(2 pts) 1. List any two of the four conditions associated with what economists call perfect competition.
   (a) homogeneous or undifferentiated products
   (b) large # of sellers (and buyers)
   (c) no barriers to entry or exit
   (d) perfect information

2. Suppose the Engel curve for a particular commodity is given by:

   ![Graph](image)

   (2 pts) Calculate the income elasticity for this particular product. Show all work.
   \[
   \frac{\Delta Q}{\Delta I} \times \frac{I}{Q} = \frac{6}{20} \times \frac{40}{33} = \frac{12}{33} = \frac{4}{11} = 0.364
   \]

(1 pt) 3. How would economists classify the commodity in question 2?

necessity

4. Suppose that a retailer sells 500 six-packs of Dr. Pepper per day at $3.50/six-pack. Also, suppose that the cross-price elasticity between Dr. Pepper and Pepsi is 0.6.

(1 pt) (a) Then Dr. Pepper and Pepsi are what type of goods?

substitutes

(1 pt) (b) If the retailer lowers the price of Pepsi from $4.00 to $3.60/six-pack, what is the percentage change in the price of Pepsi?

10% decrease

(1 pt) (c) Given your answer in (b), what is the percentage change in sales of Dr. Pepper?

6% decrease

(1 pt) (d) Make a prediction to the retailer as to the number of six-packs of Dr. Pepper that now will be sold due to the action taken by Pepsi.

470

(1 pt) 5. We expect the cross-price elasticity of Borden milk and Head and Shoulders shampoo to be

0 independent goods
(1 pt) 6. When MPP > APP, we are in stage ______ of production.

(4 pts) 7. TRUE or FALSE. Circle the correct answer.

- F (a) In perfect competition, no firm can influence market price.
- F (b) If firms wish to maximize profit, then firms should operate in stage I of production.
- F (c) We expect the sign of the cross-price elasticity between pancakes and maple syrup to be negative.
- F (d) Any point on the TPP curve represents the maximum output at a given level of input use.

The following diagram, the TPP curve, pertains to the number of loaves of bread produced per day by Mrs. Baird, using labor as an input. Using this diagram, answer questions 8 – 11.

(1 pt) 8. When labor equals 200 hours (at point A), what is the APP of labor?

\[
\text{APP} = \frac{Q}{I} = \frac{20,000}{200} = 100
\]

(1 pt) 9. The MPP of labor between points A and B is equal to ___.

\[
\frac{\Delta TPP}{\Delta I} = \frac{\Delta Q}{\Delta I} = \frac{10,000}{200} = 50
\]

(1 pt) 10. If we are in the range of 400 hours to 800 hours of labor, to what stage of production does this situation correspond?

\[
\text{MPP} = \frac{24,000}{400} = 60 \quad \text{APP} = \frac{75}{400} = 75
\]

Since \( \text{APP} > \text{MPP} > 0 \) (stage 2)

(1 pt) 11. If we are in the range of 800 hours to 1,200 hours of labor, to what stage of production does this situation correspond?

\[
\text{MPP} < 0 \quad \text{stage 3} \quad \text{MPP} = \frac{-10,000}{400} = -25
\]

(1 pt) 12. Another name for the TPP curve is the ______ function.
13. The following information pertains to production and cost figures for a particular enterprise. Show all work.

<table>
<thead>
<tr>
<th>Capital (variable input)</th>
<th>Output</th>
<th>TFC ($)</th>
<th>TVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 units</td>
<td>1,000  units</td>
<td>$500</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

(a) What is the total cost of production? 
\[ TFC + TVC = $2,500 \]

(b) What is the average variable cost? 
\[ \frac{\text{TVC}}{Q} = \frac{2,000}{1,000} = $2/\text{unit} \]

(c) How much does this firm pay for each unit of capital, assuming that capital is the only variable input and that the firm operates in perfect competition? 
\[ \frac{\text{TVC}}{C} = \frac{2,000}{100} = $20/\text{unit} \]

14. Information concerning the production of tomato sauce and total costs is given in the table below:

<table>
<thead>
<tr>
<th>Output (units)</th>
<th>TC ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>1,200</td>
</tr>
<tr>
<td>1,100</td>
<td>1,500</td>
</tr>
</tbody>
</table>

What is the additional cost per unit of production of tomato sauce? Show all work.

\[ MC = \frac{\Delta TC}{\Delta Q} = \frac{300}{100} = $3 \]

15. The law of diminishing marginal returns states that, as the use of an input increases, its 
\[ MPR \]
will eventually fall.

Random Question:
There are only two Disney animated features in which both parents are present and don’t die throughout the movie. What are the titles of these movies? (This question is worth ½pt if you guess one movie correctly and 1pt if you guess both movies correctly.)

\[ \text{Peter Pan, 101 Dalmations, Mulan} \]

Sign the Aggie Pledge:

“On my honor, as an Aggie, I have neither given nor received any unauthorized aid on this quiz.”

Signature ___________________________ Date ____________