$91/100$

Economics 211
Exam II

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Section Number: _6_

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V. good !

$86/100$ +5

Note: Problems 5 and 6 on HW 8 have been cancelled.
Also, there will be a couple of changes made to Problem 1
of the same assignment. These changes will be mentioned
in section meetings tomorrow

1) Firm Alpha is a perfectly competitive firm in long run equilibrium. Alpha is minimizing its long run costs by operating at point A, where its output is ten widgets.
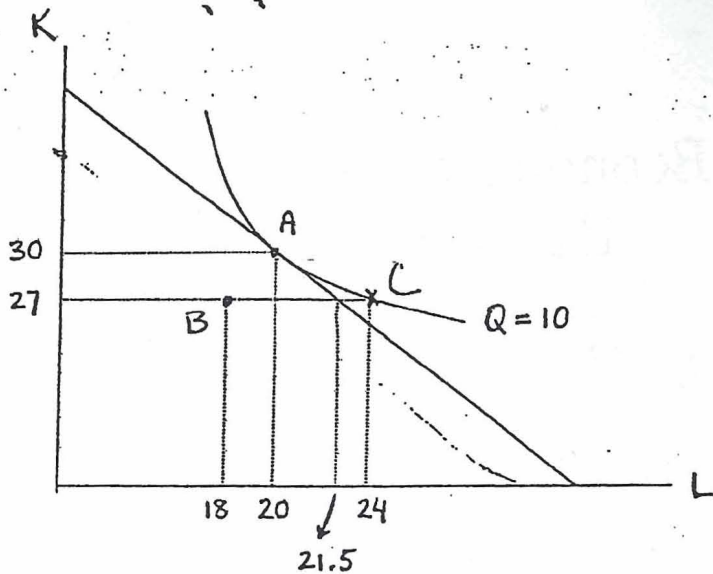
a) If the marginal rate of technical substitution at point A is −2, what is the relationship between the price of labor and the price of capital?

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$$P_L = 2P_K \text{ since } -\frac{MP_L}{MP_K} = -\frac{P_L}{P_K} = -2$$

b) The least cost combination for producing ten widgets is 30 units of capital and 20 units of labor. The total cost for this input combination is $140. What are the prices of capital and labor?

3

$$20 \times P_L + 30 \times 2P_L = \$140$$
$$\Rightarrow P_L = \$1.75$$
$$\Rightarrow P_K = \$0.875$$

$$30P_K + 20 \times 2P_K = \$140$$
$$\Rightarrow P_K = \$2 \checkmark$$
$$\Rightarrow P_L = \$4 \checkmark$$

c) What is the price of a widget?

Total cost $= \$140 \Rightarrow$ average cost $= \frac{140}{30} = \$\frac{14}{3}$ /unit

≈ 4.6667.

$\Rightarrow$ Price $\approx \$4.667$ + (indirect cost)
= average cost if there is

1F2F3A

2) The mousetrap industry is perfectly competitive. A hundred identical firms are in the industry at this moment in time. The cost curves of a typical firm are given below, as well as the market demand for mousetraps.
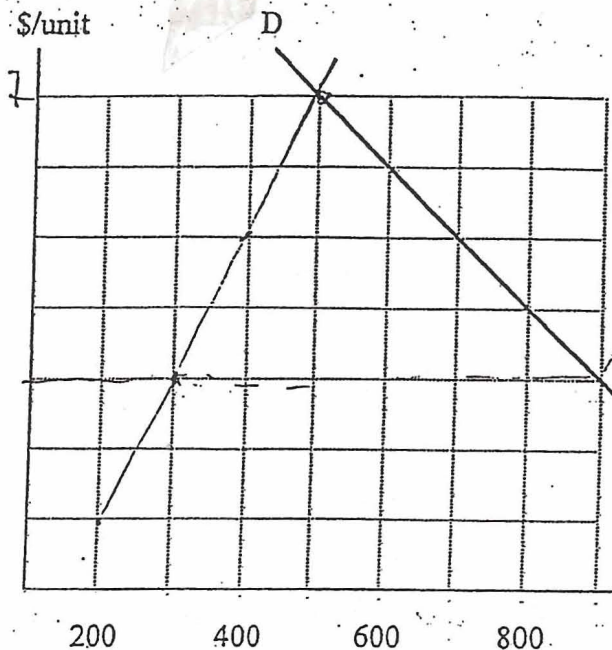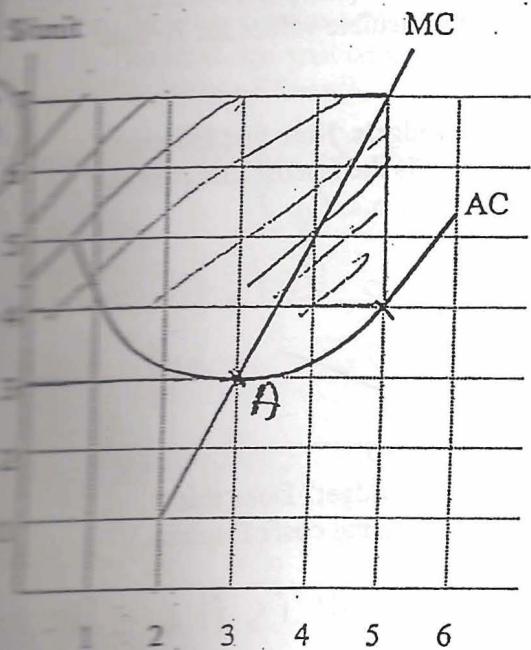
Note that the first vertical line in the graph at right is for a quantity of 200, not 100. In each graph, the horizontal axis represents mousetraps.

