Name _____ Student ID _____

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

Mid Term Examination: Semester 2	Academic Year: 2008
Date: 28 December 2008	Time: 09:00 – 12:00
Subject: 225-354 Logistics and Supply Chain Management	Room: ห้องหัวหุ่น

ทุจริตในการสอบ 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	5	
2	5	
3	5	
4	5	
5	5	
6	5	
7	5	
8	5	
9	15	
10	20	
11	25	

Tests are prepared by
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Problem 1: (5 points) What are definitions of supply chain management and logistics management given by Council of Supply Chain Management Professionals? Also graphically illustrate the various stages in the supply chain and the different flows involved the purchase of gas at gas retail station.

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**Problem 2: (5 points)** Describe the importance and usefulness of logistics to manufacturing operations.

Problem 3: (5 points) Which are concepts and principles of logistics and supply chain?

Problem 4: (5 points) How many levels are there in business logistics planning? And what are they? Also explain the details and relationship between each level.

Problem 5: (5 points) Explain logistics assets productivity strategies.

Problem 6: (5 points) Graphically illustrated the trade-offs between these costs, transportation cost, inventory cost, revenue, and total cost. Draw in the provided graph below.

Cost   Revenue

0

0
Increasing number of stocking points
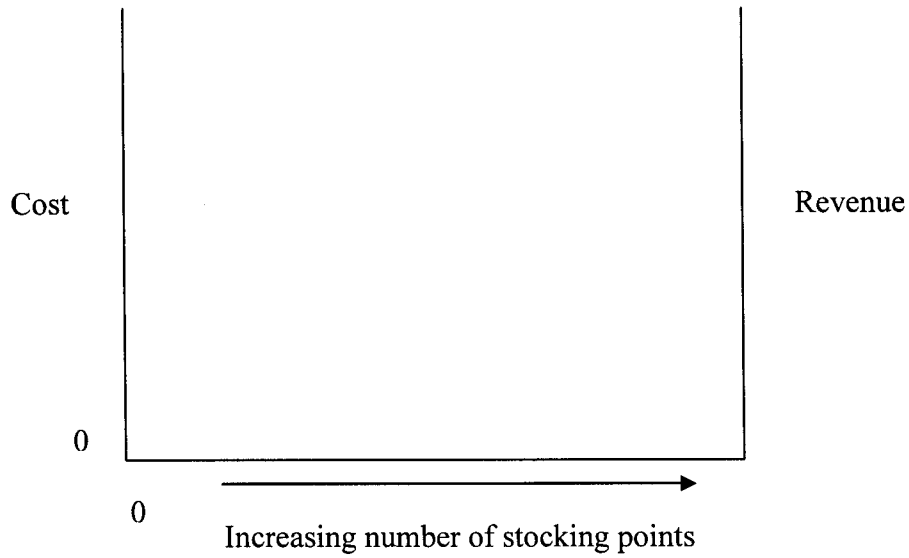
Problem 7: (5 points) Graphically illustrated the trade-offs between these costs, transportation cost, order processing cost, inventory cost, lost sales cost, and total costs. Draw in the provided graph below.

