Carleton UNIVERSITY

FINAL EXAMINATION

Fall 2012

Student Last Name: _____

Student First Name: _____

Student Number:_____

DURATION: 3 HOURS **No. of Students: 320**
Department Name & Course Number: BUSI 2504 **Section: C, D, E, F**
Course Instructor(s) : Yuriy Zabolotnyuk

AUTHORIZED MEMORANDA

Calculator
Hand-written notes on one side of 8.5" x 11" sheet

Students MUST count the number of pages in this examination question paper before beginning to write, and report any discrepancy to a proctor.
This question paper has XXX pages.

This examination question paper may not be taken from the examination room.

In addition to this question paper, students require: an examination booklet yes
Scantron sheet yes

		Received
Multiple choice questions (50 marks):	1 - 25 – 50 marks	_____
Problems (50 marks):	Q1 –XX marks	_____
	Q2 –XX marks	_____
	Q3 –XX marks	_____
	Q4 –XX marks	_____
	Total – 100 marks	_____

Do ALL 25 multiple choice problems: 2 marks per question for a total of 50 marks.

1. The stock of Uncle Fred's has a beta a 1.23 and an expected return of 13.42 percent. The risk-free rate of return is 3.8 percent. What is the expected return on the market?
   A) 9.87 percent
   B) 10.04 percent
   C) 10.67 percent
   D) 11.23 percent
   E) 11.62 percent

2. Which of the following would be considered an example of systematic risk?

   A) News that Canadian GDP growth is lower than expected
   B) Quarterly profit for Petro Canada equals expectations
   C) Lower quarterly sales for Chapters than expected
   D) Legalization of marijuana in BC
   E) All of the above

3. What is the beta of a portfolio comprised of the following securities?

Stock	Amount Invested	Beta
A	$6,480	1.03
B	$2,920	1.73
C	$5,160	0.87

   A) .86
   B) .97
   C) 1.02
   D) 1.11
   E) 1.22

4. Which one of the following statements is correct?
   A) A beta of 1.2 indicates that a security has less risk than the overall market.
   B) Risk-free asset has a beta of zero.
   C) A stock with a beta of 1.4 has less systematic risk than a stock with a beta of .9.
   D) The risk premium associated with a stock will decrease as the beta of the stock increases.
   E) The beta of a diversified portfolio will approach zero as the number of stocks in the portfolio is increased.

5. Six Days, Inc., has a 7 percent, semi-annual coupon bond with a current market price of $1,010.40. The bond has a par value of $1,000 and a yield to maturity of 6.87 percent. How many years is it until this bond matures?
   A) 10.67 years
   B) 11.81 years
   C) 15.98 years
   D) 22.07 years
   E) 23.62 years

6. UFC, Inc. has a 20-year bond issue outstanding that pays a 7.5 percent coupon. The bond's quoted price is 98.75 and it has a par value of $1,000. Interest is paid semi-annually. What is the yield to maturity?
   A) 7.43 percent
   B) 7.59 percent
   C) 7.62 percent
   D) 37.97 percent
   E) 75.95 percent

7. Joe's Equipment needs $225,000 today to purchase some new equipment. They are planning on issuing 10-year bonds with a $1,000 face value, 6% coupon rate and *semi-annual* interest payments. The current market rate of interest is 6.5%. How many bonds must Joe's Equipment sell to raise the money they need?
   A) 216
   B) 225
   C) 226
   D) 231
   E) 234

8. This morning Peter purchased a 15-year, $1,000 face value zero coupon bond for $394.34. Assume the yield-to-maturity remains constant over the life of the bond. What price should Peter receive for his bond if he wants to sell it 4 years from today?
   A) $505.40
   B) $515.60
   C) $544.44
   D) $555.85
   E) $561.33

9. A given rate is quoted as 8% APR, but has an EAR of 8.24%. What is the rate of compounding during the year?
   A) Annually
   B) Semiannually
   C) Quarterly
   D) Monthly
   E) Continuously

10. Peter is considering a project with an initial cost of $42,000 and annual cash inflows of $9,100 a year for six years. What discount rate, when applied to this project, will produce a profitability index of 1.0?
    A) 7.00%
    B) 7.65%
    C) 7.88%
    D) 8.05%
    E) 8.11%

11. You would like to invest in the following project.

Year	Cash Flow
0	-$55,000
1	$30,000
2	$37,000

Victoria, your boss, insists that only projects that can return *at least* $1.10 in today's dollars for every $1 invested can be accepted. She also insists on applying a 10 percent discount rate to all cash flows. Based on these criteria, you should:

A) accept the project because it returns almost $1.22 for every $1 invested.
B) accept the project because it has a positive PI.
C) accept the project because the NPV is $2,851.
D) reject the project because the PI is 1.05.
E) reject the project because the IRR exceeds 10 percent.

