Chapter 13—The Costs of Production

MULTIPLE CHOICE

1. Economists normally assume that the goal of a firm is to
   (i) make profit as large as possible even if it means reducing output.
   (ii) make profit as large as possible even if it means incurring a higher total cost.
   (iii) make revenue as large as possible.

   a. (i) and (ii)
   b. (i) and (iii)
   c. (ii) and (iii)
   d. None of the above are correct.

   ANS: A DIF: Average REF: 272

2. Total revenue equals
   a. total output multiplied by price per unit of output.
   b. total output divided by profit.
   c. (total output multiplied by sales price) - inventory surplus.
   d. (total output multiplied by sales price) - inventory shortage.

   ANS: A DIF: Easy REF: 272

3. XYZ corporation produced 300 units of output but sold only 275 of the units it produced. The average cost of production for each unit of output produced was $100. Each of the 275 units sold was sold for a price of $95. Total revenue for the XYZ corporation would be
   a. -$3,875.
   b. $26,125.
   c. $28,500.
   d. $30,000.

   ANS: B DIF: Average REF: 272

4. Which of the following would be categorized as an implicit cost?
   (i) wages of workers
   (ii) raw material costs
   (iii) forgone investment opportunities

   a. (i) and (iii)
   b. (iii) only
   c. (ii) and (iii)
   d. All of the above are correct.

   ANS: D DIF: Average REF: 273

5. An example of an explicit cost of production would be
   a. the cost of forgone labour earnings for an entrepreneur.
   b. the lost opportunity to invest in other capital markets when the money is invested in one's business.
   c. the cost of flour for a baker.
   d. None of the above are correct.

   ANS: C DIF: Average REF: 273

6. Which of the following is an implicit cost?
   (i) the owner of a firm forgoing an opportunity to earn a large salary working for a Wall Street brokerage firm
   (ii) interest paid on the firm's debt
   (iii) rent paid by the firm to lease office space

   a. (ii) and (iii)
   b. (i) and (iii)
   c. (i) only
   d. All of the above are correct.

   ANS: C DIF: Average REF: 273

7. An example of an implicit cost of production would be
   a. the income an entrepreneur could have earned working for someone else.
   b. the cost of raw materials for producing bread in a bakery.
   c. the cost of a delivery truck in a business that rarely makes deliveries.
   d. All of the above are correct.

   ANS: A DIF: Average REF: 273

8. John owns a shoe-shine business. His accountant most likely includes which of the following costs on his financial statements?
   a. wages John could earn washing windows
   b. dividends John's money was earning in the stock market before John sold his stock and bought a shoe-shine booth
   c. the cost of shoe polish
   d. All of the above are correct.

   ANS: C DIF: Average REF: 274

   Scenario 13-1
   Joe wants to start his own business. The business he wants to start will require that he purchase a factory that costs $300,000. To finance this purchase, he will use $100,000 of his own money, on which he has been earning 10 percent interest. In addition, he will borrow $200,000, and he will pay 12 percent interest on that loan.

9. **Refer to Scenario 13-1**. For the first year of operation, what is the explicit cost of purchasing the factory?
   a. $12,000
   b. $20,000
   c. $24,000
   d. $44,000

   ANS: C DIF: Average REF: 273

10. **Refer to Scenario 13-1**. For the first year of operation, what is the opportunity cost of purchasing the factory?
    a. $10,000
    b. $20,000
    c. $24,000
    d. $34,000

    ANS: D DIF: Average REF: 273

11. Economic profit
    a. will never exceed accounting profit.
    b. is most often equal to accounting profit.
    c. is always at least as large as accounting profit.
    d. is a less complete measure of profitability than accounting profit.

    ANS: A DIF: Average REF: 274

Scenario 13-3
Tony is a wheat farmer, but he also spends part of his day teaching guitar lessons. Due to the popularity of his local country western band, Farmer Tony has more students requesting lessons than he has time for if he is to also maintain his farming business. Farmer Tony charges $25 an hour for his guitar lessons. One spring day, he spends 10 hours in his fields planting $130 worth of seeds on his farm. He expects that the seeds he planted will yield $300 worth of wheat.

