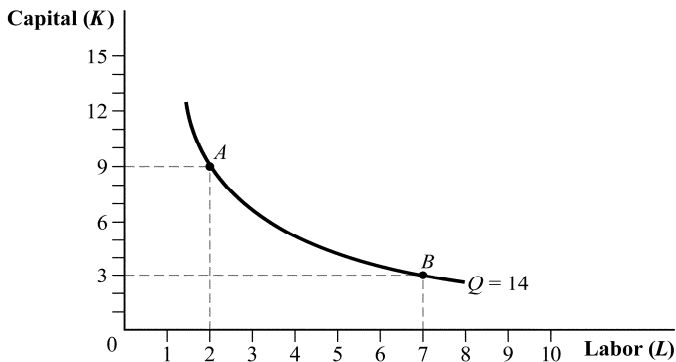


## Quiz #4 -- March 11, 2021

Use the following to answer question 1.

**Figure 6.3**



1. (Figure 6.3) Which of the following statements is (are) TRUE?

- I. More output is produced at point  $A$  than at point  $B$ .
- II. The ratio of the marginal product of labor to the marginal product of capital is higher at point  $A$  than at point  $B$ .
- III. The  $MRTS_{LK}$  is equal at points  $A$  and  $B$ .

- A) I, II, and III
- B) II
- C) III
- D) II and III

2. Suppose a firm with a production function given by  $Q = K^{0.75}L^{0.25}$  produces 10,000 units of output. The firm pays a wage of \$50 per unit and pays a rental rate of capital of \$50 per unit.

(Note:  $MP_L = K^{0.75}/4L^{0.75}$ ;  $MP_K = 3L^{0.25}/4K^{0.25}$ ).

To minimize the cost of producing 10,000 units of output, the firm should use:

- A) 3 times as many units of labor as units of capital.
- B) equal amounts of labor and capital.
- C) 3 times as many units of capital as units of labor.
- D) 16 units of capital and 5 units of labor.

3. The production function given by  $Q = 10K^{1/2}L^{2/3}$  has \_\_\_\_\_ returns to scale.
- A) constant
  - B) instant
  - C) increasing
  - D) decreasing
4. Consider the production function  $Q = Af(K, L)$ . Which of the following statements is (are) TRUE?
- I. An increase in total factor productivity growth is represented by an increase in  $K$  or  $L$ .
  - II. An increase in total factor productivity growth means that the same amount of output can be produced using fewer inputs.
  - III. If  $A$  increases by 10%, the amount of output produced will increase by 10%, holding the quantity of inputs fixed.
- A) II
  - B) I, II, and III
  - C) II and III
  - D) I
5. Chad runs a coffee shop that has annual revenues of \$300,000, supply costs of \$100,000, and employee salaries of \$60,000. He has the option of renting out the coffee shop for \$90,000 per year, and he has three outside offers from competitors to work as a senior barista at Starbucks (for an annual salary of \$30,000), at Simon's coffee house (for an annual salary of \$40,000), and at Peet's coffee shop (for an annual salary of \$60,000). He can only hold one job at a time. What should Chad do?
- A) He should rent out his coffee shop and take the job at Starbucks.
  - B) He should rent out his coffee shop and take the job at Simon's.
  - C) He should rent out his coffee shop and take the job at Peet's.
  - D) He should continue to run his coffee shop.

6. Which of the following statements is (are) TRUE?

- I. If marginal cost is rising, the average total cost must be rising.
- II. The marginal cost curve intersects both the average total and average variable cost curves at their minimum points.
- III. If marginal cost is less than average variable cost, the average variable cost curve is negatively sloped.

- A) I, II, and III
- B) I and III
- C) II
- D) II and III

7. Which of the following statements is (are) TRUE?

- I. The firm's total cost is the sum of its fixed and variable costs.
- II. Over the long term, the costs of the firm's inputs tend to become fixed.
- III. In the long run, the firm can adjust the use of all of its inputs.

- A) II
- B) I
- C) I and III
- D) I, II, and III

8. In the long run, because firms can adjust both capital and labor:

- A) firms will grow.
- B) production is more expensive because firms must invest in both labor and capital.
- C) the impact of diminishing marginal returns is lessened.
- D) firms fire workers, replacing the labor productivity with capital.

9. A firm's production function is given by  $Q = KL$ , where  $MP_L = K$  and  $MP_K = L$ . The wage rate ( $W$ ) = \$50 and the rental per unit of capital ( $R$ ) is \$12.50. In the short run, capital ( $K$ ) is fixed at 10 units. The short-run average total cost of producing 100 units of output is \_\_\_\_\_, and the long-run average total cost of producing 100 units of output is \_\_\_\_\_.

- A) \$14.75; \$8.80
- B) \$6.25; \$5
- C) \$6.25; \$4.20
- D) \$14.75; \$9

10. A firm is producing 10,000 units of output at a total cost of \$5,000. If the firm increases output by 5,000 units and its total costs rise by \$2,000, the firm has:
- A) economies of scale.
  - B) economies of scope.
  - C) constant returns to scale.
  - D) diseconomies of scale.

## Answer Key - S21-4

1. B
2. C
3. C
4. C
5. C
6. D
7. C
8. C
9. B
10. A