Question #1 of 78

Question ID: 1456158

Given the following cash flow stream:

End of Year	Annual Cash Flow
1	$4,000
2	$2,000
3	-0-
4	-$1,000

Using a 10% discount rate, the present value of this cash flow stream is:

A) $3,636.00.

B) $4,606.00.

C) $3,415.00.

Explanation

PV(1): N = 1; I/Y = 10; FV = -4,000; PMT = 0; CPT → PV = 3,636

PV(2): N = 2; I/Y = 10; FV = -2,000; PMT = 0; CPT → PV = 1,653

PV(3): 0

PV(4): N = 4; I/Y = 10; FV = 1,000; PMT = 0; CPT → PV = -683

Total PV = 3,636 + 1,653 + 0 – 683 = 4,606

(Module 1.2, LOS 1.c)

Question #2 of 78

Question ID: 1456215

Peter Wallace wants to deposit $10,000 in a bank certificate of deposit (CD). Wallace is considering the following banks:

- Bank A offers 5.85% annual interest compounded annually.
- Bank B offers 5.75% annual interest rate compounded monthly.
- Bank C offers 5.70% annual interest compounded daily.

Which bank offers the highest effective interest rate and how much?

A) Bank C, 5.87%.

B) Bank A, 5.85%.

C) Bank B, 5.90%.

Explanation

Effective interest rates:

Bank A = 5.85 (already annual compounding)

Bank B, nominal = 5.75; C/Y = 12; effective = 5.90

Bank C, nominal = 5.70, C/Y = 365; effective = 5.87

Hence Bank B has the highest effective interest rate.

(Module 1.1, LOS 1.f)

Question #3 of 78

Question ID: 1456194

How much should an investor have in a retirement account on his 65^{th} birthday if he wishes to withdraw $40,000 on that birthday and each of the following 14 birthdays, assuming his retirement account is expected to earn 14.5%?

A) $272,977.

B) $274,422.

C) $234,422.

Explanation

This is an annuity due so set your calculator to the BGN mode. N = 15; I/Y = 14.5; PMT = –40,000; FV = 0; CPT → PV = 274,422.50. Switch back to END mode.

(Module 1.3, LOS 1.d)

Question #4 of 78

Question ID: 1456223

Assuming an annual rate of interest of 11% compounded quarterly, the future value of $8,000 invested for two years is *closest* to:

A) $9,760.

B) $9,857.

C) $9,939.

Explanation

The $8,000 investment will compound interest over 8 quarters.

The rate per quarter is 11% / 4 = 2.75%

Therefore, FV $= PV(1+r)^n$

$= 8{,}000 \times 1.0275^8$

$= 9{,}939$

Calculator inputs: I/Y = 2.75; N = 8; PV = 8,000; PMT = 0; CPT FV = –9,939.04

(Module 1.1, LOS 1.e)

Question #5 of 78

Question ID: 1456219

A local bank advertises that it will pay interest at the rate of 4.5%, compounded monthly, on regular savings accounts. What is the effective rate of interest that the bank is paying on these accounts?

A) 4.59%.

B) 4.50%.

C) 4.65%.

Explanation

$(1 + 0.045 / 12)^{12} - 1 = 1.0459 - 1 = 0.0459$.

(Module 1.1, LOS 1.f)

Question #6 of 78

Question ID: 1456178

The future value of $10,000 invested for 5 years, if the annual interest rate is 8%, compounded monthly, is *closest* to:

A) $14,000.

B) $14,700.

C) $14,900.

Explanation

The investment will compound over 5 × 12 = 60 months.

The rate per month is 8% / 12 = 0.67%.

Therefore, FV = $10,000 × $(1 + 0.08 / 12)^{60}$ = $14,898.46.

This is closest to $14,900.

Using the calculator:

N = 60; PV = -$10,000; I/Y = 0.66667 (8% / 12 months); PMT = 0; CPT → FV = $14,898.46

(Module 1.2, LOS 1.c)

Question #7 of 78

Question ID: 1456210

A stated interest rate of 9% compounded quarterly results in an effective annual rate *closest to*:

A) 9.3%.

B) 9.4%.

C) 9.2%.

Explanation

Quarterly rate = 0.09 / 4 = 0.0225.

Effective annual rate = $(1 + 0.0225)^4$ – 1 = 0.09308, or 9.308%.

(Module 1.1, LOS 1.f)

Question #8 of 78

Question ID: 1456204

It will cost $20,000 a year for four years when an 8-year old child is ready for college. How much should be invested today if the child will make the first of four annual withdrawals 10-years from today? The expected rate of return is 8%.

A) $33,138.

B) $30,683.

C) $66,243.

Explanation

First, find the present value of the college costs as of the end of year 9. (Remember that the PV of an ordinary annuity is as of time = 0. If the first payment is in year 10, then the present value of the annuity is indexed to the end of year 9). N = 4; I/Y = 8; PMT = 20,000; CPT → PV = $66,242.54. Second, find the present value of this single sum: N = 9; I/Y = 8; FV = 66,242.54; PMT = 0; CPT → PV = 33,137.76.

(Module 1.3, LOS 1.d)

Question #9 of 78

Question ID: 1456217

What is the effective annual rate if the stated rate is 12% compounded quarterly?

A) 12.55%. ✓

B) 57.35%. ✗

C) 11.49%. ✗

Explanation

If the stated rate is 12%, then the effective quarterly (period) rate is 12% / 4 = 3%

The effective annual rate is, therefore, $(1 + \text{period rate})^{\#\text{ periods in a year}} - 1$

$EAR = [1 + (0.12 / 4)]^4 - 1 = 12.55\%$

(Module 1.1, LOS 1.f)

Question #10 of 78

Question ID: 1456172

If $2,000 a year is invested at the end of each of the next 45 years in a retirement account yielding 8.5%, the amount the investor will have after 45 years is *closest* to:

A) $900,000. ✓

B) $270,000. ✗

C) $180,000. ✗

Explanation

N = 45; PMT = –2,000; PV = 0; I/Y = 8.5%; CPT → FV = $901,060.79.

(Module 1.2, LOS 1.c)

Question #11 of 78

Question ID: 1456170

Wortel Industries has preferred stock outstanding that paying an annual dividend of $3.75 per share. If an investor wants to earn a rate of return of 8.5%, how much should he be willing to pay for a share of Wortel preferred stock?