12. **Refer to Scenario 13-3**. What is the total opportunity cost of the day that Farmer Tony incurred for his spring day in the field planting wheat?
    a. $130
    b. $250
    c. $300
    d. $380

    ANS: D DIF: Average REF: 274

13. **Refer to Scenario 13-3**. Tony's accountant would most likely figure the total cost of his wheat planting to equal
    a. $25.
    b. $130.
    c. $300.
    d. $380.

    ANS: B DIF: Average REF: 274

14. **Refer to Scenario 13-3**. Tony's accounting profit equals
    a. $-80.
    b. $130.
    c. $170.
    d. $260.

    ANS: C DIF: Average REF: 274

15. **Refer to Scenario 13-3**. Tony's economic profit equals
    a. $-130.
    b. $-80.
    c. $130.
    d. $170.

    ANS: B DIF: Average REF: 274

16. The marginal product of labour is equal to the
    a. incremental cost associated with a one unit increase in labour.
    b. incremental profit associated with a one unit increase in labour.
    c. increase in labour necessary to generate a one unit increase in output.
    d. increase in output obtained from a one unit increase in labour.

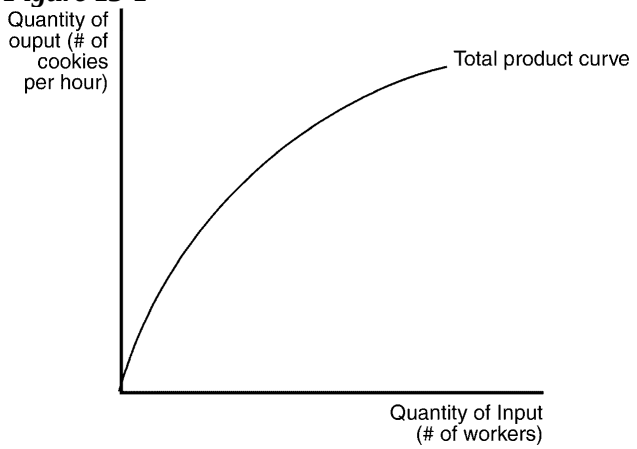
ANS: D DIF: Easy REF: 275

17. One would expect to observe diminishing marginal product of labour when
    a. crowded office space reduces the productivity of new workers.
    b. workers are discouraged about the lack of help from other workers.
    c. only new workers are trained in using the most productive capital.
    d. union workers are told to reduce their work effort in preparation for a new round of collective bargaining talks.

    ANS: A DIF: Average REF: 276

The figure below depicts a production function for a firm that produces cookies. Use the figure to answer the following questions.

Figure 13-1



18. **Refer to Figure 13-1**. As the number of workers increases,
    a. total output increases, but at a decreasing rate.
    b. marginal product increases, but at a decreasing rate.
    c. marginal product increases at an increasing rate.
    d. total output decreases.

    ANS: A DIF: Average REF: 278

19. **Refer to Figure 13-1**. With regard to cookie production, the figure implies
    a. diminishing marginal product of workers.
    b. diminishing marginal cost of cookie production.
    c. decreasing cost of cookie production.
    d. increasing marginal product of workers.

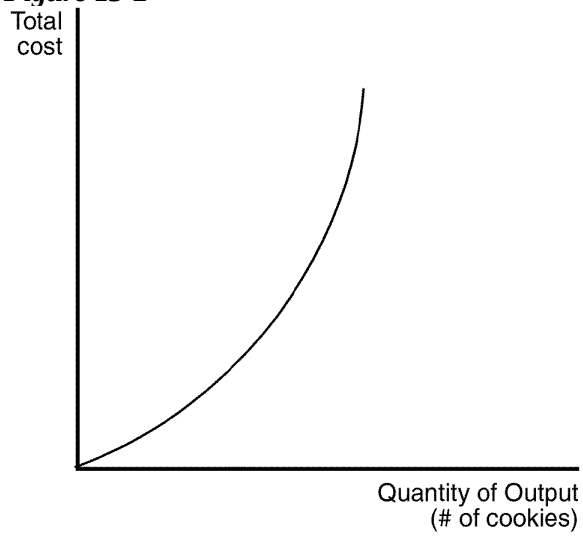
    ANS: A DIF: Average REF: 278

20. Which of the following statements about a production function is correct for a firm that uses labour to produce output?
    a. The production function depicts the relationship between the quantity of labour and the quantity of output.
    b. The slope of the production function measures marginal cost.
    c. The quantity of output is measured along the horizontal axis.
    d. All of the above are correct.

