***Personal Finance*, Third Canadian Edition (Madura/Gill)**
Chapter 2 Part 1 Tools for Financial Planning - Applying Time Value Concepts

2.1 True/False

1) Time value of money is based on the belief that a dollar that will be received at some future date is worth more than a dollar today.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

2) Future value depends on the interest rate and number of years invested but is independent of the number of compounding periods.
Answer: FALSE
Diff: 1 Type: TF
Categories: Future Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Recall

3) The present value of an annuity can be obtained by discounting the individual cash flows of an annuity and totalling them.
Answer: TRUE
Diff: 1 Type: TF
Categories: Present Value of an Annuity
Financial Type: Qualitative
Skill Type: Recall

4) To convert the table from ordinary annuity to annuity due is to multiple the annuity payment by (1+ i).
Answer: TRUE
Diff: 2 Type: TF
Categories: Present Value of an Annuity
Financial Type: Qualitative
Skill Type: Recall

5) Ten percent compounded quarterly with 10 years' investment means 40 compounding periods.
Answer: TRUE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

6) The shorter the time period, the lower the future value interest factor, other things being equal.
Answer: TRUE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

7) The longer the time period, the higher the present value interest factor, other things being equal.
Answer: FALSE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

8) The higher the interest rate, the higher the future value interest factor, other things being equal.
Answer: TRUE
Diff: 2 Type: TF
Categories: Future Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

9) The higher the interest rate, the lower the present value interest factor, other things being equal.
Answer: TRUE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

10) If you invested $10 000 when you turned 20 years of age and received a return of 11 percent annually, you would have over two million dollars when you turned 70.
Answer: FALSE
Diff: 3 Type: TF
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

11) Dividend is the rent charged for the use of money.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

12) Compound interest means earning interest on interest.
Answer: TRUE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

13) The concept of time value of money only applies to rare financial planning problems.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

14) The process of obtaining a present value is called discounting.
Answer: TRUE
Diff: 1 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Recall

15) Present value of the first year is determined by the future value divided by (1 + i).
Answer: TRUE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

16) The nominal interest rate is also called an annual percentage rate (APR).
Answer: TRUE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

17) The effective interest rate is the stated or quoted interest rate by the financial institutions.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

18) The nominal interest rate is the actual rate of interest you earn or pay.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

19) The effective rate of interest and compounding frequency have an inverse relation.
Answer: FALSE
Diff: 3 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Applied

20) Jill will have reached her goal of saving $23 000 to buy a car if she puts away $420 a month in a 7% annual interest savings account for four years.
Answer: TRUE
Diff: 3 Type: TF
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

21) Your rental payment required at the beginning of each month is an annuity due.
Answer: TRUE
Diff: 3 Type: TF
Categories: Future Value of an Annuity
Financial Type: Qualitative
Skill Type: Applied

22) Your monthly life insurance payments due at the beginning of each month are an annuity due.
Answer: FALSE
Diff: 2 Type: TF
Categories: Future Value of an Annuity
Financial Type: Qualitative
Skill Type: Applied

23) To calculate the present value, all you need is the amount of money in the future, the interest rate, and the number of years the money will be compounded.
Answer: FALSE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

24) John wants to have a $10 000 down payment for his car in three years. If he puts away $7,000 today and gets a 12.6% annual return, he will have the money he needs.
Answer: TRUE
Diff: 3 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

25) Future value interest factor (FVIF) uses $1.00 to calculate the $1.00 over time with a given interest rate and the number of periods the $1.00 is compounded.
Answer: TRUE
Diff: 2 Type: TF
Categories: Future Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Recall

26) Mary deposits $4000 at the beginning of each year and the money will grow to $1 081 170 in 30 years with 12 percent compounded annually.
Answer: TRUE
Diff: 3 Type: TF
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

27) ABC Bank offers term deposits with 7.8 percent compounded quarterly, while XYZ Bank offers term deposits with 8 percent compounded annually. We know that ABC Bank offers a higher effective rate of return.
Answer: TRUE
Diff: 3 Type: TF
Categories: Interest Rate Conversion
Financial Type: Quantitative
Skill Type: Applied

28) ABC Bank offers term deposits with 8 percent compounded annually, while XYZ Bank offers term deposits with 7.9 percent compounded monthly. ABC Bank offers a higher effective yield.
Answer: FALSE
Diff: 3 Type: TF
Categories: Interest Rate Conversion
Financial Type: Quantitative
Skill Type: Applied

29) Discount refers to the process of earning interest on interest.
Answer: FALSE
Diff: 1 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

30) If you borrow money, you will receive interest.
Answer: FALSE
Diff: 2 Type: TF
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Recall

