Chapter 7 Practice

Multiple Choice

1. Suppose you are a star basketball player at a major university in your sophomore year. You are sought after by several NBA teams. Which of the following choices best characterizes your opportunity cost if you choose to drop out of college and enter the NBA?
   A) The value of your college scholarship that you have given up.
   B) The skills that two more years of playing at your college would have given you along with their additional value over the rest of your life, in addition to the educational value of the college degree.
   C) The total of explicit costs that have been incurred in the past.
   D) The total of implicit costs that have been incurred in the past.

2. You have invested about $100,000 in a new (hopefully) trendy restaurant in an urban location. These costs have gone to purchase the restaurant, prepay insurance for the following year, and purchase supplies for the restaurant. It will cost you an additional $10,000 per year to hire each waiter and waitress. (They earn tips which they get to keep.) Which of the following statements is most accurate?
   A) The $100,000 sum represents sunk costs, whereas the costs for waiters and waitresses is not sunk, but all of these costs would be considered accounting costs and
   do not include all of the possible economic costs of operating the business.
   B) The $100,000 sum represents sunk costs, whereas the costs for waiters and waitresses is not sunk, but all of these costs would be considered accounting costs, and also include all of the possible economic costs of operating the business
   C) The $100,000 sum represents sunk costs and the costs for waiters and waitresses are sunk as well.
   D) The $100,000 sum represents sunk costs and all of the possible accounting costs as well.

3. Sunk costs do not:
   A) matter.
   B) affect business shutdown decisions.
   C) affect business start-up decisions.
   D) cost as much as marginal costs.

4. You decide to purchase a car for $12,000. Upon driving the car off of the lot, the resale value of the car falls to $9,000. After purchasing the car, the $12,000 purchase price represents a(n):
   A) average cost.
   B) implicit cost.
   C) sunk cost.
   D) nonsunk cost.

5. Opportunity cost for a firm is:
   A) Costs that involve a direct monetary outlay
   B) The sum of the firm's implicit costs
   C) The total of explicit costs that have been incurred in the past
   D) The value of the next best alternative that is forgone when another alternative is chosen

6. You decide to purchase a new car for $12,000. Upon driving the car off of the lot, the resale value of the car falls to $9,000. The opportunity cost of purchasing the car is _____ and the opportunity cost of using the car is _____.
   A) $12,000 and $9,000
   B) $12,000 and $3,000
   C) Unknown and $9,000
   D) Unknown and $3,000

7. Economic costs:
   A) are the same as accounting costs.
   B) are the same as implicit costs.
   C) are the same as opportunity costs.
   D) are the same as the sum of all past explicit costs.

8. The short-run is:
   A) a time period in which all input levels are fixed.
   B) a time period in which at least one input level is fixed.
   C) three months.
   D) a time period in which no input levels are fixed.

9. The cost-minimization problem of the firm is to:
   A) minimize total costs.
   B) minimize average costs.
   C) minimize total cost of producing a particular amount of output.
   D) maximize output subject to a cost constraint.

10. Isocost lines represent:
    A) the same value for every firm in the industry.
    B) are the same as implicit costs.
    C) the same total expenditure on the inputs to the production process.
    D) the sum of all past explicit costs

11. When isocost lines shift outward from the origin, it represents:
    A) increasing levels of expenditure on the inputs to the production process.
    B) increasing sunk costs
    C) increasing opportunity costs
    D) decreasing levels of expenditure on the inputs to the production process.

12. An isocost line represents:
    A) all combinations of inputs in which the firm produces the same level of output.
    B) all combinations of inputs in which the firm has the same level of total cost.
    C) for a given level of output, the various points that will produce that same level of output at the same cost.
    D) all combinations of output that yield the same total cost level.

13. The cost-minimization problem of the firm is to:
    A) maximize output subject to a given cost constraint.
    B) minimize total cost.
    C) minimize average cost.
    D) minimize total cost of producing a particular level of output.

14. The long-run is:
    A) a time period in which all input levels are fixed.
    B) a time period in which at least one input level is fixed.
    C) one year.
    D) a time period in which no input levels are fixed.

