

Faculty of Engineering
Prince of Songkla University

Midterm Examination : Semester 2

Academic year 2008 (2551)

Date : 26 ธันวาคม 2551 (December 26, 2008)

Time 13:30 - 16:30

Subject : 225-703 Network Modeling

Room : R300

ทุจริตในการสอบ โทษขั้นต่ำ ปรับตกในวิชาที่ทุจริตนั้น
และพักการเรียน 1 ภาคการศึกษา

1. Total 6 Topics, 28 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 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	18	
2	21	
3	16	
4	16	
5	9	
6	20	
Total	100	

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 the distance (Miles). For Example, the distance between node ② and node ⑤ is 5 miles

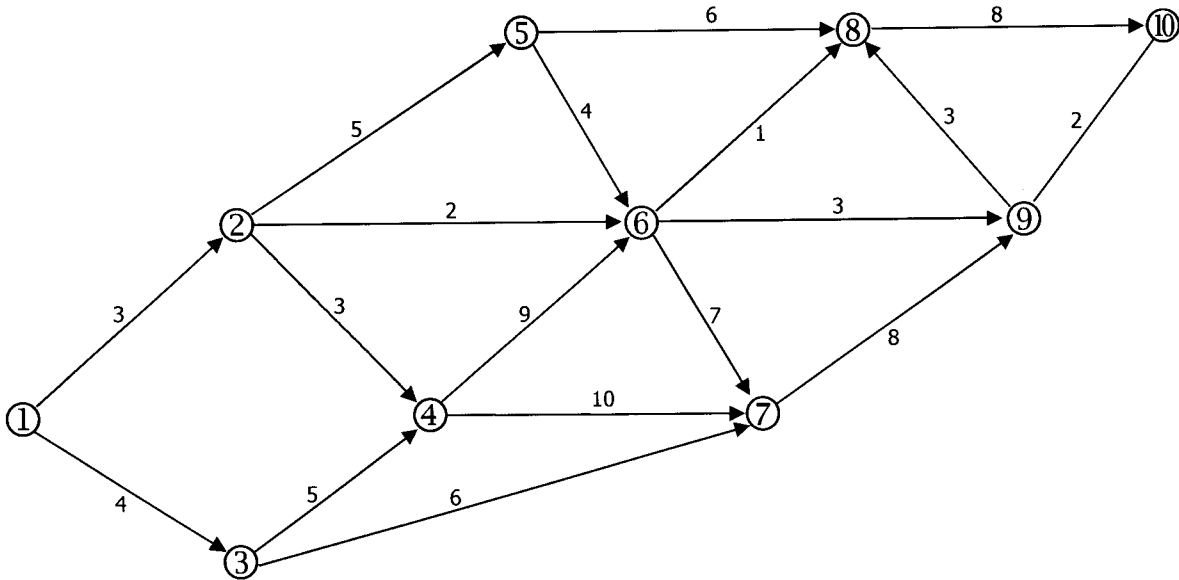


Figure 1.1

Use Dijkstra's Algorithm to find.

- 1.1 The shortest path from node ① to all nodes. What are the paths ? (7 scores)
1.2 The longest path from node ① to all nodes. What are the paths ? (11 Scores)

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2. From Figure 2.1, the number between each node is time (Minutes). For example, time travels between node ③ and node ④ is 5 minutes.