31) Fred is 29 and just sold an antique for $29 311 that he purchased at age nine for $17 800. Fred's annual rate of return on this antique is 7.2 percent.
Answer: FALSE
Diff: 3 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

32) The higher the interest rate, the higher the present value, other things being equal.
Answer: FALSE
Diff: 2 Type: TF
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

2.2 Multiple Choice

1) Approximately how much would you need to invest today, to receive $200 in ten years, if you received an annual interest rate of ten percent?
A) $65
B) $77
C) $87
D) $97
Answer: B
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

2) The present value interest factor is
A) always less than 1.0.
B) always more than 1.0.
C) assumes simple interest.
D) always between 1.0 to 2.0.
Answer: A
Diff: 1 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Applied

3) Financial institutions quote rates with different compounding periods. What is the term for the actual interest rate paid or earned?
A) Effective
B) Nominal
C) Real
D) Absolute
Answer: A
Diff: 1 Type: MC
Categories: Interest Rate Conversion
Financial Type: Qualitative
Skill Type: Recall

4) What is the term for the interest rate financial institutions quote?
A) Nominal
B) Effective
C) Annual
D) Real
Answer: A
Diff: 1 Type: MC
Categories: Interest Rate Conversion
Financial Type: Qualitative
Skill Type: Recall

5) If you have an investment that will receive $100 at the end of year one, $200 at the end of year two, and $300 at the end of year three, what is the market value of this investment today if the discount rate is 13 percent annually?
A) $553
B) $453
C) $423
D) $383
Answer: B
Diff: 3 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

6) Mary wants to have $150 after four years by depositing $100 today and earning six percent interest compounded annually for the next six years. Can Mary attain her financial goal of having $150 lump sum six years later?
A) Yes, future value is more than $150.
B) Yes, present value is more than $150.
C) No, present value is less than $150.
D) No, future value is less than $150.
Answer: D
Diff: 1 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

7) What is the future value of $200 deposited today at eight percent interest compounded annually for three years?
A) $252
B) $250
C) $248
D) $249
Answer: A
Diff: 1 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

8) What is the highest effective rate attainable with a 12 percent nominal rate?
A) 12.85 percent
B) 12.75 percent
C) 12.65 percent
D) 12.55 percent
Answer: B
Diff: 2 Type: MC
Categories: Interest Rate Conversion
Financial Type: Quantitative
Skill Type: Applied

9) If John makes annual year-end payments of $8337.83 on a 20-year loan with an annual interest rate of 7.5 percent, what is the original principal amount for John's loan?
A) $82 000
B) $83 325
C) $85 700
D) $85 000
Answer: D
Diff: 3 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

10) An antique was originally purchased 50 years ago for $2 and today is worth $600. What is the approximate annual rate of return realized on the sale of this antique?
A) 18 percent
B) 12 percent
C) 9 percent
D) 13 percent
Answer: B
Diff: 3 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

11) Nick invests $50 000 today and the fund guarantees an annuity of $12 345 for six years. What is the approximate rate of return?
A) 11.6 percent
B) 8.0 percent
C) 12.5 percent
D) Insufficient information to calculate
Answer: C
Diff: 3 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

12) Danny invests $124 090 in a fund and expects to receive $10 000 per year for the next 30 years. What is the approximate interest rate provided on the annuity?
A) 8 percent
B) 6 percent
C) 9 percent
D) 7 percent
Answer: D
Diff: 2 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

13) What is the present value of an ordinary annuity paying $1550 each year for 15 years, with an interest rate of 6.6 percent per annum?
A) $19 589
B) $16 528
C) $14 481
D) $13 568
Answer: C
Diff: 2 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

14) The future value of $676 deposited at 5.85 percent compounded annually for five years is closest to
A) $845.
B) $962.
C) $907.
D) $898.
Answer: D
Diff: 2 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

15) If the interest rate is zero, the future value interest factor equals
A) 0.0.
B) -1.0.
C) 1.0.
D) Undefined
Answer: C
Diff: 1 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

16) How long will it take Ivy's money to triple in value at 12 percent compounded quarterly?
A) 9.5 years
B) 9.7 years
C) 9.3 years
D) Not enough information
Answer: C
Diff: 3 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

17) If you borrow $20 000 as a five-year loan from the bank and the bank requires you to make end-of-year payments of $4878.05, what is the annual interest rate on this loan?
A) 8 percent
B) 6 percent
C) 7 percent
D) 4 percent
Answer: C
Diff: 3 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

