ENGR-610-Engineering Economics, Midterm Exam-1(25%)

Name :

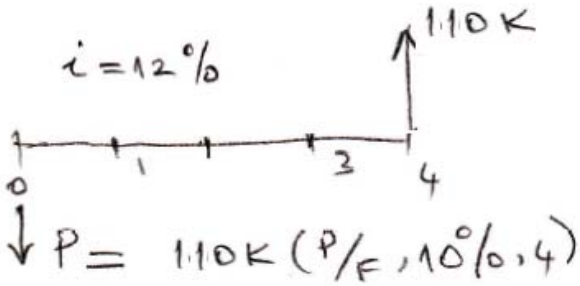
Fall-2012, Ins: M. Ozer

Procedure: Show your work next to problems. Without Cash Flow Diagram solution will not be accepted. No partial point; exact solution is required. Use pencil and erase unnecessary work. Neatness counts. !!!

Problem 1.

A construction company has an option to purchase a certain bulldozer for $110,000 at any time between now and 4 years from now. If the company plans to purchase the dozer 4 years from now, the equivalent present amount that the company is paying for the dozer at 12 % per year interest is closest to?

CFD:



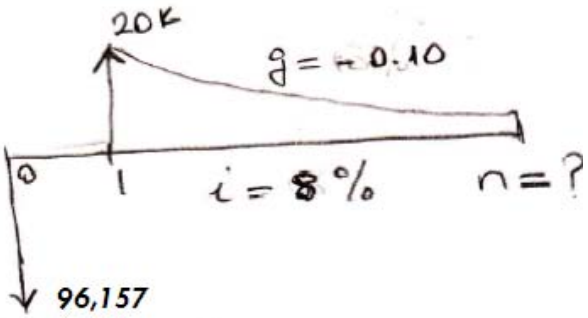
Your answer must be placed into box below

69,905

Problem 2.

The present worth of a decreasing geometric gradient is $ 96,157. The interest rate is 8% per year, and the rate of change is 10% per year. If the cash flow amount in year 1 is $20,000, the year in which the gradient ends is closed to?

CFD:



Your answer must be placed into box below

≈ 11 yrs.

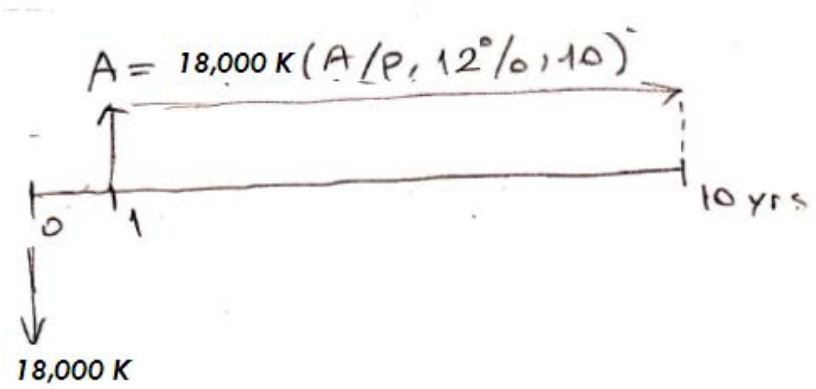
$$96{,}157 = \frac{20{,}000}{0{,}08+0{,}10}\left[1-\left(\frac{0.9}{1.08}\right)^{n}\right]$$

$$0.134587 = 0.833^{n}$$

Problem 3.

Rubbermaid Plastics Corp. invested $18,000,000 in manufacturing equipment for producing small wastebaskets. If the company uses an interest rate of 12% per year, how much money would it have to earn each year if it wanted to recover its investment in 10 years?

