Print Last Name: ➔	Print First Name: ➔	ID Number: ➔	
COURSE FINANCE	**NUMBER** COMM 308	**SECTIONS: (➔ Circle your section)** CC DD G H I J	
EXAMINATION Final Exam **VERSION BLUE**	**DATE** April 21, 2012	**TIME** 3 hours 14:00 to 17:00	**# OF PAGES 18** including cover
INSTRUCTOR: **(➔ Underline your instructor's name)** June Riley Raad Jassim Monir Wahhab Jim Kellett Nabil El Meslmani Nada El Hassan		**DIVISION** John Molson School of Business Concordia University	

READ THESE SPECIAL INSTRUCTIONS CAREFULLY

- You must submit a BLUE computer answer sheet.

- You are allowed to bring/use one or more calculators

- You allowed to bring one language dictionary (no finance/ mathematics/economics etc. dictionary)

- For Multiple Choice Questions: All answers must be recorded IN PENCIL on the computer sheet.

- For Problems:
All answers must be recorded IN INK within this exam.
Show your calculations to earn part marks. Write in the space provided.
If you are using the back of the exam for answering any question, you should label it clearly

- Please ensure you have 18 pages (including the cover page) in this exam.

- Fill in your name and other required information IN PENCIL on the Computer Answer sheet as well as IN INK on this cover sheet.

- Blank questions or those with multiple answers will not receive any credit.

SCORES (FOR INTERNAL USE ONLY)

Part I Multiple Choice Questions	Part II Long Answer Questions				
	Question 1	Question 2	Question 3	Question 4	
(Max: 70 Points)	(Max:11 Points)	(Max: 6 Points)	(Max: 7 Points)	(Max: 6 Points)	**Total: 100**

Part I: Multiple Choice Questions (28 Questions, 70 Points Total):

- This part consists of 28 Multiple Choice Questions.
- Each question counts 2.5 points for a total of 70 points.
  - **Only answers on the computer answer sheet will be graded.**
  - **Use a pencil to mark your answers on the computer sheet.**

1. You are offered the choice between receiving two annuities. Each pays $200 per year for T years (assume both are equally risky). The first is an annuity due. The second is a regular annuity. If you are a rational investor, which would you chose (assume that interest rates are greater than zero)?

   A) The ordinary annuity
   B) The annuity due
   C) Either one, because they have the same present value.
   D) Without information on the interest rate, we do not have enough information to decide.
   E) Without information on T, we do not have enough information to decide.

2. As the interest rate increases, the difference in the present value of an annuity due versus an ordinary annuity (assuming payments and number of periods are the same)?

   A) Increases.
   B) Decreases.
   C) Insufficient information to tell.
   D) Stays the same.
   E) Depends on the relationship between the present value and the future value of the payments.

3. You are analyzing a potential investment. The investment is structured as follows: you pay a lump sum up front, and receive a series of payments of equal amounts in the future. Which of the following would make the investment more appealing. Assume that your discount rate is greater than zero and assume that in each case (a, b, c, and d) only the factors mentioned change, while all else remains constant.

   A) The discount rate increases but the payment pattern remains unchanged.
   B) The total amount of the cash flows (sum of all the cash flow) you receive remains the same, but the cash flows are paid out over a longer time period.
   C) The discount rate decreases, but the cost of the investment (the payment up front at t=0) remains unchanged.
   D) Statements a and b are correct.
   E) None of the above is correct.

4. You have just borrowed $20,000, which you will repay in 10 equal annual payments. The bank's stated rate on its loans is 9% (effective annual rate). Based on this information, how much principal will you repay in the 9th (i.e. the next to last) year of the loan?

A) $1,316.40
B) $2,365.69
C) $2,859.08
D) $2,623.01
E) None of the above

$$PMT = 20{,}000 \times \left(1 - \frac{1}{1.09^{10}}\right)^{-1} = \$3{,}116.402$$

$$Year8:\ \text{Outstanding Balance} = \frac{3116.402}{1.09} + \frac{3116.402}{1.09^2} = \$5{,}482.09$$

$$Year9: Interest = 0.09 \times 5482.09 = \$493.39$$

$$Year9: \text{Principal} = 3116.402 - 493.39 = \$2623.01$$

5. If its yield to maturity is less than its coupon rate, a bond will sell at a _____; and increases in market interest rates will _____.

