

IE 342 17-18 Spring Semester

Study Set 6

Please do not submit your answers as they will not be graded!!

- 1) Suppose you purchased a piece of equipment at a cost of \$86,000 has an estimated salvage value of \$12,000 and an estimated useful life of five years. It was placed in service on May 1 of the current fiscal year, which ends on December 31. The asset falls into a seven-year MACRS property category. Determine the depreciation amounts over the useful life.
- 2) On April 1, Beth paid \$250,000 for a residential rental property. This purchase price represents \$200,000 for the building and \$50,000 for the land. Five years later, on November 1, she sold the property for \$300,000. Compute the MACRS depreciation for each of the five calendar years during which she had the property.
- 3) A consumer electronics company was formed to develop cellphones that run on or are recharged by fuel cells. The company purchased a warehouse and converted it into a manufacturing plant for \$6,000,000. It completed installation of assembly equipment worth \$1,500,000 on December 31. The plant began operation on January 1. The company had a gross income of \$8,500,000 for the calendar year. Manufacturing costs and all operating expenses, excluding the capital expenditures, were \$2,280,000. The depreciation expenses for capital expenditures amounted to \$456,000.
 - (a) Compute the taxable income of this company.
 - (b) How much will the company pay in federal income taxes for the year?
- 4) A series of four annual constant-dollar payments beginning with \$10,000 at the end of the first year is growing at the rate of 9% per year. (Assume that the base year is the current year.) If the market interest rate is 12% per year and the general inflation rate is 7% per year, find the present worth of this series of payments, based on
 - a) constant-dollar analysis
 - b) actual-dollar analysis.
- 5) Suppose that you borrow \$20,000 at 12% compounded monthly over five years. Knowing that the 12% represents the market interest rate, you realize that the monthly payment in actual dollars will be \$444.90. If the average monthly general inflation rate is expected to be 0.5%, determine the equivalent equal monthly payment series in constant dollars.
- 6) The annual fuel costs required to operate a small solid-waste treatment plant are projected to be \$1.8 million, without considering any future inflation. The best estimates indicate that the annual inflation-free interest rate will be 8% and the general inflation rate will be 6%. If the plant has a remaining useful life of six years, what is the present equivalent of its fuel costs? Use actual-dollar analysis.

- 7) A company has just received a special job order from one of its clients. The following financial data have been collected:
- This two-year project requires the purchase of special-purpose equipment for \$55,000. The equipment falls into the MACRS five-year class.
 - The machine will be sold for \$27,000 (today's dollars) at the end of two years.
 - The project will bring in additional annual revenue of \$114,000 (actual dollars), but it is expected to incur an additional annual operating cost of \$53,800 (today's dollars).
 - The project requires an investment in working capital in the amount of \$12,000 (today's dollars) at $n=0$. In each subsequent year, additional working capital needs to be provided at the general inflation rate. Any investment in working capital will be recovered after the project is terminated.
 - To purchase the equipment, the firm expects to borrow \$50,000 at 10% over a two-year period. The remaining \$5,000 will be taken from the firm's retained earnings.
 - The firm expects a general inflation of 5% per year during the project period. The firm's marginal tax rate is 40%, and its market interest rate is 18%.

- a) Compute the after-tax cash flows in actual dollars.
b) What is the equivalent present value of this amount at time 0?

- 8) A textile Company is considering automating its piece-goods screen printing system at a cost of \$20,000. The firm expects to phase out the new printing system at the end of five years due to changes in style. At that time, the firm could scrap the system for \$2,000 in today's dollars. The expected net savings due to automation also are in today's dollars (constant dollars) as follows:

End of Year	Cash Flow (in constant \$)
1	22000
2	19000
3-5	15000

The system qualifies as a five-year MACRS property and will be depreciated accordingly. The expected average general inflation rate over the next five years is approximately 5% per year. The firm will finance the entire project by borrowing at 10%. The scheduled repayment of the loan will be as follows:

End of Year	Principal Payment	Interest Payment
1	\$6,042	\$2,000
2	\$6,647	\$1,396
3	\$7,311	\$731

The firm's market interest rate for project evaluation during this inflation-ridden time is 20%. Assume that the net savings and the selling price will be responsive to this average inflation rate. The firm's marginal tax rate is known to be 40%.

- a) Determine the after-tax cash flows of this project, in actual dollars.
b) Determine the net present-value reduction (or gains) in profitability due to inflation.

