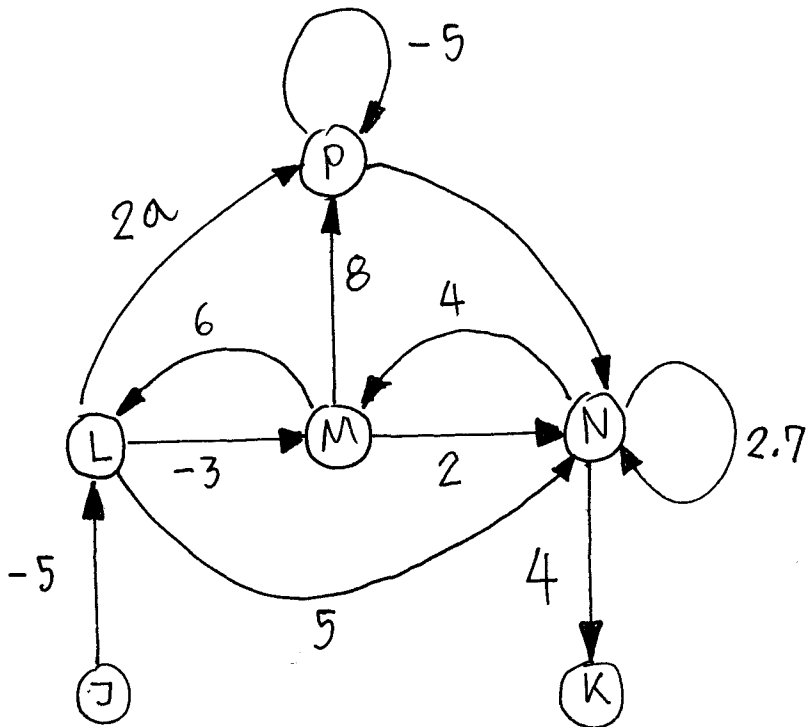


Figure 5.2

( 6 scores )

( Total 12 scores )

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6. From Flowgraph in Figure 6.1

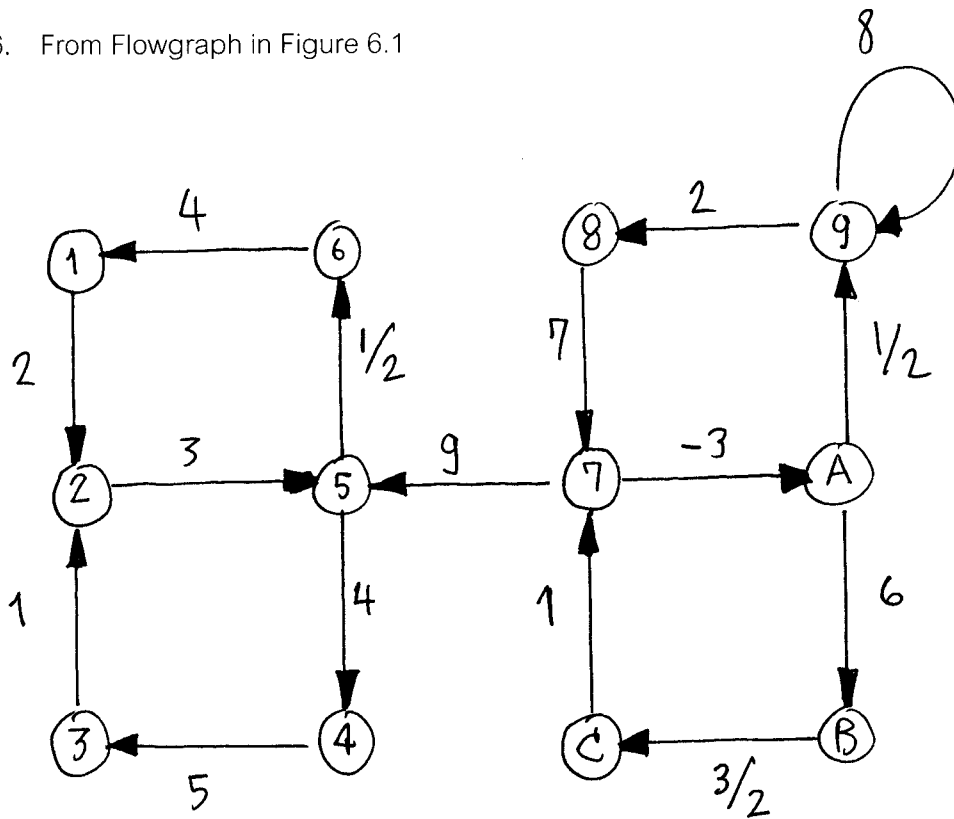


Figure 6.1

Show all calculation to prove that the relation among all variable in Figure 6.1 correct or not.

Explain the reasons clearly.

( 13 scores )

Assistant Professor Yodduang Pannara