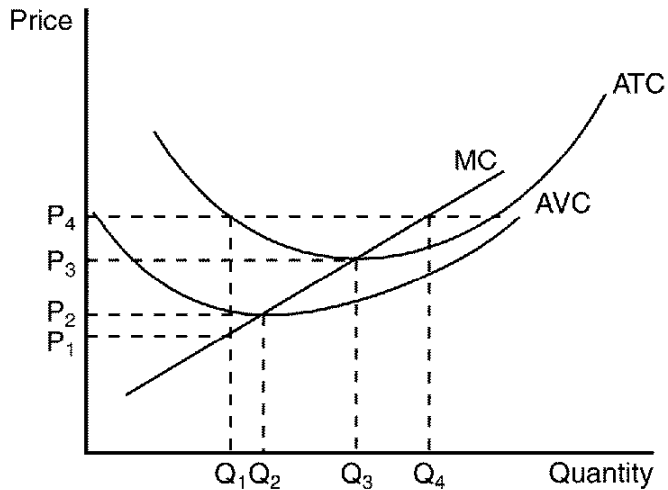Economics 5000 – Dr. Rupp
Test #1 – Feb 9th, 2010

25 Multiple Choice questions – (2 points each)
Use the following graph of a firm in a competitive market to answer questions #1 - #4:


1. When price rises from P_2 to P_3, the firm finds that
    a. it will now remain open in the long-run.
    b. if it produces at output level Q_3 it will earn a positive profit.
    c. it can cover all its variable costs, but only some of its fixed costs.
    d. it could increase profits by lowering output from Q_3 to Q_2.
2. When price falls from P_3 to P_1, the firm finds that
    a. fixed cost is higher at a production level of Q_1 than it is at Q_3.
    b. it should produce Q_1 units of output.
    c. it should produce Q_3 units of output.
    d. it should shut down immediately.
3. When price rises from P_3 to P_4, the firm finds that
    a. fixed costs are lower at a production level of Q_4.
    b. it can earn a positive profit by increasing production to Q_4.
    c. profit is still maximized at a production level of Q_3.
    d. average revenue exceeds marginal revenue at a production level of Q_4.
4. In the above figure, the short-run supply curve for a firm in this perfectly competitive market is
    a. the upward sloping portion of the AVC curve.
    b. the downward sloping portion of the AVC curve.
    c. the upward sloping portion of the ATC curve.
    d. the portion of the MC curve that lies above AVC.
    e. the portion of the MC curve that lies above ATC.
5. When price is below average variable cost, in the short-run a perfectly competitive firm will
    a. shut down and incur fixed costs.
    b. shut down and incur both variable and fixed costs.
    c. continue to operate as long as average revenue exceeds marginal cost.
    d. continue to operate as long as average revenue exceeds average fixed cost.
6. What are the returns to scale of the following function: $Q = 2K^{1/2}L^{1/2}$
    a. Increasing returns to scale
    b. Decreasing returns to scale
    c. Constant returns to scale

7. Find the marginal cost function, given the total cost function: $TC(Q) = 12Q^2 - 6Q + 12$
    a.   MC = 12
    b.   MC = 24Q – 6 + 12/Q
    c.   MC = 12Q – 6
    d.   MC = 24Q – 6
    e.   MC = 24Q

8. Find the fixed cost, given the total cost function: $TC(Q) = 12Q^2 - 6Q + 12$
    a.   FC = 12
    b.   FC = 12/Q
    c.   FC = $12Q^2 - 6Q$
    d.   FC = 12Q – 6
    e.   FC = 24Q – 6

9. Find the average variable cost, given the total cost function: $TC(Q) = 12Q^2 - 6Q + 12$
    a.   AVC = 12/Q
    b.   AVC = 12Q – 6 + 12/Q
    c.   AVC = $12Q^2 - 6Q$
    d.   AVC = – 6 + 12/Q
    e.   AVC = 12Q – 6

10. Given the short-run total cost function: $STC = 20 + 4Q + 0.5Q^2$ and the market price is $16. What is the profit maximizing Q?
    a. Q = 4
    b. Q = 16
    c. Q = 8
    d. Q = 12
    e. Q = 6

11. Given the information from #10, calculate the maximum profit.
    a. $52
    b. $-40
    c. $44
    d. $22
    e. $34

12. Given the information from #10, find the producer surplus.
    a. $64
    b. $44
    c. $72
    d. $54
    e. $40

13. Given the information from #10, find the firm's short run supply curve and express it as a function of price: $Q^s(P)$
    a. $Q^s = 4P + 0.5P^2$
    b. $Q^s = P - 4$
    c. $Q^s = 4 - 0.5P$
    d. $Q^s = 16 - 4P$
    e. $Q^s = 4 - P$

14.   Currently Moe's has 2 employees and 1 grill (capital), which produces 15 meals per day. If Moe's decides to double both inputs (employees and grills) and 32 meals are produced, what are the returns to scale for Moe's?
    a. Increasing Returns to Scale
    b. Decreasing Returns to Scale
    c. Constant Returns to Scale

15. Find the first derivative of the following function: $f(x) = 1/x$
    a. $f'(x) = 1$
    b. $f'(x) = x$
    c. $f'(x) = -1/x$
    d. $f'(x) = 1/x^2$
    e. $f'(x) = -1/x^2$

Use the following information to answer the next two questions: Widgets Inc. can hire workers at $20 per day and can rent a unit of equipment for $25 per day. Currently Widgets Inc. spends $250 per day on inputs (assume that you can hire partial quantities of inputs).