    ANS: A DIF: Average REF: 278

The figure below depicts a total cost function for a firm that produces cookies. Use the figure to answer the following questions.

Figure 13-2



21. **Refer to Figure 13-2.** Which of the following is true of the production function (not pictured) that underlies this total cost function?
    (i) Total output increases as the quantity of inputs increases, but at a decreasing rate.
    (ii) Marginal product is diminishing for all levels of input usage.
    (iii) The slope of the production function decreases as the quantity of inputs increases.

    a. (i) only
    b. (ii) and (iii)
    c. (i) and (iii)
    d. All of the above are correct.

    ANS: D DIF: Challenging REF: 278

22. **Refer to Figure 13-2**. The changing slope of the total cost curve reflects
    a. decreasing average variable cost.
    b. decreasing average total cost.
    c. decreasing marginal product.
    d. increasing fixed cost.

    ANS: C DIF: Average REF: 279

23. **Refer to Figure 13-2**. Which of the following statements best captures the nature of the underlying production function?
    a. Output increases at a decreasing rate with additional units of input.
    b. Output increases at an increasing rate with additional units of input.
    c. Output decreases at a decreasing rate with additional units of input.
    d. Output decreases at an increasing rate with additional units of input.

    ANS: A DIF: Average REF: 278

24. **Refer to Figure 13-2**. Which of the statements below is most consistent with the shape of the total cost curve?
    a. Producing an additional cookie is always more costly than producing the previous cookie.
    b. Total production of cookies decreases with additional units of input.

c. Producing additional cookies is equally costly, regardless of how many cookies are already being produced.
d. Producing additional cookies becomes increasingly costly only when the number of cookies already being produced is large.

ANS: A DIF: Average REF: 279

25. Which of these assumptions is often realistic for a firm in the short run?
a. The firm can vary both the size of its factory and the number of workers it employs.
b. The firm can vary the size of its factory, but not the number of workers it employs.
c. The firm can vary the number of workers it employs, but not the size of its factory.
d. The firm can vary neither the size of its factory nor the number of workers it employs.

ANS: C DIF: Easy REF: 278

26. Assume a certain firm regards the number of workers it employs as variable, and that it regards the size of its factory as fixed. This assumption is often realistic
a. in the short run, but not in the long run.
b. in the long run, but not in the short run.
c. both in the short run and in the long run.
d. neither in the short run nor in the long run.

ANS: A DIF: Easy REF: 278

27. The marginal product of an input in the production process is the increase in
a. total revenue obtained from an additional unit of that input.
b. profit obtained from an additional unit of that input.
c. total revenue obtained from an additional unit of that input.
d. quantity of output obtained from an additional unit of that input.

ANS: D DIF: Easy REF: 278

28. When a firm's only variable input is labour, then the slope of the production function measures the
a. quantity of labour.
b. quantity of output.
c. total cost.
d. marginal product of labour.

ANS: D DIF: Easy REF: 278

29. Let L represent the number of workers hired by a firm and let Q represent that firm's quantity of output. Assume two points on the firm's production function are (L = 12, Q = 122) and (L = 13, Q = 130). Then the marginal product of the 13th worker is
a. 8 units of output.
b. 10 units of output.
c. 122 units of output.
d. 130 units of output.

ANS: A DIF: Average REF: 278

30. On a 100-acre farm, a farmer is able to produce 3,000 bushels of wheat when he hires 2 workers. He is able to produce 4,400 bushels of wheat when he hires 3 workers. Which of the following possibilities is consistent with the property of diminishing marginal product?
a. The farmer is able to produce 5,600 bushels of wheat when he hires 4 workers.
b. The farmer is able to produce 5,800 bushels of wheat when he hires 4 workers.
c. The farmer is able to produce 6,000 bushels of wheat when he hires 4 workers.

d. All of the above are correct.

