

Econ 001: Midterm 1 Departmental Honors
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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 12 multiple-choice questions. Please use the bubble sheet for this part.

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

Part I: Multiple Choice Questions (4 points each/24 minutes/48 points total):

1. Assume a country can produce only two goods: textiles and cars. Assume further that it is currently producing positive amounts of both goods at a point on the PPF. Suppose there is an improvement in the technology used to produce cars. Which of the following becomes true for the country?

- a. It can only produce more cars than before.
- b. It can produce more of both goods.
- c. It can produce more cars than before, but only if it reduces the production of textiles.
- d. There is no change in the production possibilities.

2. The following table includes the production of rice and fabric, per worker, in the USA and India and the number of workers in each country:

	USA	India
Rice (pounds per worker)	120	70
Fabric (yards per worker)	60	20
Workers	5	10

Given this information, which of the following is correct?

- a. India has an absolute and comparative advantage in producing rice.
- b. The USA has an absolute and comparative advantage in producing rice.
- c. India has an absolute advantage and the USA has a comparative advantage in producing rice.
- d. The USA has an absolute advantage and India has a comparative advantage in producing rice.

3. Trade allows a country to:

- a. Produce outside its PPF
- b. Consume outside its PPF
- c. Produce and consume outside its PPF
- d. Even with trade a country will never consume or produce outside its PPF

4. Use the following table to answer the following two questions:

George's Utility:

Number of milkshakes consumed	0	1	2	3	4
Total utility from milkshakes (in \$)	0	\$23	\$28	\$31	\$33

The table above gives information on George's total utility from consuming milkshakes. If George has unlimited income to spend on milkshakes, and their price is \$4 each he will maximize his utility if he buys:

- a. One milkshake.
- b. Two milkshakes.
- c. Three milkshakes.
- d. We cannot answer this question, as we do not know George's marginal utility from consuming milkshakes.

5. Using the information in the table, George's consumer surplus from milkshakes will be:

- a. \$4
- b. \$5
- c. \$28
- d. \$20

6. The slope of the budget line remains the same if:

- a. The price of both goods goes up by 5%
- b. The price of the first good goes up by 5% and the price of the second good goes down by 5%.
- c. The price of both goods goes up by 5% and income goes up by 5%
- d. Both a. and c. correct

7. Suppose a tax is imposed on the producers of a good, who face a demand that is perfectly inelastic. Who will bear the tax burden?

- a. The producers will bear the whole tax burden.
- b. The consumers will bear the whole tax burden.
- c. The tax burden will be divided between the two.
- d. No one will, because quantity demanded will fall to zero

8. Suppose that the supply and the demand for printers can be characterized by:

$$\begin{array}{ll} \text{Supply:} & Q^s = 100 + 3P \\ \text{Demand:} & Q^d = 460 - P \end{array}$$

where Q^s is the supply of printers, Q^d is the demand for printers, and P is the price in dollars.

What is the equilibrium quantity of printers?

- a. 90 printers
- b. 370 printers
- c. 180 printers
- d. None of the above.

9. Given the information in Q8, if price floor is set at 50\$ per printer then:

- a. There will be excess demand
- b. There will be excess supply
- c. Markets will clear at a price of \$50
- d. None of the above.

10. Given the information in Q8, if a tax of \$20 per printer is imposed by the government then:

- a. The tax burden of the consumers will be \$15 and on the producers it will be \$5 (per printer).
- b. The tax burden of the consumers will be \$5 and on the producers it will be \$15 (per printer).
- c. The tax burden of the consumers will be \$10 and on the producers it will be \$10 (per printer).
- d. The tax burden of the consumers will be \$0 and on the producers it will be \$20 (per printer).

11. 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 2%. This means that the price elasticity for ice cream (disregarding the minus sign) is:

- a. 1
- b. .2
- c. 2
- d. .1

12. Consumer spends a given income on two goods X and Y where the price of each good is constant. When the price of X is increased, the consumption of Y increased. Therefore:

- a. Y is a normal good
- b. The consumption of X decreased, therefore X is a normal good.
- c. The consumption of X decreased but we cannot determine whether X is a normal or an inferior good.
- d. We do not know the changes in the consumption of X, therefore we cannot determine whether X is a normal or an inferior good.

