

**Faculty of Engineering**  
**Prince of Songkla University**

Final Examination : Semester 2

Academic year 2006 (2549)

Date : February 23, 2007 (23 กุมภาพันธ์ 2550)

Time : 13:30 – 16:30

Subject : 225-703 Network Modeling

Room : R300

**ทูลริตในการสอบโทษจันต่าปรับตกในทูลริตนั้น และ  
พัทการเรียน 1 ภาคการศึกษา**

Instructions :

1. Total 6 topics, 23 pages and 100 scores.
2. Do your examination in these papers and return all of them.
3. Write down your name, surname, student code in every page.
4. Show all calculations and assumptions.
5. All books, notes and calculators are allowed but you are not permitted to borrow anything from the others.

	Scores	Your Scores
1	17	
2	21	
3	10	
4	20	
5	12	
6	20	
Total	100	

Number.....

(From the number in examination list)

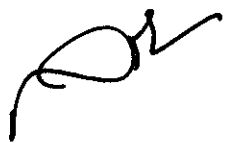
Name.....

Surname.....

Student Code.....

Year / Department.....

Assistant Professor Yodduang PANNARA



Name.....Surname.....Student code.....

1. From Figure 1.1 , the number between each node is distance. For example , the distance between node ② and node ④ is 6 miles.

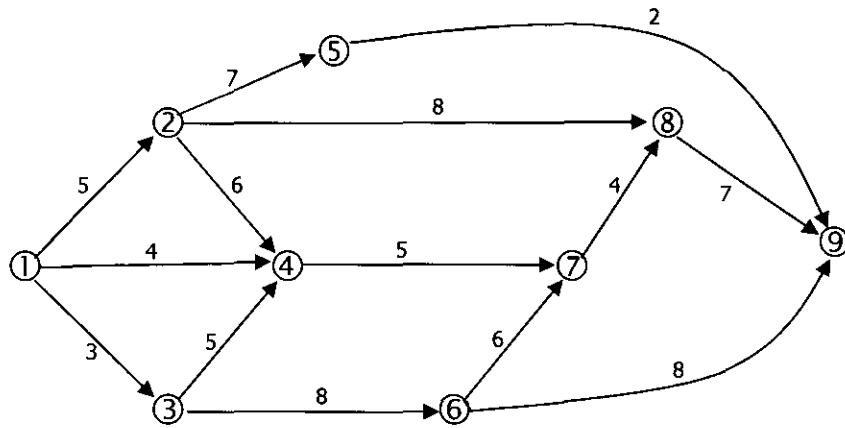


Figure 1.1

Use Dijkstra' Algorithm to find

- 1.1 The shortest path between node ① and **all nodes**. What are the value and paths? ( 7 scores )
- 1.2 The longest path between node ① and **all nodes**. What are the value and paths? ( 10 scores )

(Total 17 scores)

Name.....Surname.....Student code.....

2. From Figure 2.1, the number between each node is time (days). For example, time traveling between node ② and node ⑤ is 4 days.

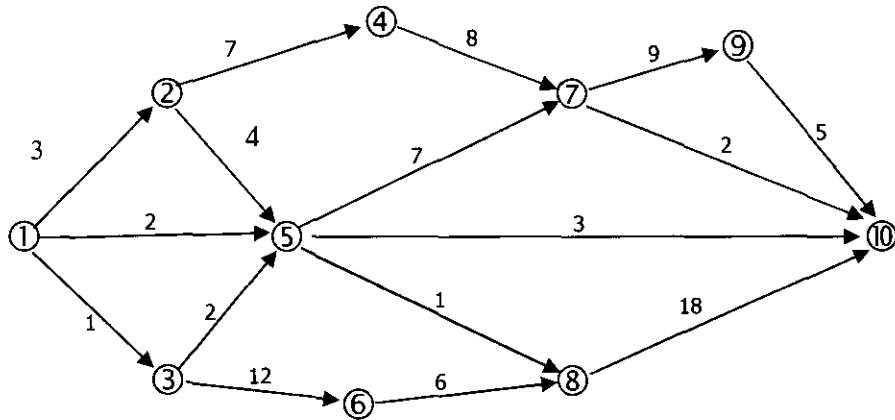


Figure 2.1

Using Network Method to find the distance and paths of

- 2.1 The shortest path level 1 and 2 between node ① and node ⑩. What are the value and paths?  
(10 scores)
- 2.2 The longest path level 1 and 2 between node ① and node ⑩. What are the value and paths?  
(11 scores)

(Total 21 scores)

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3. From Figure 3.1, Using labelling procedure to find the maximum flow and paths between node ① and node ⑨.

