IE2111 ISE Principles & Practice II
Assignment #2
Date Due: 11 February 2025, 5 pm

Instructions

You may use Excel or any computing tools to calculate your final answers, but you must explain or show the relevant formulas or equations in your solutions. Submit your completed assignment into the Drop Box outside the ISEM Department Office at E1A-06-25, or to the professor at the end of the lecture.

(Total Marks: 20)

A company is considering the acquisition of a district cooling plant that produces chilled water for central air-conditioning systems. The total investment cost is $50 million. To fund the project, the company will take a 5-year bank loan of $30 million at an interest rate of 8% per year, to be repaid with 5 equal end-of-year payments. The other $20 million of the investment cost will be funded through cash from the liquidation of other company's other investments.

Annual profits from the sales of chilled water generated by the plant to commercial buildings in the district are estimated to be $6 million per year in the first 10 years. Due to increased operations and maintenance costs as the plant ages, the annual profits are expected to be only $5 million from year 11 to year 20 and $4 million from year 21 to year 25. All cash flows are assumed to occur at the end of each year.

The plant has a useful life of 25 years with a salvage value of $100,000. The company's *MARR* is 10%.

(*a*) What is the annual repayment amount for the bank loan? (2 marks)

(*b*) Draw a cash flow diagram for the project indicating all the cash flows at the end of each year. (5 marks)

(*c*) What is the *Present Worth* of the project? Is the project economically feasible? (3 marks)

(*d*) What is the *IRR* of the project? (3 marks)

(*e*) What is the *MIRR* of the project if the financing rate is 8% and the reinvestment rate is 10%? (3 marks)

(*f*) What is the discounted pay-back period of the project? (4 marks)