**Mankiw, Chapter 13: The Costs of Production**

**Quiz** Click the correct answers

1. The amount of money that a firm receives from the sale of its output is called
   - (a) total revenue.
   - (b) total gross profit.
   - (c) total net profit.
   - (d) net revenue.

2. Profit is defined as
   - (a) net revenue minus depreciation.
   - (b) average revenue minus average total cost.
   - (c) marginal revenue minus marginal cost.
   - (d) total revenue minus total cost.

3. Profit plus total costs equals
   - (a) total revenue.
   - (b) net profit.
   - (c) capital profit.
   - (d) operational profit.

4. Those things that must be forgone to acquire a good are called
   - (a) competitors.
   - (b) substitutes.
   - (c) opportunity costs.
   - (d) explicit costs.

5. Opportunity costs are comprised of
   - (a) explicit costs.
   - (b) implicit costs.
   - (c) forgone income.
   - (d) all of the above.

6. Which of the following would be categorized as an opportunity 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

7. Which of the following is an implicit cost?
   - (i) A business owner forgoing an opportunity to earn a large salary working for a Wall Street brokerage firm.
   - (ii) Interest on debt
   - (iii) Total debt.
   - (a) (ii) and (iii)
   - (b) (i) and (iii)
   - (c) (i) only
   - (d) All of the above.

8. Economists are primarily interested in
   - (a) the marginal cost of production in a firm.
   - (b) the accounting profits generated by a firm.
   - (c) how firms make production and pricing decisions.
   - (d) the value of a firm as manifest in stock price.

9. An important implicit cost of almost every business is
   - (a) the cost of accounting services.
   - (b) the cost of compliance with government regulation.
   - (c) the opportunity cost of financial capital that has been invested in the business.
   - (d) the cost of debt.

10. Which of the following is an implicit cost of owning a business?
11. Joe wants to start his own business. The business he wants to start will require that he purchase a factory that costs $300,000. He is planning to use $100,000 of his own money, and borrow an additional $200,000 to finance the factory purchase. Assume the relevant interest rate is 10 percent. What is the explicit cost of purchasing the factory for the first year of operation?

(a) $10,000  (b) $20,000  
(c) $30,000  (d) $40,000

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(a) $10,000  (b) $20,000  
(c) $30,000  (d) $40,000

13. Economic profit is equal to

(a) total revenue minus the opportunity cost of producing goods and services.  
(b) total revenue minus the accounting cost of producing goods and services.  
(c) total revenue minus the explicit cost of producing goods and services.  
(d) average revenue minus the average cost of producing the last unit of a good or service.

14. Accounting profit is equal to

(a) total revenue minus the explicit cost of producing goods and services.  
(b) total revenue minus the opportunity cost of producing goods and services.  
(c) average revenue minus the average cost of producing the last unit of a good or service.  
(d) marginal revenue minus marginal cost.

15. A production function is a relationship between

(a) inputs and revenue.  
(b) inputs and costs.  
(c) inputs and profit.  
(d) inputs and quantity of output.

16. The marginal product of labor is equal to the

(a) increase in labor necessary to generate a one-unit increase in output.  
(b) increase in output obtained from a one-unit increase in labor.  
(c) incremental profit associated with a one-unit increase in labor.  
(d) incremental cost associated with a one-unit increase in labor.

17. One would expect to observe diminishing marginal product of labor when

(a) workers are discouraged about the lack of help from other workers.  
(b) crowded office space reduces the productivity of new workers.  
(c) union workers are told to reduce their work effort in preparation for a new round of collective bargaining talks.  
(d) only new workers are trained in using the most productive capital.

18. Diminishing marginal product of labor occurs when adding another unit of labor

(a) increases output, but not by as large a margin as previous units of labor.  
(b) decreases output.  
(c) increases output by more than the margin of previously employed labor.  
(d) none of the above.

19. The slope of a production function (or total product curve) reveals information about the

(a) average product of workers.  
(b) marginal product of workers.  
(c) total product of workers.  
(d) fixed product of workers.
20. Which of the following statements about a production function is true?
   (a) The slope of the production function measures the average product of labor.
   (b) The slope of the production function measures average total cost.
   (c) The slope of a ray from the origin to a point on the production function measures the marginal product of labor.
   (d) The slope of the production function measures the marginal product of a worker.

21. Which of the statements below best captures information about the underlying production function?
   (a) Output increases at an increasing rate with additional units of input.
   (b) Output increases at a decreasing 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.

22. Which of the following costs do not vary with the amount of output a firm produces?
   (a) marginal costs and average fixed costs
   (b) total fixed costs
   (c) average fixed costs
   (d) total fixed costs and average fixed costs

23. An example of a fixed cost would be
   (i) rent paid on the factory.
   (ii) raw materials supplied at a government regulated price.
   (iii) machine maintenance.
   (a) (i) only
   (b) (i) and (ii)
   (c) (ii) and (iii)
   (d) all of the above

24. Fixed costs can be defined as costs that
   (a) are incurred only when production is large enough.
   (b) are unaffected by production.
   (c) vary inversely with production.
   (d) vary at a fixed rate with production.

25. If a firm produces nothing, which of the following costs will be zero?
   (a) variable cost
   (b) total cost
   (c) average cost
   (d) opportunity cost

26. 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 size of the factory is fixed.
   (c) the number of workers used to produce the firm’s product is fixed.
   (d) there are no fixed costs.

27. The cost to produce the typical unit of output is the firm’s
   (a) average total cost.
   (b) variable cost.
   (c) fixed cost.
   (d) marginal cost.

