1. (18 points) Suppose Healthy Harry’s Oranges has the following Cost Schedule.

<table>
<thead>
<tr>
<th>Q</th>
<th>Fixed Cost</th>
<th>Marginal Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Aver Var Cost</th>
<th>Aver Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
<td>--</td>
<td>0</td>
<td>30</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>40</td>
<td>40/10</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>15</td>
<td>25</td>
<td>55</td>
<td>55/25</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>20</td>
<td>45</td>
<td>75</td>
<td>75/45</td>
<td>1.67</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>25</td>
<td>70</td>
<td>100</td>
<td>100/70</td>
<td>1.43</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>30</td>
<td>100</td>
<td>130</td>
<td>130/100</td>
<td>1.30</td>
</tr>
</tbody>
</table>

a) Fill in the blank columns.

b) What is the efficient quantity of production?

\[ \text{Where } ATC \text{ lowest. } 3 \text{ or } 4 \]

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\[ \text{Where } ATC \text{ lowest. } 3 \text{ or } 4 \]

c) Suppose the price of oranges is 20 and the market is perfectly competitive. Calculate Healthy Harry’s profit.

\[ P = MC \]
\[ MC = 20 \]
\[ Q = 3 \]
\[ TR = P \times Q = 3 \times 20 = 60 \]
\[ TC = 30 \]
\[ TR - TC = 60 - 30 = 30 \]

\[ \text{Yes, he will lose } 15 \text{ if he operates, but will lose } 30, \text{ the fixed cost if he does not.} \]

d) Will Healthy Harry operate in the short run? Explain why with the relevant numbers from above.

\[ \text{Yes, he will lose } 15 \text{ if he operates, but will lose } 30, \text{ the fixed cost if he does not.} \]

e) Will Healthy Harry operate in the long run? Explain why with the relevant numbers from above.

\[ \text{No, he will not continue to lose money.} \]
2. (12 points) Suppose that labor is the only variable input in the production process for a competitive profit-maximizing firm that produces coffee mugs. The firm's production function is shown below.

<table>
<thead>
<tr>
<th>Labor (number of workers)</th>
<th>Output per Hour</th>
<th>Marginal Product Of Labor</th>
<th>Value of MPL when P = $3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) Fill out the blank columns of the table above (the marginal product of labor and the value of the marginal product of labor when the price of output equals $3 per mug).

b) Suppose that the competitive wage for workers who can make coffee mugs is $19 per hour. How many workers should this firm hire? Why?

\[ VMP_L > 19 \text{ for first } h \text{ workers} \]

(c) Suppose that schools that teach pottery skills increase the supply of workers that can make coffee mugs and that this event lowers the competitive wage for coffee mug workers to $13 per hour. How many workers should this firm hire? Why?

\[ VMP_L > 13 \text{ for all } h \]

d) Does this represent a shift in the firm's demand for labor or a movement along the firm's demand for labor?

\[ \text{Movement along the firm's demand for labor} \]
3. (18 points) Suppose you are given the following information about the American Utility Corp. They have a local monopoly.

<table>
<thead>
<tr>
<th>Q</th>
<th>Fixed Cost</th>
<th>Marginal Cost</th>
<th>Variable Cost</th>
<th>Total Cost</th>
<th>Aver Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
<td></td>
<td>0</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100</td>
<td>10</td>
<td>10</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>10</td>
<td>20</td>
<td>120</td>
<td>120/2 = 60</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>10</td>
<td>30</td>
<td>130</td>
<td>130/3 = 43.33</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>10</td>
<td>40</td>
<td>140</td>
<td>140/4 = 35</td>
</tr>
</tbody>
</table>

a) Fill in the blank columns.

b) Is the American Utility Corp a natural monopoly? Explain why or why not.

Yes. ATC is declining over the relevant range.

c) Suppose the demand for their product is given below. Calculate their profit maximizing price and quantity.

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>P + δQ</th>
<th>ATC</th>
<th>MR</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>30</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>50</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
<td>60</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>40</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Operate at Q where MR = MC

Q = 3
M = MC = 10

P = P

(d) Is there a deadweight loss if they operate as a profit maximizing monopoly? Demonstrate numerically or with a graph.

Yes. Fourth person is willing to pay 15. The cost of providing it is 10, yet it will not be provided.
4. (16 points) a) Please list the five characteristics that define a market as being a monopolistically competitive one.

- Many buyers
- Many sellers
- Differentiated products
- Some ability to set price
- No barriers

b) Please give an example of a firm, either real or not, that would be a monopolistically competitive one. Make sure either by its name, or with a few words of explanation, it is clear what is being sold.

