

Econ 001: Midterm 1 Stein Answer Key
February 13th, 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 allowed!**

The exam consists of 8 multiple-choice questions and 2 short-answer questions.

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

- **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.
- **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 them all):

1. Three months prior to Madonna's spectacular Superbowl halftime performance, she contemplated singing either "Material Girl" or "Just like a Prayer." If Madonna sings "Material Girl," she would need to pay \$8,000 for a bejeweled bodysuit. For "Like a prayer" the costume would cost only \$3,000. Additionally, Madonna gets \$15,000 of benefit from singing "Material Girl" and \$5,000 in satisfaction from "Like a Prayer". Prior to purchasing either costume, what is the opportunity cost of singing "Just like a Prayer"?

- a. 23,000
- b. 18,000
- c. 13,000
- d. 10,000
- e. 3,000

2. The economic advisor to Robinson Tribe is trying to convince the tribal leader that the Robinson Tribe has absolute advantage in producing both Fish and Fruit, and thus the tribe doesn't need to work with Friday's Tribe.

	Fish (Total Per Day)	Fruit (Total Per Day)	Population
Robinson Tribe	600	1800	30
Friday Tribe	490	140	7

Using the information above, which of the following statement is true?

- I. The economic advisor is correct on Robinson Tribe's absolute advantage in both goods.
 - II. If the people in the Robinson Tribe only like to consume Fish, it makes sense for the tribal leader to adopt the advice.
 - III. If the people in the Robinson Tribe only like to consume Fruit, it makes sense for the tribal leader to adopt the advice.
- a. Only I is true.
 - b. Only II is true.
 - c. Only III is true.
 - d. I and II are true.
 - e. I and III are true.
 - f. None is true.

3. In 2011, there was an outbreak of Listeriosis from cantaloupe in Colorado. Listeriosis is a bacterial infection that typically lasts 7-10 days. Despite this outbreak, the price of Coloradan Cantaloupe rose. What could explain this rise in price?

- a. Fruit consumers substituted watermelon for cantaloupe.
- b. Jensen farms recalled 300,000 cantaloupe.
- c. Utah cantaloupe farmers starting selling to Colorado consumers.
- d. Both b and c are correct.

4. Emily, a promising lawyer, truly enjoys brewing coffee for herself and her valuation of her own brewed coffee is given by the following table.

	1 st cup	2 nd cup	3 rd cup	4 th cup
Valuation	\$2,000	\$1,500	\$1,000	\$500

Every day she faces a trade-off on how to allocate her time (12 hours) between practicing law and brewing coffee. For each hour, she could either work on one case, which pays her \$600, or make 1/2 cup of coffee. Given this information, how many cups of coffee could you expect Emily to brew every day?

- a. 1 cup
- b. 2 cups
- c. 3 cups
- d. 4 cups

5. Which of the following situations best illustrates the concept of consumer surplus?

- a. a manufacturer reduces the price of an item from \$ 2.50 to \$ 2.30 in the hope of being able to sell more units.
- b. a consumer who was not willing to buy a car at \$ 100,995, but was prepared to buy it at \$ 99,995.
- c. a British tourist who was willing to pay \$ 5.00 for a burger, but was only charged \$ 4.00 instead.
- d. a market reaches a condition whereby the demand for a product is greater than the producers' ability to supply it.

6. A manufacturer supplies a good for which with a price increase of 10% they are prepared to sell 15% more. This supply is best described as

- a. inelastic
- b. unit-elastic
- c. elastic
- d. unit-inelastic

7. In the housing market, rent control causes

- a. quantity demand to increase and quantity supply to decrease
- b. quantity demand to decrease and quantity supply to increase
- c. demand to increase and supply to decrease
- d. demand to decrease and supply to increase

8. Which of the following is sure to create dead weight loss in the economy?

- i. A deviation from equilibrium price p^*
 - ii. A deviation from equilibrium quantity Q^*
 - iii. Sales tax
 - iv. Price floor (e.g. minimum wage policy)
- a. i and ii
 - b. i, ii and iii
 - c. i only
 - d. ii only
 - e. iii and iv
 - f. ii, iii and iv

Answers:

1. d

2. c

3. b

4. b

5. c

6. c

7. a

8. d

THIS IS STILL PART I: USE BLUEBOOK I.

Explain answers carefully using graphs where appropriate. Your grade depends on your explanation as well as your answer: so show your work!

Keep your answers short! You only need a sentence or two per section.

Q1. (30 points). Please write your answer in bluebook #1.

Zach is a farmer. Suppose that he can produce corn and magic beans. In one season, he can produce a maximum of 100 units of corn or a maximum of 100 units of magic beans.

- a. Draw Zach's PPF, with magic beans on the x-axis, for one season, assuming that the opportunity cost of corn is constant.
- b. Draw Zach's PPF, with magic beans on the x-axis, for one season, assuming that the opportunity cost of corn is strictly increasing (i.e. the opportunity cost is never constant.)
- c. Now suppose that Zach trades in a competitive market at a price of 1 corn per magic bean. Add Zach's CPF to graph b. Add the point on your graph in b where Zach would choose to produce. Call this point Q.
- d. Suppose that Zach is only interested in consuming magic beans. Will he import or export magic beans? Show this export/import on your graph.

Draw again your graph from b. Include the point Q. Assume trade is no longer possible, so do not draw the line of trade.

- e. Draw another point, Q'', such that Zach is producing more magic beans than he was at Q but is still doing so efficiently.
- f. Now suppose that magic beans fill Zach with supernatural vitality that allows him to produce more corn, but not more magic beans, next season. Draw the potential PPF for next season and show how it would be affected by a move from Q to Q'' (assume that if he produces at Q this season, then he has the same productivity next season). Call this PPF2.

