CHAPTER   **SIX**

THEORY OF PRODUCTION

1. FACTORS OF PRODUCTION

'Resources that are required to produce goods and services are called Factors of Production.'

These resources are also called inputs. Factors of Production are classified as;

- Land i.e., Natural Resources
- Labor i.e., Human Resources
- Capital i.e., Artificial or Money resources
- Organization i.e., Enterprise or Entrepreneurship

1. LAND

'Land means all economic resources which are free gift of Nature to man or blessed by Nature that can go into production process'

Land stands for all natural resources that have an exchange value. It represents those natural resources that are useful and scarce. It consists of all the free natural gifts i.e., arable land, forests, livestock, minerals, oil deposits, water etc. It also consists of all the material resources beneath and around the surface of land like mineral resources and the resources above the surface of land like atmosphere and climate.

No production is possible without natural resources. So land is considered as the fundamental factor of production.

CHARACTERISTICS OF LAND

Following are the characteristics of land.

- Land is Nature's gift to man.
- Land is fixed in quantity.
- Land lacks mobility in the geographical sense.

2. LABOR

'Any mental or physical exercise of human beings which is done for the sake of material reward is called labor.'

'Any exertion of mind or body undergone partly or wholly with a view to some good other than the pleasure derived directly from the work is called labor.'

Any work, manual or mental, undertaken for a monetary consideration, is called Labor. Any work done for the sake of pleasure or love does not fall under labor. Labor is different from other factors of production. Labor is not only a means of production but also an end of production.

CHARACTERISTICS OF LABOR

Following are the characteristics of Labor.

- Labor is inseparable from laborer himself.
- Laborer has to sell his/her labor in person.

- Labor is perishable.
- Labor has a very weak bargaining power.
- Laborer has to accept the wage offered to him.
- There can be no rapid adjustment of the supply of labor to demand for it, because supply cannot be increased quickly, nor can it be reduced.

3. CAPITAL

'That part of a man's wealth which is used in producing further wealth is called Capital'.

As far the definition of capital is concerned, there are two conditions attached with capital.

- Capital is a part of wealth.
- This part of wealth helps in producing further wealth.

This shows that all the capital is a part of wealth but all the wealth is not capital. Only that part of wealth is capital which brings an income or which is used in producing further wealth.

'Produced means of production are known as Capital'.

According to this definition, capital is generally used for capital goods i.e., plants, machinery, tools, accessories, stocks of raw material, goods in process & fuel.

IMPORTANCE OF CAPITAL

- Capital plays a vital role in the modern productive system. Production without capital cannot be imagined.
- Capital raises the productivity of other factors of production. So it occupies a central position in the process of economic development.
- The process of capital formation is the cause of creation of employment opportunities in the country.

4. ENTERPRISE

The fourth factor of production is enterprise, which is supplied by the entrepreneur.

- An entrepreneur is the person who starts work, organizes and supervises it.
- He undertakes to remunerate all the factors of production: to pay rent to the landlord, interest to the capital owner, wages to labor and to make efforts for his own profit.
- 'Organizing' and 'risk-taking' are the two major functions of an entrepreneur.
- An entrepreneur is the innovator.
- Innovation may be the introduction of new method of production or an improvement in the old method.
- Innovation may be the introduction of a new commodity or a new make of an old product.
- Innovation may include the opening up of new markets.
- Innovation may also take the form of new techniques in the way of administration, finance & marketing.

- In the words of Harvey Leibenstein, an entrepreneur is the person who, "Searches and discovers economic opportunities, evaluates economic opportunities, marshals the financial resources necessary for the enterprise, makes time-binding arrangements, takes ultimate responsibility for management, is the ultimate risk-bearer, searches and discovers new economic information, translates new information into new markets, techniques and goods and provides leadership for the work groups."

RELATIVE IMPORTANCE OF FACTORS OF PRODUCTION

Production of any commodity requires the presence of all the four factors i.e., land, labor, capital & enterprise. In the absence of any of these factors, it is impossible to carry on any production process. So land, labor, capital & enterprise are the factors of production by the mutual cooperation and coordination of which goods and services are produced.

According to the Classicists, land and labor are the two basic factors of production. They consider capital and enterprise, the part of the labor. This argument has not been valid now. Every factor of production enjoys its own peculiar position. It has distinctive properties and identities.

In the present age, goods are being produced on a large scale and there are always inventions of new machines. Techniques of production are becoming complex day by day. Since every factor performs distinctive duties and functions, therefore their prices are also distinctive. Rent is the reward for the use of land. Wages are paid to the labor. Interest is the return for the use of capital. Profit is paid to the entrepreneur for undertaking the business risk. That is why labor and organization cannot be grouped together because labor gets wages whether the entrepreneur suffers losses or gains any thing.

It is very difficult to declare that such and such factors are more important and the others are less important since all the factors take part in the production process and no production process can be completed without any of these factors. It will be more realistic to say that all the factors of production are equally important.

2. LAW OF INCREASING RETURNS (LAW OF DECREASING COSTS)

LAW OF INCREASING RETURNS

'When more and more units of a variable factor are employed with the fixed factor and if it follows more than proportionate returns i.e., the marginal product of the variable factor increases, this tendency of the marginal return to rise per unit of variable factor is called the Law of Increasing Returns'.

When the units of labor, the variable factor, are applied on land, the fixed factor, the total output as well as the marginal output increases. The relationship between the units of labor and marginal output is known as the Law of Increasing Returns.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND	LABOR	MP	TP
10 Hectares	1	100	100
10 Hectares	2	150	250
10 Hectares	3	200	450
10 Hectares	4	250	700
10 Hectares	5	300	·1000

This schedule shows that the quantity of land is fixed i.e., 10 Hectares. When the labor is applied on the land, the first worker produces 100 units of the output. So the total product is 100 units and the same is the marginal product. When we apply the second worker, total production increases to 250 units and the marginal product to 150 units. As we apply more workers, the marginal product of every next worker continues to increase. This trend of Marginal Product is called Law of Increasing Returns.

EXPLANATION WITH THE HELP OF DIAGRAM
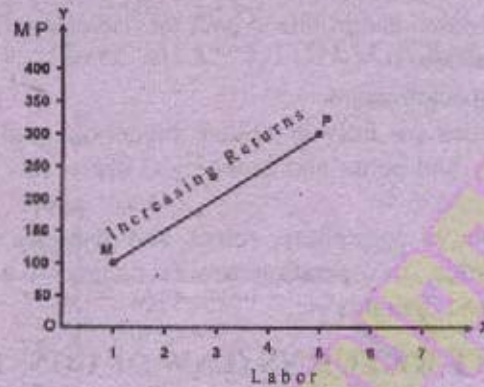
In this diagram, MP is the curve that shows the increasing trend of the marginal product. It has positive trend that shows the direct relationship between the units of labor and MP.

LAW OF DECREASING COSTS

Law of Increasing Returns is also called the Law of Decreasing Costs. When more units of labor are applied to the fixed land, the MP of labor increases, while the value of each unit of labor remains constant. The average cost declines. That is why this law is named as the Law of Diminishing Costs.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND	LABOR	WAGES	MP	TP	MC= W/MP
10 Hectares	1st	Rs.500	100	100	Rs.5.0
10 Hectares	2nd	Rs.500	150	250	Rs.3.3
10 Hectares	3rd	Rs.500	200	450	Rs.2.5
10 Hectares	4th	Rs.500	250	700	Rs.2.0
10 Hectares	5th	Rs.500	300	1000	Rs.1.7

This schedule shows that as we apply more units of labor with the fixed factor land, the

marginal product of labor increases but the wages of each unit of labor remains constant i.e., Rs.500. Therefore the average cost decreases with every increase in the units of labor.

ASSUMPTIONS OF THE LAW

Following are the assumptions of the Law of Increasing Returns.

- There is a scope in the improvement of techniques of production.
- At least one factor of production is assumed to be constant.
- Some factors are supposed to be divisible.

APPLICATION OF THE LAW

- Law of Increasing Returns applies everywhere in the initial stages till the resources are used to the optimum level.
- Its operation is prolonged in industries because man plays the dominant and vital role over there.
- The Law of Increasing Returns seems more effective in the capital-intensive industries where the scope of the division of labor is quite wide.
- Wastage of factors of production is minimized with the use of machines.
- It reduces the cost of production.
- Division of labor leads to specialization.
- Talents and abilities of labor are fully exploited. Inventions and innovations lead to improvement in technology and better and economical use of raw material that pushes down the marginal cost.
- The law is also applicable in agriculture, mines and fisheries but as nature plays dominant role in such fields, its operation sooner comes to an end. Man cannot overcomes storms, flood sand draughts etc.

