

Name \_\_\_\_\_

October 27, 1999

Pledge: *No Aid; No Violations*

Sign \_\_\_\_\_

## Quiz #2 Postmortem

Please answer FOUR (only 4) of the following five questions (25 points each):

1. A firm purchases a machine for \$10,000. Its useful life is 20 years. If the firm's accountant uses "straight-line depreciation," the depreciation expense will be \$500 in each year for the following 20 years. It is better to use a form of "accelerated depreciation:" calculating depreciation under the assumption that the machine will only last 10 years, the depreciation expense will be \$1,000 each year. The accounting records will show an increase in cost of goods sold, a decline in before tax corporate profits, and as a result, the corporate profit tax will be reduced; also, the value of the firm's machine on its books will be reduced, which might conceivably reduce property taxes. After 10 years the depreciation expense must be recorded as zero, which means that the firm has only postponed its corporate profit tax, but that is still an interest free loan from the IRS. Or the firm could sell the machine after the first 10 years, buy a new machine and start the accelerated depreciation cycle all over again. With this strategy the firm has to pay a long term capital gains tax on the excess of the market value of the second-hand machine over its zero book value, but long term capital gains are taxed at only 20%.

The one downside of accelerated depreciation is that it makes the firm look less profitable and lowers the book value of the firm's capital, but stockholders should be smart enough to recognize the way in which tax avoidance distorts the accounts.

2. In 1995 you inherited 100 shares of corporate stock from your rich uncle. He had purchased them for \$20 a share in 1990, but at the time of his death they were worth \$100 a share. Thanks to the bull market, they are now worth \$150 a share! If you sell the stock today, you will realize a long term capital gain of  $100 \times (\$150 - \$100) = \$5,000$ , thanks to "step up of basis at death" provision of the Internal Revenue Code.
3. See Figures 19 and 20 in the graph handout for the Maximizing Satisfaction handout.
4. The Magnolia Flour Company has average total costs of \$10 when  $q = 20$  if its average total cost function is  $C(q)/q = 10 + (q-20)^2/10$ . The  $(q-20)^2/10$  term is positive except when  $q = 20$ , which means that average cost must be higher at any other level of output. So with free entry and exit the long run equilibrium price is \$10. From the industry demand curve we find that when  $p = \$10$ , industry sales will be 10,000. There will be  $10,000/20 = 500$  firms in the industry.
5. Empirical research reveals that the production function for the manufacturing sector of our economy is  $Q = 10K^{0.232}L^{0.807}$ . The average product of labor is  $Q/L = 10K^{0.232}L^{-0.193}$ ;  $\partial Q/\partial L = 8.07K^{0.232}L^{-0.193} = 0.897[10K^{0.232}L^{0.807}]/L = 0.897Q/L$ .  
Since  $10(\rho K)^{0.232}(\rho L)^{0.807} = \rho^{1.039}10K^{0.232}L^{0.807}$ , the function is homogeneous of degree 1.039

The scores ranged from a minimum of 40 to a maximum of 118; the mean was 85. In the past grades for the article reports have been much higher than quiz grades, which has helped push up the average grade at the end of the semester.

On reflection I think it would be useful to scale the raw scores recorded on your quizzes. The adjusted score will be  $A = G + (100-G)/5$ , where G is the raw score.