

# VIDYA BHAWAN BALIKA VIDYA PITH

शक्तिउत्थानआश्रमलखीसरायबिहार

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H.W(Revised)

Question 6:

Explain the concepts of the short run and the long run.

ANSWER:

## Short run:

In short run, a firm cannot change all the inputs, which means that the output can be increased (decreased) only by employing more (less) of the variable factor (labour). It is generally assumed that in short run a firm does not have sufficient or enough time to vary its fixed factors such as, installing a new machine, etc. Hence, the output levels vary only because of varying employment levels of the variable factor.

Algebraically, the short run production function is expressed as

$$Q_x = f(L, \bar{K})$$

Where,

$Q_x$  = units of output x produced

$L$  = labour input

$\bar{K}$  = constant units of capital

## Long run:

In long run, a firm can change all its inputs, which means that the output can be increased (decreased) by employing more (less) of both the inputs – variable and fixed factors. In the long run, all inputs (including capital) are variable and can be changed according to the required levels of output. The law that explains this long run concept is called *returns to scale*. The long run production function is expressed as

$$Q_x = f(L, K)$$

Both  $L$  and  $K$  are variable and can be varied.

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*Question 7:*

What is the law of diminishing marginal product?

**ANSWER:**

### **Law of diminishing Marginal Product**

According to this law, if the units of the variable factor keeps on increasing keeping the level of the fixed factor constant, then initially the marginal product will rise but finally a point will be reached after which the marginal product of the variable factor will start falling. After this point the marginal product of any additional variable factor will be zero, and can even be negative.

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*Question 8:*

What is the law of variable proportions?

**ANSWER:**

### **Law of Variable Proportions**

According to the law of variable proportions, if more and more units of the variable factor (labour) are combined with the same quantity of the fixed factor (capital), then initially the total product will increase but gradually after a point, the total product will start diminishing.

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*Question 9:*

When does a production function satisfy constant returns to scale?

**ANSWER:**

Constant returns to scale will hold when a proportional increase in all the factors of production leads to an equal proportional increase in the output. For example, if both labour and capital are increased by 10% and if the output also increases by 10%, then we say that the production function exhibits constant returns to scale.

Algebraically, constant returns to scale exists when

$$f(nL, nK) = n \cdot f(L, K)$$

This implies that if both labour and capital are increased by 'n' times, then the production also increases by 'n' times.

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*Question 10:*

When does a production function satisfy increasing returns to scale?

**ANSWER:**

Increasing returns to scale (IRS) holds when a proportional increase in all the factors of production leads to an increase in the output by more than the proportion. For example, if both the labour and the capital are increased by 'n' times, and the resultant increase in the output is more than 'n' times, then we say that the production function exhibits IRS.

Algebraically, IRS exists when

$$f(nL, nK) > n \cdot f(L, K)$$

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