3. LAW OF CONSTANT RETURNS (LAW OF CONSTANT COSTS)

LAW OF CONSTANT RETURNS

'When more and more units of a variable factor are employed with the fixed factor and if it follows proportionate returns i.e., the marginal product of the variable factor remains constant, this tendency of marginal product to remain unchanged is called Law of Constant Returns'.

This law is applicable in the business where the nature and human efforts are equally preferred i.e., the business that depends upon the natural circumstances and human hands as well. In these sectors unfavorable circumstances of one are cancelled out with the favorable circumstances of the other.

According to Marshall, carpet industry is the best example. The raw material for this industry is gotten from the sheep and the carpets are woven in manufacturing sector. Production of sheep is under the law of decreasing returns while the production of carpets is under the Law of Increasing Returns. These two opposing trends cancel out each other and the marginal product remains constant.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND	LABOR	MP	TP
10 Hectares	1	300 Units	300 Units
10 Hectares	2	300 Units	600 Units
10 Hectares	3	300 Units	900 Units
10 Hectares	4	300 Units	1200 Units
10 Hectares	5	300 Units	1500 Units

This schedule shows that the quantity of land is fixed i.e., 10 hectares. When the first unit of labor is applied, the total production is 300 units and the marginal product is also 300 units. When the second unit is applied, the total product becomes 600 units while the marginal product remains 300 units. As the units of the variable factor are increased, the marginal product of that factor remains unchanged i.e., the total product increases at a constant rate. This trend of production is called the Law of Constant Returns.

EXPLANATION WITH THE HELP OF DIAGRAM
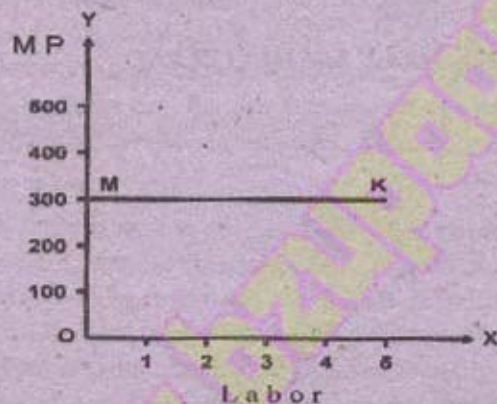
In this diagram MK curve shows the trend of constant returns. This curve is parallel to x-axis i.e., it shows that as more units of the variable factor are applied with the fixed factor, the marginal product remains constant.

ASSUMPTIONS OF THE LAW

This law is based on the following assumptions.

* In order to expand the business, factors must be available on the first price.
* The supply of raw material must be large in quantity, so that its price may not increase by the increase in its demand.

4. LAW OF DECREASING RETURNS (LAW OF INCREASING COSTS)

LAW OF DECREASING RETURNS

When more and more units of a variable factor are employed with the fixed factor and if after some limit it follows less than proportionate returns i.e., the marginal product of the

variable factor decreases, this tendency of the marginal return to decline per unit of variable factor is called the Law of Decreasing Returns'.

This law is applicable in every business after the least-cost combination is attained. If, after such combination, more units of variable factor are applied, the total product increases at a decreasing rate i.e., the marginal product of the variable factor declines.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND	LABOR	MP	TP
10 Hectares	1	300 Units	300 Units
10 Hectares	2	250 Units	550 Units
10 Hectares	3	200 Units	750 Units
10 Hectares	4	150 Units	900 Units
10 Hectares	5	100 Units	1000 Units

This schedule shows that quantity of land is fixed. When the first unit of labor is applied on it, the total product is 300 units and marginal product is also 300 units. Marginal product decreases as more units of labor are applied on land.

EXPLANATION WITH THE HELP OF DIAGRAM
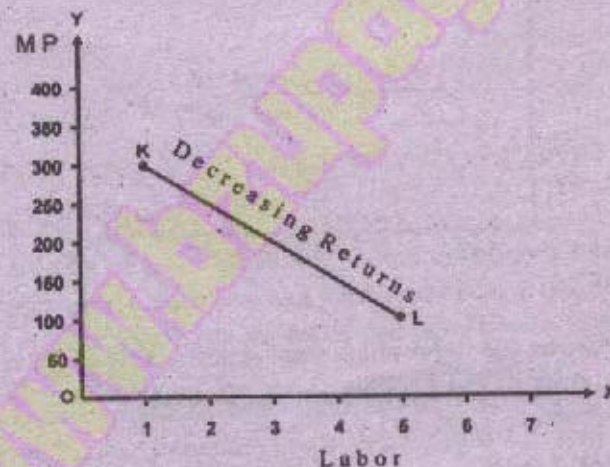
In this diagram KL is the curve that shows the trend of the marginal product. The curve shows the decreasing returns.

LAW OF INCREASING COSTS

Law of Decreasing Returns is also called the Law of Increasing Costs. When more units of a variable factor are applied with the fixed factor, the marginal product of the variable factor starts decreasing after some limit while the value of each unit of variable factor remains constant, that is why per unit cost increases. This trend of increasing per unit cost justifies the second name of this law.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND	LABOR	WAGES	MP	TP	MC= W/MP
10 Hectares	1st	Rs.500	300 Units	300 Units	Rs. 1.7
10 Hectares	2nd	Rs.500	250 Units	550 Units	Rs. 2.0
10 Hectares	3rd	Rs.500	200 Units	750 Units	Rs. 2.5
10 Hectares	4th	Rs.500	150 Units	900 Units	Rs. 3.3
10 Hectares	5th	Rs.500	100 Units	1000 Units	Rs. 5.0

This schedule shows that as we apply more units of labor with the fixed factor land, the marginal product of labor increases but the wages of each unit of labor remains constant i.e., Rs.500. Therefore the marginal cost decreases as the unit of labor are applied. When more units of labor are applied with the fixed factor land, marginal product starts declining and marginal cost increases. That is why this law is also called the Law of Increasing Costs.

ASSUMPTIONS OF THE LAW

The Law of Decreasing Returns is based on the following assumptions.
*   It is assumed that the labor is the only variable factor.
*   It is assumed that as output increases, there occurs no change in factor prices.
*   It is assumed that all the units of a variable factor are equally efficient.
*   It is assumed that there are no changes in techniques of production.
*   It is assumed that the least-cost combination of factors is achieved.

APPLICATION OF THE LAW

This law is universal and is applicable in each and every business but it affects agricultural production very soon for the following reasons;
*   Agricultural production depends upon the natural circumstances. These circumstances are often unfavorable. That is why agricultural output remains very low.
*   The quantity of land is fixed very soon because its supply is always fixed.
*   The productivity and fertility of land becomes poor after continuous cultivation. Therefore this law is implemented here very soon.
*   Agricultural product is the victim of natural calamities. That is why this law starts here very soon.

5. COMMON EXPLANATION OF LAWS OF RETURNS AND LAWS OF COST

Laws of Returns are infact the other name of laws of cost.
*   Law of Increasing Returns MP↑ → Law of Decreasing Cost MC ↓
*   Law of Constant Returns $\overline{MP}$ → Law of Constant Cost $\overline{MC}$
*   Law of Decreasing Returns MP↓ → Law of Increasing Cost MC ↑

Now we explain these laws with the help of schedule and diagram.

LAND	LABOR	W	MP	TP	MC= W/MP	STAGES OF PRODUCTION
10 Hectares	1st	Rs.500	100	100	Rs.5.0	Law of Increasing Return (Law of Decreasing Cost)
10 Hectares	2nd	Rs.500	150	250	Rs.3.3	
10 Hectares	3rd	Rs.500	200	450	Rs.2.5	
10 Hectares	4th	Rs.500	250	700	Rs.2.0	
10 Hectares	5th	Rs500	300	1000	Rs.1.7	Law of Constant Return (Law of Constant Cost)
10 Hectares	6th	Rs.500	300	1300	Rs.1.7	
10 Hectares	7th	Rs.500	300	1600	Rs.1.7	
10 Hectares	8th	Rs.500	250	1850	Rs.2.0	Law of Decreasing Return (Law of Increasing Cost)
10 Hectares	9th	Rs.500	200	2050	Rs.2.5	
10 Hectares	10th	Rs500	150	2200	Rs.3.3	
10 Hectares	11th	Rs.500	100	2300	Rs.5.0	
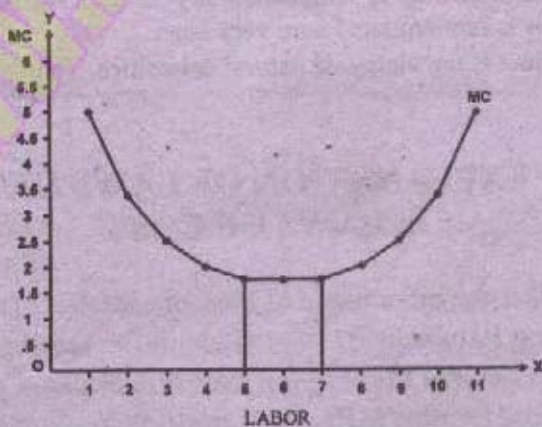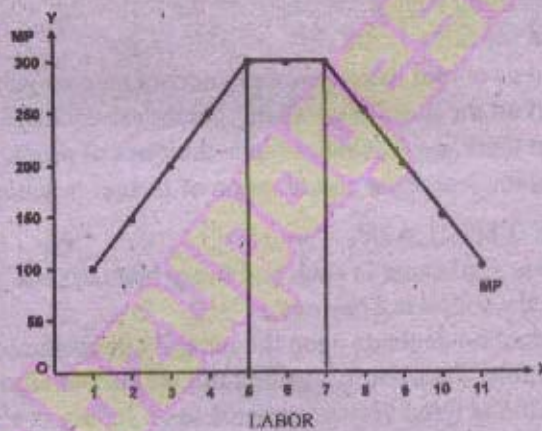
This schedule and diagram show that as we apply more units of labor with the fixed factor land, the marginal product of labor increases but the wages of each unit of labor remain