a) Draw the short run industry supply curve for mousetraps in the second graph. Explain how you obtained your answer. What will the price of mousetraps be?

fixed Cost ↓ P, Since when going from Q=3 to Q=3 5
TC increases by 10 which means VC cost increase by 5 ⇒ 5 = FC/5
Price will be $7 (please look at graph)

b) Calculate the output and profit of the representative firm. Shade the area representing profit in the first graph.

output is equal to 5 (please see graph)
π = P·Q − TC   ↳ P = MC
= 7 × 5 − 4 × 5 = 3 × $5 = $15 ✓

3

[Note: If you have been unable to calculate P_K and P_L in part b, assume from this point on in the problem that $P_K = 1$ and $P_L = 5.5$. This combination of input prices is not the right answer. It should only be used to get answers (and partial credit) for the parts which follow if you have not been able to calculate values for P_K and P_L in part b.]

d) B is the least cost combination for producing nine widgets. Note that the nine-widget isoquant is not drawn in the diagram. Neither is the isocost line passing through point B.

   i) How much does input combination B cost?

$$Cost = 27\,P_K + 18\,P_L$$
$$= 27 \times 2 + 18 \times 4 = \$126 \checkmark$$

   ii) What is the marginal cost of producing the tenth widget? Does this represent a short run marginal cost or a long run marginal cost? Explain your answer.

Marginal cost of producing the tenth widget is $MC = 140 - 1$
(This is the long run MC since K and L both are changing) $\checkmark$

e) Suppose that a fire destroys three of Alpha's thirty units of capital. Alpha has a short run commitment to deliver ten widgets to firm Beta.

   i) What combination of inputs will Alpha use? Label the point at which Alpha will operate as point C.

(please see the graph)
$$K = 27 \quad, \quad L = 24 \quad for \quad Q = 10$$

   ii) What will Alpha's total costs be? How does this figure compare to the cost of producing at point A? Explain your answer.

$$T.C = 27 \times 2 + 24 \times 4 = \$150 \checkmark$$
this cost is greater than cost at point A ($140) $\checkmark$
This is normal since we are in the short run and producer can't use the best combination of K and L (since K is fixed = 27). $\checkmark$ good!

c) Ignoring capital adjustment, what price will prevail in the long run? Explain the process of adjustment and show graphically how you obtained your answer. How many mousetraps will be produced by the industry? How many mousetraps will be produced by each firm in the industry? What will be the number of firms?

Ignoring capital adjustment $P = \min LRAC = \min SR \, AC = \$3$
(please look at point A)

then total quantity will be 900 ✓

Each firm will be producing $\dfrac{300}{100} = 30$ mousetraps

3 mousetraps

number of firms $= \dfrac{900}{3} = \$300$ firms

Tom, is the only person who knows how to make pecan pie in all of Lebanon. The demand for pecan pie in Lebanon is given by $P = 20 - Q$. Tom has no fixed costs, and producing an extra pie always costs him an extra $\$2$.

a) How many pecan pies will Tom produce? What will be the price of a pecan pie? What will Tom's profit be? Show your work, and draw a graph which represents your results, including Tom's profit.

