Very Important (READ THIS):

All students with seven digit ID numbers must add "2" in front of their ID number to make it eight digit. For example:

ID # 6770177 should be made 26770177

You should put the eight-digit ID (26770177 in the above example) on both the exam and the bubble sheet.

Print Last Name: ➔	**Print First Name:** ➔	**ID Number:** ➔	
COURSE FINANCE	**NUMBER** COMM 308/4	**SECTIONS:** CC, G, H, K	
EXAMINATION Mid Term Exam Version **Blue**	**DATE** March 29, 2015	**TIME** 2 hours	**# OF PAGES 12** including cover

READ THESE INSTRUCTIONS CAREFULLY

- **This exam is composed of 23 multiple-choice questions and 2 multi-part problems. Some of the sub-questions rely on information calculated in other parts of the question. Carry through errors will not be penalized**

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

- **For Problems:**
  All answers must be recorded within this exam.
  Show all work. Credit will not be given for answers without supporting information. Use the back of the pages for scratch.

- **Cell phones must be turned off, programmable calculators, PDAs, Lap Tops are not allowed.**

- **Please ensure you have 12 pages (including cover) in this exam.**

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

SCORES (FOR INSTRUCTORS USE ONLY)

Multiple Choice Questions (Max: 69 Points)	**Long Answer Questions**			**Total** (100 Points)
	Question 1 (Max: 16 Points)	Question 2 (Max: 7 Points)	Question 3 (Max: 8 Points)	

(Summer 2, 2013)

1. If a project has a discounted payback period within the acceptable time, and it has conventional cash flows
   A. It could still have a negative NPV
   B. It must be the best alternative available
   C. It can't possibly fail
   D. It cannot have a negative NPV
   E. Choices A and C are correct.

(Fall, 2013)

2. Consider the following two projects:

Project	Year 0	Year 1	Year 2	Year 3
A	-$250	$100	$200	$100
B	-$350	$100	$325	$100

What is the crossover rate for these two projects?

   A. 27.42%
   B. 22.97%
   C. 11.80%
   D. 7.72%
   E. None of the above

Summer 2, 2014

3. The FarNorth Corp. has been presented with an investment opportunity that will yield cash flows of $40,000 per year in Years 1 through 4, $30,000 per year in Years 5 through 9, and $35,000 in Year 10. This investment will cost the firm $200,000 today, and the firm's cost of capital is 10 percent. Assume cash flows occur evenly during the year, 1/365th each day. What is the discounted payback period for this investment?

   A 6.75 years
   B 6.67 years
   C **8.45 years**
   D 9.35 years
   E 10.0 years

(Summer 2, 2013)

4. Which of the following statements is/are true?
   I. When IRR, PI, Payback period, discounted payback period and NPV decision rules give conflicting answers, then decision should be based on the NPV.
   II. IRR decision rule can be reliably used to choose between mutually exclusive projects.
   III. Discounted payback is always longer than the payback period.
   A. I
   B. I and II
   C. I and III (Assuming no capital constraints)
   D. I, II, and III
   E. None of the above (This is true because PI is superior under capital constraints)

(Summer 2, 2013)

5. When the cost of capital is less than IRR for two independent projects, then: (Assume both projects have conventional cash-flows, i.e. one cash outflow at time zero followed by a series of cash inflows)
   A. The project with the highest equivalent NPV should be chosen.
   B. The project with the highest IRR should be chosen.
   C. The project with the highest PI should be chosen.
   D. The NPV and IRR methods will always result in the same accept and reject decisions.
   E. All of the above.

(Fall, 2013)

6. Project A and Project B are mutually exclusive. Project A has an IRR of 10 percent. Project B has an IRR of 12 percent. The crossover rate is 7%. Both projects have standard cashflow, (i.e. investment at time zero followed by a series of cash inflows). If the firm's marginal cost of capital is 6 percent, then:
   A. Project A should be accepted and Project B rejected.
   B. Project B should be accepted and Project A rejected.
   C. Both projects should be accepted.
   D. Both projects should be rejected.
   E. Decision should be based on NPV and not IRR. Given the information in this question, it is impossible to make a decision.