A) $31.88. ✗

B) $44.12. ✓

C) $42.10. ✗

Explanation

To calculate the price, we need to discount the future dividend stream at the investor's required return.

The stream of dividends is a perpetuity (a fixed dividend each year forever).

Given the PV of a perpetuity = cash flow / discount rate

Then price = $3.75 / 0.085 = $44.12

(Module 1.2, LOS 1.c)

Question #12 of 78

Question ID: 1456148

Selmer Jones has just inherited some money and wants to set some of it aside for a vacation in Hawaii one year from today. His bank will pay him 5% interest on any funds he deposits. In order to determine how much of the money must be set aside and held for the trip, he should use the 5% as a:

A) discount rate. ✓

B) opportunity cost. ✗

C) required rate of return. ✗

Explanation

He needs to figure out how much the trip will cost in one year, and use the 5% as a discount rate to convert the future cost to a present value. Thus, in this context the rate is best viewed as a discount rate.

(Module 1.1, LOS 1.a)

Question #13 of 78

Question ID: 1456163

The future value a 10-year annuity paying an annual sum of $10,000 at the end of each year given a discount rate of 10% would be:

A) $100,000.

B) $159,374.00.

C) $175,312.00.

Explanation

N = 10; I/Y = 10; PMT = –10,000; PV = 0; CPT → FV = $159,374.

(Module 1.2, LOS 1.c)

Question #14 of 78

Question ID: 1456184

An investor makes 48 monthly payments of $500 each beginning today into an account that will have a value of $29,000 at the end of four years. The stated annual interest rate is *closest to*:

A) 10.00%.

B) 9.00%.

C) 9.50%.

Explanation

Because this is an annuity due (payments at the start of each period) the calculator must first be set to BGN mode.

N = 48; PMT = 500; FV = –29,000; PV = 0; CPT I/Y = 0.7532

This percentage is a monthly rate because the time periods were entered as 48 months. It must be converted to a stated annual percentage rate (APR) by multiplying by the number of compounding periods per year: 0.7532 × 12 = 9.04%.

(Module 1.2, LOS 1.c)

Question #15 of 78

Question ID: 1456218

Other things equal, as the number of compounding periods increases, what is the effect on the effective annual rate (EAR)?

A) EAR increases.

B) EAR decreases.

C) EAR remains the same.

Explanation

The EAR increases with the frequency of compounding.

(Module 1.1, LOS 1.f)

Question #16 of 78

Question ID: 1456175

Given investors require an annual return of 12.5%, a perpetual bond (i.e., a bond with no maturity/due date) that pays $87.50 a year in interest should be valued at:

A) $70.

B) $1,093.

C) $700.

Explanation

87.50 ÷ 0.125 = $700.

(Module 1.2, LOS 1.c)

Question #17 of 78

Question ID: 1462763

Five years ago, an investor borrowed $5,000 from a financial institution that charged a 6% annual interest rate, and he immediately took his family to live in Nepal. He made no payments during the time he was away. When he returned, he agreed to repay the original loan plus the accrued interest by making five end-of-year payments starting one year after he returned. If the interest rate on the loan is held constant at 6% per year, what annual payment must the invstor make in order to retire the loan?

A) $1,638.23.

B) $1,588.45.

C) $1,338.23.

Explanation

With no interest paid on the original $5,000 loan, at 6% in five years the loan balance will be:

New loan balance = $5,000(1.06)^5 = $6,691.13 or PV = 5,000; I/Y = 6; N = 5; PMT = 0; CPT → FV = –$6,691.13.

$6,691.13 is the loan that has to be retired over the next five years. The financial calculator solution is:

PV = 6,691.13; I/Y = 6; N = 5; FV = 0; CPT → PMT. You obtain PMT = –1,588.45.

(Module 1.2, LOS 1.c)

Question #18 of 78

Question ID: 1456167

A firm is evaluating an investment that promises to generate the following annual cash flows:

End of Year	Cash Flows
1	$5,000
2	$5,000
3	$5,000
4	$5,000
5	$5,000
6	-0-
7	-0-
8	$2,000
9	$2,000

Given BBC uses an 8% discount rate, this investment should be valued at:

A) $23,529.00. ✗

B) $19,963.00. ✗

C) $22,043.00. ✓

Explanation

PV(1 - 5): N = 5; I/Y = 8; PMT = -5,000; FV = 0; CPT → PV = 19,963

PV(6 - 7): 0

PV(8): N = 8; I/Y = 8; FV = -2,000; PMT = 0; CPT → PV = 1,080

PV(9): N = 9; I/Y = 8; FV = -2,000; PMT = 0; CPT → PV = 1,000

Total PV = 19,963 + 0 + 1,080 + 1,000 = 22,043.

(Module 1.2, LOS 1.c)

Question #19 of 78

Question ID: 1456155

If 10 equal annual deposits of $1,000 are made into an investment account earning 9% starting today, how much will you have in 20 years?

A) $39,204. ✓

B) $42,165. ✗

C) $35,967. ✗

Explanation

Switch to BGN mode. PMT = –1,000; N = 10, I/Y = 9, PV = 0; CPT → FV = 16,560.29. Remember the answer will be one year after the last payment in annuity due FV problems. Now PV_{10} = 16,560.29; N = 10; I/Y = 9; PMT = 0; CPT → FV = 39,204.23. Switch back to END mode.

(Module 1.2, LOS 1.c)

Question #20 of 78

Question ID: 1456156

An annuity will pay eight annual payments of $100, with the first payment to be received three years from now. If the interest rate is 12% per year, what is the present value of this annuity? The present value of:

A) an ordinary annuity of 8 periods at 12%. ✗

B) a lump sum discounted for 3 years, where the lump sum is the present value of an ordinary annuity of 8 periods at 12%. ✗

C) a lump sum discounted for 2 years, where the lump sum is the present value of an ordinary annuity of 8 periods at 12%. ✓

Explanation

The PV of an ordinary annuity (calculation END mode) gives the value of the payments one period before the first payment, which is a time = 2 value here. To get a time = 0 value, this value must be discounted for two periods (years).

