Instructions:
1) The part of the exam is closed book and closed notes. No scrap paper is allowed; use the back of the exam if necessary.
2) Partial points are based on readily observable evidence that you know at least part of the solution concept. The more evidence presented (and the clearer the evidence), the better the chance for partial points. In other words, SHOW ALL WORK!
3) If you have additional time remaining, give your work one last check.
4) True/False questions are worth 2 points. Multiple-choice questions are worth 3 points. Short answer/Fill in the Blanks questions usually take less than three sentences and are worth 4 points.

1. Assuming a financial manager was doing their job, and after selecting the optimal capital budget, minimizing WACC is equivalent to maximizing shareholders wealth.
   a. True
   b. False

2. Explain why your answer to the previous question was correct.
   \[
   \text{minimize } WACC \Rightarrow \text{max } \text{firms value} \Rightarrow \text{max shareholders wealth}
   \]

3. For bonds, price sensitivity to a given change in interest rates generally increases as years remaining to maturity increases.
   a. True
   b. False

4. If you use the constant dividend growth model to value a stock, which of the following is certain to cause you to DECREASE your estimate of the current value of the stock?
   a. Decreasing the required rate of return for the stock.
   b. Decreasing the estimate of the amount of next year’s dividend.
   c. Increasing the firm’s long run earnings growth rate.
   d. Decreasing the rate of inflation in the economy.
   e. none of the above

5. If two firms have the same current dividend and the same expected growth rate, their stocks must sell at the same current price or else the market will not be in equilibrium.
   a. True
   b. False

6. The before-tax cost of debt, which is lower than the after-tax cost, is used as the component cost of debt for purposes of developing the firm’s WACC.
   a. True
   b. False

7. Under pecking order theory, an acquisition financed by debt is a better capital budgeting project than an internal expansion financed by issuing new stock.
   \[
   \text{true} \quad \text{false}
   \]

8. It is generally easier for management to control operating risk than financial risk.
   A) True
   B) False

9. Historically which of the following BEST describes the correct order of returns? (lowest to highest)? Assume the corporate bonds, preferred stock and common stock is for a single (the same) company.
   a. T-bills, T-bonds, Corporate bonds, Preferred Stocks, Common Stocks
   b. T-bills, T-bonds, Corporate Bonds, Common Stocks, Preferred Stocks
   c. T-bonds, Corporate bonds, T-bills, Common Stocks, Preferred Stocks
   d. Preferred Stocks, T-bills, T-bonds, Corporate bonds, Common Stocks
   e. Common Stocks, Preferred Stocks, Corporate Bonds, T-bills, T-bonds
10. If a firm utilizes debt financing, a decrease in earnings before interest and taxes (EBIT) will result in a more than proportionate decrease in earnings per share.
   A) True
   B) False

11. Which of the following statements is most correct?
   a. The cost of capital used to evaluate a project should be the cost of the specific type of financing used to fund that project.
   b. The cost of debt used to calculate the weighted average cost of capital is based on an average of the cost of debt already issued by the firm and the cost of new debt.
   C) A firm's WACC is our "best" estimate of the required return on an average risk project for that same firm.
   d. When calculating WACC, one should use the estimates that produce the lowest WACC. This lower WACC will allow us to accept more positive NPV projects.
   e. The cost of equity capital is generally easier to measure than the cost of debt, which varies daily with interest rates, or the cost of preferred stock since preferred stock is issued infrequently.

12. Because creditors can foresee, to at least some extent, the costs of bankruptcy, they charge a higher rate of interest to compensate for the present value of bankruptcy costs.
   a. True
   b. False

13. Define "financial leverage clientele.

   Investor tax situation causes people to sort into groups, each of which prefers a type of firm.

