

UNIVERSITY OF MANITOBA
Faculty of Management
Department of Accounting and Finance

Professors: I. Khan, C. Liao, D. Stangeland
FIN 2200 Corporation Finance Final Examination
Dec 11, 2015; 6:00 p.m. - 9:00 p.m.

Note: it is your responsibility to verify that this examination has **14** pages.

Name:
ID number:
Check (✓) the box (☐) corresponding to the section in which you are registered. <input type="checkbox"/> A01 Khan, T/Th 11:30 – 12:45 <input type="checkbox"/> A04 Liao, T/Th 8:30 – 9:45 <input type="checkbox"/> A02 Khan, T/Th 1:00 – 2:15 <input type="checkbox"/> D01 Stangeland, Distance Education <input type="checkbox"/> A03, Liao, T/Th 10:00 – 11:15

- Section I of the exam has **40** multiple-choice questions worth a total of **60 points**. Answer all multiple-choice questions on the bubble sheet.
- Section II of the exam contains **3** long-answer questions worth a total of **40 points**. Answer all questions in the spaces provided. **Show all relevant work** (i.e., formulas and substitutions). **DO NOT INDICATE WHICH CALCULATOR BUTTONS YOU HAVE PRESSED. Do not round any intermediate calculations.**
- Write or print legibly in the space provided for answering each long answer problem. Label everything carefully so that it is clear what you are doing.
- **Rounding rules:**
 - *Final dollar* answers should be rounded to 2 decimal places, unless otherwise specified.
 - *Final interest rate* answers should be rounded to 4 decimal places if stated as a percentage and 6 decimal places otherwise, unless otherwise specified.
 - Other final answers may be rounded to 6 decimal places, unless otherwise specified.
- **DO NOT FORGET TO RESET YOUR CALCULATOR TO “1 P/YR” AND PAYMENTS TO THE “END” MODE.**

Question	Maximum Total Marks	Marks Awarded
Multiple Choice	60	
Long Q. 1	13	
Long Q. 2	13	
Long Q. 3	14	
Total Marks	100	

I. Multiple Choice Section:

Each of the following questions is followed by several suggested answers or completions. **Do not round any intermediate calculations.** Select the best alternative and place the corresponding letter on the accompanying computerized answer sheet.

(Value: 40 x 1.5 = 60 marks)

1. QualityUsedCars Inc reported net income of \$300 million for the most recent fiscal year. The firm had CCA expenses of \$125 million and capital expenditures of \$150 million. Although they had no interest expense, the firm did have an increase in net working capital of \$20 million. What is the firm's free cash flow?
 - a. \$255 million
 - b. \$295 million
 - c. \$305 million
 - d. \$345 million
 - e. \$595 million

2. Healthwise Inc is considering adding a health snack bar to its existing facility. This will entail an increase in inventory of \$8,000, an increase in accounts payable of \$2,500, and an increase in property, plant, and equipment of \$20,000. All other accounts will remain unchanged. The change in net working capital resulting from the addition of the health snack bar is:
 - a. -\$8,000
 - b. \$5,500
 - c. \$10,500
 - d. \$25,500
 - e. \$30,500

Consider the following two projects for the next two questions:

Project	Year 0 Cash Flow	Year 1 Cash Flow	Year 2 Cash Flow	Year 3 Cash Flow	Year 4 Cash Flow	Discount Rate
A	-100	40	50	60	N/A	.15
B	-73	30	30	30	30	.15

3. The incremental IRR of Project A over Project B is closest to:
 - a. 1.7%
 - b. 10.4%
 - c. 12.6%
 - d. 21.6%
 - e. 23.3%

4. The profitability index for Project A is closest to:
 - a. 0.12
 - b. 0.15
 - c. 1.20
 - d. 12.00
 - e. 50.00

Consider following probability distribution of returns for AAA Inc for the next question:

Current Stock Price (\$)	Stock Price in One Year (\$)	Return R	Probability PR
	\$35	40%	25%
\$25	\$25	0%	50%
	\$20	-20%	25%

5. The standard deviation of the return on AAA Inc is closest to:
- 2.50%
 - 4.75%
 - 15.81%
 - 21.79%
 - 34.57%

Consider the following covariances between securities for the next question:

	<i>Ford</i>	<i>Microsoft</i>
<i>Ford</i>	0.0568	-0.0193
<i>Microsoft</i>	-0.0193	0.2420