(Winter, 2014)

7. A new project with a life of 10 years, costs $210,000 and is expected to generates annual net cash inflows of $x each year. The project has a discounted payback period of 10 years. Which of the following statement/s is/are most correct: (*Note: RRR stands for the required rate of return for the project*)
   A. $NPV_A=0$, and $PI_A=1$
   B. $IRR_A=RRR_A$, and Payback period will be less than 10 years
   C. $NPV_A>0$, and $PI_A>1$
   D. Both A and B
   E. The answer will depend on the magnitude of "x".

(Summer 1, 2014)

8. Which of the following statements is most correct concerning a project with normal cash flows (i.e., a cash outflow in Year 0 followed by cash inflows in all subsequent years)?
   A. If the NPV of a project is negative, then the profitability index of the project will always be less than one.
   B. If the NPV of a project is positive then the discounted payback period rule will always accept the project
   C. If the PI of a project is greater than one, then the IRR will always be less than the project's cost of capital
   D. If the NPV of a project is zero, then the IRR of the project will be equal to the discount rate for the project.
   E. Both A and D.

(Fall 2014 number 13)

9. Consider the required rate of return for the stock "LBB" is k% EAR. Given no change in required returns, the price of the stock "LBB" whose dividend is constant will:
   A. Increase over time at a rate of k%.
   B. Decrease over time at a rate of k%.
   C. Increase over time at a constant rate, which may be different from k%.
   D. A and C
   E. None of the above.

Summer 2, 2013 number 22

10. The constant growth rate model of the DDM implies that
    A. Earnings are not relevant to stock prices
    B. The stock price grows at the same rate as dividends
    C. Dividends remain constant from now to infinity
    D. Both B and C
    E. All the above are implied by the model

Fall 2014 question 7

11. Which of the following statements is most correct?
    A. The dividend yield on a stock is equal to the expected return less the expected capital gain.
    B. Assume that the required rate of return on a given stock is 16%. If the stock's dividend is growing at a constant rate of 2.5%, its expected capital gain is 2.5% as well.
    C. A stock's dividend yield can never exceed the expected growth rate.
    D. Answers A and B are correct.
    E. Answers A, B and C are correct.

Summer 2, 2014 number 14

12. If the dividend yield for year one is expected to be 6% based on a current price of $25, what will year four dividend be? Dividends grow at a constant rate of 7%.
    A. $1.33
    B. $1.49
    C. $1.84
    D. $1.97
    E. None of the above

$D_1/P_0 = 0.06 \Rightarrow D_1 = 0.06*25 = 1.5$; $D_4 = D_1*(1+g)^3 = 1.5*(1.07)^3 = 1.8376$.

Summer 2, 2014 number 13

13. Consider a stock which has a current price P_0 equals to $40 and it just paid a dividend D_0 = $4.20 whereby the growth in dividends is expected to be constant at 7%. What is the stock's expected total return for the coming year?
    A. 9.6%
    B. 17.0%
    C. 17.5%
    D. 18.2%
    E. We are not given beta of the stock to be able to calculate total return.

Total return = Dividend Yield + Capital Gains Yield =

$D_1/P_0 + g = [D_0*(1+g)]/P_0 + g = [4.2*(1.07)]/40 + 0.07 = 0.11235 + 0.07 = 0.18235 = 18.2\%$

Summer 2, 2013 number 23

14. What would be the estimated price of HotSpices Ltd. if it currently earns $5.00 per share, and has a payout rate of 40% (D_0 = $2.00). Dividends are expected to grow at a constant rate of 8% per year. The required rate of return is 14.5%.
    A. $13.29
    B. $14.89
    C. $23.53
    D. $30.76
    E. $33.23

$D_0 = 0.4*5 = \$2 \Rightarrow D_1 = D_0 * (1+g) = 2 * (1.08) = \$2.16$;
$P_0 = D_1/(r-g) = 2.16 / (0.145-0.08) = \$33.23$

Winter 2014 number 14

15. A company recently paid a dividend of $2.75. The expected ROE for next year is 14.5%. An appropriate required return on the stock is 10%. If the firm has a retention ratio of 65%, the dividend in the coming year should be equal to
    A. $0.26
    B. $2.75
    C. $2.89
    D. $3.01
    E. We cannot calculate the next dividend without knowing the current price

$g = b * ROE = 0.65 * 0.145 = 9.425\%$; $D_1 = D_0 * (1+g) = 2.75 * (1.09425) = \$3.01$

Fall 2014,11

16. The expected return on the market portfolio is 13% and the risk-free is 5%. A particular asset has a beta of 0.25. To your opinion, this asset has an expected return of 6%. Which of the following statement is correct?

