THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

PART B: MICRO

Chapter 4 : Producer Behaviour

Q. NO	QUESTION	MARKS
1	A production function states that there exists a technical relationship between: (i)input prices and output prices (ii) input prices and quantity of output (iii) the quantity of inputs and the quantity of outputs (iv) the quantity of inputs and input prices	1
2	Whenever MP falls and is positive, TP changes at what rate? (i) TP increases at an increasing rate (ii) TP increases at a diminishing rate (iii) TP diminishes after reaching its maximum (iv) None of these	1
3	When average product decreases, the marginal product is always: (i) greater than average product (ii) less than average product (iii) increasing (iv) decreasing	1
4	Statement - 1: When all inputs are changed in the same proportion, it is known as change in scale of production. Statement – 2: In the short run, a firm can not vary all the inputs. (i) Statement-1 is true and Statement- 2 is false (ii) Statement- 1 is false and Statement-2 is true (iii) Both Statement-1 and 2 are true (iv) Both Statement-1 and 2 are false	1
5	AP can rise when MP is falling. It is possible only when: (i) MP is greater than AP (ii) MP is smaller than AP (iii) MP is zero (iv) MP is negative.	1
6	Statement - 1: When there are diminishing returns to a factor, total product always decreases. Statement – 2: Total product will increase only when marginal product increases. (i) Statement-1 is true and Statement- 2 is false (ii) Statement- 1 is false and Statement-2 is true (iii) Both Statement-1 and 2 are true (iv) Both Statement-1 and 2 are false	1
7	Choose the incorrect pair of statements from the set of statements given in column I and column II Column I: (A) Short Run production function; (B) Negative returns to a factor Column II: (i) One factor is variable and others are fixed,; (ii) Defective factor ratio between fixed and variable factors.	1

	(C) Law applicable in the short run — (iii) Law of Variable Proportions (D) When Total Product is Zero — (iv) Marginal Product is maximum and constant. (i)A and i (ii) B and ii (iii) C and iii (iv) D and iv	
8	Assertion (A): In the Law of variable proportions, MP rises, then falls positively till zero and ultimately becomes negative. Reason (R): In the short run, as we hold one factor input fixed and keep increasing the other, the factor proportions changes. Initially MP rises till these proportions are suitable for production and then MP falls when these proportions become less suitable for the production. (i) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A) (ii) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A) (iii) Assertion (A) is true but Reason (R) is false. (iv) Assertion (A) is false but Reason (R) is true.	**1**
9	Assertion (A): A rational firm will always try to operate in the second phase of law of variable proportion. Reason (R): In the second phase of Law of Variable Proportion, TP is maximum and constant and MP becomes zero. Though MP falls still positive addition is made to TP and the Producer is able to obtain a bigger TP compared to TP in the first phase. (i) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A) (ii) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A) (iii) Assertion (A) is true but Reason (R) is false. (iv) Assertion (A) is false but Reason (R) is true.	**1**
10	Fill the blank (i) 10 (ii) 20 (iii) 30 (iv) 40	**1**
11	During short period, production can be increased through – (a) Greater application of fixed factor (b) Greater application of variable factor (c) Greater application of all the factors of production None of the above	**1**

