Econ 001: Midterm 1 Answer Key
October 10, 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. The UA has signed an agreement with Ruckus Network to provide a set of restricted music download services for free. One alternative that was not chosen was Ruphsody. That service would cost each student $30 a year but is on average $40 better than the free service. What was the true cost, per student, of choosing Ruckus?

a. $0
b. $10
c. $40
d. -$10

2. Susie and Lucy are stranded on an island. They can only produce hats or collect berries. Their production possibilities are given in the following table:

	Hats (per day)	Berries (per day)
Susie	X	Y
Lucy	W	Z

If we know that Susie has a comparative advantage in the production of hats, which of the following is true?

a) X is bigger than W
b) X is bigger than Y
c) Y/X is less than Z/W
d) None of the above

3. China produces tea and cars. The opportunity cost of cars increases as more cars are produced. Suppose China is producing at a point on the PPF in which the opportunity cost of the goods produced are different from their marginal benefit. This implies that:

a) China is efficient in terms of production.
b) China is choosing an efficient allocation of resources.
c) Both a and b are correct.
d) Neither a nor b is correct.

4. The cross elasticity of demand for SUVs and gasoline is known to be -0.35. Suppose there several major oil refinery plants that have come back into operation. In the market for SUVs, which of the following will occur:

a. The equilibrium price and quantity of SUVs will increase
b. The equilibrium price and quantity of SUVS will stay the same
c. The equilibrium price will decrease and the quantity will increase
d. The equilibrium price and quantity will decrease

5. A car producer recently lowered the price for cars, which resulted in an increase in the total revenue. This suggests that:

a. A car is a normal good
b. A car is an inferior good
c. Demand for cars is elastic
d. Demand for cars is inelastic

6. For a normal good A, which of the following will result in an increase in demand?

    a. The price of A goes down
    b. The supply of A increases
    c. The supply of A decreases
    d. Income goes up.

7. Assume that Tim cleans Ryan's house weekly for $80. Ryan would be willing to pay as much as $100 weekly to have his house cleaned. Tim's opportunity cost is $70. If Tim cleans Ryan's house, consumer surplus and producer surplus are, respectively,

    a. $100 and $10.
    b. $80 and $70.
    c. $70 and $80.
    d. $20 and $10.

8. From an efficiency standpoint, per unit taxes should be set on goods that have:

    a. A completely inelastic demand.
    b. A completely inelastic supply.
    c. A completely elastic demand
    d. A completely elastic supply.
    e. Both a & b are correct.
    f. Both c & d are correct.
    g. Both a & c are correct.
    h. Both b & d are correct.

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

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.

Suppose that Tuscany can produce only wine or clothes, and that its Production Possibility Frontier (PPF) is represented by a straight line.

   a) Draw Tuscany's PPF with clothes on the horizontal axis. Explain what it means, in terms of opportunity cost, that Tuscany's PPF is a straight line?

Answer:
A straight PPF is expected. Axis should be labeled.
A straight PPF implies that the opportunity cost of producing clothes (and wine) is constant.

Points: 6
Graph: (1 labels, 1 straight): 3 points
Implies constant O.C. for goods: 3 points.

Tuscany is well known for being a great exporter of wine.

   b) Using the previous information, what can you say about the world relative prices, if you observe that Tuscany is exporting wine and importing clothes?

Answer:
It must be that the relative price of wine (in terms of clothes) is higher in the world market than the O.C. of wine (in terms of clothes) is in Tuscany.
Or: It must be that the relative price of clothes (in terms of wine) is lower in the world market than the O.C. of clothes (in terms of wine) is in Tuscany.

Points: 5
Getting the sign right: 3 points
Explanation (one good in terms of the other good): 1 point.
Relating to prices;1 point

   c) Add to your graph a Consumption Possibilities Frontier that is consistent with these prices.

Answer:
The CCP is a straight line that originates from the maximal wine production point (on the vertical axis) and is above the PPF.

Points: 5

Straight line: 1 point
Starts at correct point: 2 points
Is above PPF: 2 points

In the last decade, Tuscany has faced a sizeable wave of immigration from China. These Chinese workers are all identical to each other. They can be employed for the production of either wine or clothes, but, compared to Tuscan workers, they have a comparative advantage in the production of clothes.

    d) Explain what is meant by the statement that Chinese workers have a comparative advantage in the production of clothes.

