

Name _____ Student ID _____

Prince of Songkla University
Department of Industrial Engineering, Faculty of Engineering

Mid Term Examination: Semester 2
Date: 27 December 2007
Subject: 225-601 Supply Chain Management

Academic Year: 2007
Time: 09:00-12:00
Room: R200

ทฤษฎีในการสอบ โทษขั้นต่ำ คือ ปรับตกในรายวิชาที่ทุจริต และพักการเรียนหนึ่งภาคการศึกษา

Instructions: Read carefully

1. All materials are allowed.
2. There are **11** problems for this test. Do all of them. Also show your work clearly and legibly.
3. Answer the questions in this test paper, only.
4. You must write your name and your student ID in every page of the test.
5. Total score is 100 points.

Distribution of Score

Problem	Points	Points Gained
1	8	
2	8	
3	8	
4	8	
5	8	
6	8	
7	8	
8	8	
9	10	
10	10	
11	16	

Tests are prepared by
Nikorn Sirivongpaisal

Name _____ Student ID _____

Problem 1: (8 points) Explain the 3 decision phases (categories) that must be made in a successful supply chain.

Problem 2: (8 points) Describe the cycle view of the processes within a supply chain.



Name _____ Student ID _____

Problem 3: (8 points) Consider the purchase of gas at a retail gas station. Describe the various stages in the supply chain and the different flows involved.

Problem 4: (8 points) Discuss the two keys to the success or failure of a company.



Name _____ Student ID _____

Problem 7: (8 points) Explain the basic trade-off between responsiveness and efficiency for transportation driver and information driver of supply chain performance.

Problem 8: (8 points) Explain the main advantage of in-transit merge over drop-shopping and the advantages and disadvantages of distributor storage with carrier delivery.

Name _____ Student ID _____

Problem 7: (8 points) Explain the basic trade-off between responsiveness and efficiency for transportation driver and information driver of supply chain performance.

Problem 8: (8 points) Explain the main advantage of in-transit merge over drop-shopping and the advantages and disadvantages of distributor storage with carrier delivery.

Name _____ Student ID _____

Problem 9: (10 points) From data of problem 2 in your textbook, page 160, formulate the mathematical model. **(Do not solve for the solution, formulate model only)**



Problem 10: (10 points) Select only one problem and work on it from the following two problems.

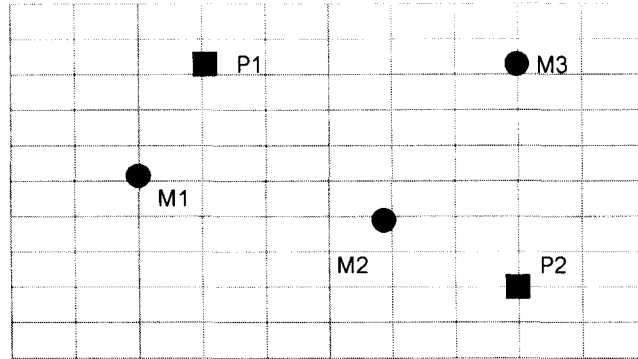
Problem 10.1 One manufacturing company is considering expansion by building a new factory in either "City A" or "City B", or perhaps even in both cities. It is also considering building at most one new warehouse, but the choice of location is restricted to a city where a new factory is being built. The net present value of each of these alternatives is shown in the following table. Also the capital required is shown in the same table. From information given, formulate the model that maximizes the total net present value. **(Do not solve for the solution, formulate model only)**

Alternatives	Net Present Value	Capital Required
Building factory in "City A"	9 million Baht	6 million Baht
Building factory in "City B"	5 million Baht	3 million Baht
Building warehouse in "City A"	6 million Baht	5 million Baht
Building warehouse in "City B"	4 million Baht	2 million Baht



Point(i)	Product	Total Volume Moving (units)	Transportation Rate (Baht/unit/Kilometer)	Coordinate Xi	Coordinate Yi
P1	A	2000	0.050	3	8
P2	B	3000	0.050	8	2
M1	A&B	2500	0.075	2	5
M2	A&B	1000	0.075	6	4
M3	A&B	1500	0.075	8	8

Problem 10.2 The company, which has two plants supplying the warehouse, which, in turn, supplies three demand centers, is considering the location for the single warehouse that will minimize transportation costs. Each plant and demand center location is expressed as a geometric coordinate point, as following figure. Product A is supplied from P1 and product B from P2. These products are reshipped to the markets. Coordinate points, volumes, and transportation rates are summarized in the following table. Find the location for the warehouse and calculate the transportation cost. **Do only 3 iterations.** Note: scale of figure is 1:10 Km.



Point(i)	Product	Total Volume Moving (units)	Transportation Rate (Baht/unit/Kilometer)	Coordinate Xi	Coordinate Yi
P1	A	2000	0.050	3	8
P2	B	3000	0.050	8	2
M1	A&B	2500	0.075	2	5
M2	A&B	1000	0.075	6	4
M3	A&B	1500	0.075	8	8

Name _____ Student ID _____



Problem 11: (16 points) Reliable is a cell phone manufacturer serving the Asian and North American markets. Current annual demand of their products in Asia is 2,000,000, whereas the demand in North America is 4,000,000. Over the next two years, demand in Asia is expected to go up by 60 percent with a probability of 0.65, or go down by 25 percent with a probability of 0.35. Over the same period, demand in North America is expected to go up by 5 percent with a probability of 0.5, or go down 10 percent with a probability of 0.5. Reliable currently has a production facility in Asia with a capacity of 2,400,000 units per year and a facility in North America with a capacity of 4,200,000 per year. The variable production cost per phone in Asia is \$15 and the variable production cost per phone in North America is \$17. It costs \$3 to ship a phone between the two markets. Each phone sells for \$40 in both markets. Reliable is debating whether to add 3,000,000 units or 2,500,000 units of capacity to the Asia plant. The larger plant increase will cost \$18,000,000, whereas the smaller addition will cost \$15,000,000. What do you recommend? Assume that reliable uses a discount factor of 10 percent.

Name _____ Student ID _____