12	Read the following statements – Assertion (A) and Reason (R). Choose one of the correct alternatives given below: Assertion (A): Production function establishes a relation between input and output, which is economical in nature. Reason (R): Production function specifies either the maximum output that can be produced with the given inputs or the minimum quantity of inputs needed to produce a given level of output. **(A)** Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A) (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A) (C) Assertion (A) is true but Reason (R) is false. (D) Assertion (A) is false but Reason (R) is true.	**1**
13	What is meant by production?	**1**
14	Which one of the following is correct? (a) TC = TFC XTVC (b) TC = TVC + TFC (c) TC = TFC ÷ TVC TC = TFC – TVC	**1**
15	A producer starts the business in the building owned by him and borrow money for running it. Identify implicit cost.	**1**
16	If it is given that the total variable cost for producing 30 units of output is Rs.6000 and for 31 units is Rs.6600. Find the value of marginal cost.	**1**
17	Read the statements carefully and choose the correct alternative among those given below – Statement 1 – When price remains same at all output levels, both AR and MR curves coincide in a horizontal straight line parallel to the x-axis. Statement 2 – When MR is constant, TR increases at an increasing rate. Alternatives (a) Both the statements are true (b) Both the statements are false (c) Statement 1 is true and statement 2 is false Statement 2 is true and statement 1 is false	**1**
18	Which concept of revenue is called price?	**1**
19	A firm reaches shut-down point when – (a) TR = TVC (b) TR = TC (c) TC = AVC MC = AC	**1**
20	Read the following statements carefully. State true or false with a reason - As output rises, the difference between total cost and total variable cost tends to fall.	**1**
21	Riniki has a production house, she employs 50 units of labour and 9 units of capital. After some time, she increased 5 more units of labour, keeping the capital constant. Which type of production function is indicated here? a) Short-run production function b) Long-run production function c) Both (a) and (b) None of the above	**1**

Labour	TPP	MPP
1	20	20
2	50	30
3	70	
4	80	10
5	60	-20

<table>
<tr><td>22</td><td>What does the following table indicate?

<table><tr><td>Fixed factor</td><td>Total Product</td><td>Marginal product</td></tr><tr><td>10</td><td>38</td><td>6</td></tr><tr><td>10</td><td>42</td><td>4</td></tr></table>a) Increasing returns
b) Decreasing returns
c) Negative returns
d) Constant returns</td><td>1</td></tr>
<tr><td>23</td><td>Assertion: Production function relates to maximum output for any level of input.
Reason: When technology improves it is not possible for output to increase as inputs are already at its maximum efficient level.
Alternatives:
a) Both the statements are true and reason (R) the correct explanation of assertion (A)
b) Both the statements are true but reason (R) is not the correct explanation of assertion (A)
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true.</td><td>1</td></tr>
<tr><td>24</td><td>Assertion: With the employment of more units of variable factor both MP and TP increases
Reason: Certain factors of production are indivisible.

Alternatives:
a) Both the statements are true and reason (R) the correct explanation of assertion (A)
b) Both the statements are true but reason (R) is not the correct explanation of assertion (A)
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true.</td><td>1</td></tr>
<tr><td>25</td><td>Assertion: Under returns to a factor, factor ratio continuous to change.
Reason: There exist both fixed and variable factors in returns to a factor

Alternatives:
a) Both the statements are true and reason (R) the correct explanation of assertion (A)
b) Both the statements are true but reason (R) is not the correct explanation of assertion (A)
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true.</td><td>1</td></tr>
<tr><td>26</td><td>“In fact, MP_L of agricultural workers in some less developed countries—such as India, Pakistan and Bangladesh, is, in fact, negative. Workers are so</td><td>1</td></tr>
</table>

	many in number that an additional worker may just cause the total product to fall by standing in others' way in which case MP_L is negative." Which statement is correct? a) MP_L is negative because workers are poor b) MP_L is negative because workers are too many c) MP_L is negative because workers are unskilled MP_L is negative because workers are standing in others way.	
27	Total product initially increases at an increasing rate, then at a decreasing rate, then becomes maximum and, ultimately, falls. For this reason, both AP_L and MP_L initially rise, reach a maximum, and then decline. At which phase does TP increases at a decreasing rate? a) Phase I b) Phase II c) Phase III All three phases	**1**
28	What does the following situation indicate? Fixed factor | Total Product | Marginal product 5 | 14 | 8 5 | 24 | 10 a) Increasing returns b) Decreasing returns c) Negative returns Constant returns	**1**
29	Identify the phase of production function in which TP increases at an increasing rate and MP also increases. a) Increasing returns to a factor b) Decreasing returns to a factor c) Diminishing returns to a factor Negative returns to a factor	**1**
30	Statement 1: In the short run production function all the factors of production are variable. Statement 2: The Law of variable proportion however works only in the long run. Alternatives: a) Both statement 1 and statement 2 are true b) Both statement 1 and statement 2 are false c) Only statement 1 is true d) Only statement 2 is true	**1**
31	Mention three reasons for the emergence of increasing returns to a factor.	**3**

