Econ 001: Final Exam (Dr. Stein)
Dec 12, 2008

Instructions:

- **This is a 120-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!

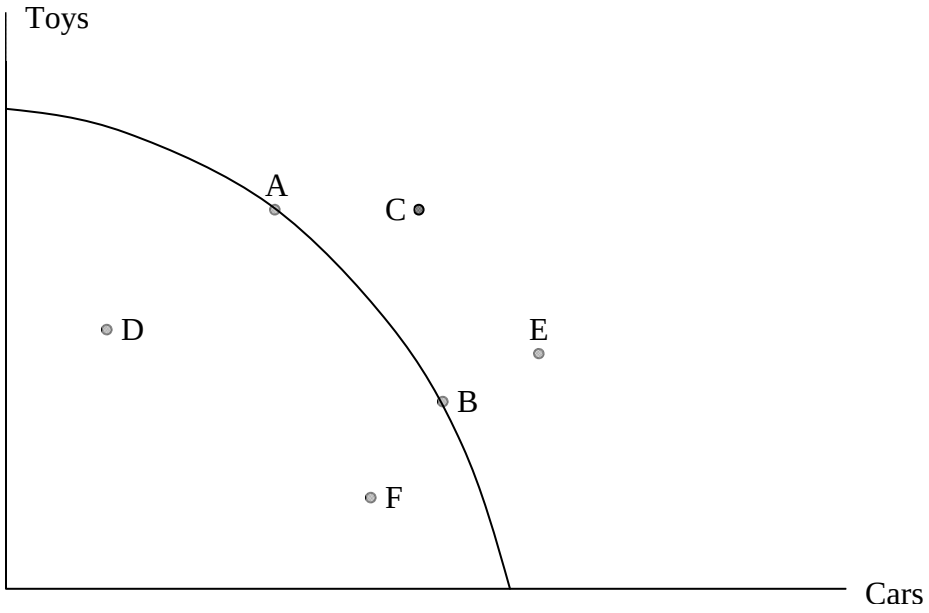
Check: The Exam has 2 parts.
Part 1 consists of 14 multiple-choice questions. Please write you answers in blue book 1.
Part 2 consists of 2 short answer questions. Please use one book for Q1 & Q2.
Part 3 consists of 2 short answer questions. Please use one book for Q3 & Q4.

Part I: Multiple Choice Questions (3 points each/42 points total):

1. Anya had two choices during the Thanksgiving break. She could have gone to New York City and her budget for that trip was $500. Alternatively, she could have stayed home for free and spend the time writing a novel. Since she enjoys writing so much, Anya would get a utility equaling to $500 from staying at home. We learn that Anya decided to go to New York over the break and that indeed she used her $500 budget. If Anya behaved rationally, which of the following is true?

   a. Anya expected a benefit of no more than $500 on this trip.
   b. Anya expected a benefit of at least $1000 on this trip.
   c. Anya expected a benefit of between $500 and $999on this trip.
   d. We cannot judge.

2. Suppose the USA was producing at point B in 1970 and that this point was allocatively efficient. Which of the following accurately describes the Marginal Benefit of cars, in terms of toys, at point A relative to point B?



   a. Assuming that the MB(cars) is downward sloping, MB(a) > MB(b)
   b. Assuming that the MB(cars) is downward sloping, MB(a) < MB(b)
   c. Assuming that the MB(cars) is downward sloping, MB(a) = MB(b)
   d. Even if we assume that the MB(cars) is downward sloping, there is not enough information to compare the MB(a) to MB(b).

3. Using the graph above. Suppose we know the country is producing at point A but consuming at a point between B & E then we can infer that:

   a. The country is importing Toys.
   b. The country is importing Cars.
   c. The country would prefer point B to point A.
   d. Both a and c are correct.
   e. Both b and c are correct.

4. Suppose there is only ONE worker in the society and he produces two goods. Which of the statement is true?

   a. The PPF has to be linear (a straight line).
   b. As there is scarcity in this society, the PPF must be concave (bowed).
   c. If the law of diminishing return applies, the PPF will be linear.
   d. None of the above.

