PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Mid-term Examination: Semester 1   Academic Year: 2005

Date: August 1, 05.   Time: 13.30 – 16.30

Subject: 225-345 Engineering Economy   Room: R 300

Instructions

- There are 7 questions (11 pages).
- Total score is 100.
- Answer all questions.
- Dictionary, calculators, computers, books and lecture-notes are allowed.

ด้วยเกียรติและศักดิ์ศรี ข้าพเจ้าจะซื่อสัตย์ในการสอบ

ลงชื่อ..ตอน...........

ทุจริตในการสอบโทษขั้นต่ำคือปรับตกในรายวิชาที่ทุจริต และพัก

การเรียน 1 ภาคการศึกษา

Good luck

Sakesun Suthummanon

1. A car corporation assembles up to 30 cars per month in Hatyai facility. Production has dropped to 25 units per month over the last 5 months due to a worldwide economic slow down. The following information is available.

   Fixed cost   = $750,000 per month

   Variable cost per unit   = $35,000

   Price per unit   = $75,000

   a) How does the reduced production level of 25 units per month compare with the current breakeven point?
   b) What is the current profit level per month for the facility?
   c) What is the difference between the price and variable cost per car that is necessary to break even at a monthly production level of 15 units, if fixed costs remain constant?

   (20 points)

2. A manufacturer of toy is considering three locations: Patanee, Naratiwat, and Yala- for a new plant. Cost studies indicated that fixed cost per year at the sites are $30,000, $60,000, and $110,000, respectively; and variable cost are $75 per unit, $45 per unit, and $25 per unit, respectively. The expected selling price of the toy produced is $120. The company wishes to find the most economical location for an expected volume of 2,000 units per year.

(25 points)

3. The following relations describe the supply and demand for posters.

$$Q_D = 65,000 - 10,000 \, P \, \text{....... Demand function}$$
$$Q_S = -35,000 + 15,000 \, P \text{........Supply function}$$

Where Q is the quantity and P is the price of the poster, in dollars.
a) Complete the following table.

Price ($)	Q_S	Q_D	Surplus or Shortage
6.00			
5.00			
4.00			
3.00			
2.00			
1.00			

b) Plot the demand and supply curves.
c) What is the equilibrium price?

(15 points)

Name……………………………… ……………………………..Code…………….

4. A numerical model of the behavior of a firm's cost is shown in the following table.

   a. Complete the following table.

Quantity	Total revenue	Total Fixed cost	Toal variable cost	Total cost	Avreage Cost	Marginal cost
0	0	100	0.00	100.00		
1	110	100	55.70	155.70	155.7	55.70
2	220	100	105.60			
3		100	153.90			
4		100	204.80			
5		100	262.50			
6		100	331.20			
7		100	415.10			
8		100	518.40			
9		100	645.30			
10		100	800.00			
11		100	986.70			
12	1320	100	1209.60	1309.60		

   b. What would you advices this firm to do?

(20 points)

5. The Engineering school of Suriyan University has long been located in Hatyai, along the mountain of Kho Hong. However, the main campus of the university is located in the suburb of Natavee, Songkhla. In 2004, the engineering school began planning the construction of a new building and need to decide on an appropriate location. Should it be built on the current site, where it would remain near the downtown Hatyai engineering firms? Or should it be moved to Natavee, where it would be physically integrated with the rest of the university?

The downtown location had many prominent supporters. They argued that it was cost –effective to locate the new building in the city because the university owned the land. A large parcel of land would have to be purchased in Natavee if the building were to be built there. Does this argument make economic sense?

(10 points)

6. Equations for the production costs of two items are given below. What are the costs at the break-even point?

$$C_1 = 60,000 + 0.021 X$$
$$C_2 = 78,000 + 0.008 X$$

Where, X is the production unit.

(5 points)

10

7. The fixed costs of a company are $500,000 per year. Variable costs are 50% of sales. If annual sales amount to $750,000, what is the annual profit or loss?

   (5 points)