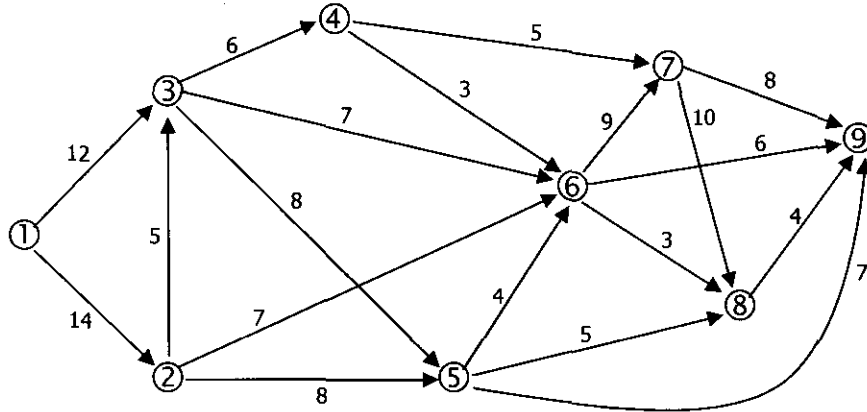
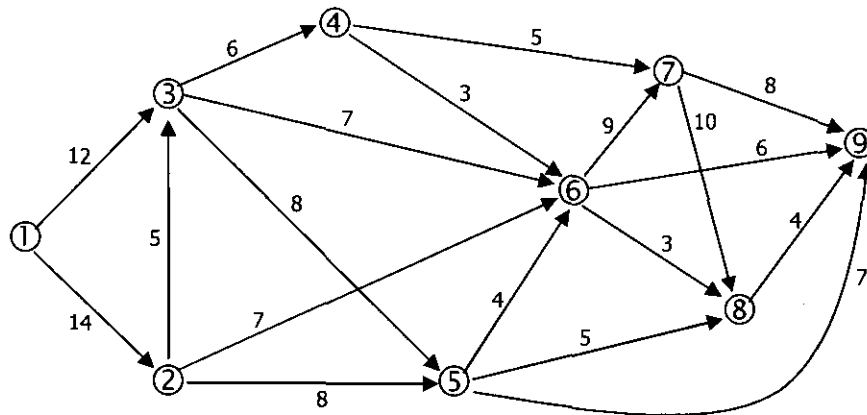


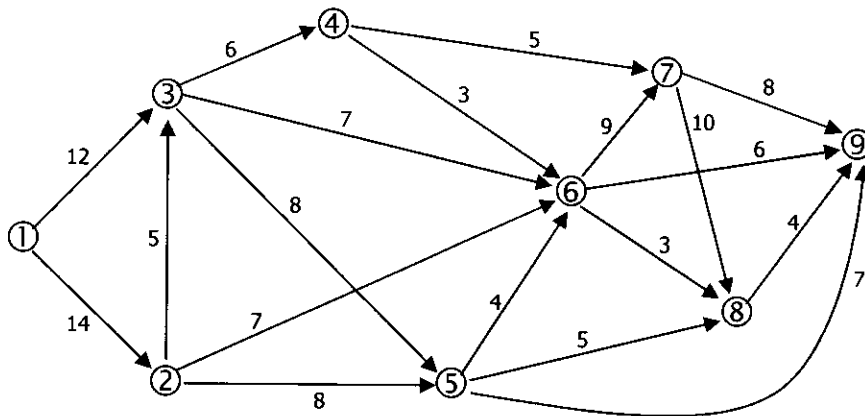
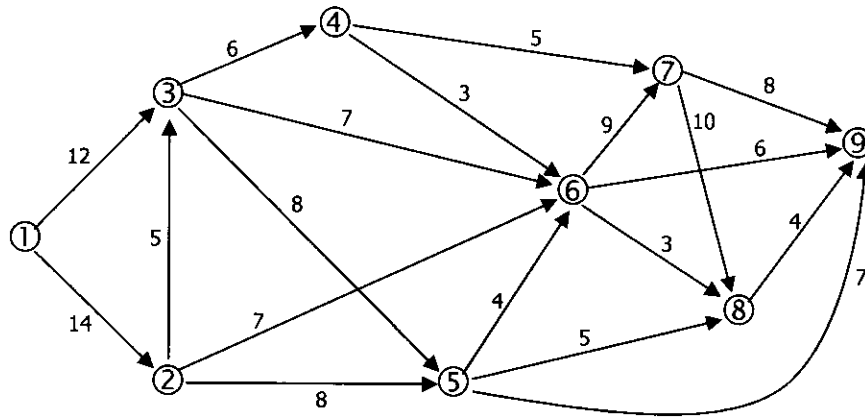
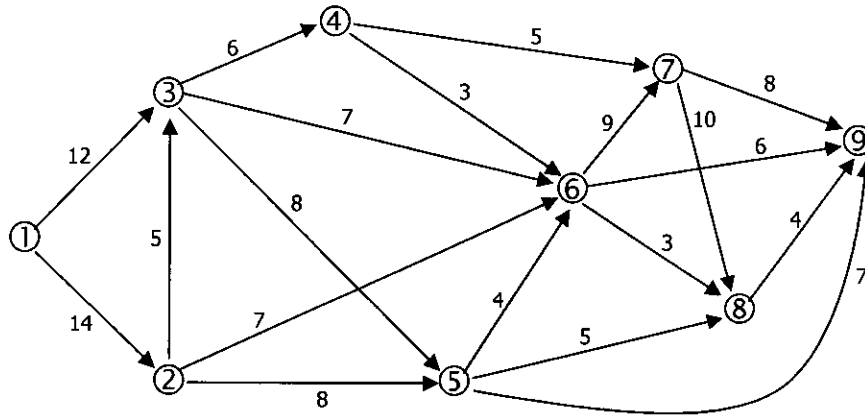
Figure 3.1