5. Bill and Ted live on a desert island. They can each gather food, compose songs, or divide their time between the two tasks. If they are producing efficiently and we find that Bill only gathers food and that Ted both composes songs and gathers food, which of the following is true?

   a. Bill has a higher opportunity cost of gathering food than Ted.
   b. Ted has a higher opportunity cost of gathering food than Bill.
   c. Bill has an absolute advantage in composing songs.
   d. Ted has a comparative advantage in gathering food.

6. Consider the market for Nintendo's Wii. If consumers decided that Wiis are not "cool" anymore, what would happen in this market?

   a. Supply decreases; demand decreases
   b. Supply decreases; quantity demanded decreases
   c. Quantity supplied decreases; demand decreases
   d. Quantity supplied decreases; quantity demanded increases.

7. Consider the markets for broccoli and cauliflower.

Suppose that the market for **broccoli** is given by:

Demand: $P_B=5-Q_B-P_C$
Supply: $P_B=30+Q_B$

Suppose that the market for **cauliflower** is given by:

Demand: $P_C=40-Q_C-P_B$
Supply: $P_C=30+Q_C$

Given this information:

   a. Cauliflower and broccoli are complements.
   b. Cauliflower and broccoli are substitutes.
   c. Both a and b are correct.
   d. Neither a nor b are correct.

8. Using the information from question 7, if the government subsidized broccoli, which of the following would be true?

   a. Consumption of broccoli will increase.
   b. Consumption of cauliflower will increase.
   c. Both a and b are correct.
   d. Neither a nor b are correct.

9. Suppose Ann will only consume two good, Apples and Bananas. Suppose the price of apples increases. Which of the statements is true?

    a. The substitution effect will always increase the consumption of apples.
    b. The substitution effect will always increase the consumption of bananas.
    c. The demand curve of apples is downward sloping.
    d. We cannot judge the direction of the substitution effect without knowing more information.

10. Which of the following is true?
    a. If the demand curve is downward sloping for a good then the good must be normal.
    b. If the demand curve is downward sloping for a good then the good must be inferior.
    c. If the demand curve is upward sloping for a good then the good must be inferior.
    d. If the demand curve is upward sloping for a good then the good must be normal.
    e. We cannot tell whether a good is normal or inferior without a change in income, which is information that the demand curve does not provide.

11. Which of the following is consistent with a perfectly competitive industry in the long-run equilibrium?

    a. Each firm is facing a downward sloping demand curve.
    b. There is significant entry into the market as profits are positive.
    c. Firms are producing where P=ATC instead of P=MC and therefore are not maximizing profits.
    d. Each firm is making a normal profit since the market price is equal to ATC.

12. GM will stop providing health care to its retired workers this coming January. This will likely:

I. Increase economic profits at any positive output.
II. Reduce their losses if they decide to shut down.

Comparing these two effects we find that:

    a. I>II
    b. I<II
    c. I=II
    d. All three may be correct depending on the size of these health care savings.

13. Suppose a firm can distinguish between professors and students. The firm also knows that the quantity demanded by professors at any given price is higher. The marginal cost is 1 for any quantity. Which of the following is true?

a. The DWL is smaller than if the firm could perfectly price discriminate
b. The MR the firm gets from the last product bought by the students is 1, but the MR the firm gets from the last produce bought by professors is greater than 1.
c. The firm would get more profit if it sets a single price for all consumers rather than setting different prices for professors and students.
d. The profits from selling only to students *must* be smaller than the profits selling only to professors.

14. During the current recession we expect both high and low income to decrease but the effect will not be constant. Suppose that the Gini coefficient falls from .4 to .35. This implies that during the recession:

a. Inequality increases.
b. Inequality decreases.
c. Inequality does not change.
d. There was perfect equality both before and after the recession.

Answers:
1. b
2. a
3. b
4.d
5.b
6.c
7.a
8.c
9.b
10. c
11.d
12.c
13.d
14.b

Part II: Short Answer Questions 1&2.