A) discount (i.e., less than par value), decrease this discount.
B) discount (i.e., less than par value), increase this discount.
C) premium (i.e., greater than par value), decrease this premium.
D) premium (i.e., greater than par value), increase this premium.
E) none of the above.

6. The _____ the time to maturity for a bond, the _____ is its price change in response to a given change in interest rates.

A) Longer, Smaller
B) Longer, Greater.
C) The relationship between the time to maturity and price sensitivity of bonds depends on how stock prices change upon a change in interest rates.
D) The relationship between the time to maturity and price sensitivity of bonds depends on how the par value of the bond changes upon a change in interest rates.
E) There exists no relationship between time to maturity and price sensitivity of bonds.

7. Ten years ago a firm issued 30-year $1,000 face value bond at par. At that time, the market rate for such bonds was 9%. Today these bonds are yielding 8%. Coupon is paid annually. What is the price of these bonds today?

A) $ 1,098.18
B) $ 1,067.95
C) $ 1,000.00
D) $ 908.71
E) $ 656.36

$$Coupon = 9\% = \$90$$

$$\text{Price} = \frac{90}{0.08} \times \left(1 - \frac{1}{1.08^{20}}\right) + \frac{1000}{1.08^{20}} = \$1{,}098.18$$

8. Pern Corp. just paid an annual dividend of $2.00. Dividends are expected to grow at a constant rate forever. The price of the stock is currently $28.40. The required rate of return for this stock is 14 percent. What is the expected growth rate of Pern's dividend?

A) 6.5%
B) 6.96%
C) 7.48%
D) 8.37%
E) 19.66%

$$28.4 = \frac{2\times(1+g)}{0.14-g} \Rightarrow 28.40\times(0.14-g) = 2\times(1+g)$$

$$g = \frac{1.976}{30.40} = 0.065 = 6.5\%$$

9. A money manager is managing the account of a large investor. The investor holds the following stocks:

Stock	Amount Invested	w	Estimated Beta
A	$2,000,000	2/15	0.8
B	5,000,000	5/15	1.1
C	3,000,000	3/15	1.4
D	5,000,000	5/15	???

The portfolio's required rate of return is 17 percent. The risk-free rate is 7 percent and the return on the market is 14 percent. What is Stock D's estimated beta?

A) 1.256
B) 1.389
C) 1.429
D) 2.026
E) 2.154

$$CAPM \Rightarrow (0.17-0.07) = \beta_p \times (0.14-0.07)$$

$$\Rightarrow \beta_p = \frac{0.1}{0.07} = \frac{10}{7} = \frac{2\times0.8+5\times1.1+3\times1.4+5\times\beta_4}{15}$$

$$\Rightarrow \beta_4 = 2.026$$

10. All of the following are anticipated effects of a proposed project. Which of these should be included in the initial project cash flow related to net working capital?

I. an inventory decrease of $5,000

II. an increase in accounts receivable of $1,500

III. an increase in fixed assets of $7,600

IV. a decrease in accounts payable of $2,100

A) I and II only
B) I and III only
C) II and IV only
D) I, II, and IV only
E) I, II, III, and IV

11. An investment pays $2,000 every third year for 45 years (a total of 15 payments). Your opportunity cost is 8% compounded semi-annually. The present value of this investment is:

A) $7,317.16
B) $9,666.46
C) $13,323.85
D) $19,636.29
E) None of the above

$$\textit{Effective 3 year rate}: \; k = \left(1 + \frac{0.08}{2}\right)^{6} - 1 = 0.265319$$

$$PV_0 = \frac{2000}{0.265319} \times \left(1 - \frac{1}{1.265319^{15}}\right) = \$7317.16$$

12. A normal project which has a NPV greater than zero will also:

I. Have a payback period less than its life.
II. Have an IRR greater than the required return.
III. Have a profitability index (PI) greater than one.

A) I and III only
B) II and III only
C) I, II, and III
D) II only
E) None of the above

13. Which of the following statements is incorrect:

A) Usually each share of a corporation's stock entitles the holder to one vote per share on matters requiring a vote.
B) Unlimited life, easy transferability of ownership, limited liability; these are all typical characteristics of a corporation.
C) In a partnership there is usually a limited liability for the owners (i.e. the partners).
D) General partners are personally liable for obligations of the partnership.
E) Partnerships are not taxable; partners pay personal taxes on partnership profits.