constant i.e., Rs.500. Therefore the marginal cost decreases up to fifth unit of labor. When 6th, 7th units of labor are applied with the fixed factor land, marginal product remains the same so marginal cost also remains the same. After this, marginal product start decreasing and marginal cost increases.
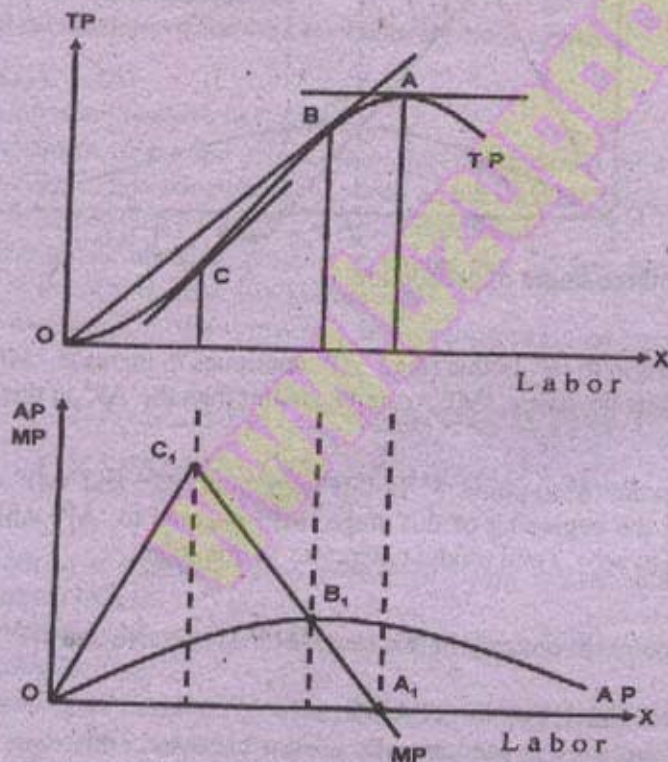
6. LAW OF VARIABLE PROPORTIONS

'The marginal product of a variable input (which is being added to that are fixed in quantity) will eventually decline'.

Law of variable proportions is also known as Law of Non- Proportional Returns' and Law of Eventually Decreasing Returns'

'An increase in some input relative to other comparatively fixed'inputs will cause output to increase but after a point, the extra output resulting from the same addition of input will become less and less'.

This law is the short run analysis of production. It has been observed that when the input of one resource is increased, keeping the inputs of other resources constant, the output increases up to a point but then it begins to decline. This relationship between one variable factor and output, holding other factors constant, is known as the Law of Variable Proportions.


This diagram (A) shows the relationship between the amount of labor and its total product. At first total product increases at an increasing rate up to point 'C'. After this point total product

still increases but at a decreasing rate up to point 'A'. After point 'A', total product starts declining.

The fact that the rate of increase in total product slows down from point 'C' is an important technological phenomenon known as the Law of Variable Proportions..

STAGES OF PRODUCTION
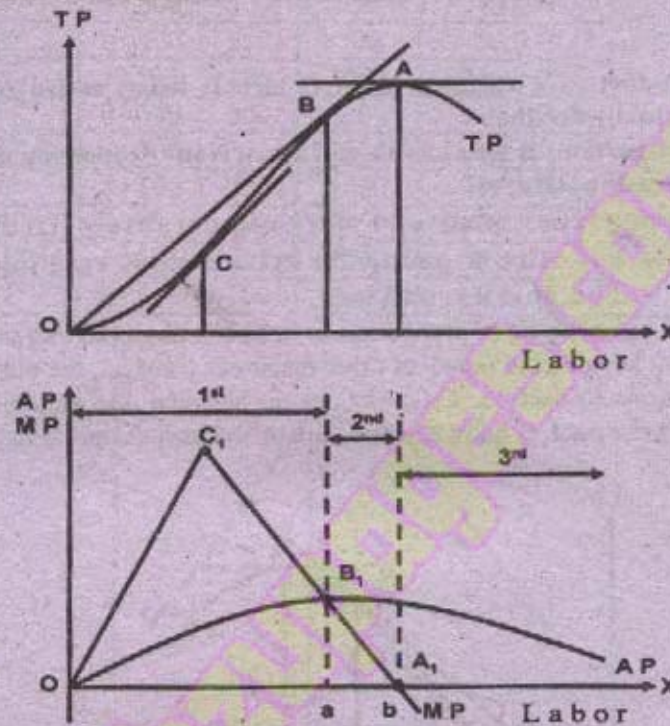
This diagram shows three stages of production.

STAGE – I
This stage is from origin to 'a'. In this stage 'AP' continues to increase. 'MP' increases, reaches its maximum and starts declining. 'MP' remains greater than the 'AP' in this stage.

STAGE – II
This stage is from point 'a' to point 'b'. In this stage both 'AP' and 'MP' decline but still they remain positive. At the beginning of this stage 'MP' is equal to 'AP' while at the end of this stage 'MP' is equal to zero. Total product increases in this stage.

STAGE – III
This stage is from point 'b' onward. In this stage 'MP' is negative and 'TP' starts declining.

ECONOMIC OR RELEVANT STAGE
It is obvious that third stage is economically useless because in this stage labor/land ratio is so high that as more labor is applied, total product declines. Similarly in the first stage land/labor ratio is so high that the marginal product of land is negative. It shows that first stage is also meaningless.

Stage second is the only stage in which the marginal products of both the inputs are positive and the producer will operate only in this stage.

The labor/land ratio, the producer will select in the second stage depends on the prices of two inputs. If the price of labor is free, the labor/land ratio that maximizes profits is attained at the end of this stage. If the price of land is zero, the best-input ratio is attained at the beginning of this stage. Law of Variable Proportions starts at point 'C_1' but economically relevant point is 'B_1' from where 'AP' starts declining.

ASSUMPTIONS OF THE LAW
Following assumptions are necessary for the validity of the law.

1. CONSTANT TECHNOLOGY
It is assumed that the technique of production should remain unchanged during the production process.

2. SHORT RUN
It is assumed that this law will be valid only in the short run since in the short run one factor must remain unchanged.

3. HOMOGENEOUS FACTORS
It is assumed that all the units of the variable factor are homogeneous.

FEATURES OF THE LAW
Following are some important features of the law.

* It is the requirement of the law that at least one input should be constant, so that the ratio, at which the inputs are combined, varies as the variable input is changed. That is why this law is named as the Law of Variable Proportions.
* The only refers to the marginal product. It means that the law may be at work while total product or average product still increasing.
* It is also the assumption of the law that technology remains constant

7. LAW OF VARIABLE PROPORTIONS WITH THE HELP OF SCHEDULE AND DIAGRAM

'The marginal product of a variable input (which is being added to that are fixed in quantity) will eventually decline'.

Law of variable proportions is also known as Law of Non-Proportional Returns' and Law of Eventually Decreasing Returns'

'An increase in some input relative to other comparatively fixed inputs will cause output to increase but after a point, the extra output resulting from the same addition of input will become less and less'.

This law is the short run analysis of production. It has been observed that when the input of one resource is increased, keeping the inputs of other resources constant, the output increases up to a

point but then it begins to decline. This relationship between one variable factor and output, holding other factors constant, is known as the Law of Variable Proportions.

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It is assumed that all the units of the variable factor are homogeneous.

