Faculty of Engineering

Prince of Songkla University

Final Examination : Semester 2   Academic year 2007 (2550)

Date : February 22, 2008 (22 กุมภาพันธ์ 2551)   Time : 13:30 – 16:30

Subject : 225-703 Network Modeling   Room : A401

ทุจริตในการสอบโทษขั้นต่ำปรับตกในที่ทุจริตนั้น และ
พักการเรียน 1 ภาคการศึกษา

Instructions :

1. Total 6 topics, 23 pages and 100 scores.

2. Do you examination in these papers and return all of them.

3. Write down your name, surname, student code in every page.

4. Show all calculation and assumption.

5. All book, notes and calculators are allowed but you are not permitted to borrow anything from the others.

	Scores	Your Scores
1	18	
2	21	
3	12	
4	14	
5	20	
6	15	
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.
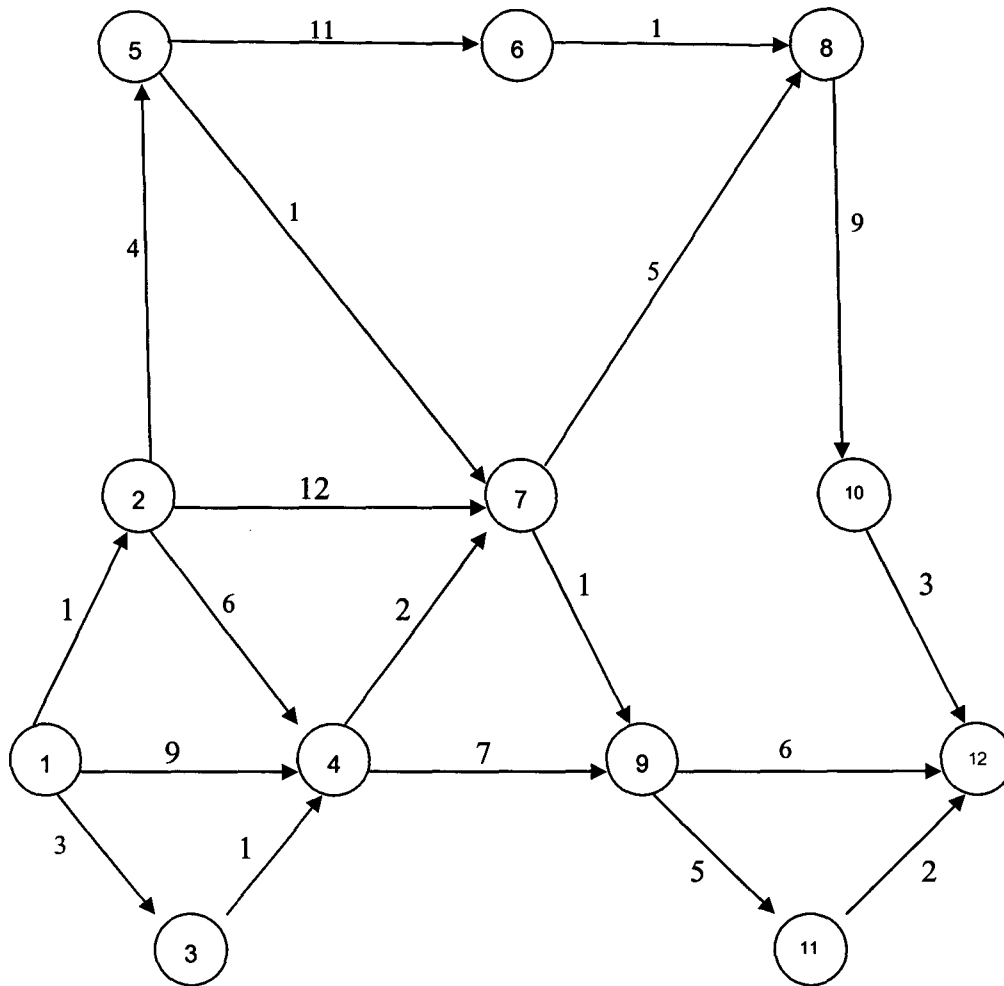

Figure 1.1

Use Dijkstra' Algorithm to find

1.1 The shortest path between node ① and all nodes. What are the value and paths ? (8 scores)

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

(18 scores)