14. Which of the following statements is correct?

A) A well-diversified portfolio diversifies essentially all market risk of a stock.
B) A well-diversified portfolio diversifies essentially all risk of a stock.
C) A well-diversified portfolio diversifies essentially all firm-specific risk of a stock.
D) A well-diversified portfolio guarantees that you will receive at least the risk-free rate.
E) A well-diversified portfolio maximizes the ratio of firm-specific risk to market risk.

15. A portfolio consists of two stocks (stock GGG and stock HHH) with the following characteristics:

	Stock GGG	Stock HHH
Share price	$40	$120
# of shares in portfolio	1200	600
Return	7%	11%
Standard deviation of returns	15%	25%
Correlation (GGG, HHH)	-0.6	

The total risk (as measured by the standard deviation) of the portfolio is closest to:

A) 12.4%
B) 16.2%
C) 14.4%
D) 21.0%
E) 19.2%

$$w_1 = \frac{40\times1200}{40\times1200+120\times600} = \frac{2}{5} = 0.4$$
$$w_2 = 1-0.4 = 0.6$$
$$\sigma_p^2 = 0.4^2\times0.15^2 + 0.6^2\times0.25^2 + 2\times0.4\times0.6\times(-0.6)\times0.15\times0.25$$
$$\sigma_p^2 = 0.0153 \Rightarrow \sigma_p = \sqrt{0.0153} = 0.1237 \approx 12.4\%$$

16. Stock U has a beta of 1.5, and stock V has a beta of 0.8. A portfolio consists of $3million invested in stock U and $2million invested in stock V. The risk-free rate is 2% and the market risk premium is 6%. Which of the following answers is correct:

A) Stock U must have the higher standard deviation of its returns than stock V.
B) Based on the CAPM, the required rate of return on stock V must be higher than the required rate of return on stock U.
C) The beta of the portfolio is less than 1.5 $0.8 < \beta_{port} < 1.5$
D) The portfolio's standard deviation will be higher than the standard deviation of stock U and also higher than the standard deviation of stock V.
E) None of the above answers is correct.

17. GrowthRUS purchased a corner lot five years ago at a cost of $640,000. The lot was recently appraised at $810,000. At the time of the purchase, the company spent $50,000 to grade the lot and another $4,000 to build a small building on the lot to house a parking lot attendant who has overseen the use of the lot for daily commuter parking. The company now wants to build a new retail store on the site. The building cost is estimated at $1.2 million. What amount should be used as the initial cash outflow (time zero cash flow) for this building project?

A) $1,200,000
B) $1,840,000
C) $1,890,000
D) $2,010,000
E) $2,060,000

-1.2-0.810 = -2.01 mil
: 2.01 mil outflow.

18. How many years (to the nearest half year) will it take for $X to triple with a stated interest rate of 9.6% (APR compounded monthly)?

A) 11 years.
B) 11.5 years.
C) 12 years.
D) 12.5 years.
E) Not enough information to answer

$$EAR = \left(1+\frac{0.096}{12}\right)^{12} - 1 = 10.0339\%$$

$$3x = x \times (1.100339)^n \Rightarrow 3 = (1.100339)^n$$

$$n = \ln(3) / \ln(1.100339) = 11.49\,years \approx 11.5\,years$$

19. Normal project A has an internal rate of return (IRR) of 15 percent. Normal project B has an IRR of 14 percent. Both projects have a cost of capital of 12 percent. Which of the following statements is most correct?

A) Both normal projects have a positive net present value (NPV).
B) Project A must have a higher NPV than Project B.
C) If the cost of capital were less than 12 percent, Project B would have a higher IRR than Project A.
D) Statements a and c are correct.
E) Statements a, b, and c are correct.

20. According to CAPM, if the expected return on asset 1, $E(r_1)$, is greater than the expected return on asset 2, $E(r_2)$, then:

A) r_1 must always be greater than r_2
B) σ_1 must be greater than σ_2
C) β_1 must be greater than β_2
D) A, B and C must be true
E) A, B and C are false

21. XYZ has recently purchased Class 10 equipment for $100,000 with a CCA rate of 30%. XYZ's tax rate is 40%. Under the half-year rule, what is the amount of depreciation that XYZ can claim as a tax-deductible expense in the second year?