32 Identify the three phases of the Law of Variable Proportion from the following schedule. **3**

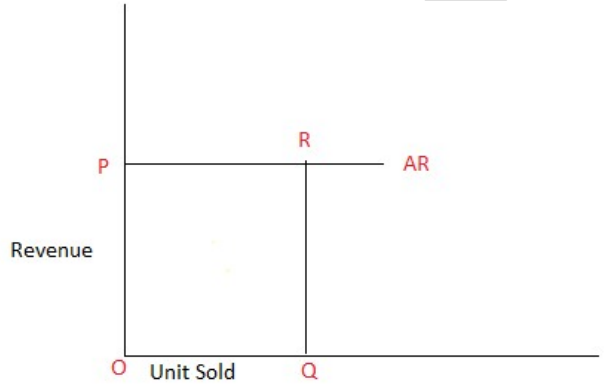
Variable input	Total Product (units)
1	30
2	60
3	80
4	90
5	70

33 Why does a rational producer always operate in the second stage of Law of Variable Proportion? **3**

34 State the behaviour of marginal products in the law of variable proportions. Explain the causes of this behaviour. **3**

35 On the basis of given diagram, answer the following questions: **3**

(i) Indicate whether price will fall or remain the same with rise in output



(ii) What does the closed area OPRQ indicate?

What will be the nature of MR curve?

36 Complete the following table **3**

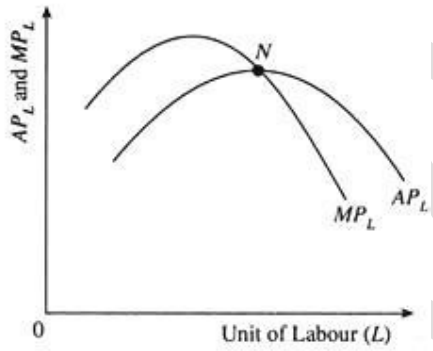
Output (units)	Average Cost (Rs.)	Marginal cost(RS.)
1	13	____
2	12	_____
3	____	10
4	10.5	_____
5	11	_____
6	___	17

37 Given production function of a firm $Q = 10\ L^{1/2}\ K^{1/2}$ **3**

Calculate the maximum possible output that the firm can produce with 25 units of labour and 9 units of capital.

38 Read the passage and answer the questions that follows: **3**

Time plays an important role in the theory of production. In production theory we draw a distinction between the short run and the long run. In the short run, some inputs remain fixed and the others are variable. In the long

	run, all inputs are variable. Thus, in the short run, changes in output occur due to changes in the use of variable factors. But, in the long run output changes when there are changes in all factors of production, including capital. In fact, all fixed factors are converted into variable factors in the long run. This is why all costs are variable in the long run. This means that if the producer wishes to expand output in the short run, this usually means using more hours of labour service with the existing plant and equipment. Similarly, if the producer wishes to reduce output in the short run, certain types of workers can be laid off. But it is not possible to sell a machine or discharge a building, even when its use may fall to zero. a) In a short run production function, inputs are……. (fixed/variable/both), while in the long run, all inputs are……. (fixed/variable/both) b) The producer can increase output by selling their machines and equipment. (True/false) c) The productivity of..... (fixed/variable/) factor may be zero in the short run.	
39	 Fig. 2: Average and Marginal Product Study the above figure and answer the following questions: a) The value of Marginal product of labour MP_L = ... (dQ / dL or dL / dQ) b) At point N, AP = MP = 0 (True or False) Beyond point N, ……(AP< MP or AP> MP)	**3**
40	Read the passage and answer the questions below: Production function means a mathematical representation of the relationship between tangible inputs and the tangible output of a firm during the production of goods. It describes the method that will enable the maximum production of goods by technically combining the four major factors of production at a certain timeframe using a specific technology most efficiently. It changes with development in technology. J H Von was the first person to develop the proportions of the first variable of this function in the 1840s.	**4**

