

COURSE FINANCE	NUMBER COMM308/2	SECTIONS C and D	
EXAMINATION 2 nd Midterm Exam Version: White	DATE November, 2014	TIME 2 Hours	# OF PAGES 10 + Cover + Crib
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MATERIALS ALLOWED: YES, Translation Dictionaries. Crib Sheet Included

CALCULATORS ALLOWED: YES. Non-programmable

SPECIAL INSTRUCTIONS

-**PRINT** your Name and I.D. #, on this exam cover page. All responses must be recorded on the exam itself. There is no separate answer sheet.

-Excluding this cover sheet, this exam contains 10 pages.
A 2-page crib sheet is provided separately.

-Please ensure that there are no pages missing.

-For each multiple choice question, provide **ONLY ONE** answer.

-There is no negative marking (you may/should guess the correct answer).

-Part I is made up of 18 multiple choice questions that are worth 2 marks each. No work is required in Part I and no marks are awarded for incorrect multiple choice answers. Part II contains 3 questions worth a total of 14 marks. Part III contains 3 questions worth a total of 10 marks. Work must be shown in the space provided to receive marks for these last two parts.

Name _____ *Solutions* _____

ID# _____

Please Do Not Write Anything Below

Part I Total Marks _____ /36

Part II Total Marks _____ /14

Part III Total Marks _____ /10

Grand Total _____ /60

PART I Multiple Choice:

Circle the correct response. Pencil is advisable. No marks will be awarded if either no letter is circled or if more than one letter is circled. It is NOT necessary to show work in this part of the exam. Each question is worth 2 marks.

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1. Identify the CORRECT statement(s).
- I. If markets are perfectly efficient and one searches hard enough, positive NPV investments can still be found.
II. Strong form efficiency refers mainly to the importance of public information.
III. Competition among investors increases market efficiency.
IV. If a market is semistrong form efficient, there is no value in having inside information.
- a. II only.
b. I and III only.
c. III only. *
d. III and IV.
e. I, II and III only.
- 14
2. During the technology stock market bubble in the late 90s many people were able to systematically make money by resorting to "day trading". They identified stocks that went up in price the day before, bought those in the morning and sold them at the end of the trading day. Which form of market efficiency was violated?
- a. Strong form
b. Semi-strong form
c. Weak form*
d. Semi-weak form
e. Semi-efficient form
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3. Which of the following is likely to be associated with the highest level of total risk?
- a. Long-term corporate bonds
b. Canadian Treasury bills
c. Long-term government bonds
d. Common stock of the smallest companies listed on the Toronto Stock Exchange *
e. Common stock of the largest companies listed on the Toronto Stock Exchange

4. The government has been trying to decide whether or not to purchase for its own use any of the new, advanced missiles it has developed. One argument in favour of purchasing the missiles is that since so much money has been spent on development, it would be a waste of money not to buy them now. What is the major problem with this argument?

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- a. It includes erosion costs in the decision-making process
- b. It includes sunk costs in the decision-making process *
- c. It includes opportunity costs in the decision-making process
- d. It includes net working capital changes in the decision-making process
- e. It includes financing costs in the decision-making process

5. On December 27, 2001 CEO Martha Stewart sold 3,928 shares of ImClone Systems for \$60. On Dec. 28, 2001 the Federal Drug Administration announced its decision not to approve a new cancer drug proposed by ImClone. On December 31 – the first trading day after the announcement, ImClone fell 18%. Which form of market efficiency was violated?

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- a. Strong form *
- b. Semi-strong form
- c. Weak form
- d. Semi-weak form
- e. Semi-efficient form

6. The principle of diversification tells us that:

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- a. Concentrating an investment in two or three large stocks will reduce your overall risk.
- b. Concentrating an investment in two or three large stocks will eliminate all of your risk.
- c. Spreading an investment across many diverse assets will eliminate some of the risk. *
- d. Spreading an investment across many diverse assets cannot (in an efficient market) eliminate any risk.
- e. Spreading an investment across many diverse assets will eliminate all of the risk.

7. You are evaluating two mutually exclusive projects, A and B. Project A costs \$350 and has cash flows of \$250 in each of the next 2 years. Project B costs \$300 and generates cash flows of \$300 and \$100 for the next 2 years, respectively. What is the crossover rate for these projects?