Remark : The meaning of number in each node is capacity flow. ( Unit is gallons / hour )

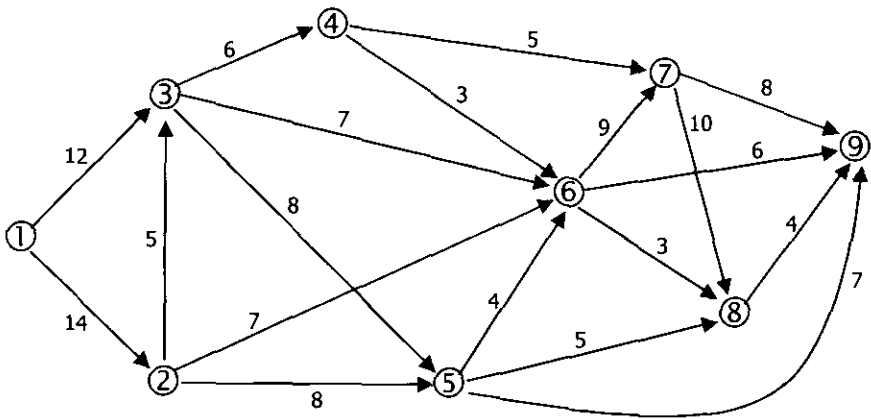
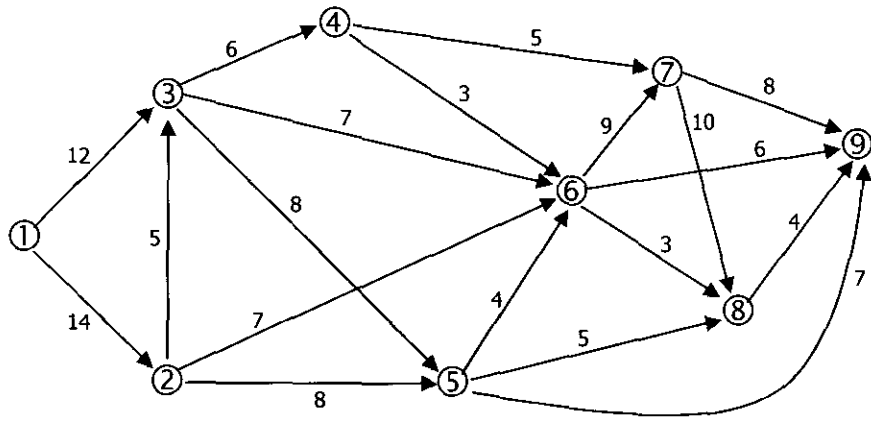
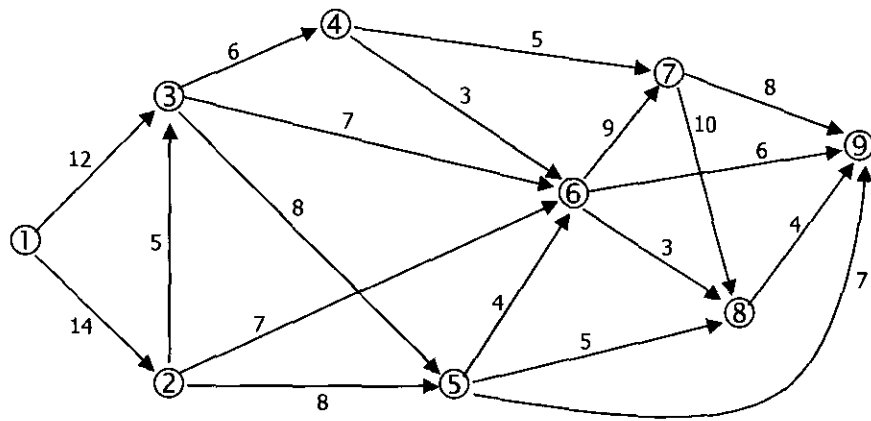
( 10 scores )



