Economics 3250 Dr. Lozada
Spring 2020 Exam 1

This exam has 25 points. There are six questions on the exam. Most of the questions are worth 4 points, but one is worth 5 points.

Put your answers to the exam in a blue book or on blank sheets of paper.

You have the entire class period (80 minutes) to take this test.

Answer the questions using as much precision and detail as the time allows. *Correct answers which are unsupported by explanations will not be awarded points.*

Answer all of the following six questions.

1. **[4 points]**

   (a) What do economists mean by the term "competitive" firm?

   (b) In what way does the economists' use of the term "competitive" differ from the way that word is used in everyday language?

   (c) Draw a graph showing the "marginal revenue" curve for a competitive firm, and explain why you drew it the way you did. Be sure to label the axes of the graph.

2. **[5 points]** Attached to this exam is a copy of your textbook's Box 6.1. Explain its "Panel (a)," and, in particular, explain the "Inefficient Production" label. Why is this production inefficient? Why is it being produced? Who produces it? Why do they produce it?

3. **[4 points]** Discuss a difficulty which a social planner would have in making plans for the future if the social discount rate were negative.

4. **[4 points]** Suppose one observes two people in Yellowstone National Park; call the two people 'A' and 'B.' Suppose they live in different places, but each one incurred travel costs of $400 to visit this park.

   (a) What can be concluded about the value which Person A puts on Yellowstone National Park?

   (b) What can be concluded about the value which Person B puts on Yellowstone National Park?

   (c) Suppose a list of other national parks, together with the travel cost to reach them, is as follows.

	cost needed for A to visit	cost needed for B to visit
National Park X	$300	$200
National Park Y	$900	$300
National Park Z	$1000	$500

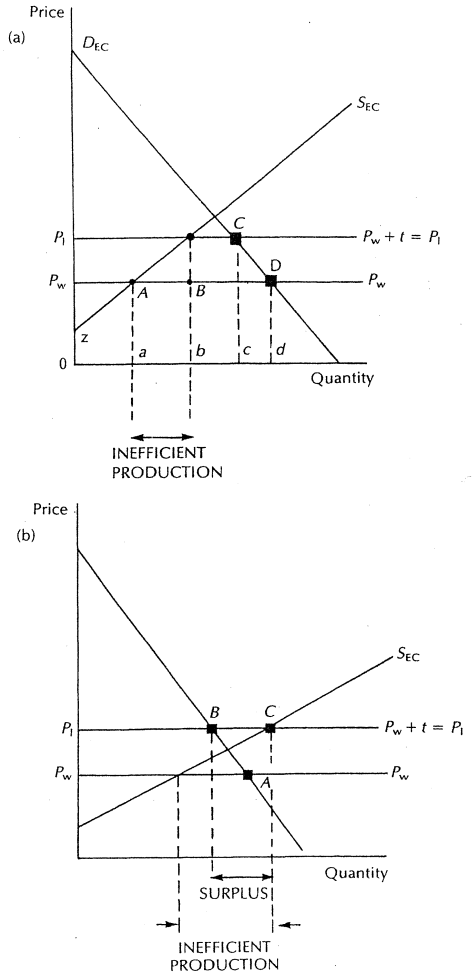
   Neither A nor B visit National Parks X, Y, or Z; A and B only visit Yellowstone National Park.

      i. What can you tell, if anything, about the value which Person A puts on Yellowstone National Park compared to National Park X? compared to National Park Y? compared to National Park Z?

Continues→

Box 6.1 Overproduction under the Common Agricultural Policy and the effect on the environment

Panels (a) and (b) Supply and demand for agricultural produce in the EC.



ii. What can you tell, if anything, about the value which Person B puts on Yellowstone National Park compared to National Park X? compared to National Park Y? compared to National Park Z?