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- a. 27.47%
- b. 83.48%
- c. 61.80%
- d. 26.38%
- e. 30.28% *

$$NPV_A - NPV_B = 0$$

$$CF_0 \quad -50$$

$$CF_1 \quad -50$$

$$CF_2 \quad 150$$

$$IRR \quad CPT = 30.278\%$$

8. Use the following information to answer the next question. You invest in a portfolio of assets A and B as follows.

Asset	Investment	Expected return over next period
A	\$10,000	20%
B	\$15,000	15%

What is the expected return for the period for a portfolio of assets made up of A and B?

- a. 17.5%
 b. 17.0% *
 c. 16.5%
 d. 16.0%
 e. 15.0%

$$E(R_p) = \left(\frac{10,000}{25,000}\right)(.2) + \left(\frac{15,000}{25,000}\right)(.15) = 0.17$$

9. You have done a thorough study of the economy and Stock X and have concluded: (1) the probability of having a boom next year is 20 percent, a stable economy is 55 percent, and a recession is 25 percent, and (2) the price of Stock X will be \$90 if there is a boom, \$50 if the economy is stable, and \$30 if there is a recession. What is the expected return on Stock X if it is currently selling for \$48?

- a. -9.43%
 b. 10.42% *
 c. 18.06%
 d. 26.50%
 e. 28.50%

$$\text{Expected Price} = (.2)(90) + (.55)(50) + (.25)(30) = 53$$

$$E(R_x) = \frac{53 - 48}{48} = 10.4167\%$$

10. What is the portfolio beta if 40% of your funds are invested in the market portfolio, 30% in an asset that is three times as volatile as the market portfolio, and the remainder is invested in a risk-free asset?

- a. 0.25.
 b. 0.50.
 c. 0.75.
 d. 1.00.
 e. 1.30. *

$$\beta_p = (.4)(1) + (.3)(3) + (.3)(0) = 1.30$$

11. Calculate the standard deviation for a stock with the following returns:

4.3%, 3.2%, 5.6%, 10.5% and -7.6% (this last return is negative).

- a. 2.48%
- b. 3.02%
- c. 4.89%
- d. 5.15%
- e. 6.65% *

Use financial calculator functions DATA, STAT to find $S_x = 6.65\%$

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12. The WahRak Corporation is considering acquiring a new machine for its plant in Brossard. The company has provided you with the following information:

Cost of the machine: \$80,000
 Economic useful life: 4 years
 Reduction in annual operating costs: \$55,000 before taxes

If the cost of the machine is to be depreciated straight-line to a salvage value of zero, what is the net cash flow in each of the four years? Assume a tax rate of 34%.

- a. \$36,300
- b. \$43,100 *
- c. \$44,800
- d. \$61,800
- e. \$83,500

$$CF = (55,000)(1 - .34) + (.34)(20,000) = \$43,100$$

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13. You are considering the following projects but have limited funds to invest and so cannot accept them all. Using the profitability index, rank the projects in the order in which you would accept them. That is, rank them from best to worst.

Project	Initial Investment	NPV	PV(CF)	PI
A	\$100,000	\$30,000	130,000	$130,000 / 100,000 = 1.3000$ ③
B	\$80,000	\$25,000	105,000	$105,000 / 80,000 = 1.3125$ ②
C	\$40,000	\$17,000	57,000	$57,000 / 40,000 = 1.4250$ ①

- a. C, A, B
- b. A, C, B
- c. A, B, C
- d. C, B, A *
- e. B, C, A

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14. The Leibniz Corporation is in a 35% tax bracket. If it invests in capital assets that increase its depreciation by \$500,000 per year, its cash flow will

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- a. Be unchanged
- b. Decrease by \$175,000
- c. Decrease by \$500,000
- d. Increase by \$325,000
- e. Increase by \$175,000*

Increase by $500,000 (1 - 0.35) = 175,000$

15. Prof. Heron has \$12,500 to invest. The expected return on the market portfolio is 12% with a standard deviation of 15%. What are the expected return and standard deviation for his portfolio if he borrows an additional \$2,500 at the risk free rate of 3 percent and invests everything in the market portfolio?