Please use one Blue Book to answer Q1 & Q2.

Q1. (20 points)

"The Nation's employers cut 533,000 jobs in November, the Bureau of Labor statistics reported Friday." (New York Times, Saturday, Dec 6th , 2008).

This question asks you to analyze the causes of these job losses and their impact on unemployment and wages and future job losses.

We will look at one specific labor market: that of steel workers.

a. Start by drawing the supply & demand of labor with demand downward sloping & supply upward sloping. What is the equilibrium wage rate? Mark graphically. At this wage rate, mark graphically the level of employment & unemployment of steel workers.

Answer:
Typical S&D with w* & L* marked. No unemployment.

Points:3
S&D:1
W* & L*:1
no unemployment:1

b. With the freeze in credit, construction work has been reduced significantly and thus the demand for steel has contracted. How will this affect the demand for steel workers? Show graphically.
Answer:
The decrease in demand for steel will bring a lower price of steel- the output of the steel workers. We therefore should expect a rotation in of the labor demand.

Points:2
Decrease demand for labor: 1
Rotation of demand for labor: 1

c. Many steel workers are unionized and their wages are fixed through long term contract. Under this assumption what will happen to employment & unemployment of steel workers? Show graphically.
Answer:

As the fixed wage from part (a) we will get lower employment. L corresponds to intersection of w* & new D(L). Unemployment will be the difference between L* & L**.**

Points: 3
Employment (or W*): 1
Unemployment:2

Note: Only 1 point if discuss in general instead of relating this to the graph above.

d. With unemployment come lower incomes. How will the unemployment of steel workers affect the demand for cars? What assumption are you making? Show graphically.

Answer:
In the markets *for cars* we will get a shift in of demand if cars are, as is clearly the case, a normal good.

Points:3
Shift in of D(cars):1
Normal good: 2
Note: Loose 2 points if it is not clear that the graph refers to the market for cars.

e. How will this affect the demand for car salespeople? How will this affect their level of employment? Show graphically.
Answer:
As in part b, in this market too, we should expect a shift in of the demand for labor and lower wages & employment.

Points:3
Shift of D(L): 1
Lower wages/employment: 2
Note: if assume sticky wages grade accordingly as long as this assumption is stated..
Note: Loose 2 points if added this to the graph for steel workers as this is a different market.

"We are caught in a downward spiral in which employment, incomes & spending are collapsing together" states Nigel Gault, chief domestic economist for HIS Global Insight."

f. Can you explain Mr. Gault's claim using your answers above?
Answer:
The layoffs in one market reduce wages & income, reduce demand for other goods and thus effect employment in other markets.

Points: 3
Looking for logic.

The New York Times article continues: “President-elect Barack Obama invoked public spending as the best way to get dead in the water economy moving again.”

g. What types of projects should the government support? Why? What are good criteria or considerations to take into account? (Three full sentences are expected).
Answer:
A few possible criteria can be mentioned here:
1. these should be good that will increase employment and thus effect other markets through increased wages.
2. In general government should be in the market to provide public goods (non excludable & non Rival)
3. The government should balance the need for efficiency (getting us to the PPF) with equity (e.g., making sure people don’t starve).

Points: 3
We are looking for use of terminology studied in class in a logical and reasonable way.

Q2. (10 points)
If you did not bring a calculator show your work for full credit.

The city of Philadelphia has a competitive labor market. The labor demand and labor supply in the city for the year 2008 were given by the equations:

$$w = 100 - 2L$$
$$w = 2L$$

where, like usual w refers to the wage rate and L to labor.

a. What is the equilibrium wage and employment in 2008? What is the total wage income earned by Philadelphia's workers?

Answer:
In Equilibrium 100-2L=2L or L*=25 & w*50.
Total wage income is L*W*=25*50=1250

Points: 2
L* =25 & W*=50:1
L*W*=1250: 1

Michael Nutter, the mayor of Philadelphia, has two years left in office: 2009 and 2010. His goal is to increase the wage income earned by Philadelphia's workers in the years 2009 and 2010. He is considering between two projects only one of which can be implemented. These projects are
Project I: Build the Comcast Center
Project II: Build 10 new schools in West and North Philadelphia.
Each of these projects would have a different impact on the labor market.

