École de gestion
TELFER
School of Management

LIÉE au LINKED with LEADERSHIP

ADM 2350N
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Quiz #1 Examination
Version #1 Solutions

Name: _____
Student ID #: _____

Statement of Academic Integrity
The Telfer School of Management does **NOT** condone academic fraud, an act by a student that may result in a false academic evaluation of that student or of another student. Without limiting the generality of this definition, academic fraud occurs when a student commits any of the following offences: plagiarism or cheating of any kind, use of books, notes, mathematical tables, dictionaries or other study aid unless an explicit written note to the contrary appears on the exam, to have in his/her possession cameras, radios (radios with head sets), tape recorders, pagers, cell phones, or any other communication device which has not been previously authorized in writing.

Statement to be signed by the student:
I have read the text on academic integrity and I pledge **NOT** to have committed or attempted to commit academic fraud in this examination.

Signed:_____

Note: an examination copy or booklet without that signed statement will **NOT** be graded and will receive a quiz exam grade of zero.

General Instructions:

1. Please **SIGN** the academic integrity statement above.
2. Please put your **Name and Student ID# on ALL NINE pages** of this exam.
3. This is an **open book and open notes exam**. Notes are **any handwritten or printed materials,** including but not limited to, previous assignments, quizzes, and exams plus their solution sets.
4. The use of **scientific and financial calculators is encouraged**.
5. **Laptop computers or any other devices that can be used for communication are NOT permitted**.
6. Please **do NOT take apart the pages** of this exam.
7. You have **1 hour and 10 minutes** to work this exam.
8. Good Luck!

Part I - Multiple Choice Questions (4 Marks)

There are four multiple-choice questions in this part. Each question counts 1 mark. Circle the **ONE** answer that is the **BEST** answer to each question. No credit is given for (a) no answer, (b) more than one answer, or (c) an answer other than the best answer to a question.

1. Which of the following are marketable securities?

   a. Government of Canada Bonds.
   b. Shares of BCE.
   c. Canada Savings Bonds.
   d. Guaranteed Investment Certificates.
   e. All of the above.
   f. Both a. and b. above are examples of marketable securities.

2. Which of the following examples is (are) agency problem(s) between shareholders and management?

   a. Management refuses a merger offer because of the possibility of major changes in management.
   b. Management takes a high risk to potentially increase the value of management stock options.
   c. The firm **INCREASES** its debt to **INCREASE** the price of common shares via a share buy-back program.
   d. Management keeps dividends **HIGH** to enhance shareholder wealth by signalling to the market that the firm is confident about being able to sustain its earnings.
   e. Both a. and b. above are examples of agency problems faced by shareholders.
   f. Both c. and d. above are examples of agency problems faced by shareholders.

3. The **PRESENT VALUE** of $100 received in four years

   a. Varies INVERSELY with the interest rate.
   b. Varies **DIRECTLY** with the interest rate.
   c. Varies **INVERSELY** for rates **BELOW 10** percent and **DIRECTLY** for rates **ABOVE 10**.
   d. Varies **INVERSELY** for rates **ABOVE 10** percent and **DIRECTLY** for rates **BELOW 10**.
   e. The present value is **INVARIANT** to changes in interest rates.
   f. Not enough information is provided to answer this question.

4. Use the following three statements to answer this question:

   I. The prices of bonds with **HIGHER** durations are **LESS** sensitive to interest rate changes than are those with **LOWER** durations.

   II. All else being equal, durations will be **HIGHER** when (1) market yields are **LOWER**, (2) bonds have **LONGER** maturities, and (3) bonds have **LOWER** coupons.

   III. Duration is a measure of interest rate or price risk of a bond

   Which answer below best describes the three above statements?

   a. I is **CORRECT**; II and III are **INCORRECT**.
   b. II is **CORRECT**; I and III are **INCORRECT**.
   c. III is **CORRECT** I and II are **INCORRECT**.
   d. I and II are **CORRECT**; III is **INCORRECT**.
   e. I and III are **CORRECT**; II is **INCORRECT**.
   f. II and III are CORRECT; I is INCORRECT.
   g. I, II, and III are **CORRECT**.
   h. I, II, and III are **INCORRECT**.

Part II - Multiple Choice Problems (6 Marks)

There are three multiple-choice problems in this part. Each problem is worth 2 marks. ***To receive credit, you must show your work.*** Each problem is on a separate page and an additional blank work page is provided for each problem. If you are using a financial calculator, **show what you are entering into the financial registers and show significant keystrokes.** Please also **specify the brand and model number**.