Any restaurant, bar, etc.

c) Suppose all the firms in a monopolistically competitive market have cost curves like ones to the right. Show their price of $P_{MC}$ and their quantity by $Q_{MC}$.

d) Are they making a profit or a loss or breaking even? Show on the graph.

\[ P = AR \]

The difference between $AR$ and $ATC$ is $Q_{MC}$.

e) Is the industry in long run equilibrium? How can you tell?

No. $ATC$ is being made. This will attract other firms.
Multiple Choice – 2 points each

*5. Economic profit is equal to total revenue minus
   a. implicit costs.
   b. explicit costs.
      the sum of implicit and explicit costs.
   c. marginal costs.
   e. variable costs.

Use the following information for the next question.

<table>
<thead>
<tr>
<th>Number of Workers</th>
<th>Output</th>
<th>MPL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>1</td>
</tr>
</tbody>
</table>

*6. The production process described above exhibits
   a. **constant marginal product of labor.**
   b. increasing marginal product of labor.
   c. diminishing marginal product of labor.
   d. increasing returns to scale.
   e. decreasing returns to scale.

*7. If a competitive firm doubles its output, the total revenue
   a. more than doubles.
   b. doubles.
   c. less than doubles.
   d. cannot be determined because the price of the good may rise or fall.

*8. Compared to a perfectly competitive market, a monopoly market will usually generate
   a. higher prices and higher output.
   b. higher prices and lower output.
   c. lower prices and lower output.
   d. lower prices and higher output.

*9. If oligopolists engage in collusion and successfully form a cartel, the market outcome is
   a. the same as if it were served by a monopoly.
   b. the same as if it were served by competitive firms.
   c. efficient because cooperation improves efficiency.
   d. none of the above.

*10. Which of the following firms has the least incentive to advertise?
   a. a manufacturer of home heating and air conditioning
   b. a manufacturer of breakfast cereal
   c. a **wholesaler** of crude oil
   d. a restaurant
11. An increase in the demand for apples will cause all of the following EXCEPT.
   a. **an increase in the price of apples**
   b. an increase in the value of the marginal product of apple pickers
   c. an increase in the wage of apple pickers
   d. a decrease in the number of apple pickers employed

12. The poverty line is set at
   a. **two times the price of a new car**
   b. five times the value of average rent.
   c. three times the cost of providing an adequate diet.
   d. one third of average family income.

13. Since 1935, the income distribution in the United States has
   a. **been unchanged.**
   b. narrowed slightly from 1935 to 1970 and then widened slightly from 1970 to today.
   c. widened slightly from 1935 to 1970 and then narrowed slightly from 1970 to today.
   d. slowly widened.
   e. slowly narrowed.

14. Suppose Jan is starting up a small lemonade stand business. Variable costs for Jan’s lemonade stand would include
   a. **lemonade mix.**
   b. cost of building the lemonade stand.
   c. cost of hiring an artist to design a logo for her sign.
   d. all of the above.

15. The Wheeler Wheat Farm sells wheat to a grain broker in Seattle, Washington. Since the market for wheat is generally considered to be competitive, the Wheeler Farm
   a. **does not choose the quantity of wheat to produce.**
   b. does not have any fixed costs of production.
   c. is not able to earn an accounting profit.
   d. does not choose the price at which it sells its wheat.

16. The Wheeler Wheat Farm sells wheat to a grain broker in Seattle, Washington. Since the market for wheat is generally considered to be competitive, the Wheeler Wheat Farm maximizes profit by choosing
   a. to produce the quantity at which average fixed cost is minimized.
   b. to sell its wheat at a price where marginal cost is equal to average total cost.
   c. the quantity at which market price is equal to the farm’s marginal cost of production.
   d. to minimize its average total cost.

17. The short-run supply curve for a firm in a perfectly competitive market
   a. **is determined by forces external to the firm.**
   b. is reflected in its marginal cost curve (above average variable cost).
   c. will be influenced by the magnitude of fixed costs.
   d. is likely to slope downward.
18. The legislation passed by Congress in 1890 to reduce the market power of large and powerful "trusts" is called
   a. the Sherman Act.
   b. the Clayton Act.
   c. the 14th Amendment.
   d. none of the above.

19. If Levi Strauss & Co. were to require every store that carried their clothing to charge customers 20% more than the store's cost for each item of clothing, Levi Strauss & Co. would be practicing
   a. tying.
   b. cost plus pricing.
   c. resale price maintenance.
   d. fixed retail pricing.

20. If firms in a monopolistically competitive industry are making profits,
   a. firms will likely be subject to regulation.
   b. barriers to entry will be strengthened.
   c. new firms will enter the market.
   d. some firms must exit the market.

21. The value of the marginal product curve gets its shape from
   a. diminishing marginal product.
   b. increasing marginal product.
   c. tight labor markets.
   d. a surplus of workers.

22. The current poverty rate in the U.S. is approximately
   a. 6.9 percent.
   b. 12.7 percent.
   c. 16.2 percent.
   d. 33.2 percent.