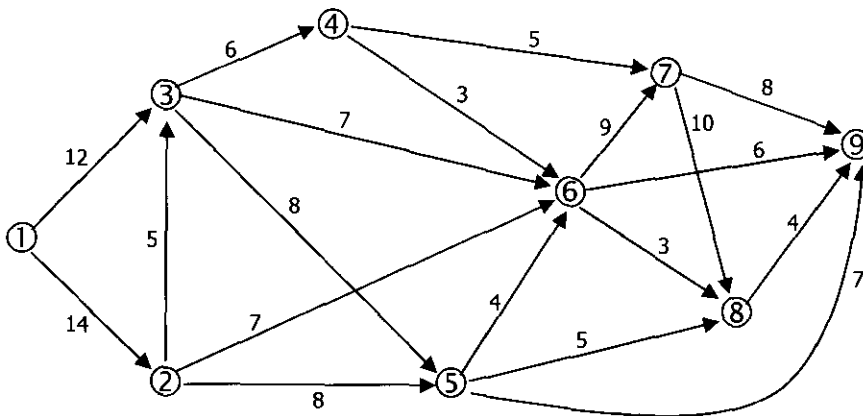
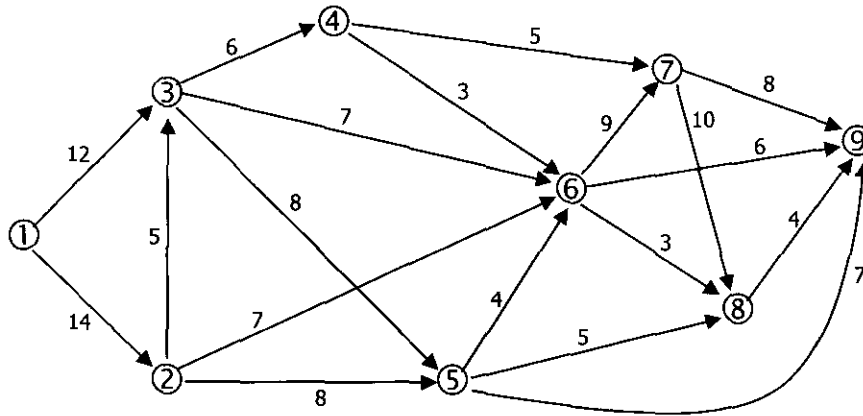
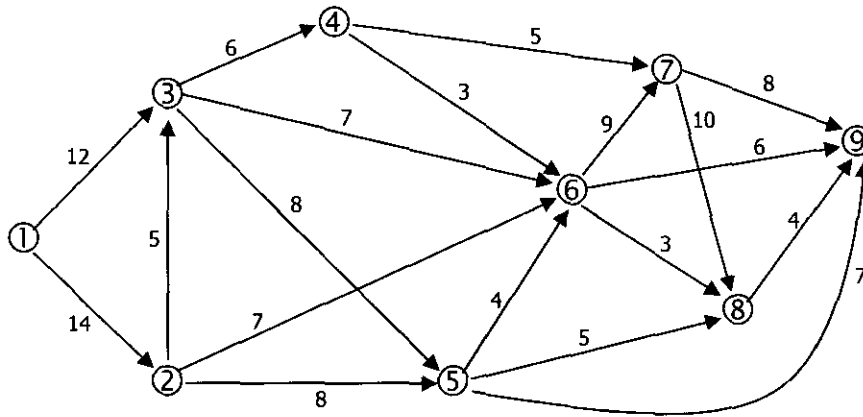
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4. From Flowgraphs in figure 4.1 and 4.2, use Mason's Rule to find relation between

