1. (16 points) Many high schools sell “pouring rights” for soft drinks to firms like Pepsi and Coca-Cola. For a certain fee paid by the company, they are given the right to be the only seller of soft-drinks at a school. (Ever wonder why the scoreboard at your school said Pepsi?) Suppose that Springfield High School sells exclusive pouring rights to Krusty Kola for $2. The cost to Krusty for each bottle of pop (soda if you are from the East Coast) is $1. The Demand for the Krusty Kola is given below. We will assume that partial bottles of Krusty Kola cannot be sold.

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.50</td>
<td>0</td>
</tr>
<tr>
<td>$2.25</td>
<td>1</td>
</tr>
<tr>
<td>$2.00</td>
<td>2</td>
</tr>
<tr>
<td>$1.75</td>
<td>3</td>
</tr>
<tr>
<td>$1.50</td>
<td>4</td>
</tr>
</tbody>
</table>

The Demand for Krusty Kola is given below.

\[
\begin{array}{ccccccc}
\text{Price} & \text{Demand} \\
\$2.50 & 0 \\
\$2.25 & 2.25 \\
\$2.00 & 3.75 \\
\$1.75 & 5.25 \\
\$1.50 & 6.00 \\
\end{array}
\]

a) Fill in all of the columns in the table below.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Fixed Cost</th>
<th>Marginal Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Total Revenue</th>
<th>Marginal Revenue</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2.25</td>
<td>2.25</td>
<td>-0.75</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4.00</td>
<td>1.75</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>5.25</td>
<td>1.25</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>6.00</td>
<td>0.75</td>
<td>0</td>
</tr>
</tbody>
</table>

b) What is the profit maximizing quantity for Krusty Kola?

3

\[
\text{Marginal Cost} \geq \text{Marginal Revenue} \quad Q = 3. \quad \text{Also, } \pi \text{ at } Q \text{ Max of 2.25}.
\]

c) What is the profit maximizing price for Krusty Kola?

$1.75

(d) How much profit will the company make?

\[
\pi = 1.25 = TR - TC
\]
2. (4 points) I went on Yahoo and discovered there are 39 hair salons/beauty parlors in Delaware. (Honestly, I did.) What kind of market structure is this: Perfect Competition, Monopoly, Homogenous Oligopoly or Monopolistic Competition? How can you tell?

Monopolistic Competition
- Many sellers
- Differentiated (people prefer one over another)
- Few buyers
- Buyer behavior - some quickly by set price

3. (12 points) I was surfing the net and discovered that in the 1960s in Europe there was a zinc cartel. Let us suppose, for simplicity, that there were ten identical firms selling zinc and zinc is homogenous. The graph to the right is for the industry as a whole and the one to the left for a typical firm.

a) What is the price for zinc?

Lush at industry

\[ MC = MC \quad q = 20 \quad p = 5.50 \text{ (approximately)} \]

b) How much profit will our typical firm make? ($ amount please.) Show your work

\[ p = 5.50 \]

\[ \text{ATC} = \frac{2.5}{1.50} \text{ per unit of zinc} \]

\[ \frac{5}{3.75} \text{ (approximately)} \]

c) Even without government intervention, cartels tend to break up. Explain why

Greed (Each firm will try to sell more at the higher price. If they do, then price will fall)

\[ S = MC \quad S = D \quad @ A = 4 \]

\[ \text{Industry} \]
4. Suppose that labor is the only input used by a perfectly competitive firm. The firm’s production function is as follows:

<table>
<thead>
<tr>
<th>Days of Labor</th>
<th>Units of Output</th>
<th>Marginal Product</th>
<th>Value of Marginal Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>7</td>
<td>$70</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>6</td>
<td>$60</td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>6</td>
<td>$60</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>4</td>
<td>$60</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>2</td>
<td>$70</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>1</td>
<td>$10</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

a) Calculate the marginal product for each additional worker.

b) Each unit of output sells for $10. Calculate the value of the marginal product of each worker.

c) Compute the demand schedule showing the number of workers hired for all wages from zero to $100 a day.

d) Graph the firm’s demand curve. Carefully number and label the axes.

e) What happens to this demand curve if the price of output rises? Show the direction of the change in the graph. (You may assume all else is held equal.)
5. (16 points) The price of corn was approximately $3.00 a bushel in 2006. The graph to the right shows the national market for corn and the one to the left shows the market for Farmer John.

a) What type of market is the market for corn? Explain how you can tell.

Perfect competition. Many firms identical product.

b) What is Farmer John’s marginal revenue? (Number please.)

\[ MR = \text{Price} \]

c) Was he making a profit? How can you tell?

Yes, \( P > \text{ATC} \)

d) The demand for corn has increased and the current price is about $3.50. In the graph to the left above, show the change in the curve very carefully.

Marginal Revenue \( P = MR \) at \( q \)

e) Show how much corn Farmer John will now bring to market.

Approx. 4.5m

f) What will happen in the (industry) market for corn in the long run? Why does this occur?