18) Betty wants to accumulate $1 million by the end of 20 years by making equal annual year-end deposits over the next 20 years. Assuming Betty can earn 10 percent over this period, how much must she deposit at the end of each year?
A) $18 560
B) $22 480
C) $27 760
D) $17 460
Answer: D
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

19) In a recessionary economy, the interest rate on deposits can be 0 percent. However, Raymond has an investment of $25 000 now, and in three years it will mature and pay Raymond $32 000. What is the approximate annual interest rate he will receive?
A) 9.3 percent
B) 8.6 percent
C) 8.9 percent
D) Insufficient information to calculate this question
Answer: B
Diff: 2 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

20) Assuming an inflationary economy, the future value interest factor is
A) always equal to 1.0.
B) always less than 1.0.
C) always greater than 1.0.
D) always uncertain.
Answer: C
Diff: 1 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Recall

21) The future value of $810 deposited today at 7.71 percent compounded annually for four years is closest to
A) $1620.
B) $1090.
C) $1060.
D) $1066.
Answer: B
Diff: 2 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

22) What is the present value of $1000 to be received ten years from today, assuming an interest rate of nine percent per annum?
A) $402
B) $488
C) $470
D) $422
Answer: D
Diff: 2 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

23) The amount to be invested today at a given interest rate over a specified period in order to equal a future amount is called
A) present value interest factor.
B) future value.
C) present value.
D) future value interest factor.
Answer: C
Diff: 1 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Qualitative
Skill Type: Recall

24) The future value of today's $200 to be received 10 years later with an interest rate of 10 percent per annum is
A) $424.
B) $484.
C) $542.
D) $519.
Answer: D
Diff: 2 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

25) If you want to have $10 000 for a down payment on a new car in three years' time, assuming an interest rate of 4.5 percent compounded annually, how much money do you need to deposit as a lump sum today?
A) $8650
B) $8712
C) $8112
D) $8763
Answer: D
Diff: 2 Type: MC
Categories: Present Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

26) Raymond wants to save the college tuition fees his child will need in ten years by starting with a deposit of $6500 today and depositing another $500 at the end of each year. How much will Raymond have in ten years if he gets a rate of return of four percent?
A) $15 625
B) $11 960
C) $15 865
D) $17 023
Answer: A
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

27) If you want to save $40 000 for a down payment on a home in five years, assuming an interest rate of 4.5 percent compounded annually, how much money do you need to save each month?
A) $666
B) $609
C) $622
D) $597
Answer: D
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

28) Hazel needs to plan the mortgage amount she can afford. How much would she need to pay monthly on a mortgage of $200 000 at six percent interest, calculated semi-annually and amortized over 30 years?
A) $555
B) $1211
C) $1199
D) $1190
Answer: D
Diff: 3 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

29) How much interest would Aleem save if he paid off his mortgage over 15 years instead of 30 years? His mortgage is $100 000 at six percent interest calculated semi-annually.
A) $64 111
B) $107 069
C) $58 297
D) $62 959
Answer: D
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

30) Julian is a student relying on student loans. He feels he would like to borrow an extra $4000 each year for the next four years to take vacations to recover from studying. Assume that no interest accrues until he completes his education and begins paying off the loan. The interest rate for the loan amount will be seven percent per year compounded monthly and he will pay it off over five years. What would his monthly payment be on this loan?
A) $374
B) $267
C) $271
D) $317
Answer: D
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

31) Rebecca is retiring next month when she turns 65. She can select a pension of $1745 monthly guaranteed for the rest of her life, but not indexed for inflation, or take a lump sum of $312 000. Assume she can invest the lump sum at five percent annually and draw the same income as the pension. What age must she reach for the monthly pension to be the better choice?
A) 89
B) 90
C) 92
D) 93
Answer: C
Diff: 3 Type: MC
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

32) Jessie won a lottery and was given the following choice. He could either take $5000 at the end of each month for 25 years, or a lump sum of $700 000. Assume annual compounding and determine what interest rate he would have to beat for the lump sum to be the better choice.
A) 3.1
B) 12.3
C) 7.0
D) 7.4
Answer: D
Diff: 3 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

33) Ishan plans to retire at age 40 with a decent lifestyle. He assumes that he can safely earn a real return of 4% annually on his money and that he would need $4000 a month to last until he turned 90. How much money would he need to have accumulated at age 40 (to the nearest thousand) if he were going to retire and no longer earn any money?
A) $1 050 000
B) $2 980 000
C) $1 500 000
D) $2 400 000
Answer: A
Diff: 3 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