14. The use of debt in the firm's capital structure is called
   A) operating leverage
   B) homemade leverage
   C) financial leverage
   D) decreasing leverage
   E) none of the above

15. List 4 'real-world' factors that would affect a firm's choice of capital structure?

   1. Taxes/interest expense tax shields fully
   2. Net operating leverage/interest factors
   3. Asset preference/asset factors
   4. Mix of preference to support debt

16. What is the optimal capital structure? Why?

   1. Mix of D/E that minimizes WACC
   2. A lower max firm value.

   Capital is a cost and best mini rate $\Rightarrow$ Price
1. Rolling Corporation is constructing its Cost of Capital schedule. The firm is at its target capital structure. Its bonds have a 7 percent coupon, paid semiannually, a current maturity of 12 years, and sell for $1147.40. Rolling's beta is .85, the risk-free rate is 4.1%, and the market risk premium is 6.4%. Rolling is a constant growth firm, which just paid a dividend of $1.35, sells for $15.00 per share, and has a growth rate of 4%. The firm's tax rate is 35%.

The firm's book value balance sheet is as follows:

<table>
<thead>
<tr>
<th>Asset</th>
<th>$481,780</th>
<th>Long Term Debt</th>
<th>$91,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity ($25 par)</td>
<td>$1,330</td>
<td>Retained Earnings</td>
<td>$39,430</td>
</tr>
</tbody>
</table>

a. (2 points) What is the firm's leverage ratio?

\[
\frac{91 \times 1147.40}{(91 \times 1147.40) + (1330 \times 15)} = \frac{104415.4}{185413.4} = 56.3\%
\]

b. (2 points) What is the Yield to Maturity on Rolling's debt?

\[
YTM = \frac{1147.40}{1000} = 12\% 
\]

1. par = $1200 
2. M = 250
3. I = 2.66 * 2 = 53.2\%

c. (2 points) What is Rolling's cost of retained earnings using the Discounted Cash Flow approach?

\[
rs = \frac{1330}{15} + .04 = 13.36\%
\]

d. (2 points) What is Rolling's cost of retained earnings using the Capital Asset Pricing Model approach?

\[
r_s = r_f + (r_m - r_f) = 4.1\% + (6.4\%) = 9.5%\%
\]

e. (2 points) Since the cost of Retained Earnings differs with the two above approaches, which rate should you use as the cost of retained earnings? Explain your choice.

The right time is to choose fewer or accept too many projects, choose high risk or accept too few. Right time accept all good projects.

f. (2 points) Using your DCF estimate of the cost of retained earnings, what is Rolling's WACC?

\[
WACC = \frac{(563\%)(53.2\%)}{12} + (1-.563\%)(13.36\%) = 1.98 + .584 = 7.79\%
\]

2. (3 points) Cold Boxes Ltd. has 100 bonds outstanding. The bonds have a par value of $1000, a coupon rate of 6%, and pay interest semiannually. They are currently selling for $868 per bond. What is the annual coupon interest rate?

\[
\frac{M}{FV} = \frac{6 \times 2}{12} = 12 \%
\]

\[
\frac{FV}{M} = \frac{-868}{1000} = 86.8\%
\]

\[
\left(1 + \frac{I}{2}\right)^2 = \frac{6.564}{1000} = 6.56\%
\]
3. Use the following information for the next several questions. Consider a world of perfect capital markets. This world has no corporate or personal taxes, all investors have homogeneous expectations, no bankruptcy costs, and M&M’s no-tax theory of capital structure is true.

Company Y is financed has the following market value balance sheet:

\[
\begin{align*}
\text{Assets} &= \$400 \\
\text{Liabilities} &= \$0 \\
\text{Equity} &= \$400
\end{align*}
\]

The firm had $28.00 in EBIT last year. The firm has 80 shares outstanding. The firm expects this same return for the foreseeable future. The firm is a zero growth firm, that pays out all excess earnings as dividends. Any time the firm changes its capital structure, it changes only the debt/equity mix and does not change its total assets. The firm’s liabilities consists entirely of perpetual debt. The firm’s debt is risk-less, perpetual, selling at par, and has a 4% yield. If the firm were to change its capital structure, new debt would still have a 4% yield. The expected return on the market is 8%. Given this information, answer the following questions:

a. (3 points) What is the firm’s return on equity?