5. **[4 points]** Your textbook has a table which includes the following:

	Deaths per million people exposed
Radionulcides in drinking water	6,300
Benzene occupational exposure	39,600
Acrylonitrile occupational exposure	42,300
Arsenic/copper exposure	63,000

Does it follow that society's first priority, from among these four hazards, should be to take measures reducing "arsenic/copper exposure"? Why or why not?

6. **[4 points]**

(a) Using Figure 1 below, suppose that polluters have the right to pollute. Explain why, according to the "Coase Theorem," output might end up at $Q = 1$. State the assumptions needed for this argument to be true.

(b) Using Figure 1, suppose that polluters have the right to pollute. Explain why, if diminished income causes pollution victims to be less willing and able to spend money on environmental quality, output would end up at $Q > 1$ despite your answer to part (a).

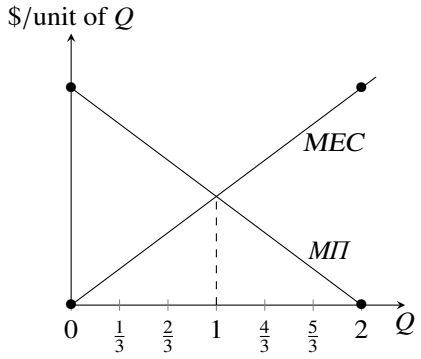


Figure 1. Marginal External Cost is *MEC*; marginal profit is *MΠ*; and the output of the commodity which causes pollution is Q.

Answers to Exam 1, Econ. 3250, Spring 2017

1. Spring 2011 Ex. 1 Qu. 1
2. Spring 2009 Ex. 1 Qu. 3. Ideally, one would justify interpreting the area under S_{EC} as costs because: total cost is the area under the supply curve because the supply curve is also the marginal cost curve.
3. Suppose the society has a resource, called a "cake" although unlike a real cake it never spoils (it could last forever—maybe like some fruitcakes) and the society is trying to decide when to eat the cake. Eating it tomorrow is better than eating it today because having a negative discount rate means that future consumption is worth more than present consumption. (For example, a dollar tomorrow would be worth more than a dollar today, and you would be willing to pay more than \$1 in order to receive \$1 in the future. Proof: the present value of \$1 one year from now is $1/(1+r)$, so if $r < 0$, then $1+r < 1$ and $1/(1+r) > 1$. This is the opposite to the situation with a positive discount rate.)

   However, while eating it tomorrow is better than eating it today, eating it the day after tomorrow is better than eating it tomorrow. Similarly, eating it a year from now is better yet. And eating it a decade from now would be even better. And eating it a millennium from now would be even better.

   Denote by "T" the date at which society eats the cake. The larger T is, the greater society's utility of eating the cake is. However, the limit of these plans, which is eating the cake at $T = \infty$, is the worst possible plan because it entails never eating the cake at all. It follows that there is no optimal date at which to eat the cake.

   This situation is not impossible, but it would make it hard for the social planner to decide when to eat the cake, which is what the exam question asks.

4. (a) Person A's value of Yellowstone is greater than or equal to \$400, because otherwise he would not have spent the \$400 to visit Yellowstone.
   (b) Person B's value of Yellowstone is greater than or equal to \$400, because otherwise he would not have spent the \$400 to visit Yellowstone.
   (c) i. For Person A, National Park X costs only \$300 to visit, while Yellowstone costs \$400 to visit, but Person A nevertheless visited Yellowstone but not Park X. So Person A must value Park X less than \$400.

We don't know whether Person A didn't visit Parks Y and Z because he values them less than Yellowstone, or because their travel costs are so much higher than the travel cost to Yellowstone that he chooses not to visit them even though he values them more than Yellowstone.

Let Yel_A be Person A's value for Yellowstone. From part (a), $Yel_A > 400$, and Person A's net benefit (benefit minus cost) for Yellowstone is $Yel_A - 400 > 0$.

On the other hand, Person A does not visit Park X, so his value for Park X, X_A, must be so low that X_A minus A's travel cost to X, which is \$300, must be negative: $X_A - 300 < 0$ so $X_A < 300$.

