Economics 101
Spring 2001
Section 4 - Hallam
Exam 4A - Blue

1. Marginal revenue measures
   a. the change in cost required to produce one more unit of output.
   b. the change in revenue from the production of one more unit of output.
   c. the change in output that can be obtained from one more dollar of expenditure.
   d. the level of output divided by the level of input.
   e. the change in output that results from one more unit of an input.

2. Marginal cost measures
   a. the change in an input required to produce one more unit of output.
   b. the change in output that can be obtained from one more dollar of expenditure.
   c. the change in cost from the production of one more unit of output.
   d. the change in output that results from one more unit of an input.
   e. the level of output divided by the level of input.

3. Marginal physical product measures
   a. the change in an input required to produce one more unit of output.
   b. the change in output that can be obtained from one more dollar of expenditure.
   c. the change in cost from the production of one more unit of output.
   d. the change in output that results from one more unit of an input.
   e. the level of output divided by the level of input.

4. Average physical product measures
   a. the change in an input required to produce one more unit of output.
   b. the change in output that can be obtained from one more dollar of expenditure.
   c. the change in cost from the production of one more unit of output.
   d. the change in output that results from one more unit of an input.
   e. the level of output divided by the level of input.

5. We say that a firm experiences *economies of scale* or increasing returns to size when
   a. MC is increasing.
   b. MC > AC.
   c. the firm imposes costs on outside firms.
   d. ε_S (elasticity of scale) < 1.
   e. AC > MC.

6. What is the shutdown rule for a firm in the short-run?
   a. In the short-run, if some fixed costs are not sunk, the firm should continue to produce if (Total Revenue (TR) + sunk fixed costs) > Total costs; otherwise, it should shut down.
   b. In the short-run, the firm should continue to produce if total revenue (TR) exceeds total costs (TC); otherwise, it should shut down.
   c. In the short-run, if some fixed costs are not sunk, the firm should continue to produce if (TR - TVC) > (TFC - sunk fixed costs) > 0; otherwise, it should shut down.
   d. In the short-run, the firm should continue to produce if total revenue (TR) is less than total variable costs.
   e. Both a and c are reasonable rules.

7. For a firm to minimize cost, which of the following must hold, where input prices are given by w_1 and w_2 and input quantities are given by x_1 and x_2?
   a. $\frac{MPP_{x_2}}{w_2} = \frac{MPP_{x_1}}{w_1}$
   b. $\frac{-w_2}{w_1} = MRS_{x_1 x_2} = \frac{\Delta x_1}{\Delta x_2}$
   c. the slope of the budget line $\left(\frac{-p_2}{p_1}\right)$ and the slope of the indifference curve must be equal
   d. both a and b
   e. a, b, and c

8. When marginal product is negative
   a. total product is falling.
   b. total product is rising at an increasing rate.
   c. average product is rising.
   d. total product is rising at a decreasing rate.
   e. average product is at a maximum.

9. Which of the following statements is true?
   a. The substitution effect of a price change measures movements between indifference curves
   b. The income effect of a price change measures the change in the quantity demanded of a good due exclusively to changes in real income with prices held fixed
   c. The income effect of a price change is always positive
   d. The substitution effect of a price change can be of either sign
   e. Both b and c are correct

10. Why do some firms have lower long run costs?
    a. problems motivating workers
    b. a good location
    c. unique skills
    d. all of the above
    e. b and c above

For questions 11, 12, and 13 consider the following data on berets and scarves in France and China where the data is production per time period. Assume that the production possibility frontier is linear. With no scarf production, France can produce 60,000 berets. With 2,000 scarves, France has no beret production, etc.

	Berets	Scarves
France	60,000	0
France	0	2,000
China	125,000	0
China	0	2,500

11. Which of the following statements is true?
    a. France has an absolute advantage in beret production
    b. China has an absolute and comparative advantage in scarf production
    c. France has a comparative advantage in scarf production
    d. France has a comparative advantage in beret production
    e. Both b and d are correct.

12. If each country produced 1,000 scarves and then each used their remaining resources for beret production, what would total beret production be?
    a. 145,000 berets
    b. 105,000 berets
    c. 25,000 berets
    d. 100,000 berets
    e. 80,000 berets

13. If China produced 500 more scarves than in problem 12, and France produced 500 less scarves than in problem 12 and each used their remaining resources for beret production, what would total beret production be?
    a. 100,000 berets
    b. 110,000 berets
    c. 95,000 berets
    d. 115,000 berets
    e. none of the above

Use the following table to answer question 14 where the data in the table gives the cost per unit for each item.