4.1 Node (A) and node (B) in Figure 4.1 (10 scores)

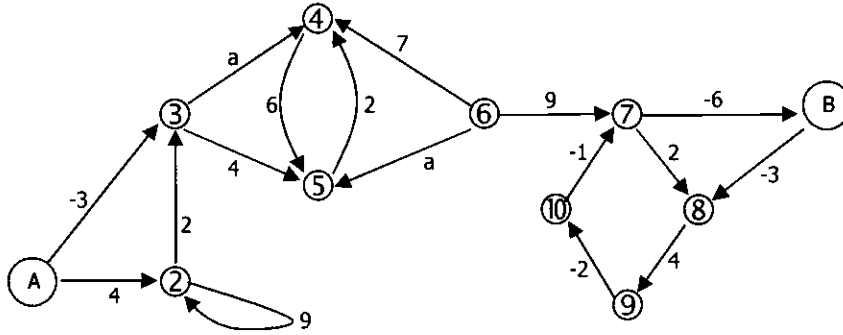


Figure 4.1

4.2 Node (X) and node (Y) in figure 4.2 (10 scores)

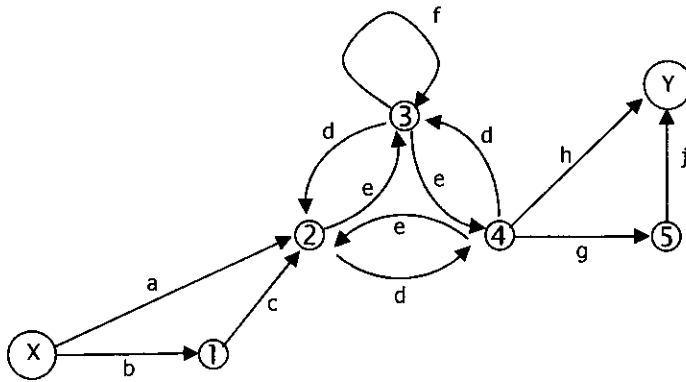


Figure 4.2

(Total 20 scores)



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5. From Flowgraphs in figure 5.1

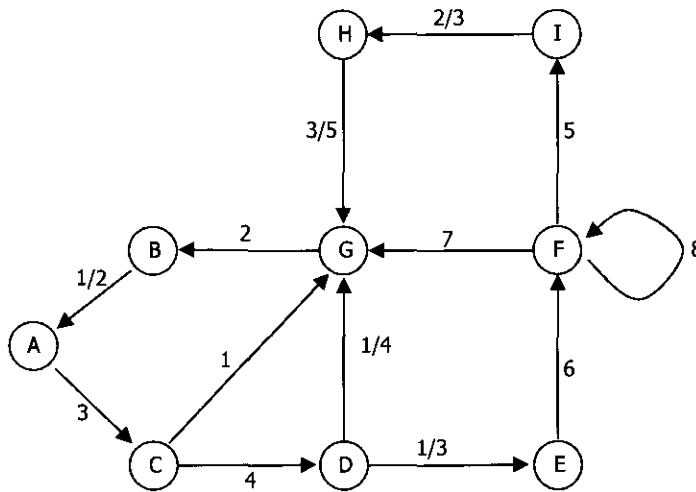


Figure 5.1

Show all calculation that figure 5.1 is correct or not. Explain the reason clearly.

( 12 scores )

Name.....Surname.....Student code.....

6. In Thailand country, after Mr. Square Face got out of the beautiful country. The mobile business becomes fair. There are 3 mobile companies: AIX, DTAX and TRU, which are all competitors. AIX has 55% market share while DTAX and TRU have 32% and 13% market share respectively. At that time there are 32,000,000 customers.

AIX, DTAX and TRU launched new promotions. After four months from those new promotions from all companies, there are 2,500,000 new customers using new mobile numbers. The new 2,500,000 customers started using mobile number from AIX 38%, DTAX 36%, TRU 26%. Finally at present, the situation of each company is as follows.

After AIX launching the new promotion, 40% of the AIX customers remain using it, other 42% of customers use DTAX and 16% of customers use TRU. The 2% of customers quit using mobile numbers.

The other companies establish new promotions. DTAX has 60% of the customers still using DTAX, other 25% of customers use AIX, other 12% of customers use TRU and 3% of customers do not use any mobile numbers. For TRU customers, 62% of customers use the same product, 6% of customers use AIX and another 25% of customers change to DTAX. The last 7% of customers quit using mobile numbers.

Draw only Flowgraphs in present. Show relation between each node and also show the value of each Transmittance. **(No need to do any calculation.)**

(20 scores)

