Homework 10 - Due 4 November 2011

Math 1140 Financial Mathematics

Collaboration Policy: You are encouraged to collaborate with your fellow students on this homework. You must turn in individual solutions and you are not allowed to use any written, typed, or recorded artifact from the meeting with your classmates. You are allowed to use any resources **except for the Appendix D in the textbook (the solutions to the odd-numbered exercises)**.

Pledge: On my honor, I pledge that I have neither given nor received unauthorized aid on this assignment.

Name(use block letters):

Signature:

For full credit you must show your work and your calculations for all the problems. I am not asking for the presentation of silly arithmetic!

Problem 1

The essence of all perpetuities is that you can distribute the _____ forever if you do not touch the _____.

Problem 2

Generex Inc makes a grant to a university of $\$1,000,000$ an January 1, 2003. Starting on January 1, 2005, semiannual payments will be made to a math scholarship fund. At $7\%(2)$, how large will these payments be if
a) the last is on January 1, 2015
b) the grants continue in perpetuity?

Problem 3

Calculate the equivalent interest rates for:
a) $8\%(4) = \_\_\_\%(12)$
b) $9\%(12) = \_\_\_\%(2)$
c) $6.8\%(1) = \_\_\_\%(4)$
d) $5.2\%(4) = \_\_\_\%(2)$

Problem 4

A man has an inheritance of $\$200,000$ from which he wants to withdraw $\$10,000$ quarterly starting immediately. If money earns 9% compounded monthly, compute the number of full quarterly stipends and the final stipend.

Problem 5

Victoria wants to save $\$20,000$ by making $500 monthly deposits. If her monthly deposits are made starting immediately and if her savings is making $5\%(1)$, find the number of full monthly

deposit and the last partial deposit.

Problem 6

Joseph pays \$100 per month into a savings account earning $5\%(4)$, with the first deposit on May 1, 1999 and the last on August 1, 2003. Then money sits until October 1, 2005 when Joseph takes out his first semiannual retirement payment. Find the semiannual retirement payment if
a) the last one is on April 1, 2010.
b) the retirement payments are to last indefinitely.

Problem 7

A small business makes $\$15,000$ quarterly payments into an equity fund that earns an average return of $8\%(12)$. The fund was started June 1, 1999 and payments will continue until September 1, 2010. Suppose the fund is reinvested on September 1, 2010 at $9\%(4)$, and starting on October 1, 2012 monthly payments will be made from the account to help cover emplyees' benefits. With payments starting on October 1, 2012, how much is available monthly if
a) payments continue until August 1, 2020?
b) payments continue indefinitely?