K

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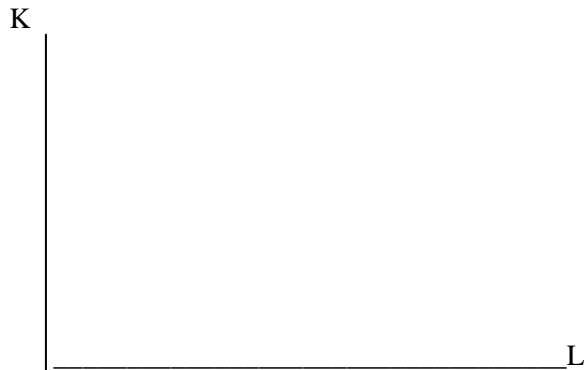
16. Draw an isocost curve above where Widgets Inc. spends $250. What is the slope of the isocost curve?
    a. -1/2
    b. -1/10
    c. -4/5
    d. -5/4
    e. -2/3

17.   If Widgets Inc. hires 5 workers and rents 6 pieces of equipment, then the marginal product of labor = 15 and the marginal product of capital = 20. Given this information, is Widgets Inc. optimizing? If no, then what should Widget do?
    a. Yes
    b. No, hire more workers, use less capital
    c. No, fire workers, use more capital

18.   Given the following production function: $Q = 2L^{0.5}$. Find the long-run cost as a function of Q: TC(Q)
    a. $TC(Q) = 2wQ^{0.5}$
    b. $TC(Q) = 4wQ^{0.5}$
    c. $TC(Q) = 4wQ^2$
    d. $TC(Q) = wQ^2/4$
    e. $TC(Q) = wQ^2/2$

19.   Given the following production function: $Q = 2L^{0.5}$. Find the long-run average cost as a function of Q: ATC(Q)
    a. $ATC(Q) = 2wQ^{-0.5}$
    b. $ATC(Q) = 4wQ^{0.5}$
    c. $ATC(Q) = wQ/2$
    d. $ATC(Q) = wQ/4$
    e. $ATC(Q) = 4wQ$

20. This cost function exhibits what kind of returns to scale? (hint, find the derivative dATC(Q)/dQ)
    a. Economies of scale
    b. Diseconomies of scale
    c. Constant Returns to scale

21. Which of the following beer categories is growing the fastest?
    a. Premium
    b. Super-premium
    c. Budget/Value
    d. Imports & craft beer

22. The survivor test, used by economists to estimate the extent of economies of scale indicates which of the following size beer plants have survived over-time?
    a. Small-sized breweries (< 1 million barrels a year production)
    b. Mid-sized breweries (between 1 and 4 million barrels a year production)
    c. Large-sized breweries (brewing capacity above 4 million barrels a year)

23. What is product differentiation?
    a. Product price is higher to reflect higher input costs
    b. Charging different prices to different people
    c. The point in which marginal revenue begins to diminish
    d. Offering different products in different markets
    e. Slightly different products, hence companies can charge different prices

24. The beer industry has what kind of externalities associated with it?
    a. Positive externalities in both production and consumption of beer.
    b. Negative externalities in both production and consumption of beer.
    c. Negative externalities only with the production of beer.
    d. Negative externalities only with the consumption of beer.
    e. Positive externalities only with the consumption of beer.

25. Why did Molson Coors and SAB Miller form a joint venture to combine their U.S. operations?
    a. To gain market power
    b. To lower their advertising costs
    c. To lower their tax rates
    d. To improve quality
    e. Take advantage of economies of scale

Extra credit (you are eligible to answer the extra credit question if you meet two criteria: (1) your cell phone did not ring during class or during this test and (2) you are taking the test at the regularly scheduled day and time):

26. Blind taste tests of light beers marketed in the premium and value/budget categories reveal:
    a. Substantial differences between these categories
    b. Little difference between these categories

Short Answer: (4 questions worth 12.5 points each)

1. Complete the following table for the short-run cost curves for the production function: $Q = 2KL$ where in the short-run K is fixed at 2 units, with the rental price per unit of capital = $5 and the wage rate = $10.

Workers	Output	TC	VC	FC	ATC	AVC	AFC	MC
0					--	--	--	--
1								
2								

2. Calculating a long-run equilibrium: all firms have identical cost structures. Each firm has a long-run average cost curve: $AC(Q) = 40 - Q + 0.01Q^2$ and a corresponding long-run marginal cost curve: $MC(Q) = 40 - 2Q + 0.03Q^2$. The market demand curve is: $D(P) = 25,000 - 1,000P$.

      a. What is the long-run equilibrium quantity per firm (show your work)

      b. Find the long-run equilibrium price (show your work)

      c. Find the number of firms (show your work)

3. The market demand curve is: $P = 100 - Q$. $MC = 9Q$.

    a. Find the equilibrium quantity.

    b. Find the equilibrium price.

    c. Sketch a graph that shows both Consumer and Producer Surplus.

P

Q

    d. How much is the Consumer and Producer Surplus areas?

4. A firm sells a product in a perfectly competitive market, at a price of $50. The firm has a fixed cost of $30. Fill in the following table.

Output	Total Revenue	Total Cost	Profit	Marginal Revenue	Marginal Cost
0	0			--	--
1					50
2					20
3					30
4					42
5					54
6					70

    a. In the short-run, what level of output does the firm maximizes profit?

    b. Is this firm open or closed in the short-run?

    c. In the long-run, would this firm be open or closed?

NAME ECON 5000 TEST #1   SPR'10

form no. 30423

EXAMPLE

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IMPORTANT DIRECTIONS FOR MARKING ANSWERS

Use #2 pencil only.
Make heavy black marks that fill the circle completely.
Erase clearly any answer you wish to change.
Make no stray marks on this answer sheet.

PRACTICE

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