

Econ 001: Midterm 1 Answer Key  
October 7th, 2010

**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 Midterm has 2 parts. You need 2 blue books.

Part 1 consists of **8** multiple-choice questions. Please use the first page of a blue book to record your answers.

Part 2 consists of 2 short answer questions. Please use a separate blue book for each.

**Part I: Multiple Choice Questions (5 points each/40 points total):**

1. Students can attend GREAT meetings on Sundays or Mondays. There is no additional charge for these sessions. Which of these statements is true?
  - a. Attendance is free in terms of economic costs.
  - b. Students should be indifferent between the two days as they pay zero dollars on both.
  - c. Both above statements are true.
  - d. None of the above is true.

2. The following table compares **total** wheat and computer production in India and Israel (in millions of units).

|                           | India | Israel |
|---------------------------|-------|--------|
| Wheat (total per day)     | 900   | 500    |
| Computers (total per day) | 9     | 1      |

Note: Suppose India has 1000 times more workers than Israel.

Which of these statements is true?

- I. India has an absolute advantage in wheat production.
  - II. Israel has a comparative advantage in wheat production.
- a. Both are True.
  - b. Only I is True
  - c. Only II is True
  - d. Both are False

3. Suppose an economy produces two goods, pizzas and lemonade, using labor. Last year, it produced 50 pizzas and 30 lemonades. This year, it produces 60 pizzas and 40 lemonades. If we know that in both years the economy was on its production possibilities frontier, which of the following events could not explain the increase in output?

- a. A reduction in unemployment.
- b. An increase in available labor.
- c. An improvement in technology.
- d. Any of these events could explain the increase in output.

4. Due to the recent oil spill, many vacation resorts along the Gulf Coast have closed. What would we expect to happen to price of vacation resorts in other parts of the country?

- a. There will be no effect, because the Gulf Coast resorts are substitutes for other resorts and a change in supply of a substitute would not effect price.
- b. Price will increase.
- c. Price will remain the same but quantity will be greater.
- d. Price will decrease.

5. When quantity demanded has increased at every price, it might be because:
- The number of buyers in the market has decreased.
  - Income has increased and this good is an inferior good.
  - The consumer prefers another good more than this good.
  - The price of a substitute good has increased.
6. Suppose the demand elasticity for HP laptop is exactly one and now the government imposes a tax of \$100 for each laptop. Which of the following is true?
- The revenue of HP doesn't change with the tax.
  - The revenue of HP decreases with the tax.
  - The revenue of HP increases with the tax.
  - There is no DWL.
7. The Bourse movie theater is expecting many empty seats on the next showing of "Freakonomics, the Movie." They are thinking of responding by lowering ticket prices with the hope that this will increase revenues. This strategy will work if:
- Demand is elastic.
  - Demand is inelastic.
  - Demand is unit elastic.
  - Demand is perfectly inelastic.
8. Suppose that demand is downward sloping & supply upward sloping. Subsidies cause Dead Weight Loss despite the fact that:
- Consumer surplus increases
  - Producer surplus increases.
  - Total surplus increases.
- only I is correct
  - only II is correct
  - only III is correct
  - All three are correct.
  - Both I & II but not III
  - Both II & III but not I
  - Both I & III but not II
  - None increases: that is why we get Dead Weight Loss!!!

**Answer Key:**

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

**Part II: Short Answer Questions (30 points each/60 points total):**

Please use a separate blue book for each question.

**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.** Spiceland has three workers produce sugar and tea as follows:

|          | Sugar (units per day) | Tea (units per day) |
|----------|-----------------------|---------------------|
| Adam     | 1                     | 2                   |
| Brittany | 1                     | 1                   |
| Carlos   | 3                     | 1                   |

- a. Draw the daily combined PPF for these three workers with tea on the horizontal axis.
- b. Suppose that together they produce 1 unit of tea efficiently, how much sugar will they be producing? Show this point on your PPF and label it X. What will each person be producing at point X?
- c. Draw the marginal cost (opportunity cost per unit) of tea.

Suppose that the marginal benefit of tea can be represented as follows:

$$MB(t) = 7 - t, \text{ where } t \text{ is the quantity of tea consumed.}$$

- d. In what sense is point X efficient? In what sense is it not? Explain.

Suppose now that Spiceland can trade with another country at a price of 1 sugar = 2 tea.

- e. Explain why this trade ratio is consistent with their producing at point X.
- f. Add the CPF in this case and suggest a consumption point Y that is consistent with X and with the info given above about the marginal benefit of tea. Add point Y to your graph. Partial credit will be given to a graphical answer. Full credit to numerical solution.

