EC101 DD/EE. Problem Set 5

Multiple Choice (MC) questions have only one correct answer. 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 you 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. At the equilibrium of a perfectly competitive market, discuss whether the following statements are true or false:
   i. Consumer surplus is maximized and so is producer surplus
   ii. The sum of producer surplus and consumer surplus is maximized
   iii. Consumer surplus is equal to producer surplus
   iv. Each person is as satisfied as she/he could be

2. [MC] The marginal cost curve is increasing when total cost curve is:
   a. positive and increasing at a decreasing rate
   b. positive and increasing at an increasing rate
   c. positive and decreasing at a decreasing rate
   d. negative and decreasing at an increasing rate

3. [MC] Refer to the diagram below. In this competitive market, combined consumer and producer surplus is maximized at:

   ![Diagram with labels A, B, C, D, E, F, G, H, K, Supply, Demand, Price, Output]

   a. Price M
   b. Price B
   c. Output G
   d. Output H

4. [MC] When the allocation of resources is Pareto efficient,
   a. consumer surplus is maximized
   b. society is providing the greatest good to the greatest number.
   c. no consumer would prefer someone else's consumption bundle to his or her own.
   d. it is not possible to make someone better off without making someone worse off.

5. Fill in the blanks:
   i. The total cost of 10 potatoes is the sum of the ______ (price/variable costs/marginal costs/WTP) of each potato plus the ______ (total cost/WTP/fixed cost).
ii. The marginal cost of the 10th potato is the ______ (total cost/WTP/fixed cost/variable cost) of 10 potatoes minus the ______ (total cost/WTP/fixed cost/variable cost) of 9 potatoes.

6. [MC] Suppose Mike and John are two brothers who are given $110 to divide between them. Given this information, which of the following is an example of Pareto efficiency?
   a. They each get $55
   b. Mike is older, so they decide Mike should get a bigger share. Mike gets $70 while John gets $40.
   c. Mike takes the whole $110 and John gets nothing.
   d. **ALL** of the above

7. Suppose Napoleon is the only producer of high-heeled men’s shoes.
   i. Is Napoleon a price taker or a price setter in the market for shoes?
   ii. Does Napoleon have a supply curve?

8. Suppose Fantine finds a very pretty satin shoe in a garbage bin (only the left shoe). A few feet away, Cosette finds the matching right shoe. Fantine is willing to pay $20 for a pair of satin shoes, while Cosette is only willing to pay $10. A single shoe is useless to anyone.
   i. Each girl has one shoe. Is this Pareto efficient?
   ii. What situation(s) would be Pareto efficient?
   iii. What situation(s) would maximize economic surplus?

9. [MC] Suppose there are three identical vases available to be purchased. Andres is willing to pay $30 for a vase, Beatriz is willing to pay $25 for a vase, and Carlos is willing to pay $20 for a vase (no one wants more than one vase). If the price is $25, how many vases will be sold and what is the value of consumer surplus in this market?
   a. One vase will be sold, and consumer surplus is $30
   b. One vase will be sold, and consumer surplus is $5
   c. Two vases will be sold, and consumer surplus is $5
   d. Three vases will be sold, and consumer surplus is $0

10. In the market described below, calculate the producer surplus and the consumer surplus.
11. Draw graphs of total costs for firms producing good X with the production characteristics listed below. Put “Total Cost” on the vertical axis (y-axis) and “Quantity produced” on the horizontal axis (x-axis). (Note: The most important part of this problem is that you draw the correct shape of the total cost curve.)
   i. Firms have increasing marginal costs.
   ii. Firms have constant marginal costs.
   iii. Firms have decreasing marginal costs.

12. Below is a chart with a table with total costs a firm will pay at different production levels. How much will the firm produce (supply) and what will the producer surplus be when the price is $8? $7? $6? $5? $4? (Answer it for each price.)

<table>
<thead>
<tr>
<th>Units ($)</th>
<th>Total Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
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<td>58</td>
</tr>
<tr>
<td>7</td>
<td>69</td>
</tr>
<tr>
<td>8</td>
<td>72</td>
</tr>
</tbody>
</table>

13. Michael likes egg rolls. Draw his total utility curve for egg rolls when
   i. his marginal utility is positive and increasing.
   ii. his marginal utility is positive and constant.
   iii. his marginal utility is positive and decreasing.

14. True or false? Discuss.
   i. Marie sells potatoes in a perfectly competitive market. The cost of bringing 10 potatoes to sell to the market is higher than the cost of bringing just 2. Therefore the 10th potato will be sold at a higher price than the 2nd potato.
   ii. Every type of firm (competitive and noncompetitive) has a supply curve.
   iii. Buying or selling a quantity greater than the equilibrium quantity reduces welfare.

15. Can producer surplus ever be negative? If yes, can you think of an example? If no, why not?

16. In the free city of Karalis, the evil Zaru controls the access to the public beach, and demands a payment to pass through his dominion. The government, worried about the effect of the payment on tourism, passes a law that forces Zaru to let people access the beach for free.
   i. Is the new law a Pareto improvement? Explain on your answer.
   ii. What can you say about the total surplus of all the people in Karalis before and after the new law is passed?