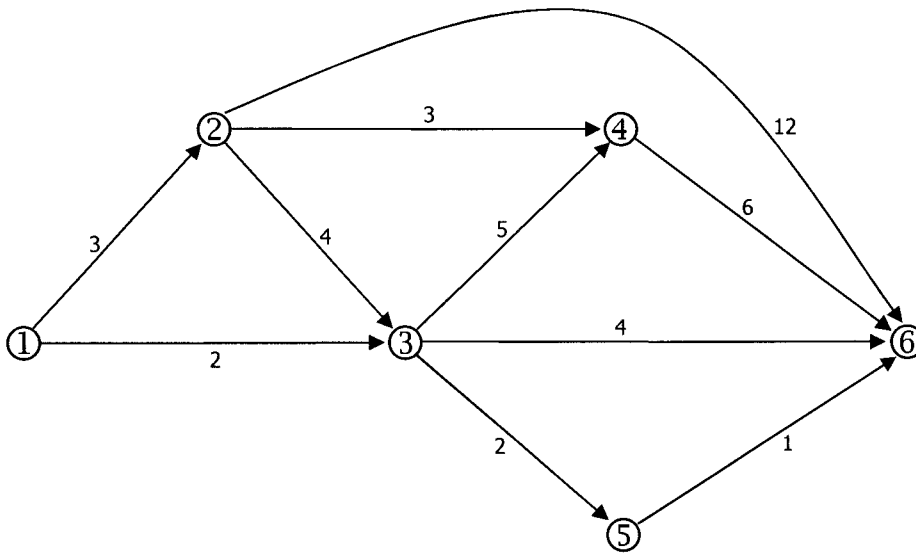


Figure 2.1

Use Network Method to find.

- 2.1 The shortest path level 1 and 2 from node ① to node ⑥. What are the paths ?
(10 scores)
- 2.2 The longest path level 1 and 2 from node ① to node ⑥. What are the paths ?
(11 scores)

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3. Use labeling procedure.