6. The variance of a portfolio made up of equal investments in Ford and Microsoft stock is:
- 0.0097
 - 0.0193
 - 0.0651
 - 0.1687
 - 0.2551
7. Suppose you have \$10,000 in cash to invest. You decide to sell short \$5,000 worth of Kortal stock trading at \$25/share and invest the proceeds from your short sale, plus your \$10,000 into one-year Canadian Treasury Bills earning 5%. At the end of the year, you decide to liquidate your portfolio when Kortal stock is trading at \$30/share. The return on your portfolio is closest to:
- 57.5%
 - 2.5%
 - 1.375%
 - 2.5%
 - 57.5%
8. Your portfolio consists solely of an investment in Bortal stock. Bortal has an expected return of 13% and a volatility of 25%. The market portfolio has an expected return of 12% and a volatility of 18%. The risk-free rate is 4%. Assume that the CAPM assumptions hold in the market. Assuming you want to maintain the current volatility of your portfolio, then the amount that you should invest in the market portfolio to maximize your expected return is closest to:
- 72%
 - 92%
 - 110%
 - 140%
 - 160%
9. Canadian bankruptcy law was created to ensure that _____ are treated fairly and the value of the assets is not needlessly destroyed.
- shareholders
 - stakeholders
 - creditors
 - owners
 - customers

10. Which of the following statements is FALSE?
- Modigliani and Miller's conclusion verified the common view, which stated that even with perfect capital markets, leverage would affect a firm's value.
 - We can evaluate the relationship between risk and return more formally by computing the sensitivity of each security's return to the systematic risk of the economy.
 - Increasing the leverage of the firm causes investors in the firm's equity to require a higher expected return.
 - Leverage increases the risk of equity even when there is no risk that the firm will default.
 - For a company that has some positive probability of bankruptcy, the yield to maturity of risky debt is higher than the debt's expected return.
11. Which of the following is NOT one of Modigliani and Miller's set of conditions referred to as perfect capital markets?
- All investors hold the efficient portfolio of assets.
 - There are no taxes, transaction costs, or issuance costs associated with security trading.
 - A firm's financing decisions do not change the cash flows generated by its investments, nor do they reveal new information about them.
 - Investors and firms can trade the same set of securities at competitive market prices equal to the present value of their future cash flows.
 - There are no bankruptcy costs.
12. Which of the following statements is FALSE regarding higher leverage in a firm's capital structure?
- Higher leverage may reduce the value of the firm because it may induce management to switch to higher risk assets when the firm is near financial distress.
 - Higher leverage may increase the value of the firm because it may use up free cash flows that management would otherwise waste on corporate perquisites.
 - Higher leverage may increase the value of the firm because the pressure to make debt payments may reduce management shirking their responsibilities.
 - Higher leverage will add less value to the firm if the government simultaneously increases the personal tax rate on debt income and reduces the personal tax rate on equity income.
 - Higher leverage will increase the weighted average cost of capital for a firm because the firm becomes more risky.
13. Which of the following statements is TRUE?
- Personal taxes have the potential to offset some of the corporate tax benefits of leverage.
 - The actual interest tax shield depends on the reduction in the total taxes (both corporate and personal) that are paid.
 - The amount of money an investor will pay for a security ultimately depends on the benefits the investor will receive—namely, the cash flows the investor will receive after all taxes have been paid.
 - Just like corporate taxes, personal taxes reduce the cash flows to investors and diminish firm value.
 - All of the above are true.