A) $30,000
B) $15,000
C) $42,000
D) $25,500
E) $45,000

$$Year1: Depreciation = \frac{1}{2} \times 0.3 \times 100,000 = \$15,000$$

$$Year2: Depreciation = 0.3 \times (100,000 - 15,000) = \$25,500$$

22. A firm that uses its WACC as a cutoff without considering project risk:

I. Tends to become less risky over time.

II. Tends to accept negative NPV projects over time.

III. Likely will see its WACC rise over time.

A) II only
B) I and II only
C) I and III
D) II and III only
E) I, II, and III

23. If portfolio weights are positive: 1) Can the return on a portfolio ever be less than the smallest return on an individual security in the portfolio? 2) Can the variance of a portfolio ever be less than the smallest variance of an individual security in the portfolio.

A) 1) yes; 2) yes
B) 1) yes; 2) no
C) 1) no; 2) yes
D) 1) no; 2) no
E) 1) maybe; 2) no

24. Consider the following return distribution:

State	Probability	Return	$r_i - E(r_i)$	$\left[r_i - E(r_i)\right]^2 \times p_i$
Boom	0.15	0.4	0.295	0.01305375
Good	0.5	0.2	0.095	0.0045125
Recession	0.25	-0.1	-0.205	0.01050625
Depression	0.1	-0.3	-0.405	0.0164025

Calculate the standard deviation

A) 0.04448
B) 0.06428
C) 0.15687
D) 0.21089
E) 0.310912

$$E(r_i) = 0.15 \times 0.4 + 0.5 \times 0.2 - 0.1 \times 0.025 - 0.3 \times 0.1 = 10.5\%$$
$$\text{var} = \sum p_i \times \left[r_i - E(r_i)\right]^2 = 0.044475$$
$$\sigma = \sqrt{0.044475} = 0.21089$$

25. Assuming g will remain constant, the dividend yield is a good measure of the required return on a common stock under which of the following circumstances?

A) g > 0
B) g = 0
C) g < 0
D) Under no circumstance
E) Under all circumstance

Ret=Div. Yield + Capital gain
With constant growth, Capital gain = g
Therefor: Ret = Div. Yield if g=0

26. Toni's Tools is comparing machines to determine which one to purchase. The machines sell for differing prices, have differing operating costs, have differing machine lives, and will be replaced when worn out. These machines should be compared using:

A) net present value only.
B) internal rate of return.
C) their equivalent annual NPV.
D) the profitability index approach.
E) All of the above.

27. Jeff's Stereo Sound is expanding its product offerings to reach a wider range of customers. The expansion project includes increasing the floor inventory by $150,000 and increasing its debt to suppliers by 50% of that amount. The company will also spend $200,000 for a building contractor to expand the size of the showroom. As part of the expansion plan, the company will be offering credit to its customers and thus expects accounts receivable to rise by $25,000. For the project analysis, what amount should be used as the initial cash flow for net working capital?

A) $75,000
B) $100,000
C) $125,000
D) $150,000
E) $175,000

$$NWC = \Delta Inventory + \Delta AR - \Delta AP$$
$$= \$150,000 + 25,000 - 0.5 \times 150,000$$
$$= \$100,000$$

28. According to the semi-strong form of the EMH, investors who invest in a stock after a highly positive announcement concerning the stock can expect to earn a(n)_____

A) normal return because the stock will be fairly priced when purchased.
B) extraordinary return because the new information will not affect the price until later.
C) loss because things often are not what they seem.
D) zero return because the next price is expected to be the same as the last price.
E) EMH does not have any prediction regarding the above situation.

Part II: Problems (30 Points Total)

- Answer on this document, in the space provided. Use the back of the sheet if you need additional space. Label it clearly. Any work on the back of the sheet, which is not labeled clearly, will not be graded.

Q1. **(11 Points) Time Value Mechanics:** This question has two parts. Part (a) is Time Value of Money. Part (b) is equity valuation. Information from part (a) should not be used in part (b)

Q1 Part a) (5 Points) Time value of Money

It is August 31, 2012. Dana wants to become a paralegal and she has enrolled in an online training program with Thomson Education Direct. She is reading a letter from Thomson, which outlines her payment options. She can either pay $821.95 on September 1, 2012 or she could choose a payment plan consisting of 17 equal payments of $56.29 at the end of every month starting on September 30, 2012 (and continuing until January 31, 2014). She has a credit card with a 15% APR (compounded monthly). Should she call Thomson tomorrow and put the entire $821.95 on her credit card? Why or why not?