EXPLANATION WITH THE HELP OF SCHEDULE

LAND (FIXED INPUT)	LABOR (VARIABLE INPUT)	TP	MP	AP	STAGES OF PRODUCTION
10 Hectares	0	0	0	0	
10 Hectares	01	04	4	4	STAGE NO I
10 Hectares	02	12	8	6	STAGE NO I
10 Hectares	03	18	6	6	
10 Hectares	04	20	2	5	STAGE NO II
10 Hectares	05	20	0	4	STAGE NO II
10 Hectares	06	18	-2	3	STAGE NO III
10 Hectares	07	14	-4	2	STAGE NO III

This schedule shows that a firm starts business with the land as a fixed factor and labor as a variable factor. As the firm adds successive units of labor to the land, the extra output added by each unit of labor increases up to the 2nd unit and after this it begins to decline. So there are various stages of production that can be explained as follows.

STAGE – I
According to the schedule when the firm employs one unit of labor on a fixed input i.e., land, 4 units of output is produced. As the firm increases the workers to two units, total output increases to 12 units. The marginal product increases from 4 to 8 units. In this stage total product increases at an increasing rate and the marginal product is greater than the average product.
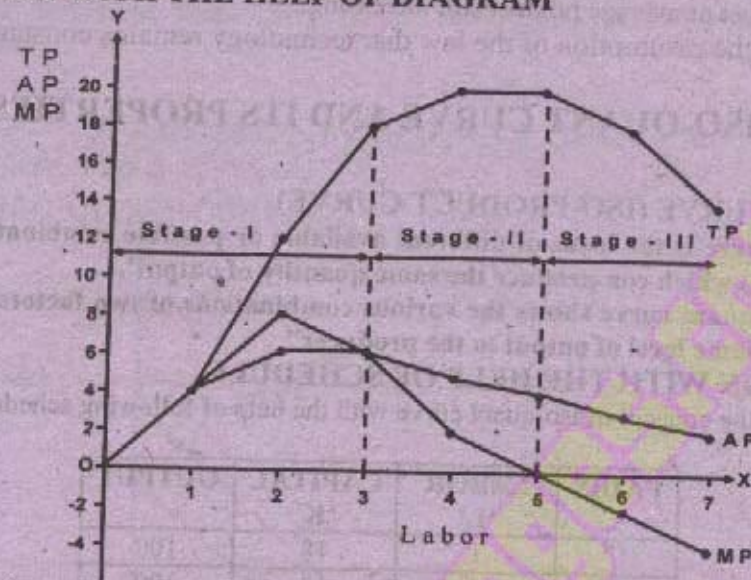
STAGE – II
In this stage total product increases but at a decreasing rate i.e., marginal product starts declining. Average product also decreases but it remains higher than the marginal product.

STAGE – III
When the firm employs 5 or more units of labor with the fixed factor land, the combination

becomes more unfavorable. Marginal product becomes zero and then negative. Total product starts declining. Average product continues to decline but remains positive.

EXPLANATION WITH THE HELP OF DIAGRAM

In this diagram TP is the total product curve, AP is the average product curve and MP is the marginal product curve.

Total product increases at an increasing rate in the first stage. Marginal product increases, reaches it maximum and remains higher than the average product in this stage.

Total product increases at a decreasing rate in the second stage. Marginal product declines and remains below the average product.

Total product is maximum in the beginning of the third stage and starts decreasing as the marginal product become negative. Average product in this stage goes on decreasing but remains positive.

ECONOMIC OR RELEVANT STAGE

It is obvious that third stage is economically useless because in this stage labor/land ratio is so high that as more labor is applied, total product declines. Similarly in the first stage land/labor ratio is so high that the marginal product of land is negative. It shows that first stage is also meaningless.

Stage second is the only stage in which the marginal products of both the inputs are positive and the producer will operate only in this stage.

The labor/land ratio, the producer will select in the second stage depends on the prices of two inputs. If the price of labor is free, the labor/land ratio that maximizes profits is attained at the end of this stage. If the price of land is zero, the best-input ratio is attained at the beginning of this stage. Law of Variable Proportions is economically relevant where 'AP' starts declining.

FEATURES OF THE LAW

Following are some important features of the law.

* It is the requirement of the law that at least one input should be constant, so that the

ratio, at which the inputs are combined, varies as the variable input is changed. That is why this law is named as the Law of Variable Proportions.

- The only refers to the marginal product. It means that the law may be at work while total product or average product still increasing.
- . It is also the assumption of the law that technology remains constant

8. ISO-QUANT CURVE AND ITS PROPERTIES

ISO-QUANT CURVE (ISO-PRODUCT CURVE)
'An iso-quant curve is the locus of different available or possible combinations of capital (K) and labor (L) which can produce the same quantity of output'.

"An iso-quant curve shows the various combinations of two factors of production which gives the same level of output to the producer"

EXPLANATION WITH THE HELP OF SCHEDULE
\We can explain the concept of iso-quant curve with the help of following schedule.

PAIRS	LABOR 'L'	CAPITAL 'K'	OUTPUT
1st	1	18	100
2nd	2	13	100
3rd	3	9	100
4th	4	6	100
5th	5	4	100
6th	6	3	100

This schedule shows that different combinations of labor and capital are available to the entrepreneur who can produce 100 units of output by using any one combination out of these available combinations because these can produce the same quantity of output.

In this diagram we can see that IQ is iso-quant curve. If the entrepreneur is at point 'a' on this curve, he uses one unit of labor and nine units of capital and if he is at point 'C', he uses three units of labor and four units of capital. Al the points at IQ show the same level of output so that entrepreneur is indifferent about these points. Iso-Quant is also known as **Production Indifference Curve.**
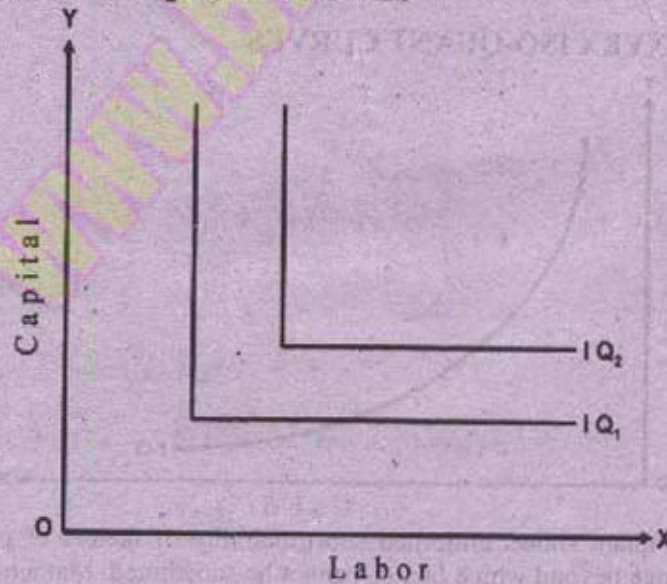
9. KINDS OF ISO-QUANT CURVES

There are four kinds of iso-quant curves.

1. LINEAR ISO-QUANT CURVES
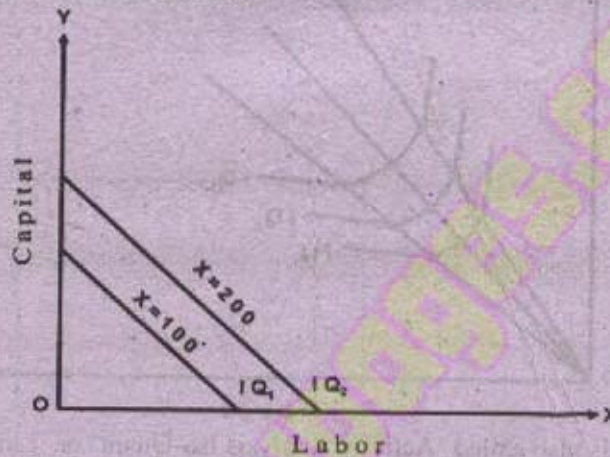
This type of iso-quant shows the perfect substitutability of factors of production. We can produce given unit of a commodity by using only labor or only capital.

2. INPUT- OUTPUT ISO-QUANT CURVES

Input-Output is also called 'LEONTIEF ISO-QUANT' after the name of Leontief who invented these iso-quant curves.

The shape of these iso-quant curves is right angle. In this case the proportion of factors of production is fixed. There is only one method of production for any one commodity.