	This function depends on the price factor and output levels that producers can easily observe. Moreover, every manufacturing plant converts inputs into outputs. Therefore, the production function is essential to know the quantity of output the firms require to produce at the said price of goods. It determines the output and the combination inputs at a certain capital and labour cost. It is a common phenomenon that a firm's marginal cost starts to increase at higher production levels, which is known as diminishing returns to scale. The diminishing returns to scale lead to a lesser proportional increase in output quantity by increasing the input quantities. d) What are the four factors of production? e) Production function may change with change in …… (output/technology/profit) f) According to the principle of diminishing returns to scale, an increase in the quantity of inputs will lead to a… .....(higher/lesser) increase in output. g) Suppose there are only 2 factors of production, L and K, write a production function.	
41	Ariz ventures out on a start-up with Rs.12 lakhs financed by a commercial bank. The business is operated from the family garage in partnership with his friend Himanku who is paid a monthly salary. Identify the explicit and implicit cost associated and give reasons.	**4**
42	A firm's revenue is the money that it earns from selling its product. Revenues equal the number of units that a firm sells times the price at which it sells each unit. There are two ways in which firms can obtain higher revenues: sell more products or sell at a higher price. So if a firm wants to make a lot of revenue, it should sell a lot of its product at a high price. Then again, you probably do not need to study economics to figure that out. The problem for a manager is that her ability to sell a product is limited by what the market will bear. Typically, we expect that if she sets a higher price, she will not be able to sell as much of the product. Equivalently, if she wants to sell a larger quantity of product, she will need to drop the price. I. Suppose a firm sell 2500 toys in a month at Rs. 150 each, then its total monthly revenue will be …… II. The problem for a manager is her inability to sell products because market is limited. (True/False) III. Higher the price .....(higher/lower) the sale. IV. A firm can earn more revenue by a) selling more products b) selling at a higher price c) both (a) and (b) d) none of the above	**4**
43	What is the producer's equilibrium? A producer produces that quantity of his product at which marginal cost and marginal revenue are equal. Is he earning maximum profits? Give reasons.	**4**
44	Firm A decides to increase its production and produce the goods in two different plants X and Y. In plant X, labour is in excess and its marginal productivity of labour is negative. The firm decides to shift some labour from	**4**

<table>
<tr><td></td><td>plant X to plant Y. Should this decision of firm A right? What will be the outcome?</td><td></td></tr>
<tr><td>45</td><td>Complete the following table.
<table>
<tr><td>Employment of variable input</td><td>TP</td><td>AP</td><td>MP</td></tr>
<tr><td>1</td><td>100</td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td>140</td></tr>
<tr><td>3</td><td></td><td>140</td><td></td></tr>
<tr><td>4</td><td>480</td><td></td><td></td></tr>
</table></td><td>4</td></tr>
<tr><td>46</td><td>Case Based Question:
Read the given cases carefully and answer the questions on the basis of the same.