$MR = 20 - 2Q$

$MC = MR$

$20 - 2Q = 2 \Rightarrow Q = 9$

then $P = 20 - 9 = \$11$ ✓

$\pi = (11 - 2) \times 9 = 9 \times 9 = \$81$
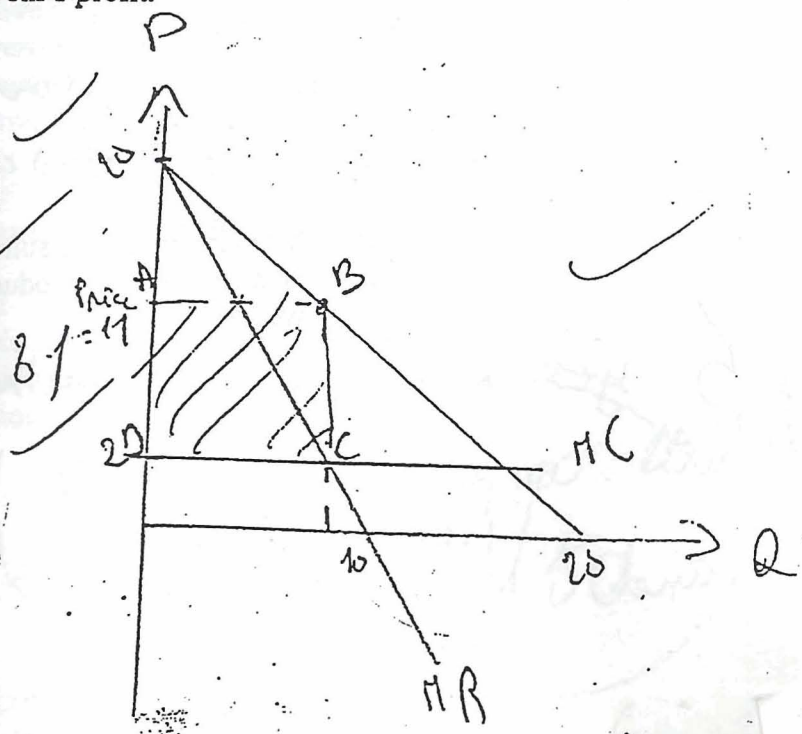
Tom's profit

$= \text{area of } ABCD$

b) You discover that your neighbor "Tom" is really Carlos the Jackal, the international terrorist wanted in 73 nations at the last count (recounts are pending). This presents you with a fine opportunity to make some money. You decide to tell Carlos that you will keep your mouth shut if he pays you $30 (scheme I) or if he pays you $4 for every pie he produces and sells (scheme II).

    i)   Under scheme I, how many pies will Carlos produce? At what price will a pie be sold? What will Carlos' profit be? What will your payoff be?

3   he will produce 9 pies and $P = \$11$
his profit will be $81 - 30 = \$51$
my payoff $= \$30$

    ii)   Under scheme II, how many pies will Carlos produce? At what price will a pie be sold? What will Carlos' profit be? What will your payoff be?

3 Scheme II cost will be $8 \cdot 6$ Carlos' profit $= (13 \cdot 6) \times 7 = \$49$
$20 - 2Q = 6 \Rightarrow 2Q = 14 \Rightarrow Q = 7$ my payoff $= 4 \times 7 = \$28$
$\Rightarrow P = 13$

    iii)   Which scheme would Carlos choose? Why?

1 Carlos choose the first scheme since $51 > 49$

c) After taking Econ 211, you realize that you could have made more money out of this situation.

    i)   What is the maximum lump sum payment which you could have demanded from Carlos?

*3* $U \leq \$81$, because above this is one he could will refuse

    ii)   Would this maximum lump sum payment have been different if Carlos had a fixed cost of production of $10, instead of zero fixed costs as we have assumed?

1.5 yes No, it will be the same because Carlos will compare his profit to his total variable cost (and never to fixed cost.)

1 If the demand curve for a firm's output is downward sloping, we can conclude that

    a) the firm is not a price taker; it can influence the price of the product it sells
    b) the firm cannot affect the price of the product it sells
    c) the firm must lower its prices if it hopes to increase its profit
   d) the firm's contribution to total output of the product is insignificant

2 A firm's marginal revenue is always

    a) total revenue divided by the number of units sold
    b) the change in total revenue resulting from the sale of an additional unit
    c) the change in price resulting from the sale of an additional unit
    d) price times the quantity of the product sold

3 As a general rule, it will always pay a firm to increase output whenever

    a) average fixed cost is less than marginal cost
    b) marginal revenue is less than average cost
    c) average variable cost equals marginal cost
    d) marginal revenue is greater than marginal cost
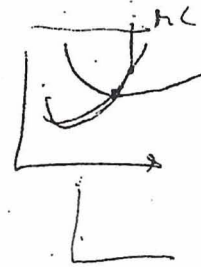
4 A perfectly competitive firm is in the following position: Output = 1000, market price = 3, total cost = 6000, fixed cost = 2000, marginal cost = 3. The firm's best action in this situation is to

    a) reduce output but keep producing
    b) increase its selling price
    c) leave output unchanged
    d) produce zero output
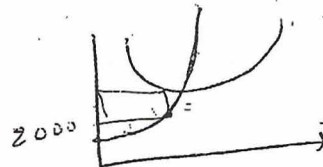
5 A perfectly competitive firm's short run supply curve is

    a) the entire marginal cost curve
    b) the rising portion of the average variable cost curve
    c) the rising portion of the average cost curve
    d) the marginal cost curve above the average variable cost curve