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

2. From Figure 2.1, the number between each node is time (Days). For example, time travel
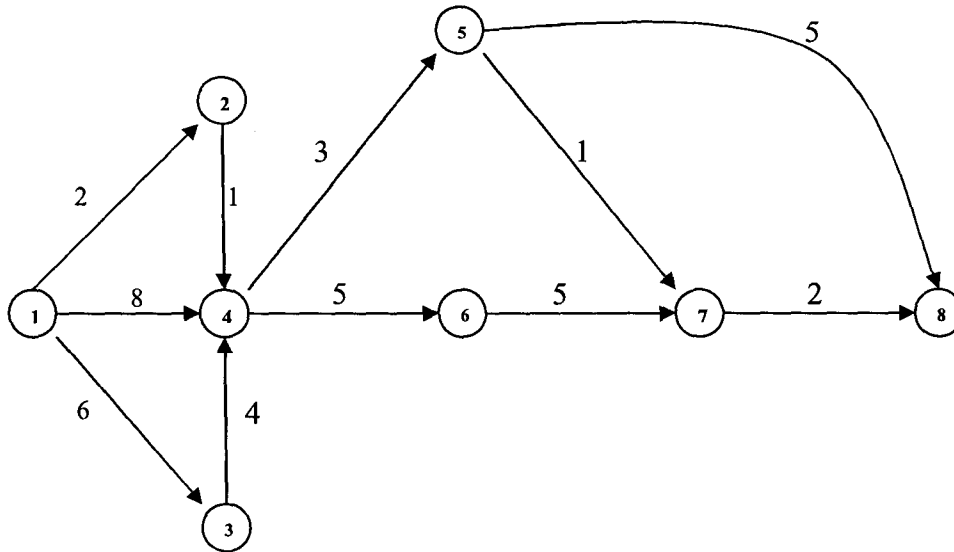   between node ② and node ④ is 1 day.

Figure 2.1

Using Network method to find the distance and paths of

2.1 The shortest paths level 1 and 2 between node ① and node ⑧.(10 scores)

2.2 The longest paths level 1 and 2 between node ① and node ⑧. (11 scores)

(Total 2 scores)

Name....................Surname...........................Student code...............................
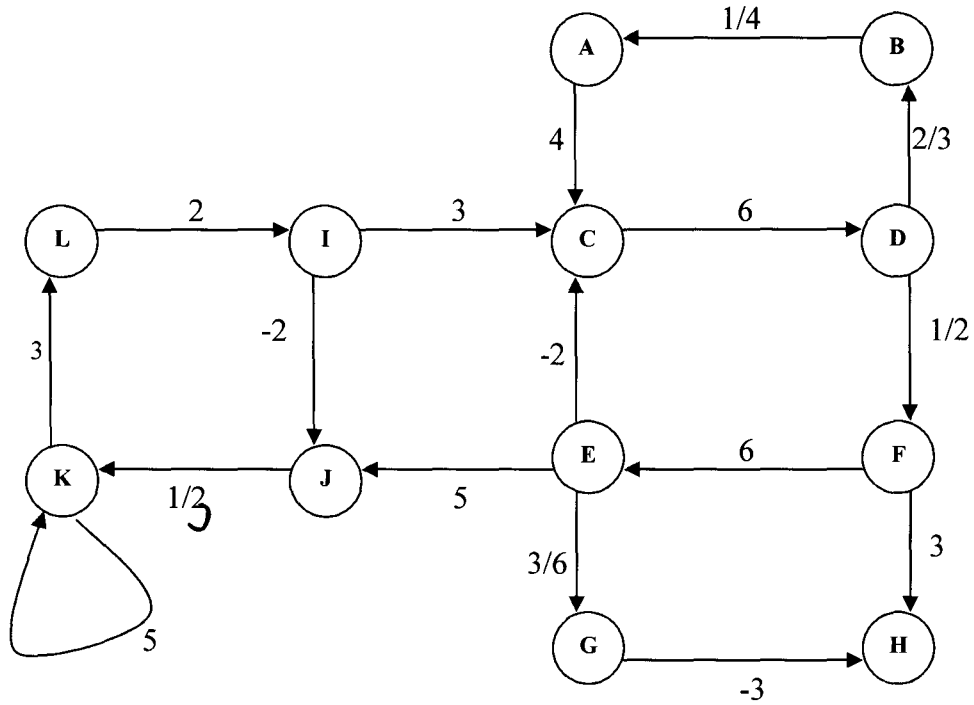
3. From Flowgraph in figure 3.1

Figure 3.1

Use Flowgraph method to show that figure 3.1 is correct or not. Explain the reason clearly.