CFD:

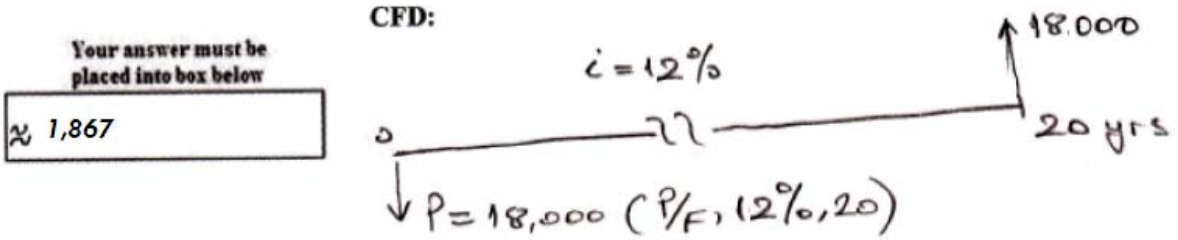


Your answer must be placed into box below

≈ 3,186 K

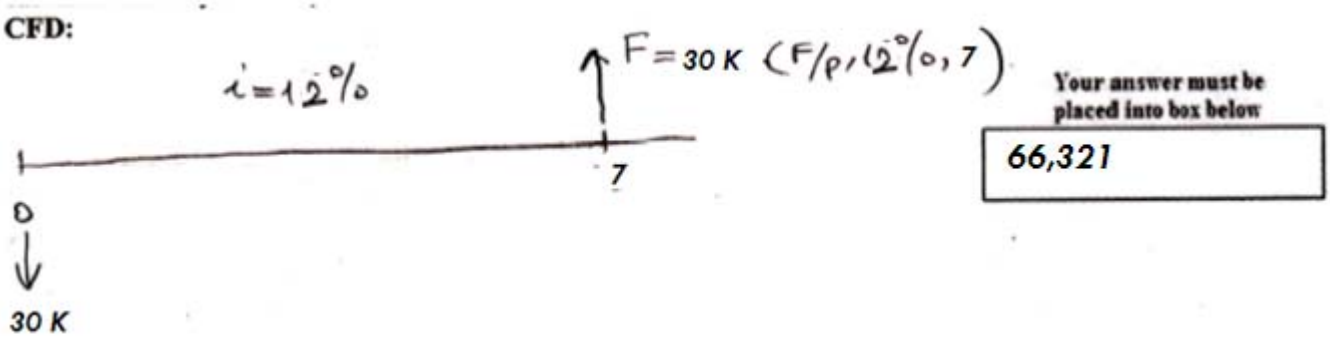
Problem 4.
A deposit of $18,000 twenty years from now at an interest rate of 12% per year will have a present value closest to

CFD:



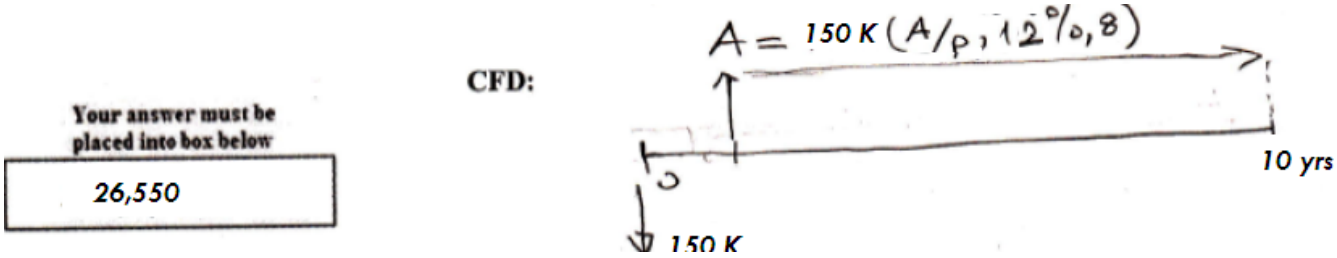
Problem 5.
The future worth in year 7 of a present investment of $30,000 at an interest rate of 12% per year is closest to

CFD:



