

Econ 001: Midterm 2 (Dr. Stein) Answer Key
March 23, 2011

Instructions:

- This is a 60-minute examination.
- Write all answers in the blue books provided. Show all work. Use diagrams where appropriate and label all diagrams carefully.
- Write your name and your Recitation Instructor's name in every blue book that you use.
- This exam is given under the rules of Penn's Honor system.
- All blue books, blank or filled, must be handed in at the end of this exam. No blue books may be taken from the room.
- **No calculators are allowed!**

The Midterm has 2 parts. Part 1 consists of 8 multiple-choice questions. Part 2 consists of 2 short-answer questions.

You need 2 blue books. You are required to use the two blue books as follows:

1. **BOOK 1:** write your answers to the **8 multiple-choice questions** on the first page and then write your answers to the **first short-answer question** in the remainder of the book.
2. **BOOK 2:** write your answers to the **second short-answer question**.

Part I: Multiple Choice Questions (Best 7 out of 8: 4 points each/28 points total):
Please answer all MC questions. Only the best 7 will count towards your grade.

1. Which of the following statements are correct:
 - I. A consumer will choose to purchase where the Marginal Rate of Substitution is equal to the relative price ratio.
 - II. If both income and prices double, consumption of both goods will be unchanged.
 - III. If prices double and income is constant the MRS will be unchanged.
 - a. I
 - b. I and II
 - c. II and III
 - d. I, II and III

2. We learn that between $P=\$1$ and $P=\$2$ the demand for chewing gum is downward sloping. Which of the following statements must be true between these prices

- I. Chewing gum is an inferior good.
- II. If chewing gum is an inferior good, the income effect must be smaller than the substitution effect.

- a. Only I.
- b. Only II.
- c. Both I and II.
- d. Neither I nor II.

3. If we are told that the firm has fixed costs and that it is producing where marginal productivity is diminishing, which of the following statements will be **true**:

- a. MC will be upward sloping
- b. AFC curve is downward sloping
- c. ATC is increasing as long as MC is above ATC
- d. Both a and c are true, but b is not.
- e. Both b and c are true, but a is not.
- f. a, b & c are all true.

4. John sells cotton in a competitive industry. Recently, he hired a financial analyst to analyze his firm's performance. The analyst recommends that John increase his production. The analyst must have concluded that the firm's

- a. marginal cost exceeds marginal revenue.
- b. total revenue exceeds marginal revenue.
- c. marginal revenue exceeds total cost.
- d. marginal revenue exceeds marginal cost.

5. When new firms have an incentive to enter a perfectly competitive market, their entry will:

- a. increase the price of the product.
- b. drive down profits of existing firms in the markets.
- c. shift the market supply curve to the left.
- d. increase demand for the market.

6. Given the following information for a perfectly competitive firm, what is true about the quantity produced by the firm?

$$\text{TVC} = q^2 + 9q$$

$$\text{TFC} = 50$$

$$\text{MC} = 2q + 9$$

$$P = 19$$

- a. The firm will produce zero units.
- b. The firm will produce at $\text{MR} = \text{MC}$ in both the short run and the long run.
- c. The firm will produce at $\text{MR} = \text{MC}$ in the short run and zero units in the long run.
- d. None of the above are correct.

7. Which of the following choices contains 3 characteristics of a profit-maximizing, unregulated, perfect-price-discriminating monopoly? Choose only one of the following:

- a. Inefficient output, marginal revenue curve below demand curve, zero consumer surplus.
- b. Efficient output, marginal revenue curve equal to demand curve, positive consumer surplus.
- c. Efficient output, marginal revenue curve below demand curve, zero consumer surplus
- d. Efficient output, marginal revenue curve equal to the demand curve, zero consumer surplus.

8. Which of the following is not a common characteristic of both perfectly competitive market and monopolistic competition?

- a. Firms earn zero profit in the long run.
- b. Firms produce at the quantity where $\text{MR} = \text{MC}$.
- c. Firms are price taker.
- d. No barrier to enter the market.

Answer Key:

1. d

2. b

3. f

4. d

5. b

6. b or c

7. d

8. c

Part II: Short Answer Questions:

Q1. (36 points) Please use bluebook #1 for this question.

An increase in the price of **grains** has driven up the demand for arable land and hence its price. This has affected not only the markets for grains, but the markets for other products too. This question asks you to analyze these effects on the market for **lettuce**, using large & clear graphs.

Throughout the question, assume that the market for lettuce is perfectly competitive. Joanne is one specific farmer in this market.

- a. Let us start with the market for lettuce in a long run equilibrium. Draw the Average Total Cost, the Marginal Cost & the Average Variable Cost curves that Joanne faces. Mark a price that is consistent with the market being in the long run equilibrium.
- b. Draw the market supply & demand for lettuce so that it is consistent with part a. Suppose that land is a fixed cost in the production of lettuce and that its price has increased.
- c. What will be the effect of the increase in the fixed cost of using land on the Average Total Cost, the Marginal Cost & the Average Variable Cost curves that Joanne faces? Be specific. Graph the new curves. How will her production change in the short run? Under what conditions will Joanne choose to shut down and not produce in the short run?
- d. The published statement from the most recent meeting of the Federal Reserve includes this sentence: “The recent increases in the prices of energy and other commodities are currently putting upward pressure on inflation.” Explain using your graphs above why an increase in the price of commodities (e.g., grains) may effects the prices of other goods (in this case, lettuce). Does your answer depend on whether we are discussing short run or long run effects? Explain.

