

國立臺北大學 112 學年度日間學士班轉學生招生考試試題

學制系級：金融與合作經營學系日間學士班 3 年級

科目：財務管理

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1. (10 points) Upon retiring, you anticipate living for another 25 years. You'd like to make \$75,000 a year in income. If the annual interest rate is 9%, how much should you have saved in your retirement account to obtain this income? (Presume the payments begin a year after your retirement.)
2. (10 points) A giant crane is about to be purchased by Mass Company. It is anticipated to require a \$6 million initial investment and to produce a \$3 million end-of-year cash flow per year for three years. There will be a disposal fee of \$1 million at the conclusion of the fourth year. If the project's cost of capital is 12 percent, determine the project's MIRR (modified internal rate of return).
3. (15 points) A project needs a \$200,000 initial expenditure and anticipates generating \$120,000 in annual cash flow before taxes for two years (cash flows will occur at $t = 1$ and $t = 2$). The rate of corporation taxation is 21%. Using the MACRS 3-year plan, the assets will depreciate as follows: ($t = 1$: 33%); ($t = 2$: 45%); ($t = 3$: 15%); ($t = 4$: 7%). The company's tax condition enables it to utilize all available tax shields. The opportunity cost of capital is 12 percent. Assume the asset can be sold for book value when the project is finished. Determine the project's NPV.
4. (15 points) An investment of \$900 is needed for a project today. Sales of \$1,100 year can be produced forever. The first year's costs are \$600, and after that they rise by 20% annually. (Assume all the sales and costs occur at year's end; in this case, expenses are \$600 at time $t = 1$). Anytime and without penalty, the project can be terminated. Ignore taxes and calculate the NPV of the project at a 12 percent discount rate.
5. (10 points) The common stock of XYZ Corporation is currently worth \$40 million, and its risk-free debt is currently worth \$60 million. The estimated market risk premium is 10%, and the common stock of the corporation has a beta of 0.8. What is the firm's cost of capital if the Treasury bill rate is 6%? (Assume no taxes.)
6. (15 points) At time zero ($t = 0$), a project requires a \$90,000 initial investment in equipment and a \$10,000 initial investment in working capital. You anticipate that the project will generate revenues of \$120,000 per year for three years. You predict that manufacturing expenses will account for 60% of revenues. Assume that all income and expenses (i.e., $t = 1$, $t = 2$, and $t = 3$) occur at year's end. Over the three-year period, the equipment depreciates utilizing straight-line depreciation. The company can sell the equipment for \$10,000 at the end of the project and recover its investment in net working capital. The cost of capital is 15%, and the corporation tax rate is 21%. Calculate the project's NPV.
7. (10 points) The Solar Calculator Company plans to invest \$5 million into a new factory that makes calculators. \$2 million is spent annually on fixed costs. A solar calculator is produced for \$5 per unit and sells for \$20. What is the yearly sales level at which the factory will break even (i.e., $NPV = 0$) if it operates for three years and the cost of capital is 12 percent? (Assume that income and expenses occur at the year's end. Assume no taxes.)
8. (15 points) Petroleum Inc. (PI) controls off-shore oil leases. It is considering the construction of a deep-sea oil rig at a cost of \$500 million. The price of oil is \$100/bbl. and extraction costs are \$50/bbl. PI expects costs to remain constant. The rig will produce an estimated 1,200,000 bbl. per year forever. The risk-free rate is 10 percent per year, which is also the cost of capital. (Ignore taxes). Suppose that oil prices are uncertain and are equally likely to be \$120/bbl. or \$80/bbl. next year. Suppose that PI has the option to postpone the project by one year. Calculate the value of the real option to postpone the project for one year.

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