Production function expresses the relationship between the physical inputs and physical output of a firm for a given state of technology. In short run production function, total product is sum total of productions by all the units of variable factor along with some fixed quantity of fixed factors. Marginal product represents change in total production when one more unit of variable factor is used keeping fixed factor constant. Average product is output per unit of variable factor. Total product and average product are always positive but marginal product may be positive or negative.
(i) What is the formula of finding out total product from marginal product ?
(ii) Why marginal product may be negative?</td><td>4</td></tr>
<tr><td>47</td><td>Explain the law of variable proportion with the behaviour of total product and marginal product. Give reasons.</td><td>6</td></tr>
<tr><td>48</td><td>Explain the meaning of diminishing returns to a factor. Why do diminishing returns to a factor occur?</td><td>6</td></tr>
<tr><td>49</td><td>a) Explain the relationship between marginal product and total product.
(b) Explain the concepts of Short Run Production function and long run production function</td><td>6</td></tr>
<tr><td>50</td><td>A producer has a given production schedule of units of labour employed and his total physical product.
<table>
<tr><td>Units of Labour</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>TPP</td><td>5</td><td>11</td><td>15</td><td>17</td><td>15</td></tr>
</table>
Construct a short run production function table and identify the three phases of production.
Also find which phase of production will be most ideal for the producer and why?</td><td>6</td></tr>
<tr><td>51</td><td>Read the passage and answer the questions that follows:

In a short run production function, suppose a company produces pens using plastic and ink. Let Q be the output of pens, P the input of plastic, and I the</td><td>6</td></tr>
</table>

	input of ink. If the company uses 50 units of capital,10 units of plastic and 5 unit of ink. This means that for every unit of plastic used, the output increases by 10 units, and for every unit of ink used, the output increases by 5 units. I. Distinguish between fixed and variable factor of production. II. Write a production function on the above passage? III. What is a Linear production function? IV. The output will increase by 5 units when a unit of ……(plastic/ink) is increased. V. If the producer increases the input quantity of plastic by 6 units, output will increase by …… Units. VI. In the long run, the quantity of which factor of production given above will change?	
52	What is meant by diminishing return to a factor? Discuss any two reasons for the operation of diminishing returns to a factor.	6
53	State the different phases of change in total product according to the Law of Variable Proportion. Use a diagram.	6

ANSWER

1	(iii) quantity of inputs and quantity of outputs
2	(ii) TP increases at a diminishing rate
3	(ii) less than AP
4	(iii) Both the statements are true
5	(i) MP is greater than AP
6	(iv) Both the statements are false
7	(iv) D and iv
8	(i) Both (A) and (R) are true and (R) is the correct explanation of (A)
9	(i) Both (A) and (R) are true and (R) is the correct explanation of (A)
10	(ii) 20
11	(b) Greater application of variable factor
12	**(**D) Assertion (A) is false but Reason (R) is true.
13	Production refers to transformation of inputs into output.
14	((b) TC = TVC + TFC
15	Imputed rent of own building
16	$MC_n = TC_n - TC_{n-1}$ = 6600 – 6000 = 600
17	(c) Statement 1 is true and statement 2 is false
18	Average revenue is called price.

19	TR = TVC
20	False. Because the difference between total cost and total variable cost is equal to total fixed cost which remains constant at all levels of output.
21	a) Short-run production function
22	b) Decreasing returns
23	c) Assertion (A) is true but reason (R) is false.
24	a) Both the statements are true and reason (R) the correct explanation of assertion (A)
25	a) Both the statements are true and reason (R) the correct explanation of assertion (A)
26	b) MP_L is negative because workers are too many
27	Phase II
28	a) Increasing returns
29	a) Increasing returns to a factor
30	b)Both statement 1 and statement 2 are false
31	(i) Better utilization of fixed factor. (ii) Efficient utilization of variable factor. (iii) Better coordination between factors.
32	Phase I(Increasing returns to a factor) is up to 2 units of variable input as MP goes on increasing throughout. Phase II (Diminishing returns to a factor) is from 2 to 5 units of variable input as MP diminishes and reaches zero. Phase III (Negative returns) is from 4 to 5 units of variable input as MP becomes negative..
33	A rational producer will always operate in stage II of the law of variable proportion because the producer will find his equilibrium when TP is maximum and constant and MP becomes zero. Though MP is falling at this stage but still positive addition is made to TP and the producer is able to obtain a bigger TP compared to TP in the first stage.
34	There are three phases of change in MP: (i) MP rises – When the variable input is increased, efficient utilization of the fixed inputs takes place due to specialisation. This raises efficiency of the variable input. (ii) MP falls but is positive – Beyond a point, increasing variable input puts pressure on fixed inputs. MP continues to fall and is negative – There is so much pressure of the variable input on the fixed inputs that total product starts declining.
35	(i) Perfectly elastic demand curve in the given diagram indicates that price will remain same at all output levels. (ii) The closed area OPRQ indicates TR as area under price line (AR curve) is equal to TR. MR curve will coincide with AR curve, i.e. both AR and MR curves coincide in a horizontal straight line parallel to the x-axis.
36	