6 Firms facing a steadily declining demand for their product will continue producing

    a) until their capital wears out
    b) only as long as their variable costs are covered
    c) only as long as they are making profits
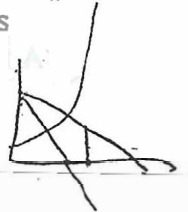   d) only as long as their fixed costs are covered

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For a perfectly competitive firm
- P = MP
- P = MR
- c) P = AVC
- d) P = MRS

If a monopolist is producing in the range where the elasticity of demand is less than one, he
- a) can increase his **profits** by producing less
- b) is already maximizing his profit
- c) cannot earn positive profit
- d) can increase his profit by producing more

If a monopoly is to persist in the long run,
- a) there must be barriers which prevent other firms from entering the industry
- b) its marginal revenue curve must be positive over the entire range of production represented by the average cost curve
- c) its average cost must decline indefinitely
- d) the demand for its product must be relatively inelastic

When a monopolist experiences cost differences in serving different groups of buyers, then
- a) price discrimination is inevitable
- b) rice discrimination is easier
- c) price differences are evidence of price discrimination
- d) price differences which reflect cost differences are not considered to be price discrimination

A difference between monopoly and perfect competition is that
- a) monopolists tend to ignore consumer demand in their price setting
- b) monopolists commonly maximize revenue while perfectly competitive firms maximize profit
- c) perfectly competitive firms cannot maintain positive economic profit in the long run
- d) monopolists emphasize cost minimization

A period of time for which at least one factor of production is fixed is known as the

    a) period of adjustment
    b) short run
    c) long run
    d) very long run

The point where marginal productivity starts to diminish is the point where
    a) marginal product reaches a maximum
    b) average product reaches a maximum
    c) the marginal product begins to fall at an increasing rate
    d) total product reaches a maximum

If total product is increasing, then
    a) average product must be increasing
    b) marginal product must be increasing
    c) marginal product must be decreasing
    d) marginal product must be greater than zero

The firm's average variable cost is at its minimum when
    a) marginal product is at its maximum
    b) average cost equals marginal cost
    c) average cost equals average variable cost
    d) average product is at its maximum

Suppose you start a business making and selling silk-screen T-shirts. You rent space for the manufacturing operation, purchase a stock of blank T-shirts, lease a silk-screen printing machine, and purchase the inks and dyes needed for printing the T-shirts. Your imputed (or indirect cost) in this case would be 1) the rental cost for the shop; 2) the cost of your time in starting and operating the business; 3) the cost of the stock of blank T-shirts; 4) the leasing charges on the silk-screen machine.
    a) 1 only
    b) 2 only
    c) 2 and 3
    d) 4 only

Currently, a firm's revenues are less than its fixed costs. This firm should
- a) increase its production
- b) decrease its production
- c) shut down
- **d) none of the above can be determined**

If $(MP_L/MP_K) = 2$ and $(P_L/P_K) = 5$, then the firm should use
- **a) relatively more capital and less labor**
- b) relatively more labor and less capital
- c) more capital and more labor
- d) less capital and less labor

Long run average costs will eventually increase because of
- a) diminishing returns
- b) an increase in input prices
- **c) planning and coordination problems**
- d) specialization

Complete the following statement: " An isoquant shows the different combinations of..."
- a) outputs produced by a given level of inputs
- b) inputs capable of producing increasing levels of output
- **c) inputs which can be used to produce a given level of output**
- d) output which can be produced by using different capital to labor ratios

As a firm moves along an isoquant from left to right, the ratio MP_L/MP_K
- a) increases
- **b) decreases**
- c) remains the same
- d) the answer cannot be determined from the information given

Suppose that a firm has a target level of spending. When it increases this target level, its isocost line will move
- a) away from the origin and become steeper
- **b) away from the origin with no change in slope**
- c). toward the origin and become steeper
- d) toward the origin and become flatter

A monopolistically competitive industry is
a) like a monopoly in that entry into the industry is impossible
b) like perfect competition in that firms have horizontal demand curves
c) like monopoly in that firms have downward sloping demand curves
d) like perfect competition in that firms produce at outputs where price is equal to marginal cost

A monopolistically competitive industry is similar to a perfectly competitive industry in that firms in both industries
a) are price takers
b) produce differentiated products
c) face highly inelastic but downward sloping demand curves
d) will have zero economic profit in the long run

The long run in monopolistic competition is characterized by
a) the firm's demand curve being tangent to its average cost curve
b) production where marginal revenue equals marginal cost
c) production at more than the minimum average cost
d) all of the above