A. This asset is correctly priced according to the CAPM because its returns lie on the SML.
B. This asset is underpriced according to the CAPM because its returns lie above the SML.
C. This asset is overpriced according to the CAPM because its returns lie above the SML.
D. This asset is overpriced according to the CAPM because its returns lie below the SML
E. This asset is underpriced according to the CAPM because its returns lie below the SML.

Fall 2014, 18

17. Suppose Sarah can borrow and lend at the risk free-rate of 5%. Assume Sarah is risk averse. Which of the following four risky portfolios should she hold in combination with a position in the risk-free asset?

A. portfolio with a standard deviation of 15% and an expected return of 20%
B. portfolio with a standard deviation of 19% and an expected return of 15%
C. portfolio with a standard deviation of 25% and an expected return of 18%
D. portfolio with a standard deviation of 12% and an expected return of 9%
E. None of the above

Fall 2014, 23

18. XYZ's beta is 1.2. During a period when the market portfolio was up by 10%, then, we could expect the return on this individual stock to: *(ceteris paribus)*

A. lose exactly 10%
B. gain more than 10%
C. lose less than 10%
D. gain more than 10%
E. None of the above

Summer 2- 2014 , 17

19. When two risky securities with correlation **equal to one**, are held in a portfolio,

A. the portfolio standard deviation will be greater than the weighted average of the individual security standard deviations.
B. the portfolio standard deviation will be less than the weighted average of the individual security standard deviations.
C. the portfolio standard deviation will be equal to the weighted average of the individual security standard deviations.
D. the portfolio standard deviation will always be equal to the securities' covariance.
E. none of the above are true.

Summer 1 – 2014, 19

20. According to the Capital Asset Pricing Model, fairly priced securities must _____.

A. have positive betas
B. have negative betas
C. have non-zero betas
D. have zero alphas
E. Both C and D

Winter 2014, 17

21. In a weak form efficient market the correlation coefficient between stock returns for two

non-overlapping time periods is expected to be

A. positive and large.
B. positive and small.
C. zero.
D. negative and small.
E. negative and large.

Winter 2014, 20

22. According to the CAPM (capital asset pricing model), the security market line is a straight line. The intercept of this line should be equal to

A. zero
B. the expected risk premium on the market portfolio
C. the risk-free rate
D. the expected return on the market portfolio
E. The average level of mispricing in the market

Fall 2013, 13

23. Which of the following is true regarding the concept of beta?

A. You can form a zero-beta portfolio by investing in as many stocks as you can afford.
B. Treasury bills have a beta of 1.
C. Market portfolio has a beta of zero.
D. To benefit from an upcoming bull market (rising market), you need to invest in low beta stocks.
E. None of the above is correct.

Part II: Problems (31 Points Total)

- **Answer on this document, in the space provided.**
- Show all of your calculations.
- Write clearly! Part marks will be awarded (when deserved).

Q1: (16 Points):

Your company must purchase new compact cars for rental fleet - choice has been narrowed down to two cars, both of which would produce the same revenue for your firm

- The Corolla costs $20,000 initially, has operating expenses of $3,000 per year and has a 4-year life, after which it will sell for $3,000
- The Camry costs $17,000 initially, has operating expenses of $3,500 per year and has a 3-year life after which it will sell for $2,000

You expect that after their useful life is over, the cars will continue to be replaced by virtually identical models.
CCA rate is 40%
Tax rate is 40%
Required rate of return is 12%
Which car should your company choose?

Corolla

The Civil: NPV

Civil	0	1	2	3	4
Initial investment and salvage:	($20,000)				$3,000
Operating costs:		($3,000)	($3,000)	($3,000)	($3,000)
After tax costs:		($1,800)	($1,800)	($1,800)	($1,800)
Cash Flows	($20,000)	($1,800)	($1,800)	($1,800)	$1,200

Initial inv.+PV of after tax costs: ($23,561)

PV of CCA Tax Shield:	$5,824
	($587)
	$5,238

1 point

NPV ($18,323)

10

2 points for After tax costs

2 points for NPV

Camry

The Chevalier: NPV

Chevalier	0	1	2	3
Initial investment and salvage:	($17,000)			$2,000
Operating costs:		($3,500)	($3,500)	($3,500)
After tax costs:		($2,100)	($2,100)	($2,100)
Cash Flows	($17,000)	($2,100)	($2,100)	($100)