(Module 1.2, LOS 1.c)

Question #21 of 78

Question ID: 1456173

An investor wants to receive $1,000 at the beginning of each of the next ten years with the first payment starting today. If the investor can earn 10 percent interest, what must the investor put into the account today in order to receive this $1,000 cash flow stream?

A) $6,759.

B) $7,145.

C) $6,145.

Explanation

This is an annuity due problem. There are several ways to solve this problem.

Method 1:

PV of first $1,000 = $1,000

PV of next 9 payments at 10% = 5,759.02

Sum of payments = $6,759.02

Method 2:

Put calculator in BGN mode.

N = 10; I = 10; PMT = -1,000; CPT → PV = 6,759.02

Note: make PMT negative to get a positive PV. Don't forget to take your calculator out of BGN mode.

Method 3:

You can also find the present value of the ordinary annuity $6,144.57 and multiply by 1 + k to add one year of interest to each cash flow. $6,144.57 × 1.1 = $6,759.02.

(Module 1.2, LOS 1.c)

Question #22 of 78

Question ID: 1456147

Vega research has been conducting investor polls for Third State Bank. They have found the most investors are not willing to tie up their money in a 1-year (2-year) CD unless they receive at least 1.0% (1.5%) more than they would on an ordinary savings account. If the savings account rate is 3%, and the bank wants to raise funds with 2-year CDs, the yield must be at least:

A) 4.5%, and this represents a discount rate. ✗

B) 4.0%, and this represents a required rate of return. ✗

C) 4.5%, and this represents a required rate of return. ✓

Explanation

Since we are taking the view of the minimum amount required to induce investors to lend funds to the bank, this is best described as a required rate of return. Based upon the numerical information, the rate must be 4.5% (= 3.0 + 1.5).

(Module 1.1, LOS 1.a)

Question #23 of 78

Question ID: 1456161

Concerning an ordinary annuity and an annuity due with the same payments and positive interest rate, which of the following statements is *most* accurate?

A) The present value of the ordinary annuity is greater than an annuity due. ✗

B) The present value of the ordinary annuity is less than an annuity due. ✓

C) There is no relationship. ✗

Explanation

With a positive interest rate, the present value of an ordinary annuity is less than the present value of an annuity due. The first cash flow in an annuity due is at the beginning of the period, while in an ordinary annuity, the first cash flow occurs at the end of the period. Therefore, each cash flow of the ordinary annuity is discounted one period more.

(Module 1.2, LOS 1.c)

Question #24 of 78

Question ID: 1456211

A stated annual interest rate of 9% compounded semiannually results in an effective annual rate *closest to*:

A) 9.2%.

B) 8.81%.

C) 18.81%.

Explanation

If the stated rate is 9% then the effective six month (period) rate is 9% / 2 = 4.5%

The effective annual rate is, therefore, $(1 + \text{period rate})^{\#\text{ Periods in a year}} - 1$

EAR = $(1 + 4.5\%)^2 - 1 = 9.2\%$

(Module 1.1, LOS 1.f)

Question #25 of 78

Question ID: 1456220

As the number of compounding periods increases, what is the effect on the EAR? EAR:

A) does not increase.

B) increases at a decreasing rate.

C) increases at an increasing rate.

Explanation

There is an upper limit to the EAR as the frequency of compounding increases. In the limit, with continuous compounding the EAR = $e^{APR} - 1$. Hence, the EAR increases at a decreasing rate.

(Module 1.1, LOS 1.f)

Question #26 of 78

Question ID: 1456179

A $500 investment offers a 7.5% annual rate of return. How much will it be worth in four years?

A) $892.

B) $650.

C) $668.

Explanation

N = 4; I/Y = 7.5; PV = –500; PMT = 0; CPT → FV = 667.73.

or: $500(1.075)^4 = 667.73$

(Module 1.2, LOS 1.c)

Question #27 of 78

Question ID: 1456166

What is the present value of a 10-year, $100 annual annuity due if interest rates are 0%?

A) $900.

B) $1,000.

C) No solution.

Explanation

When I/Y = 0 you just sum up the numbers since there is no interest earned.

(Module 1.2, LOS 1.c)

Question #28 of 78

Question ID: 1456201

Which of the following statements about compounding and interest rates is *least* accurate?

A) Present values and discount rates move in opposite directions.

B) On monthly compounded loans, the effective annual rate (EAR) will exceed the annual percentage rate (APR).

C) All else equal, the longer the term of a loan, the lower will be the total interest you pay.

Explanation

Since the proportion of each payment going toward the principal decreases as the original loan maturity increases, the total dollars interest paid over the life of the loan also increases.

(Module 1.3, LOS 1.d)

Question #29 of 78

Question ID: 1456188

Fifty years ago, an investor bought a share of stock for $10. If the stock has experienced 2% compound annual growth over the period, its price today is *closest* to:

A) $51.

B) $39.

C) $27.

Explanation

$10(1.02)^{50} = \$26.91$

Alternatively, N = 50; I/Y = 2; PV = –10; PMT = 0; CPT → FV = $26.91.

(Module 1.2, LOS 1.c)

Question #30 of 78

Question ID: 1456149

Wei Zhang has funds on deposit with Iron Range bank. The funds are currently earning 6% interest. If he withdraws $15,000 to purchase an automobile, the 6% interest rate can be best thought of as a(n):

A) discount rate.

B) financing cost.

C) opportunity cost.

Explanation

Since Wei will be foregoing interest on the withdrawn funds, the 6% interest can be best characterized as an opportunity cost — the return he could earn by postponing his auto purchase until the future.

(Module 1.1, LOS 1.a)

Question #31 of 78

Question ID: 1456168

Compute the present value of a perpetuity with $100 payments beginning four years from now. Assume the appropriate annual interest rate is 10%.

A) $751.

B) $1,000.

C) $683.

Explanation

Compute the present value of the perpetuity at (t = 3). Recall, the present value of a perpetuity or annuity is valued one period before the first payment. So, the present value at t = 3 is 100 / 0.10 = 1,000. Now it is necessary to discount this lump sum to t = 0. Therefore, present value at t = 0 is $1{,}000 / (1.10)^3 = 751$.