For Parks Y and Z: they aren't visited by Person A, so their values for Person A minus A's travel cost to them must be negative: $Y_A - 900 < 0$ and $Z_A - 1000 < 0$. Hence $Y_A < 900$ and $Z_A < 1000$.

Overall, then: $Yel_A > 400$, $X_A < 300$, $Y_A < 900$, and $Z_A < 1000$. Clearly $X_A < Yel_A$, but we cannot determine Person A's ranking for Y and Z.

ii. For Person B, National Park X costs only \$200 to visit, while Yellowstone costs \$400 to visit, but Person B nevertheless visited Yellowstone but not Park X. So Person B must value Park X less than \$400.

Similarly, for Person B, National Park Y costs only \$200 to visit, while Yellowstone costs \$400 to visit, but Person B nevertheless visited Yellowstone but not Park Y. So Person B must value Park Y less than \$400.

We don't know whether Person B didn't visit Park Z because he values it less than Yellowstone, or because its travel costs are so much higher than the travel cost to Yellowstone that he chooses not to visit it even though he values it more than Yellowstone.

Let Yel_B be Person B's value for Yellowstone. From part (b), $Yel_B > 400$, and Person B's net benefit (benefit minus cost) for Yellowstone is $Yel_B - 400 > 0$.

On the other hand, Person B does not visit Park X, so his value for Park X, X_B, must be so low that X_B minus B's travel cost to X, which is \$200, must be negative: $X_B - 200 < 0$ so $X_B < 200$.

Similarly for Parks Y and Z: they aren't visited by Person B, so their values for Person B minus B's travel cost to them must be negative: $Y_B - 300 < 0$ and $Z_B - 500 < 0$. Hence $Y_B < 300$ and $Z_B < 500$.
Overall, then: $Yel_B > 400$, $X_B < 200$, $Y_B < 300$, and $Z_B < 500$. Clearly $X_B < Yel_B$ and $Y_B < Yel_B$, but we cannot determine Person A's ranking for Z.

5. Spring 2014 Final Qu. 8

6. (a) If polluters have the right to pollute, production will initially be at $Q^{\pi} = 2$ in Figure 1. There, $M\Pi = 0$ and MEC is much higher than zero, at the black dot on the MEC curve. Because MEC represents the consumers' willingness and ability to pay for pollution reductions (output reductions, in this model), they would be willing and able to pay any amount less than the black dot in return for a marginal decrease in Q below $Q = 2$. Firms would be willing to accept any payment higher than $M\Pi = 0$ in return for a marginal decrease in Q below $Q = 2$. So any payment from pollution victims to firms between the black dots at $Q = 2$ would result in a mutually-beneficial marginal reduction in Q.
   This logic actually holds not only for $Q = 2$ but for all values of Q between 1 and 2, because for those values of Q, $MEC > M\Pi$. So there are mutually-beneficial ways of getting to $Q = 1$. However to the left of $Q = 1$, $M\Pi > MEC$, so pollution victim's willingness and ability to pay for further pollution reductions (values below MEC) have no overlap with firms' willingness to accept payment for further pollution reduction (values above $M\Pi$). So Q will remain at 1. This requires costless bargaining (also known as "no transactions costs") and no strategic behavior on the part of firms or pollution victims, as well as well-defined property rights.

   (b) Starting at $Q = 2$, the initial bargain between the firms and the pollution victims results in a decrease of Q, say to $Q = 5/3$. However, it also results in a decrease in the income (or wealth of pollution victims), and by the assumption in the question, this causes a decrease in their willingness and ability to pay for pollution reductions, that is, their MEC curve shifts down. This shift down moves the point at which MEC and $M\Pi$ intersect over to the right of $Q = 1$. Any further stages of bargaining will move the point even more to the right, further away from $Q = 1$. The bargaining process therefore would end at $Q > 1$.