Print Last Name: ➔	Print First Name: ➔	ID Number: ➔	
COURSE FINANCE	NUMBER COMM 308	SECTION:	
EXAMINATION Mid Term Exam Version Green	DATE November 16, 2014	TIME 2 hours	# OF PAGES: 16 including cover and equations

READ THESE INSTRUCTIONS CAREFULLY

- **You must submit a Green computer answer sheet with this booklet.**

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

- **You are 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 16 (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 INSTRUCTORS USE ONLY)

Multiple Choice Questions (Max: 69 Points)	Long Answer Questions				Total (100 Points)
	Question 1A (7: Points)	Question 1B (10: Points)	Question 2A (8: Points)	Question 2B (6: Points)	

Part 1Multiple Choice: Please write the letter of the correct answer in the space provided **AND** circle your choice in the list of possible answers. Students choosing more than one correct answer will get no credit for that question. **(23 questions, 3 points each)**

1. If a project has a payback period within the acceptable time, and it has conventional cash flows
   A. It cannot have a negative NPV
   B. It must be the best alternative available
   C. It can't possibly fail
   D. It must have a discounted payback period within the acceptable time
   (E.) None of the above

2. We have to compute an annuity with an equivalent present value to the NPV (EANPV) of the project in order to:
   A. Choose between two independent projects with the same life spans
   B. Choose between two mutually exclusive projects with the same life spans
   C. Choose between two complementary projects with the same life spans
   D. Choose between two independent projects with different life spans
   (E.) Choose between two mutually exclusive projects with the different life spans

3. What happens to the NPV of a five-year project if initial investments costs are increased from $400 to $600, the firm is profitable, has a 15% tax rate and employs a 12% costs of capital? Assume all costs are incurred at the end of the year.
   A. NPV decreases by $200
   (B.) NPV decrease by $170
   (C.) NPV decreases by $151.79
   D. NPV decreases by $113.04
   E. Insufficient information

$(400-600)*(1-0.15)$

$= -170$

There was confusion with the wording of this question. We mentioned "Initial investment cost..." which might have caused some of you to believe that the cost was incurred in the beginning of the year .. in which case the answer is (B). However, the last sentence reads... "Assume all costs are incurred at the end of the year" In that case the answer would be (C). We are giving you points for both (B) and (C).

4. The following information was reported last year:

	Beginning	Ending
Accounts receivable	$15,000	$25,000
Accounts payable	$25,000	$45,000
Inventory	$125,000	$135,000

What was the change in cashflow (due to changes in net working capital) for the year?

A. -$20,000
B. -$10,000
C. $0
D. $10,000
E. $20,000

$NWC = Inventory + A/R - A/P$

$NWC_B = 115,000$

$NWC_E = 115,000$

$-\Delta NWC = 0$

5. Laya is a well established company that produces bottled waters. The company is planning to launch a new product: colored water. Management are supported by previous research conducted 6 months ago that shows that such a product will have a great success in the market. The costs of this 6 month-old research were $100,000. The company financial analysts are estimating the following possible cash flows that will result from the project:

An initial investment of $60,000

$20,000 in revenue losses incurred every year by the company due to some customers moving from their current water bottles to the new coloured ones.

$50,000 in income every year

$15,000 in expenses every year

If we assume that the life of this project is forever and that the required rate of return for Laya is 10% and that the corporate tax rate is zero. What would be the NPV of the project and do you recommend Laya company to undertake this project?

A. NPV = -$10,000. Yes, take the project
B. NPV = -$10,000. No, do not take the project
C. NPV = $90,000. Yes, take the project
D. NPV = $90,000. No, do not take the project
E. NPV = $150,000. Yes, take the project

for every year: $-20,000 + 50,000 - 15,000$

CF: $15,000$

$PV_0 = \frac{15,000}{0.1} = 150,000$

$NPV = -60,000 + 150,000$

$= 90,000$

6. Carter's Inc. is a mature manufacturing firm. The company just paid a $ 10.46 dividend, but management expects to reduce payment by 4 percent indefinitely. If you require an 11.5 percent return on this stock, what will you pay for a share today?
   A. $64.78
   B. $ 67.48
   C. $ 90.95
   D. $ 145.04
   E. $ 146.44

$D_1 = 10.46 * (1 - 0.04)$

$P_0 = \frac{D_1}{r - g} = \frac{10.46 * 0.96}{0.115 - (-0.04)}$

$= 64.78$

7. Given no change in required returns, the price of a stock whose dividend is constant will:
   A. Increase over time at a rate of K.
   B. Decrease over time at a rate of K.
   C. Remain unchanged
   D. Increase over time at a rate equal to the dividend growth rate.
   E. Decrease over time at a rate equal to the dividend growth rate.