(Module 1.2, LOS 1.c)

Question #32 of 78

Question ID: 1456177

What is the maximum an investor should be willing to pay for an annuity that will pay out $10,000 at the beginning of each of the next 10 years, given the investor wants to earn 12.5%, compounded annually?

A) $52,285.

B) $55,364.

C) $62,285.

Explanation

Using END mode, the PV of this annuity due is $10,000 plus the present value of a 9-year ordinary annuity: N=9; I/Y=12.5; PMT=-10,000; FV=0; CPT PV=$52,285; $52,285 + $10,000 = $62,285.

Or set your calculator to BGN mode then N=10; I/Y=12.5; PMT=-10,000; FV=0; CPT PV= $62,285.

(Module 1.2, LOS 1.c)

Question #33 of 78

Question ID: 1456212

A local bank offers an account that pays 8%, compounded quarterly, for any deposits of $10,000 or more that are left in the account for a period of 5 years. The effective annual rate of interest on this account is:

A) 4.65%.

B) 8.24%.

C) 9.01%.

Explanation

$(1 + \text{periodic rate})^m - 1 = (1.02)^4 - 1 = 8.24\%$.

(Module 1.1, LOS 1.f)

Question #34 of 78

Question ID: 1456222

In 10 years, what is the value of $100 invested today at an interest rate of 8% per year, compounded monthly?

A) $216.00.

B) $222.00.

C) $180.00.

Explanation

N = 10 × 12 = 120; I/Y = 8/12 = 0.666667; PV = –100; PMT = 0; CPT → FV = 221.96.

(Module 1.1, LOS 1.e)

Question #35 of 78

Question ID: 1456185

Three years from now, an investor will deposit the first of eight $1,000 payments into a special fund. The fund will earn interest at the rate of 5% per year until the third deposit is made. Thereafter, the fund will return a reduced interest rate of 4% compounded annually until the final deposit is made. How much money will the investor have in the fund at the end of ten years assuming no withdrawals are made?

A) $8,872.93.

B) $9,251.82.

C) $9,549.11.

Explanation

It's best to break this problem into parts to accommodate the change in the interest rate.

Money in the fund at the end of ten years based on deposits made with initial interest of 5%:

(1) The total value in the fund at the end of the fifth year is $3,152.50:

PMT = −1,000; N = 3; I/Y =5; CPT → FV = $3,152.50. (calculator in END mode)

(2) The $3,152.50 is now the present value and will then grow at 4% until the end of the tenth year. We get:

PV = −3,152.50; N = 5; I/Y = 4; PMT = −1,000; CPT → FV = $9,251.82

(Module 1.2, LOS 1.c)

Question #36 of 78

Question ID: 1456221

If an investment has an APR of 18% and is compounded quarterly, its effective annual rate (EAR) is *closest to*:

A) 19.25%.

B) 18.81%.

C) 18.00%.

Explanation

Because this investment is compounded quarterly, we need to divide the APR by four compounding periods: 18 / 4 = 4.5%. EAR = $(1.045)^4$ – 1 = 0.1925, or 19.25%.

(Module 1.1, LOS 1.f)

Question #37 of 78

Question ID: 1456208

Natalie Brunswick, neurosurgeon at a large U.S. university, was recently granted permission to take an 18-month sabbatical that will begin one year from today. During the sabbatical, Brunswick will need $2,500 at the beginning of each month for living expenses that month. Her financial planner estimates that she will earn an annual rate of 9% over the next year on any money she saves. The annual rate of return during her sabbatical term will likely increase to 10%. At the end of each month during the year before the sabbatical, Brunswick should save approximately:

A) $3,505.00.

B) $3,330.00.

C) $3,356.00.

Explanation

This is a two-step problem. First, we need to calculate the present value of the amount she needs over her sabbatical. (This amount will be in the form of an annuity due since she requires the payment at the beginning of the month.) Then, we will use future value formulas to determine how much she needs to save each month (ordinary annuity).

Step 1: Calculate present value of amount required during the sabbatical

Using a financial calculator: **Set to BEGIN Mode**, then N = 12 × 1.5 = 18; I/Y = 10 / 12 = 0.8333; PMT = 2,500; FV = 0; CPT → PV = 41,974

Step 2: Calculate amount to save each month

Make sure the calculator is set to END mode, then N = 12; I/Y = 9 / 12 = 0.75; PV = 0; FV = 41,974; CPT → PMT = -3,356

(Module 1.3, LOS 1.d)

Question #38 of 78

Question ID: 1456196

The First State Bank is willing to lend $100,000 for 4 years at 12%. Assuming the loan is fully amortizing repayable in semiannual installments, the first payment is *closest* to:

A) $16,100.

B) $6,000.

C) $32,900.

Explanation

The loan is repayable over 8 six-month periods. The rate of interest over six months is 12% / 2 = 6%. Given the present value of the loan is $100,000, we need to calculate the six monthly annuity that arises.

Using the calculator:

N = 8; I/Y = 6; PV = -100,000; CPT → PMT = 16,103.59.

(Module 1.3, LOS 1.d)

Question #39 of 78

Question ID: 1456206

An individual borrows $200,000 to buy a house with a 30-year mortgage requiring payments to be made at the end of each month. The interest rate is 8%, compounded monthly. What is the monthly mortgage payment?

A) $1,468. ✓

B) $1,889. ✗

C) $1,776. ✗

Explanation

The present value of the loan is $200,000 repayable over 30 × 12 = 360 months. The rate of interest per month is 8% / 12 = 0.67%.

Using the calculator: PV = 200,000; FV = 0; N = 360; I/Y = 8 / 12 = 0.6667; CPT → PMT = $1,467.53.

(Module 1.3, LOS 1.d)

Question #40 of 78

Question ID: 1456227

If a $45,000 car loan is financed at 12% over 4 years, what is the monthly car payment?

A) $1,565.00. ✗

B) $1,185.00. ✓

C) $985.00. ✗

Explanation

N = 4 × 12 = 48; I/Y = 12/12 = 1; PV = –45,000; FV = 0; CPT → PMT = 1,185.02

(Module 1.1, LOS 1.e)

Question #41 of 78

Question ID: 1456160

How much would the following income stream be worth assuming a 12% discount rate?