3.1. From figure 3.1, Find the maximum flow from node ① to node ⑪ (8 scores)

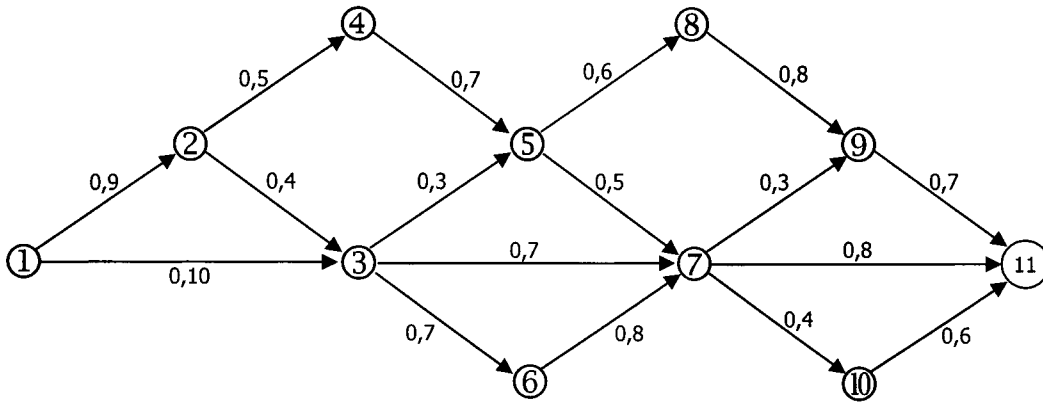


Figure 3.1

3.2. From Figure 3.2 , Find the maximum flow from node ① to node ⑩ (8 scores)

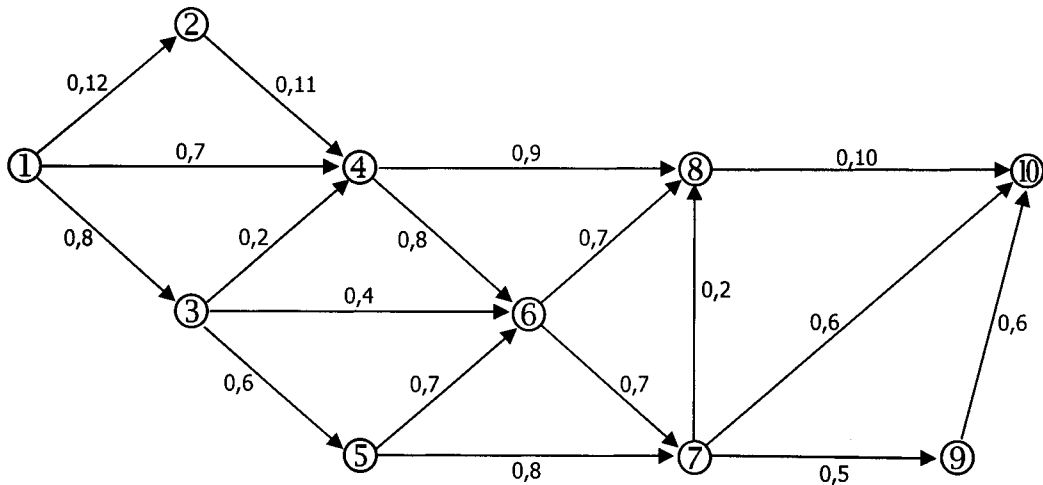


Figure 3.2

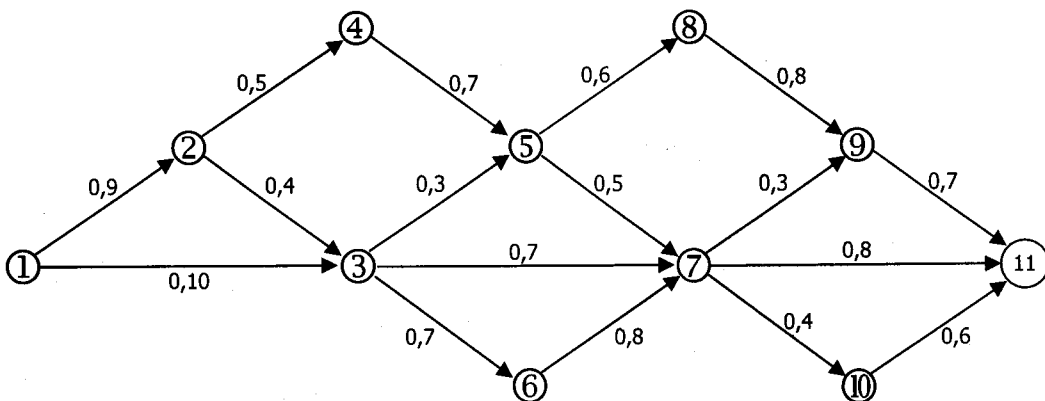
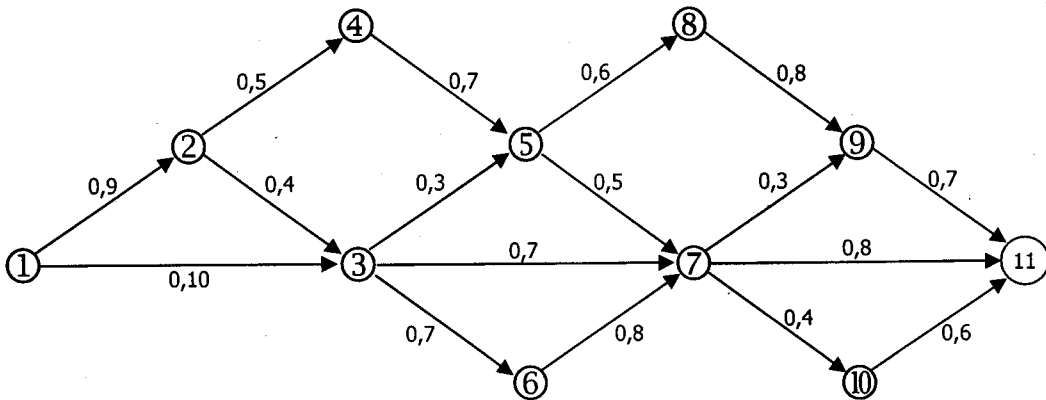
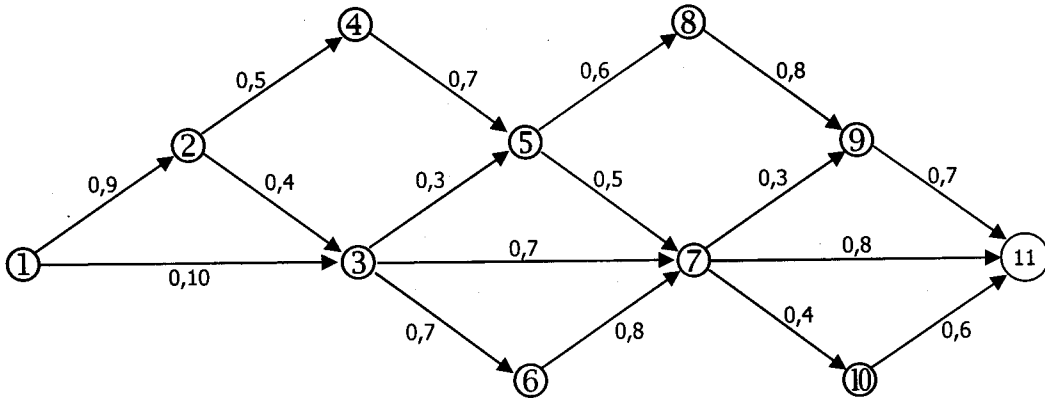
Remark

