

Test 2

100 Points (Time: 60:00 Minutes)

Instruction for all problems: Show your work. No round down or up, use 2 decimals for dollar values and 4 decimals for factors.

Question 1: (10+10+10+10 +10 +10 points)

Use tables and interpolations for Problem #1. Limit the use of (P/F, i, n) as much as possible. Consider a bridge project that has an almost similar design its cash flow. Below are the information about the project:

Nominal interest rate 17.3% compounded annually except for years 10, 20, and 30 which is continuous compounding Life of the bridge: 40 years

Major capital investment: Now through year 5, \$10,000,000 a year then single investments of the same amount at the end of years 10, 20, and 30

Bridge will be used from the start of year 6 generating income and savings of \$2,000,000 in its first year of use increasing by \$100,000 to year 10, then decreasing to year 20 to zero income level increasing again in year 21 to \$2,000,000 and increasing by 14% each year to year 30, then decreasing by 25% to year 40

Is this a profitable investment?

Question 2: (10 points)

A company that manufactures air-operated drain valve assemblies budgeted \$74,000 per year to pay for plastic components over a 5-year period. If the company spent only \$42,000 in year 1, what uniform annual amount should the company expect to spend in each of the next 4 years to expend the entire budget? Assume the company uses an interest rate of 16% per year.

Question 3: (10 points)

Periodic outlays for inventory control software at Baron Chemicals are expected to be \$150,000 immediately, \$200,000 in 1 year, and \$350,000 in 2 years. What is the present worth of the costs at an interest rate of 18% per year, compounded continuously?

Question 4: (20 points)

A retail shopping center developer signed a contract to build a \$100 million high-end shopping center in City Center, because the city and county governments agreed to sales and tax rebates totaling \$18.7 million over 10 years. The contract called for the developer to raze existing buildings 2 years from the date the contract was signed and to have the shopping center built by the end of year 3. However, due to a real estate-induced recession in the United States, the developer sought and was granted a new contract. The new contract required the developer to raze the existing buildings at the end of year 1, but the shopping center would not have to be completed for 7 years from the date the contract was signed. Assume that the cost for razing the existing buildings is \$1.3 million and the developer does not build the shopping center until 7 years from now (at a cost of \$100 million). Determine the difference in the future worth cost in year 7 of the two contracts at an interest rate of 16% per year.

IEGR 350: Engineering Economy

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Your Name: