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PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERIJNG

Final examination : semester 1 Academic Year : 2004

Date : October 8, 2004 Time : 13.30-16.30

Subject : 225-345 Engineering Economy Room : หัวหุ่น

Instruction

1. Attempt all questions.
2. write answers in this examination paper.
3. All materials are allowed in to the examination room.
4. The points are as follows :

Question No	1	2	3	4	5
Full points scored	25	25	20	25	25
Scored					

ทุจริตในการสอบ โทษขั้นต่ำคือปรับตกในรายวิชาที่ทุจริตและพักการเรียน 1 ภาคการศึกษา

Boonrueing Manasurakarn

Instructor

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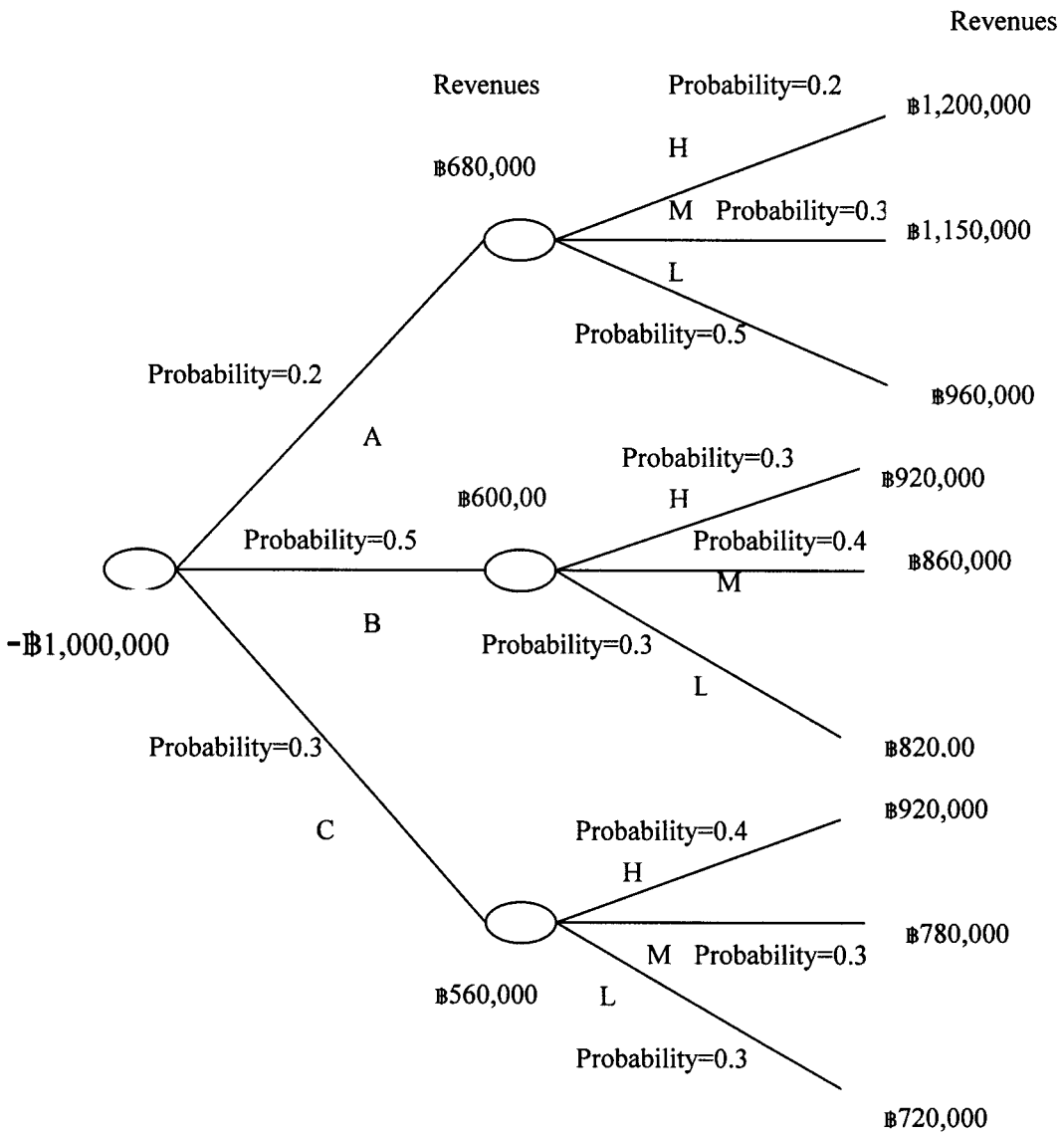
1. The uncertain cash flows for a project are described by the below probability tree diagram. The analysis period is two years, and the interest rate is 12% per year. Fill the answer in the blankets. (24 points)



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Show step by step

$PW_A(AL)$=

=

=

Show only answers

$PW_A(AH)$ =

$PW_A(AM)$ =

$PW_B(BH)$ =

$PW_B(BM)$ =

$PW_B(BL)$ =

$PW_C(CH)$ =

$PW_C(CM)$ =

$PW_C(CL)$ =

E(PW) =

=

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2. An investor is considering starting a plant. He believes that the plant could operate at about 80% of capacity 300 days per year. The plant will cost 6,000,000 baht and will have a maximum capacity of 2,000 units per day. Its market value at the end of year 5 is estimated to be 600,000 baht. To deliver the products, two trucks would be acquired, costing 800,000 baht each, having an estimated life of five years and a market value of 100,000 baht each at the end of that time. The product cost is estimated to be 100 baht per unit. If the interest rate is 10%, What is the percentage profit? Product is selling for an average of 120 baht per unit. A useful life of 5 years is expected. How many percentage is the investor earning per year? It is desired to find the present worth for the expected conditions described and to perform sensitivity analyses for the price 110, 115, 125 and 130 baht per unit and the cost 90, 95, 105 and 110 baht per unit. What is the conclusion of this analysis? (25 points)

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3. A new truck will require an investment of 2,000,000 baht and is expected to have year end market values and annual expenses as shown below. If MAAR is 10% per year, how long should the asset be retained in service?

End of year, k	market value End of year, k	Annual Expensess E_k
0	฿ 2,000,000	-
1	1,500,000	200,000
2	1,125,000	300,000
3	850,000	462,000
4	650,000	800,000
5	475,000	1,200,000

(20 points)

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4. It is desired to determine how much longer an old truck should remain in service before it is replaced by new truck (challenger) for which data were given in question 3. The market values and annual expenses of old truck are expected to be as follows :

End of year k	market value, End of year, k	annual expenses, E_k
1	฿400,000	฿550,000
2	300,000	660,000
3	200,000	780,000
4	100,000	880,000

Which alternatives(defender or challenger) should be selected?

(25 points)

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5. The estimated capital investment and the annual expenses for four diesel-powered air compressor are shown below table. The study period is five years and the MAAR is 20% per year. One of the diesel-powered air compressor must be selected, and each diesel-powered air compressor provides the same level of service. Based on this information

   1) determine the preferred diesel-powered air compressor using the IRR method,

   2) show that the present worth method using the incremental method.

	D1	D2	D3	D4
Capital investment(baht)	1,000,000	1,400,000	1,480,000	1,200,000
Annual expenses(baht)	290,000	170,000	150,000	220,000
Useful life (years)	5	5	5	5
Market value(baht)	100,000	140,000	250,000	140,000

(25 points)

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