The meaning of each number in each node is

- The first number is original flow. (Unit is gallon/ minute)
- The second number is capacity flow. (Unit is gallon/ minute)

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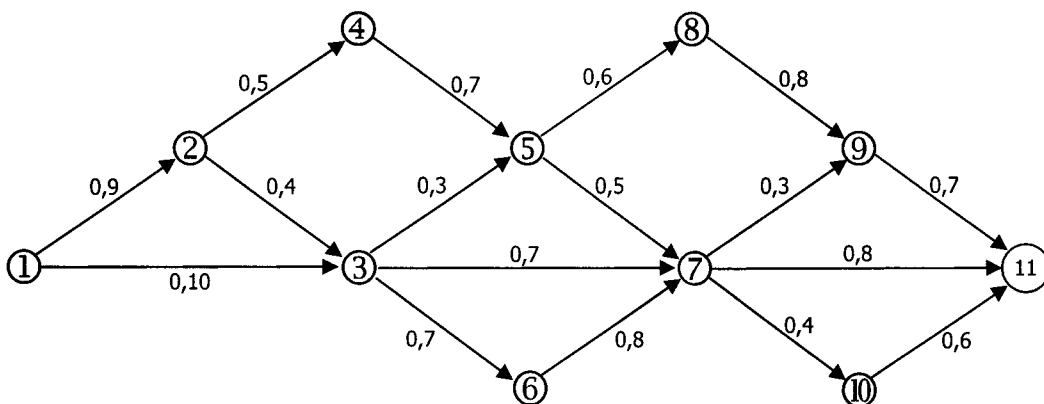
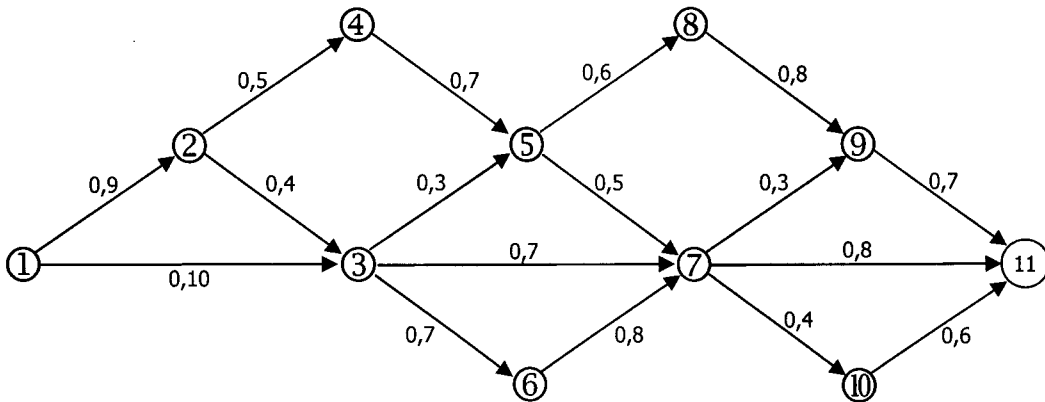
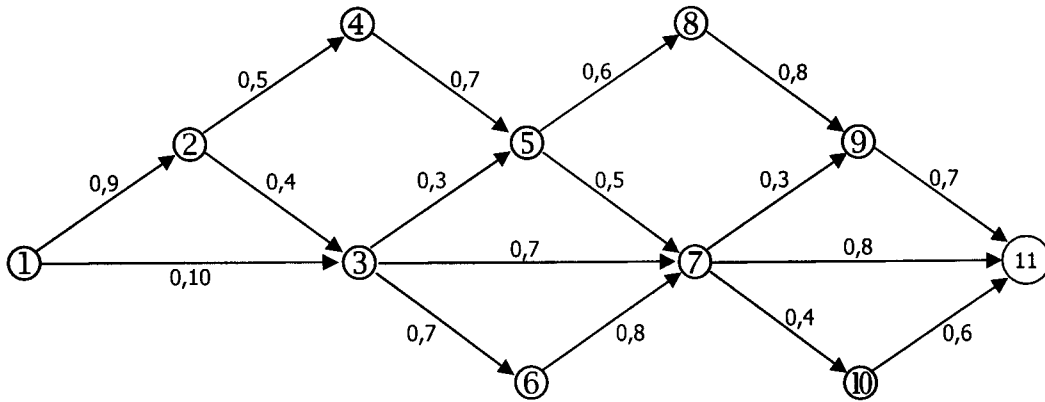
3.1.