	Coconut Oil	Rice
Philippines	17,500 pesos	4,375 pesos
India	15,000 rupees	6,000 rupees

14. Which of the following is true?
    a. India has an absolute advantage in coconut oil production
    b. The Philippines has an absolute and a comparative advantage in rice production
    c. India has a comparative advantage in coconut oil production
    d. The Philippines has a comparative advantage in coconut oil production

15. For this consumer problem assume the price of good 1 is $p_1 = 7$ and the price of good 2 is $p_2 = 6$. Consumer income is $100. Below is a table of alternative consumption choices of the two goods (q_1 and q_2), the cost of purchasing them, and the marginal utility (MU) they provide. Which is the optimal choice?

q_1	q_2	cost	MU_1	MU_2
14.29	0.00	100.00	0.303	2.116
12.57	2.00	100.00	0.436	0.907
10.86	4.00	100.00	0.527	0.581
10.00	5.00	100.00	0.569	0.487
6.57	9.00	100.00	0.733	0.269
4.00	12.00	100.00	0.883	0.175

a. $q_1 = 12.57$ $q_2 = 2$
b. $q_1 = 10.00$ $q_2 = 5$
c. $q_1 = 10.86$, $q_2 = 4$
d. $q_1 = 6.57$ $q_2 = 9$
e. $q_1 = 4.00$ $q_2 = 12$

16. What is the elasticity of demand (mid-point formula) for a demand curve given by $Q^D = 100 - 4P$ as price goes from $23 to $22?
a. -16/9
b. -225
c. -9
d. -15.666
e. -6.143

Use the following table for questions 17 and 18. The table shows data for a specific firm. Y denotes output, FC denotes fixed cost, VC denotes variable cost, C represents total cost, AFC is average fixed cost, AVC is average variable cost, ATC is average total cost, and MC is marginal cost. TR is total revenue, and MR is marginal revenue.

Y	FC	VC	C	AFC	AVC	ATC	MC	Price	TR	MR
0.00	40.00	0.00	40.00				40.00	40	0	40
1.00	40.00	35.40	75.40	40.00	35.40	75.40	31.20	38	38	36
2.00	40.00	63.20	103.20	20.00	31.60	51.60	24.80	36	72	32
4.00	40.00	105.60	145.60	10.00	26.40	36.40	19.20	32	128	24
5.00	40.00	125.00	165.00	8.00	25.00	33.00	20.00	30	150	20
6.00	40.00	146.40	186.40	6.67	24.40	31.07	23.20	28	168	16
7.00	40.00	172.20	212.20	5.71	24.60	30.31	28.80	26	182	12

17. If this firm is a price setter, how much should it produce in the short run?
a. 0
b. 2
c. 4
d. 5
e. 6

18. If this firm is a price setter, how much should it produce in the long run?
a. 0
b. 2
c. 4
d. 5
e. 6

The following table is for use with questions 19-21. The underlying production function is

$$y = 60x_1 + 20x_2 - 2x_1^2 + x_1x_2 - x_2^2$$

The price of x_1 is \$50 and the price of x_2 is \$40. The price of the output of the firm is \$2. The prices of inputs are given by w_1 and w_2. APP_i is the average physical product of the ith input while MPP_i is the marginal physical product of the ith input.

x_1	x_2	w_1	w_2	Output	Cost	APP_1	APP_2	MC	MPP_1	MPP_2
7	2	50	40	372	430	53.143	186.000	1.603	34	23
8	2	50	40	404	480	50.500		1.667	30	24
9	2	50	40	432	530	48.000	216.000	1.729	26	25
10	5	50	40	525	700		105.000	2.000	25	20
8	5	50	40	467	600		93.400	1.817	33	18
9	5	50	40	498	650			1.909	29	19
10	8	50	40	576	820			2.216	28	14
12	8	50	40	624	920	52.000		2.500	20	16
14	11	50	40	701	1140	50.071		3.333	15	12
16	11	50	40	723	1240	45.188	65.727	3.780	7	14
14	14	50	40	728	1260		52.000	3.909	18	6
20	14	50	40	764	1560	38.200	54.571	5.528	-6	12

