

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) Multiple Choice are worth 3 points each. True False are worth 2 point each. Short answer questions are worth 4 points each. Problems are worth the number of points listed in the question.

1. (3 points) What is almost always listed as the primary goal of managers?

2. (4 points) The overall process of capital budgeting can be broken down into five steps as a project moves from idea to reality. Name these five steps. Describe which step is most important.

1.

2.

3.

4.

5.

Most important =

Why?

3. (2 points) Match the Capital Budgeting method with the assumed reinvestment rate (answers may be used more than once).

- a. Net Present Value \_\_\_\_\_
- b. Internal Rate of Return \_\_\_\_\_
- c. Payback Period \_\_\_\_\_
- d. Profitability Index \_\_\_\_\_

- a. Internal Rate of Return
- b. Cost of Capital
- c. Return on Investment
- d. Return on Equity
- e. None of the above.

4. What is the best Capital Budgeting Decision Rule? Why?

5. Hard capital rationing refers to the rationing imposed externally by limited funds for borrowing from outside sources.

- a. True
- b. False

6. An option is in-the-money if exercising the option will not provide a monetary gain.

- a. True
- b. False

7. Briefly define a "real option." How do real options change the calculation of a project's NPV?

8. Project A has an internal rate of return of 18 percent, while Project B has an internal rate of return of 16 percent. However, if the company's cost of capital (WACC) is 12 percent, Project B has a higher net present value. Which of the following statements is most correct?
- The crossover rate for the two projects is less than 12 percent.
  - Assuming the timing of the two projects is the same, Project A is probably of larger scale than Project B.
  - Assuming that the two projects have the same scale, Project A probably has a faster payback than Project B.
  - Net Present Value cannot be used to choose between these two projects.
  - Answers b and c are correct.

9. (2 points each) Real Options – fill in the blanks. If you need to describe the option more fully, write your description near the question. For the record, the type of option is either call or put. The underlying asset refers to the item, which upon a change in value, will affect the decision to exercise or not exercise the option. If you need to make assumptions to answer the question, write your assumptions beside the question.

a. You go to a job interview and the potential employer makes a binding job offer provided you can graduate by Spring 2005.

Type \_\_\_\_\_ Who is long \_\_\_\_\_ Who is short \_\_\_\_\_ Underlying Asset \_\_\_\_\_

b. You are trying to avoid completing the 4531 project. If no one turns in the project, everyone gets an 85. If even one person turns in the project, all of those who do not complete the project will receive zero. For each person who does not turn in their projects, the average scores of those who turn in the project will increase by 1.5 points (i.e., from 85 to 86.5 if one person does not complete the project). In a meeting with your classmates, all of them agree to not complete the project. While you are unsure of your classmates, you are certain that you will not turn in the project.

Type \_\_\_\_\_ Who is long \_\_\_\_\_ Who is short \_\_\_\_\_ Underlying Asset \_\_\_\_\_

c. You have heard that some of your classmates were less than truthful about not completing the project. They plan to turn in the project. You have a very large, somewhat older sister who promises to physically injure anyone who turns in the project. While you disapprove of her violent tendencies, she always carries out her threats.

Type \_\_\_\_\_ Who is long \_\_\_\_\_ Who is short \_\_\_\_\_ Underlying Asset \_\_\_\_\_

d. Your 4531 professor keeps mumbling something about a “prisoner’s dilemma game.” Since several students do not appear to know the game to which he refers, he offers to add 1 point to the final exam score of anyone who can describe the game on the back of page 1 of this exam. While he may be somewhat forgetful, he keeps his word when he puts it in writing.

Type \_\_\_\_\_ Who is long \_\_\_\_\_ Who is short \_\_\_\_\_ Underlying Asset \_\_\_\_\_

10. (3 points) Someone offers to sell you a product for a given price, briefly (two sentences) describe how finance believes you should make on whether to purchase the item?

11) Depreciation increases an asset's book value each year.

- True
- False

12. (3 points) What are the three components/decisions in creating dividend policy for a firm?

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- 
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13. (3 points) What is the optimal capital structure? Why?

Instructions:

- 1) The part of the exam is open book and open notes.
- 2) Point values are listed with the question.
- 3) Show your work in order to have the possibility of partial credit.

1) (9 points) The following series of cash flows occur for  $t = 0, 1, 2, 3, 4, 5,$  and  $6,$  respectively:  $-\$115,500, \$18,500, \$28,500, \$3,500, \$8,500, \$68,500,$  and  $\$108,500.$  If the appropriate risk-adjusted discount rate is  $8\%:$

What is the IRR?