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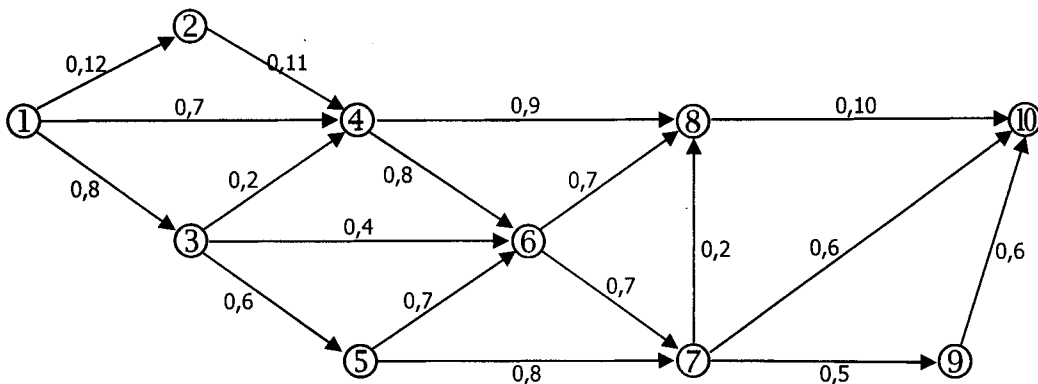
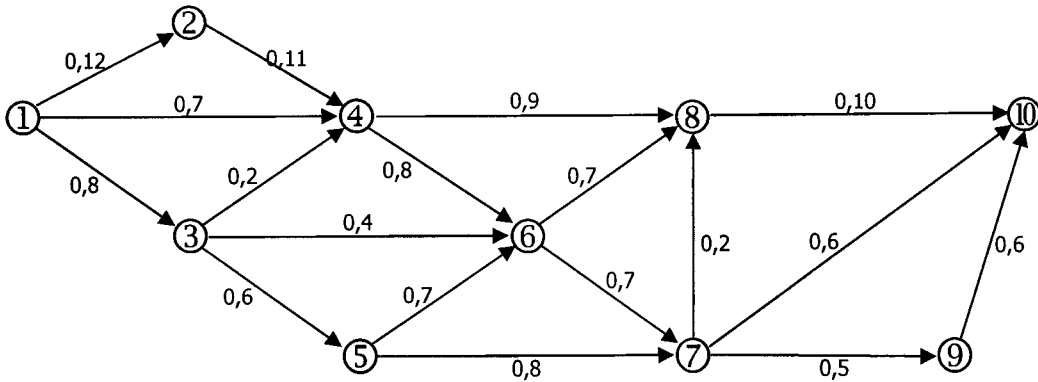
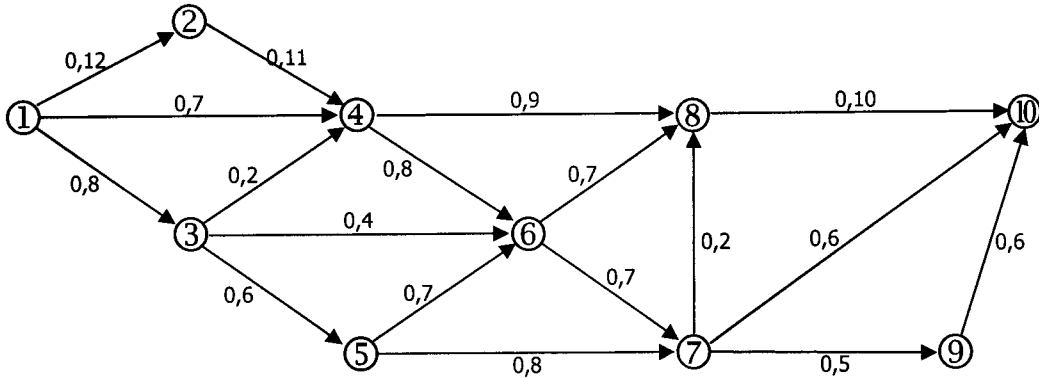
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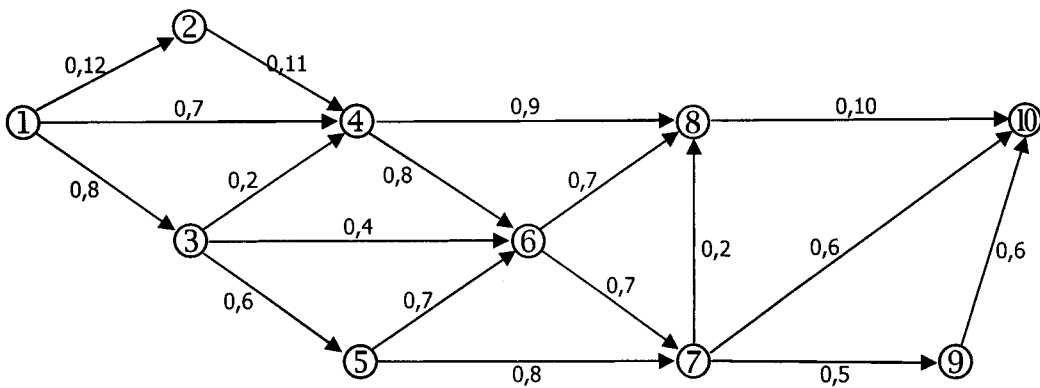