3. KINKED ISO-QUANT CURVES
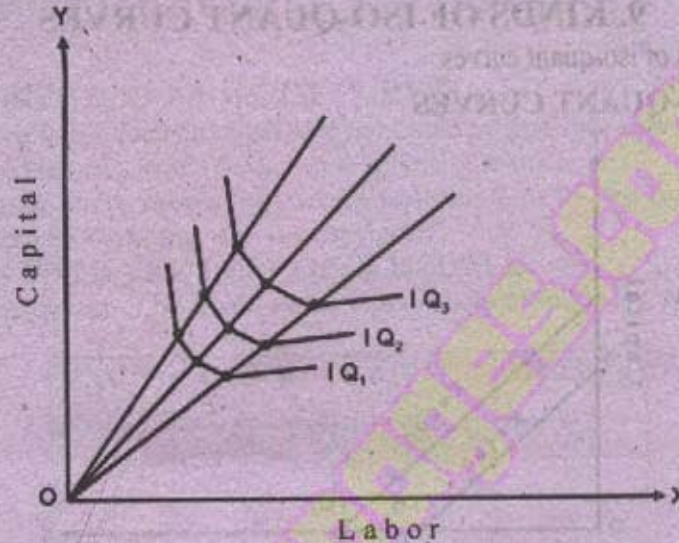
Kinked Iso-Quant is also called 'Activity Analysis Iso-Quant' or 'Linear Programming Iso-Quant'. In this case the substitutability of factors of production is limited. Substitutability is possible only at kinks. It means that there are only a few processes for producing any one commodity. This is more practical case in the real world.

4. SMOOTH CONVEX ISO-QUANT CURVES
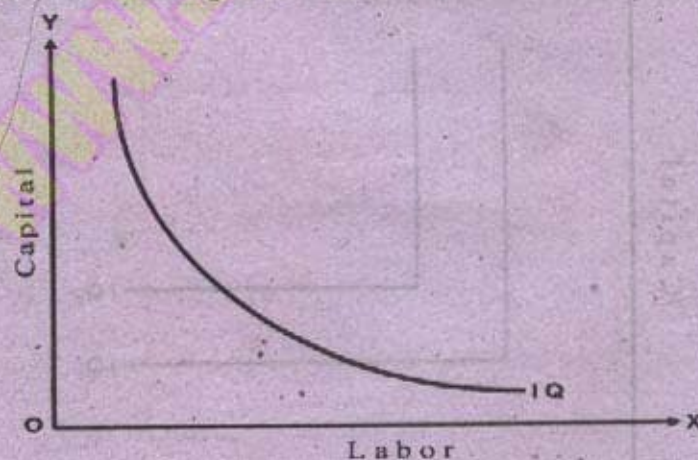
This type of iso-quant shows unlimited substitutability of factors of production but only over a certain range beyond which factors cannot be substituted. Mathematically these types

of iso-quant curves are easier to handle.

10. PROPERTIES OF ISO-QUANT CURVES

Iso-quant curves and indifference curves are greatly resembled. An iso-quant curve shows a given amount of output produced by various combinations of two inputs while an indifference curve shows various combinations of two goods that yield a given level of satisfaction. Therefore the properties of iso-quant curves resemble to those of indifference curves.

1. **An iso-quant must be negatively sloped. To maintain a given output, a reduction in the use of an input must be offset by an increased use of another input.**
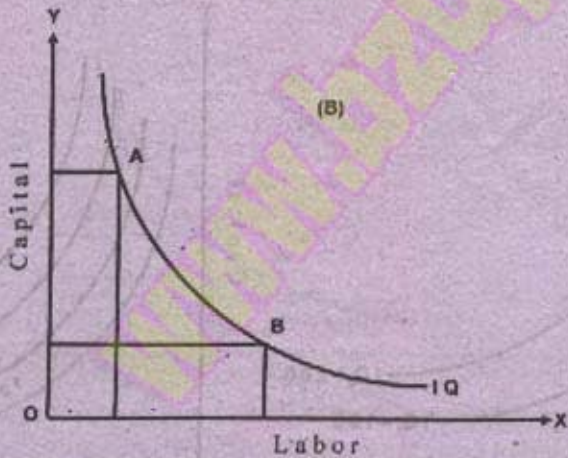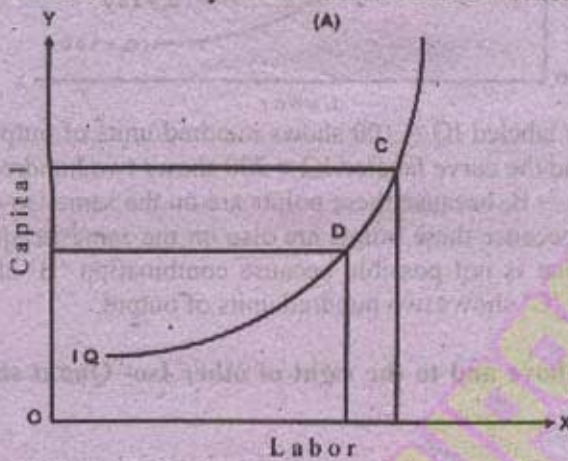
In this diagram (A), we can see that combination 'C' uses more of 'k' and 'l' as compared to combination 'D'. It means that process 'C' is inefficient.

In this diagram (B), combination 'A' uses more capital than combination 'B' while combination 'B' uses more labor than combination 'A'.

2. Iso-quant curves neither touch nor intersect each other.
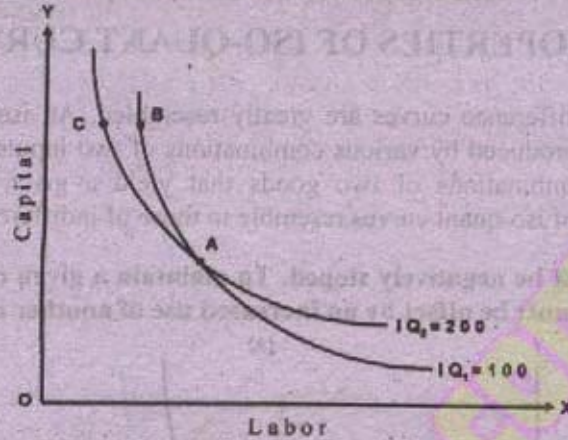
In this diagram the curve labeled IQ = 100 shows hundred units of output produced by vari combinations of inputs and the curve labeled IQ = 200 shows two hundred units of output.

On the curve IQ = 100, A = B, because these points are on the same iso-quant. Similarly on curve IQ = 200, A = C, because these points are also on the same iso-quant. It means that these should be equal to 'C' that is not possible because combination 'B' shows hundred units of out output while combination 'C' shows two hundred units of output.

3. An Iso-Quant lying above and to the right of other Iso- Quant shows a higher level output.
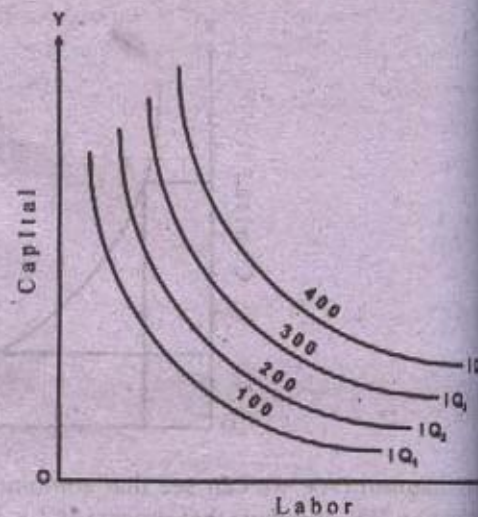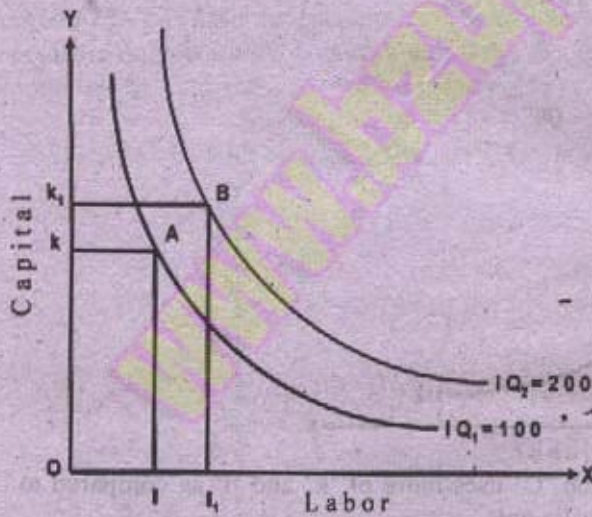
In these diagrams, combination 'B' shows 200 units of output while combination 'A' shows units of output. Combination 'B' shows more units of output as compared to combination Combination 'B' lies on IQ_2. Therefore IQ_2 shows higher level of output as compared to Different iso-quant curves show different amounts output. Higher iso-quant shows hig
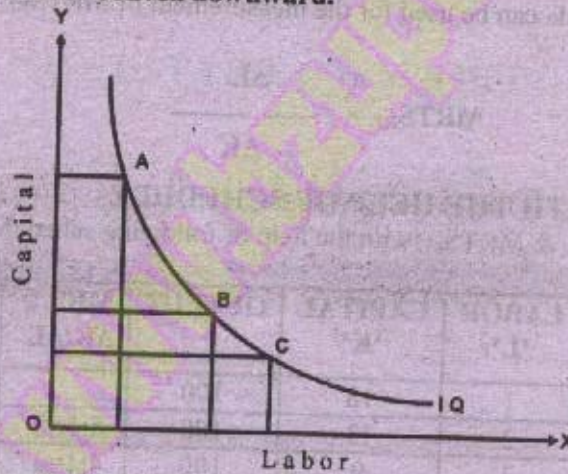
quantity of output and vice versa.

