Econ 001: Midterm 2 (Dr. Stein) Answer Key
November 8, 2012

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!

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: 5 points each/35 points total):
Please answer all MC questions. Only the best 7 will count towards your grade.

1. Rick's income is $1400 and he consumes only two goods, food and books. We know that the price of food is $2 and the price of books is $20. Which of the following are true?

   I.   Rick's marginal rate of substitution of one unit of food per book at his consumption point is 1/10 books.
   II. If Rick got an extra $600 for income, he would consume at a point where his marginal rate of substitution of food per book is the same as without the change in income.
   III. After receiving his extra $600 for income, Rick consumes food and books in the same proportion as before.

a. I only
b. II only.
c. I & II only.
d. I & III only.
e. II and III only.
f. All the statements are true

2. The COLA clause ("Cost Of Living Adjustment") is used to adjust payments like child support and social security payments. These payments change based on the change in the cost of living. The change in the cost of living is determined by the change in price of a predetermined "basket" of goods purchased by the average consumer. Which of the following could be considered a flaw of the COLA clause?

    a. It ignores the income effect
    b. It ignores the price effect
    c. It ignores the substitution effect
    d. All of the above
    e. None of the above

3. In preparation for Hurricane Sandy, Ms. O'Malley has set up groups of high school kids to fill sand bags. She has found that by increasing the number of students per groups from 3 to 4 to 5 the number of sand bags filled per hour increases from 15 to 20 to 22. She deduces that:

    I.   The marginal productivity is diminishing past the 4th student.
    II.   The fifth student in each group should be sent home.

    a. Only I
    b. Only II
    c. Both I and II
    d. None of the above

4. If a firm chooses to produce in the short run in a perfectly competitive market at a loss (negative profit), which of the following **must** be true?

    a. Marginal Cost is decreasing.
    b. The are no Fixed Costs.
    c. Average Variable cost is increasing.
    d. The marginal revenue is greater than Total Variable Cost.

5. Acme Sandbags is a profit-maximizing monopolist serving New York City. There is a large fixed cost but a constant marginal cost MC>0. Government regulations say that the firm must abide by average cost pricing. Demand for sandbags is downward sloping as usual.
Now suppose that a hurricane is rapidly approaching the city, threatening to flood it. What should happen to the price of sandbags?

    a. The price will go down.
    b. The price will stay the same.
    c. The price will go up.
    d. Acme Sandbags will altruistically provide sandbags free of charge.

6. Consider a monopoly charging the monopoly price. If the firm were to lower its price by a small amount, which of the following would certainly occur?

      I.   Producer surplus would increase.
     II.   Consumer surplus would increase.
    III.   Total revenues would increase.

  a. II
  b. I and II
  c. I and III
  d. II and III
  e. I, II and III

7. Billy thinks that the pizza market can be best modeled as monopolistically competitive. What evidence would support this analysis?

     I.   His friend, John, prefers Allegro Pizza to Pizza Hut.
     II.   He has noticed 3 new pizza stores around campus lately.

  a. I
  b. II
  c. I and II
  d. neither

8. Pippa, a supplier of party decorations in the UK, is planning to expand into the US market. The marginal cost of the renowned Celebration Package is $100, no matter where it is sold. Which of the following statements is correct?

     I.   Pippa will set the quantity in each country so that the marginal revenue is the same in both.
     II.   Pippa will set the quantity in each country so that the average revenue is the same in both.

  a. Only I
  b. Only II
  c. Both statements are correct.
  d. Neither statement is correct.

Answers:

1. c
2. c
3. a
4. c
5. a
6. d
7. c
8. a

Q1. (34 points) Please use bluebook #1 for this question.
Note that even if you make arithmetic errors in the calculations on this question, you can earn partial credit for correct set up of the equations.

Consider the market for fish hooks. We will assume in this question that this is a perfectly competitive market. There are N identical firms producing fish hooks, each of them facing the following cost curves:

$$FC = 18$$
$$MC = 9q$$
$$VC = (9/2)\, q^2$$

The market demand for fish hooks is given by Qd=1080-10P.
The short run market supply is given by Qs=50P.

a. Find the equilibrium price and quantity of fish hooks traded in the market.

b. How many firms are currently operating in the market? How many hooks is each one of them producing?

c. How much are the profits made by each one of these firms?

d. What is the LR equilibrium price? Explain.

Suppose that the price of the machines used to produce fish hooks goes up.

e. Describe the effect this will have on the firms' cost curves.

f. Describe the changes you expect to see in the **short run** in terms of the market price and the total quantity produced. How much will the typical form produce? Will it choose to shut down? Explain.

g. Describe the changes you expect to see in the **long run** in terms of the price, total quantity, number of firms, and each of these firms' production decisions. Explain.

a. Answer: Set Qd=Qs to find P = 18; Q = 900

Points: 3
Set up: 1
P & Q : 1 ceach

b. Answer: set P=MC to find q=2. N=Q/q=450

Points: 6
P=MC: 1, q=2: 2
N=Q/q: 1, N=450: 2

c. Answer: Profits=TR-TC=18*2-(18+(9/2)*2^2=zero

Points: 4
1 for profit=TR-TC
1 for correct set up
2 for profits=zero

d. Answer: As we have already found, profits at P=18 are zero, so this is the long run equilibrium price.

