Econ 601: Basic Economic Analysis
Assignment #3

Topic: Costs and Production

Text Questions
1. Why does a firm incur fixed costs over the short run when its output is zero, and why do fixed costs not change as the level of output changes? Why do a firm’s short-run total variable costs increase slowly at smaller levels of output and rapidly at larger levels of output?

2. What is the Law of Diminishing Returns and why does it affect short-run but not long-run production? How will the Law of Diminishing Returns affect the productivity of each additional student who is washing cars at a local gas station to raise money for charity? Why does this effect occur?

3. Complete the following table of short-run costs. From the information in the completed table, plot two graphs: (1) a graph of a total cost curve, and (2) a graph of an average total cost curve and a marginal cost curve.

<table>
<thead>
<tr>
<th>Output</th>
<th>Total Fixed Cost</th>
<th>Total Variable Cost</th>
<th>Total Cost</th>
<th>Avg. Total Cost</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$</td>
<td>$</td>
<td>$100</td>
<td>-------</td>
<td>$</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>150</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>180</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>210</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td>280</td>
<td></td>
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<td>5</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>600</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Choice Questions

1) The theory behind short run production costs can be narrowed to an assumption that MC is expected to initially fall, but rise at larger levels of output. This assumption follows from:

   a. the laws of supply and demand.
   b. the law of diminishing returns.
   c. the concept of diseconomies of scale.
   d. the law of diminishing marginal utility.

2) The mathematical principle that relates MC to AVC is:

   a. average rises if marginal falls.
   b. average falls if marginal is below average.
   c. marginal rises if average is above marginal.
   d. marginal falls if average is below marginal.

3) If a firm increases its rate of output by 10% and average variable costs increase, then over this range of output:
a. average total cost must be rising as output increases.
b. average fixed cost must be rising as output increases.
c. marginal costs must be greater than average variable cost.
d. average fixed cost must be greater than average variable cost.

Use the following information to answer the next two questions. Assume fixed costs are 0 and labor costs are $5.00 per person.

<table>
<thead>
<tr>
<th>Labor Input (L)</th>
<th>Output (O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>13</td>
<td>38</td>
</tr>
</tbody>
</table>
4) Average total cost when Q=30 is:
   a. $2.00
   b. $5.00
   c. $60.00
   d. none of the above

5) The per unit marginal cost of increasing output from Q=20 to Q=30 is:
   a. $0.50
   b. $5.00
   c. $50.00
   d. none of the above.

6) Those costs that are generally not considered part of costs for IRS accounting purposes are:
   a. fixed costs.
   b. variable costs.
   c. explicit costs.
   d. opportunity costs.

7) If the marginal cost of producing the 5\textsuperscript{th} unit of some good is $10 and the average variable costs of 4 units is $12.50, what is the average variable cost of 5 units?
   a. $50.00
   b. $22.50
   c. $12.00
   d. $10.00

8) Assume the average total cost of producing the 10 units of some good is $25 and the average variable cost of producing 9 units is $20. If the marginal cost of producing the 10\textsuperscript{th} unit is $20, how much are total fixed costs?
   a. $70
   b. $50
   c. $20
   d. $5

9) If the MC of producing the first unit of some good is $40.00 and the MC of the second unit is $5.00, what is the AVC of two units?
   a. $2.50
   b. $10.00
   c. $22.50
   d. $45.00

10) If the MC of producing the fifth unit of some good is $20 and the AVC of four units is $30.00, what is the AVC of 5 units?
    a. $6.00
    b. $8.00
    c. $28.00
    d. $50.00