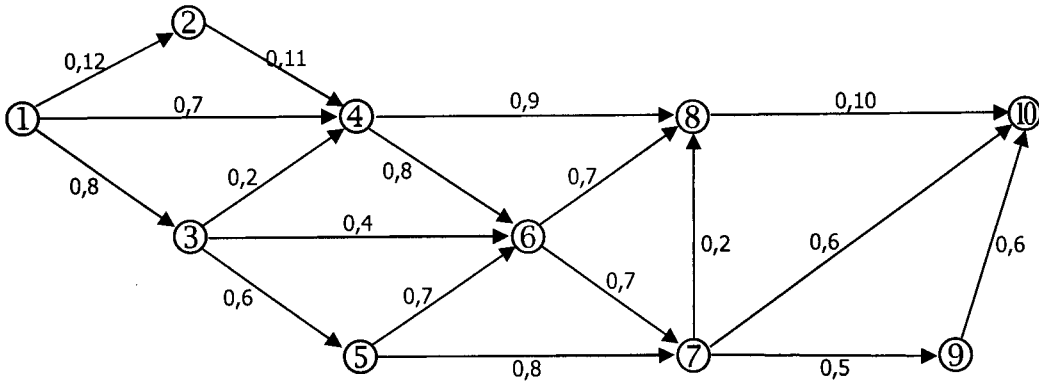
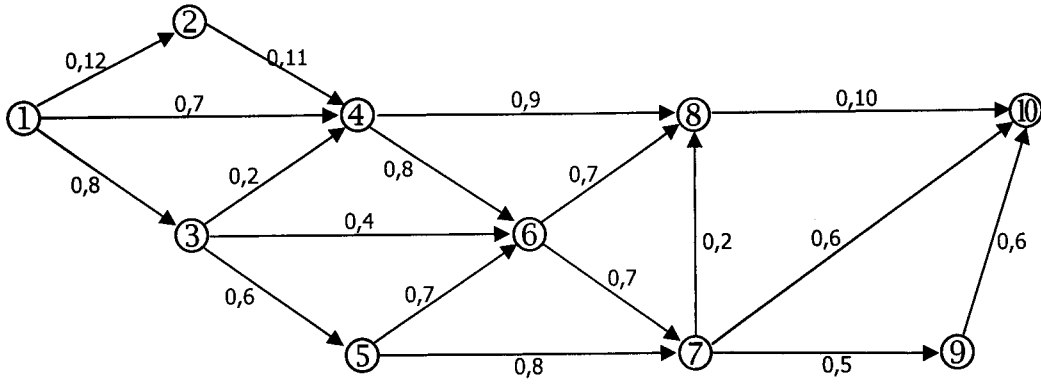
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4. From figure 4.1, the number between each node is the reliability. For example, the reliability between node ① and node ② is 0.95

