Intermediate Microeconomics 301  
Second Mid-Term  
Friday, April 1, 2005

Time: 50 minutes.

Instructions. To obtain credit, you must give arguments to support your answer. The numbers in brackets at the start of each question are the numbers of points the questions are worth.

Exercise 1 [35]: Suppose a production function is given by \( f(K, L) = 4K^{\frac{1}{2}}L^{\frac{3}{2}} \), and that the price of capital is $2 and the price of labor is $4. (Long Run analysis)

1. What combination of labor and capital minimizes the cost of producing any given output?
2. What is the minimum cost of producing \( q \) units of output?
3. What are the marginal cost of production and the average cost?

Exercise 2 [35]: The manager of Elwyn Company recently hired an economist to estimate the firm’s cost function. Based on estimates provided by the economist, the firm’s total cost function is

\[
TC = 500 + 3Q + 20Q^2
\]

where \( TC \) is total costs, and \( Q \) is the output.

1. Calculate the average total cost, average fixed cost, average variable cost and marginal cost for any \( Q \).
2. What is the marginal cost when output is 10, and what is the average total cost?
3. The economist is asked to determine for what level of output the production will exhibit diseconomies of scale. He claims that it is for a production of about \( Q = 7 \)? Explain how he jumps to this conclusion, and if you believe it to be true.
4. What is the supply of the firm?

Exercise 3 [30]: The inverse demand for a product is \( p = 30 - 2Q \) and the supply function is \( Q = 1 + p \),

1. what is the equilibrium?
2. At the equilibrium price, what is the consumer’s surplus? The producer’s surplus?
3. What is the impact of the imposition of a price floor on the equilibrium? How does it affect the total welfare?