Labor demand equation under Project I is given by

$$w = 100 - L/2$$

b. What would be the equilibrium wage and employment in Philadelphia in the years 2009 and 2010 if Project I is undertaken? Calculate the total wage income of Philadelphia workers in 2009 (which is the same as in 2010) under Project I.
Answer:
100-L/2=2L or L_I=40 & W_I=80 so that $L_{I*}W_I$=3200

Points: 2
L_I =40 & W_I=80:1
L*W=3200: 1

Project II would have no impact on the labor market in the year 2009 so that the labor demand would be the same as in 2008. However Project II will result in an increase in the marginal product of labor in 2010 so that labor demand in 2010 is given by

$$w = 220 - 2L$$

c. What would be the equilibrium wage and employment in Philadelphia in 2010 if Project II is undertaken? Calculate the total wage income of Philadelphia workers in 2010 under Project II.

Answer:

220-2L=2L or L_{II}=55 & W_{II}=110 so that L_{I}*W_{I}=6500

Points: 1

L_{II} =55 & W_{II}=110:.5

L*W=6050: .5

d. Based on what you have learnt in class what criterion would you suggest Mr. Nutter should use in deciding between the two projects.

Answer:

He should compare the present value of each project and choose the one with the highest PV.

Points: 1

Use the criterion that you suggested above to answer the following questions.

e. Suppose the interest rate is 20% which project would Mr. Nutter choose?

Answer:

The following table summarizes the information we found above

	Wage Income 2009	**Wage Income 2010**
Project I	**3200**	**3200**
Project II	**1250**	**6050**

So PV(I)=3200/(1.2)+3200/(1.2)^2=4889

PV(II)=1250/(1.2)+6050/(1.2)^2=5243

Points:2

1 for each PV.

f. How does the mayor's relative evaluation of the two projects change as the interest rate increases?

Answer:

Note that in project II we sacrifice lower wages in the short term (2009)for higher wages in the long term (2010). The lower the interest rate the more likely is this sacrifice to be worth while. So a lower interest will encourage going for project II and a high interest rate for project I.

Points:

2 for logic.

Part III: Short Answer Questions 3&4.
Please use one Blue Book to answer Q3 & Q4.

Q3. (20 points)

SEPTA is an example of a regulated natural monopoly. There are large fixed costs to run the system of trains & busses, but the marginal cost of having an additional customer use the system is low and constant.

This question asks you to analyze how the government should regulate SEPTA and some consequences of such regulations.

a. Start by graphing the cost curves for SEPTA. Assume the marginal cost of each additional passenger is constant and equal to $1. Draw the MC curve. Add an Average Total Cost curve that is consistent with SEPTA having large fixed costs and with the MC curve you drew. Add a downward sloping demand

Answer:
See midterm 2.

Points:2

b. If SEPTA were an unregulated monopoly how many riders would use it? What price would they be charged? What is the dead weight loss due to this pricing? Show all graphically.

Answer:
See midterm 2.

Points:3
Q^M, P^M, DWL: 1 point each.

c. What price would lead to efficient use of SEPTA? What would happen if the government regulated SEPTA to charge this price?

Answer:
See midterm 2.

Points: 2
P=MC: 1 point, exit:1 point

d. What is the break even or zero profit price (show graphically)?

Answer:
See midterm 2.

Points:1
P=ATC: 1 point

Riding public transportation is good for the environment as it reduces emissions of CO2. Suppose each passenger reduces the impact of global warming by $.5 (50 cents) per ride.

e. Add the social marginal cost of SEPTA ridership to your graph above.
Answer:
SMC=MC-.5=.5

Points:2

f. How do your answer to parts b, c & d change?
Answer:
Monopoly: no change in price & quantity but note that now DWL is larger.
Efficient outcome: where SMC=D
Zero profit: as above.