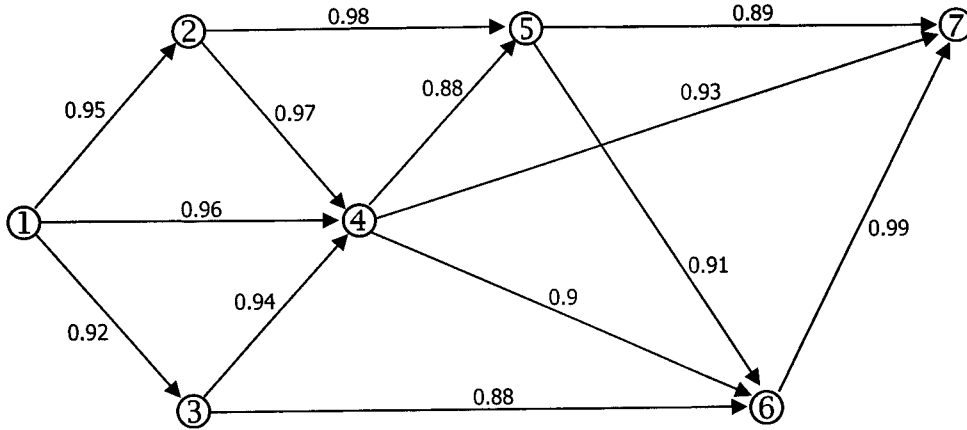


Figure 4.1

Use Dijkstra's Algorithm to find the maximum reliability and the path.

4.1. From node ① to node ⑦. (11 scores)

4.2. From node ③ to node ⑦. (5 scores)

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5. From figure 5.1, the number between each node is maximum transportation. Unit is gallon per minute.