4. In between two Iso-quant curves, there can be a number of Iso-quant curves.
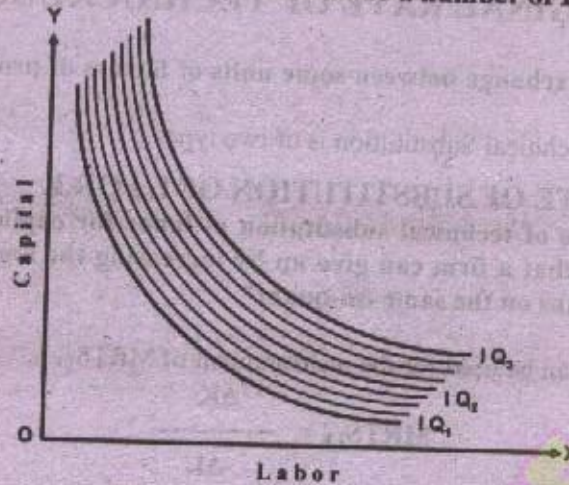
In this diagram, we can see that IQ1, IQ2 & IQ3 show different levels of output but in between these Iso-quant curves, there are many other Iso-quant curves, which show the different levels of output.

5. An Iso-Quant must be convex downward.

Convexity means that tangent line should be below the curve. In this diagram, Iso-quant curve is convex and $MRTS_{LK}$ is decreasing. We can see that if we want to use more of labor we will have to reduce the use of capital to maintain a given level of output.

11. MARGINAL RATE OF TECHNICAL SUBSTITUTION

"MRTS is the rate of exchange between some units of factors of production L & K which are equally preferred."

The Marginal Rate of Technical Substitution is of two-types.

1. MARGINAL RATE OF SUBSTITUTION OF L FOR K

'The marginal rate of technical substitution of labor for capital, $MRTS_{LK}$, refers the amount of capital that a firm can give up by increasing the amount of labor used one unit and still remains on the same iso-quant'.

Following formula can be used for the measurement of $MRTS_{LK}$.

$$MRTS_{LK} = \frac{\Delta K}{\Delta L}$$

2. MARGINAL RATE OF SUBSTITUTION OF K FOR L

'The marginal rate of technical substitution of capital for labor, $MRTS_{KL}$, refers the amount of labor that a firm can give up by increasing the amount of capital use by one unit and still remains on the same iso-quant'.

Following formula can be used for the measurement of $MRTS_{KL}$.

$$MRTS_{KL} = \frac{\Delta L}{\Delta K}$$

EXPLANATION WITH THE HELP OF SCHEDULE

We can explain $MRTS_{LK}$ & $MRTS_{KL}$ with the help of following schedule.

PAIRS	LABOR 'L'	CAPITAL 'K'	OUTPUT	MRS_{LK} $\Delta K/\Delta L$	MRS_{KL} $\Delta L/\Delta K$
1st	1	18	100	---------	1:5=0.20
2nd	2	13	100	5:1=5	1:4=0.25
3rd	3	9	100	4:1=4	1:3=0.33
4th	4	6	100	3:1=3	1:2=0.50
5th	5	4	100	2:1=2	1:1=1.00
6th	6	3	100	1:1=1	-----------

An iso-quant shows various combinations of inputs that produce a given output and the slope the iso-quant shows the rate at which one input can be substituted for the other with changing the given output.
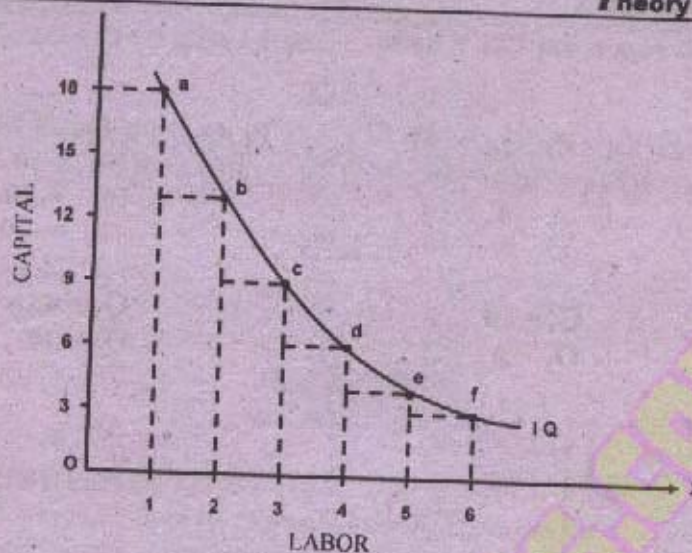
In this figure, if we move from point 'a' to 'b' along iso-quant, the amount of capital used is reduced by ΔK and that of labor is increased by ΔL. The slope of iso-quant between the two points, 'A' and 'B', ΔK/ΔL, shows the rate at which two inputs can be substituted for each other.

$$MRTS_{LK} = \Delta K/\Delta L$$

12. ISO-COST LINE (FIRM'S BUDGET LINE)

"Iso-Cost Line shows the various combinations or a pairs of two factors of production where firm's income is equal to firm's expenditure on these factors of production while prices of factors of production and firm's income (total outlay) are given."

"Budget Line is the locus of combinations or pairs of two factors of production that can be purchased if the firm's entire money income is spent."

$$P_L . Q_L + P_K . Q_K = M$$

M= Total resources possessed by the Firm.

This condition shows that **total expenditures** on two factors of production must be equal to the resources possessed by the producer i.e., all the resources of the producer must be spent.

This definition of Firm's Budget Line has three points which are as follows:

- Budget Line is the locus of points.
- Each point shows a combination of two factors of production L & K.
- The producer has to spend all of his resources if he wants to purchase any of these combinations.

Suppose that price of labor 'P_L' and the price of capital 'P_K' is **rupee one** per unit and the total
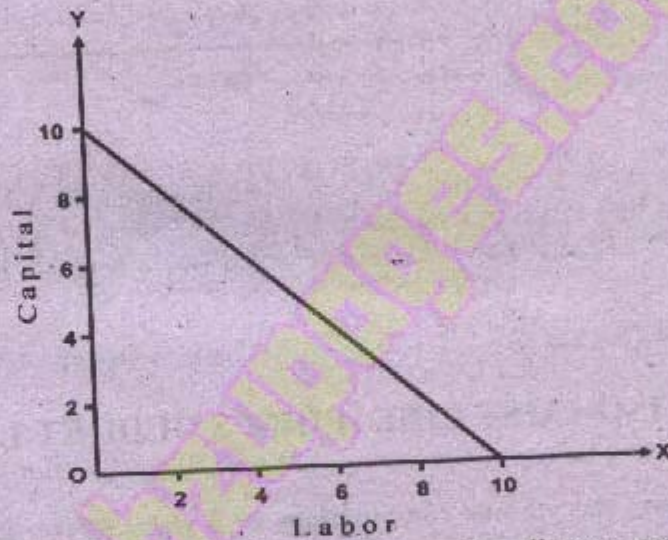
outlay of the firm is **rupees ten** T.O. = Rs.10

$$P_L.Q_L + P_K.Q_K = M$$
$$1(10) + 1(0) = 10$$
$$10 + 0 = 10$$
$$10 = 10$$

$$P_L.Q_L + P_K.Q_K = M$$
$$1(0) + 1(10) = 10$$
$$0 + 10 = 10$$
$$10 = 10$$

$$Q_x = 10$$
$$Q_y = 0$$

$$Q_x = 0$$
$$Q_y = 10$$

Labor

The firm can buy 10 units of L or 10 units of K by spending all resources. But if the firm wan
to buy both the factors of production, it can buy them in different combinations.
In this diagram we see that if the firm spends all of its total outlay on capital, it can purchase
10 units of capital. If the firm spends all of its total outlay on labor, it can buy 10 units of labor. B
joining these two points by a straight line, we get the iso-cost line of the firm.

