

Econ 001: Midterm 1
October 11, 2001

Instructions:

- This is a 60-minute examination. You have ten minutes for review.
- 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.
- The use of Programmable Calculators is in violation of Departmental rule. It is strictly forbidden!

The Midterm has 2 parts.

Part 1 consists of 10 multiple-choice questions. Please use the bubble sheet for this part.

Part 2 consists of 3 short answer questions. Please use a separate blue book for each answer.

Part I: Multiple Choice Questions (25 minutes/50 points):

1. Suppose the government sets a price ceiling that falls below the equilibrium price. Assuming price controls are effective, which of the following is true?

- There is an excess supply.
- There is an excess demand.
- The legal market price rises.
- The demand curve shifts to the left and the market reaches a new equilibrium.

2. The following table shows labor productivity in Fabric and Rice and the total labor force in India and in the U.S.A. (Assume labor is the only factor of production.)

	India	U.S.A.
Fabric	30 yards/worker	70 yards/worker
Rice	30 pounds/worker	70 pounds/worker
Labor Force	15 million	5 million

Choose the correct statement.

- U.S.A. has an absolute advantage in both Fabric and Rice.
- India has an absolute advantage in both Fabric and Rice.
- U.S.A. has an absolute advantage in Fabric and India has an absolute advantage in Rice.
- U.S.A. has an absolute advantage in Rice and India has an absolute advantage in Fabric.

3. Using the same information as in Q2, which of the following is correct:
- India will specialize in Rice since it has comparative advantage in Rice.
 - The U.S. will specialize in Fabric since it has comparative advantage in Fabric.
 - There are no gains from trade in this case.
 - None of the above.
4. If the demand curve is totally inelastic and the supply curve has a positive slope then the imposition of a per-unit tax in this market implies that:
- Consumers bear the burden of the whole tax, consumers' expenditures increase and producers' revenues do not change.
 - Consumers bear none of the tax burden, consumers' expenditures increase and producers' revenues decrease.
 - Consumers bear the burden of the whole tax, consumers' expenditures decrease and producers' revenues decrease.
 - Consumers bear none of the tax burden, consumers' expenditures increase and producers' revenues increase.
5. Suppose that the supply and the demand for umbrellas can be characterized by:

$$\begin{array}{ll} \text{Supply:} & Q^s = 100 + 2P \\ \text{Demand:} & Q^d = 160 - P \end{array}$$

where Q^s is the supply of umbrellas, and Q^d is the demand for umbrellas.
What is the equilibrium price?

- \$20
- \$60
- \$30
- \$100

6. Given the information in Q5, how many umbrellas are purchased in equilibrium?
- 160 umbrellas
 - 140 umbrellas
 - 180 umbrellas
 - 30 umbrellas

7. Given the information in Q5, if a tax of \$5 per umbrella is imposed, then the price of umbrellas (that consumers pay) will:
- Increase by \$5
 - Increase by less than \$5
 - Increase by more than \$5
 - Decrease by less than \$5
8. Suppose Tom can buy as many apples as he likes. If the marginal utility Tom gets from apples (in \$ terms) is greater than the price of apples then Tom should:
- Buy more apples.
 - Buy fewer apples.
 - Not change his apple consumption.
 - Unless Tom has taken Econ 001 his behavior will not be rational.
9. In January, 2,500 quarts of ice cream are sold in Boston at \$2 a quart. In February, The price went down by 10% and the quantity sold increased by 20%. This means that the price elasticity for ice cream (disregarding the minus sign) is:
- 1
 - .2
 - 2
 - .1
10. We should expect the demand curve for gasoline to be:
- More elastic in the long run than in the short run.
 - Less elastic in the long run than in the short run.
 - To have the same elasticity in the short and long run.
 - To always be completely elastic.

Part II: Short Answer Questions:

Please use a separate Blue Book to answer each of the 3 questions.

Q1. (9 minutes/18 points).

