**Problem 1: (25 Points)**

Garry’s savings account earns 12% compounded monthly where Garry plans to deposit $1000 every three months. The first deposit occurred on January 1, 2009, and the last deposit will occur on October 1, 2011.

1. What is the effective annual interest rate?
2. What is the effective interest rate for three-month period?
3. What is the present worth of his investment? Assume today is April 12, 2011.
4. How much money will Garry have in his account on December 31, 2011?
5. Suppose Garry wants to withdraw the money in three equal yearly amounts beginning January 1, 2012. How much will he withdraw each time?

**Problem 2: (25 Points)**

One of three alternative equipments is under consideration. The estimated cash flows for each alternative are given below. The firm's MARR is 15%.

|  |  |  |  |
| --- | --- | --- | --- |
| **Manufacturer** | **C** | **D** | **K** |
| First cost | $22,000 | $26,200 | $17,000 |
| Annual costs | 7,000 | 7,500 | 5,800 |
| Salvage value at the end of useful life | 4,000 | 5,000 | 3,500 |
| Useful life | 4 years | 3 years | 6 years |

Use the Net Present Value to decide which of the three alternatives, if any, should be adopted? State your assumptions.

**Problem 3: (25 Points)**

A successful Engineering graduate of AUB wants to start an endowment in her name that would provide scholarships to students of engineering management. She wants to provide an annual scholarship per year and perpetually starting two years from now. Therefore, she plans to deposit an endowment of $1,000,000 in four annual amounts that starts with an initial amount of $400,000 to open a savings account this year, and which will increase gradually by a fixed amount until the total endowment, with an interest rate of 12% interest per year compounded semiannually. What will be the amount of the scholarship to be awarded for ever on her behalf? Clearly state your analysis assumptions.

**Problem 4: (25 Points)**

1. A treasury bond of face value equal to $10,000 and coupon rate of 12% per year paid quarterly over 5 years was issued at the beginning of 2 years ago. How much is the maximum that you will be willing to purchase this bond for if it is put for sale this month (i.e. during April this year) and your minimum attractive rate of return is 15% per year.
2. How much would the total net earnings be to the original owner by the end of this month if he decided to sell the bond for 10% less than its face value, knowing that the original owner was depositing his income in a savings account that pays 8% per year compounded quarterly?