28. As the quantity produced increases,
   (a) average fixed cost decreases.
   (b) average fixed cost increases.
   (c) variable cost always decreases.
   (d) none of the above

29. The amount that total cost rises when the firm produces one additional unit is called
   (a) marginal cost.
   (b) average cost.
   (c) fixed cost.
   (d) variable cost.

30. The cost to produce an additional unit of output is the firm’s
31. Marginal cost equals
   (i) the average fixed cost of the current unit.
   (ii) change in total costs divided by change in quantity produced.
   (iii) change in variable costs divided by change in quantity produced.
   (a) (i) and (ii)  (b) (ii) and (iii)  (c) (ii) only  (d) all of the above

32. Marginal cost equals
   (a) total cost divided by total quantity.
   (b) the slope of the total cost curve.
   (c) total output divided by the change in total cost.
   (d) none of the above

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

34. Assume that a given firm experiences fixed cost and decreasing marginal product of labor with the addition of each worker regardless of the current output level. Average total cost will be
   (a) U-shaped.  (b) always rising.  (c) always falling.  (d) constant.

35. Assume that a given firm experiences fixed cost and decreasing marginal product of labor with the addition of each worker regardless of the current output level. Average fixed cost will be
   (a) U-shaped.  (b) always rising.  (c) always falling.  (d) constant.

36. Assume that a given firm experiences fixed cost and decreasing marginal product of labor with the addition of each worker regardless of the current output level. Average variable cost will be
   (a) U-shaped.  (b) rising.  (c) falling.  (d) constant.

37. Marginal cost will be
   (a) U-shaped.  (b) always rising.  (c) always falling.  (d) constant.

38. If marginal cost is rising
   (a) marginal product must be rising.  (b) marginal product must be falling.
   (c) average variable cost must be falling.  (d) average fixed cost must be rising.

39. Diminishing marginal product suggests that the marginal
   (a) product of an extra worker is less than the previous worker’s marginal product.
   (b) cost of an extra worker is less than the previous worker’s marginal cost.
   (c) product of an extra worker is greater than the previous worker’s marginal product.
   (d) cost of an extra worker is unchanged.

40. Diminishing marginal product suggests that
   (a) marginal cost is downward sloping.
   (b) additional units of output are more expensive.
   (c) the firm is at full capacity.
   (d) all of the above

41. The average fixed cost curve
   (a) declines as long as it is above marginal cost.
   (b) declines as long as it is below marginal cost.
42. Diminishing marginal product causes the average variable cost curve to
   (a) rise. (b) fall. (c) rise until it equals the total cost curve. (d) level out.

43. The efficient scale of the firm is the quantity of output that
   (a) maximizes marginal product. (b) minimizes average total cost. (c) minimizes average fixed cost. (d) minimizes average variable cost.

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

45. When marginal cost exceeds average total cost,
   (a) average fixed cost must be falling. (b) average fixed cost must be rising. (c) average total cost must be rising. (d) average total cost is falling.

46. The average total cost curve is increasing when
   (a) marginal cost is increasing. (b) marginal cost is decreasing. (c) marginal cost is less than average total cost. (d) marginal cost is greater than average total cost.

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

48. The marginal cost curve crosses the average total cost curve at
   (a) the efficient scale. (b) economies of scale. (c) diseconomies of scale. (d) maximum ATC.

49. At all levels of production beyond the point where the marginal cost curve crosses the average variable cost curve, average variable cost
   (a) falls. (b) remains unaffected. (c) rises. (d) All of the above are possible, it depends on the shape of the marginal cost curve.

50. Which of the lines is most likely to represent average total cost?
51. Which of the lines is most likely to represent average fixed cost?

(a) A  
(b) B  
(c) C  
(d) D

52. Which of the lines is most likely to represent average variable cost?

(a) A  
(b) B  
(c) C  
(d) D

53. Which of the lines is most likely to represent marginal cost?
54. When a factory is operating in the short run,
   (a) total cost and variable cost are usually the same.
   (b) average fixed cost rises as output increases.
   (c) it cannot adjust the quantity of fixed inputs.
   (d) it cannot alter variable costs.

55. In the long run,
   (a) all inputs are considered to be variable.
   (b) variable inputs change to fixed inputs.
   (c) some inputs, such as plant and machinery, remain fixed.
   (d) variable inputs are rarely used.

56. The long-run average total cost curve
   (a) is flatter than the short-run average total cost curve.
   (b) is not U-shaped.
   (c) is always decreasing as output increases.
   (d) is always increasing as output increases.

57. The length of the short run
   (a) can never exceed 3 years.
   (b) can never exceed 1 year.
   (c) is always less than 6 months.
   (d) is different for different types of firms.

58. Economies of scale occur when
   (a) long-run average total costs rise as output increases.
   (b) average fixed costs are falling.
   (c) long-run average total costs fall as output increases.
   (d) average fixed costs are constant.

59. Diseconomies of scale occur when
   (a) long-run average total costs rise as output increases.
   (b) long-run average total costs fall as output increases.
   (c) average fixed costs are falling.
   (d) average fixed costs are constant.

60. Constant returns to scale occur when
   (a) long-run average total costs are constant as output increases.
   (b) marginal product of labor is falling.
   (c) the firm’s long-run average cost curve is falling as output increases.
   (d) the firm’s long-run average cost curve is rising as output increases.

61. When a firm is operating at an efficient scale, average total cost will
(a) fall as output is increased.
(b) fall as output is decreased.
(c) be at its maximum.
(d) none of the above

62. One of the most important properties of cost curves is that
(a) the average fixed cost must eventually rise.
(b) the average total cost curve first rises, then falls with increased output.
(c) the marginal cost eventually rises with the quantity of output.
(d) for most producers, the average total cost curve must never cross the marginal cost curve.