15. When the level of capital is plotted on the vertical axis and the level of labor is plotted on the horizontal axis, the slope of the isocost line is (assuming w is the price of labor and r is the price of capital and production uses only these two inputs):
    A) $-w/r$
    B) $-r/w$
    C) MP_K/MP_L
    D) MP_L/MP_K

16. To derive the equation for an isocost line when the level of capital is plotted on the vertical axis and the level of labor is plotted on the horizontal axis, you should:
     A) solve the production function for K.
     B) solve the production function for L.
     C) solve the total cost equation for K.
     D) solve the total cost equation for L.

17. Let a firm use labor *(L)* and capital *(K)* as its only inputs to produce an output, Q. The cost of labor is $w = \$5$ per labor hour and the cost of capital is $r = \$15$ per machine hour. When capital is measured on the vertical axis and labor on the horizontal axis, what is the slope of an isocost line for this firm?
     A) *-3*.
     B) *-5*.
     C) *-15*.
     D) *-1/3*.

18. A firm uses labor and capital, (L,K), to produce an output. The hourly cost of labor is $10, and the hourly cost of capital is $50. Which of the following combinations of labor and capital hours of use represent points on the firm's $100,000 isocost line?
     A) (10000, 2000)
     B) (2000, 10000)
     C) (1000, 1800)
     D) (1000, 1000)

19. In order to solve graphically for an interior cost minimum of the firm, subject to the constraint of producing a particular target level of output, we:
     A) shift in the isocost line as much as possible.
     B) shift out the isoquant as much as possible.
     C) shift the isocost line left as much as possible subject to the constraint that it touches the target isoquant at least once.
     D) shift the isoquant left as much as possible subject to the constraint that it touches the target isocost at least once.

20. Which of the following statements correctly characterizes the solution to a cost minimization problem with an interior solution?
     A) The isoquant is tangent to the isocost line.
     B) The isoquant lies to the interior of the isocost line.
     C) The isocost line lies to the interior of the isoquant.
     D) The distance between the isoquant and the isocost line is maximized.

21. When a firm uses inputs in a fixed proportion, the cost minimizing combination of capital and labor
    A) occurs when the firm uses either all workers or all machines.
    B) occurs when the firm uses equal amounts of workers and machines.
    C) occurs where the ratio of the marginal productivities equals the ratio of the input prices.
    D) occurs at the corner point on the isoquant.

22. Suppose that a firm uses only two inputs in its production process. The ratio of the marginal products of these inputs always exceeds the ratio of the prices of the inputs. What can you say about the cost-minimizing point of the firm?
    A) It is an interior solution.
    B) A cost-minimizing point must not exist.
    C) If a cost-minimizing point exists, it must be at a corner.
    D) Costs must be negative at the cost-minimizing point.

23. Suppose for a particular production function that
$$MP_L = 36\left(\frac{K}{L}\right) \quad MP_K = 36\left(\frac{L}{K}\right)$$
If the price of capital is $5 per unit and the price of labor is $125 per unit, at the cost-minimizing combination of capital and labor the firm should employ:
    A) five times as much labor as capital.
    B) five times as much capital as labor.
    C) 125/36 units of capital and 5/36 units of labor.
    D) 36/125 units of capital and 36/5 units of labor.

24. Suppose in a particular production process that capital and labor are perfect substitutes so that three units of labor are equivalent to one unit of capital. If the price of capital is $4 per unit and the price of labor is $1 per unit, the firm should:
    A) employ capital only.
    B) employ labor only.
    C) use three times as much capital as labor.
    D) use three times as much labor as capital.

