

**Short Answer (15 points each)**

1. If you submit a limit order to buy shares of stock, will your order show up as a bid or ask price?
2. Assume two annuities have the same future value (on date of final payment). All characteristics of the annuities are identical except for growth rate of the cash flows and initial cash flow. What must be true about the initial cash flow of the annuity with payments that grow at a slower rate?
3. Assume the corporate tax rate is 35% and that your firm's depreciation expense rises by \$100 per year. Calculate how your firm's revenues need to change so that free cash flow remains unchanged.
4. Set up the calculations needed to determine the return on Kroger (KR) between 11/29/2011 and 11/29/2012 if you assume all dividends are reinvested.

<u>Date</u>	<u>Day</u>	<u>Dividend</u>	<u>Price</u>	<u>Return</u>
11/29/11	0	\$0.00	\$22.35	n.a.
2/13/12	76	\$0.115	\$23.16	4.1%
5/11/12	164	\$0.115	\$22.97	0.0%
8/13/12	258	\$0.115	\$22.44	- 1.8%
11/13/12	350	\$0.15	\$24.77	11.1%
11/29/12	366	\$0.00	\$26.25	6.0%

5. Assume you have invested \$100,000 in Tiffany (TIF) and \$200,000 in USAirways. The standard deviation of returns on TIF is 35% and on USAirways is 45%. What else do you need to know to determine the standard deviation of returns on your portfolio?
6. Vulcan Materials (VMC) is currently funded with \$9.63 billion of equity with an expected return of 7.7%. Assuming markets are perfect, set up the calculations needed to determine the expected return on VMC stock if it were to issue \$2.81 billion of debt with an expected return of 2.85% and use the proceeds to repurchase shares.
7. Who might benefit and who loses if a firm that is funded entirely with equity grows by undertaking negative NPV projects? Note: You only need to state who benefits and who loses, not why.
8. Assume you own a call on Netflix and the standard deviation of returns on Netflix stock drops. What has happened to the value of your call?
9. Assume bonds issued by David Blaine Capital mature for \$100 million in 7 years. Assume also that in 7 years, David Blaine's assets will equal either \$120 million or \$70 million. The payoffs on these bonds can be duplicated by owning a risk-free bond and a long or short option on the firm's assets. What option position is required? What is the payoff on this option for each ending value for David Blaine's assets?
10. Assume you have used the Black-Scholes Option Pricing Model to value Yehaa stock and have found that  $d_1$  equals 0.758 and  $d_2$  equals 0.580. Set up the calculations needed to determine the beta of Yehaa's assets if the market value of its debt equals \$190 million, the market value of its equity equals \$200 million, and the beta of Yehaa's stock is 0.97.

## Problems (75 points each)

1. Assume markets are perfect and that Troll Brothers Homebuilders and Taffany Homes have identical assets that will generate either \$3 million or \$15 million in net cash flow three years from today. Troll is financed with only common stock with a market value of \$4 million. Taffany is financed with debt that matures for \$4 million three years from today and equity with a market value of \$1.5 million. The interest rate on the bonds is 10%. Set up a table that demonstrates the transactions required to generate an arbitrage profit and that shows that the conditions of arbitrage are met. Note: calculations required.
2. Assume that you are planning to combine (long or short) the following into a portfolio with the goal of earning an expected return of 10% with the lowest possible risk. Identify your best portfolio on a graph.

<u>Asset</u>	<u>Expected Return</u>	<u>Volatility</u>
Treasuries	2%	0%
Kroger	5%	12%
Deere	10%	31%

Note: The correlation between the returns on Kroger and Deere equals +0.1.

Use the following to answer questions 3 and 4

Assume that Falling Apple Inc. is considering whether or not to build a new factory at a cost of \$150 million. The firm has already spent \$5 million on the land on which the factory will be built. This land could be sold today for an after-tax cash flow of \$4 million. If it is built, the factory will generate net cash flows of \$1 million four months from today. After this initial cash flow, cash flows will occur monthly and will grow by 0.5% each. The final cash flow will occur 30 years from today.

The factory can be expanded at any time over the next 4 years at a cost of \$50 million. The expansion is expected generate net cash flows of \$4.5 million per year through 30 years from today. In addition, the factory can be sold for \$75 million any time over the next 5 years.

The standard deviation of returns on the factory will equal 30% and on the expansion will equal 40%. This exceeds the standard deviation of returns of 25% on Falling's existing assets. The beta of the factory and the expansion will be 1.2. This exceeds the beta of Falling's existing assets which equals 1.1.

The expected return on the market equals 8% and the risk-free rates vary by maturity as follow:  
1 month = 0.12%; 2 months = 0.07%; 3 months = 0.10%; 4 months = 0.13%; 5 months = 0.14%;  
6 months = 0.15%; 1 year = 0.21%; 2 years = 0.29%; 3 years = 0.35%; 4 years = 0.47%;  
5 years = 0.64%; 10 years = 1.73%; 20 years = 2.74%; 30 years = 3.04%

3. Set up the calculations needed to determine the net present value of building the factor ignoring the impact of any options on the value of the project. Note: No need to solve anything.
4. Set up the calculations needed to determine the impact being able to sell the factory on the value of the factory to the firm. Note: No need to solve anything.
5. Assume that the corporate tax rate is 35%, that the personal tax rate on equity income is 25%, and that the personal tax rate on interest income equals 45%. Assume also that Snews Corp. has a 20% chance of earning \$100 million, a 50% chance of earning \$120 million, and a 30% chance of earning \$155 million. Determine the optimal level of leverage for Snews. Note: calculations required.
6. WEAir Inc.'s stock price currently equals \$26 per share. Over each of the next two years, WEAir's stock will rise by \$5 per share or fall by \$4 per share. Calculate the value of a call with a \$25 strike price that expires two years from today if the risk-free interest rate equals 1%.