ECO 3033 Sample Objective Questions, Exam I.

True/False  
*Indicate whether the sentence or statement is true or false.*

1. The marginal product of a variable input is unrelated to the marginal cost of additional output that the input could produce.  
   - False

2. Total variable cost is the inverse of total product.  
   - False

3. Implicit costs are those costs of production for which specific payment has been made sometime in the past or for which the firm is committed in the future.  
   - False

4. Variable costs are costs that increase or decrease as a firm's output increases or decreases.  
   - True

5. The social costs of firm are the private costs of the resources that the firm uses plus any additional costs imposed on society by the firm's operations.  
   - True

6. Average fixed cost is equal to total fixed costs divided by the level of output.  
   - True

7. The demand function for a firm relates the quantities of a product or service that consumers would like to purchase during some specific period to the variables which influence consumer decisions to buy the good or service.  
   - True

8. Marginal revenue is the rate of change of total revenue with respect to price.  
   - False

9. If the cross elasticity of demand of good X for changes in the price of good Y is negative, the two goods are complements.  
   - True

10. A firm determines that the own price elasticity of demand for its brand of a product is negative. Thus, it knows that demand is inelastic.  
    - False

Multiple Choice  
*Identify the letter of the choice that best completes the statement or answers the question.*

11. The price of a firm's product times the quantity demanded of that product is: 
   - C
     a. marginal revenue.  
     b. the firm's demand curve.  
     c. total revenue.  
     d. price elasticity of demand.  
     e. average revenue.

12. Which of the following statements regarding arc elasticities is FALSE? 
   - B
     a. The arc elasticity approximates point elasticity.  
     b. Arc elasticities do not measure responsiveness; only point elasticities do this.  
     c. Arc elasticities do NOT use derivatives in their calculations.  
     d. Arc elasticities are elasticities calculated between two points or two values of a variable.  
     e. The arc elasticity refers to the average responsiveness of Qx.
13. If the absolute value of the price elasticity of demand is less than 1, then:
   a. an increase in price decreases total revenue.
   b. an increase in price has no affect on total revenue.
   c. a decrease in price lowers total revenue.
   d. a decrease in price raises total revenue.
   e. a change in price has no affect on total revenue.

14. If the value of the cross price elasticity of demand of good X for a change in good Y’s price is less than 0, then:
   a. the goods are complementary.
   b. the goods are substitutes.
   c. demand is said to be inelastic.
   d. the goods are superior goods.
   e. demand is said to be elastic.

15. Long-run marginal cost:
   a. is the rate of change of long-run fixed cost as the level of output changes.
   b. is the rate of change of long-run total cost as the level of output changes.
   c. is always constant.
   d. is usually fixed over a given range of production.
   e. is the rate of change of long-run average cost as the level of output changes.

16. Short-run marginal cost:
   a. is the rate of change of short-run fixed cost as the level of output changes.
   b. is the rate of change of short-run total variable cost as the level of output changes.
   c. is the rate of change of short-run total cost as the level of output changes.
   d. is the rate of change of short-run average cost as the level of output changes.
   e. b and c

17. Which of the following are implicit costs for a typical firm?
   a. insurance costs
   b. electricity costs
   c. opportunity costs of capital owned and used by the firm
   d. cost of labor hired by the firm
   e. the cost of raw materials

18. Accounting profit equals
   a. explicit costs minus implicit costs
   b. economic profit minus implicit costs
   c. economic profit minus explicit costs
   d. economic profit minus explicit costs and implicit costs
   e. economic profit plus implicit costs

19. Which of the following is most likely to be a fixed resource for the City Slicker’s Dude Ranch?
   a. the lodge where the guests stay
   b. food for the guests
   c. stable hands to take care of the horses
   d. hay for the horses
   e. water for the horses
20. The Scott Company has estimated the demand curve for its product is represented by the equation:

\[ Q = 8000 - 5P, \quad \rho = 1600 - 2Q \]

where \( Q \) is the quantity sold per week and \( P \) is the price per unit.

- (a) Based on the estimated demand curve, write the equations for Scott's:
  - (i) Total Revenue
  \[ \text{Total Revenue} = 1600Q - 2Q^2 \]
  - (ii) Average Revenue
  \[ \text{Average Revenue} = 1600 - 2Q \]
  - (iii) Marginal Revenue
  \[ \text{Marginal Revenue} = 1600 - 4Q \]

- (b) What is the maximum total revenue per week that Scott can obtain from sales of its product? (Give the exact dollar amount and show how you determined it.)

\[ 800 \times (4000) = 3,200,000 \]

- (c) Calculate the point price elasticity of demand for Scott's product when \( Q = 5000 \). Is demand elastic or inelastic at that quantity? How do you know?

\[ \varepsilon = -5 \times \frac{5000}{800} = -6 \]

- (d) Calculate the arc price elasticity of demand for Scott's product between \( Q = 3000 \) and \( Q = 3200 \). Interpret your results, and relate it to what will happen to total revenue if Scott is initially at \( Q = 3000 \) and decides to cut price to increase its sales from 3000 to 3200 units.

\[ \varepsilon = \frac{-40 \times 1960}{4200} = -1.58 \]

Problem A.

21. Complete the following table, given that the price of input a is constant and that a is the only variable input.

<table>
<thead>
<tr>
<th>Input a (units)</th>
<th>Q (Output in units)</th>
<th>Arc MPa</th>
<th>Arc SMC</th>
<th>AVC Undefined</th>
<th>SAC Undefined</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>10</td>
<td>5</td>
<td></td>
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<td>3</td>
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<td>5</td>
<td>6</td>
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<td>75</td>
<td>15</td>
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<td>20</td>
<td>2.50</td>
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<td>10</td>
<td>5.00</td>
<td>3.57</td>
<td>3.71</td>
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</tbody>
</table>
22. Level-Mow, Inc. manufactures an highly reliable riding lawnmower. Level-Mow currently sells 1200 units per month at a current price of $1,900.

a. Its main competitor, Super-Cut, Inc. has just lowered the selling price of its comparable model from $1,000 to $800. If the arc cross price elasticity of demand between the two mowers is .818 over the range of the proposed price cuts, then what will be the new quantity of lawnmowers sold by Level-Mow, Inc.?

b. Assume that Super-Cut, Inc. has completed its price reduction mentioned in part a above. If Level-Mow now wants to counter Super-Cut's price reduction with one of its own, then to what price must Level-Mow go in order to return to its original volume of 1200 units? (Assume an own price elasticity of -.6 for Level-Mow.)

\[
a. \quad .818 = \frac{Q_2-1200}{-1000} \cdot \frac{1000}{Q_2+1200} \\
9Q_2 - 10,800 = -.818Q_2 - 981.4 \\
9.818Q_2 = 9818.4 \quad ; \quad Q_2 = \frac{1000}{2}
\]

\[
b. \quad -.6 = \frac{200}{P_2 - 1900} \cdot \frac{P_2 + 1900}{2200} \\
P_2 + 1900 = -6 \times 6 \times P_2 + 12,540 \\
7.6P_2 = 10,640 \quad ; \quad P_2 = \frac{1400}{2}
\]