8. The Gordon Model (Constant growth rate model) of the DDM implies that:
   A. The stock Price grows at the same rate as dividends
   B. The growth rate g is less than the discount rate r
   C. Earnings are not relevant to stock prices
   D. Both A and B
   E. All of the above are implied by the model.

9. Under which of the following scenarios will increasing the payout ratio for a firm will have no effect on its equity value?
   A. When the return on equity is equal to its cost of equity
   B. When the return on equity is less than the cost of equity
   C. When the return on equity is greater than the cost of equity
   D. Never
   E. Always

10. Carter's Inc. has two divisions of equal size. Division A has a beta of 0.93, while Division B has a beta of 1.57. Carter's has no debt, and is completely equity-financed. The real risk free rate is 6.5 percent, and the market risk premium is 5.3 percent. The Cost of capital for Carter's is 16 percent. The projects in division A are discounted at A's required return, and division B projects are discounted at B's required return. Which division has a lower cost of capital than the overall cost of capital for the firm?

A. Division A
B. Division B
C. Both Division A and Division B
D. Neither Division A nor Division B
E. All of the above is incorrect

A: $R_E = 0.065 + 0.93(0.053)$
$= 11.429\%$

B: $R_E = 0.065 + 1.57(0.053)$
$= 14.821\%$

11. When we use WACC to assess a project, we assume that the _____ ratio doesn't change.

A. Reward to total risk
B. Reward to systematic risk
C. Reward to unsystematic risk
D. Debt to Equity
E. No such assumption is required

12. Which of the following will increase the WACC of a firm?

A. An increase in the debt to equity ratio.
B. An increase in the risk free rate of return
C. An increase in the tax rate
D. A decrease in the level of risk of a project
E. Both B and C

13. Which of the following statements is true about the weighted average cost of capital (WACC) Method?

A. The WACC for a firm reflects the risk and the target capital structure for a firm's existing assets as a whole.
B. WACC doesn't explicitly calculate interest tax shields that are generated by debt securities for the financing of a project.
C. WACC does not adjust for the tax deductibility of interest costs.
D. Only A and B are correct
E. Only A and C are correct

14. Which of the following statements is (are) correct?
   A. It is possible to have a situation where the market risk of a single stock is less than the market risk of a portfolio of stocks.
   B. If you select a group of stocks whose returns are perfectly positively correlated, then you could end up with a portfolio for which none of the unsystematic risk is diversified away.
   C. If investors become more risk averse, then the new security market line would have a higher market risk premium.
   D. Both B and C are correct
   E. All of the above statements are correct.

15. Given the following probability distribution, what are the expected return and the standard deviation of returns for security J?

State	pj (Probability)	kj (Expected return)
1	0.4	10%
2	0.6	15%
3	0.1	20%

   A. 12%; 5.18%
   B. 15%; 3.54%
   C. 15%; 3.16%
   D. 15.5%; 0.22%
   E. None of the above

As announced probabilities incorrect. Therefore Choice (E) is the correct answer. However,if you failed to catch that and estimated the average and the standard deviation using the given numbers and the correct process, then you should end up with choice (B).
Therefore I am giving you points for both choice (E) and (B).

16. Suppose Sarah can borrow and lend at the risk free-rate of 7%. 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 12%
   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. Insufficient information.

$S.R = \frac{12-7}{15} = 0.33$
$S.R. = 0.421$
$S.R = 0.48$
$S.R = 0.166$

17. You just read the following from The Financial Post on Thursday, May 12, 2014: "Gannett Co. Inc. the largest U.S. newspaper publisher, reported a lower third-quarter profit yesterday because of weak advertising growth and lower-than-expected revenues, sending shares down 3.4%. Revenue rose 2.7% to US$1.91-billion, but fell short of analysts' views ranging from US$1.92-billion to US$1.99-billion, according to Reuters Estimates." Assume nothing happens before the event. This is consistent with: (pick the best answer)

A. Weak form EMH (Efficient market hypothesis)
B. Semi-strong form EMH
C. Strong form EMH
D. Markets are Inefficient
E. None of the above

18. When two risky securities with correlation coefficient $\rho=1$ 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.