During the Great Depression the United States was not utilizing all of its resources. When WWII started it could therefore increase the production of both guns and butter at the same time.

- a. Draw a production possibilities frontier of the United States during the great depression. Plot Guns on the horizontal axis and Butter on the vertical axis. Show graphically how, when WWII started, it was possible for the United States to increase both guns and butter at the same time.
- b. Would it be possible to increase both guns and butter, when the war started, if the United States were at full employment prior to WWII? Explain using your graph.
- c. The needs of war encouraged huge technological advances in the production of guns. How would this affect the PPF? Show graphically. Assume that there was no technological change in the production of butter.

Q2. (8 minutes/16 points)

The recent slow down in the economy has frightened investors in the stock market that retail stores will not do as well as they have in the past few years. Nonetheless some shares have done better than others. This question helps you analyze the expected revenues of clothing stores. Throughout this question assume that the supply curves do not change.

- a. Suppose clothes bought at Nordstrom are a normal good.
 1. Define a normal good.
 2. Show graphically how a decrease in consumers' income will affect the demand for Nordstrom's clothes.
 3. Show graphically what will happen to the equilibrium price and quantity.
 4. Will revenues increase or decrease? Show this in your graph.
- b. Suppose clothes bought at Target are an inferior good.
 1. Define an inferior good.
 2. Show graphically how a decrease in consumers' income will affect the demand for Target's clothes.
 3. Show graphically what will happen to the equilibrium price and quantity.
 4. Will revenues increase or decrease? Show this in your graph.

Note: Question 3 is on the next page.

Q3. (Stein's sections only) (8 minutes/16 points)

The following is a table showing Mark's utility from CDs (in \$ terms). Use this information to answer the questions below. Make sure you **EXPLAIN** your results and **show your work**.

Number of CDs purchased	Total Utility
0	0
1	10
2	18
3	21
4	23
5	22

- a. What is Mark's marginal utility from the second CD?
- b. At a price of \$7 per CD, how many CDs will Mark purchase?
- c. What is his consumer surplus at this price?
- d. At a price of \$1 per CD, how many CDs will Mark purchase?
- e. What is his consumer surplus at this price?

Answers to Short Answer Questions:

Q1. (9 minutes/18 points).

During the Great Depression the United States was not utilizing all of its resources. When WWII started it could therefore increase the production of both guns and butter at the same time.

- d. Draw a production possibilities frontier of the United States during the great depression. Plot Guns on the horizontal axis and Butter on the vertical axis. Show graphically how, when WWII started, it was possible for the United States to increase both guns and butter at the same time.

Using the graph (attached) we see that if the US was not at full employment it was inside the PPF at a point such as A.

(3 points for this)

From such a point it is possible to move to a point on the PPF where both guns and butter production are greater (such as point B).

(3 points for this)

Note: The correct answer has to be from a point inside the PPF to a point where both more guns and more butter are produced. A movement such as from A to C (same guns, more butter) >>> loose 2 points.

- e. Would it be possible to increase both guns and butter, when the war started, if the United States were at full employment prior to WWII? Explain using your graph.

No. If the U.S. was at full employment it would be on the PPF (a point such as A') where increasing one good entails decreasing the other good.

Moving from A' to B' increase butter at the expense of Guns.

Note: A student should get full credit if they explain here that a technological change or increase in the work force would cause the PPF to shift out during war times. This was not the intended answer but if explained *correctly* it is consistent with events during WWII.

- f. The needs of war encouraged huge technological advances in the production of guns. How would this affect the PPF? Show graphically. Assume that there was no technological change in the production of butter.

Answer: the New PPF would intersect the Y axis at the same point but would intersect the X axis at a bigger quantity of guns.

Note: loose 3 points if move PPF out for both goods. (See attached graph.)