Points: 5
Monopoly: no change in price & quantity:1
DWL is larger:1
Efficient outcome: where SMC=D: 2 points
Zero profit: as above:1 point

"Zero profit pricing, in a case where a good has positive externalities, is just not good enough. We need another mechanism to support Public Transportation" says Moran, a graduate student in the economics department.

g. Use your answer from part f to explain her statement.
Answer:
With positive externality caused by public transportation the gap between efficient use of SEPTA and the use we should expect with zero cost pricing is larger than before and the Dead Weight Loss of this policy is larger.
Points:
2
Need to talk about larger gap between Q(profits=zer) & Q(efficient) than we thought.

h. What mechanism can we use to achieve **efficient** use of SEPTA (show graphically)?

Answer:

The government could regulate the price of a ride to $.50 and give SEPTA a lump sum subsidy to cover the difference between costs & revenues. Note that the lump sum is FC+.5*$Q^{efficient.}$
Another possible mechanism is a per unit subsidy large enough to encourage the unregulated monopoly to produce the efficient amount. Students must show this graphically.

Points:3
Scheme 1: 1.5 points for price regulation & 1.5 for lump subsidy.
Scheme 2: full credit if graph correct.

Q4. (10 points)

Ann, Bob and Clair are the only volunteers in a sea turtle conservation fund named "The Leatherback Fund".

The Leatherback Turtle, is the largest reptile in the world and is under critical risk of extinction. Shrimp catchers drag large nets behind the boats, turtles get swept into these nest and die..

The worried volunteers are considering launching a worldwide TV campaign, "Shrimp is Murder," to inform the public about the deadly effects of the shrimp industry on sea turtles and to (hopefully) reduce the demand for shrimp or to bring about changes in the shrimping technology.

The Marginal Benefit of the volunteers from launching the campaign is given by:

Ann: 50 K
Bob: 300 K
Clair: 400K

And the cost of the campaign is 450K
If the campaign is not launched the MB for each is volunteer is 0.

a. What is the maximal amount each of the volunteers will be willing to pay to launch the campaign? If they can't collaborate, will the campaign be launched? Explain.

Answers:
The maximal willingness too pay is their Marginal Benefit as stated above. As each one has a MB<450 the campaign will not be launched.

Points: 2
Willingness too pay=MB: 1
No campaign: 1

Now assume that the volunteers can collaborate by voting. If it least 2 volunteers support the campaign, it is launched.

Suppose that is the campaign is launched the costs are going to be evenly distributed only among **the volunteers who support the decision.**

b. Will Bob and Clair support the campaign? Prove mathematically

Answers:
The cost of the campaign is $450K so that if 2 vote for it, it will be $225K each. For both Clair & Bob this is below their MB so they will vote for this and the campaign will run.

Points: 2
Need to prove that Clair & Bob can pay for it: 1
The cost<MB for each: 1

c. Given your answer to part (2), Will Ann support the campaign? Prove mathematically. What is the problem here?

Answers:
If Ann votes for the campaign she will be required to pay 450/3=150K which is greater than her MB. Thus Ann will not vote for the campaign. Ann will get the benefits in any case as this is a non excludable good. She is a free rider.

Points: 2
Ann will not vote for it (TA: we'll talk about grading):1
Free riding: 1

Clair suggests an alternative scheme to finance the campaign. She suggest Ann contribute any amount she wants and that then both Bob and Clair will each contribute 4 times as much as Ann does.

d. Will this scheme be efficient? Equitable?

Answers:
Ann will contribute 50K. Then Bob & Clair will each contribute 4*50=200 and we get total contribution of 450K. Note that for each member the contribution is no higher than their MB so they will agree to do so.
This is efficient because sum of MB>450.
This is equitable (fair) because no one forces them to contribute but they choose to do it anyway. This is unfair become Ann pays her full MB but Bob & Clair do not.

Points: 4
Scheme: 2
Efficient: 1
Equitable (or not): 1

You are done! Have a great winter break !