Assignment: Homework 4b (show your work)
Due on __________, September __, 200__

1. If the discount rate is 12.8%, find the following interest factors to 4 decimal places using annual compounding. Show the formula you used.

   a) \((A|P, 12.2\%, 12)\)
   b) \((P|F, 12.2\%, 12)\)
   c) \((F|A, 12.2\%, 12)\)
   d) \((P|A, 12.2\%, 12)\)
   e) Interpolate the answer for b) from the tables in the appendix of the Boyd text and compare to the value calculated above. Why are the results different?

2. Here are two series of cash flows with an interest rate of 8% per period:

<table>
<thead>
<tr>
<th>Period</th>
<th>Project X</th>
<th>Project Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>$1,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>6-10</td>
<td>2,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

   a. Find the equivalent present values of the two projects.
   b. Find the equivalent values of the two projects at the end of 10 years.
   c. Find the equivalent uniform series of payments per period for the two projects.

3. Find the equivalent present value of a series of $1000 payments flowing at the end of every odd-numbered year, beginning in 2004, if the effective annual interest rate is 9%. Consider “the present” to be the start of 2004. A time line or cash flow diagram may help you understand this problem.

4. Find the annual effective interest rate that should be charged in order to receive $250 at the end of five years for a $150 loan given today. Assume annual payments.

5. Find the effective interest rate that corresponds to a nominal rate of 6% per year

   a. compounded semi-annually
   b. compounded quarterly
   c. compounded monthly
   d. compounded daily
   e. compounded continuously
6. A loan of $6,000 requires monthly payments of $200 over a three-year period. These payments include both principal and interest.
   a. Determine the nominal rate of interest per year.
   b. Determine the effective interest rate per year.
   c. Find the amount of unpaid principal on the loan after one year of 12 payments (hint calculate the values at the end of one year).
   d. Find the total interest paid during the first year (12 payments).

7. You pay an insurance company $100,000.00, in return for which the insurance company promises to pay you and/or your heirs 6% interest at the end of each year forever and they will keep the $100,000.00 payment, how much should you receive each year?

8. Consider a prospective investment in a warehouse having a first cost of $300,000, operating and maintenance costs of $35,000 per year, and an estimated net disposal value (salvage value) of $50,000 at the end of 60 years. Assume an 8% annual interest rate. (it helps to draw a cash flow diagram for the costs and income flows)
   a. What is the present value of this investment if the planning horizon is 60 years?
   b. If replacement structures have the same first cost, life, salvage value, and operating and maintenance costs as the first one, what is the capitalized cost (present value) of perpetual service? (Note the difference between a 60-year life and infinite life!)

9. Using an interest rate of 7%, determine the present value of the following cash flow sequence:

<table>
<thead>
<tr>
<th>End of Period</th>
<th>Cash Flow (In thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-80</td>
</tr>
<tr>
<td>1-5</td>
<td>+20</td>
</tr>
<tr>
<td>6-10</td>
<td>+10</td>
</tr>
<tr>
<td>11</td>
<td>-10</td>
</tr>
</tbody>
</table>

(It is possible, of course, to discount each of the cash flows one-by-one. However, by using appropriate factors the calculation can be simplified.)