Q2. (8 minutes/16 points)

The recent slow down in the economy has frightened investors in the stock market that retail stores will not do as well as they have in the past few years. Nonetheless some shares have done better than others. This question helps you analyze the expected revenues of clothing stores. Throughout this question assume that the supply curves do not change.

c. Suppose clothes bought at Nordstrom are a normal good.

1. Define a normal good.

2 points:

A normal good has an income elasticity >0 .

The $\% \text{ change in quantity} / \% \text{ change in income} > 0$.

Thus an increase in income will cause the quantity demanded at any price to go up.

(any of these, if complete, gets full credit)

2. Show graphically how a decrease in consumers' income will affect the demand for Nordstrom's clothes.

2 points:

This will be a shift IN of the demand for clothes from Nordstrom's.

(see graph)

3. Show graphically what will happen to the equilibrium price and quantity.

2 points:

Price will decrease. So will quantity.

(see graph)

4. Will revenues increase or decrease? Show this in your graph.

2 points:

Revenue will decrease. As both Price and quantity decrease.

(1 point for showing on graph, 1 point for concluding the revenues will decrease)

d. Suppose clothes bought at Target are an inferior good.

1. Define an inferior good.

2 points:

An inferior good has an income elasticity < 0 .
The $\frac{\% \text{ change in quantity}}{\% \text{ change in income}} < 0$.
Thus an increase in income will cause the quantity demanded at any price to go down.

(any of these, if complete, gets full credit)

2. Show graphically how a decrease in consumers' income will affect the demand for Target's clothes.

This will be a shift OUT of the demand for clothes from Target's.
(see graph)

3. Show graphically what will happen to the equilibrium price and quantity.

Price will increase. So will quantity.

(see graph)

4. Will revenues increase or decrease? Show this in your graph.

Revenue will increase. As both Price and quantity increase.

(1 point for showing on graph, 1 point for concluding the revenues will increase)

Note: Question 3 is on the next page.

Q3. (Stein's sections only) (8 minutes/16 points)

The following is a table showing Mark's utility from CDs (in \$ terms). Use this information to answer the questions below. Make sure you **EXPLAIN** your results and **show you work**.

Number of CDs purchased	Total Utility
0	0
1	10
2	18
3	21
4	23
5	22

f. What is Mark's marginal utility from the second CD?

3 points:

$$18-10=8$$

g. At a price of \$7 per CD, how many CDs will Mark purchase?

3 points:

He will purchase 2 units. For units 1 & 2 $MU > p$ so Mark will purchase them Any further unit has a $MU < 7$, so it make no sense to purchase.

(loose 2 points if no explanation given)

h. What is his consumer surplus at this price?

3 points:

$$C.S.=TU-\text{expenditure}=18-(7*2)=4$$

$$\text{or } (10-7) + (8-7)=3 + 1 =4$$

i. At a price of \$1 per CD, how many CDs will Mark purchase?

3 points:

He will purchase as long as $MU > 1$, in this case 4 units.

(loose 2 points for no explanation)

j. What is his consumer surplus at this price?

$$C.S.=TU-\text{expenditure}=23-(1*4)=23-4=19$$

$$\text{or } (10-1) + (8-1)+(3-1)+(2-1)=9 + 7+2+1 =19$$

Q3. (Levine's sections only) (8 minutes/16 points)

Lynn, a rational consumer, spends her weekly income on hamburgers and hot dogs. Her income is \$20, the price of hamburgers, \$2, and the price of hot dogs, \$5.

Using a budget line indifference curves, show how Lynn would choose her best affordable combination of hamburgers and hot dogs. Explain.

ANSWERS: (Levine's Q3)

Drawing the budget line correctly (intercepts: hamburgers 10, hot dogs,4): 4 POINTS.

Drawing illustrative indifference curve(s): 2 POINTS.

Showing the best affordable combination as the tangency between the BL and an IC: 2 POINTS.

Explanation of why this is the best affordable point (including why the highest possible IC is desirable, ie it is the highest possible total utility): 8 POINTS.

