

Name.....Ccde.....

PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING

Final Examination: Semester 1

Academic Year: 2010

Date: 5 Oct 2010

Time: 13:30-16:30

Subject: 225-346 Engineering Economy

Room: R200, S817, A400

**Instructions**

- There are 7 questions and 1 extra question (8 pages).
- Total score is 100.
- Answer all questions.
- Dictionary, calculators, books and lecture-notes are allowed.

ถูกพระบิดามีศักดิ์ศรี ยอมติด E ดีกว่าทujurิต  
ข้าพเจ้าจะซื่อสัตย์ในการสอบ

ลงชื่อ.....ตอน.....

ทujurิตในการสอบโทษขั้นต่ำคือปรับตกในรายวิชาที่ทujurิต และพักการเรียน 1 ภาคการศึกษา

Good luck  
Sakesun Suthummanon

Question	Score		
1	10		
2	10		
3	20		
4	15		
5	15		
6	20		
7	10		
Extra	2		

คะแนนเป็นของนอกกาย ไม่ retire มาใหม่ได้

1  
15

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

**Question 1:** You purchased a building five years ago for \$100,000. Its annual maintenance expense has been \$5,000 per year. At the end of three years, you spent \$9,000 on roof repairs. At the end of five years (now), you sell the building for \$120,000. During the period of ownership, you rented out (ให้เช่า) the building for \$10,000 per year paid at the beginning of each year (หมายความว่าให้เช่าทันทีที่ซื้อตั้งแต่ต้นปีที่ 1 แต่ไม่สามารถให้เช่าในปีที่ 5 เพราะขายอาคาร). Use the AW and IRR methods to evaluate this investment when your MARR is 8% per year.

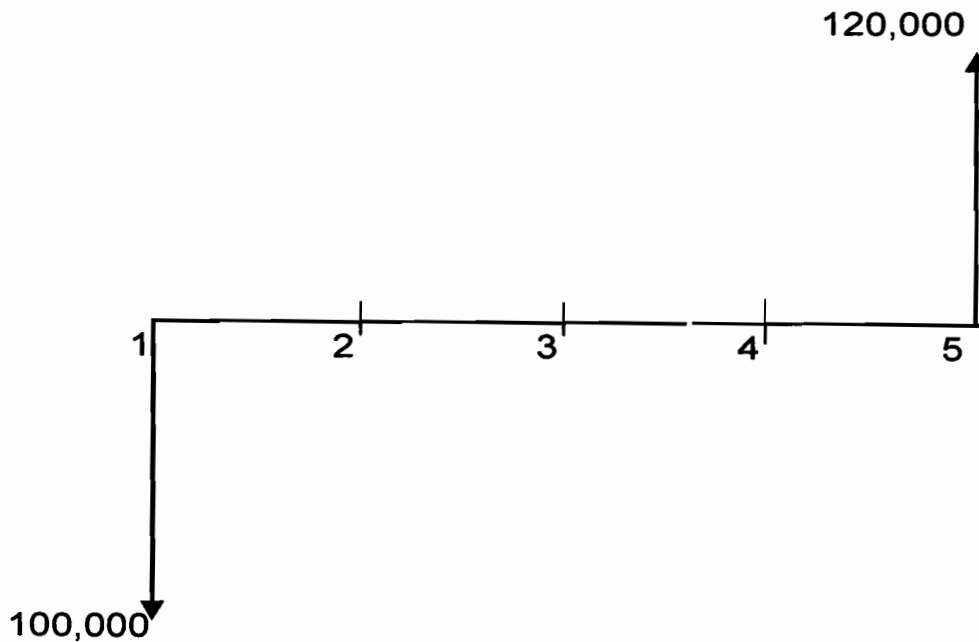
**Answer:**

AW.....

IRR.....

Conclusion.....

**Complete the Cash Flow Diagram**



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2  
5

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

**Question 2:** A battery manufacturing plant has been ordered a machine for its system. Three firms have provided quotations on the machine. An analysis of the quotations provided the following table of costs.

	A	B	C
Installed cost,\$	35,000	40,000	100,000
Annual operating cost ,,\$	8,000	7,000	2,000
Annual income,\$	2,000	2,200	3,500
Salvage value,\$	20,000	0	0

If the installation can be expected to last twenty years and MARR is 7%, which machine should be purchased? Use the PW analysis.

**Answer:**    **PW of A**.....

**PW of B**.....

**PW of C**.....

**Conclusion**.....

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

**Question 3:** White Valley Ski Resort is planning the ski lift operation for its resort. Management is trying to determine whether one or two lifts will be necessary; each lift can accommodate 250 people per day. Skiing normally occurs in 14-week period from December to April, during which the lift will operate seven days per week. The first lift will operate at 90% capacity if economic conditions are bad, the probability of which is believed to be about 0.3. During normal times the first lift will be utilized at 100% capacity, and the excess crowd will be provided 50% utilization of the second lift. The probability of normal time is 0.5. Finally, if times are really good, the probability of which is 0.2, the utilization of second lift will increase to 90%. The equivalent annual cost of installing a new lift, recognizing the time value of money and the lift's economic life, is \$50,000. The annual cost of installing two lifts is only \$90,000 if both are purchased at the same time. If used at all, each lift costs \$200,000 to operate, no matter how low or high its utilization rate. Lift tickets cost \$20 per customer per day. Should the resort purchase one lift or two? Show the decision tree diagram.

**Answer:** Purchase.....

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

**Question 4:** If the MARR is 10%, use the incremental approach (IRR) analysis to select the one economically alternative.

	A	B	C	D
Initial cost (\$)	-200,000	-275,000	-190,000	-350,000
Annual costs (\$)	+22,000	+35,000	+19,500	+42,000
Life, (year)	30	30	30	30

**Answer:** Select.....

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

**Question 5:** A firm has invested in \$14000 Machinery with a 7 year useful life. The machinery will have no salvage value, as the cost of removing it will equal scrap value. The uniform annual benefits from the machinery are \$3600. For a 47% income tax rate, and straight line depreciation, compute the after tax rate of return. (หา IRR หลังการคิดภาษี)

**Answer:** After tax rate of return .....

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

**Question 6:** According to the table, answer the following questions:

year, n	marginal cost data defender	EUAC if kept n years, challenger
1	2500	4500
2	2400	3600
3	2300	3000
4	2550	2600
5	2900	2700
6	3400	3500
7	4000	4000

a) Should we use  $n=1$  for the replacement analysis for the defender? Why or why not? Justify your answer

**Answer:**

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b) What is the economic service life of the challenger?

**Answer:** ESL = .....year, EUAC = .....

c) What is the economic service life of the defender?

**Answer:** ESL = .....year, EUAC = .....

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d) How long the defender should be retained in service?

**Answer:** .....

Name.....(Code.....

**Question 7:** Hatyai City plans a pipeline to transport water from Khohong mountain to the city. The pipeline will cost \$8 million and have expected life of 30 years. The city anticipates it will need to keep the water line in service indefinitely. Compute the capitalized cost (Present worth) assuming 7% interest.

**Answer:**  $PW-C = \dots\dots\dots$

Extra Question

1. ท่านมีความคิดเห็นอย่างไรในกรณีที่นักศึกษาเซ็นชื่อแทนกันในการเข้าชั้นเรียน (ท่านมีอิสระในการแสดงความคิดเห็น)