ANS: A DIF: Average REF: 278

31. An example of a fixed cost would be
(i) raw materials supplied at a government -regulated price.
(ii) rent paid on a factory.
(iii) machine maintenance.

a. (ii) only
b. (i) and (ii)
c. (ii) and (iii)
d. All of the above are correct.

ANS: B DIF: Average REF: 279

32. Suppose Jan is starting up a small lemonade stand business. Variable costs for Jan's lemonade stand would include the cost of
a. building the lemonade stand.
b. hiring an artist to design a logo for her sign.
c. lemonade mix.
d. All of the above are correct.

ANS: C DIF: Average REF: 279

33. One assumption that distinguishes short-run cost analysis from long-run cost analysis for a profit-maximizing firm is that in the short run,
a. output is not variable.
b. the number of workers used to produce the firm's product is fixed.
c. the size of the factory is fixed.
d. there are no fixed costs.

ANS: C DIF: Average REF: 279

34. Average total cost tells us the
a. total cost of the first unit of output, if total cost is divided evenly over all the units produced.
b. cost of a typical unit of output, if total cost is divided evenly over all the units produced.
c. cost of the last unit of output, if total cost does not include a fixed cost component.
d. variable cost of a firm that is producing at least one unit of output.

ANS: B DIF: Average REF: 282

35. Marginal cost tells us the
a. value of all resources used in a production process.
b. marginal increment to profitability when price is constant.
c. amount by which total cost rises when output is increased by one unit.
d. amount by which output rises when labour is increased by one unit.

ANS: C DIF: Average REF: 282

Scenario 13-4
For the following questions, assume that a given firm experiences decreasing marginal product of labour with the addition of each worker regardless of the current output level.

36. **Refer to Scenario 13-4.** Average total cost will be

a. always rising.
b. always falling.
c. constant.
d. U-shaped.

ANS: D DIF: Average REF: 282

37. **Refer to Scenario 13-4**. Average fixed cost will be
a. always rising.
b. always falling.
c. U-shaped.
d. constant.

ANS: B DIF: Average REF: 282

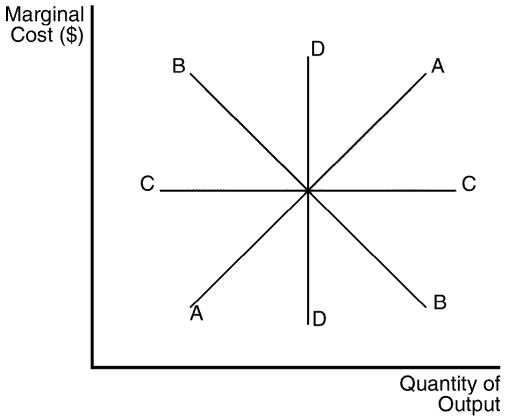
38. **Refer to Scenario 13-4**. Average variable cost will be
a. always rising.
b. always falling.
c. U-shaped.
d. constant.

ANS: A DIF: Average REF: 282

39. **Refer to Scenario 13-4**. Marginal cost will be
a. always rising.
b. always falling.
c. U-shaped.
d. constant.

ANS: A DIF: Average REF: 282

Figure 13-3



40. **Refer to Figure 13-3**. Which of the above marginal cost curves reflects the existence of diminishing marginal product?
a. A
b. B
c. C
d. D

ANS: A DIF: Average REF: 282

41. If marginal cost is rising,

a. average variable cost must be falling.
b. average fixed cost must be rising.
c. marginal product must be falling.
d. marginal product must be rising.

ANS: C DIF: Average REF: 282

42. Average total cost is very high when a small amount of output is produced because
a. average variable cost is high.
b. average fixed cost is high.
c. marginal cost is high.
d. All of the above are correct.

