CIVL 314
Summer 2015
Quiz 2

Name KEY

1. If the nominal interest rate is 4% per year and the compounding period is 1/2 year (i.e., 1 semiannual period), determine the following. Show all work clearly.

(a) the effective interest rate per semiannual period 2%

$$i = \frac{r}{m} = \frac{4\%}{2} = 2\%$$

(b) the effective interest rate per year 4.04%

$$i_a = \left(1+\frac{r}{m}\right)^m - 1 = \left(1+\frac{0.04}{2}\right)^2 - 1 = 0.0404 \text{ or } 4.04\%$$

2. The two alternatives shown in the table below are being compared on the basis of annual worth. Determine the cost of Alternative B that would be used to compare with Alternative A. It is not necessary to determine the cost of Alternative A; only the cost of Alternative B should be determined (due to time limitations). The interest rate is 4%, compounded annually. *{Set up the solution showing factor notation. If equations are used, show the equation used also. Clearly show the values substituted for the factors, whether obtained from a table or from an equation.}*

	Alternative A	Alternative B
First cost	- $600,000	- $4,000,000
Annual cost	- $175,000	- $5,000
Periodic cost every 10 years	----------	- $60,000
Salvage value	+ $15,000	----------
Life	8 years	Infinity

$$AW_B = (-\$4,000,000)(0.04) - \$5000 - \$60,000\left[\frac{A}{F},4\%,10\right]$$

$\left[\frac{A}{F},4\%,10\right] = 0.08329$

$$= -169,997$$

$$AW_A = -\$600,000\left[\frac{A}{P},4\%,8\right] - \$175,000 + \$15,000\left[\frac{A}{F},4\%,8\right]$$

$\left[\frac{A}{P},4\%,8\right] = 0.14853$ $\quad \left[\frac{A}{F},4\%,8\right] = 0.10853$

$$= -\$262,490$$

NOT REQ'D, BUT WOULD BE WORKED LIKE THIS

What is the capitalized cost of Alternative B?

$$CC_B = \frac{AW_B}{i} = \frac{-\$169,997}{0.04}$$

$$= -\$4,249,935$$

$$CC_A = \frac{AW_A}{i} = \frac{-262,490}{0.04}$$

$$= -\$6,562,251$$

If the capilized cost of A & B were being compared, CC_A could be det'med like this. For LCM = ∞ and an infinite number of 8 year cycles, the AW would be $-262,490