

Multiple choice – 3 points each – 30 points total

1. For a multi-product firm with all equity, if a project's beta is different from that of the overall firm, then the:
 - A. project should be discounted at a rate commensurate with its own beta.
 - B. project should be discounted at the T-bill rate.
 - C. project should be discounted using the overall firm's beta.
 - D. project should be discounted at the market rate.
 - E. CAPM can no longer be used.

2. The internal rate of return (IRR):
 - I. rule states that for a project with conventional cash flows, an IRR that is less than the required rate should be accepted.
 - II. is the rate generated solely by the cash flows of an investment.
 - III. is the rate that causes the net present value of a project to exactly equal zero.
 - IV. can effectively be used to analyze all investment scenarios.
 - A. I and IV only
 - B. II and III only
 - C. I, II, and III only
 - D. II, III, and IV only
 - E. I, II, III, and IV

3. If portfolio weights are positive: 1) Can the return on a portfolio ever be less than the smallest return on an individual security in the portfolio? 2) Can the variance of the portfolio ever be less than the smallest variance of an individual security in the portfolio?
 - A. 1) yes 2) yes
 - B. 1) yes 2) no
 - C. 1) no 2) yes
 - D. 1) no 2) no
 - E. 1) maybe 2) yes

4. A stock had returns of 8%, 15%, -13%, and 21% over the past four years. What is the geometric average return for this time period?
 - A. 7.8%
 - B. 9.1%
 - C. 7.4%
 - D. 6.9%
 - E. 8.3%

5. Which one of the following stocks will have the highest expected return?

Stock	A	B	C	D	E
Standard deviation	32%	46%	67%	38%	41%
Beta	.8	1.1	.9	1.2	1.3

- A. Stock A.
B. Stock B.
C. Stock C.
D. Stock D.
E. Stock E.
6. You are given the following cash flows for two projects:
- | Project | Year 0 | Year 1 | Year 2 | Year 3 |
|---------|--------|--------|--------|--------|
| A | -\$700 | \$300 | \$300 | \$300 |
| B | -\$950 | \$400 | \$400 | \$450 |
- What is the crossover rate?
- A. 12.5%
B. 15.0%
C. 17.5%
D. 20.0%
E. 22.5%
7. You are told that a project breaks even on a financial basis. Assuming conventional cash flows, the IRR of the project:
- A. equal to zero.
B. greater than the required return.
C. less than to the required return.
D. equal to the required return.
E. None of the above.
8. Suppose a firm uses a constant WACC to make capital investment decisions without any adjustments for risk. The firm will tend to:
- A. reject profitable, low risk projects and accept unprofitable, high risk projects.
B. reject profitable, low risk projects and reject unprofitable, high risk projects.
C. accept profitable, low risk projects and reject unprofitable, high risk projects.
D. accept profitable, low risk projects and accept unprofitable, high risk projects.
E. become less risky over time.

9. The EAC method for evaluating projects applies when which of the following project characteristics exist?
- I. The projects are mutually exclusive.
 - II. The projects have different economic lives.
 - III. The projects will be replaced more or less indefinitely.
- A. I only
B. II and III only
C. I and III only
D. I and II only
E. I, II, and III
10. Which of the following risks does not exist in a well-diversified portfolio?
- A. Asset-specific risk
 - B. Market risk
 - C. Non-diversifiable risk
 - D. Systematic risk
 - E. Benchmark risk

Partial Credit Problems --- SHOW ALL WORK

Problem 1 (11 points) A project under consideration will produce cash flows of \$630,000 per year for 13 years. The project will cost \$3.8 million today to begin production. In one year, it is possible that the project will be a runaway success. If this is true, the company can spend \$1.8 million at that time to expand production. After expansion, the annual cash flows would be \$1.35 million per year. There is a 30 percent likelihood of a runaway success. In either case, the project will still end 13 years from today. What is the value of the option to expand assuming a required return of 12 percent? What is the minimum new cash flow that the company would require to undertake the expansion?

Problem 2 (10 points) Hawley Corp. had sales of \$95 million for the current year. Costs were \$57 million, and net investment was \$12 million. Each of these is expected to grow at 13 percent next year, with the growth rate declining by 2 percent per year until the growth rate reaches 5 percent. There are 7.75 million shares of stock outstanding and investors require a return of 11 percent return on the company's stock. To estimate the terminal value, you feel that the PE ratio is most appropriate and the correct PE multiple is 14. The corporate tax rate is 35 percent. What is your estimate of the company's stock price?

Problem 3 (11 points) Muscle Motors has a new sports car called the SmoMobile® that it is evaluating before bringing to market. The new car, which is customized for the buyer, would be sold for the next five years at a price of \$95,000 each. The equipment necessary for production will cost \$165 million and be depreciated on a 5-year MACRS schedule. The company projects that fixed costs will be \$53.9 million per year and variable costs will be \$49,600 per car. The company will require an investment in inventory equal to 10 percent of sales a year prior to the sale. The inventory will be returned at the end of the project's life. The equipment can be sold for \$20 million at the end of the project, although the company will retain the equipment for a future model. The required return is 12 percent and the tax rate is 38 percent. How many cars must be sold each year to make this investment attractive to the company?

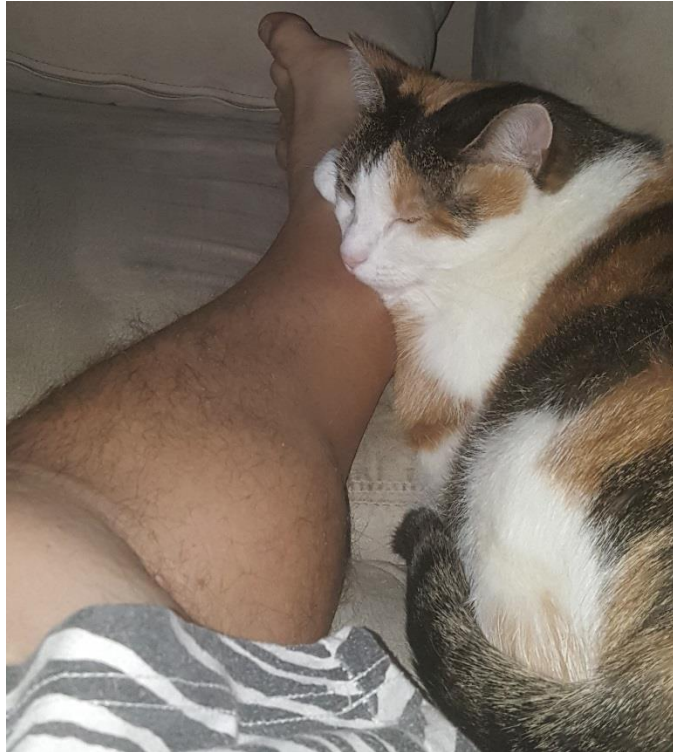
Problem 4 (13 points) Hörnqvist Industries is considering the production of hockey skates. The new skates would have a price of \$159 today. The equipment necessary for production will cost \$18.5 million and will be depreciated on a 10-year MACRS schedule. The projected sales are 40,000, 48,000, 53,000, 60,000, and 65,000 pairs per year for the next five years, respectively. Variable costs will be \$35 per pair and fixed costs are estimated at \$2.5 million per year, both in today's dollars. The company expects that the project will continue indefinitely and the cash flow will increase at a .5 percent real rate. The company has a tax rate of 38 percent and a nominal required return of 11 percent on new product lines. What is the NPV of the new skates?

Problem 5 (25 points)

PRETTY KITTY SUPPLIES

Pretty Kitty Supplies (PKS) is based in Bethesda, Ohio and has manufactured and sold cat toys, litter boxes, and related items for the past 60 years. The company has the opportunity to manufacture and market a new line of premium cat toys. As an employee of the company, you have been asked to analyze the project.

The Project: PKS is trying to determine whether to license, manufacture and sell a new line of premium cat toys. The toys are designed to create a more interactive experience for cute kitties.



(NOTE: This is my kitty, Ginger!! Isn't she cute?)

An evaluation of the project has estimated that sales will be \$1.3 million, \$1.6 million, \$1.9 million, \$2.2 million, and \$2.4 million per year over the next five years, respectively. Variable costs of production for the new toy are 34 percent of sales. As was mentioned, PKS will be licensing the new toy designs from another company, Wonderful Kitty. The original owner of that company appeared on *Shark Tank* and struck a deal with Mr. Wonderful. In the negotiations for license, Mr. Wonderful said they would require a 6 percent licensing fee be paid to Wonderful Kitty per dollar of sales of the new product in perpetuity. Management has determined that the necessary equipment will cost \$3.75 million and will be depreciated on a 15-year MACRS schedule. The new toys will require an investment of 15 percent of current year's total sales in NWC each year. The NWC requirement is the same for all products manufactured by PKS. Fixed costs will be \$275,000 per year.

An outside consultant, who was hired at a cost of \$75,000, has determined that the company will lose sales of \$110,000, \$120,000, \$130,000, \$130,000, and \$140,000 from its existing cat toys year over the next five years, respectively. The existing cat toys have a variable cost equal to 32 percent of sales and fixed costs of \$325,000 per year.

Other Issues: PKS believes that the cash flows from the new product line will grow at an annual rate of 2.2 percent for the indefinite future after Year 5. PKS has a capital structure of 25 percent debt. The floatation costs of debt are 3 percent and the floatation costs of equity are 6 percent. The company finances 80 percent of the equity of new project using retained earnings. Net working capital does not require floatation costs.

At the beginning of the negotiations, PKS paid \$150,000 for the option to choose whether to manufacture the new toys for the next two years. This means that PKS can decide whether to manufacture the new toys any time over the next two years but no other company can manufacture the new toys during this time. However, if PKS decides not to license the toys in the next two years, Wonderful Kitty is free to go to any other company. If this happens, PKS will lose projected sales of \$110,000, \$125,000, and \$140,000 of its current cat toys in Years 3 through 5 to the competitor that introduces the new cat toy line.

The tax rate for PKS is 38 percent. The hurdle rate for the new toy line is 10.1 percent.

Analysis: Calculate the payback period, profitability index, NPV and IRR.