19. What is the average product of x_2 when $x_1 = 10$ and $x_2 = 8$?
    a. 57.6
    b. 105
    c. 72
    d. 14
    e. none of the above

20. Which of the following is true?
    a. The least cost way to produce 372 units of output is to use 7 units of x_1 and 2 units of x_2
    b. The least cost way to produce 525 units of output is to use 10 units of x_1 and 5 units of x_2
    c. The marginal rate of substitution of x_1 for x_2 when $x_1 = 10$ and $x_2 = 8$ is -1.25
    d. The profit maximizing level of output is 525
    e. Both b and d are correct

21. Which of the following is true?
    a. The least cost way to produce 723 units of output is to use 16 units of x_1 and 11 units of x_2
    b. The marginal rate of substitution of x_1 for x_2 when $x_1 = 10$ and $x_2 = 5$ is -1.25
    c. Increasing x_1 from 14 to 20 when x_2 is equal to 14 will increase profits
    d. If the price of both inputs is doubled, the least cost way to produce 525 units of output is to use 10 units of x_1 and 5 units of x_2
    e. Both a and d are correct

For questions 22-23 consider the following perfectly competitive industry which produces walking shoes. The market demand in the industry is given by a linear demand function $Q^D = 500 - 2P$ where Q^D is the demand for pairs of walking shoes. The inverse demand is $P = 250 - \frac{1}{2} Q$. There are 7 identical manufacturers of walking shoes. Each manufacturer has the same production costs and there is only one size of plant for all firms. The long-run total and marginal cost functions are:

$TC(q) = 484 + 8q + q^2$
$MC(q) = 8 + 2q$.

22. In a short run market equilibrium, how many pairs of walking shoes will each firm produce?
    a. 27
    b. 44
    c. 22
    d. 96.8
    e. 100

23. Which of the following statements is true?
    a. In the long run there will be 7 firms in this industry
    b. In the long there will be 20 firms in this industry
    c. In the long there will be 18 firms in this industry
    d. If there are 4 firms in this industry, industry price will be $100
    e. Both c and d are correct

24. Consider a firm with the following cost function.

$$cost(y) = 18 + 6y + 0.5y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 6 + y$$

Average cost reaches its minimum at the point where it is equal to marginal cost. In the short run $10 of the fixed costs are sunk, so $8 of the fixed costs are avoidable. Average avoidable cost also reaches its minimum at the point where it is equal to marginal cost.

From a long-run perspective, what is the level of y at which average cost is minimized.

    a. 3
    b. 6
    c. 9
    d. 2
    e. 8

25. Consider a firm with the following cost function.

$$cost(y) = 16 + 6y + y^2$$

Assume that in the long run, all costs are avoidable. Marginal cost is given by

$$MC(y) = 6 + 2y$$

In the short run $12 of the fixed costs are sunk, so $4 of the fixed costs are avoidable. Average avoidable cost reaches its minimum at the point where it is equal to marginal cost.

From a short run perspective, what is the level of y at which average avoidable cost is minimized.

a. 2
b. 3
c. 4
d. 5
e. 7

26. What is the industry supply function for an industry made up of the firms in questions 24 and 25 in the short run?
    a. $y = 0$ if $p \le 10$, $y = 3/2p - 9$ if $p \ge 10$
    b. $y = 0$ if $p \le 12$, $y = p - 6$ if $12 \le p \le 14$, $y = 3/2p - 9$ if $p \ge 14$
    c. $y = 0$ if $p \le 10$, $y = \frac{1}{2}p - 3$ if $p \ge 10$
    d. $y = 0$ if $p \le 12$, $y = p - 6$ if $p \ge 12$
    e. $y = 0$ if $p \le 14$, $y = 3/2p - 9$ if $p \ge 14$

27. Assume that industry demand is given by $Q^D = 21 - p$. What will be the long run equilibrium price in this industry (questions 24 and 25) assuming the firms always behave competitively?
    a. $10
    b. $12
    c. $13
    d. $13.5
    e. $14

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Question	Correct Answer	# Right	Question	Correct Answer	# Right
1	b		14	c	
2	c		15	b	
3	d		16	c	
4	e		17	d	
5	e		18	a	
6	e		19	c	
7	d		20	e	
8	a		21	d	
9	b		22	b	
10	e		23	c	
11	c		24	b	
12	b		25	a	
13	c		26	a	
			27	d	