ENG 106 Homework #3 (due 1 Feb)

Present Worth

#1 Read the note on p. 210. Is the actual-dollar assumption realistic given the cash flows stated in each of the following three problems: 5.13, 5.33 and 5.45? State your reasoning.

(partial answer: For 5.33, the periodic renovation and annual maintenance costs would be expected to increase with inflation, so the given amounts are almost certainly stated in constant (today’s) $ rather than in actual $.)

5.13 Also, which project(s) would you select if the projects were independent? If they were mutually exclusive and there was a “do nothing” alternative with no cash flows? If they were mutually exclusive and there was no “do nothing” alternative? (partial answer: PW for C = $1282.)

5.33a Then repeat the analysis with i = 10%. (approx. answers: about $14 million & $12 million)

5.45 To be consistent with the AEW analysis below, assume the cash flows are stated in constant dollars and the MARR of 12% is inflation-free. (partial approx. answers for (a), PW for A over LCM of lives = about -$34k; for (b), PW for A = about -$28k)

Annual Equivalent Worth

#5 Read notes on p.259. Is the actual-dollar assumption realistic for the cash flows stated in 6.25 and #7 State your reasoning.

(partial answer regarding #7: In the real world, it’s very likely the year-end installment payments would be in actual $.)

6.25 (approx. answer: about $64k)

#7. A firm can purchase a machine for $40k under the following conditions: a down payment of $4k immediately, and a series of five equal annual installment payments beginning at EOY 1, calculated with 7% interest on the unpaid balance. Alternatively, the equipment can be bought for $36k cash now. Using AEW as the basis, determine which option is better, given the firm’s MARR = 10%. (partial answer: AEC for down-pmt option = about $9.8k/yr)

#8. Using AE worth as the basis for comparison, repeat problem 5.45. Start with the given data (not with your PW results from above) and use the “shortcuts” inherent in the AE method where possible. Assume the cash flows are stated in constant dollars and the MARR of 12% is inflation-free. These are some of the necessary conditions for using AE to compare the first copies of repeated projects that have unequal lives. Note that for part b, the planning horizon must be used explicitly. As a check on your results, for each part (a or b) the ratios of AE to PW should be the same for all the alternatives. (partial answer: AEW for Project A = about -$5.0k for both parts (a) and (b))

The following is not part of the homework.

ENG 106: Unknown Interest Rates and Present Worth Profiles

Please evaluate the following four cash flows and bring your results to lectures beginning on 4 February. Do not turn them in. For each flow, at what interest rate (to the nearest percent per period) is the present worth of the flow equal to zero? For each flow, sketch or plot the PW(i) over the range of i from -20% to +20% per period.