- $100 received today.
- $200 received 1 year from today.
- $400 received 2 years from today.
- $300 received 3 years from today.

A) $721.32. ✗

B) $810.98.

C) $1,112.44.

Explanation

N	i	FV	PV
0	12	100	100.00
1	12	200	178.57
2	12	400	318.88
3	12	300	213.53
			810.98

(Module 1.2, LOS 1.c)

Question #42 of 78

Question ID: 1456182

A local bank offers a certificate of deposit (CD) that earns 5.0% compounded quarterly for three and one half years. If a depositor places $5,000 on deposit, what will be the value of the account at maturity?

A) $5,875.00.

B) $5,931.06.

C) $5,949.77.

Explanation

The value of the account at maturity will be: $\$5{,}000 \times (1 + 0.05 / 4)^{(3.5 \times 4)} = \$5{,}949.77$;

or with a financial calculator: N = 3 years × 4 quarters/year + 2 = 14 periods; I = 5% / 4 quarters/year = 1.25; PV = $5,000; PMT = 0; CPT → FV = $5,949.77.

(Module 1.2, LOS 1.c)

Question #43 of 78

Question ID: 1456152

The real risk-free rate can be thought of as:

A) approximately the nominal risk-free rate plus the expected inflation rate.

B) approximately the nominal risk-free rate reduced by the expected inflation rate. ✓

C) exactly the nominal risk-free rate reduced by the expected inflation rate. ✗

Explanation

The approximate relationship between nominal rates, real rates and expected inflation rates can be written as:

Nominal risk-free rate = real risk-free rate + expected inflation rate.

Therefore we can rewrite this equation in terms of the real risk-free rate as:

Real risk-free rate = Nominal risk-free rate – expected inflation rate

The exact relation is: (1 + real)(1 + expected inflation) = (1 + nominal)

(Module 1.1, LOS 1.b)

Question #44 of 78

Question ID: 1456228

Paul Kohler inherits $50,000 and deposits it immediately in a bank account that pays 6% interest. No other deposits or withdrawals are made. In two years, what will be the account balance assuming monthly compounding?

A) $50,500. ✗

B) $53,100. ✗

C) $56,400. ✓

Explanation

To compound monthly, remember to divide the interest rate by 12 (6%/12 = 0.50%) and the number of periods will be 2 years times 12 months (2 × 12 = 24 periods). The value after 24 periods is $\$50{,}000 \times 1.005^{24} = \$56{,}357.99$.

The problem can also be solved using the time value of money functions: N = 24; I/Y = 0.5; PMT = 0; PV = 50,000; CPT FV = $56,357.99.

(Module 1.1, LOS 1.e)

Question #45 of 78

Question ID: 1456159

A loan of $15,000 is to be paid off in monthly payments over 5 years at 12% annual interest. What is the amount of each payment?

A) $334.

B) $4,161.

C) $1,802.

Explanation

I = 12 / 12 = 1; N = 5 × 12 = 60; PV = 15,000; CPT → PMT = 333.67.

(Module 1.2, LOS 1.c)

Question #46 of 78

Question ID: 1456164

If $2,500 is invested at the end of each year for the next 10 years, earning 15% interest compounded annually, the value at the beginning of the eleventh year is be *closest* to:

A) $58,380.

B) $50,760.

C) $60,870.

Explanation

The beginning of the eleventh year is the same point in time as the end of the tenth year. So we can perform the calculation as if the question were asking for a value at the end of the tenth year.

N = 10; I = 15; PMT = 2,500; CPT → FV = $50,759.

(Module 1.2, LOS 1.c)

Question #47 of 78

Question ID: 1456169

Suppose you are going to deposit $1,000 at the start of this year, $1,500 at the start of next year, and $2,000 at the start of the following year in a savings account. How much money will you have at the end of three years if the rate of interest is 10% each year?

A) $4,000.00.

B) $5,346.00.

C) $5,750.00.

Explanation

Future value of $1,000 for 3 periods at 10% = 1,331

Future value of $1,500 for 2 periods at 10% = 1,815

Future value of $2,000 for 1 period at 10% = 2,200

Total = $5,346

N = 3; PV = -$1,000; I/Y = 10%; CPT → FV = $1,331

N = 2; PV = -$1,500; I/Y = 10%; CPT → FV = $1,815

N = 1; PV = -$2,000; I/Y = 10%; CPT → FV = $2,200

(Module 1.2, LOS 1.c)

Question #48 of 78

Question ID: 1456197

An investor has the choice of two investments. Investment A offers interest at 7.25% compounded quarterly. Investment B offers interest at the annual rate of 7.40%. Which investment offers the *higher* dollar return on an investment of $50,000 for two years, and by how much?

A) Investment A offers a $122.18 greater return.

B) Investment B offers a $36.92 greater return.

C) Investment A offers a $53.18 greater return.

Explanation

Investment A: I = 7.25 / 4; N = 2 × 4 = 8; PV = $50,000; PMT = 0; CPT → FV = $57,726.98

Investment B: I = 7.40; N = 2; PV = $50,000; PMT = 0; CPT → FV = $57,673.80

Difference = investment A offers a $53.18 greater dollar return.

(Module 1.3, LOS 1.d)

Question #49 of 78

Question ID: 1456180

An investment product promises to pay a lump sum of $25,458 at the end of 9 years. If an investor feels this investment should produce a rate of return of 14%, compounded annually, the present value is *closest* to:

A) $7,618.00.

B) $7,829.00.

C) $9,426.00.

Explanation

25,458 / 1.14^9 = 7,828.54

Alternatively, N = 9; I/Y = 14; FV = -25,458; PMT = 0; CPT → PV = $7,828.54.

(Module 1.2, LOS 1.c)

Question #50 of 78

Question ID: 1456162

Justin Banks just won the lottery and is trying to decide between the annual cash flow payment option or the lump sum option. He can earn 8% at the bank and the annual cash flow option is $100,000/year, beginning today for 15 years. What is the annual cash flow option worth to Banks today?

A) $855,947.87.

B) $924,423.70.

C) $1,080,000.00.

Explanation

First put your calculator in the BGN.

N = 15; I/Y = 8; PMT = 100,000; CPT → PV = 924,423.70.

Alternatively, do not set your calculator to BGN, simply multiply the ordinary annuity (end of the period payments) answer by 1 + I/Y. You get the annuity due answer and you don't run the risk of forgetting to reset your calculator back to the end of the period setting.

OR N = 14; I/Y = 8; PMT = 100,000; CPT → PV = 824,423.70 + 100,000 = 924,423.70.

(Module 1.2, LOS 1.c)

Question #51 of 78

Question ID: 1456225

What is the maximum price an investor should be willing to pay (today) for a 10 year annuity that will generate $500 per quarter (such payments to be made at the end of each quarter), given he wants to earn 12%, compounded quarterly?

A) $6,440.

B) $11,300.

C) $11,557.

Explanation

Using a financial calculator: N = 10 × 4 = 40; I/Y = 12 / 4 = 3; PMT = -500; FV = 0; CPT → PV = 11,557.

(Module 1.1, LOS 1.e)

Question #52 of 78

Question ID: 1456186

A successful investor has decided to set up a scholarship fund for deserving students at her alma mater. Her plan is for the fund to be capable of awarding $25,000 annually in perpetuity. The first scholarship is to be awarded and paid out exactly four years from today. The funds will be deposited into an account immediately and will grow at a rate of 4%, compounded semiannually, for the foreseeable future. How much money must the investor donate today to fund the scholarship?

A) $549,487.

B) $528,150.

C) $574,253.

Explanation

The investor has to ensure that the amount deposited now will grow into the amount needed to fund the perpetuity. With semiannual compounding, the effective annual rate (EAR) earned on funds in the account is:

$$\text{EAR} = \left(1 + \frac{\text{annual rate}}{2}\right)^2 - 1 = \left(1 + \frac{0.04}{2}\right)^2 - 1 = 0.0404 = 4.04\%$$

The present value of the perpetuity = $25,000/0.0404 = $618,811.88.

Note that since the first scholarship award is paid out in four years, the present value of the perpetuity represents the amount that must be in the account at time t = 3. We can find the required deposit from:

FV = −618,811.88; N = 3; I = 4.04; CPT → PV = $549,487.24 or $\frac{618{,}811.88}{1.0404^3}$ = $549,487.24

(Module 1.2, LOS 1.c)

Question #53 of 78

Question ID: 1456174

An investor purchases a 10-year, $1,000 par value bond that pays annual coupons of $100. If the market rate of interest is 12%, what is the current market value of the bond?

A) $887. ✓

B) $1,124. ✗

C) $950. ✗

Explanation

Note that bond problems are just mixed annuity problems. You can solve bond problems directly with your financial calculator using all five of the main TVM keys at once. For bond-types of problems the bond's price (PV) will be negative, while the coupon payment (PMT) and par value (FV) will be positive. N = 10; I/Y = 12; FV = 1,000; PMT = 100; CPT → PV = –886.99.

(Module 1.2, LOS 1.c)

Question #54 of 78

Question ID: 1456153

Renee Fisher invests $2,000 each year, starting one year from now, in a retirement account. If the investments earn 8% or 10% annually over 30 years, the amount Fisher will accumulate is *closest* to:

	8%	10%	
A)	$225,000	$330,000	✓
B)	$225,000	$360,000	✗
C)	$245,000	$360,000	✗

Explanation

N = 30; I/Y = 8; PMT = -2,000; PV = 0; CPT FV = 226,566.42

N = 30; I/Y = 10; PMT = -2,000; PV = 0; CPT FV = 328,988.05

(Module 1.2, LOS 1.c)

Question #55 of 78

Question ID: 1456154

Bill Jones is creating a charitable trust to provide six annual payments of $20,000 each, beginning next year. How much must Jones set aside now at 10% interest compounded annually to meet the required disbursements?

A) $87,105.21.

B) $95,815.74.

C) $154,312.20.

Explanation

N = 6, PMT = -$20,000, I/Y = 10%, FV = 0, Compute PV → $87,105.21.

(Module 1.2, LOS 1.c)

Question #56 of 78

Question ID: 1456189

Given an 8.5% discount rate, an asset that generates cash flows of $10 in Year 1, –$20 in Year 2, $10 in Year 3, and is then sold for $150 at the end of Year 4, has a present value of:

A) $135.58.

B) $163.42.

C) $108.29.

Explanation

Using your cash flow keys, $CF_0 = 0$; $CF_1 = 10$; $CF_2 = -20$; $CF_3 = 10$; $CF_4 = 150$; I/Y = 8.5; NPV = $108.29.

(Module 1.2, LOS 1.c)

Question #57 of 78

Question ID: 1456165

An investor will receive an annuity of $5,000 a year for seven years. The first payment is to be received 5 years from today. If the annual interest rate is 11.5%, what is the present value of the annuity?

A) $23,185.00.

B) $15,000.00.

C) $13,453.00.

Explanation

With PMT = 5,000; N = 7; I/Y = 11.5; value (at t = 4) = 23,185.175. Therefore, PV (at t = 0) = 23,185.175 / $(1.115)^4$ = $15,000.68.

(Module 1.2, LOS 1.c)

Question #58 of 78

Question ID: 1456195

Sarah Parker is buying a new $25,000 car. Her trade-in is worth $5,000 so she needs to borrow $20,000. The loan will be paid in 48 monthly installments and the annual interest rate on the loan is 7.5%. If the first payment is due at the end of the first month, what is Sarah's monthly car payment?

A) $483.58.

B) $416.67.

C) $480.57.

Explanation

N = 48; I/Y = 7.5 / 12 = 0.625; PV = 20,000; FV = 0; CPT → PMT = 483.58.

(Module 1.3, LOS 1.d)

Question #59 of 78

Question ID: 1456200

Optimal Insurance is offering a deferred annuity that promises to pay 10% per annum with equal annual payments beginning at the end of 10 years and continuing for a total of 10 annual payments. For an initial investment of $100,000, the amount of the annual payments will be *closest* to:

A) $38,375.

B) $42,212.

C) $25,937.

Explanation

The time line for the cash flows is as follows:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
$100,000										?	?	?	?	?	?	?	?	?	?

One period before the deferred annuity begins (i.e., at t = 9), the value will be: $100,000 × $(1 + 0.10)^9$ = $235,794.77.