Initial inv. + PV of after tax costs: ($20,620)

PV of CCA Tax Shield:	$4,951
	($438)
	$4,513

1 point

NPV ($16,108)

11

Comparing The EAC

$$-\$18{,}323 = C_{Civil} \times \left[\frac{1}{0.12}\left(1 - \frac{1}{1.12^4}\right)\right]$$

$$\Rightarrow C_{Civil} = -\$6{,}033$$

2 points

$$-\$16{,}108 = C_{Chevalier} \times \left[\frac{1}{0.12}\left(1 - \frac{1}{1.12^3}\right)\right]$$

$$\Rightarrow C_{Chevalier} = -6{,}706$$

2 points

Choose the Civil Corolla

2 for decision

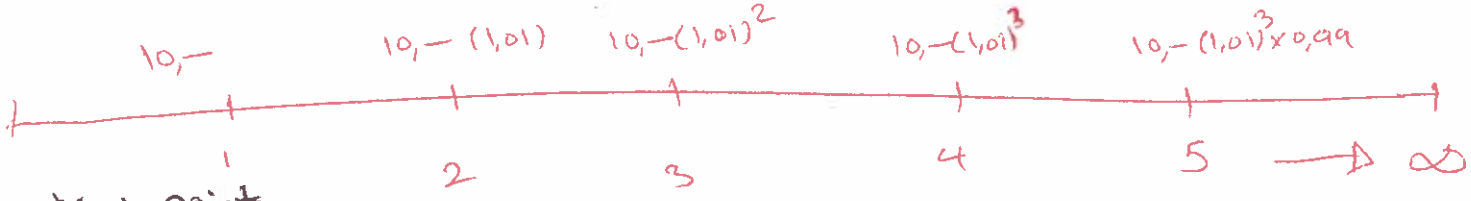
12

Q2: (7 Points)

You are considering acquiring a firm that you believe can generate expected cash-flow of $10,000 next year and after that the cash-flows will increase at a constant rate of 1% per year for three years (till year 4) and then start to decline at the rate of 1% per year for ever. However, you recognize that those cash flows are uncertain. You expect that the beta of the firm is 0.4. How much is the firm worth?
The risk free rate is 5% and the market risk premium is 10%.

$$r = r_f + \beta (r_m - r_f)$$

$$= 0,05 + 0,4\,(0,1) = 0,09$$ * 2 Points



* 1 point

$$P_4 = \frac{10,000\,(1,01)^3 \times 0,99}{0,09 + 0,01} = 101,999.80$$ * 1 point

* 2 points * 1 point

$$P_0 = \frac{10,000}{0,09 - 0,01}\left(1 - \left(\frac{1,01}{1,09}\right)^4\right) + \frac{101,999.80}{1,09^4}$$

$$= 32851.23 + 72259,23$$

$$PV_0 = 105,110,46$$

Part II: Problèmes (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.
- Show all your work. Unsupported statements or numbers will not receive any credit.

Q3 8

Q1. (6 Points) Risk and Return:

Quebecare Inc. has a beta of 1.20. The risk free rate is 6% and the expected return on the market portfolio is 14.5%. The company presently pays an annual dividend of $5 per share. However, investors expect all future dividends to experience a decline of 1% per annum for many years to come.

a. (3 Points) What is the stock's present market price per share, assuming the required rate of return is determined by the CAPM?

4

$$E(R) = 0.06 + 1.2 \times (0.145 - 0.06) = 0.162$$ 2 points

$$P_0 = \frac{D_1}{E(R) - g} = \frac{5 \times 0.99}{0.162 + 0.01} = \frac{4.95}{0.163} = \$29.78$$ 2 points

b. (3 Points) Consider an alternative investment in the stock of Cancare Inc. Cancare has an expected return of 15% and a beta of 1.5. Should you purchase this stock? (why or why not?)

