Assignment 2

EECE/CPEN 481

Instructor: Jeff Carmichael

Selected problems from the textbook (Engineering Economic Analysis: Fourth Canadian Edition).

Problems are drawn mainly from material in Chapters 4 and 5.

1. Problem 1 (1.5 pts)
2. Problem 2 (1.5 pts)
3. Problem 3 (1 pt)
4. Problem 4 (1 pt)
5. Problem 5 (1.5 pts)
6. Problem 6 (1.5 pts)

Assignment 2

1. **Problem 1**

If $800 is deposited in a savings account at the beginning of each of 15 years, and the account earns 3.2% interest per year, how much will be in the account at the end of 15 years? Round to the nearest dollar.

2. **Problem 2**

The following two sets of revenues (incoming cash flows) will be equivalent in terms of economic desirability if A has a certain value. Assuming an interest rate of 4% compounded annually applies, what is the value of A (rounded to the nearest dollar) that causes these two sets of revenues to be equal to firm receiving the revenues?

Year	Cash Flow Option 1	Cash Flow Option 2
1	+A	+250
2	+A	+500
3	+A	+750
4	+A	+1,000
5	0	+1,250

3. **Problem 3**

Pete borrows $42,000 to buy a car. He must repay the loan in 48 equal end-of-period monthly payments. Interest is calculated at 0.55% a month. Determine the following:

(a) The nominal annual interest rate, rounded to the nearest tenth of a percent
(b) The effective annual interest rate, rounded to the nearest tenth of a percent
(c) The amount of the monthly payment, rounded to the nearest dollar

4. **Problem 4**

A man had to have the muffler replaced on his car. The repairman offered two alternatives. For $440 he would install a muffler, which would be guaranteed to last for two years. For $750 he would install a muffler guaranteed to last for four years. Assuming the present owner expects to keep the car for about three more years, which muffler would you advise him to have installed, and how much would he save? Use an interest rate of 6% (apply this as a discount rate). Assume that the less expensive muffler would last only two years, and could be replaced by a muffler at the same cost.

5. Problem 5

A cost analysis is to be made to determine what, if anything, should be done in a situation offering three "do-something" and one "do-nothing" alternatives. Estimates of the cost and benefits are as follows:

Alternatives	Cost ($)	Uniform Annual Benefit ($)	End-of-Useful-Life Salvage Value ($)	Useful Life (years)
1	500	135	0	5
2	600	100	250	5
3	700	100	180	10
4	0	0	0	0

Use a 10-year analysis period for the four mutually exclusive alternatives. At the end of five years, Alternatives 1 and 2 may be replaced with identical alternatives (with the same cost, benefits, salvage value, and useful life).

(a) If an 8% interest rate is used, which alternative should be chosen?

(b) If a 12% interest rate is used, which alternative should be chosen?

6. Problem 6

A steam boiler is needed as part of the design of a new plant. The boiler can be fired by natural gas, fuel oil, or coal. A decision must be made on which fuel to use. An analysis of the costs shows that the installed cost, with all controls, would be least for natural gas at $40,000; for fuel oil it would be $75,000; and for coal it would be $240,000. If natural gas is used rather than fuel oil, the annual fuel cost will increase by $5,500. If coal is used rather than fuel oil, the annual fuel cost will be $15,000 per year less. Assuming 6% interest, a 20-year analysis period, and no salvage value. which is the most economical installation?