E120: Principles of Engineering Economics

Practice exam for Midterm #2

Part 1: Concepts. (25 points)

1. Circle the only correct answer.

1.1 Which of the following is a right of an owner of a share of common stock?

a. The right to directly choose the auditing firm the company uses.
b. The right to sue the company in bankruptcy proceedings if common dividends are not paid.
c. The right to vote for directors
d. The right to participate in any new debt offerings the company sells to public.
e. Preference over preferred shareholders in the payment of dividends.

1.2 Which of the following criteria is/are biased in favor of liquid investments?

I. Payback period
II. AAR
III Discounted payback period

a. I only
b. III only
c. I and II only
d. I and III only
e. I, II and III

1.3 If a project with conventional cash flows has an IRR less than the required return, then:

a. The profitability is less than 1.
b. The discounted payback period is zero.
c. The AAR is greater than the required return.
d. The payback period is less than the maximum acceptable period.
e. The NPV is positive.

1.4 The Equivalent Annual Cost method for evaluating projects applies when which of the following project characteristics exist(s)?

I. The projects generate different cash inflows.
II. The projects have different economic lives (duration).
III. The projects will be renewed indefinitely

a. III only
b. I and II only
c. I and III only
d. II and III only
e. I, II, and III.

1.5 Which of the following criteria should be applied to evaluate mutually exclusive projects?

I. NPV
II. IRR
III. PI

a. I only
b. II only
c. I and II only
d. I and III only
e. II and III only

Part 2: calculations.

2. (25 points) You are given the following stock quote for the stock that just paid dividend.

52 weeks					Yld		Vol				
Hi	**Lo**	**Stock**	**Sym**	**Div**	**%**	**PE**	**100s**	**Hi**	**Lo**	**Close**	**Chg.**
48.72	27.10	Dynegy	DYN	1.00	3.3	18	20925	31.55	29.40	30.20	-0.56

a. (12 points) Assume the quote dividend is annual, and the expected annual growth rate in dividends is 10%. Then what is the required return suggested by the constant growth model on Dynegy stock?

b. (13 points) Suppose that the dividend is expected to grow at 5% for the next 2 years and then at 10% forever. If the required return is 14%, is the stock overvalued, undervalued or fairly priced?

3. (25 points) Bill plans to open a do-it-yourself dog bathing center in a storefront. The bathing equipment will cost $50,000. Bill expects the after-tax cash inflows to be $15,000 annually for 8 years, after which he plans to scrap the equipment and retire to the beaches of Jamaica.

a. (6 points) What is the project's payback period?

b. (6 points) Assume the required return is 10%. If Bill's target of discounted payback period is 4 years, should he make the investment?

c. (13 points) Assume the required return is 15%, what is the project's NPV and profitability index of the investment? Should Bill make the investment?

4. (25 points) You are considering investing in a cost-cutting process. Pretax cost saving from the project is expected to equal $50 for each of the three years of the project's life. The process has an initial cost of $225 and will be depreciated straight-line to zero over three years. Assume a 34% tax bracket, a discounted rate of 10%, and a salvage value of zero.

a. (7 points) what is the value of the annual depreciation tax shield for the project?

b. (7 points) How much is the annual operating cash flow from the project?

c. (11 points) If the equipment is sold at the end of year 3 for $80, what is the NPV of the project?

E120: Principles of Engineering Economics

Midterm Exam #2
November 9, 2005
Instructor: Wen-Yu Liao

Name: _____ (please print)

SID: _____

- **Closed books and notes but two 2-sided A4-size sheets are allowed. No PDAs or laptops allowed. Use of cell phones during the exam is forbidden.**
- **Clearly state all the mathematical expressions that are needed to solve the problems. No credit will be given to numerical answers without the proper setup.**
- **Answer each of the following questions in the space provided. If you need more space to show major computations you performed to obtain your answer for a particular problem, use the back of the preceding page.**
- **Present your work in an organized and neat fashion.**

Problem	1	2	3	Total
Score				

Part 1: Concepts. (25 points, 5 each, no partial credit)

1.1) Which of the following statements is **FALSE**?

a. With unconventional cash flows, there will be multiple IRRs.
b. For each project with nonzero discount rate, discounted payback period is always longer than regular payback.
c. Based on the average accounting rule, a project is acceptable if its average accounting return is higher than the IRR.
d. When there's a conflict between the results of NPV and IRR rules, we should use NPV rule. T

1.2) Which of the following statements is **FALSE** regarding common stock and preferred stock?

a. The holders of the preferred stock will receive dividends prior to the holders of common stock.
b. Preferred stock is better than common stock.
c. Common stock holders have voting rights while preferred stock holders generally don't.
d. Corporations usually create different classes of common stocks with unequal voting rights.

1.3) You are told that the profitability index (PI) of a new project is 1, that means:

I. The internal rate of return is the same as the required return for the project.
II. The net present value of this project is zero.
III. The net present value of this project is the same as the initial costs of the project.

a. Only I is true.
b. I & II are true.
c. I & III are true.
d. None of I, II, and III is true.

1.4) Which of the following statements is **FALSE** about the dividend growth model?

a. The price of the stock will grow at the same rate as the dividend.
b. The required return of the stock is the sum of dividend yield and capital gains yield.
c. The capital gains yield is the same as the dividend growth rate.
d. We can compute the value of the stock if we know only the required return and dividend growth rate for the stock.

1.5) Suppose you are considering two mutually exclusive investments both with conventional cash flows. Given that the required rate of return for these projects is 10%, the crossover rate is 12 percent. What can we say about these two investments?

a. At the crossover rate, the NPV of these two investments are zero.
b. NPV and IRR rule will give us the same result on which investment to choose.
c. We should choose the investment with higher NPV.
d. We should choose the investment with higher IRR.

Part 2: calculations.

Problem 2 (25 points)

GrowthPower Inc. has issued new preferred stocks. The first dividend will be issued one year from now in the amount of $5 per share and future dividends will be issued annually. The company expects the dividends to remain constant for 5 years. After that, the dividend will grow at a rate of 5% every 6 months, forever. Suppose the required rate of return on this stock is 12% compounded monthly for the first 5 years and then 12% compounded quarterly there after, what is the present value of a share of the preferred stock?

Problem 3 (50 points)

Your firm is considering a replacement project. The existing SP printer was purchased 10 years ago at the cost of $1,500 with expected life of 15 years. The current market value of the SP printer is $400 and the expected salvage value in 5 years will be $100. The new FP printer can be purchased for $ 2,000 and its expected life is 5 years. It is estimated that the FP printer can be sold at $400 at the end of 5 years. Over its 5-year life, your firm can reduce the cost of labor and raw material by $6,000 per year. The marginal tax rate of your firm is 40%.

(a) (12 points) Suppose both printers are to be depreciated to zero using straight-line method. What are the operating cash flows for this project?

(b) (12 points) Suppose the net working capital (NWC) is increased by $ 200 only once at the time of replacement. What are the total cash flows related to changes in NWC at the time of replacement (e.g. year 0) and the end of the project? (e.g. year 5)?

(c) (12 points) What are the total cash flows related to capital spending (NCS) at the time of replacement (e.g. year 0) and the end of the project? (e.g. year 5)?

(d) (14 points) Suppose the required rate of return for the project is 12%, what is the NPV of this project? Based on the NPV, do you think your firm should replace the existing SP printer with the FP printer?