$$EMR = \frac{APR}{m} = \frac{15\%}{12} = 1.25\%$$

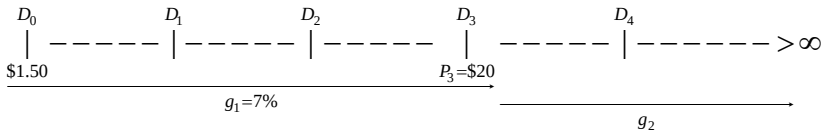
$$PV_{payment\ plan} = \frac{56.29}{0.0125} \times \left(1 - \frac{1}{1.0125^{17}}\right) = \$857.29 > \$821.95$$

$\therefore$ Choose the credit card

------- 2 Point for getting EMR correct
------- 2 Points for getting the correct comparison
------- 1 Point for correct decision

(6 Points) Equity valuation This part has two related sub parts (i) and (ii)
The stocks of Wonka Inc. are expected to sell for $20 per share three years from now. Wonka has just paid a dividend of $1.50 per share and the dividends are expected to grow at a rate of 7% per year for the next three years and at a certain constant rate afterwards.
Assuming the required rate of return is 15%:

i) (3 Points) What is the expected constant growth rate beginning in year 4? What is the dividend yield in year 3?



$k = 0.15$

$D_4 = D_0 \times 1.07^3 \times (1+g_2) = 1.83756 \times (1+g_2)$ ---- 1 Point for getting D4 correct

$P_3 = \frac{D_4}{k-g_2} = \frac{1.83756 \times (1+g_2)}{0.15-g_2} = \$20$ ----- 1 Point for setting up the price correctly

$\therefore 1.83756 \times (1+g_2) = 20 \times (0.15-g_2)$

$g_2 = 0.05323 = 5.32\%$ ---------- 0.5 Point for getting g2 correct

Dividend Yield = k - g2 = 0.15-0.0532 = 9.69% ---- 0.5 points

ii) (3 Points) What is the current price for Wonka stock?

$$P_0 = \frac{P_3}{(1+k)^3} + \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3}$$

---- 1 point for correctly discounting P3

$$P_0 = \frac{P_3}{(1+k)^3} + \frac{D_1}{k-g_1}\left(1-\left(\frac{1+g_1}{1+k}\right)^3\right)$$

---- 1 point for discounting D1, D2, D3 correctly

$$= \frac{20}{1.15^3} + \frac{1.5\times1.07}{0.15-0.07}\left(1-\left(\frac{1.07}{1.15}\right)^3\right) = \$17.05$$

---- 1 Point for getting final answer correct.

Q2. (6 Points)

Mature Industries (MI) Inc. has the following financing outstanding:

- 40,000 bonds with 7% coupon (annually paid), face value = $1,000, price = 100% (Bonds price quoted as a percentage of the face value), 10 years maturity
- 100,000 zero coupon bonds, Face Value = $1,000, price = 50%, maturity = 15 years
- 2,000,000 shares of common stock, price = $50, beta = 1.25

Additional information: Tax rate = 30%, Return on the market = 9%, risk-free rate = 3%

Calculate the Company's:

(a) Cost of coupon debt (b) Cost of zero coupon debt (c) cost of equity
(d) WACC.

Coupon Bond:

Price = 100% of the face value = $1000
Bond trading at par ➔ Yield = 7%
Cost of coupon debt = 7%
Cost of coupon debt (after tax) = 0.07*(1-0.3) = 4.9%

---1 Point for getting either pre or after tax cost of debt

Zero Coupon Bond:

Price = 50% of the face value = $500

$$P_0 = \frac{FV}{(1+YTM)^{15}} \quad \Rightarrow 500 = \frac{1000}{(1+YTM)^{15}} \quad \Rightarrow (1+YTM)^{15} = 2$$

$$YTM = 2^{\frac{1}{15}} - 1 = 0.04729 = 4.729\%$$

Cost of zero coupon debt = 4.729%
Cost of zero coupon debt (after tax) = 0.04729*(1-0.3)=0.033103 = 3.3103%

---1 Point for getting either pre or after tax cost of debt

Equity:

$$CAPM: k_e = RF + \beta_e \times (ER_m - RF)$$

$$k_e = 0.03 + 1.25 \times (0.09 - 0.03) = 0.105 = 10.5\%$$

---1 Point for getting cost of equity correct.