14. The expected costs of financial distress are paid by
- The bondholders because they cannot anticipate financial distress and the actual financial distress costs will be different than the expected costs.
 - The stockholders because their firm's bonds cannot be issued for as high a price as the bonds of a firm that won't have financial distress.
 - The government because it has to bail out bankrupt firms and keep taxes higher in case this is required.
 - Society because workers in a bankrupt firm lose their jobs and will need government assistance when they are unemployed.
 - The bondholders because they receive less when the firm defaults.
15. Given a rate of 12% per year, compounded quarterly, what is the equivalent rate per year, compounded annually?
- 11.8375%
 - 12.4864%
 - 12.5509%
 - 12.9859%
 - 13.3519%
16. When you retire in 25 years, you would like your income each year to have the purchasing power of \$200,000 today. You will earn 7% on your retirement savings each year (compounded annually) and expected inflation is 3% per year (compounded annually). What is the nominal amount of your first retirement income cash flow in 25 years?
- \$418,755.59
 - \$518,434.41
 - \$1,085,486.53
 - \$2,272,767.74
 - None of the above
17. Your friend intends to retire 25 years from today. After analyzing your friend's needs, you determine that a sum of \$1,050,000 25 years from today will be required to meet her financial needs. Your friend plans on making quarterly contributions starting today and continuing those payments up to and including the day she retires (25 years from today). She will be able to earn an effective quarterly rate of return of 3% on her investments. You then advise that her quarterly payment will need to be
- \$1,675.96
 - \$1,729.00
 - \$28,799.26
 - \$33,175.96
 - None of the above
18. Two years ago you purchased a new car. You financed your car for 60 months with monthly payments made at the end of the month. Your effective monthly interest rate is 0.4917%. If your monthly payments are \$617.16 and you have just made your 24th monthly payment on your car, then the outstanding principal balance on your SUV loan is closest to
- \$13,939.01
 - \$20,316.80
 - \$20,831.53
 - \$22,316.78
 - None of the above
19. A bond with annual coupons has a face value of \$X. The coupon rate is 8% and the bond's yield to maturity (expressed as an effective annual rate is 8%). The next coupon is exactly one year from now and the bond will mature in Y years. Which one of the following statements is true?
- The bond will be selling at face value.
 - The bond will be selling at a discount to face value.
 - The bond will be selling at a premium to face value.
 - None of the above is correct; we would need to know X.
 - None of the above is correct; we would need to know Y.

20. Bonds issued by a local entity, denominated in the local currency, traded in a local market, but purchased by foreigners are called
- domestic bonds
 - Yankee bonds
 - Eurobonds
 - foreign bonds
 - None of the above
21. The Company has a bond outstanding with a face value of \$1,000 that reaches maturity in 15 years. The bond has a coupon rate of 8% and that the coupon payments are to be made semi-annually. Assuming that this bond trades for \$1,035.44, then the yield to maturity (stated as an effective semi-annual rate) for this bond is equal to:
- 3.7%
 - 3.8%
 - 7.6%
 - 7.7%
 - None of the above is within 0.1% of the YTM.
22. The price of a 1-year, zero-coupon, risk-free security with face value \$1,000 is \$961.54. The price of a 2-year, zero-coupon, risk-free security with face value \$1,000 is \$890.00. What is the price of a 2-year risk-free bond with face value of \$1,000, coupon rate of 5% and annual coupons?
- \$890.00
 - \$938.08
 - \$981.67
 - \$982.58
 - None of the above
23. Given the information below, find the forward rate for year 3 (the forward rate quoted today for an investment that begins two years from now and matures three years from now).
- | Maturity (years) | 1 | 2 | 3 | 4 |
|-------------------------|----------|----------|----------|----------|
| Zero-Coupon YTM | 5.80% | 5.50% | 5.20% | 5.00% |
- 4.5%
 - 5.0%
 - 5.2%
 - 4.6%
 - None of the above

Use the following information to answer the next two questions:

Bora Bora Corporation (BBC) is expected pay a dividend of \$1.40 per share at the end of this year and \$1.50 per share at the end of the second year. You expect BBC's stock price to be \$25.00 at the end of two years. BBC's equity cost of capital is 10%.

24. Suppose you plan to hold BBC stock for one year. The price you would be willing to pay today for a share of BBC's stock is
- \$23.17
 - \$20.65
 - \$21.95
 - \$21.30
 - None of the above
25. Suppose you plan to hold BBC stock for one year. The price you would expect to be able to sell a share of BBC stock for in one year is
- \$26.50
 - \$22.20
 - \$23.15
 - \$24.10
 - None of the above