12. The agency problem is best defined as a conflict of interest between a firm's:

A) various employees.
B) various managers.
C) managers and the firm's employees.
D) stockholders and the firm's managers.
E) stockholders and the firm's debtors.

13. Fast Eddie's Used Cars will sell you a 2000 Ford Taurus for $3,000 with no money down. You agree to make weekly payments for two years, beginning one week after you buy the car. The stated rate on the loan is 26%. How much is each payment?

A) $32.96
B) $37.06
C) $38.19
D) $45.90
E) $69.65

14. What are the arithmetic and geometric average returns for a stock with annual returns of 21 percent, 8 percent, -32 percent, 41 percent, and 5 percent?

A) 5.6 percent; 8.6 percent
B) 5.6 percent; 6.3 percent
C) 8.6 percent; 5.6 percent
D) 8.6 percent; 8.6 percent
E) 8.6 percent; 7.1 percent

15. Matt is analyzing two *mutually exclusive* projects of similar size and has prepared the following data. Both projects have 5 year lives.

	Project A	Project B
Net present value	$15,090	$14,693
Payback period	2.76 years	2.51 years
IRR	9.3 percent	9.6 percent
Required return	8.3 percent	8.0 percent
Required AAR	9.0 percent	9.0 percent

Matt has been asked for his best recommendation given this information. His recommendation should be to accept:

A) project B because it has the shortest payback period.
B) both projects as they both have positive net present values.
C) project A and reject project B based on their net present values.
D) project B and reject project A based on their IRRs.
E) project B and reject project A based on both the payback period and the average accounting return.

16. Master Meter is planning on constructing a new $20 million facility. The company plans to pay 20% of the cost in cash and finance the balance. How much will each monthly loan payment be if they can borrow the necessary funds for 30 years at 9% compounded monthly?

A) $128,740
B) $133,667
C) $141,982
D) $148,016
E) $160,925

17. Which one of the following would have the greatest present value, assuming a positive discount rate?

A) $1,000 today plus $100 a month for 2 years
B) $1,000 today plus $200 a month for a year
C) $1,000 today plus $400 a month for six months
D) $2,200 today plus $200 a month for six months
E) $2,200 today plus $100 a month for a year

18. The monthly mortgage payment on your house is $586.81. It is a 30 year mortgage at a quoted rate of 7.8% with semi-annual compounding. How much did you borrow?

A) $75,000
B) $75,500
C) $80,000
D) $82,500
E) $85,000

19. Your recently departed rich, eccentric uncle has left for you in his will a large sum of money. Unfortunately, rather than give you this sum of money immediately, he has instructed the executor of the will to pay you $10,000 in one year. This payment is to grow by 9% each year and to be made each year forever. If the appropriate discount rate is 10%, how much have you actually inherited?
    A) $100,000
    B) $1,000,000
    C) $11,111.11
    D) $9,090.90
    E) $10,000,000

20. Kim Lee is analyzing two projects. The first requires a $1,200 initial investment and returns $600 a year for four years. The second project requires a $1,500 initial investment and returns $700 a year for four years. What is the crossover point for these two projects?
    A) 4.25%
    B) 6.37%
    C) 8.14%
    D) 12.59%
    E) The crossover point cannot be computed based on the information provided.

21. You purchased a bond on January 1, 2012 for $839.67. The bond has a $1,000 face value, an 8% annual coupon, and can be sold for $842.33 on December 31, 2012. What is your total dollar return for the year?
    A) $2.66
    B) $42.66
    C) $72.34
    D) $77.34
    E) $82.66

22. The common stock of ABC Inc. sells for $32.60 a share. The stock is expected to pay $2.10 per share at the end of the year when the annual dividend is distributed. ABC's has established a pattern of increasing its dividends by 3.5 percent annually and expects to continue doing so. What is the rate of return on this stock?
    A) 6.44 percent
    B) 6.67 percent
    C) 7.03 percent
    D) 9.94 percent
    E) 10.29 percent