25. A firm's production function is given by $Q = KL$. The wage rate of labor is $w = 10 and the rental rate of capital is $r = 20. The firm wants to produce 1,800 units of output. What is the most efficient combination of labor and capital (L, K)?
    A) $(10, 20)$
    B) $(20, 90)$
    C) $(60, 30)$
    D) $(90, 20)$

26. A firm's production function is given by $Q = KL$. The wage rate of labor is $w = \$10$ and the rental rate of capital is $r = \$20$. The firm wants to produce 1,800 units of output in the most efficient way possible. How much does the firm spend?
    A) $2,000
    B) $1,300
    C) $1,200
    D) $1,100

27. A firm's production function is given by $Q = KL$. The wage rate of labor is $w = \$10$ and the rental rate of capital is $r = \$20$. What is the most efficient combination of labor and capital (L, K) that also yields a cost of exactly $1000?
    A) $(10, 45)$
    B) $(25, 50)$
    C) $(50, 25)$
    D) $(20, 40)$

28. A firm's production function is given by $Q = KL$. The wage rate of labor is $w = \$10$ and the rental rate of capital is $r = \$20$. The firm spends exactly $1000 in the most efficient way possible. How much output can the firm produce?
    A) 450
    B) 800
    C) 1000
    D) 1250

29. A firm's production function is given by $Q = K^2 L$. Further, the wage rate is $w = \$10$ and the rental rate of capital is $r = \$20$. What is the most efficient combination of labor and capital (L, K) that also results in a total cost level of exactly $1,200?
    A) $(20, 50)$
    B) $(25, 47.5)$
    C) $(30, 45)$
    D) $(40, 40)$

30. A firm's production function is given by $Q = K^2 L$. Further, the wage rate is $w = \$10$ and the rental rate of capital is $r = \$20$. Suppose that the firm spends exactly $1200 in the most efficient way possible. How much output can the firm produce?
    A) 50,000
    B) 56,406.25
    C) 60,750
    D) 64,000

31. A firm has a Cobb-Douglas production function for its inputs of capital and labor. The firm is currently paying $10 per labor hour and $5 per machine hour. The firm is currently at an efficient production level, employing an equal number of machines and workers. What can we infer about the marginal productivities of capital and labor at this point?

   A) $MP_K = MP_L$
   B) $MP_K = 2MP_L$
   C) $MP_L = 2MP_K$
   D) $MP_L = .5MP_K$

32. Let a firm use labor *(L)* and capital *(K)* as its only inputs to produce an output, Q. The cost of labor is $w = \$5$ per labor hour and the cost of capital is $r = \$15$ per machine hour. What is the equation of the 1.5-million isocost line?

   A) *1.5m = L + K*.
   B) *1.5m = 5L + 15K*.
   C) *1.5m = (5L)(15K)*.
   D) *1.5m = (5L + 15K)Q*.

33. The "equal bang per buck" condition refers to the firm equating:
   A) marginal revenue with marginal cost.
   B) the marginal productivity of the last dollar spent on labor with the marginal productivity of the last dollar spent on capital.
   C) the marginal productivity of capital with the marginal productivity of labor.
   D) the cost of capital with the cost of labor.

34. A firm uses capital and labor to produce an output. The absolute value of the slope of the isocost line equals:
   A) the ratio of the marginal productivities of the inputs.
   B) the ratio of the output prices.
   C) the ratio of the input prices.
   D) the ratio of capital to labor.

35. A firm's production function is given by $Q = K^2L$. Further, the wage rate is $w = \$10$ and the rental rate of capital is $r = \$20$. Suppose the firm wants to produce 27,000 units of output. What is the most efficient combination of labor and capital (L, K)?

   A) $(20, 20)$
   B) $(30, 30)$
   C) $(30, 90)$
   D) $(90, 30)$

36. A firm's production function is given by $Q = K^2 L$. Further, the wage rate is $w = \$10$ and the rental rate of capital is $r = \$20$. Suppose that the firm wants to produce 27,000 units of output in the most efficient way possible. How much does the firm spend?
    A) $600
    B) $900
    C) $1,500
    D) $2,100

37. Suppose capital and labor are perfect complements for a particular production process. If the price of labor increases, holding the price of capital and the level of output constant, the firm should:
    A) use more capital and less labor.
    B) use more labor and less capital.
    C) use the same amounts of capital and labor.
    D) eliminate all use of labor.