26. Acoustic Industries has a dividend yield of 4.5% and a cost of equity capital of 12%. Acoustic Industries' dividends are expected to grow at a constant rate indefinitely. The growth rate of Acoustic's dividends is
- 7.5%
 - 5.5%
 - 16.5%
 - 12%
 - None of the above
27. JRN Enterprises just announced that it plans to cut its dividend from \$2.50 to \$1.50 per share and use the extra funds to expand its operations. Prior to this announcement, JRN's dividends were expected to grow at 4% per year and JRN's stock was trading at \$25.00 per share. With the new expansion, JRN's dividends are expected to grow at 8% per year indefinitely. Assuming that JRN's risk is unchanged by the expansion, the value of a share of JRN after the announcement is closest to:
- \$25.00
 - \$15.00
 - \$31.25
 - \$27.50
 - None of the above
28. Pane in the Glass Autobody Ltd. (PITGAL) just paid a quarterly dividend of \$1.60 per share. PITGAL's dividends grow at a quarterly rate of 1.5%. The company has announced that following the quarterly dividend in one year's time, dividends will grow at a quarterly rate of 2%. Given the risk associated with PITGAL's stock, the required quarterly expected effective return is 3.78%. What is the current price of one share of PITGAL stock?
- \$78.88
 - \$89.94
 - \$90.80
 - \$91.28
 - None of the above
29. You have invested in a Canadian Real Estate Investment Trust (REIT) by holding 100 of its units in your Tax Free Savings Account (TFSA). Employment income that you receive is taxed at a rate of 46% and dividend income that you receive is taxed at a rate of 33%. Assume Canadian corporations are taxed at a rate of 35%. If the REIT has business income before tax of \$1 per unit and pays all income to unit holders, how much is left in your TFSA after all required taxes are paid?
- \$36.18
 - \$54
 - \$65
 - \$67
 - \$100
30. For which business form is raising outside equity capital most difficult?
- Sole Proprietorship
 - Limited Partnership
 - Limited Liability Partnership
 - General Partnership
 - Corporation
31. Peach Corp. common stock is currently trading at \$100 per share. European call options on Peach with exercise price of \$106 are currently selling for \$6. The risk free interest rate is 5% EAR. What is the price of the equivalent European put option on Peach assuming all options have 6 months until expiration?
- \$2.55
 - \$5.05
 - \$6.95
 - \$8.49
 - \$9.45

32. In one year the economy will either be weak, normal, or strong with probabilities of .3, .35, and .35 respectively. Security W pays \$100 if the economy is weak, security N pays \$100 if the economy is normal, and security S pays \$100 if the economy is strong. The current prices of these securities are as follows: $W = \$40$, $N = \$30$, $S = \$25$. What is the risk free rate of interest?
- 2.2%
 - 5%
 - 5.263%
 - 9.783%
 - 11.111%
33. In one year the economy will either be weak, normal, or strong with probabilities of .3, .35, and .35 respectively. Security W pays \$100 if the economy is weak, security N pays \$100 if the economy is normal, and security S pays \$100 if the economy is strong. The current prices of these securities are as follows: $W = \$40$, $N = \$30$, $S = \$25$. What is the expected return on the Market Index (M) that pays \$800, \$1000 or \$1200 depending on whether the economy is weak, normal or strong respectively?
- 2.2%
 - 5%
 - 5.263%
 - 9.783%
 - 11.111%
34. Consider American options on IBM stock with exercise price equal to \$125 and expiration in 9 months. **Holding all else constant**, which of the following changes will increase the price of both the call and put options?
- IBM's stock price increases
 - IBM stock's total risk increases
 - IBM stock's systematic risk increases
 - The time until expiration changes to 8 months
 - The exercise price is changed to \$100
35. As a hobby, you calculate put-call parity prices of put options every day. One day you observe that the market price of a put option is less than what you calculated based on put-call parity. Assume there are no transaction costs and the underlying stock does not pay dividends, what should you do?
- Do nothing, put-call parity is just a theoretical concept that is not relevant to the real world.
 - Simultaneously buy the put and the corresponding call, short sell the stock, and invest the present value of the exercise price in the risk-free asset.
 - Simultaneously write the put and the corresponding call, buy the stock, and borrow the present value of the exercise price at the risk-free rate.
 - Simultaneously buy the put and the stock, write the corresponding call, and borrow the present value of the exercise price at the risk-free rate.
 - Simultaneously buy the put and the stock, write the corresponding call, and invest the present value of the exercise price in the risk-free asset.
36. Which of the following is true for American options with exercise price of \$110 when the underlying stock price drops to zero. Assume the risk free rate is 10% and both options have one year until expiration.
- Both the put and call options will have zero value.
 - The put option's value will be \$100 and the call option's value will be zero.
 - The put option's value will be \$110 and the call option's value will be zero.
 - The put option's value will be zero and the call option's value will be \$100.
 - The put option's value will be zero and the call option's value will be \$110.

