Introduction to Microeconomics

Week 10

TA: Arti Agarwal

IIT Kanpur

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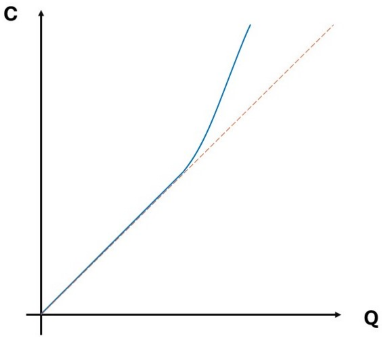
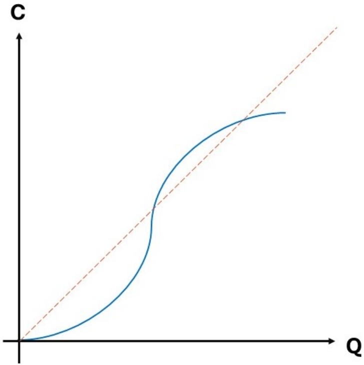
Question 1

Which of the following diagrams is an example of increasing returns to scale followed by decreasing returns to scale?

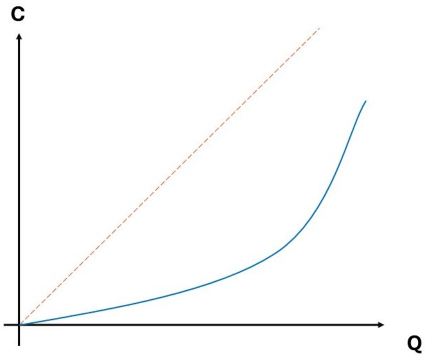


A)

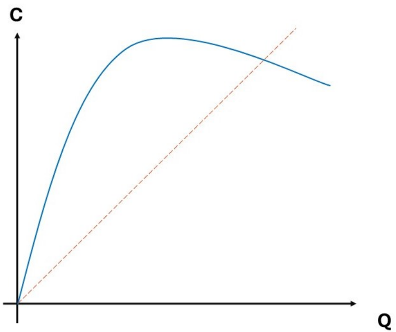


B)

Question 1



C)



D)

Question 2

A paper mill has a production function given by $Q = KL$. The cost of renting machinery (K) is given by $r = 100$ and wages of workers (L) are given by $w = 15$. All values are in same units.

1. What are the cost-minimizing values of K, L if the mill wants to produce 500 units in the long run?
2. In the short run, the mill can use only 5 units of K. The mill wants to produce $Q = 500$. How many workers does the mill hire?
3. In the next short run, the mill fixed $\bar{K} = 9$. How many workers does the mill now hire to produce 500 units?

Question 3

A firm produces canned foods, with the production function $Q = 4\sqrt{KL}$. Capital is rented at rate r and wages are w.

1. Find the output expansion path for the firm.
2. Derive the expressions for the conditional factor demands for L and K.
3. Find the cost function for the firm.

Question 4

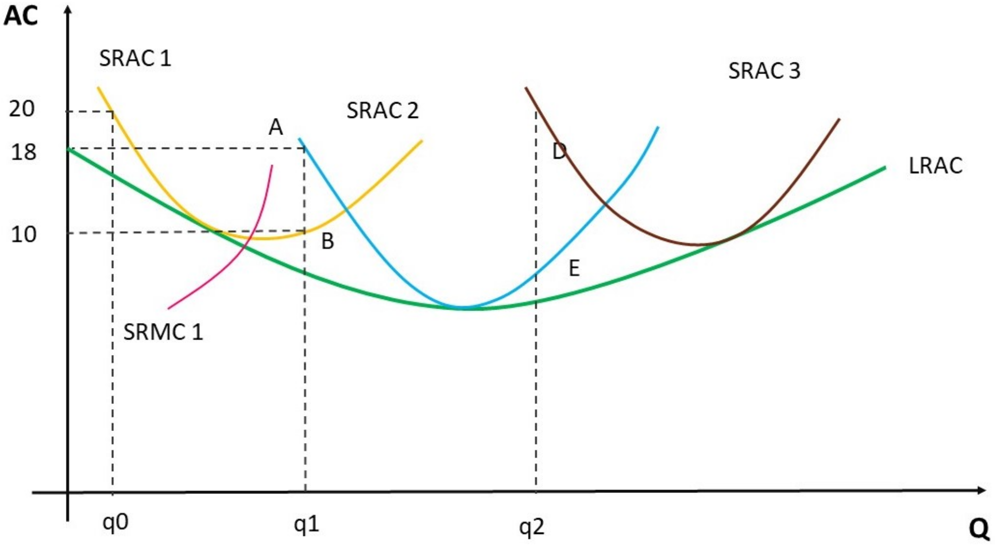
A firm uses two inputs x_1, x_2 for production. Its production function is $q = f(x_1, x_2)$. The firm has fixed one input to $\bar{x_1} = 100$ units in the short run. Which of the following statements is/are true about the firm's costs?

A) The long run cost is always going to be equal to or lower than short run costs of the firm.

B) There is a unique value of output for which short run and long run costs will be the same.

C) Depending on the form of the production function, there may be no level of output for which long run costs are same as short run costs.

D) At the output level where long run and short run costs are equal, the firm is minimizing its cost of production.


AC
SRAC 1
20
18
10
A
SRAC 2
B
SRMC 1
SRAC 3
D
E
LRAC
q0
q1
q2
Q

Question 5

Refer to the figure on the previous slide. Which of the following statements is/are true?

A) The long-run average cost curve is the envelope of the short-run curves.

B) At output level q_2 the firm will choose to produce using capital corresponding to SRAC 3.

C) Producing at the level q_2 is more cost effective for the firm than producing at level q_1 when it utilizes capital corresponding to SRAC 2.

D) All SRAC curves touch the LRAC curve at their lowest point.

E) The SRMC curves intersect the SRAC curves at their minima.

Reference Reading

1. *The Economy 2.0: Microeconomics* by CORE Econ.
2. *Introduction to Economic Analysis v. 1.0*
3. *Workouts in Intermediate Microeconomics 6e* by Hal Varian
4. *Microeconomics* by Jeffrey Perloff
5. *Microeconomics* by Pindyck and Rubenfield