

**Short Answer (15 points each)**

1. If you submit a market order to buy shares of stock, is the bid or ask price the price at which your transaction will occur?
2. Assume two annuities have the same future value (on date of final payment). All characteristics of the annuities are identical except for number of total payments and initial cash flow. What must be true about the initial cash flow of the annuity that makes fewer total payments?
3. Assume the corporate tax rate is 35% and that your firm's depreciation expense falls by \$500 per year. Calculate how your firm's revenues need to change so that unlevered net income remains unchanged.
4. Assume that you have calculated the average return on Tiffany (TIF) over the past 5 years as equaling 17%. Set up the calculations needed to determine the standard deviation of returns on TIF over the past five years if the returns for the past five years were as follows: -48%, +86%, +49%, +8%, -9%
5. What happens to the standard deviation of a portfolio of two assets if the correlation between the two assets falls?
6. Assume the market value of Martin Marietta's stock is \$4.17 billion and of its bonds is \$1.10 billion. Assume also that the expected return on Martin Marietta's stock is 8.25% and on its bonds is 3.75%. Assuming markets are perfect, set up the calculations needed to determine the expected return on Martin Marietta's stock if it were to issue enough equity to retire all of its debt?
7. Based on our discussions of capital structure, how would you expect stock and bond prices to react to a firm announcing its plans to pay a large, one-time dividend? Note: You only need to state what you expect to happen, not why it would happen.
8. Assume you own a put on Dell and the price of Dell stock drops. What has happened to the value of your put?
9. Calculate your total profit or loss if you sell 5 call contracts on Dow Chemical with a \$25 strike price for \$4.35 per share and Dow's stock price equals \$30 per share when the calls expire.
10. Assume that when using the Black-Scholes Option Pricing Model to value a call, you calculate  $d_1$  as 0.907,  $d_2$  as 0.817, and  $PV(K)$  as \$24.93. Set up the calculations needed to determine the beta of the call if the beta of the stock is 1.9 and the price of the stock is \$28.

**Problems (75 points each)**

1. Assume markets are perfect and that Troll Brothers Homebuilders and Taffany Homes have identical assets that will generate either \$1 million or \$5 million in net cash flow three years from today. Troll is financed with only common stock with a market value of \$1.5 million. Taffany is financed with debt that matures for \$1.35 million three years from today and equity with a market value of \$0.3 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 achieving a standard deviation of returns of 8% with the highest possible expected return. Identify your best portfolio on a graph.

<u>Asset</u>	<u>Expected Return</u>	<u>Volatility</u>
Treasuries	2%	0%
USAir	4%	8%
Best Buy	9%	27%
Deere	10%	31%

Note: The correlations between USAir, Best Buy, and Deere are all between +0.1 and +0.3.

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%

- 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.
- Set up the calculations needed to determine the impact being able to expand the factory on the value of the factory to the firm. Note: No need to solve anything.
- Assume that the corporate tax rate is 35%, that the personal tax rate on equity income is 20%, and that the personal tax rate on interest income equals 40%. Assume also that Snews Corp. has a 30% chance of earning \$20 million, a 50% chance of earning \$40 million, and a 20% chance of earning \$55 million. Determine the optimal level of leverage for Snews. Note: calculations required.
- WEAir Inc.'s stock price currently equals \$22 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 put with a \$25 strike price that expires two years from today if the risk-free interest rate equals 1%.