Using a financial calculator and solving for a 10-year annuity:

N = 10; I/Y = 10; PV = –235,794.77; FV = 0; CPT PMT = 38,374.51

(Module 1.3, LOS 1.d)

Question #60 of 78

Question ID: 1456157

An annuity will pay eight annual payments of $100, with the first payment to be received one year from now. If the interest rate is 12% per year, what is the present value of this annuity?

A) $1,229.97. ✗

B) $556.38. ✗

C) $496.76. ✓

Explanation

N = 8; I/Y = 12%; PMT = -$100; FV = 0; CPT → PV = $496.76.

(Module 1.2, LOS 1.c)

Question #61 of 78

Question ID: 1456176

What is the present value of $200 to be received one year from now, $300 to be received 3 years from now, and $600 to be received 5 years from now assuming an interest rate of 5%?

A) $919.74. ✓

B) $980.89. ✗

C) $905.87. ✗

Explanation

$200 / (1.05) + 300 / (1.05)^3 + 600 / (1.05)^5 = 919.74$.

This can also be solved using the net present value function: $CF_0 = 0$; C01 = 200; C02 = 0; C03 = 300; C04 = 0; C05 = 600; I = 5; CPT NPV = 919.74

(Module 1.2, LOS 1.c)

Question #62 of 78

Question ID: 1456216

A local loan shark offers 4 for 5 on payday. What it involves is that you borrow $4 from him and repay $5 on the next payday (one week later). What would the stated annual interest rate be on this loan, with weekly compounding? Assuming 52 weeks in one year, what is the effective annual interest rate on this loan? Select the respective answer choices closest to your numbers.

A) 1,300%; 10,947,544%. ✓

B) 25%; 1,300%. ✗

C) 25%; 300%. ✗

Explanation

Stated Weekly Rate= 5/4 – 1 = 25%

Stated Annual Rate = 1,300%

Annual Effective Interest Rate = $(1 + 0.25)^{52} - 1 = 109,476.44 - 1 = 10,947,544\%$

(Module 1.1, LOS 1.f)

Question #63 of 78

Question ID: 1456150

Which one of the following statements *best* describes the components of the required interest rate on a security?

A) The real risk-free rate, the default risk premium, a liquidity premium and a premium to reflect the risk associated with the maturity of the security. ✗

B) The real risk-free rate, the expected inflation rate, the default risk premium, a liquidity premium and a premium to reflect the risk associated with the maturity of the security. ✓

C) The nominal risk-free rate, the expected inflation rate, the default risk premium, a liquidity premium and a premium to reflect the risk associated with the maturity of the security.

Explanation

The required interest rate on a security is made up of the nominal rate which is in turn made up of the real risk-free rate plus the expected inflation rate. It should also contain a liquidity premium as well as a premium related to the maturity of the security.

(Module 1.1, LOS 1.b)

Question #64 of 78

Question ID: 1456151

T-bill yields can be thought of as:

A) nominal risk-free rates because they contain an inflation premium.

B) nominal risk-free rates because they do not contain an inflation premium.

C) real risk-free rates because they contain an inflation premium.

Explanation

T-bills are government issued securities and are therefore considered to be default risk free. More precisely, they are nominal risk-free rates rather than real risk-free rates since they contain a premium for expected inflation.

(Module 1.1, LOS 1.b)

Question #65 of 78

Question ID: 1456226

Jamie Morgan needs to accumulate $2,000 in 18 months. If she can earn 6% at the bank, compounded quarterly, how much must she deposit today?

A) $1,829.08.

B) $1,832.61.

C) $1,840.45.

Explanation

Each quarter of a year is comprised of 3 months thus N = 18 / 3 = 6; I/Y = 6 / 4 = 1.5; PMT = 0; FV = 2,000; CPT → PV = $1,829.08.

(Module 1.1, LOS 1.e)

Question #66 of 78

Question ID: 1456214

A major brokerage house is currently selling an investment product that offers an 8% rate of return, compounded monthly. Based on this information, it follows that this investment has:

A) a periodic interest rate of 0.667%. ✓

B) a stated rate of 0.830%. ✗

C) an effective annual rate of 8.00%. ✗

Explanation

Periodic rate = 8.0 / 12 = 0.667. Stated rate is 8.0% and effective rate is 8.30%.

(Module 1.1, LOS 1.f)

Question #67 of 78

Question ID: 1456199

Lois Weaver wants to accumulate $1.5 million in a retirement fund when she retires in 30 years. If Weaver can earn a 9% rate of return on her investments, the amount she must invest at the end of each year for 30 years to reach her goal is *closest* to:

A) $11,000. ✓

B) $29,000. ✗

C) $40,000. ✗

Explanation

Using a financial calculator: N = 30; I/Y = 9; FV = -1,500,000; PV = 0; CPT → PMT = 11,004.52.

(Module 1.3, LOS 1.d)

Question #68 of 78

Question ID: 1456202

A recent ad for a Roth IRA includes the statement that if a person invests $500 at the beginning of each month for 35 years, they could have $1,000,000 for retirement. Assuming monthly compounding, what annual interest rate is implied in this statement?

A) 7.411%.

B) 7.625%.

C) 6.988%.

Explanation

Solve for an annuity due with a future value of $1,000,000, a number of periods equal to (35 × 12) = 420, payments = -500, and present value = 0. Solve for i. i = 0.61761 × 12 = 7.411% stated annually. Don't forget to set your calculator for payments at the beginning of the periods. If you don't, you'll get 7.437%.

(Module 1.3, LOS 1.d)

Question #69 of 78

Question ID: 1456181

Given a 5% discount rate, the present value of $500 to be received three years from today is:

A) $400.

B) $432.

C) $578.

Explanation

N = 3; I/Y = 5; FV = 500; PMT = 0; CPT → PV = 431.92.

or: $500/1.05^3 = 431.92$.

(Module 1.2, LOS 1.c)

Question #70 of 78

Question ID: 1456213

Which of the following is the *most* accurate statement about stated and effective annual interest rates?

A) The stated rate adjusts for the frequency of compounding. ✗

B) The stated annual interest rate is used to find the effective annual rate. ✓

C) So long as interest is compounded more than once a year, the stated annual rate will always be more than the effective rate. ✗

Explanation

The effective annual rate, not the stated rate, adjusts for the frequency of compounding. The nominal, stated, and stated annual rates are all the same thing.