19. XYZ Inc.'s stock has a beta of 1.40, and its expected return is 12.00%. ABC Inc.'s stock has a beta of 0.80. If the risk-free rate is 4.00%, what is the required rate of return on ABC stock?

A. A.12.00%
B. B.9.93%
C. C.8.57%
D. D.4.75%
E. C. None of the above

XYZ: $12 = 4 + 1.4(E(R_M) - 4)$

$E(R_M) = 9.714\%$

ABC: $E(r) = 4 + 0.8 * 5.714$

$= 8.57\%$

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

A. have positive betas
B. have negative betas
C. have zero betas
D. have zero alphas
E. Have positive alphas

21. Which of the following is true regarding the concept of beta?
    A. To benefit from an upcoming bull market (rising market), you need to invest in low beta stocks.
    B. Treasury bills have a beta of 0.
    C. Total risk equals beta risk plus systematic risk.
    D. You can form a zero-beta portfolio by investing in as many stocks as you can afford.
    E. All assets with beta of 1 may be used as a market proxy.

22. Which of the following statements is true?
    A. All risk free assets have beta equal to zero.
    B. Any asset with beta equal to one may be used as a market proxy.
    C. An asset with beta equal to zero is not necessarily the risk free asset.
    D. Statements A and C are true.
    E. Statements A, B, and C are true.

23. A particular asset has a beta of 1.2. The expected return on the market portfolio is 13% and the risk-free is 5%. To your opinion, the asset has an expected return of 16%. 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.

$E(r) = 5 + 1.2(13-5) = 14.6\% < 16\%$

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).

Q1A: (7 Points) Note: *Information from part (a) should not be used in part (b)*

You have been given the following projections for Smooth Sail Corporation (SSC) for the coming year:

Sales	= 10,000 *units*
Sales price per unit	= $10
Variable cost per unit	= $5
Fixed costs	= $10,000
Bonds outstanding	= $15,000
K_d on outstanding bonds	= 8%
Tax rate	= 40%
Shares of comon stock outstanding	= 10,000 *shares*
Beta	= 1.4
RF	= 5%
R_m	= 9%
Dividend payout ratio	= 60%
Growth rate	= 8%
Total Earnings	= $23,280

Calculate the current price per share for SSC.

Total Dividend: $23,280 * 0.6 = 13,968\ \$$ 1

Dividend per share $= \frac{13,968}{10,000} = 1.3968$ 1

$=$ projection for coming year D_1: 2 points

CAPM: $k = R_f + \beta(R_m - R_f)$

$= 0.05 + 1.4 * (0.09 - 0.05) = 10.6\%$ 1 point

$P_0 = \frac{1.3968}{0.106 - 0.08} = 53.72\ \$$ 2 points

Q1B: (10 Points) Note: *Information from part (a) should not be used in part (b)*

Misery Inc. specializes in purchasing the assets of distressed and bankrupt firms and then selling them at a huge profit. Due to its business model, Misery does brisk business during bear markets but it has few opportunities in a booming economy. The correlation between the returns on the market portfolio and Misery stock is $\rho_{i,m} = -0.1$. Misery stock returns have a standard deviation of $\sigma_i = 0.3$ (i.e. 30%) while the variance of the return on the market portfolio is $\sigma_m^2 = 0.04$. The risk free rate equals $R_f = 5\%$ and the expected return on the market is 10%.

a) (2 Point) Analysts predict that the price of Misery stock will increase to \$21 by the end of the year from its current level of \$20 per share. If Misery pays no dividends, what return can Misery investors expect based on this forecast?

$$\frac{21\$ - 20\$}{20\$} = 5\%$$

2 points

b) (4 Points) What is the beta of Misery's stock?

$$\beta = \frac{\rho_{i,m} * \sigma_i}{\sigma_m} = \frac{-0.1 \times 0.3}{\sqrt{0.04}} = -0.15$$

1 point 1 point

2 points

c) (4 Points) What is the required return on Misery stock based on its systematic risk? Comment on the desirability of including Misery stock in a portfolio.