5. An investment pays **$1,000** at the **BEGINNING** of **EVERY** week for a year (a total of 52 payments). Your opportunity cost is a nominal or quoted annual rate of **6.50** percent based on compounding **weekly**. The **PRESENT VALUE** of this investment is:

   a. $52,000.00
   b. $50,315.60
   c. $50,378.49
   d. $53,759.68
   e. $53,692.57
   f. $15,764.81
   g. None of the above

Scientific Calculator Approach:

$$k = \frac{QR}{m} = \frac{6.5\%}{52} = 0.125\% \; or \; 0.00125$$

$$PV_0 = \frac{PMT \times (1+k)\left[1 - \frac{1}{(1+k)^n}\right]}{k} = \frac{\$1{,}000 \times 1.00125 \times \left[1 - \frac{1}{1.00125^{52}}\right]}{0.00125} = \$50{,}378.49$$

Financial Calculator Approach:

(1) Set P/Y = C/Y = 52 and set calculator to **BGN** mode.
(2) Set N = 52, I/Y = 6.5, PMT = 1,000, and FV = 0.
(3) CPT PV = - 50,378.49.

Marking Scheme:

NB. The marks for each answer may be **LESS** if you made other than the indicated mistakes. You must show your work to receive any credit.

0 marks for a. as you simple summed up the 52 payments
1 mark for b. as you calculated the PV of an ordinary annuity rather than an annuity due
2 marks for c. **PROVIDED** you showed your work and everything is correct
1 mark for d. as you calculated the FV of an annuity due rather than the required PV of an annuity due
0 marks for e. as you calculated the FV of an ordinary annuity rather than the required PV of an annuity due
1 mark for f. as you calculated the PV of an annuity due but you used 6.5% as the monthly rate
0 or 1 mark for g. depending on the nature of your mistake(s)

ADDITIONAL SPACE IS PROVIDED FOR WORKING PROBLEM 5

6. If you invested $1,000, **to the nearest 1/100 of a year** how long will to take to **quadruple** your money (i.e. accumulated compound interest plus original principal totaling $4,000) at an interest rate of **10.409%**?

a. 9.00
b. 10.00
c. 11.00
d. 12.00
e. 13.00
f. 14.00
g. None of the above

Scientific Calculator Approach:

$$n = \frac{\ln\left(\frac{FV_n}{PV_0}\right)}{\ln(1+k)} = \frac{\ln(4)}{\ln(1.10409)} = 13.99993772 \cong 14.00$$

Financial Calculator Approach:

(1) Set P/Y = C/Y = 1 and set calculator to **END** mode.
(2) Set I/Y = 10.409, PV = - 1,000, PMT = 0, and FV = 4,000.
(3) CPT N = 14.00.

Marking Scheme:

NB. The marks for each answer may be **LESS** if you made other than the indicated mistakes. You must show your work to receive any credit.

1 mark for the correct formula or entering everything **EXCEPT** I/Y correctly in the financial calculator
1 mark for correct n **PROVIDED** everything else is correct

$$n = \frac{\ln\left(\frac{FV_n}{PV_0}\right)}{\ln(1+k)} = \frac{\ln(4)}{\ln(1.10409)} = 13.99993772 \cong 14.00$$

ADDITIONAL SPACE IS PROVIDED FOR WORKING PROBLEM 6

7. Mega.Com issued a **semi-annual** pay **14 percent** nominal annual coupon **twenty-year** bond **eight years** ago. The nominal market yield until maturity for the **remaining twelve years** for this bond is **10 percent**. What is the current price of the bond if its face (i.e. maturity or par) value is **$1,000**?

   a. $1,000.00
   b. $1,275.97
   c. $1,216.76
   d. $1,272.55
   e. $1,213.40
   f. $770.61
   g. None of the above

Scientific Calculator Approach:

$$B = \frac{I \times \left[1 - \frac{1}{(1+k)^n}\right]}{k} + \frac{F}{(1+k)^n} = \frac{\$70 \times \left[1 - \frac{1}{1.05^{24}}\right]}{0.05} + \frac{\$1{,}000}{(1.05)^{24}} = \$965.90 + 310.07 = \$1{,}275.97$$

Financial Calculator Approach:

(1) Set P/Y = C/Y = 2 and set calculator to **END** mode.
(2) Set N = 24, I/Y = 10, PMT = 70, FV = 1,000.
(3) CPT PV = -1,275.97.

Marking Scheme:

NB. The marks for each answer may be **LESS** if you made other than the indicated mistakes. You must show your work to receive any credit.

0 marks for a. as this answer is correct only when the coupon rate and YTM are the same
2 marks for b. **PROVIDED** that you showed your work and everything is correct
1 mark for c. as you calculated the price of a semi-annual pay bond with 8 years to maturity instead of 12
1 mark for d. as you calculated the price of an annual pay instead of a semiannual pay bond
0 marks for e. as you calculated the price of an annual pay bond with 8 years to maturity instead of 12
1 mark as you calculated the price of a semi-annual pay bond but you mixed up the coupon rate and YTM
0 or 1 mark for g. depending on the nature of your mistake(s)

ADDITIONAL SPACE IS PROVIDED FOR WORKING PROBLEM 7