

NAME:

DATE: February 26, 2015

## IEGR 350 (Engineering Economy)

### EXAM #1

1. Suppose that we know that  $p = 1,000 - D/5$ , where  $p$  = price in dollars and  $D$  = annual demand. The *total* cost ( $C_T$ ) per year can be approximated by  $\$1,000 + 2D^2$ . (10 pts total...2 pts each)
  - a. What is the profit equation for this problem? HINT: Do **not** just show the equation from textbook!
  - b. Determine the value of  $D^*$  (in whole units) that maximizes profit.
  - c. Show that in part (b) profit has been maximized rather than minimized.
  - d. What is the maximum profit generated?
  - e. If the demand was equal to 350 units, how much profit could be generated?

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2. What lump sum of money must be deposited into a bank account at the present time so that \$2500 per year can be withdrawn for five years, with the first withdrawal scheduled for five years from now. The interest rate is 10% per year. Draw the correct cash flow diagram (CFD) for this scenario (2 pts) then solve fully (8 pts)

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3. Let's re-explore problem 4-7. However, determine the following: (a) how much would the monthly payments be if the loan was for 48 months for financing a \$35,000 loan on the purchase of a new automobile with a monthly interest rate of 0.5%, and (b) how much interest and principal will be paid in the third (3<sup>rd</sup>) month of this loan? **Show part (b) as a table to receive "full" credit.** (10 pts)

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4. How much total interest would have been paid by the end of year 3 for a 3-year loan of \$3300 if the interest is *payable each year* and the interest rate is 5% when 10% of the loan is repaid at the end of year 2 and the remaining balance of the loan is repaid at the end of the third year? Solve completely. **MUST show 'ALL' work for credit.**