IE 360 Engineering Economic Analysis
Exam 1
Sample Test - Dr. Park

Name:

Read the following instructions carefully

- You are allowed to open only your textbook on this exam.
- Fill in your name and identification number on this exam sheet.
- Fill in your name, identification number, exam version number, and course number on your general purpose scan sheet. Use the scan sheet to answer all questions.
- You must return both the exam sheet and the scan sheet at the end of the examination. This is the only check we have that you took the exam.
- Remember that the Student Academic Honesty Codes apply to this exam. You should neither give nor receive help on this examination.
- Note that your answer may differ slightly from the choices listed due to rounding errors. Select the closest answer from the listed choices.
- All interest rates are nominal interest rates per year unless specified otherwise.

Problem 1

What is the future worth (at the end of year 10) of a cash flow series of 10 equal annual deposits of $2,000 if all deposits are made at the beginning of each year starting today (year 0) at 9% annual interest? Choose the correct range.

A. less than $33,118
B. between $33,119 and $33,122
C. between $33,123 and $33,124
D. between $33,125 and $33,126  
E. more than $33,127

**Problem 2**

Consider the cash flow series shown below. Find out the required equal annual deposits (end of year) in a bank to generate the cash flows from year 4 through year 7.

Assume that an interest rate is 10\% compounded annually. The value of A should be:

A. less than $693  
B. between $694 and $696  
C. between $697 and $699  
D. between $700 and $702  
E. more than $702

**Problem 3**

You bought a car by securing a loan in the amount of $20,000 from Auburn Bank at an interest rate of 9\% compounded monthly. You agreed to pay off the loan in 48 equal monthly installments (each payment occurs at the end of each month). Immediately after 36th payment, you want to pay off the remainder of the loan in a lump sum amount, what should this amount be?

A. less than $5,693
Problem 4

Consider the cash flow series shown below. What is the total future value of cash outflows at the end of 5 years with the changing interests specified?

A. less than $1,813
B. between $1,814 and $1,817
C. between $1,818 and $1,822
D. between $1,823 and $1,826
E. more than $1,827

Problem 5

If you borrow $10,000 at 10% compounded annually with the repayment schedule below, what is the amount A?
Problem 6

Consider the cash flow series shown below. What value of C makes the inflow series equivalent to the outflow series at an interest rate of 6% compounded annually?

A. less than $1,730
B. between $1,731 and $1,735
C. between $1,736 and $1,740
D. between $1,741 and $1,745
E. more than $1,746
Problem 7

Consider the following cash flows:

What is P equal to if i=10% compounded annually?

A. 2,000(P/A,10%,8)(P/F,10%,1) + 1,000(P/G,10%,6)(P/F,10%,3)
B. 2,000(P/A,10%,8)(P/F,10%,1) + 1,000(P/G,10%,5)(P/F,10%,4)
C. 2,000(P/A,10%,8)(P/F,10%,1) + 1,000(P/G,10%,4)(P/F,10%,4) + 4,000(P/F,10%,9)
D. 2,000(P/A,10%,8)(P/F,10%,1) + 1,000(P/G,10%,5)(P/F,10%,3) + 4,000(P/F,10%,9)

Problem 8

You have $5,000 to invest in a financial security. From a financial point of view, which of the following is the worst deal?

A. 12% compounded annually.
B. 11.8% compounded semi-annually.
C. 11.5% compounded quarterly.
D. 11.2% compounded daily.
Problem 9

You want to borrow $10,000 from a local bank, which is to be repaid in 2 equal semiannual installments. The loan officer initially offered an interest rate of 12% compounded monthly. However, you were able to negotiate that interest be compounded semiannually instead of monthly. With this negotiation, how much do you save in total interest payments over the loan life?

A. less than $20
B. between $21 and $25
C. between $26 and $30
D. more than $31
Problem 10

What interest rate would make the following two cash flows equivalent?

\[ \begin{align*}
\text{\$200} & \quad \text{\$100} \\
0 & \quad 1 & \quad 2 \\
\text{\$150} & \quad \text{\$120} \\
0 & \quad 1 & \quad 2
\end{align*} \]

A. 0% < i ≤ 15%
B. 15% < i ≤ 30%
C. 30% < i ≤ 45%
D. 45% < i ≤ 60%
E. 60% < i ≤ 100%