Answer Key:

a. A straight line PPF from (0,100) to (100, 0)

Points: 3

Straight:2

Right points:1

b. Answers:

Curved PPF from (0,100) to (100, 0)

Points: 4

Curved:2

Right points:2

c. Answers:

Straight CPF with slope of 1 tangent to PPF.

Zach will produce at the point of tangency.

Points: 10

CPF straight:2

Slope 1: 2

Tangent:2

Consumption point:4

d. Answers: Zach will import beans. Imports equal the horizontal distance from Q to the intercept of CPF & X axis.

Points:5

Import beans:2

Correct distance:3

e. Answers: Q'' on PPF to the right of Q.

Points: 2

f. If Zach is at Q this season his PPF is as before. If he produces at Q'' next season's PPF will have Y-intercept greater than 100 next season. The X intercept remains the same.

Points:6

PPF shifted out correctly:6

(shifted out on both axis: 2)

Part II:

Q2. (35 points). Please write your answer in bluebook #2.

In this problem we will consider the incidence of Pell Grants on students and institutions, based on recent research by Lesley J. Turner. The federal Pell Grant Program provides billions of dollars in subsidies to low-income college students to increase affordability and access to higher education. The issue discussed in the paper is who benefits from this subsidy and how does this depend on the characteristics of the colleges studied.

To make the analysis simple, we will assume that students purchase one credit in order to attend college and that the market is characterized by the following demand & supply:

$$Q_d = 6 - P$$

$$Q_s = 2P$$

- a) Begin by drawing the supply and demand graph using the equations above. Remember to label all axes, curves, and intercepts. **Make this graph big, as you will be coming back to it.**
- b) What is the equilibrium price and equilibrium quantity? Mark these values on your graph. What are the consumer surplus, producer surplus and total surplus generated by this market? Provide numerical calculations and values.
- c) At the equilibrium price, there are potential students who do not purchase an education credit. Show these potential students on your graph. Why do they not purchase any credits (i.e. why do they not go to college)? What is the consumer surplus they derive from this market?

The government, through the Pell Grant program, provides a per-credit subsidy of \$1.50

- d) Again, draw a new graph of the supply and demand. What are the equilibrium prices (to students and Universities) and equilibrium quantity? Mark these values on your graph. What are the consumer surplus, producer surplus and total surplus generated by this market? (Setting up the equations is sufficient for full credit, you need not get the exact numerical value).
- e) The paper by Ms. Turner suggests that the benefit to students receiving Pell Grants is lower in selective colleges than in less selective colleges, despite the fact that their size of the subsidy is similar. Assuming that the Pell Grant is \$1.5 per credit, suggest a case where students do not benefit at all from this subsidy. Draw this case graphically. Do you think this case is consistent with the University being more or less selective? Explain.
- f) From an efficiency perspective should we subsidize more or less selective Colleges? Explain. Which colleges should we subsidize if the goal is to increase enrollment? Explain.

Answer Key

a. Graph with upward sloping supply (through the origin) and downward sloping demand (starting at 6 on the price axis). Axes should be labeled something like “Price” and “College Credits.”

Points: 3

Label: 1

Demand: 1

Supply: 1

b. $P^* = 2, Q^* = 4.$

$CS = 0.5(6-2)4 = \$8$, area under demand and above P^*

$PS = 0.5(2-0)4 = \$4$, area above supply and below P^*

$TS = CS + PS = \$12$

Points: 7

P&Q: 1 each

CS and PS: 2 each (one for correct area, 1 for correct answer)

TS: 1

c. Portion of the demand curve past $Q^* = 4$, where students value college credits at less than \$2 (which is why they do not purchase any credits). They derive a consumer surplus of 0 from this market.

Points: 4

Correct area: 1

Reason: 1

Zero surplus: 2

d. $P^{**}(\text{to students}) = \$1, P^{**}(\text{to universities}) = \2.5 , derived from shifting supply down \$1.5 everywhere.

$Q^{**} = 5$

$CS = 0.5*(6-1)*5 = \$12.5$, area under demand and above \$1.

$PS = 0.5*(2.5-0)*5 = \$6.25$, area above supply and below \$2.5.

$SE = 1.5*5 = \$7.5$

$TS = CS + PS - SE = 12.5 + 6.25 - 7.5 = 11.25$

(which is less than before)

Points: 11

Graph set up (shifted S out or D in): 1

Equation set up: 1

$P_{\text{students}}^{**}, P_{\text{univ}}^{**}$ & Q^{**} : 1 each

CS, PS: 2 each (one for graph, one for set up of equation)

TS: 2 (1 for understanding that we need to deduct subsidy expenditure, 1 for correct set up). Note: 2 if state that $\text{New TS} = \text{Old T.S.} - \text{DWL}$ and mark DWL correctly.

e. If supply is perfectly inelastic the benefits of the subsidy will fall on the Universities but not for the students themselves. Note that graphically we will need to shift the demand in this case. Price to student does not change but the university receives more money. This seems roughly consistent with the school being more selective, as selective schools have relatively few spots that they could fill many times over with applicants.

(the completely elastic demand case will also get full credit if done correctly. Note that in this case it is probably consistent with the schools being less selective as they have close substitutes.)

Points: 6

Understanding the issue relates to elasticity:2

Correct graph:2

Relating to selectivity:2

f. From an efficiency perspective the subsidies should go to the more selective (more inelastic supply) colleges since the subsidy will be less distorting of the equilibrium quantity. If we want to increase enrollment we need to subsidize the elastic case which, given the findings of the paper is the unselective colleges. But that case will also be causing more Dead Weight Loss.

(Note that the answer is the same if they draw a completely elastic demand)

Points: 4

Efficiency more selective:2

Enrolment increase: less selective:2