Answer:
The O.C. of clothes (in terms of wine) for the Chinese works is lower than the opportunity cost of clothes (in terms of wine) for the Tuscan workers.
Or: The O.C. of wine (in terms of clothes) for the Chinese works is higher than the opportunity cost of wine (in terms of clothes) for the Tuscan workers.

Points: 6
Getting the sign right: 3 points
Explanation: 2 points.
        one good in terms of the other good: 1 point

    e) Show what happens to the PPF of Tuscany as this immigration takes place: show in the same figure how the PPF looks like *before* (i.e. as in part (a)) and *after* the immigration of the Chinese workers.

Answer:
Note that two changes happen here: first we have more workers so PPF shifts out. Second: we now have two different types of workers so the PPF has a kink. The new PPF should clearly represent both changes.

Points: 6
Intersections with both axis are at bigger quantities: 3 points
A PPF with one kink: 3 points.
PPFs that are only partially correct will get only partial credit.

    f) What does the marginal opportunity cost of clothes look like? (draw the graph).

Answer:
As stated: we now have two different types of workers so the PPF has a kink. The MC curve that is consistent with this is a step curve: lower O.C. reflects the lower O.C. of Chinese workers. The higher step reflect the higher O.C. of Tuscan workers.
Points: 6
Understanding what graph is expected/labeling axis: 2 points
Step: 2 points
Explanation *or* marking each step correctly: 2 point.

Q2.
Note: In the question below you are asked to answer numerically. However, a graph may help you reach the correct answer and we recommend you use one as you proceed.
Be sure to show your work and explain your answer.

Consider the market for coffee. Suppose that this market is described by the following demand and supply functions:

$P = 70 - 3Q_d + P_t$ or $Q_d = (1/3)*(70 - P + P_t)$

$P = 30 + Qs$,   or $Q_s = P - 30$

where P is the price of coffee, Q is the quantity of coffee, and P_t is the price of tea.

a. Suppose that the price of tea is equal to $20. What is the equilibrium price and quantity of coffee?

Answer:
With P_t =20, the demand equation becomes P= 90 -3Q.
In equilibrium Qd=Qs.
Therefore, we get Q=15 and p=45.

Points: 8
Set up of P= 90 -3Q: 2 points
Explanation: Qs=Qd: 2 point
Q=15: 2 points
P=45: 2 points.

b. Calculate the total surplus generated in this market.

Answer:
Total Surplus=TS=0.5x60x15=450.
Could calculate this by calculating C.S. + P.S. or by doing the whole area together.
For full credit need an explanation either by showing area on graph or by giving the method (e.g., 0.5x60x15=450).

Points: 5
Explanation: 2
Answer: 3

c. Is tea a substitute or a complement to coffee? Explain briefly using the relevant theory and the demand function, not your intuition.

Answer:
Note that an increase in the price of tea will shift the demand curve out. This implies that the elasticity of coffee to the price of tea is positive. Therefore tea is a substitute to coffee.

Points: 5
Explanation: 3
Answer: 2

d. Now assume that the price of tea increases to $40. Calculate the new total surplus generated in the market of coffee. Is it higher than the total surplus when P$_t$=20$? If yes, does this mean that the equilibrium described in part a is inefficient?

Answer:
When p_t=40, the demand equation becomes p=110-3Q. The new equilibrium is given by Q=20 and p=50. The Total Surplus is now TS=0.5x80x20=800>450. This does not mean that the equilibrium in part a is inefficient. The surplus generated by that equilibrium is the biggest possible given consumers willingness to pay (the demand curve) at that time.

Points: 8
Calculating new surplus: 3
Stating that it is bigger: 1
Explaining that this is not a sign that the quantity in part a) was inefficient: 4

e. Assume once again that P$_t$=$20. The government believes that coffee is bad for the consumers' health and decides to impose a tax of $20 per unit of coffee sold. Calculate the -after tax- equilibrium price and quantity. What is the tax revenue? What is the deadweight loss? Show your answers graphically.

Answer:
With a 20$ tax per unit sold, we have to set p_d=t+p_s. The new equilibrium is Q=10, pd=60. Tax revenue= TR=10x20=200. DWL=0.5x5x20=50. Alternatively, the new total surplus is (TS)'= (CS)'+(PS)'=150+50=200. Therefore, DWL=TS-(TS)'-TR=450-200-200=50.

Points: 8
Price and quantity: 2 each (1 for method, one for answer)
Tax revenue: 2
DWL: 2