(12 scores)

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

4. From Flowgraph in figure 4.1, use Mason's Rule to find relation between node $\boxed{A}$ and

node $\boxed{B}$ in Figure 4.1.
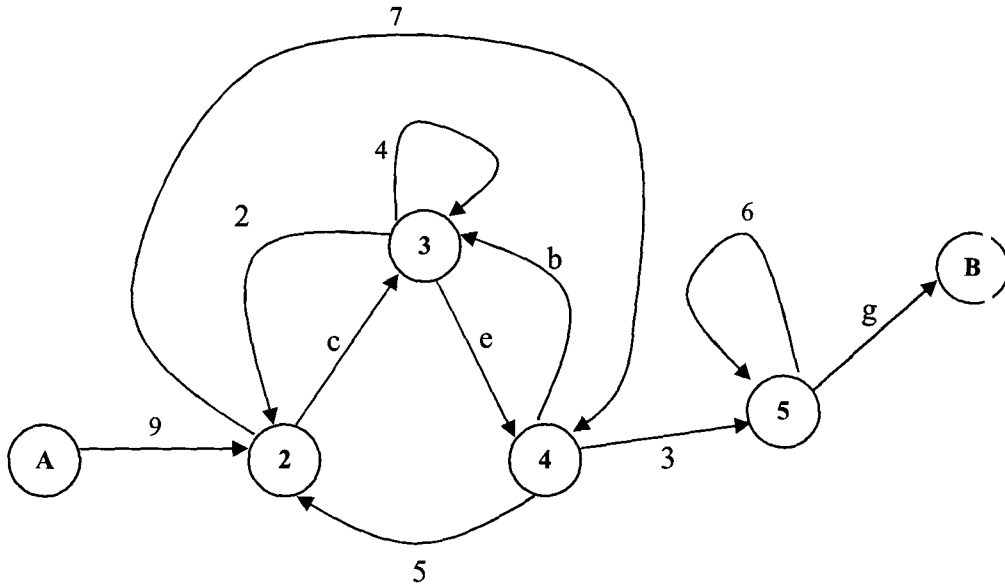
Figure 4.1

(Total 14 score:)

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

5. There are 3 brands of motorcycles in the market : Honba, Yamaya, Suzuka.   In the past, the market share of Honba, Yamaya and Suzuka are 50%, 30% and 20%, respectively.

The data from the real world when the customers buy new motorcycles are as followed

The customers who use Honba before

- use Honba again   45%

- change to Yamaya   30%

- change to Suzuka   20%

- quit using motorcycles   5%

The customers who use Yamaya before

- change to Honba   30%

- use Yamaya again   50%

- change to Suzuka   16%

- quit using motorcycles   4%

The customers who use Suzuka before

- change to Honba   10%

- change to Yamaya   40%

- use Suzuka again   50%

Use Flowgraph technique

5.1. Draw the Flowgraph that represents this model. (15 scores)

5.2. How many percent of market share will it be for each brand in the future? (5 scores)

(Total 20 scores)

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

6. There is a game in the fair : Ring Toss Game (Figure 6.1). Each time the probability to toss into the pole is 0.2. (Hint : $\sum$ probability $= 1$)

    There are 3 rules to win the game. (Each rule is independent)

    1. The first rule, toss into the pole 3 times consecutively.

    2. The second rule, toss into the pole 3 times (Don't need to be consecutive).

    3. The third rule, toss into the pole 3 times : First two times must be consecutive, and the last time doesn't need to.

    Draw only Flowgraph or GERT Network to represent each rule and show that you understand it. (Do not calculate.)
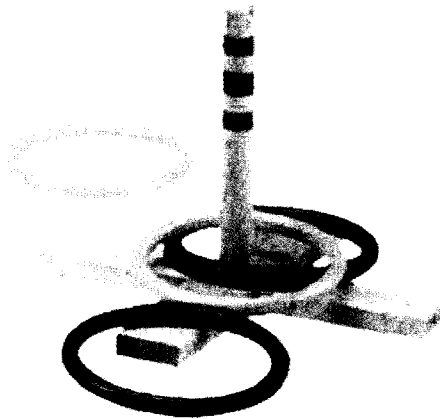

Figure 6.1

(15 score)