Points: 4 2 for p=18, 2 for explanation that we are looking for profits=zero..

e. Answer: If the price of the machines, a fixed input, used to produce fish hooks goes up then the ATC curve goes up but the AVC and the MC curve stay the same.

Points: 6
2 each

Note: A student will get a maximum of 4/6 if he/she claimed that machines are a variable cost, but the rest of the question will be graded according to the answer here. So they are not punished twice.

f. Answer: Since MC curve stay the same and there is no entry/exit in the short run, the aggregate supply curve doesn't change so P and Q stay the same.
Note that P is still higher than AVC (only ATC went up) so firms do not shut down in the short run and q is unchanged.

Points: 4
MC doesn't change & N is constant so P & Q the same: 2

No shut down: 1
q the same :1

Note: if you shifted AVC and MC the answer is more complicated. P probably increases and Q decreases. N stays the same (definition of short run) and q therefore decreases.

g. Answer: In the long run Price will increase to the minimum of the new (and higher) ATC.
Q decreases because the demand is downward sloping.
N decreases because some firms exit the market since they were making negative profits.
q increases because MC is upward sloping so the minimum of the new ATC will be at a higher quantity.

Note: If you shifted AVC & MC we do not know what happens to either q or N in the LR, though we know that P increases and Q decreases.

Points: 7
P, Q, : 2 each
N & q: 1.5 each. Need explanations.

Q2. (31 points)

Please show your work using your graphs! Grading depends on the ability of the TA to evaluate whether or not you understand the <u>graphical </u>interpretation of these models.
Do add any curves not specifically mentioned if they will help your analysis.
Feel free to use colored pens.

Cassy Ices is the only ice cream store on Long Beach Island (LBI). Cassy has typical upward sloping Marginal Cost curve and faces a downward sloping Demand curve.

   a. Show graphically the quantity of ice cream Cassy would sell and the price she should charge to maximize profits.

Last summer, with the cost and demand curve as above, Cassy made $1,000 in economic profits.

   b. Show these profits on your graph.

Hurricane Sandy caused extensive damage to houses on Long Beach Island (LBI). <u>Cassy expects that by next summer the demand will be back to what it was before the hurricane, she also expects the same cost curves as before</u>. But now she is wondering if her goal should still be profit maximization.

In a **new graph**, please show:

   c. What is the maximum quantity she could sell regardless of making profits? What price would that correspond to? Indicate graphically.

   d. What is the quantity Cassy should sell if her goal was to maximize revenues? What price would that correspond to? Indicate graphically.

   e. What is the quantity Cassy should sell if her goal was to achieve efficiency? What price would that correspond to? Indicate graphically.

   f. Cassy calculates that if she were to produce the efficient quantity her losses would be $3,000. Show these losses on your graph.

   g. Cassy states: "As I know each of my customers well, I have decided to charge each of them their maximum willingness to pay. That way, I can make society better off and feel good about helping LBI recover from Sandy." Evaluate her claim.

a. Answers: Typical monopoly graph. Q^M where MC = MR. P^M as the point on the demand curve corresponding to the quantity Q^M.

Points: 5
Typical D, MR & MC: 1 each
Q^M: 1 point
P^M: 1 point

b. Answers: Profits are the area $(P^M - ATC(Q^M))$ x Q^M.

Points: 4
Adding ATC correctly: 2
Area: 2

Note: Maximum of 2/4 if showed producer surplus instead of profits.
NOTE: Lose 2 point if you did not draw a new graph. Be nice to your graders: help them follow your work by being clear!

c. Answers: The maximum ice cream she could sell is where demand intersects the X-axis and that would imply setting P=zero.

Points: 4
2 for Q, 2 for P
d. Answers: This would be the quantity where where MR = 0 the corresponding price can be found on the demand curve.

Points: 4
2 for Q, 2 for P
e. Answers: Quantity where MC = MB. P^{eff} = MC.

Points:
2 for Q, 2 for P

f. Answers: Losses are the area $(P^{eff} - ATC(Q^{eff}))$ * Q^{eff}.

Points: 3
Note: if in your new graph ATC is higher then demand for the monopoly output you loose 1 point as in this case the monopoly will never produce.

g. Answers: Casey is planning to perfectly price discriminate. In this case profit maximization would generate the efficient quantity as MR=D=MB=MC. But this would make society better off in the sense that she maximizes total surplus, but she should not "feel good about herself" as she takes all this surplus for herself and leaves no consumer surplus.

Points: 7
Understanding that his is perfect price discrimination:2
Therefore efficient quantity: 1
A discussion of surplus: 2
Relating this to equity:2