Part II: Short Answer Questions:

Please use a separate Blue Book to answer each of the 2 questions.

Q1. (approx. 13 minutes - 26 points)

In the following question you are asked to analyze the apparel market using the supply and demand model. Using graphs be careful to label everything and to explain your answer clearly. Remember that **credit depends on your explanation** as much as on your answer.

- a. Suppose that there has been a technological improvement in the manufacturing of shirts. Using the S&D graph explain how this will affect the equilibrium price and quantity of shirts. Will revenues from shirts increase or decrease?
- b. Suppose that there has been no change in the technology of manufacturing jeans. What effect, if any, will the technological improvement in shirts have on the market of jeans? Specifically, using the S&D graph, explain how this will affect the equilibrium price and quantity of jeans. Will revenues from jeans increase or decrease?
- c. Suppose now that there was no technological change in the manufacturing of shirts. A market analyst has found that the price of jeans has gone up. Given that incomes have gone down she argues that jeans must be an inferior good. Is she correct?

Q2. Honors Question (approx. 13 minutes - 26 points)

You own a firm which uses labor to produce two products: Xena action figures (good x) and Yoda action figures (good y). Each worker can only work on good x or good y at a given time. For EACH type of action figure, the output depends on the number of workers making that good:

0 workers assigned to produce good	=	0 units of that good produced						
1 worker	"	"	"	"	= 6 units	"	"	"
2 workers	"	"	"	"	= 11 units	"	"	"
3 workers	"	"	"	"	= 15 units	"	"	"
4 workers	"	"	"	"	= 18 units	"	"	"
5 or more workers	"	"	"	"	= 20 units	"	"	"

Answer the following questions based upon that production function. State clearly any assumptions you might need to make in order to answer each question. Parts (d)-(f) require a graph to be drawn with 3 supply curves. Use a complete page to do this, and use three colors if possible. If you don't have colored pens, label the three supply curves (d), (e), and (f).

- Draw your firm's PPF if you have four employees. [5 points]
- Suppose you can sell Xena action figures for \$2, and Yoda action figures for \$3. How many of each would you produce if you have four employees? What would your total revenue be? [4 points]
- Again assuming the prices are as in part (b), what is the most you would pay for a fifth worker, and why? [4 points]
- In a new graph, draw your firm's supply curve of Xena action figures if you can sell Yoda action figures for \$3, and you have four workers. [Hint: label your axes precisely.] [5 points]
- On the same graph but in a new color, repeat part (d) if you can sell Yoda action figures for \$5, and you have four workers. Briefly discuss the difference between this curve and the one from part (d). [4 points]
- On the same graph but in a new color, repeat part (d) if you can sell Yoda action figures for \$3, have four workers, but now the government, responding to anti-American rhetoric from the ever-pugnacious Lucy Lawless, has imposed a 10% tax on all Xena related products, to be paid by the producer. [No tax is placed on Yoda action figures.] Briefly discuss the difference between this curve and the one from part (d). [4 points]
- Extra Credit: suppose you can sell Xena action figures for \$2, Yoda action figures for \$3, and you can choose how many workers to hire. However, you have to pay each worker \$ w . Express your firm's output of Yoda action figures as a function of w .
- If You Have Lots of Time Left and Want to Show Off: repeat part (g) for a general increasing, differentiable, strictly concave production function $x = f(L_x)$. [That is, if you put L_x workers on the production of good x , then you get $f(L_x)$ amount of output. Assume you can hire any fraction of a worker and pay that same fraction of a wage. Hint: what should be the relationship between $f'(L_x)$ and $f'(L_y)$?]

Answer key to Fall 2001 Midterm:

1. a
2. a
3. c
4. a
5. a
6. b
7. b
8. a
9. c
10. a