38. Suppose capital and labor are perfect substitutes for a particular production process. If the price of labor increases, holding the price of capital and the level of output constant, the firm may:
    A) use more capital and less labor.
    B) use more labor and less capital.
    C) use the same amounts of capital and labor.
    D) Either use more capital and less labor or use the same amounts of both inputs.

39. Suppose that capital and labor are perfect complements in a one-to-one ratio in a firm's production function. The firm is currently at an efficient production level, employing an equal number of machines and workers. Suppose the cost of labor were to double and the cost of capital were to fall by half. If the firm wanted to produce the previous level of output, the firm would hire:
    A) more labor and less capital.
    B) less labor and more capital.
    C) the same amounts of labor and capital.
    D) twice as much labor as capital.

40. Suppose that a firm uses only capital, K, and labor, L, in its production process. At the firm's current long-run combination of capital and labor, it uses positive amounts of both inputs and measures the marginal products as $MP_K = 15$ and $MP_L = 10$. The rental rate of capital is $r = 6$ and the current wage rate for labor is $w = 3$. The firm:
    A) is currently minimizing total cost in the long run.
    B) could lower cost by increasing the usage of capital and decreasing the usage of labor.
    C) could lower cost by increasing the usage of labor and decreasing the usage of capital.
    D) cannot lower cost without also lowering the level of output.

41. The expansion path graphs:
    A) the combinations of capital and labor that minimize total cost for various levels of output.
    B) the combinations of capital and labor that have the same total cost for various levels of output.
    C) the combinations of capital and labor that have the same level of output.
    D) how the firm can expand output while holding total cost constant.

42. An increase in the quantity of output will cause the cost minimizing quantity of an input to go _____ if the input is a normal input and will cause the cost minimizing quantity of the input to go _____ if the input is an inferior input.
    A) up; up
    B) up; down
    C) down; up
    D) down; down

43. For a production process with ten inputs, how many inputs could be inferior inputs?
    A) 5
    B) 0
    C) 9
    D) 10

44. An input demand curve represents:
    A) how the cost-minimizing amount of input varies with the level of output.
    B) how the cost-minimizing output varies with an input's price.
    C) how the cost minimizing amount of input changes with the input's price.
    D) how the cost minimizing output varies with the output price.

45. A curve that shows how the firm's cost-minimizing quantity of capital varies with the price of capital is the firm's:
    A) price-expansion curve.
    B) labor demand curve.
    C) capital demand curve.
    D) elasticity of demand curve.

46. Suppose that a firm's production function of output Q is a function of only two inputs, labor *(L)* and capital *(K)* and can be written $Q = 25LK$. Letting the wage rate for labor be w and the rental rate of capital be r, the equation for the firm's demand for labor would be:

A) $L = \sqrt{\dfrac{wQ}{25r}}$

B) $L = \sqrt{\dfrac{25r}{wQ}}$

C) $L = \sqrt{\dfrac{rQ}{25w}}$

D) $L = \sqrt{\dfrac{25w}{rQ}}$

47. Suppose that a firm's production function of output Q is a function of only two inputs, labor *(L)* and capital *(K)* and can be written $Q = 25LK$. Let the wage rate for labor be $w = 1$ and the rental rate of capital be $r = 1$. If the firm produces 100 units of output, how many units of labor will it use?

A) 1
B) 2
C) 3
D) 4

48. When the elasticity of substitution between capital and labor is low:

A) labor demand will be price elastic.
B) labor demand will be price inelastic.
C) the capital-labor ratio will be low.
D) the labor demand curve will be a flat line.

49. A high elasticity of substitution between capital and labor implies that labor demand will be:

A) price elastic.
B) unitary price elastic.
C) price inelastic.
D) more inelastic than capital demand.

50. Suppose that a firm has a Cobb-Douglas production function for its inputs of capital and labor. The firm is currently paying $10 per labor hour and $5 per machine hour. The firm is currently at an efficient production level, employing an equal number of machines and workers. Suppose the cost of labor were to double and the cost of capital were to fall by half. If the firm wanted to produce the previous level of output for the previous cost, the firm would hire:
   A) more labor and less capital.
   B) less labor and more capital.
   C) equal amounts of labor and capital.
   D) twice as much labor as capital.