2 points

Using CAPM: $E(r) = 5\% + (-0.15) * (0.1 - 0.$

$= 4.25\%$

2 points

A negative Beta asset has negative correlat with market so holding it in a portfolio will have diversification benefits as it reduces the portfolio risk

Q2A: (8 Points) Note: *Information from part (a) should not be used in part (b)*

Service Inc. is investigating four different opportunities. Information on the four projects under study is as follows: (Assume all projects have standard cash-flows: initial cash outflow followed by a series of cash inflows)

	Project 1	Project 2	Project 3	Project 4
Investment required	$400,000	$500,000	$600,000	$700,000
Net present value	$75,000	$100,000	$125,000	$150,000
Line of project	6 years	9 years	12 years	15 years

Service Inc. has a WACC of 10%. The expected market return is 6% and the prevailing risk free rate is 2%.

a. (4 Points) Compute the project profitability index for each investment project.

$$PI_1 = \frac{400{,}000 + 75000}{400{,}000} = 1.1875$$

$$PI_2 = \frac{500{,}000 + 100{,}000}{500{,}000} = 1.2$$

$$PI_3 = \frac{600{,}000 + 125{,}000}{600{,}000} = 1.20833$$

$$PI_4 = \frac{700{,}000 + 150{,}000}{700{,}000} = 1.2142$$

b. (2 points) If the firm faces severe capital constraints, what would be the most reliable method of ranking the above four projects?

PI

c. (2 points) If the firm faces no capital constraints, what would be the most reliable method of ranking the above four projects?

EANPV

Q2B: (6 Points) Note: *Information from part (a) should not be used in part (b)*

XYZ Inc. has 10,000,000 shares of common stock, 4,000,000 shares of preferred stock, and 500,000 bonds outstanding. The common stock has a book value of $20, currently sells for $18, and has a beta of 2.8. The preferred stock currently sells for $15 per share and pays a $1.5 dividend. The bonds have a par value of $1,000, an 8% coupon rate and make semi-annual coupon payments. The bonds have 10 years to maturity and currently sell at par. The risk free rate is 2% and the expected return on the market is 6%. XYZ's tax rate is 30%.

Value of Common Stock: $18 * 10{,}000{,}000 = 180{,}000{,}000$

Value of pref. Stock: $15 * 4{,}000{,}000 = 60{,}000{,}000$

Value of Debt: $1000 * 500{,}000 = 500{,}000{,}000$

$740{,}000{,}000$

weights 1 point

$R_E = 2\% + 2.8 * (6\% - 2\%) = 13.2$ 1p

$EAR = \left(1 + \frac{0.08}{2}\right)^2 - 1 = 8.16\%$ 1p

$k_D * (1 - T_C) = 8.16\% * (1 - 0.3) = 0.05712$ 1p

$k_P = \frac{1.5}{15} = 10\%$ 1p

$WACC = 13.2\% * \frac{180\,M}{740\,M} + 10\% * \frac{60\,M}{740\,M} + 5.712\% * \frac{500\,M}{740\,M}$

$= 7.881\%$ 1p

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]

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 = $E(R_U) - R_f$ **[13.1]**

$$E(R) = \sum_j R_j \times P_j \quad \textbf{[13.2]}$$

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

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

$$E(R_P) = x_1 \times E(R_1) + x_2 \times E(R_2) + K + x_n \times E(R_n) \quad \textbf{[13.4]}$$

$$\sigma^2_P = x^2_L \sigma^2_L + x^2_U \sigma^2_U + 2x_L x_U \text{CORR}_{L'U} \sigma_L \sigma_U \quad \textbf{[13.5]}$$

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

Total return = Expected return + Unexpected return ➔ $R = E(R) + U$ **[13.6]**

Announcement = Expected part + Surprise **[13.7]**

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

Total risk = Systematic risk + Unsystematic risk **[13.9]**

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

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

$$R_E = R_f + \beta_E \times [R_M - R_f] \quad \textbf{[14.2]}$$

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

$C_1 = 0$ 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 $S_0 - E \geq 0$

$S_0 = C_0 + E/(1 + R_f)$ **[25.5]**
$C_0 = S_0 - E/(1 + R_f)$

Call option value = Stock value – Present value of the exercise price **[25.6]**

$$C_0 = S_0 - E/(1 + R_f)^t$$