Spring 2012: Final A for 1:25 Class   Name _____

Notes: 1) "Annuity" and "perpetuity" may have growing or constant cash flows. 2) While you are welcome to solve any problem to a final answer, you will only earn points for setting them up. "Setting up" means writing down the appropriate equations and plugging in the appropriate numbers. For multistep problems, you can plug unsolved variables into later steps. Note however, that some problems will require some calculations for you to figure out how to solve them.

Short Answer (15 points each)

1. Assume that the bid price of Apple equals $609.94. How is this number related to buying shares, selling shares, limit orders, and market orders?

2. Assume that the APR on an account equals 2.5% per year with quarterly compounding. What is the effective semi-annual interest rate on this account?

3. Assume that two annuities have the same present value and return. However, the cash flows for Annuity A are growing faster than the cash flows for Annuity B. How does the initial cash flow for Annuity A compare to the initial cash flow for Annuity B?

4. Your boss just came into your office to tell you that he failed to include $100,000 of depreciation in the fourth year of a project you are analyzing. How will fixing this error affect the profits and cash flows associated with the project?

5. Assume the correlation between two stocks is negative. What does this tell you about the returns on these two stocks?

6. What information do you need to calculate the Sharpe ratio of a portfolio? Note: use words not symbols in your answer.

7. Assume that the bid price for a Proctor & Gamble call with a $65 strike price is $1.27 and the ask price for this call is $1.32. If you sell this call (create a short call) what is your overall profit or loss if Proctor & Gamble's stock price ends up at $70.

8. Assume perfect capital markets and that Amazon Taxes reduces its leverage. How does the expected return on Amazon Taxes' stock change? Why are stockholders indifferent to this change?

9. Management typically knows more about a firm that outside investors. What signal does a debt issue by the firm create as a result of this difference? Note: You do not need to explain why, just what.

10. What transactions involving a put are required to duplicate the payoff on a firm's risky bonds? Be specific.

Problems (75 points each)

1. Assume that capital markets are perfect and that two firms have identical assets. Firm A has no debt and the value of its equity equals $50,000. Firm B has outstanding equity worth $25,000 and bonds that mature four years from today for $35,000. The return on these bonds is 5%.

   a. What set of transactions will generate an arbitrage profit today? What is your profit?
   b. Show that the conditions of arbitrage are met if the value of the firm ends up equaling $15,000 and if the value ends up equaling $80,000 four years from today.

2. Given a risk-free rate of 1% and the following returns on Pepsi (PEP) and the Exxon-Mobil (XOM), set up the calculations needed to the standard deviation of returns on a portfolio of $40,000 of Pepsi and $60,000 of Exxon-Mobil.

Return on:

Year	Pepsi	Exxon-Mobil
2012	-1%	0%
2011	+9%	+33%
2010	+35%	+4%

Use the following information to answer questions 3 and 4.

Amazon is considering whether to build a new distribution center in Nebraska.

The distribution center will cost $10,000,000 to build and will begin generating monthly cash flows six months from today that will continue through five years from today. The first cash flow will equal $200,000 and cash flows grow by 0.2% per month.

If sales exceed expectations, the distribution center can be expanded any time over the next two years at a cost of $5,000,000. The present value of the cash flows from this expansion equal $4,000,000 today. However, if sales fail to materialize, the facility can be sold any time over the next year for $7,000,000.

The standard deviation of returns on the distribution center is expected to equal 40%. This exceeds the standard deviation of returns on Amazon as a whole which equals 30%, but is less than the standard deviation of returns on the expansion which equals 50%.

The beta of the factory will equal 0.9. This exceeds the beta of Amazon as a whole which equals 0.7 and of the expansion which equals 1.1.

The market is expected to earn 8% per year and the annualized returns on Treasuries vary by maturity as follows:
1-month = 0.012%; 2-months = 0.065%; 3-months = 0.079%; 4-months = 0.094%; 5-months = 0.117%; 6-months = 0.153%; 1-year = 0.187%; 2-years = 0.254%; 3-years = 0.402%; 4-years = 0.593%; 5-years = 0.821%

3. Set up the calculations needed to determine the net present value of the facility excluding any options associated with it.

4. Set up the calculations needed to determine how the possibility of selling the distribution facility in one year affects the value of the facility.

5. Assume that the tax rate on corporate income equals 25%, on personal equity income equals 15%, and on interest income equals 30%. Assume also that there is a 25% chance that Cantaloupe Computers will earn $100,000, a 45% chance that Cantaloupe will earn $250,000, and a 30% chance that Cantaloupe will earn $450,000. Determine (rather than just set up the calculations to determine) Cantaloupe's optimal level of debt.

6. Assume that you believe that Netflix's stock price will rise. What trades today involving Netflix's stock, calls on Netflix's stock, or puts on Netflix's stock would allow you to gain if you are correct? How would you benefit in each case? How would the downside you face differ across the strategies?