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- a. 15%, 18%
- b. 13.8%, 18% *
- c. 18%, 13.8%
- d. 15%, 15%
- e. None of the above

Borrowing is a negative investment. Therefore it should have a negative weight. Let x_2 be the weight in the risk free security.

$$x_2 = \frac{-2,500}{12,500} = -0.2$$

Weights add up to 1. $\Rightarrow 1 = x_1 + (-0.2) \Rightarrow \boxed{x_1 = 1.2}$

$$E(R_p) = (1.2 \times 12) - (0.2 \times 0.03) = 13.8\%$$

$$\sigma_p = \sqrt{(1.2)^2 (15)^2} = 18\%$$

16. The MWIR Corporation is expanding its product offerings to reach a wider range of customers. The expansion project includes increasing the floor inventory by \$300,000 and increasing its debt to suppliers by 40% of that amount. The company will also spend \$400,000 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 \$75,000. For this project analysis, what amount should be used as the initial cash flow for net working capital?

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- a. -\$655,000
- b. +\$655,000
- c. -\$105,000
- d. -\$255,000*
- e. None of the above

$$\Delta NWC = 300,000 - (4 \times 300,000) + 75,000 = -255,000 \uparrow$$

Therefore the initial CF is $= -255,000$

17. Danielle has constructed a portfolio of two stocks (A & B). The expected return of her portfolio is 21.5%. The total value of her portfolio is \$240,000 and \$96,000 of it is in stock B. The risk-free rate is 4.45% and the market risk premium is 8.05%. The beta of stock B is 1.75. Assume all stocks are fairly priced; find the expected return of stock A.

- a. 2.962%
 b. 18.538%
 c. 23.475% *
 d. 25.944%
 e. Since the Beta of stock A is not provided, its expected return cannot be determined.

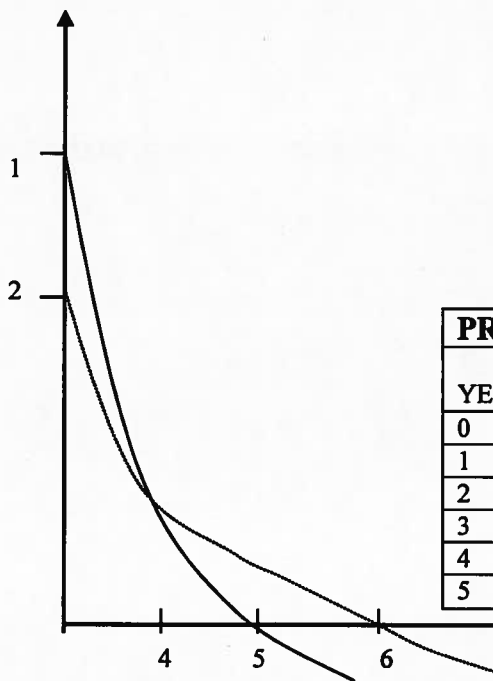
$$E(R_B) = 0.0445 + 1.75 [0.0805] = 0.185375$$

$$0.215 = \left(\frac{144,000}{240,000}\right)E(R_A) + \left(\frac{96,000}{240,000}\right)(0.185375)$$

Solve to find $E(R_A) = 0.23475$

18. Consider the following two mutually exclusive projects which are graphed below.

NET PRESENT VALUE



PROJECT A				
YEAR	NET CASH FLOW	DISCOUNTED AT		
		8%	11.93%	18%
0	-\$80,000			
1	+ 5,000	\$4,630	\$4,467	\$4,237
2	+ 4,500	\$3,858	\$3,592	\$3,232
3	+ 5,500	\$4,366	\$3,922	\$3,347
4	+ 4,000	\$2,940	\$2,548	\$2,063
5	+ 115,000	\$78,267	\$65,458	\$50,268

+ \$4,000 = Point 1 on graph

PROJECT B				
YEAR	NET CASH FLOW	DISCOUNTED AT		
		8%	12.81%	21%
0	-\$80,000			
1	+ 10,000	\$9,259	\$8,864	\$8,264
2	+ 9,000	\$7,716	\$7,072	\$6,147
3	+ 11,000	\$8,732	\$7,662	\$6,209
4	+ 8,000	\$5,880	\$4,940	\$3,732
5	+ 94,000	\$63,975	\$51,451	\$36,241