SLOPE OF THE ISOCOST LINE
The formula to find out the slope of an Iso-cost line is Rise/Run. So according to this formula:

$$P_L.Q_L + P_K.Q_K = M$$
$$P_L.Q_L + P_K(0) = M$$
$$P_L.Q_L = M$$
$$Q_L = M/P_L$$

$$P_L.Q_L + P_K.Q_K = M$$
$$P_L.(0) + P_K.Q_K = M$$
$$P_K.Q_K = M$$
$$Q_K = M/P_K$$

$$Q_L = M/P_L$$
$$Q_K = 0$$

$$Q_L = 0$$
$$Q_K = M/P_K$$

Slope of the Budget Line = Rise / Run

So the Slope of the Budget Line = $\dfrac{M/P_K}{M/P_L}$

Slope of the Budget Line = $\dfrac{M}{P_K}$ $\quad X \quad$ $\dfrac{P_L}{M}$

Slope of the iso-cost Line = $\dfrac{P_L}{P_K}$

SHIFT IN ISO-COST LINE

Iso-cost Line may shift from its original position. There can be two possibilities.

- Prices of both factors of production remaining the same, if income (total outlay) of the firm changes, the Iso-cost Line will shift parallel to the or inal Iso-cost Line accordingly.
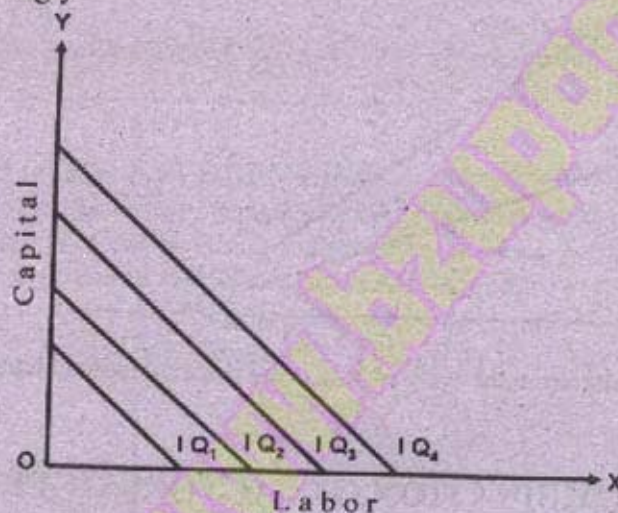
If the income (total outlay) of the firm increases or decreases or if the prices of both inputs increase and decrease, the iso-cost line will shift upward or downward.
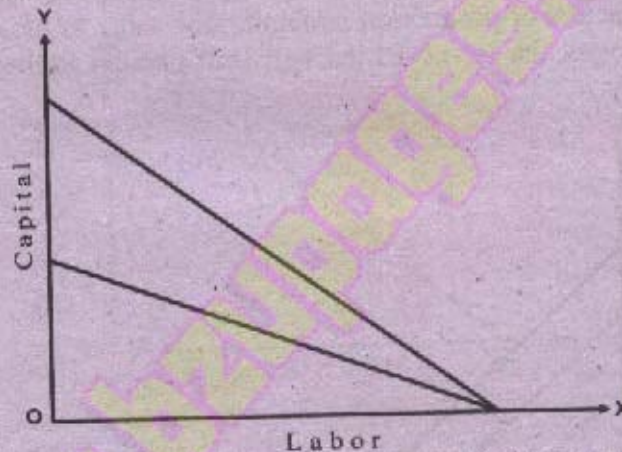
ROTATION OF ISO-COST LINE

Income (total outlay) of the firm and the price of one factor of production remaining the same, if the price of other factor of production changes, iso-cost line will rotate accordingly
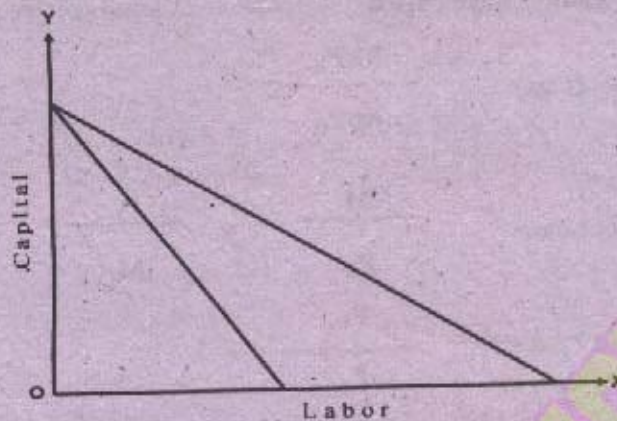
This diagram shows the rotation in the iso-cost line if the price of labor changes and the price of capital remain constant.

This diagram shows the rotation in the iso-cost line if the price of capital changes and the price of labor remain constant.

13. OPTIMUM COMBINATION OF FACTORS OF PRODUCTION WITH THE HELP OF ISO-QUANT CURVE THEORY

ISO-QUANT CURVE (ISO-PRODUCT CURVE)
'An iso-quant curve is the locus of different available or possible combinations of capital (K) and labor (L) which can produce the same quantity of output'.
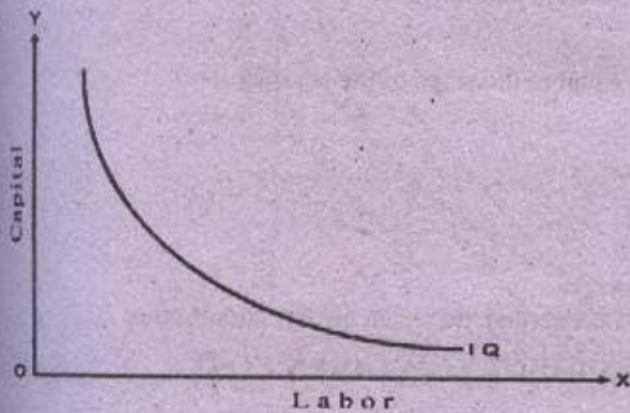
"An iso-quant curve shows the various combinations of two factors of production which gives the same level of output to the producer"

EXPLANATION WITH THE HELP OF SCHEDULE
We can explain the concept of iso-quant curve with the help of following schedule.

PAIRS	LABOR 'L'	CAPITAL 'K'	OUTPUT
1st	1	18	100
2nd	2	13	100
3rd	3	9	100
4th	4	6	100
5th	5	4	100
6th	6	3	100

This schedule shows that different combinations of labor and capital are available to the entrepreneur who can produce 100 units of output by using any one combination out of these available combinations because these can produce the same quantity of output

In this diagram we can see that IQ is iso-quant curve. If the entrepreneur is at point 'a' on this curve, he uses one unit of labor and nine units of capital and if he is at point 'C', he uses three units of labor and four units of capital. Al the points at IQ show the same level of output so that entrepreneur is indifferent about these points. Iso-Quant is also known as **Production Indifference Curve.**

ISO-COST LINE (FIRM'S BUDGET LINE)

"Iso-Cost Line shows the various combinations or a pairs of two factors of production where firm's income is equal to firm's expenditure on these factors of production while prices of factors of production and firm's income (total outlay) are given."

$$P_L.Q_L + P_K.Q_K = M$$

M= Total resources possessed by the Firm.
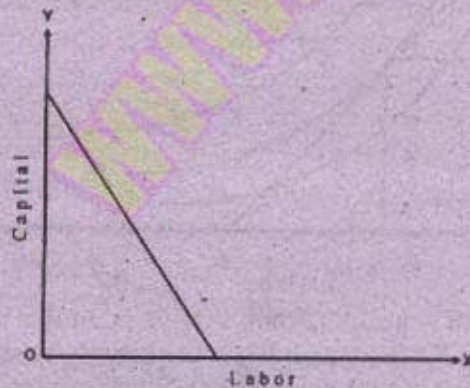
EQUILIBRIUM OF THE FIRM

The objective of the firm is to maximize its profit and when it achieves the target, it is said to be in equilibrium.

ASSUMPTIONS
- The goal of the firm is profit maximization.
- The price of output is given.
- The prices of inputs are given.

CONDITIONS
There are two conditions for a firm to be in equilibrium.

1. NECESSARY CONDITION
The slope of the iso-cost should be equal to the slope of the iso-quant.

$$\frac{P_L}{P_K} = MRTS_{LK}$$

2. SUFFICIENT CONDITION
Iso-quant should be convex to the origin.

As far the equilibrium of the firm is concerned, there can be two possibilities.