\[
\frac{28}{400} = 7\%
\]

b. (3 points) What is the firm’s current weighted average cost of capital.

\[
7\%
\]

c. (3 points) What is the current price per share?

\[
\frac{400}{80} = \$5.00
\]

Now assume that the above firm issues $200 in debt and uses the funds to repurchase equity. This change in capital structure reveals no new information about future firm prospects.

d. (3 points) What is the beta of the firm’s levered equity?

\[
10\% = 10 + B(08-.04) \Rightarrow B = 1.5
\]

e. (3 points) What is the overall firm’s new return on levered equity?

\[
7\% = \left(\frac{200}{400}\right)(4\%) + \frac{200}{200}(8\%) = 8\%
\]

f. (2 points) What is the firm’s new Weighted Average Cost of Capital?

\[
7\%
\]

4. (4 points) Dandy Product’s overall weighted average required rate of return is 9 percent. Its yogurt division is riskier than average, its fresh produce division has average risk, and its institutional foods division has below-average risk. Dandy adjusts for divisional by adding or subtracting 2 percentage points and project risk by adding or subtracting 3 percentage points. Thus, the maximum adjustment is 2 + 3 percentage points. What is the risk adjusted required rate of return for a low-risk project in the yogurt division?

\[
9 + 2 - 3 = 8
\]

Key
5. Now consider a DIFFERENT COMPANY in a world that of perfect capital markets, with one change, CORPORATE TAXES DO EXIST. This world has no personal taxes, all investors have homogeneous expectations, no bankruptcy costs, and M&M's with corporate taxes theory of capital structure is true. Company Y is financed has the following market value balance sheet:

Assets = $ 250  
Liabilities = $150  
Equity = $100

The firm had $25 in EBIT last year. The firm has 20 shares outstanding. The firm expects the same return/profits for the foreseeable future. The firm is a zero growth firm, that pays out all excess earnings as dividends. Any time the firm changes its capital structure, it changes only the debt/equity mix and does not change its physical/fixed assets. Liabilities consist only of the firm's debt. The debt is riskless, perpetual, selling at par, and has a 6% pre-tax yield. If the firm were to change its capital structure, new debt would still have a 6% pre-tax yield. The firm's tax rate is 40%. Given this information, answer the following questions:

a. (2 points) What is the value of the firm's perpetuity debt tax shield?

\[ 150 \times 40\% = 60 \]

b. (3 points) What is the current weighted average cost of capital (WACC)?

\[
\left( \frac{150}{250} \times 10\% \right) \times (1 - 0.4) + \left( \frac{100}{250} \times 9.6\% \right) = 2.16 + 3.84 = 6.00\%
\]

Now assume the firm redeems $150 in debt and issues $150 in equity.

c. (3 points) Write out the firm's new balance sheet after all of the changes.

\[ 190 = 0 + 190 \]

d. (3 points) What is the firm's Weighted Average Cost of Capital?

\[ \frac{15}{190} = 7.9\% \]

Now assume the firm can change its capital structure to be any combination of debt and equity, but that level of fixed assets cannot be changed.

e. (3 points) What is the firm's unlevered equity beta?

\[ 5 = K \]
f. (3 points) Write out the balance sheet that corresponds with the maximum firm value.

\[ \frac{25}{100} = 416.66 = \text{max} \]

\[ 416.66 \times 1.166 = 166.64 \]

\[ \frac{25}{35} = 416.66 - 62.02 \]

6. (3 points) The DJH Corporation just paid a of $2.68. It expects its cash dividends to grow 4.1% per year forever. DJH has a debt ratio of L = 33%. Its borrowing rate is rd = 8.0%. DJH pays corporate taxes at the rate of 30%, rf = 4.2%, rm = 9.9%, and DJH's common stock is currently selling for $22 per share. What is DJH's expected cost of stock?

\[ \frac{2.68 (1 + 4.1\%)}{22} + 4.1\% = 16.78\% \]