

Name \_\_\_\_\_

October 27, 1999

Pledge: *No Aid; No Violations*

Sign \_\_\_\_\_

## Quiz #2

### Please Note:

1. The examination will end at 11:50!
2. Start your answers in the space provided, but continue if necessary on the back of the page or on the last sheet of the exam, which is intentionally left blank. Extra sheets are available in the front of the room.
3. Show your calculations in order that you may receive partial credit even if you make a numerical error.
4. After you have completed the exam, please use any time remaining to check over your work and catch and slips. Then place your exam on the desk in the front of the room and leave quietly.

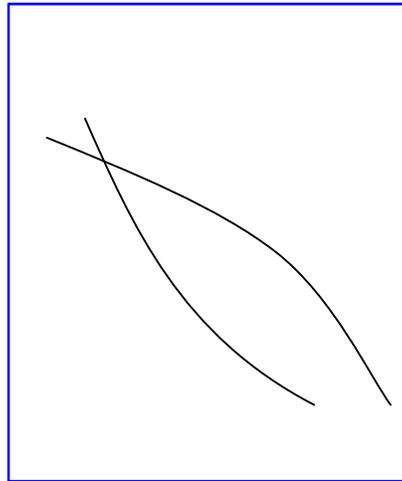
Please answer FOUR (only 4) of the following five questions (25 points each):

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 \$\_\_\_\_\_ each year for the following 20 years. Suppose instead, that the accountant uses "accelerated depreciation;" specifically, he calculates depreciation under the assumption that the machine will only last 10 years. How much depreciation expense will the firm be able to take each year? How will our firm's accounting profits, the value of its assets, and its corporate profit tax liability be affected by the adoption of this alternative accounting procedure? Should the firm use accelerated depreciation? Explain.

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 your stock today, how large a capital gain will you realize? How much capital gains tax will you owe as a result of this transaction, given that the tax rate on long-term capital gains is 20%.

3. Here is the start of a “Box Diagram.”  
A “Pareto Optimum” (efficient) allocation of resources is a situation where no one can be made better off without making at least one other person worse off.
- Please add curves as appropriate in order to complete the diagram. Then label *everything* carefully.
  - Please indicate all of the “Pareto Optimum” points on your graph.



4. The Magnolia Flour Company has average total costs of  $C(q)/q = 10 + (q-20)^2/10$ .
- At what level of output is average total cost at its minimum?
  - Suppose the product is sold in a perfectly competitive market with demand function  $Q = 20,000 - 1000p$ . Suppose also that there is free entry and exit from this industry. In the long run the price will be \$\_\_\_\_\_, industry sales will be \_\_\_\_\_, and there will be  $n =$  \_\_\_\_\_ 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 equation for the average product of labor is:
  - The equation for the marginal product of labor is:
  - Is this production function for this firm homogeneous of degree one (constant returns to scale)?

*HONORS OPTION:* Consider the following two statements. If the statement is true, prove it; if it is false present a counter example.

- If output is at that point where average variable cost is minimized, then marginal cost must equal average variable cost.
- A profit maximizing firm will charge price  $p = (1/(1-\eta)) dC/dq$ , where  $\eta = -\frac{dq}{dp} \frac{p}{q}$  is the price elasticity of demand and  $dC/dq$  is marginal cost.

Note: No credit for partial answers.

(Continue answers on this page if you need the space or use as scratch space)