What is the payback period?

What is the Profitability Index?

2. (5 points) You have the following cash flows, Year 0=0, Year 1=-800, Year 2 = +5000, Year 3 = -5000. If your cost of capital is  $10\%:$

a. What is the correct NPV?

b. What is the correct IRR?

3. (5 points) Consider the projects shown below. If you were hard capital rationed to  $\$110$  for the initial investment, which project(s) should you choose?

| Project:      | A   | B   | C   | D   | E   | F   | G   | H  | I  |
|---------------|-----|-----|-----|-----|-----|-----|-----|----|----|
| Initial Cost: | 25  | 30  | 15  | 40  | 45  | 40  | 25  | 20 | 5  |
| NPV:          | 2.0 | 3.5 | 3.6 | 3.2 | 2.8 | 3.8 | 4.2 | .7 | .9 |

4. (3 points) Suppose you buy some land for  $\$100,000$  and immediately buy a European put option on the same piece of land with a strike price of  $\$110,000$  and expiration one year from today. If in one year the price of the land is  $\$120,000,$  what is the intrinsic value of the option at expiration?

5. (3 points) Suppose you can buy a call option on a piece of land. The land is currently valued at  $\$75,000.$  In one year, the land will either be worth  $15\%$  more or  $8\%$  less. The options strike price is  $\$74,000$  and the riskless rate of return is  $4\%.$  What is the value of the call option today?

6. (3 points) Suppose you owned the land, and wanted to buy a put option, using the same inputs as above. How much is the put option, with exercise value of  $\$74,000,$  worth today?

7. (20 points) Your firm is considering replacing an existing machine with a new machine. The old machine is involved in a project that should last five more years. Here are the details of the old machine: 1) It was bought 2 years ago for \$20,000, 2) It was being depreciated using the 7-year MACRS rates, 3) It can be sold today for \$14,000, 4) If you decide not to replace the machine today, it can be sold for \$2,000 at the end of year 5. Here are details of the new machine: 1) It will cost \$40,000, 2) It will be depreciated as per the 5-year MACRS rates, 3) It can be sold at the end of year 5 for \$4,000. Current production is \$50,000 and this will increase to \$60,000 per year. The old machine had a Cost of Goods Sold (excluding depreciation and fixed costs) of 50%, while the new machine will reduce the Cost of Goods Sold (excluding depreciation and fixed costs) to 45%. Fixed costs, mainly annual maintenance costs, will increase from \$4,000 to \$8,000 per year. The increased efficiency will lower our inventory level by \$2000 and accounts payable by \$1500. Concurrent with purchase of the new machine, management will take out a \$25,000 five-year amortized bank loan with monthly payments. The quoted interest rate is 8%. The firm's tax rate is 40% and its weighted average cost of capital (WACC) is 13%. Management classifies projects as low risk, average risk, or high risk. Depending on the project's risk, the firm adjusts the cost of capital (up or down) by 2%. This project will be financed with bank debt estimated with a pre-tax cost of 10%. Since this is a product expansion, management feels that this is a low risk project.

(Fill in the blanks for 2 points) At a discount rate of \_\_\_\_\_% the NPV of this project is \$\_\_\_\_\_. For 18 points show how the previous two answers are correct.

8. (2 points) Carter Corporation has some money to invest, and its treasurer is choosing between City of Chicago municipal bonds and IBM corporate bonds. Both bonds have the same maturity, and they are equally risky and liquid. If IBM bonds yield 5.8 percent, and Carter's marginal income tax rate is 35 percent, what yield on the Chicago municipal bonds would make Carter's treasurer indifferent between the two?

9. 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 = \$ 150 | Liabilities = \$0 |
|                 | Equity = \$150    |

The firm had \$27 in EBIT last year. The firm has 30 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 30%. Given this information, answer the following questions:

a. (2 points) What is the current weighted average cost of capital (WACC)?

b. (2 points) What is the firm's current dividends per share?

Now assume the firm issues \$120 in debt and repurchases \$120 in equity.

c. (2 points) Write out the firm's new balance sheet after all of the changes.

10. (3 points) A firm has the following book-value balance sheet; Debt = \$30,000, Common Stock (\$1 par) = 300 and Retained Earnings = \$36,000. The book value of assets is the total of Debt, Common Stock and Retained Earnings. The firm's bonds are currently selling at par and the firm's stock is currently selling for \$27. The firm's tax rate is 40%. What is the value of the firm's tax shield (i.e. the change in firm value due to the use of leverage in the capital structure)? Show your answer to the nearest \$1.