23. Tony Soprano will loan you money on a "five-for-six" arrangement; i.e., for every $5 he gives you today, you give him $6 one month from now. What is the EAR of this loan?
    A) 410%
    B) 240%
    C) 792%
    D) 1,040%
    E) 13,104%

24. Peterson Nurseries just paid a $3.20 annual dividend. The company has a policy whereby the dividend increases by 3 percent annually. You would like to purchase 100 shares of stock in this firm but realize that you will not have the funds to do so for another 3 (three) years. If you desire a 12 percent rate of return, how much should you expect to pay for 100 shares when you can afford to buy this stock in three years?
    A) $3,468
    B) $3,772
    C) $3,885
    D) $4,002
    E) $4,225

25. A stock had the following prices and dividends. What is the geometric average return on this stock?

Year	Price	Dividend
1	$23.19	–
2	$24.90	$.23
3	$23.18	$.24
4	$24.86	$.25

    A) 3.20 percent
    B) 3.36 percent
    C) 3.59 percent
    D) 3.81 percent
    E) 7.54 percent

Do ALL FOUR problems.
Show how you arrived at your answer including (1) the general form of equation, (2) the equation with the correct numbers substituted in, and (3) the solution!

1. (12 marks) DJ Deadmous is celebrating his 35th birthday today (cheers!). He wants to start saving now for his anticipated retirement at the age of 60. He wants to be able to withdraw $10,000 from his savings account each month for 20 years following his retirement (the first withdrawal is one month after his 60th birthday). Deadmaus also wants to buy a flashy red Audi R8 for his 60th birthday (so he can drive to the best gigs in fashion) which will cost him another $120,000 at that point. Deadmaus decided to invest his money in QueBank which offers 12% APR compounded quarterly. Assume that the interest rate will stay the same after Deadmaus retires.

a) If Deadmaus makes the first payment on his 36th birthday and continues to make *annual* deposits until he is 60 (the last deposit will be on his 60th birthday), what amount he must deposit *annually* to be able to make the desired withdrawals at retirement (including funds needed to buy new car). (9 points)

$EAR=(1+0.12/4)^4-1=0.1255$ (12.55%)
$EMR=(1+0.1255)^{1/12}-1=0.0099$ (0.99%)

Present value of his retirement needs:
PMT=10,000
N=20*12=240
I/Y=0.99%
PV=> 915,137.78
Adding the car value ($120,000) to it means that Deadmaus needs
915,137.78+120,00=$1,035,137.78 (1 mark) when he gets 60.

To be able to generate that much cash, he needs to invest $7,132.07annually.
FV=$1,035,137.78
N=25
I/Y=12.55%
PMT=> $7,132.07

b) Suppose that Deadmaus inherited a large sum of money. Rather than making annual payments he has decided to make one lump-sum payment on his 35th birthday to cover retirement needs. What amount does he have to deposit? (3 points)

He needs to deposit the present value of his retirement needs:
$\$1,035,137.78/(1+0.1255)^{25}=\$53,871.709$

2. (10 marks) Cash Flow Company shows the following information on its 2012 income statement.

Sales:	$150,000
Costs:	80,000
Other expenses:	5,000
Depreciation Expense:	7,000
Interest Expense	15,000
Taxes:	13,000
Dividends:	9,000

In addition, they have indicated that they issued $6,500 in new equity in 2012 and retired $6,000 worth of outstanding long-term debt.

a) What is the 2012 operating cash flow (2 points)
OCF=EBIT+Depreciation-Taxes=Sales-Costs-Taxes=150,000-80,000-5,000-13,000=52,000

b) What was the cash flow to creditors in 2012? (2 points)
CFC=Interest-New Debt=15,000-(-6,000)=21,000

c) What was the cash flow to stockholders in 2012(2 points)
CFS=Dividend -New Equity=9,000-6,500=2,500

d) If net fixed assets increased by $4,500 in 2012, what was the addition to NWC? (2 points)

Change in NWC=Change in Fixed Assets + Depreciation=4,500+7,000=11,500

e) What was the cash flow from assets in 2012? (2 points)
CFFA=CFB+CBS=21,000+2,500=23,500

3. (16 marks) Dr.Z's investment portfolio is *equally invested* in Stock Y and Market Portfolio. The risk-free rate is 2%. Additional information on Stocks Y and the Market Portfolio is provided below.