**Answer Key:**

**a. PPF with two kinks and points at (0,5), (2,4), (3,3), (4,0).**

**Points: 5**

**2 kinks: 1**

**Each point: 1**

**b. Answer:**

**1 unit of tea efficiently means making 4.5 units of sugar. Adam makes 1 unit of tea and half a unit of sugar, everyone else makes only sugar.**

**Points: 5**

**Sugar=4.5: 2**

**Each person's output category: 1**

**c. Answer:**

**Stepwise, increasing function with the values**

**½ from 0 to 2 tea units**

**1 from 2 to 3 tea units**

**3 from 3 to 4 tea units**

**Points: 5**

**Each correct step: 1**

**x-axis: 0.5 points**

**y-axis: 0.5 points**

**d. Answer:**

**MB line intersects MC at (4,3). In other words at the point X  $MB > MC$ .**

**Hence, X is productively efficient by not allocatively efficient.**

**Points: 4**

**Productively efficient: 1**

**Allocatively efficient: 1**

**Explanation (graphical, numeric or relating MB & MC) : 2**

**e. Answer:**

**Comparing the international price ratio to each individual's Opportunity Cost, we see that both Brittany & Carlos have lower opportunity cost than that price for producing sugar (or a higher O.C. for tea) so they should produce sugar. As for Adam his O.C. is equal to the international price so it doesn't matter which he produces. This is consistent with point X.**

**Points: 4**

**Need to relate international price to opportunity costs to explanation choice of specialization.**

**f. Answer:**

**CPF: straight line from (0,5) to (10, 0).**

**Spiceland essentially now faces a MC of tea constant at  $\frac{1}{2}$  from 0 to 10 units of tea. New MC line intersects MB at 6.5 tea units, this allows for the consumption of 1.75 sugar units as well (from the CPF).**

**Points: 7**

**CPF: 4 (1 for understanding that not in PPF, 2 for correct)**

**Understanding that we need to relate MB to MC of  $\frac{1}{2}$ : 2**

**Correct answer: 2**

**Q2.**

Currently, there is no sales tax on food in Pennsylvania. In this question, we will analyze the effect of introducing such a tax.

To make the analysis consistent with the model learned in class, we will assume that the sales tax is a per unit tax.

- a. Let us start with the current state of no tax. Draw a graph with typical supply and demand curve of food. Suppose the equilibrium price of food is \$2 per unit. Add this to your graph. What are the consumer's surplus, producer's surplus and total surplus? Shade the areas on your graph (no calculations needed).

Suppose now the state government decides to charge a 50 cents per unit sales tax on food (imposed on producers).

- b. Draw a new graph with the tax. Show graphically the new equilibrium price that consumers pay and quantity they purchase.
- c. What are the consumer's surplus, producer's surplus, dead weight loss and government revenue now? Shade them on your graph in part b.

Suppose the tax is charged on consumers, which means consumers pay 50 cents tax in addition to the listed price. Many consumers complain that, "The tax is too heavy. The 50 cents increase in the price of food is killing us."

- d. Is their claim correct in the sense that "food price will go up by 50 cents"? Use your graph to explain.
- e. Suppose you learn that their claim is correct. What does this mean about the graph you drew in part (a)? Be very specific.

**Answer Key:**

**a. Usual S&D graph. Equilibrium marked at  $P=\$2$ . C.S.=area under D-curve and above  $\$2$ . P.S. area above S-curve and under  $\$2$ . T.S. is sum of the two.**

**Points: 8**

**Axis & labeling S&D: 1**

**Equilibrium: 1**

**C.S.=2**

**P.S.:2**

**T.S. the sum: 2**

**b. Answer:**

**Need to shift S curve up by 50 cents. Equilibrium price for consumers,  $P_1$ , at intersection of new S&D. Corresponding quantity= $Q_1$ .**

**Points: 5**

**S shifted: 3 (2 point shift in, 1 point by 50 cents)**

**P & Q: 2 (1 each)**

**c. Answer:**

**C.S.=area under D-curve and above  $\$ P_1$ . P.S. area above original S-curve and under  $\$ P_1-.5$ . tax rev= $.50*Q_1$ . T.S. is sum of the three.**

**Note: Students may also denote P.S. as area above new S curve & under  $P_1$ . In this case, though, they must be careful to explain the T.S. correctly.**

**Points: 8**

**2 each.**

**d. Answer:**

**This claim is not correct as  $\$2-.50 < P_1$ .**

**Must either show graphically the effect of imposing the tax on consumers or state that it will have the same effect as a tax on producers. -2 points if not.**

**Points: 4**

**e. Answer:**

**If their claim is correct it must be the case that demand is completely inelastic. In this case the full tax burden will fall on the consumer and their price will increase by the full 50 cents.**

**Points: 5**

**Demand completely inelastic.**

**(only 3 points awarded for answering with “supply needs to be perfectly elastic”)**