EC101 DD/EE. Problem Set 7 Trade and Externalities

Multiple Choice (MC) questions have only one correct answer, which may depend on your interpretation of the question. Other kinds of questions may have more than one correct answer. If you don’t understand the meaning of a question, you may write to your own TF (on course website see Classes > Teaching Fellows), but do not expect him/her to give you answers. The problem set will not be graded, but the way you discuss the problems in your discussion section will affect your discussion-section score. Your work on the problem sets will improve your performance in the course, but only if you understand the ideas behind the answers. Good reasons for your answer are more important than what the answer is. You are allowed to work on the problem sets with other students.

1. Michael and Lebron James are very good friends because both of them are interested in two things only: winning NBA championships and writing books about economics. It takes Lebron 4 years to win an NBA championship, but only 1 year to write an economics book. Michael, while not as tall and not such a great passer, is in excellent shape, so it would take him 10 years to win an NBA championship, and 5 years to write a book.
   a. Who has an absolute advantage in producing NBA championships? What about writing books about economics?
   b. Calculate the opportunity cost of winning an NBA championship in terms of sacrificed economics books for both Lebron and Michael.
   c. Based on your previous answer, who has a comparative advantage in winning NBA championships? What about in writing books?
   d. If Lebron and Michael are such good friends that they only care about the joint number of economics books and NBA championships that they obtain together, what should each of them do during the next 20 years of their lives?

2. Discuss whether the following statements are true or false. Explain each answer.
   a. If I’m slower at making everything than my neighbor is, then my neighbor will have no reason to trade with me.
   b. The Coase Theorem states that externalities can be internalized by private negotiation.
   c. In a market with price-taking buyers and sellers, a tax will decrease total welfare.
   d. When a good imposes a negative externality on society, a government prohibition on the production and exchange of that good would yield economic efficiency.

3. [MC] If there are two producers who each produce the same two products, which of the following cannot happen?
   a. One producer has an absolute advantage on one of the products.
   b. One producer has a comparative advantage on one of the products.
   c. One producer has the comparative advantage on both products.
   d. One producer has the absolute advantage on both products.

4. For each of the following, determine whether the following statements describe a positive externality, a negative externality, or neither:
   a. Your roommate buys and lights a scented candle in her room, which makes your whole apartment smell good.
   b. Your uncle buys and smokes cigars around you, increasing your risk of getting lung cancer.
   c. You own a cafe on Comm Ave. Another cafe opens across the street that takes away some of your customers.
5. Professor M would like his EC101 students to learn a lot (efficiency) but he would also like to have a fair distribution of grades (equity).
   i. The Head TF announces that every student who gets less than 70% on the final exam will fail the course. Is this a good incentive for studying? Is it good for equity?
   ii. Answer the same question as in the previous part if the Head TF decides he was being too nice and announces to fail everyone with less than 95% on the final exam.
   iii. One of the TFs (a much nicer one) wants to give a B+ to all the students. Is this a good for learning? Does it increase equity?
   iv. Professor M announces that he will fail everyone who doesn’t get 70% on the final exam. However, on the day of the exam, he cancels the exam and gives everyone an A−. Will this increase efficiency and learning? Is it good for equity?

6. The following table shows the marginal private value, marginal private cost, and marginal social value of installing internet service to villages. Installation starts in large villages and then moves to smaller ones.

<table>
<thead>
<tr>
<th>Village Number</th>
<th>Marginal Private Value</th>
<th>Marginal Private Cost</th>
<th>Marginal Social Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>26</td>
<td>19</td>
</tr>
</tbody>
</table>

   i. What is the equilibrium quantity of output in this market?
   ii. What is the socially-optimal level of output in this market?
   iii. How large would a subsidy need to be in this market to move the market from the equilibrium level of output to the socially-optimal level of output?

7. [MC] In the presence of pollution, more abatement increases social surplus whenever
   a. the level of pollution is greater than zero.
   b. the amount of abatement is less than the amount of remaining pollution.
   c. the marginal cost of abatement is less than the marginal benefit of abatement.
   d. the marginal cost of abatement is greater than the marginal benefit of abatement.

8. At its peak, the Medellin Cartel, led by the infamous Pablo Escobar, was estimated to control more than 90% of the global cocaine market. Explain why a drug cartel can have a comparative advantage in trading illegal drugs.

9. It is often argued that higher education creates positive externalities.
   i. Give some reasons why education may create positive externalities.
   ii. Draw on a graph the private benefit, the social benefit and the marginal cost.
   iii. Is the equilibrium without government intervention efficient? If not, how can the government increase social surplus?
   iv. Draw the effect of a government intervention on the previous graph. Has social welfare increased?

10. Give 3 (new, not in the notes or problem set) examples of positive externalities and 3 (new, not in the notes or problem set) examples of negative externalities. For each example, mention a mechanism that would increase total surplus by inducing people to internalize the externalities.
11. In each of the following situations there is a deadweight loss. Graph each of these situations and shade the area corresponding to the deadweight loss.
   i. Binding price ceiling.
   ii. Binding price floor.
   iii. Tax.
   iv. Subsidy.

12. Carl is a carpenter and builds small homes. Peter is a kid who has no real skills and lives next door. The following table shows how many hours it takes for them to build a home and mow Carl’s grass. Using the table, answer the following questions:

<table>
<thead>
<tr>
<th>Hours to complete task</th>
<th>Carl</th>
<th>Peter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mow Carl’s lawn</td>
<td>1 hr</td>
<td>2 hrs</td>
</tr>
<tr>
<td>Build a home</td>
<td>200 hrs</td>
<td>50 hrs</td>
</tr>
</tbody>
</table>

   i. Who has the absolute advantage in each task?
   ii. Who has the comparative advantage in each task?
   iii. Suppose Peter wants a home, and Carl wants to have his lawn mown every week. Could Carl and Peter both benefit from trade?

13. True or false:
   i. The equilibrium in a perfectly competitive market without externalities is always efficient (i.e. it maximizes total surplus).
   ii. A competitive equilibrium in the presence of externalities is efficient.
   iii. In a perfectly competitive market without externalities, a subsidy will create a deadweight loss.
   iv. In a perfectly competitive market with a positive externality, a subsidy will increase social welfare.