Econ 001: Midterm 1 Answer Key
February 7, 2006

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.**
- The use of Programmable Calculators is in violation of Departmental rule. It is strictly forbidden!

The Midterm has 2 parts.
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 (4 points each/32 points total):

1. David is considering going to school at Penn for four years. The tuition is $25,000 a year, but he knows that after graduation he can earn $30,000 more than high school graduates for each subsequent year of work. If he does not go to college, he can work right away and earn $20,000 a year. What is David's opportunity cost of going to Penn for 4 years?

   a. $20,000
   b. $45,000
   c. $80,000
   d. $180,000

2. A point to the right of an existing production possibility boundary might be attainable

   a. If less of one good is produced
   b. With full employment of resources
   c. With economic growth
   d. With a reallocation of the factors of production

3. Consider the following table of productivities per hour:

	Shirts	Pairs of Pants
Adam	3	7
Beth	4	16

Which of the following is a correct?

a. Adam has an absolute advantage in shirts.
b. Adam has an absolute advantage in pants.
c. Adam has a comparative advantage in shirts.
d. Adam has a comparative advantage in pants.

4. Refer to the above table. If Adam and Beth trade, which of the following statements is true?

a. Adam will spend at least some of his time making shirts.
b. Beth will make both shirts and pants, and Adam will specialize in home goods.
c. Beth will get all of the gains from trade.
d. Beth does not gain from trade at all.

5. An increase in the price of a good and a resulting decrease in total expenditure on this good are associated with:

a. Inferior goods
b. Substitute goods
c. Elastic demand
d. Normal goods

6. Suppose shirts and pants are complements in consumption. Demand has been weaker than expected and Gap is considering putting **one** of these two goods on sale. If the firm's goal is to maximize the joint revenue from both products it should put on sale the good that has:

a. The higher elasticity of demand.
b. The lower elasticity of demand.
c. The higher elasticity of income.
d. The lower elasticity of income.

7. Suppose the current price of coffee is $2 a cup and 1,000 cups are sold per day. A tax of 50 cents per cup of coffee would raise:

    a. Exactly $500.
    b. At most $500.
    c. At least $500.
    d. Less than $500 as long as demand is downward sloping.

8. A subsidy on education is:

a. Efficient, because it increases producer surplus.
b. Efficient, because it increases consumer surplus.
c. Efficient, because it increases producer surplus and consumer surplus simultaneously.
d. Inefficient despite the fact that increases producer surplus and consumer surplus simultaneously.

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

Part II: Short Answer Questions (34 points each/68 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!

Q1.
Amy and Ben are married. Their production possibilities are given in the next table:

	Potatoes (per day)	Tomatoes (per day)
Amy	10	20
Ben	3	15

a. Draw their joint PPF per day (with potatoes on the horizontal axis).

Answer:
PPf should go through (0,35), (10,15), (13,0)

Points: 7 total
2 for each point
1 for kink

b. Graph their marginal cost of potato production in terms of tomatoes. (Hint: Put potatoes on the horizontal axis.)

Answer:
Graph is a step function as follows: MC=2 for 0 through 10 potatoes, then MC=5 up to 13 potatoes

Points: 4 total
2 for understanding what type of graph is required
1 for each step

c. Suppose Amy and Ben choose to produce 11 potatoes. What must be the marginal benefit of the last potato in this case?

Answer:
If they produce 11 potatoes, then Ben makes the last potato, so MC=5 and this implies that MB=5.

Points: 5 total
3 for MC=5
2 for this implies MB=5

d. If indeed Amy and Ben consume 11 potatoes, calculate and show on your PPF from [part a] how many tomatoes will be produced each day. Who will produce which goods?

To get 11 potatoes, Amy spends all her time making potatoes, and Ben makes 1 potato, so he spends 1/3 of his time on potatoes, and 2/3 on tomatoes, so he gets 10 tomatoes. The point on the graph is 11 potatoes and 10 tomatoes.

Points: 5 total
1 for Amy produces potatoes
1 for Ben splits his time
1 for getting 10 tomatoes
2 for showing on graph

Ben wants to have comparative advantage in potato production, so he decides to go to Mr. Potatohead School to increase his productivity in potato production. The school is free.

e. At least how many potatoes a day should Ben be able to produce after he finishes his school to achieve his ambition?

Answer:
Ben would like to lower his O.C. of a potato to below 2 tomatoes (Amy's O.C.). As he produces 15 tomatoes this would require producing at least 7.5 potatoes.
So: he must be able to make at least 7.5 potatoes per day.

Points: 5 total
3 for explanation, 2 for answer.

f. After graduating Mr. Potatohead School with honors, Ben is now able to produce 15 potatoes a day. Amy and Ben increase their production of potatoes to 13. What has happened to the marginal benefit from the last potato?

Now Ben has a comparative advantage in potatoes and he will be the one producing

them. As his O.C. is 1 we know that the MC=1 so the MB will be=1 as well.

Points: 4 total
2 for understanding that MC=1
2 MC=MB=1

g. Can they consume more of both goods now?
Yes. They used to produce (& consume) 11 potatoes and 10 tomatoes. Now they can produce & consume 13 potatoes, and 22 tomatoes.

Points: 4 total
For full credit need to compare old and new consumption points numerically or graphically.

Q2.

Consider the market for used laptops. Suppose that it is described by the following demand function:

$$P^d = 22 - 3Q - 2I$$

where P is the price of laptops, Q is the quantity demanded of laptops and I is income .

Also, suppose that the supply of laptops is given by:

$$P^s = 5 + 2Q$$

a. Suppose that income is equal to 1. What is the equilibrium price and quantity in this market? Depict graphically your numerical answer.

Answer:
Demand: P=20-3Q. So we get P=11, Q=3.

Points: 9 total
2 for understanding what the demand curve is.
2 for setting Pd=Ps
1 for Q
1 for P
3 for graph (1 for demand, 1 for supply, 1 for equilibrium)

b. What is the total surplus generated by this market?

Answer:
From the graph, we take the area of the triangle we get, which is ½*15*3=22.5

Points: 6 total
3 for method
3 for answer
(Can calculate C.S. and P.S. separately and add up too)

c. Are laptops a normal good? Explain using a numerical example and/or graphs

Answer:
No. If we increase income (for example to 2), demand would shift in (e.g. to P=18-3Q)
For a normal good as income increases demand shifts out.

Points: 7 total
No: 1 point
Understanding what a normal or inferior good is: 3 points

Numerical/graphical explanation: 3 points

d. Suppose the government puts a price ceiling of $10 on laptops. Will this have any effect on the market? Will there be a shortage or surplus in the market? How big will it be? Please solve numerically and graphically.

Answer:
There will be a shortage. If P=10, we get QD=3.33, and QS=2.5, so the shortage is the difference between these.

Points: 8 total
2 Qd
2 Qs
2 Shortage (Qd-Qs)
2 for graph

e. What is the total surplus generated by the market when a price ceiling of $10 is in effect?

Answer:
The trapezoid between demand & supply up to Q=2.5

Points: 4 total
Need to show on graph or calculate numerically.