34) Mortgages are annuities in that a fixed monthly fixed amount to the lender (assume monthly payments and an interest rate that compounds semi-annually). Sara is planning to take on a mortgage of $100 000 and believes she can afford monthly payments up to $700. How much interest would she save if she decided to pay off her mortgage over 20 years, rather than over 25 years? Her mortgage is at five percent interest calculated semi-annually.
A) $42 000
B) $18 120
C) $34 896
D) $16 776
Answer: D
Diff: 3 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

35) Alexis wants to have saved $600 000 by the time she retires at age 60. She is turning 46 in the next week and has accumulated $220 000 in her RRSP accounts. Assuming she can continue to get a 6% annual return on her RRSP investments, how much does she need to keep saving each month to reach her goal?
A) $2262
B) $1467
C) $2102
D) $396
Answer: D
Diff: 3 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

36) The most important thing to note about an annuity is
A) that the payment must not change over time.
B) that the payment increases according to the discount rate.
C) it reflects the growth of a single lump sum.
D) that it reflects the power of simple interest.
Answer: A
Diff: 1 Type: MC
Categories: Future Value of an Annuity
Financial Type: Qualitative
Skill Type: Recall

37) Naldo is considering selling a painting he inherited from his grandparents and which cost $200 when purchased 72 years ago. He accepted an offer for $22 000 for it recently. What is the annualized rate of return on this painting?
A) 1.12%
B) 2.75%
C) 11.7%
D) 6.75 %
Answer: D
Diff: 3 Type: MC
Categories: Future Value of a Single Dollar Amount
Financial Type: Quantitative
Skill Type: Applied

38) Tracey is buying a condo and will have a mortgage of $180 000 which she plans to pay off in 25 years. The interest rate is 5% compounded semi-annually. Her payments would be $1046 a month. She has heard she can reduce the time it would take to pay off her mortgage if she pays $523 every two weeks instead. How many years it would take her to pay off her mortgage if she chooses the second option.
A) 10.2 years
B) 21.7 years
C) 25.0 years
D) 21.5 years
Answer: D
Diff: 3 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

39) If your credit card says 28% interest compounded daily, what is the effective interest rate?
A) 32.3%
B) 29.8%
C) 31.9%
D) 28.9%
Answer: A
Diff: 2 Type: MC
Categories: Interest Rate Conversion
Financial Type: Quantitative
Skill Type: Applied

40) In which situation is simple interest the most appropriate interest calculation to use?
A) When there is one compounding period
B) Never
C) Always
D) When there are two or less compounding periods
Answer: A
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Qualitative
Skill Type: Applied

41) Joe and Bill are the same age and starting their careers. Each plans to retire at age 65 and each wants to have $600 000 in his RRSP account by then. If they both get seven percent annual return on their RRSP savings, which one will be closer to reaching his goal?
A) Bill if he starts saving $800 a month when he is 45 years old
B) Joe if he starts saving $200 a month when he is 25 years old
C) Bill if he starts saving $1000 a month when he is 45 years old
D) Joe if he starts saving $150 a month when he is 20 years old
Answer: D
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

42) What is the effective interest rate for a car loan advertised at five percent compounded monthly?
A) 5.1%
B) 5.2%
C) 5.3%
D) 5.4%
Answer: A
Diff: 2 Type: MC
Categories: Interest Rate Conversion
Financial Type: Quantitative
Skill Type: Applied

43) If Jenn could get a 10 percent annual return on her investment holdings, how long would it take for her to double her money?
A) 7.3 years
B) 6.9 years
C) 10.0 years
D) 83.5 years
Answer: A
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

44) Selena wants to have enough funds to cover $13 000 per year for four years of her daughter's university expenses and will need the money at the beginning of each year. If her funds get an annual return of 4.3 percent, how much would she need to have in the account when her daughter starts university?
A) $48 764
B) $46 857
C) $52 000
D) $48 872
Answer: D
Diff: 2 Type: MC
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

45) Ruby is expecting her first child next month and would like to have $80 000 saved for university education when the child turns 17. If Ruby can get a 6.6 percent annual return on the education savings for her child, how much does she need to start saving each month once the baby is born?
A) $2688
B) $392
C) $224
D) $218
Answer: D
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

46) Ralph wants to know what he should be able to save in his child's RESP account if he contributes $2,500 per year and also gets the CES grant of $500 each year. He wants to assume a conservative investment return of four percent annual return and that he will only contribute until the child is 15 (assume 15 years of $3000 deposits).
A) $46 500
B) $52 200
C) $65 500
D) $60 700
Answer: D
Diff: 2 Type: MC
Categories: Applying Time Value Concepts
Financial Type: Quantitative
Skill Type: Applied

2.3 Essay

1) Assuming a discount rate of 14 percent per year, Peter wants to know the market value of his investment today based on the following cash flows. Explain your reasoning.

