EGR 312 ENGINEERING ECONOMY
***PRACTICE* TEST 1**

1. If you invest $2,500 in a money market account now, how much will the account be worth in 6 years at an interest rate of 4% per year?

$3,163.30

2. How much would you receive at the end of 4 years if you invest $2,000 now and $1,000 in 2 years in a fund offering a rate of 8% per year compounded quarterly?

$3,917.23

3. What are the nominal and effective quarterly rates for a certificate of deposit advertising 13.2% per year compounded monthly?

3.30% nominal
3.34% effective

4. A college student is looking for a new car. If the dealership is advertising an interest rate on new car loans of 6% per year compounded monthly and no down payment, and the student estimates he can afford payments of up to $300 per month for the next 4 years, what is the maximum price of the car he can afford now?

$12,774.10

5. What is the present value of a piece of equipment that costs $12,000 now and will generate revenue of $6000 the first year, with revenues increasing by $500 every year from year 2 through year 5? The interest rate is 8% per year.

   $15,642.47

6. A delivery company is considering expanding its fleet of vehicles by 5 trucks this year. Through a special leasing program, each truck will cost $3000 now and $3000 per year for the next 7 years. At the end of 7 years, the company can expect to pay an additional "lease return" fee of $5000 (total). The business will only purchase the new vehicles if the expected increase in yearly revenues will offset the lease cost. The interest rate is 7% per year.

   a. Draw the cash flow diagram.

   b. What yearly revenue (starting in year 1) is required to justify the fleet expansion? (Assume equivalent yearly revenues.)

      $18,361.06

   c. Assume the revenues justify the expansion. Alternatively, the company may choose to keep the fleet at its current size and add another shift to meet its anticipated delivery schedule. If the present value of the additional shift has been estimated at $100,000, should the company expand the fleet or add a shift? Justify your answer.

      $PW_{lease} < PW_{shift}$ so expand the fleet

7. A new milling machine will cost $50,000 to purchase and install in a carpet manufacturing plant. Revenues are expected to be $4000 per year for the first 4 years and then increase by $500 per year every year after that (from year 5 on). In year 15, the machine will be scrapped for parts which the company will sell for $5000.

   a. Draw the cash flow diagram.

   b. What is the present worth of this machine at an interest rate of 9%?

      $3,968.24

   c. The manufacturing engineering group estimates that yearly operation and maintenance costs will be $3000 per year for the first 8 years, then increase by 5% every year after that. Management has asked you to determine the equivalent annual worth of the machine including both revenues and costs. SET UP (but do not solve) this problem as you would solve it in Excel.