ANS: B DIF: Average REF: 283

43. Total cost necessarily rises due to
(i) rising marginal cost.
(ii) falling marginal cost.
(iii) increasing marginal product.

a. (i) only
b. (i) and (ii)
c. (ii) only
d. None of the above are correct.

ANS: D DIF: Average REF: 283

44. The efficient scale of the firm is the quantity of output that
a. maximizes marginal product.
b. maximizes profit.
c. minimizes average total cost.
d. minimizes average variable cost.

ANS: C DIF: Easy REF: 285

45. When marginal cost is less than average total cost,
a. marginal cost must be falling.
b. average variable cost must be falling.
c. average total cost is falling.
d. average total cost is rising.

ANS: C DIF: Average REF: 284

46. When marginal cost exceeds average total cost,
a. average fixed cost must be rising.
b. average total cost must be rising.
c. average total cost must be falling.
d. marginal cost must be falling.

ANS: B DIF: Average REF: 284

47. Average total cost is increasing whenever
a. total cost is increasing.
b. marginal cost is increasing.
c. marginal cost is less than average total cost.
d. marginal cost is greater than average total cost.

ANS: D DIF: Average REF: 284

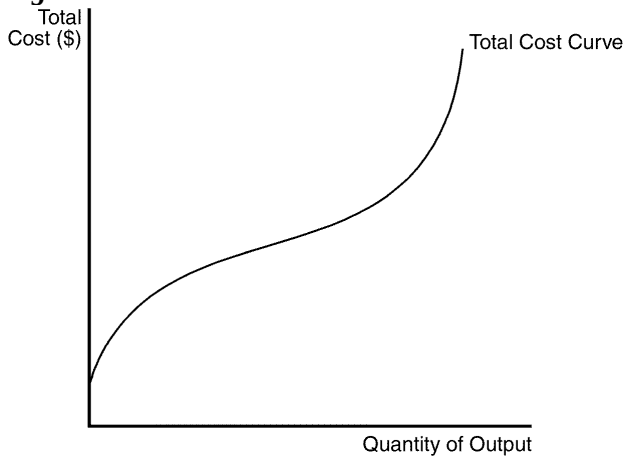
48. Marginal cost is equal to average total cost when
    a. average variable cost is falling.
    b. average fixed cost is rising.
    c. marginal cost is at its minimum.
    d. average total cost is at its minimum.

    ANS: D DIF: Average REF: 284

49. The marginal cost curve crosses the average total cost curve at
    a. the efficient scale.
    b. the minimum point on the average total cost curve.
    c. a point where the marginal cost curve is rising.
    d. All of the above are correct.

    ANS: D DIF: Average REF: 284

Figure 13-4



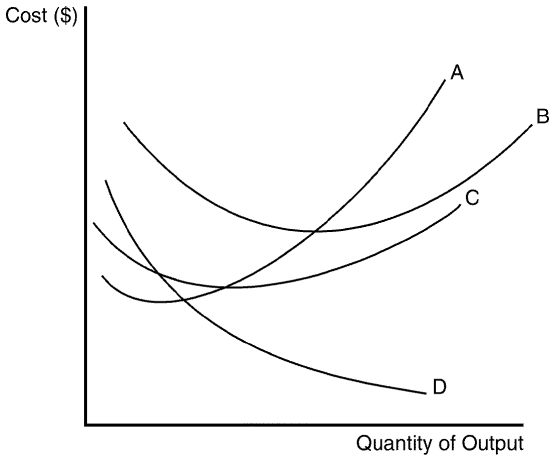
50. **Refer to Figure 13-4**. Which of the following can be inferred from the figure above?
    (i) Marginal cost is increasing at all levels of output.
    (ii) Marginal product is increasing at low levels of output.
    (iii) Marginal product is decreasing at high levels of output.

    a. (i) and (ii)
    b. (ii) and (iii)
    c. (i) and (iii)
    d. All of the above are correct.

    ANS: B DIF: Challenging REF: 284

The curves below reflect information about the cost structure of a firm. Use the figure to answer the following questions.