(Module 1.1, LOS 1.f)

Question #71 of 78

Question ID: 1456198

Steve Hall wants to give his son a new car for his graduation. If the cost of the car is $15,000 and Hall finances 80% of the value of the car for 36 months at 8% annual interest, his monthly payments will be:

A) $413. ✗

B) $376. ✓

C) $289. ✗

Explanation

PV = 0.8 × 15,000 = -12,000; N = 36; I = 8/12 = 0.667; CPT → PMT = 376.

(Module 1.3, LOS 1.d)

Question #72 of 78

Question ID: 1456192

Elise Corrs, hedge fund manager and avid downhill skier, was recently granted permission to take a 4 month sabbatical. During the sabbatical, (scheduled to start in 11 months), Corrs will ski at approximately 12 resorts located in the Austrian, Italian, and Swiss Alps. Corrs estimates that she will need $6,000 at the beginning of each month for expenses that month. (She has already financed her initial travel and equipment costs.) Her financial planner estimates that she will earn an annual rate of 8.5% during her savings period and an annual rate of return during her sabbatical of 9.5%. How much does she need to put in her savings account at the end of each month for the next 11 months to ensure the cash flow she needs over her sabbatical? Each month, Corrs should save approximately:

A) $2,070.

B) $2,080.

C) $2,065.

Explanation

This is a two-step problem. First, we need to calculate the present value of the amount she needs over her sabbatical. (This amount will be in the form of an annuity due since she requires the payment at the beginning of the month.) Then, we will use future value formulas to determine how much she needs to save each month.

Step 1: Calculate present value of amount required during the sabbatical

Using a financial calculator: Set to BEGIN Mode, then N = 4; I/Y = 9.5 / 12 = 0.79167; PMT = 6,000; FV = 0; CPT → PV = -23,719.

Step 2: Calculate amount to save each month

Using a financial calculator: Make sure it is set to END mode, then N = 11; I/Y = 8.5 / 12.0 = 0.70833; PV = 0; FV = 23,719; CPT → PMT= -2,081, or approximately $2,080.

(Module 1.3, LOS 1.d)

Question #73 of 78

Question ID: 1456224

The future value of $1,000 invested for one year at a rate of interest of 12% compounded monthly is *closest* to:

A) $1,127.

B) $1,120.

C) $1,121.

Explanation

The monthly interest rate is 12% / 12 = 1%. The future value after 12 months will be $1,000 × $(1.01)^{12}$ = $1,126.83.

(Module 1.1, LOS 1.e)

Question #74 of 78

Question ID: 1456171

Assuming a discount rate of 10%, which stream of annual payments has the *highest* present value?

A)	$110	$20	$10	$5	✓
B)	$20	-$5	$20	$110	✗
C)	-$100	-$100	-$100	$500	✗

Explanation

This is an intuition question. The two cash flow streams that contain the $110 payment have the same total cash flow but the correct answer is the one where the $110 occurs earlier. The cash flow stream that has the $500 that occurs four years hence is overwhelmed by the large negative flows that precede it.

(Module 1.2, LOS 1.c)

Question #75 of 78

Question ID: 1456183

The value in 7 years of $500 invested today at an interest rate of 6% compounded monthly is *closest to:*

A) $780. ✗

B) $760. ✓

C) $750. ✗

Explanation

PV = -500; N = 7 × 12 = 84; I/Y = 6/12 = 0.5; compute FV = 760.18

(Module 1.2, LOS 1.c)

Question #76 of 78

Question ID: 1456190

A share of George Co. preferred stock is selling for $65. It pays a dividend of $4.50 per year and has a perpetual life. The rate of return it is offering its investors is *closest* to:

A) 4.5%. ✗

B) 6.9%. ✓

C) 14.4%. ✗

Explanation

4.5 / 65 = 0.0692, or 6.92%.

(Module 1.2, LOS 1.c)

Question #77 of 78

Question ID: 1456203

An investor who requires an annual return of 12% has the choice of receiving one of the following:

Option A: 10 annual payments of $1,225.00 to begin at the end of one year.

Option B: 10 annual payments of $1,097.96 beginning immediately.

Which option has the highest present value (PV) and approximately how much greater is it than the other option?

A) Option A's PV is $42 greater than option B's. ✗

B) Option B's PV is $114 greater than option A's. ✗

C) Option B's PV is $27 greater than option A's. ✓

Explanation

Option A: N = 10, PMT = -$1,225, I = 12%, FV = 0, Compute PV = $6,921.52.

Option B: N = 9, PMT = -$1,097.96, I = 12%, FV = 0, Compute PV → $5,850.51 + 1,097.96 = 6,948.17 or put calculator in Begin mode N = 10, PMT = $1,097.96, I = 12%, FV = 0, Compute PV → $6,948.17. Difference between the 2 options = $6,921.52 – $6,948.17 = -$26.65.

Option B's PV is approximately $27 higher than option A's PV.

(Module 1.3, LOS 1.d)

Question #78 of 78

Question ID: 1456191

Tom Gisard has signed up with the U.S. Peace Corps for a two-year term that begins in 18 months. Gisard has calculated that he will need $1,500 at the beginning of each month for living expenses. The annual rate of return during his time in the Peace Corps is estimated at 7.25%. He will save an equal amount at the end of each month for the next 18 months in an account that returns 6.25%, compounded monthly. Each month, Gisard should save approximately:

A) $1,786.

B) $1,748.

C) $1,707.

Explanation

This is a two-step problem. First, calculate the present value of the amount Gisard needs during the Peace Corps assignment at the end of Month 18. (This amount will be in the form of an annuity due because he requires the payment at the beginning of the month.) Then, determine how much he needs to save each month (ordinary annuity).

Step 1: In BGN mode: N = 24 (months); I/Y = 7.25 / 12; PMT = 1,500; FV = 0; CPT PV = 33,620.

Step 2: In END mode: N = 18 (months); I/Y = 6.25 / 12.0; PV = 0; FV = 33,620; CPT PMT = –1,786.45.

(Module 1.2, LOS 1.c)