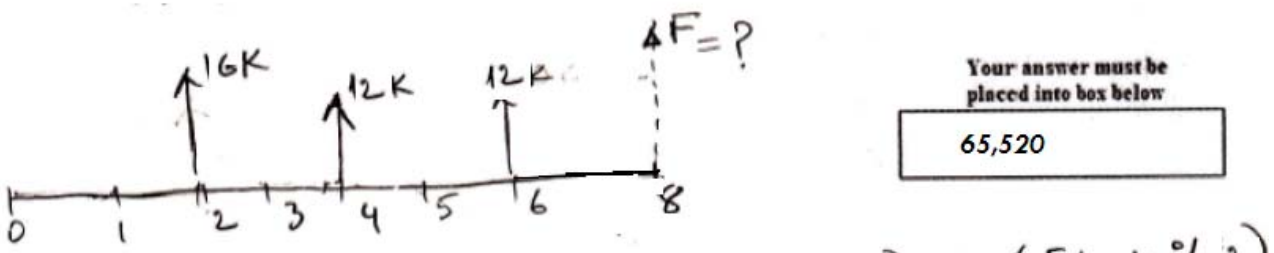
Problem 6.
A manufacturing company borrows $150,000 with a promise to repay the loan with equal annual payments over a 10-year period. At an interest rate of 12% per year, the annual payment will be closest to

CFD:

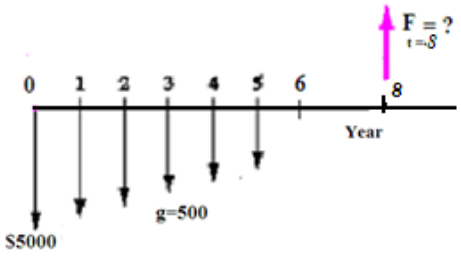


Problem 7.
The future worth (in year 8) of $16,000 in year 2, $12,000 in year 4, and $12,000 in year 6 at an interest rate of 10% per year is closest to

CFD:



Problem 8.
Find the Future worth (at time 8-***corrected in class)*** of the cash flow diagram below. Assume i = 12 % per year.



$P_{t=-1} = 5K(P/A,12\%,6) - 500(P/G,12\%,6)$

$F_{t=8} = P_{t=-1}(F/P,12\%,9)$

Your answer must be placed into box below

44,624

Problem 9.
Compute the annual worth (start year 1) of the following cash flows at i = 12% per year.

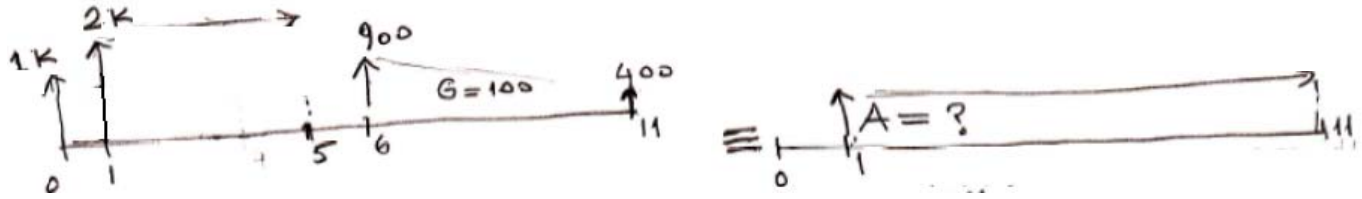
CFD:

$A = 5K(A/P,12\%,11) + 1K(P/A,12\%,5)(A/P,12\%,11) + 900(P/A,12\%,6)(P/F,12\%,5)(A/P,12\%,11) - 100(P/G,12\%,6)(P/F,12\%,5)(A/P,12\%,11)$

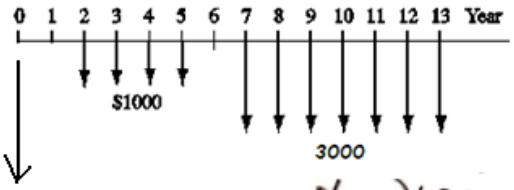
Year	Amount, $	Year	Amount, $
0	1000	8	700
1–5	2000	9	600
6	900	10	500
7	800	11	400

Your answer must be placed into box below

1,651



Problem 10.
Use the cash flow diagram below to calculate the present amount, which equivalent to all the cash flows shown, if the interest rate is 12% per year.



Your answer must be placed into box below

≈ 9,648

$P = 1000(P/A,12\%,4)(P/F,12\%,1) + 3000(P/A,12\%,7)(P/F,12\%,6)$

Problem 11.
What nominal rate per month is equivalent to an effective rate of 12% per year, compounded yearly?

$i_{eff/yr} = i_{nom//yr}$ [compounded yearly !]

Your answer must be placed into box below

$i = 1\%$

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