Weights:

$$V = 40,000 \times 1,000 + 100,000 \times 500 + 2,000,000 \times 50 = \$190,000,000$$

$$w_{CouponDebt} = \frac{40,000 \times 1,000}{190,000,000} = \frac{4}{19}$$

$$w_{ZeroDebt} = \frac{100,000 \times 500}{190,000,000} = \frac{5}{19}$$

$$w_{Equity} = \frac{2,000,000 \times 50}{190,000,000} = \frac{10}{19}$$

---1 Point for getting all the weights correct. Deduct 0.5 for one mistake. Deduct 1 point for two mistakes.

WACC:

$$WACC = \frac{4}{19} \times 0.049 + \frac{5}{19} \times 0.033103 + \frac{10}{19} \times 0.105 = 0.07429 = 7.429\%$$

- 1 Point for after tax cost of coupon bond
- 1 point for after tax cost of zero debt
- If WACC formulae is incorrect, deduct 2 points

Q3. (7 Points)

Important: when drawing payoff or profit diagrams, you need to show the location of each important point on the diagram by writing down the relevant numbers next to each point (i.e. indicate intersections with the horizontal and vertical axes and any points where the payoff/profit function changes abruptly).

Given the premium for a $40-Strike 3 month Call option on a stock currently selling for $40 is $2.78, and the premium for a $45-Strike 3 month Call option on the same stock is $0.97. The risk free interest rate is 8.33% annual effective. An investor constructs the following portfolio:

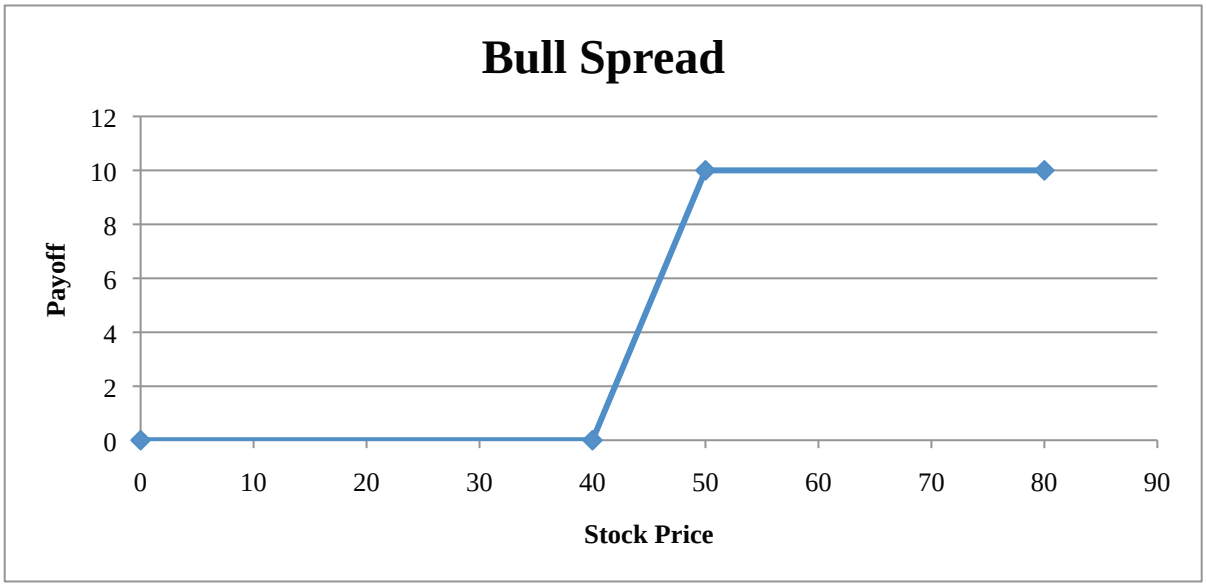
- Long a European Call option with a strike price of $40.00.
- Short a European Call option with a strike price of $50.00

This trading strategy is known as a Bull Spread.

a) (5 Points) Draw the payoff diagram for the above bull spread.

