

STUDY GUIDE
CHAPTER 3: PRODUCTION AND COSTS

■ **WHAT YOU SHOULD KNOW IN THIS CHAPTER**

- (1) The concept of production function, short run and long run, isoquant, marginal products, returns to scale, isocost...
- (2) Optimal input combination (basic production efficiency)
- (3) Input/output allocation among plants
- (4) Cost function and cost curves
- (5) Sunk costs, fixed costs, variable costs.
- (6) Exogeneous effects on cost (curves)
- (7) Economies of scale: reasons, MES, applications
- (8) Economies of scope: reasons, applications
- (9) Learning: reasons, applications

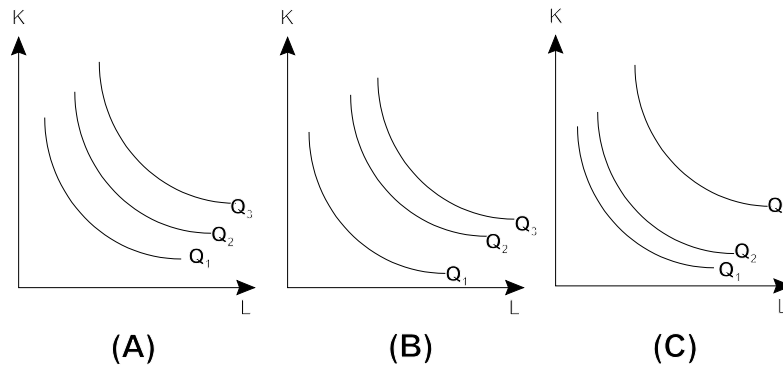
■ **SAMPLE MULTILE CHOICE QUESTIONS**

1. Given the production function:

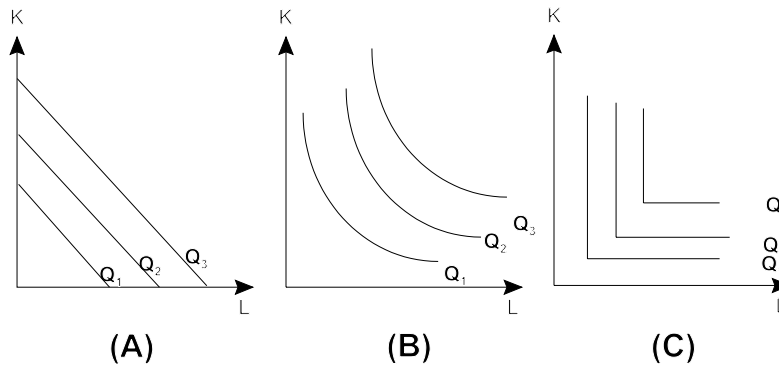
	OUTPUT		
K = 1	10	16	20
K = 2	16	20	25
K = 3	20	25	30
	L = 1	L = 2	L = 3

- What is the marginal product of the second unit of labor when K =1?
- A. 16
 - B. 6
 - C. 1
 - D. 10
2. The production function has:
- A. constant returns to scale
 - B. increasing returns to scale
 - C. decreasing returns to scale
 - D. unknown returns to scale because there are no information about costs.
3. A producer uses two inputs, capital (K), labor (L). She notices that when she increases both K and L by 10% each, her output increases by 5%. This is an example of
- A. increasing returns to scale
 - B. constant returns to scale
 - C. decreasing returns to scale
 - D. There is not enough information to tell the nature of returns to scale.

4. Consider the three following isoquant maps, with $Q_2 = 2Q_1$ and $Q_3 = 3Q_1$. It is most likely that Figures (A), (B) and (C) correspond respectively to

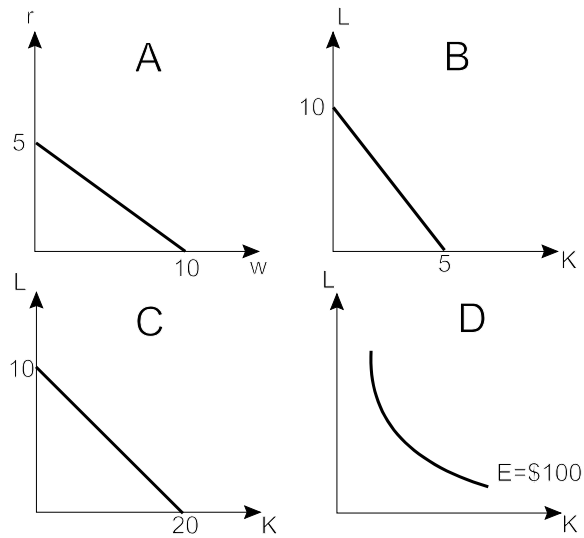


- A. Constant, increasing, and decreasing returns to scale
 B. Increasing, decreasing, and constant returns to scale
 C. Constant, decreasing, and increasing returns to scale
 D. Decreasing, increasing, and constant returns to scale
5. Consider the following three isoquant maps. The degrees of input of substitutability in the three figures can be ranked in the following order