		Return in Each State	
State	Probability of State	Stock Y	Market Portfolio
Excellent	20%	15%	15%
Normal	40%	5%	25%
Poor	20%	-25%	10%

a) What are the expected return and standard deviation of returns on Stocks Y and on the Market Portfolio? (4 marks)

$E(r_y)=0.20*0.15+0.40*0.05+0.2*(-0.25)=0$
$E(r_{market})=0.20*0.15+0.40*0.25+0.2*0.10=0.15$

$var(r_y)=0.20*(0.15-0)^2+0.40*(0.05-0)^2+0.2*(-0.25-0)^2=0.018$
$st.dev(r_y)=sqroot(0.018)=0.1342$

$var(r_{market})=0.20*(0.15-0.15)^2+0.40*(0.25-0.15)^2+0.2*(0.10-0.15)^2=0.0045$
$st.dev(r_{market})=sqroot(0.0045)=0.0671$

b) What is the covariance between returns of Stock Y and the Market Portfolio? What is the correlation between returns of Stock Y and the Market Portfolio? (3 marks)

$covar(r_y, r_{market})=0.20*(0.15-0)(0.15-0.15)+0.40*(0.05-0)(0.25-0.15)+0.2*(-0.25-0)(0.10-0.15)^2=0.0045$

$corr(r_y, r_{market})= covar(r_z, r_{market})/[st.dev(r_y)*st.dev(r_{market})]$
$corr(r_y, r_{market})=0.0045/(0.1342*0.0671)=0.5$

c) What are the expected return and the standard deviation of Dr.Z's portfolio? (3 marks)

$E(r_z)=0.5*0+0.5*0.15=0.075$
$var(r_z)=0.5^2*0.1342^2+0.5^2*0.0671^2+2*0.5*0.5*0.1342*0.0671*0.5=0.0484$
$st.dev(r_z)=sqroot(0.0484)=0.22$

d) What is the beta of Stock Y? (2 marks) *Hint*: to calculate beta, use the following formula $\beta_i = \frac{covar(r_i, r_{market})}{variance(r_{market})}$

β_y =0.0045/0.0045=1

e) What should be the required returns on Stock Y according to CAPM? Is Stock Y correctly priced according to CAPM? (2 marks)

CAPM implies the following return to Stock Y: $r_y=r_f+\beta_y(E(r_m)-r_f)=0.02+1*(0.15-0.02)=0.15$ (
The Stock Y returns 0% (while it has to return 15% according to CAPM), so it is overpriced.

f) What is the beta of Dr.Z's portfolio? (2 marks)
$\beta_z= 0.5\beta_y +0.5\beta_m=0.5*1+0.5*1=1$

4. (12 marks) Gangnam Style Inc. is considering building a new $300,000 manufacturing plant. This new plant is expected to generate cash flows of $73,150 per year for the next 5 years. Gangnam has just paid a dividend on their common shares of $1.00 per share. It is expected that dividends on its common shares will grow at 5% indefinitely. The stock is currently selling at $22 per share and its beta is 1.2. Gangnam new bonds will pay semi-annual coupons with a 10% coupon rate, have 20 years to maturity, $1000 face value and have a quoted price of 95.5. Gangnam tax rate is 40% and its target debt-to-equity ratio is equal to 1.5. The flotation cost for equity is 5% and the flotation cost for debt is 3%.

a) What is the company's cost of capital? (6 marks)

Cost of equity (DGM Approach):
$r_e=D_1/P_0+g=1*(1+0.05)/22+0.05=0.0977$ (9.77%)

Cost of debt r_d=5.127%2=10.54%
FV=1,000
PV=-955
PMT=50
N=40
I/Y=> 5.27%

D/E=1.5
w_e=0.4
w_d=0.6
tax rate=0.4

WACC=$w_e*r_e+w_d*r_d*$(1-tax rate)=0.4*9.77%+0.6*10.54%*(1-0.4)=3.908+3.7944=7.70%

b) What is the company's average flotation cost? (2 marks)

fc= $w_e*f_e+w_d*f_d$=0.4*5%+0.6*3%=3.8%

c) Should the company accept the investment project if it applies the NPV decision rule? (4 marks)

True cost of the project, including flotation cost is:
CF0=300,000/(1-flotation cost)=300,000/(1-0.038)=$311,850.31
Present value of cash inflows is
PMT=73,159
N=5
I/Y=7.7% (WACC)
PV=>294,390.72

NPV=311,850.31+294,390.72= -17,459.58 <0 - reject the project