Payoff Matrix:

Stock price	0	40	50	60
Long Call 40	0	0	10	20
Short Call 50	0	0	0	-10
Portfolio payoff:	0	0	10	10



-- 0.5 for correct label on x-axis
-- 0.5 for correct label on y-axis
-- 1 Point for correctly identifying $40 --payoff turns up (above zero)
-- 1 point for correctly identifying $50 -- payoff attains maximum
-- 1 point for identifying $10 as the maximum payoff
-- 1 point for getting the final picture perfectly correct.

b) (2 Point) Assuming that the Put-Call parity holds. What is the implied premium for a $40-Strike 3 month Put option on the above stock?

$$Put\ Call\ Parity: \quad P + S = C + PV(X)$$
$$P = ? \quad S = \$40 \quad C = \$2.78 \quad X = \$40$$
$$k = 8.33\%\ EAR$$

$$Effective\ 3\ Month\ rate = (1 + 0.0833)^{\frac{1}{4}} - 1 = 2.0204\%$$

$$P = 2.78 - 40 + \frac{40}{1.020204} = \$1.9878 \approx \$1.99$$

--- 1 point for using correct interest rate for getting PV(X)
--- 1 point for getting the Put premium correct.

Q4. (6 Points) Short Answers:

a) (2 Points) True/False/Uncertain? (Justify your answer with a one-sentence explanation) According to CAPM, an asset with a beta below one has a total risk greater than the market portfolio.

FALSE -- 1 Point for True/False
Total risk = Systematic risk + Firm specific risk
= Beta risk + Firm specific risk
Market beta is equal to one. Therefore, An asset with beta less than 1 will have lower systematic risk than the market. However, we do not know anything about the Firm specific risk.

-- 1 Point for getting the reason correct

b) (2 Points) You are a risk-averse investor who is considering investing in one of two economies. The expected return and volatility of all stocks in both economies is the same. In the first economy, all stocks move together – all stocks move up in good time and move down in bad times. In the second economy, stock returns are independent – change in one stock's price has no effect on the change in another stock's price. Which economy should you choose to invest in? (Assume that good and bad times are random events, which cannot be forecasted).

As a risk-averse investor, I will choose the second economy.
The independence of the asset returns would allow diversification of firm specific risk through portfolio formation in economy two.
In economy one, the two asset returns are perfectly positively correlated (correlation = 1) and therefor, there will be no diversification benefits from portfolio formation.

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--- 1 Point for correct decision (choose second economy)
--- 1 point for correct reasoning.
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c) (2 Points) The law strictly forbids insider trading. There has been regular prosecution against individuals who have traded with insider information about their own firms. What implication does this information have for strong-form efficiency in the market? Explain briefly.

Most likely, markets cannot be strong form efficient.
In order for the stock price to include insider information, the information has to enter the market. The most obvious route for this is through trading. If insider trading is strictly forbidden, this route is closed.

However, it is also possible that the market might still be less then perfectly strong form efficient. This could be a result of investors being able to correctly anticipate the insider information and trade on the basis of that anticipation. These trades will move the prices to reflect the anticipation and thereby making the market somewhat strong form efficient.

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-- Award 1 point if arguing in the right direction.
-- award full point if answer is reasonably well argued.
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Equation List - Comm 308 - Booth-Cleary Text

5.3	Present Value of FV_n : $PV_0 = \frac{FV_n}{(1+k)^n}$
5.4	Future value of an annuity: $FV_n = \frac{PMT}{k}\left[(1+k)^n - 1\right]$
5.5	Present Value of an annuity: $PV_n = \frac{PMT}{k}\left[1 - \frac{1}{(1+k)^n}\right]$
5.8	Present value of perpetuity: $PV_0 = \frac{PMT}{k}$
5.10	Effective rate with continuous compounding: $k = e^{QR} - 1$
5.11	Effective rate: $k = \left(1 + \frac{QR}{m}\right)^{\frac{m}{f}} - 1$
5A-2	Present value of growing perpetuity: $PV_0 = \frac{PMT_0(1+g)}{k-g} = \frac{PMT_1}{k-g}$
5A-4	Present value of growing annuity: $PV_0 = \frac{PMT_1}{k-g}\left[1 - \left(\frac{1+g}{1+k}\right)^n\right]$
6.3	Current Yield: $CY = \frac{Annual\ Interest}{B}$
6.6	Price of T-Bill given BEY: $P = \frac{F}{\left(1 + k_{BEY} \times \frac{n}{365}\right)}$
7.10	Share price with growth opportunities: $P_0 = \frac{EPS_1}{k_c} + PVGO$
7.11	Growth rate: $g = b * ROE$
8.3	Total return = Income yield + Capital gain (loss) yield = $\frac{CF_1}{P_0} + \frac{P_1 - P_0}{P_0}$
8.5	Geometric average (GM) $= \left[(1+r_1)(1+r_2)(1+r_3)\times(1+r_n)\right]^{1/n} - 1 = \left(\prod_{i=1}^{n}(1+r_i)\right)^{\frac{1}{n}} - 1$
8.6	Expected return: $ER = \sum_{i=1}^{n}\left(r_i * \text{Prob}_i\right)$
8.7	Ex-post $\sigma = \sqrt{\frac{\sum_{i=1}^{n}\left(r_i - \bar{r}\right)^2}{n-1}}$
8.8	Ex-ante $\sigma = \sqrt{\sum_{i=1}^{n}\left(\text{Prob}_i\right)\left(r_i - ER\right)^2}$
8.9	Expected portfolio return: $ER_p = \sum_{i=1}^{n}\left(w_i * ER_i\right)$
8.11	Portfolio standard deviation: $\sigma_P = \sqrt{\left(w_A\right)^2\left(\sigma_A\right)^2 + \left(w_B\right)^2\left(\sigma_B\right)^2 + 2\left(w_A\right)\left(w_B\right)\left(COV_{A,B}\right)}$
8.12	$COV_{A,B} = \sum_{i=1}^{n}\text{Prob}_i(r_{A,i} - \bar{r_a})(r_{B,i} - \bar{r_b})$