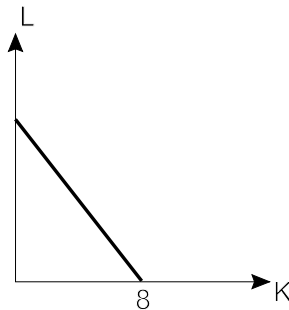
- A. Figure (A) is the most substitutable, Figure (C) is the least
 B. Figure (C) is the most substitutable, Figure (A) is the least
 C. Figure (B) is the most substitutable, Figure (C) is the least
 D. Figure (A) is the most substitutable, Figure (B) is the least

6. Which of the following diagrams shows the isocost where total outlay is \$100, $r = 20$ and $w = 10$?



- A. A
 B. B
 C. C
 D. D
 E. none of the above.

7. If the isocost in the diagram below corresponds to a total outlay (E) = \$50 and a wage rate (w) equal to 5, then:



- A. $r = 8$ and the vertical intercept is $w = 5$
 B. $r = 6.25$ and the vertical intercept is $L = 10$
 C. $r = 10$ and the vertical intercept is $w = 5$
 D. There is not enough information to determine r as well as the vertical intercept.
8. A firm using 2 inputs, X and Y, is using them in the most efficient manner when
- A. $MP_X = MP_Y$
 B. $P_X = P_Y$ and $MP_X = MP_Y$
 C. $MP_X/P_Y = MP_Y/P_X$
 D. $MP_X/MP_Y = P_X/P_Y$

9. You are an efficiency expert hired by a manufacturing firm that uses K and L as inputs. The firm produces and sells a given output. If $w = \$40$, $r = \$100$, $MP_L = 20$, and $MP_K = 40$:
- the firm is cost minimizing.
 - the firm should use less L and more K to cost minimize.
 - the firm should use more L and less K to cost minimize.
 - the firm is profit maximizing but not cost minimizing.
10. The general rule for allocating a resource efficiently across different production activities is to choose the allocation for which the
- average product of the resource is the same in every activity.
 - marginal product of the resource is the same in every activity.
 - total product of the resource is the same in every activity.
 - average product is equal to the marginal product in every activity.
11. At the optimal combination of two inputs,
- the slopes of the isoquant and isocost curves are equal.
 - costs are minimized for the production of a given output.
 - the marginal rate of technical substitution equals the ratio of input prices.
 - all of the above
 - A and C only.
12. Regarding sunk costs, fixed costs, and variable costs:
- all fixed costs are sunk, but not all sunk costs are fixed
 - all sunk costs are fixed, but not all fixed costs are sunk
 - some sunk costs are variable costs
 - none of the above is correct
13. Which of the following statements is *incorrect*:
- Fixed costs do not vary with output.
 - Sunk costs are those costs that are forever lost after they have been paid.
 - Fixed costs are always greater than sunk costs.
 - Fixed costs could be positive when sunk costs are zero
14. A total cost function of the form: $TC = 100 + 2Q + 10Q^2$ implies
- $TFC = 100$ and $MC = 2Q + 10Q^2$
 - $TVC = 2Q + 10Q^2$ and $MC = 2 + 20Q$
 - $AVC = 2Q$ and $MC = 10Q^2$
 - $ATC = 100/Q$ and $AFC = 2 + 10Q$
15. Carolyn knows average total cost and average variable cost for a given level of output. Which of the following costs can she NOT determine given this information?
- total cost
 - average fixed cost
 - fixed cost
 - variable cost
 - Carolyn can determine all of the above costs given the information provided.
16. **Economies of scale** exist whenever long-run average costs
- increase as output is increased.
 - decrease as output is increased.
 - remain constant as output is increased.
 - none of the above

17. **Minimum Efficient Scale** is:
- A. the minimum output level that the firm can produce at the lowest average cost
 - B. the minimum output level that the firm can produce at the lowest marginal cost
 - C. the smallest plant that the firm can build in the short run
 - D. the smallest plant that the firm can build to take advantage of learning.
18. If the **Minimum Efficient Scale** of a typical firm in a certain industry is 40% of total demand then:
- A. This firm will definitely be the largest firm in the industry
 - B. No more than two firms can survive in this industry
 - C. Firms in this industry can never satisfy total demand
 - D. There is a lot of room for this firm to learn to cut costs
19. A soft-drink bottler finds that producing 2,000 cases of cans and 3,000 cases of bottles of cola in one plant is less costly than using two separate plants to produce the same total output. This production process exhibits:
- A. Increasing returns to scale
 - B. Economies of scope
 - C. Diminishing returns
 - D. Both A and B
 - E. Both B and C.
20. A learning curve that is downward-sloping is most probably an indication that
- A. there are economies of scale
 - B. repetition of various production tasks cause unit costs to decrease.
 - C. workers must learn new skills in order to deserve higher wages.
 - D. over time, firms know how to better compete with rivals.