

Name.....Code.....

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination: Semester 1

Academic Year: 2006

Date: 10/12/2006

Time: 13.30-16.30

Subject: 225-345 Engineering Economy

Room: R 200

Instructions

- There are 8 questions (10 pages).
- Total score is 110.
- Answer all questions.
- Dictionary, calculators, computers, books and lecture-notes are allowed.

ด้วยเกียรติและศักดิ์ศรี ข้าพเจ้าจะขอสัตย์ในการสอบ

ลงชื่อ.....ตอน.....

ทอริตในการสอบโทษขั้นต่ำคือปรับตกในรายวิชาที่ทอริต และพัก
การเรียน 1 ภาคการศึกษา

Good luck
Sakesun Suthummanon

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1. A new minor league baseball team is coming to town and the owners have decided to build a new stadium, either small or large. The success of the team with regard to ticket sales will be either favorable (high) or unfavorable (low), with probabilities of 0.75 and 0.25, respectively. If demand for tickets is high, the large stadium would provide a payoff of approximately \$20 million. If ticket sales are weak, the loss on the large stadium would be \$5 million. If a small stadium is constructed, and ticket sales are weak, the payoff is \$500,000 after deducting the cost of construction. If ticket sales are strong, the team can choose to build an upper deck, or to maintain the existing facility. Expanding the stadium in this scenario has a payoff of \$10 million, whereas maintaining the same number of seats has a payoff of only \$3 million.

a) Draw a decision tree for this problem.

b) What should management do to achieve the highest expected payoff?

(20 points)

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2. Build-Rite Construction has received favorable publicity from guest appearances on a public TV home improvement program. Public TV programming decisions seem to be unpredictable, so Build-Rite cannot estimate the probability of continued benefits from its relationship with the show. Demand for home improvements next year may be low, moderate, or high. But Build-Rite must decide now whether to hire more employees, do nothing, or develop subcontracts with other home improvement contractors. Build-Rite has developed the following payoff table.

unit: \$

Alternative	Demand for Home Improvements		
	Low	Moderate	High
Hire	-250,000	100,000	625,000
Subcontract	100,000	150,000	415,000
Do nothing	50,000	80,000	300,000

Which alternative is best, according to each of the following decision criteria?

- a) Maximin
 - b) Maximax
 - c) Laplace
 - d) Minimax Regret
- (20 points)**

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3. An investment costs \$8,000 and will have a 10% salvage value in 5 years. Maintenance is \$1,000 per year, and annual taxes are 1% of the original cost. What is the present worth of all costs? The interest rate is 10%.**(10 points)**



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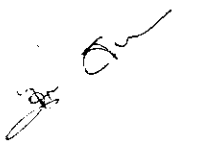
4. Suppose at year 0 you were offer a piece of paper that guaranteed you would be paid \$400 at the end of three years and \$600 at the end of five years. How much would you be willing to pay for this piece of paper if you wanted your money to produce a 12% interest rate? Suppose the interest rate increase to 15%. Will the value of present worth be larger or smaller? **(10 points)**

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5. The first year maintenance cost for a new automobile is estimated to be \$100, and it increases at a uniform rate of 10% per year. What is the present worth of cost of the first three years of maintenance in this situation, using an 8% interest rate? **(10 points)**

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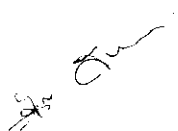
6. A city plans a pipeline to transport water from a distant watershed area to the city. The pipeline will cost \$8 million and have an expected life of seventy years. The city anticipates it will need to keep the water line in service indefinitely. Compute the capitalized cost (Present worth) assuming 7% interest. **(10 points)**



7. Two pieces of construction equipment are being analyzed:

Year	Alternative A	Alternative B
0	-\$2,000	-\$1,500
1	1,000	700
2	850	300
3	700	300
4	550	300
5	400	300
6	400	400
7	400	500
8	400	600

Based on 8% interest rate which alternative should be selected? (20 points)



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8. Apply some of the concepts presented in this course to the real life.

Hint: Provide an example: Identify a problem, alternatives, outcomes, criteria, and process for the selection. **(10 points)**