Figure 13-5



51. **Refer to Figure 13-5**. Which of the curves is most likely to represent average total cost?
    a. A
    b. B
    c. C
    d. D

    ANS: B DIF: Average REF: 283

52. **Refer to Figure 13-5**. Which of the curves is most likely to represent average fixed cost?
    a. A
    b. B
    c. C
    d. D

    ANS: D DIF: Average REF: 283

53. **Refer to Figure 13-5**. Which of the curves is most likely to represent average variable cost?
    a. A
    b. B
    c. C
    d. D

    ANS: C DIF: Average REF: 283

54. **Refer to Figure 13-5**. Which of the curves is most likely to represent marginal cost?
    a. A
    b. B
    c. C
    d. D

    ANS: A DIF: Average REF: 283

55. **Refer to Figure 13-5**. This particular firm is necessarily experiencing increasing marginal product when curve
    a. A is falling.
    b. B is falling.
    c. C is falling.
    d. D is falling.

    ANS: A DIF: Challenging REF: 283

56. **Refer to Figure 13-5**. This particular firm is necessarily experiencing diminishing marginal product when curve
    (i) A is rising.
    (ii) B is rising.
    (iii) C is rising.

    a. (i) only
    b. (iii) only
    c. (i) and (ii)
    d. All of the above are correct.

    ANS: D DIF: Challenging REF: 283

57. **Refer to Figure 13-5**. Curve A is U-shaped because of
    a. diminishing marginal product.
    b. increasing marginal product.
    c. the fact that increasing marginal product follows decreasing marginal product.
    d. the fact that decreasing marginal product follows increasing marginal product.

    ANS: D DIF: Challenging REF: 283

Adrian's Premium Boxing Service subcontracts with a chocolate manufacturer to box premium chocolates for their mail order catalogue business. She rents a small room for $150 a week in the downtown business district that serves as her factory. She can hire workers for $275 a week.

Table 13-2

Number of Workers	Chocolates Produced per Week	Marginal Product of Labor	Cost of Factory	Cost of Workers	Total Cost of Inputs
0	0				
1		330	150	275	425
2	630				
3		150		825	975
4	890				
5	950	60		1,375	
6		10			1,800

58. **Refer to Table 13-2**. What is the marginal product of the second worker?
    a. 110
    b. 200
    c. 260
    d. 300

    ANS: D DIF: Average REF: 276

59. **Refer to Table 13-2**. What is the total cost associated with making 890 boxes of premium chocolates per week?
    a. 1,250
    b. 1,325
    c. 1,400
    d. 1,575

    ANS: A DIF: Average REF: 279

60. **Refer to Table 13-2**. During the week of July 1st, Adrian doesn't box any chocolates. What are her costs during the week?
    a. 0
    b. 150
    c. 275
    d. 425

    ANS: B DIF: Average REF: 279

61. **Refer to Table 13-2**. One week, Adrian earns a profit of $125. If her revenue for the week is $1100, how many boxes of chocolate did she produce?
    a. 140
    b. 330
    c. 780
    d. 950

    ANS: C DIF: Average REF: 276

62. **Refer to Table 13-2**. Adrian has received an order for 3000 boxes of chocolates for next week. If she expects that the trend in the marginal product of labour will continue in the same direction, it is most likely that her best decision will be to
    a. not commit to meeting the order until she can move to a larger room and hire more workers to box the chocolates.
    b. close her business until she is able to hire more productive workers.
    c. hire about 12 new workers and hope she can satisfy the order.
    d. commit to meeting the order and then take three weeks to complete the job.

    ANS: A DIF: Average REF: 276

63. At what level of output will average variable cost equal average total cost?
    a. when marginal cost equals average total cost
    b. for all levels of output in which average variable cost is falling
    c. when marginal cost equals average variable cost
    d. There is not a level of output where this occurs, as long as fixed costs are positive.

    ANS: D DIF: Average REF: 282

64. Thirsty Thelma owns and operates a small lemonade stand. When Thelma is producing a small quantity of lemonade she has few workers and her equipment is not being fully utilized. Because she can easily put her idle resources to use,
    a. the marginal cost of an extra worker is large.
    b. the marginal cost of one more glass of lemonade is small.
    c. the marginal product of an extra worker is small.
    d. her lemonade stand is likely to be crowded with workers.