Year	Cash flows
1 to 5	$20 000 per year
6 to 10	$35 000 per year

Answer:
Present value of years 1 - 5
This first part a five year annuity
P/Y is 1, C/Y is 1
FV = 0
I/Y = 14
N = 5
PMT = -20 000
CPT PV = 68 661.62

The second part is another five year annuity, the rest of which need to be discounted again to the present time to determine current market value.
FV = 0
I/Y = 14
N = 5
PMT = -35 000
PV yr 5 = $120 157.83

Then to PV it to now,
FV = 120 157
I/Y = 14
N = 5
PMT = 0
PV yr 5 = $62 406.21

So based on the discount factor of 14%, the market value today would be $131 067
Diff: 3 Type: ES
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

2) Develop an example to illustrate the power of compound interest. Be sure to illustrate your points using numbers and calculations.
Answer: There are many possibilities.

Comparing a simple interest example versus compound interest over many years.

Illustrating that saving $200 per month for 40 years at 7% return is more than saving $800 a month for 20 years with the same return.

Example: Saving $200 per month from age 25 to 65 at 7% return would give a future value of $494 308

I/Y 7, N 40 × 12, PMT -200, PV 0 and CPT FV

And $96 000 was actually saved - $200 × 12 × 40

Compare with the future value of saving $800 per month for 20 years at 7% return.

I/Y 7, N 20 × 12, PMT - 800, PV 0 and CPT FV $406 029

And $192 000 was actually saved - $800 × 12 × 20
Diff: 3 Type: ES
Categories: Future Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied

3) Use an illustration to show the difference between annual, semi-annual, monthly and daily compounding. Give examples and illustrations using numbers from real life for each one.
Answer:

Annual interest:
Means the interest is charged or paid once per year - for example, on some GICs, Canada Savings Bonds. Example: $1000 at 4% interest would give you $1040 at the end of the year.

Semi-annual interest:
This means the interest is calculated half at the middle of the year and then half at the end of the year. This applies to most bonds and mortgages.
Example: A $10 000 bond paying 6% interest pays $300 interest at the middle of the year and $300 at the end of the year. When you assume that you would have interest growing on the first $300, you realized that you would have more than $600 interest at the end of the year.

Monthly interest:
Example: A line of credit or car loan would normally have interest calculated monthly. Again this will end up being a higher actual or effective rate, than if it were compounded annually.

Daily interest:
Example: Most credit cards charge interest daily.
For example, a credit card charging 21% but calculated daily would give an effective rate of 23.36%.
Diff: 3 Type: ES
Categories: Interest Rate Conversion
Financial Type: Qualitative
Skill Type: Applied

4) Review all the considerations in a decision to take either a lump sum payment of $600 000 from a pension plan at retirement (age 65) versus a guaranteed monthly payment for life of $3000 (a life annuity). Assume the tax implications are neutral. Use calculations to illustrate your points and indicate what assumptions you use. Give your opinion on the best option.
Answer:
Pros of the annuity:
Life expectancy - the risk of living past expectation, say 25, 30 or 35 years and being impoverished in extreme old age.

Consider that a 3% return and life expectance of 20 years (to age 85) would produce $3300 per month, so it seems you are not getting a good deal with $3000 a month. But if you feel you may live to age 100, then it is a great deal. (I/Y 3, N 20 × 12, PV $600 000, FV 0) CPT PMT $3300

If you assume would get paid until age 85, you would be getting an effective interest rate of 1.9% which is not very high. (N 20 × 12, PV 600 000, PMT $3000, FV 0) CPT I/Y 1.9%

However, with the annuity you get the security of a guaranteed income for life.

This gives safety, security and peace of mind.

Ability to plan your lifestyle and monthly cash flow expenditures.

Pros of the lump sum:
More flexibility with what you can do with your money.

More control over your money.

More control over what you pass on to your heirs.

If you had taken the annuity and then died at age 75, the value to you would only have been $327 892 (I/Y 1.97, N 10 × 12, PMT $3000, FV 0) which is much less than $600 000

It would then be much better for your heirs if you happen to die early, to have the lump sum.

Hopefully you can get better than a 3% return, so would be better off.

But what if you live a long time? If you could get a 4% annual return and lived until age 95, $600 000 would be sufficient to provide only $2630 a month, so you would have run out of money if you were spending $3000 a month.
(I/Y 4, N 40 × 12, PV $600 000, FV 0) CPT PMT $2630

Your opinion...
Diff: 3 Type: ES
Categories: Present Value of an Annuity
Financial Type: Quantitative
Skill Type: Applied