Output (units)	Average Cost (Rs.)	Marginal cost (RS.)	
1	13	12	
2	12	8	
3	10	10	
4	10.5	12	
5	11	13	
6	12_	17	

37	150 units
38	a) both, variable b) False c) fixed
39	a) dQ / dL b) False AP> MP
40	a) Land, labour, capital and entrepreneurship b) Technology c) Lesser d) Q = f (L, K)
41	I. Interest paid on loan to the commercial bank is explicit cost because it is actual money expenditure. II. Imputed rent on his family garage is implicit cost as it is paid to the owner themselves III. Salary of the owner is implicit cost because owner of the garage does not receive any salary IV. The salary paid to his friend is explicit cost as it is actual money expenditure.
42	I. Rs. 3,75,000 II. False III. Lower IV. c) both (a) and (b)
43	Producer's equilibrium refers to that price and output combination which brings proft to the producer and profit declines as more is produced. Conditions of Producer's Equilibrium (i) Marginal revenue is equal to marginal cost. (ii) MR= MC and MC is rising Fulfilment of the first condition alone does not ensure maximum profits. It is possible that MR=MC condition may be fulfilled at more than one output level but only that output level beyond which MC>MR is the maximum profit output level.
44	Firm A should transfer the labour whose marginal physical productivity is negative. The cost of transferring this labour to plant Y will be least as production in plant X will not suffer. Also

	they will be more productive in plant Y as lack of fixed factor was the cause of their low marginal production in the plant X. It was that ideal factor ratio in plant X was disturbed by employing excess labour. When this excess labour is shifted to plant Y, they are productively employed bringing ideal factor proportion.
45	

Employment of variable input	TP	AP	MP
0	0	---	--
1	100	100	100
2	240	120	140
3	420	140	180
4	480	120	60

46	(i) TP = Summation of MP (ii) When variable factor is overcrowded with fixed factor, it yields negative marginal product.
47	The law of variable proportion states that if we go on employing more and more units of a variable factor with some quantities of fixed factor, the total product increases at an increasing rate in the beginning, then increases at a diminishing rate and after certain level it diminishes. Accordingly, the marginal product increases in the beginning, then it starts falling but remains positive and ultimately it continues to fall and also becomes negative. In phase I, TP increases at an increasing rate and MP increases throughout. In phase II, TP increases at a diminishing rate and MP falls but remains positive. In phase III, TP starts falling and MP becomes negative. Reasons: Increasing returns to a factor: It is due to greater use of variable factor makes it possible to utilize fixed factor fully and also to introduce a greater division of labour. Diminishing returns to a factor: It is because variable factor and fixed factor has crossed the optimum combination of proportion between them. Negative returns: It is because of variable factor is overcrowded with fixed factor negative marginal product. Drawing diagram is optional.
48	Diminishing returns to a factor refers to a situation in which total product tends to increase at a diminishing rate, when additional units of variable factor are employed with fixed factors of production. Marginal product continuously falls but remains positive. Reasons: (i) Fixity of factors : As more and more units of the variable factor continues to be combined with the fixed factor, the latter gets over utilized . Hence, the diminishing returns to a factor. (ii) Imperfect substitution: Factors of production are imperfect substitutes of each other. More and ore units of labor can not be continuously used in place of additional capital. Hence diminishing returns to a factor occurs.
49	(i) Relationship between TP and MP: 1. Due to more and more use of variable factor, MP tends to rise and TP increases at an increasing rate. 2. After reaching maximum, MP of the variable factor starts diminishing and may ultimately become zero. TP increases at a diminishing rate. 3. When MP is zero , TP is maximum and constant. 4. After becoming zero, MP becomes negative. Accordingly, TP starts declining. (ii) Short run is a period of time, when some factors of production are fixed and some are variable and output can be increased only by increasing the employment of variable factor.In the short run, the scale of production can not change, it remains constant.