Cost

0

0%   100%
Improved customer service
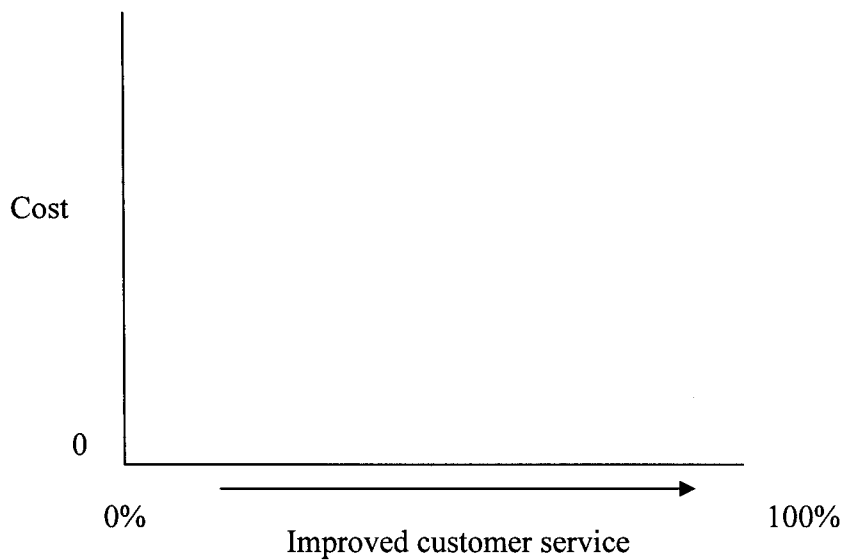
Problem 8: (5 points) Explain the main advantage of in-transit merge over drop-shopping and the advantages and disadvantages of distributor storage with carrier delivery.

Problem 9: (15 points) Suppose that a manufacturer of men's shirts can produce a dress shirt in its Houston, Texas, plant for $8 per shirt (including the cost of raw materials). Chicago is a major market for 100,000 shirts per year. The shirt is priced at $15 at Chicago. Transportation and storage charges from Houston to Chicago amount to $5 per hundredweight. Each packaged shirt weighs 1 lb.

As an alternative, the company can have the shirts produced in Taiwan for $4 per shirt (including the cost of raw materials). The raw materials, weighing about 1 lb. per shirt, would be shipped from Houston to Taiwan at a cost of $2 per hundredweight. When the shirts are completed, they are to be shipped directly to Chicago at a transportation and storage cost of $6 per hundredweight. An import duty of $0.50 per shirt is assessed.

From a total systemwide costs point of view, should the shirts be produced in Taiwan? **Note:** hundredweight is equal 100 lb.

Problem 10: (20 points) One manufacturing company has manufacturing plants worldwide. Their locations and capacities are shown in the following table. The major markets for company's product are in North America, South America, Europe, Japan, and the rest of Asia. Demand at each market is also shown in the table. Transportation costs from each plant to each market are shown in table. If there are no limits on the amount produced in a plant, how much should each plant produce? **(Do not solve for the solution, formulate model only)**

	North America	South America	Europe	Japan	Asia	Capacity (tons/year)	Production Costs/ton
U.S.A.	600	1,200	1,300	2,000	1,700	185	10,000
Germany	1,300	1,400	600	1,400	1,300	475	7,530
Japan	2,000	2,100	1,400	300	900	50	16,740
Brazil	1,200	800	1,400	2,100	2,100	200	7,306
India	2,200	2,300	1,300	1,000	800	80	9,200
Demand (tons/year)	270	190	200	120	100		

Problem 11: (25 points) 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.**
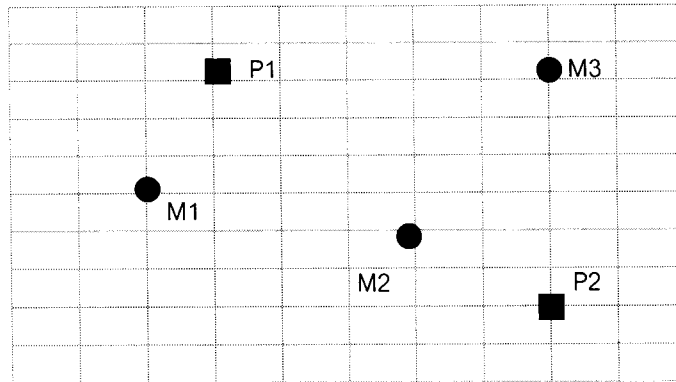
Point(i)	Product	Total Volume Moving (units)	Transportation Rate (Baht/unit/Kilometer)	Coordinate Xi	Coordinate Yi
P1	A	2000	0.050	3	8
P2	B	3000	0.050	8	2
M1	A&B	2500	0.075	2	5
M2	A&B	1000	0.075	6	4
M3	A&B	1500	0.075	8	8