8.14	$COV_{AB} = \rho_{AB}\sigma_A\sigma_B$
8.16	If $\rho_{AB} = -1$, then: $\sigma_P = w\sigma_A - (1-w)\sigma_B$
9.3	$E(R_P) = RF + \left(\frac{E(R_A) - RF}{\sigma_A}\right)\sigma_P$
9.4	Slope of CML $= \frac{ER_M - RF}{\sigma_M}$
9.6	Sharpe Ratio $= \frac{ER_P - RF}{\sigma_P}$
9.7	$\beta_i = \frac{Cov_{i,M}}{\sigma_M^2} = \frac{\rho_{i,M}\sigma_i}{\sigma_M}$
9.8	$\beta_P = w_A\beta_A + w_B\beta_B + \ldots + w_n\beta_n$
9.9	$k_i = RF + (ER_M - RF)\beta_i$
12.2	*Option* Premium = $IV + TV$
12.5	Put Call Parity: $P + S = C + PV(X)$
13.1	$NPV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + .. + \frac{CF_n}{(1+k)^n} - CF_0 = \sum_{t=1}^{n}\frac{CF_t}{(1+k)^t} - CF_0$
13.3	$PI = \frac{PV(Cash \text{ inflows})}{PV(Cash \text{ outflows})}$
14.1	$CF_0 = C_0 + \Delta NWC_0 + OC$
14.2	$CF_t = CFBT_t(1-T) + CCA_t(T)$
14.4	$ECF_n = SV_n + \Delta NWC_n$
14.5	$NPV = PV(CF_t) + PV(ECF_n) - CF_0$
14.6	$PV(Operating\ Cash\ Flows) = \frac{CFBT(1-T)}{k}\left[1 - \frac{1}{(1+k)^n}\right]$
14.7	$PV(CCA\ Tax\ Shield) = \frac{(C_0)(d)(T)}{d+k} * \frac{(1+0.5k)}{(1+k)} - \frac{(SV_n)(d)(T)}{d+k} * \frac{1}{(1+k)^n}$
20.8	Cost of Capital: $K_a = \frac{ROI \times IC}{V} = \frac{K_e S + K_d(1-T)D}{V} = K_e\frac{S}{V} + K_d(1-T)\frac{D}{V}$
20.9	$WACC = K_e\frac{S}{V} + K_p\frac{P}{V} + K_i\frac{D}{V}$, Where: $K_i = K_d(1-T)$
20.10	Market value: $S = P_0 \times n$
20.13	Net proceeds: $NP = \frac{I(1-T)}{K_i}\left[1 - \frac{1}{(1+K_i)^n}\right] + F\left(\frac{1}{(1+K_i)^n}\right)$
20.14	Cost of preferred shares: $K_p = D_p \Big/ NP$
20.17	$K_{ne} = \frac{D_1}{NP} + g$
20.21	$K_e = \frac{D_1}{P_0} + g = \frac{X_1(1-b)}{P_0} + b * ROE$
20.27	Cost of new equity: $K_{ne} = K_e * \frac{P_0}{NP}$