37. Which of the following is NOT a valid reason for WestJet to hedge its fuel costs by using futures contracts?
- The hedging will help WestJet reduce the expected costs of financial distress.
 - The hedging will allow WestJet to avoid higher fuel costs but benefit if fuel costs decline.
 - The hedging will help WestJet avoid issuance costs associated with raising capital from outside investors to offset potential negative net income.
 - The hedging will allow WestJet to utilize more debt in its capital structure and benefit from associated tax shields.
 - The hedging will allow WestJet to use stock based compensation more effectively as incentives for its management and employees.
38. Calvin has a long position in oil futures for 100,000 barrels. Klein has a short position in oil futures for 100,000 barrels. Yesterday's closing futures price for oil was \$60 per barrel. If today's closing price is \$58 per barrel, what is the marking to market for Calvin and Klein? The initial margin requirement was 10% and the maintenance margin requirement is 5%.
- Calvin: \$2; Klein: -\$2
 - Calvin: \$20,000; Klein: -\$20,000
 - Calvin: -\$20,000; Klein: \$20,000
 - Calvin: \$200,000; Klein: -\$200,000
 - Calvin: -\$200,000; Klein: \$200,000
39. A real return bond ...
- Only pays coupons when the firm's real investment projects are profitable.
 - Pays greater cash flows when inflation rates are higher.
 - Pays both coupons and face value rather than just coupons so that the amount invested is really returned.
 - Is always sold at a discount unless interest rates are really high compared to the coupon rate.
 - Is risk free unless the economy goes into recession.
40. Which type of bond gives the bondholder something similar to a call option on the firm's stock?
- Sovereign bonds
 - Sinking fund bonds
 - Real return bonds
 - Convertible bonds
 - Callable bonds

Question Two (13 marks)

Use the data provided in the table below to answer the questions that follow. Assume that the CAPM holds.

Security	Expected Return	Standard Deviation of Returns	Beta
A	5%	25%	0.5
B	11%	18%	1.5
Market Portfolio	8%	15%	1.0

- a. **(2 marks)** What is the market risk premium and the risk-free rate of return?
- b. **(1 marks)** If Security A and B are perfectly negatively correlated, what is the standard deviation of the minimum-variance portfolio comprised of these two securities?
- c. **(4 marks)** Suppose you short \$2,000 of Security A and use that money plus \$10,000 of your own money to invest in Security B. Assume the correlation between Security A and B is 0.4. What is your portfolio's expected return, standard deviation of returns, and beta?

(continued on next page)

- d. **(2 marks)** Ignore your answers to parts a, b, and c. Assume the risk-free rate is 3%. Find the exact composition of the mean-variance efficient portfolio (i.e. comprised of the risk-free asset and the market portfolio) that has an expected return of 12%.
- e. **(2 marks)** Ignore your answers to parts a, b, c, and d. Assume the risk-free rate is 3%. Find the expected return of the mean-variance efficient portfolio (i.e. comprised of the risk-free asset and the market portfolio) that has a standard deviation of 0.2.
- f. **(2 marks)** Ignore your answers to parts a, b, c, d, and e. Assume the risk-free rate is 3%. Suppose there exists another Security C with an expected return of 15% and a beta of 2.3. Is Security C overvalued or undervalued relative to the CAPM?

Question Three (14 marks)

Best Brewery (BB) management is concerned about the price of barley needed to produce beer next summer. BB normally buys its supply of malting barley for summer beer sales in March so that the beer production process will be finished by the beginning of summer. Currently, March futures contracts on Malting Barley are trading with a futures price of \$150 per metric tonne. Options per metric tonne of Malting Barley are available as follows: Calls with exercise price of \$148 per metric tonne are priced at \$20 each. Puts with exercise price of \$146 per metric tonne are priced at \$16 each.

- a. **(2 marks)** What hedging strategy using Futures can BB implement? Be sure to indicate whether it is a long or short futures strategy and briefly explain what it means.

- b. **(2 marks)** What hedging strategy using options can BB implement? Only consider long strategies; be sure to indicate whether it is a long call or long put strategy and briefly explain what it means.

- c. **(5 marks)** What is the net amount BB will pay per metric tonne of malting barley? Consider the following hedging strategies in the three columns and the final prices for malting barley in March in the five rows. Fill in the table below indicating the net amount BB pays for one metric tonne of malting barley (including any hedging costs or benefits related to the hedging strategy shown).

March Price of Malting Barley	No Hedging Done	Futures Hedge	Options Hedge
\$100			
\$125			
\$150			
\$175			
\$200			

- d. **(2 marks)** Assume prices in the table above were equally likely (each has a probability of 20%). If BB will experience extreme bankruptcy costs for any net barley price over \$155, then what is the best strategy for it to pursue? Briefly explain.

- e. **(3 marks)** What would be three differences if BB used a forward hedge instead of a futures hedge?