Firms will enter. A profit is being made.
4. Suppose that labor is the only input used by a perfectly competitive firm. The firm’s production function is as follows:

<table>
<thead>
<tr>
<th>Quantity of Labor</th>
<th>Units of Output</th>
<th>Marginal Product</th>
<th>Value of Marginal Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>7</td>
<td>$70</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>6</td>
<td>$60</td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>6</td>
<td>$60</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>6</td>
<td>$60</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>2</td>
<td>$20</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>1</td>
<td>$10</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

a) Calculate the marginal product for each additional worker.

b) Each unit of output sells for $10. Calculate the value of the marginal product of each worker.

c) Compute the demand schedule showing the number of workers hired for all wages from zero to $100 a day.

<table>
<thead>
<tr>
<th>Wage</th>
<th>Number of Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>0</td>
</tr>
<tr>
<td>$70</td>
<td>1</td>
</tr>
<tr>
<td>$60</td>
<td>1</td>
</tr>
<tr>
<td>$50</td>
<td>3</td>
</tr>
<tr>
<td>$40</td>
<td>5</td>
</tr>
<tr>
<td>$30</td>
<td>6</td>
</tr>
<tr>
<td>$20</td>
<td>7</td>
</tr>
</tbody>
</table>

\[ W \leq 100 \]

\[ Q = 0 \]

\[ Q = 70 \]

\[ Q = 60 \]

\[ Q = 50 \]

\[ Q = 30 \]

\[ Q = 40 \]

\[ Q = 50 \]

\[ Q = 10 \]

\[ Q = 0 \]

d) Graph the firm’s demand curve. Carefully number and label the axes.

e) What happens to this demand curve if the price of output rises? Show the direction of the change in the graph. (You may assume all else is held equal.)
6. (13 points) Suppose you are given the following information about Acme Widget.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Fixed Cost</th>
<th>Marginal Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Average Fixed Cost</th>
<th>Average Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
<td></td>
<td>0</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>9</td>
<td>21</td>
<td>29</td>
<td></td>
<td>2.67</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>11</td>
<td>32</td>
<td>40</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

a) Fill in all of the blank columns and the blank spaces in the Fixed Cost and Total Cost Column.

b) What is the efficient level of production for the firm?

\[ Q = 3 \]

\[ A \overline{T} C \text{ at } Q = 3 \]

c) In space to the right, draw the firm Average Fixed Cost curve. Carefully label and number both axes.

d) Does the shape you drew conform to the real world? Explain

Yes, spreading the overhead.
Multiple Choice. (3 points each)

Tony is a wheat farmer, but he also spends part of the day teaching guitar lessons. Due to the popularity of his local country western band, Farmer Tony has more students requesting lessons that he has time for if he is to also maintain his farming business. Farmer Tony charges $25 an hour for his guitar lessons. One spring day, he spends 10 hours in his fields planting $130 worth of seeds on his farm. He expects that the seeds he planted will yield $300 worth of wheat.

7. Tony’s economic profit equals $…
   a. $-130.
   b. $-80.
   c. $130.
   d. $170.

8. The efficient scale of the firm is the quantity of output that
   a. maximizes marginal product.
   b. maximizes profit.
   c. minimizes average total cost.
   d. minimizes average variable cost.

9. In a competitive market,
   a. each seller can sell all he wants to sell at the going price.
   b. buyers and sellers are price takers.
   c. the goods offered by the different sellers are largely the same.
   d. All of the above are correct.

10. A natural monopoly occurs when
    a. the product is sold in its natural state (such as water or diamonds).
    b. there are economies of scale over the relevant range of output.
    c. the firm is characterized by a rising marginal cost curve.
    d. production requires the use of free natural resources, such as water or air.

11. The legislation passed by Congress in 1890 to reduce the market power of large and powerful “trusts” is called the
    b. Sherman Act.
    d. 14th Amendment.

12. If Levi Strauss & Co. were to require every store that carried their clothing to charge customers 20 percent more than the store’s cost for each item of clothing, Levi Strauss & Co. would be practicing
    a. resale price maintenance.
    b. fixed retail pricing.
    c. tying.
    d. cost plus pricing.
The figure below depicts the demand, marginal revenue and marginal cost curves of a profit-maximizing monopolist. Used the figure to answer question 13.

13. Which of the following areas represents the deadweight loss due to monopoly pricing?
   a. triangle bde
   b. triangle bge
   c. rectangle acdb
   d. rectangle cfgd

Use the following information to answer question 14.
Rocchetta Industries manufactures and supplies bottled water in Mexico. As a result of a contamination of water supplies at many of Mexico’s resort communities, the demand for bottled water has increased.

14. We would expect that, as a result of the contamination, the value of the marginal product for Rocchetta Industries workers would
   a. be offset by a decrease in wages.
   b. be unaffected by a rise in demand for bottled water.
   c. rise.
   d. fall.

15. In the long run, a monopolistically competitive firm produces a quantity that is
   a. equal to the efficient scale.
   b. less than the efficient scale.
   c. greater than the efficient scale.
   d. consistent with diseconomies of scale.
16. (2 points. Extra credit if no more than one absence and answered correctly.)

The Brown Jug has decided to cut the price of chicken wings from 30 cents to 20 cents. Sales increased from 50 up to 80. What is the value of the price effect and of the output effect?

<table>
<thead>
<tr>
<th>Price effect</th>
<th>Output effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 original</td>
<td>30 more @ .20</td>
</tr>
<tr>
<td>.10 less</td>
<td></td>
</tr>
</tbody>
</table>

Price effect = **$5.00**  
Output effect = **$6.00**