51. Consider a production process with two inputs and assume the level of one of the inputs is fixed in the short run. To determine the optimal level of the variable input you should:
   A) solve the total cost equation for the level of the variable input.
   B) solve the total cost equation for the level of the fixed input and substitute that into the production function.
   C) solve the production function for the level of the fixed input.
   D) solve the production function for the level of the variable input.

52. A firm's production process uses labor, L, and capital, K, to produce an output, Q according to the function $Q = 25KL$. Let labor be fixed at level $L = \bar{L}$. What is the cost minimizing level of capital that the firm must use to produce a target level of output, $Q = \bar{Q}$?

   A) $K = \dfrac{\bar{L}}{25Q}$

   B) $K = 25\bar{L}Q$

   C) $K = \dfrac{\bar{Q}}{25\bar{L}}$

   D) $K = \dfrac{Q^2}{2500\bar{L}}$

53. A firm's production process uses labor, L, and capital, K, and materials, M, to produce an output, Q according to the function $Q = KLM$. The wage rate for labor is $w = 2$, the rental rate of capital is $r = 1$, and the cost of materials is $m = 4$ per unit. What is the long run cost-minimizing level of capital that the firm must use to produce a target level of output, $Q = 1000$?
   A) $K = 5$
   B) $K = 10$
   C) $K = 20$
   D) $K = 40$

54. A firm's production process uses labor, L, and capital, K, and materials, M, to produce an output, Q according to the function $Q = KLM$. The wage rate for labor is $w = 2$, the rental rate of capital is $r = 1$, and the cost of materials is $m = 4$ per unit. Let materials input be fixed now at $M = 2$. What is the cost minimizing level of capital that the firm must use to produce a target level of output, $Q = 1600$?

    A) $K = 5$
    B) $K = 10$
    C) $K = 20$
    D) $K = 40$

True/False

55. The short-run is a time period in which all input levels are fixed.

56. The short-run is a time period in which at least one input level is fixed.

57. The short-run is one month or less.

58. The short-run is three months or less.

59. The short-run is a time period in which no input levels are fixed
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60. The long-run is a time period in which all input levels are fixed.

61. The long-run is a time period in which at least one input level is fixed.

62. The long-run is one year or longer.

63. The long-run is a time period in which no input levels are fixed.

64. The long-run is more than three months.

65. The isoquant is tangent to the isocost line characterizes the solution to a cost minimization problem with an interior solution

66. The isoquant lies to the interior of the isocost line characterizes the solution to a cost minimization problem with an interior solution

67. The isocost line lies to the interior of the isoquant characterizes the solution to a cost minimization problem with an interior solution

68. The expansion path graphs the combinations of capital and labor that minimize total cost for various levels of output.

69. The expansion path graphs the combinations of capital and labor that have the same total cost for various levels of output.

70. The expansion path graphs the combinations of capital and labor that have the same level of output.

71. The expansion path graphs how the firm can expand output while holding total cost constant.

72. All fixed costs are sunk costs.

73. All sunk costs are fixed costs.

74. A firm decides to purchase a computer for $1,500 at the beginning of the month. The computer will be used for administrative purposes that do not vary with the volume of product that the firm makes. The computer has no re-sale value. This is a fixed cost. At the end of the month, this cost is sunk.

Answers

Multiple Choice

1. B
2. A
3. B
4. C
5. D
6. A
7. C
8. B
9. C
10. C
11. A
12. B
13. D
14. D
15. A
16. C
17. D
18. C
19. C
20. A
21. D
22. C
23. B
24. B
25. C
26. C
27. C
28. D
29. D
30. D
31. C
32. B
33. B
34. C
35. B
36. B
37. C
38. D
39. C
40. C
41. A
42. B
43. C
44. C
45. C
46. C
47. B
48. B
49. A
50. B
51. D
52. C
53. C
54. D

True and False

55. False
56. True
57. False
58. False
59. False
60. False
61. False
62. False
63. True
64. False
65. True
66. False
67. False
68. True
69. False
70. False
71. False
72. False
73. True
74. True