Long run is a period of time, when all factors are variable. Here the output can be increased by employing all factors of production in the same proportion. In the long run, the scale of production can be changed.

50

Variable input	TP	MP	PHASE	
1	5	5	I	
2	11	6	I	MP increasing at an increasing rate
3	15	4	II	
4	17	2	II	MP is declining
5	15	-2	III	MP is negative

Phase I: Both TP and MP increasing at an increasing rate up to 2 units
Phase II: TP increasing but at a decreasing rate. MP falls but is positive.
Phase III: MP becomes negative, TP falls with additional input.

Ideal stage: Phase II: TP increasing but at a decreasing rate. MP falls but is positive.

51

I. Fixed factors are those factors of production whose quantity cannot be changed with change in the level of output. For example, the quantity of land, machinery etc. cannot be hanged during short run.
On the other hand, variable factors are those factors of production whose quantity can easily be changed with change in the level of output. For example, we can easily change the quantity of labour to increase or decrease the production

II. Q = 10P + 5I.

III. The linear production function represents a production process in which the inputs are perfect substitutes for each other.

IV. Ink

V. 60

capital

52

Diminishing returns to a factor refers to a phase when total product increases at a decreasing rate and marginal product falls, but remains positive, with increase in variable factor.
Two reasons for the operation of diminishing returns to a factor

(i) Optimum combination of factors – Among different combinations between variable and fixed factor, there is one optimum combination, at which total product is maximum. After making the optimum use of fixed factor, the marginal return of variable factor, the marginal return of variable factor begins to diminish.

Over utilization of fixed factor- As we keep on increasing the variable factor, eventually a position come when the fixed factor has its limits and starts yielding diminishing return

53

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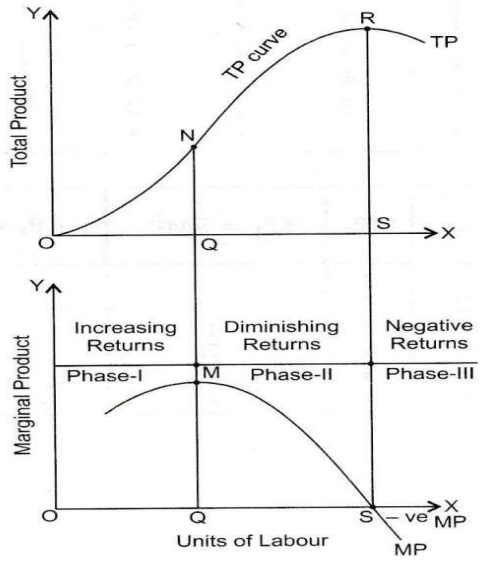
Phases of changes in total product according to the Law of Variable Proportion are shown in the given diagram



(i) Phase – 1 Increasing Return – This stage is in between O to N on the TP curve. In this stage , MP tends to rise till OQ units of labour are used with the constant application of fixed factors. When MP is rising, TP tends to rise at an increasing rate. This occurs till point N on TP curve and point M on MP curve. This is a situation of increasing returns to a factor.

(ii) Phase - 2 Diminishing Return – This stage is between N to R on TP curve. Beyond OQ units of labour, MP tends to decline and TP increases only at diminishing rate. This occurs between M and S on the MP curve and N and R on TP curve. This is a situation of diminishing return to a factor.

(iii) Phase – 3 Negative Return – This stage is beyond R on TP curve. Beyond OS units of labour, MP becomes negative. Now TP starts declining. This is a situation of negative returns to a factor.