

INDIVIDUAL SUPPLEMENTAL PROBLEMS Set B

Problem B1. [25 total project problem points] **DUE Monday, November 3, 2008**

The RX Drug Company has just purchased a pill capsulating machine for \$390,000. The plant engineer estimates the machine has a useful life of 25,000,000 capsules. The marketing department estimates production requirements to be 1,000,000 pills for the next two years, increasing to 1,500,000 for the following 4 years, increasing to 2,000,000 for the following 4 years, and increasing to 3,000,000 for the following 3 years. Compute the depreciation schedule for the machine by each of the following methods:

- (a) Straight line. [3 points]
- (b) Double declining balance. [8 points]
- (c) MACRS tax law. [8 points]
- (d) Unit of production depletion. [6 points]

Present the results in a summary table and plot the "Book Value" as a function of time. Neglect any potential salvage value.

Problem B2. [25 total project problem points] **DUE Monday, November 3, 2008**

You have purchased a 1/16 interest in a producing oil well for \$225,000. Recoverable oil reserves for the well were estimated at the time of purchase to be 300,000 barrels, 1/16 of which represents your share of the reserves. During the subsequent year, you received \$7,850 as 1/16 share of the gross income from the sale of a total of 2,000 barrels of oil. From this amount you have to pay \$600 as your share of the operating expense of producing the oil. Your Federal plus State combined income tax rate is 41%.

- (a) Compute your **depletion allowance** for the year.
- (b) What is your **after tax profit**.

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Problem B3. [40 total project problem points] **DUE Monday, November 3, 2008**

An engineer who is 25 years of age plans to retire at 65 years of age (a 40 working year career). Two alternative pension plans are available: plan 'A' pays 6.03% nominal annual interest compounded quarterly (with quarterly deposits being made), while plan 'B' pays 5.98% nominal annual interest compounded daily (with daily deposits being made, 365 days per year ignoring leap year).

- (a) **Determine the total annual deposits required for each plan to give a lump sum of \$500,000 at retirement.**
- (b) **Compare the effective annual interest rates** (*NOTE: carry enough significant digits to compare the difference!*) **and select the best plan.**

Assume the same engineer could deposit the total (employee + employer contribution) 15.30% FICA on \$57,800 annual wages into a 5.1% savings account compounded annually (with annual deposits being made).

- (c) **Determine the future value of the account at retirement and the perpetual annual income available from the interest.**

If the engineer becomes accustomed to a \$57,800/year life style (in today's, 2008 dollars) and desires to continue that life style.

- (d) **What annual income must be generated during the first year after retirement?** *Assume the inflation rate averages 4% per year.*

Problem B4. [10 total project problem points] **DUE Monday, November 3, 2008**

Investment A costs \$10,000 today and pays back \$43,000 seven years from now. Investment B costs \$10,000 today and pays back \$5,400 each year for seven years. If the annual interest rate of 5.3% is used for comparison, **which investment is superior?**