+ \$2,000 = Point 2 on graph

DISCOUNT RATE

The discount rate that point 5 on the graph equals is:

- a. 8%
 b. 11.93% *
 c. 12.81%
 d. 18%
 e. 21%

Point 5 represents the IRR for Project A

At $k = 11.93\%$ from spreadsheet

$$04,467 + 03,592 + 03,922 + 02,548 + 065,458 - 80,000 \approx 0$$

PART II Problems (Show all your work) Work must be shown to receive marks. (14 marks total)

1. A proposed investment in a new asset has an installed cost of \$400,000. It has a 30% CCA rate that is calculated on a declining balance basis. The asset has an expected life of five years, after which it will have no salvage value. There are no working capital consequences from the investment and the pool remains open after the asset is sold. The tax rate is 40% and the required rate of return is 16%. The asset is expected to provide constant pre-tax operating cash flows (excluding depreciation) of \$180,000 per annum over its five-year life. What is the expected NPV of the project? Assume that the half-year rule applies. (5 marks)

Solution:

$$NPV = 180,000(1 - .4)PVA_{16\%,5} + \left[\frac{400,000 \times .3 \times .4}{.16 + .3} \right] \left[\frac{1.08}{1.16} \right] - 400,000$$

$$= \$50,775.14$$

2. Analysts predict that the price of Cauchy stock will increase to \$25 by the end of the year from its current level of \$23 per share. Cauchy stock returns have a standard deviation of 0.40 (40%) while the variance of the return on the market portfolio is 0.04. The risk-free rate equals 3% and the expected return on the market is 12%. If the covariance between the returns on the market portfolio and Cauchy stock is 0.02, is Cauchy stock overpriced? Underpriced? By how much is it overpriced/underpriced? (5 marks)

Solution:

$$\beta = \frac{0.02}{0.04} = 0.5 \text{ and according to CAPM: } E(R_{Cauchy}) = 0.03 + 0.5[0.12 - 0.03] = 0.075$$

$$\text{But the expected return on the stock is: } \frac{25 - 23}{23} = 0.08696$$

The expected return is too high (compared to the required return) which implies that the stock is underpriced. Find the correct price by solving:

$$\frac{25 - P_0}{P_0} = 0.075 \text{ . We get: } P_0 = \$23.26 \text{ . Therefore the stock is currently underpriced by}$$

$$\$23.26 - \$23.00 = \$0.26$$

3. Suppose you observe the following situation:

<u>Security</u>	<u>Beta</u>	<u>Expected Return</u>
MW Corp.	1.30	14.9%
IR Corp.	.80	10.4%

Assume that these securities are correctly priced. Based on the CAPM, what is the expected return on the market? What is the risk-free rate? (4 marks)

Solution: According to the CAPM, all correctly priced securities should fall on the SML. Set up the equation for each security and solve simultaneously.

$$0.149 = R_f + 1.30 [E(R_m) - R_f]$$

$$0.104 = R_f + 0.80 [E(R_m) - R_f]$$

You should find:

$$R_f = 3.2\%, E(R_m) = 12.2\%$$

PART III (Short Theory questions) (10 marks total)

1. State two weaknesses usually associated with the IRR method. Be brief and to the point. (4 marks)

Solution:

For non – conventional projects, it may result in i) multiple IRRs; ii) No IRR
iii) Assumes that intermediate cash flows will be reinvested at the same IRR; iv) Ranking of mutually exclusive project may lead to a conflict with NPV; v) Interpretation may be reversed in borrowing vs. lending type projects; vi) Problems may arise because the scale of the project is not considered

2. Why isn't the risk of a portfolio just a weighted average of the risks of the assets in the portfolio? Answer in three lines or less. (3 marks)

Solution:

Because we have to take the correlation or covariance between stocks into consideration. The only instances when it would be a weighted average measure is when $\rho = +1$ or -1 .

3. What does the second term in the PV (CCA Tax Shield) formula represent? Answer in two lines or less. (3 marks)

Solution:

It represents the PV of tax shield (savings) on CCA beyond the EUL of the asset which is lost because the SV must be written off the asset pool (class)