    ANS: B DIF: Average REF: 282

65. When marginal cost is rising, average variable cost
    a. must be rising.
    b. must be falling.
    c. must be constant.
    d. could be rising or falling.

    ANS: D DIF: Challenging REF: 284

66. Consider the following information about bread production at Beth's Bakery:

Worker	Marginal Product
1	5
2	7
3	10
4	11
5	8
6	6
7	4

Beth pays all her workers the same wage and labour is her only variable cost. From this information we can conclude that Beth's marginal cost

a. declines as output increases from 0 to 33, but increases after that.
b. declines as output increases from 0 to 11, but increases after that.
c. increases as output increases from 0 to 11, but declines after that.
d. continually increases as output rises.

ANS: A DIF: Challenging REF: 284

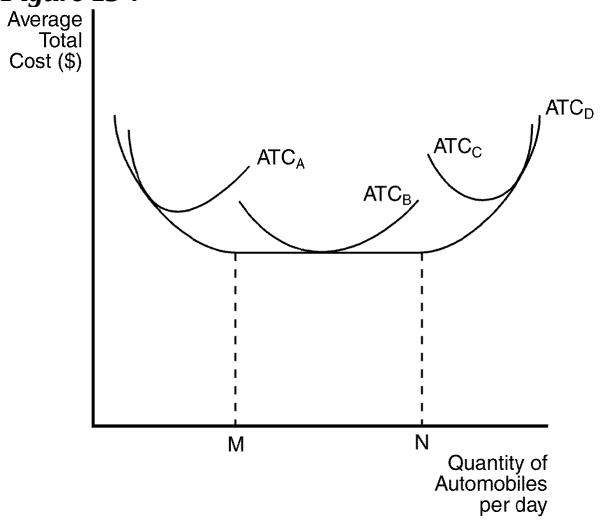
67. At Bert's Bootery, the total cost of producing twenty pairs of boots is $400. The marginal cost of producing the twenty-first pair of boots is $83. We can conclude that the average

a. variable cost of 21 pairs of boots is $23.
b. total cost of 21 pairs of boots is $23.
c. total cost of 21 pairs of boots is $15.09.
d. total cost of 21 pairs of boots cannot be calculated from the information given.

ANS: B DIF: Challenging REF: 284

The figure below depicts average total cost functions for a firm that produces automobiles. Use the figure to answer the following questions.

Figure 13-7



68. **Refer to Figure 13-7**. Which of the curves is most likely to characterize the short-run average total cost curve of the smallest factory?

a. ATC_A
b. ATC_B
c. ATC_C
d. ATC_D

ANS: A DIF: Easy REF: 287

69. **Refer to Figure 13-7**. Which curve represents the long-run average total cost?
    a. ATC_A
    b. ATC_B
    c. ATC_C
    d. ATC_D

    ANS: D DIF: Easy REF: 287

70. **Refer to Figure 13-7**. In the long run, the firm can operate on which of the following average total cost curves?
    a. ATC_A
    b. ATC_B
    c. ATC_C
    d. All of the above are correct.

    ANS: D DIF: Easy REF: 287

71. **Refer to Figure 13-7**. This firm experiences diseconomies of scale at what output levels?
    a. output levels above N
    b. output levels between M and N
    c. output levels below M
    d. All of the above are correct, if the firm is operating in the long run.

    ANS: A DIF: Average REF: 287

72. **Refer to Figure 13-7**. At levels of output below M the firm experiences
    a. economies of scale.
    b. diseconomies of scale.
    c. economic profit.
    d. accounting profit.

    ANS: A DIF: Average REF: 287

73. Long-run average total cost curves are often U-shaped
    a. for the same reasons that average total cost curves are often U-shaped.
    b. because of constant returns to scale.
    c. because of increasing coordination problems at low levels of production and increasing specialization of workers at high levels of production.
    d. because of increasing specialization of workers at low levels of production and increasing coordination problems at high levels of production.

    ANS: D DIF: Challenging REF: 288