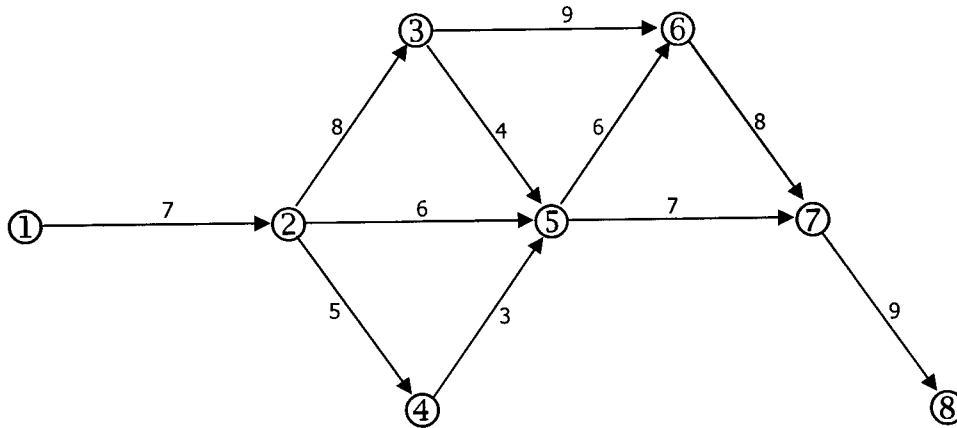


Figure 5.1

Use Linear Programming formulates the objective function to find the maximum flow and all constraints (Do not calculate to solve the problem) (9 scores)

Ans

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6. From Figure 6.1, value at each path is Baht per times that pass that path. Value at each node is Bath per times that pass that node.

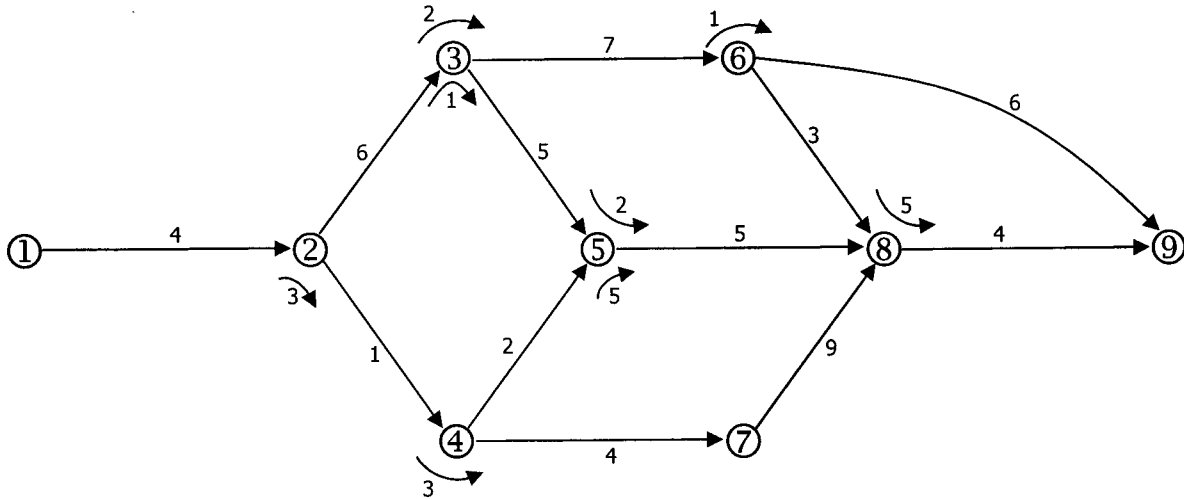


Figure 6.1

Use Dijkstra's Algorithm to find

- 6.1 The minimum cost and path from node ① to node ⑨. (10 scores)
- 6.2 The maximum cost and path from node ① to node ⑨. (10 scores)