4

$E(R) = 0.15$

$\beta = 1.5$

CAPM $(E(R) = 0.06 + 1.5 \times (0.145 - 0.06)$

$= 18.75\% > 0.15$ 2 points

$\Rightarrow$ The asset is overpriced

$\Rightarrow$ Do not buy (Assuming CAPM is correct)

2 points

Formula Sheet

$\text{PV} \times (1 + r)^t = \text{FV}_t$ [5.3]

$$PV_0 = \frac{FV_t}{(1+r)^t}$$

$$\text{Annuity present value} = \frac{C}{r} \times \left(1 - \text{Present value factor}\right) = \frac{C}{r} \times \left\{1 - \frac{1}{(1+r)^t}\right\}$$ [6.1]

$$\textit{Annuity FV factor} = (\textit{Future value factor} - 1)/r = \left(\frac{(1+r)^t - 1}{r}\right)$$ [6.2]

Annuity due value = Ordinary annuity value $\times (1 + r)$ [6.3]

Perpetuity present value $\times$ Rate = Cash flow [6.4]

$$PV \times r = C$$

$$\textit{Annuity present value factor} = \frac{1}{r} \times (1 - \text{Present } \textit{value factor})$$ [6.5]

$$\text{PV} = \frac{C}{r - g}$$ [6.6]

$$\text{PV} = \frac{C}{r-g}\left[1 - \left(\frac{1+g}{1+r}\right)^t\right]$$ [6.7]

$$EAR = \left(1 + \frac{QR}{m}\right)^m - 1$$ [6.8]

$\text{EAR} = e^q - 1$ [6.9]

$1 + R = (1 + r) \times (1 + h)$ [7.2]

$R \approx r + h$ [7.4]

$r = (D_1/P_0) + g$ [8.5]

$$\text{PV tax shield on CCA} = \frac{[IdT^c]}{d+k} \times \frac{[1 + .5k]}{1+k} - \frac{S_n dT^c}{d+k} \times \frac{1}{(1+k)^n}$$ [10.5]

Total dollar return = Dividend income + Capital gain (or loss) [12.1]

$$Var(R) = \left(\frac{1}{(T-1)}\right) \times \left[(R_1 - \bar{R})^2 + \ldots + (R_T - \bar{R})^2\right]$$ [12.3]

$$\text{Geometric average return} = [(1 + R_1) \times (1 + R_2) \times \cdots \times (1 + R_T)]^{1/T} - 1$$ [12.4]

Risk premium = Expected return – Risk-free rate = $E(R_i) - R_f$ [13.1]

$$E(R) = \sum_j R_j \times P_j$$ [13.2]

$$\sigma^2 = \sum_j [R_j - E(R)]^2 \times P_j$$ [13.3]

$$\sigma = \sqrt{\sigma^2}$$

$$E(R_P) = x_1 \times E(R_1) + x_2 \times E(R_2) + \cdots + x_n \times E(R_n)$$ [13.4]

Covariance of returns: $COV_{L,U} = \sum_{i=1}^{n} \text{Prob}_i \left(r_{L,i} - E(r_L)\right)\left(r_{U,i} - E(r_U)\right)$

$$\sigma_P^2 = x_L^2\sigma_L^2 + x_U^2\sigma_U^2 + 2x_L x_U \text{CORR}_{L,U}\sigma_L\sigma_U$$ [13.5]

$$\sigma_P = \sqrt{\sigma_P^2}$$

$$\text{Covariance}_{L,U} = \text{CORR}_{L,U}\sigma_L\sigma_U$$ [13.6]

Total return = Expected return + Unexpected return ➔ $R = E(R) + U$

Announcement = Expected part + Surprise [13.7]

R = E(R) + Systematic portion + Unsystematic portion [13.8]

Total risk = Systematic risk + Unsystematic risk [13.9]

$$E(R_i) = R_f + [E(R_M) - R_f] \times \beta_i$$ [13.10]

$$\beta_2 = \frac{\text{COV}(R_2, R_M)}{\sigma^2(R_M)}$$ [13A.4]

$$R_E = R_f + \beta_E \times [R_M - R_f]$$ [14.2]

$$WACC = \left(\frac{E}{V}\right) \times R_E + \left(\frac{P}{V}\right) \times R_P + \left(\frac{D_m}{V}\right) \times R_D \times (1 - T_C)$$ [14.6]

$C_1 = 0$ if $(S_1 - E) \leq 0$ [25.1]

$C_1 = S_1 - E$ if $(S_1 - E) > 0$ [25.2]

$C_0 \geq 0$ if $S_0 - E < 0$ [25.4]
$C_0 \geq S_0 - E$ if $S_0 - E \geq 0$