Note: We are not looking for a general analysis of inflation; rather we want an understanding that draws on this specific example.

Answer Key:

2 points for large & clear graphs

a. Answers:

Usual upward sloping MC, U shaped ATC and AVC with ATC above AVC and the distance between the two curves decreasing as q increases. MC intersects ATC and AVC at their minimums. For long run eqbm P, MC, ATC all intersect at the same point.

Points: 10

Label Axis: P/\$ and q:1

Upward sloping MC:1

U shaped ATC and AVC:1

ATC above AVC:1

The distance between the two curves decreasing as q increases:1

MC intersects ATC and AVC at their minimums:1 each (2 total)

For long run eqbm P, MC, ATC all intersect at the same point:3

b. Answers:

Ideally a side-by-side graph with the market eqbm price the same as in the previous picture. If not side-by-side graphs, need to clearly indicate that the two prices are the same.

Points: 5

Usual; S&D : 2

Label axis: P/\$ & Q: 1

P clearly consistent with part a: 2

c. Answers:

MC and AVC unchanged. ATC shifts upward. MC = P unchanged so the production decision is unchanged in the short run. Joanne now losing money. Joanne would shut down if MC = P falls below AVC since all of these objects are unchanged here, we know that this is not the case.

Points: 10

MC and AVC unchanged:2 each

ATC shifts upward: 2

ATC still intersects MC at its minimum: 1 point

MC = P unchanged so the production decision is unchanged in the short run: 2 points.

Joanne would shut down if MC = P falls below AVC:1

Since all of these objects are unchanged here, we know that this is not the case:2

d. Answers:

Note that in the short run all producers choose the same quantity as before and none leave the market. Hence there are no effects from increased grain prices in the short run. In the long run, some lettuce farmers that are consistently losing money will leave the industry, shifting supply inwards and raising the market equilibrium price. The key mechanism here is that the increased costs will cause supply to shift inward in the long run.

Points: 9

Short run no change: 2 points.

Long run: losses → exit:2

→ shift of supply left: 2 points

→ Price increase: 3 points

Q2. (36 points)

Please show your work!

Let us revisit the topic of pricing venue tickets for sports and music events. We will use the case of the Wells Fargo Center, where the 76ers (Philadelphia's NBA basketball team) plays. To make the numbers simple we'll assume that the stadium holds a fixed 100 seats. As in midterm 1, we will assume that demand for the games fluctuates depending the team that the 76ers play against.

Throughout the question assume that the Marginal Cost per person is \$10 and that there are no fixed costs.

- a. When the 76ers play against the Detroit Pistons demand for the games is relatively low. $P=110-Q$ which implies that $MR=110-2Q$. What price should the firm set for these tickets? How many tickets will be sold?
- b. Sean, a consultant hired by the firm says: "At this price there are many empty seats. If the firm would reduce the price of the tickets revenue would increase." Is he correct? Should the firm reduce the price of the ticket? Explain why or why not.
- c. When the 76ers play against the Boston Celtics demand for the games is high. $P=210-Q$ which implies $MR=210-2Q$. What price should the firm set for these tickets? How many tickets will be sold? Are there empty seats in this case?
- d. Catherine, a 76ers fan, likes to go to all of their games, irrespective of who they are playing. She says that the prices per ticket are set too high and thus the market is inefficient. She suggests a marginal cost pricing rule instead. Would you support her suggestion? Be specific about each case (Pistons & Celtics).

Answer Key:

a. The arena sets $MR = 110 - 2Q = 10 = MC$ so $Q^D = 50$ and each ticket is sold for $P^D = 60$.

Points: 8

Set $MR=MC$:3

$Q^D = 50$: 3

$P^D = 60$:2

b. Answers:

Sean is correct that there are empty seats: 50 empty seats to be exact. Reducing the price of tickets by a small amount would increase revenue. An unregulated monopolist always produces on the elastic part of the demand curve (where $MR > 0$). However the firm should not reduce the price since profits would fall as a result (MC would then exceed MR). Reducing the price would increase revenues but it would increase costs by even more.

Points: 10

There are empty seats: 1

Lowering the price would increase revenue: 2

Because the firm is producing where $MR > zero$: 2

But profits would decrease: 3

Explanation: 2 (can be profit max was as above, or past this q $MC > MR$).

Note: students who only comment that profits will decrease get a max of 5 points.

d. Answers:

Marginal Cost pricing would mean setting a price of \$10 per ticket.

In part a, this would imply that $Q^P = 110 - 10 = 100$ and all seats would be filled. Total surplus would indeed be maximized here as we get production where $MB = MC$. Note that all of the PS is transferred to consumers.

From an efficiency standpoint this pricing rule is an improvement. It is not clear if it is equitable.

In part c, the efficient number of seats were being sold (the stadium was full) so the MC pricing rule only serves to redistribute the entire PS to CS, but total surplus is unchanged. (Extensions of this model may worry about losses from search costs that result from the excess demand at $P = 10$ for the Celtics game).

Points: 10

Understanding that Marginal Cost Pricing means setting $P = 10$: 2 points

Pistons: Total surplus increases: 3

Distributed differently: 1

Celtics: Total surplus does not increase: 3

Distributed differently: 1

Note: Students who only comment on profitability did not understand this question.