A) MAXIMIZATION OF OUTPUT SUBJECT TO A GIVEN COST
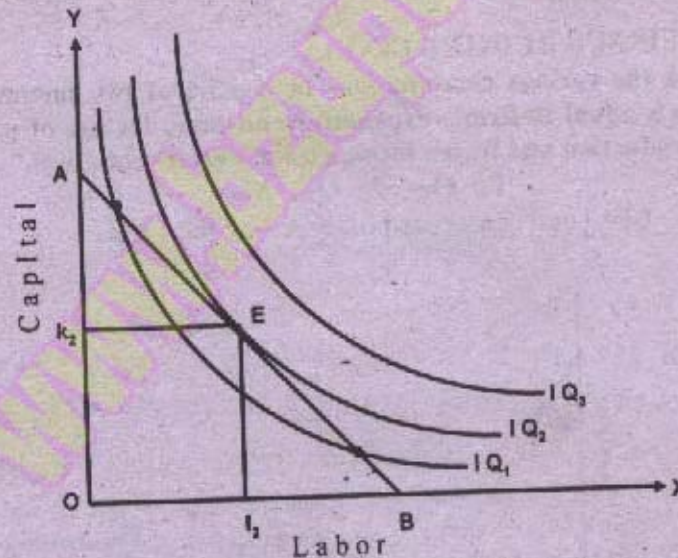
This diagram shows that the firm is in equilibrium at point E. At this point the slope of iso-cost curve and the slope of iso-quant IQ_2 are equal. IQ_2 is the highest iso-quant that can be achieved by the firm subject to a cost constraint. At point E, the optimal combination of inputs is 'K_2' and 'L_2'. At point E both the conditions are fulfilled.

- The slope of Iso-Quant at point E, $\Delta K / \Delta L$ is equal to the slope of iso-cost curve P_L / P_K.
- The second condition is also fulfilled because IQ_2 is convex to the origin.

B) MINIMIZATION OF COST FOR A GIVEN LEVEL OF OUTPUT

In the above case we had given iso-cost line but in this case we have given iso-quant and we have to minimize the cost of the firm for a given level of production. In this case equilibrium conditions will be the same as in the case above.
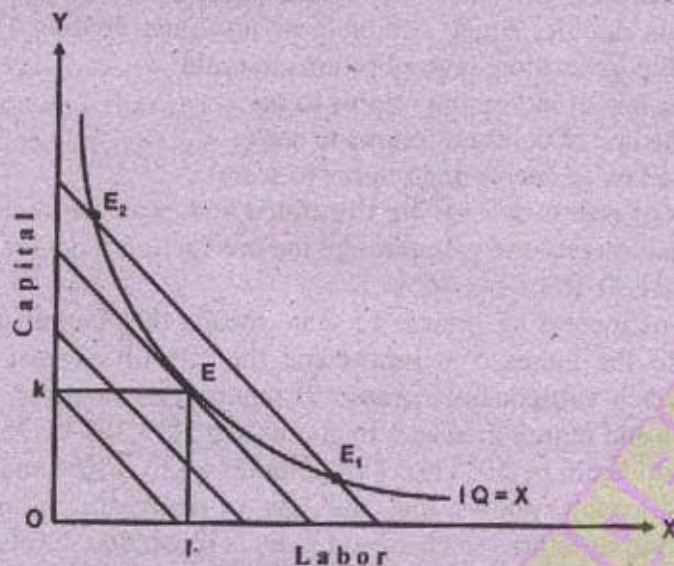
In this diagram, we can see that to acquire 'x' level of output least cost combination is 'L, K'. The firm will be in equilibrium at point E, because at this point slopes of iso-cost and iso-quant are equal.

Points below E are desirable, because they show lower costs but are not attainable for output 'x'. Points above E show higher costs. So point E is least-cost point.

14. THE LAWS OF RETURN TO SCALE

"Returns to Scale" refers to the degree by which output changes as a result of a given change in the quantity of all inputs used in the production. We will use iso-quants to analyze input-output relationship under the condition that both the inputs (labour and capital) are variable and their quantity is changed *proportionately and simultaneously*. When both the inputs are changed proportionately, the scale of production, i.e., the size of the firm, changes. The laws of production that pertain to the input-output relationships under the condition of changing scale of production are called the *Laws of Returns to Scale*. The laws of returns to scale are a long-term phenomenon. In the long run, supply of both labour and capital is changed. The firms can therefore employ more of both labour and capital to increase their production.

THREE LAWS OF RETURNS TO SCALE

When all the inputs are increased *proportionately* (i.e., by some multiple of the existing scale), there are technically three possible ways in which total output may increase:

(i)   it may increase more than proportionately,

(ii)   it may increase proportionately, and

(iii)   it may increase less than proportionately.

For example, if both the inputs (labour and capital) are doubled, the resulting output may be more than double, equal to double or less than double. This kind of inputs-outputs relationship gives three laws of returns to scale:

(i)   the law of increasing returns to scale

(ii)   the law of constant returns to scale

(iii)   the law of decreasing returns to scale

These three laws of return to scale are illustrated and explained below first graphically with the help of iso-quants and then through the *production function*.

INCREASING RETURNS TO SCALE

The law of increasing returns to scale means that output increases more than proportionately to the increase in inputs and the rate of increase in output goes on increasing with each subsequent increase in inputs. For example, suppose inputs are increased by 50% and output increases by more than 50%, say by 75%, and when inputs are again increased again by 50% and output increases by 100% and so on. This kind of input-output relationship shows that the law of increasing returns to scale is in operation. This kind of returns to change in scale is illustrated in following diagram.
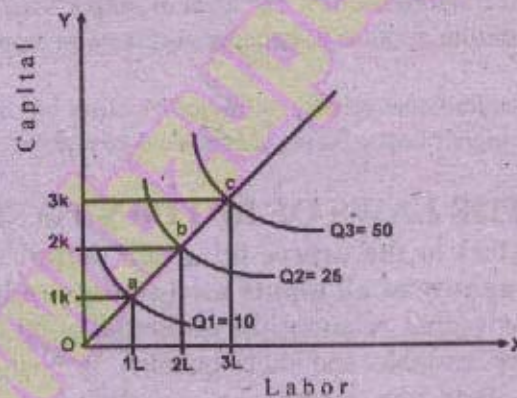
The three iso-quants – Q_1, Q_2 and Q_3 – represent three different levels of production – 10 units, 25 units and 50 units, respectively. For instance, movement from point *a* to *b* denotes doubling the inputs, labour and capital. As in diagram shows, input combination increases from $1K + 1L$ to $2K + 2L$. The movement from *a* and *b* also indicates increase in output from 10 units to 25 units. This means that when inputs are doubled, output is more than doubled.

Similarly, movement from point *b* to *c* shows increase in inputs from $2K + 2L$ to $3K + 3L$, i.e., a 50% increase in inputs, and a rise in output from 25 units to 50 units, i.e.

a 100% rise in output. This also gives a more than proportionate increase in the output in response to rise in inputs. This shows the *law of increasing returns to scale.*

CONSTANT RETURNS TO SCALE

When change in output is proportional to the change in inputs, it shows constant returns to scale. In other words, if quantities of both the inputs, K and L, are doubled and output is also doubled, then the returns to scale are constant. The constant returns to scale, is illustrated in following diagram.
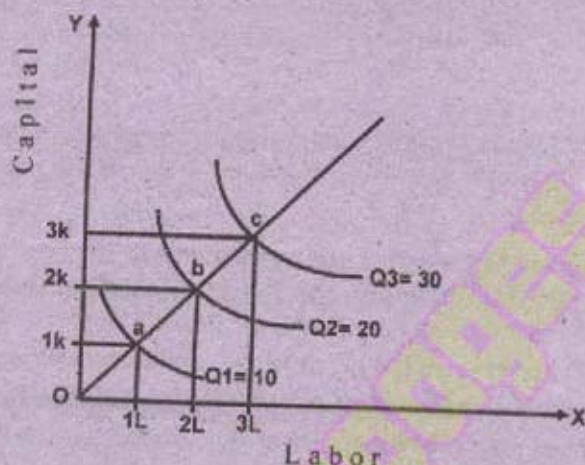
The iso-quants, $Q_1 = 10$, $Q_2 = 20$ and $Q_3 = 30$ indicate three different levels of output. In the figure, the movement from point a to b indicates doubling both the inputs – capital increases from $1K$ to $2K$ and labour increases from $1L$ to $2L$. When inputs are doubled, output is also doubled, i.e., output increases from 10 to 20. The movement from b to c indicates 50% increase in the inputs, as K increases from $2K$ to $3K$ and L from $2L$ to $3L$. As a result, output increases from 20 to 30, i.e., by 50%. This relationship between the change in inputs and the proportionate change in output may be summed up of as follows:

$$1K + 1L = Q = 10$$
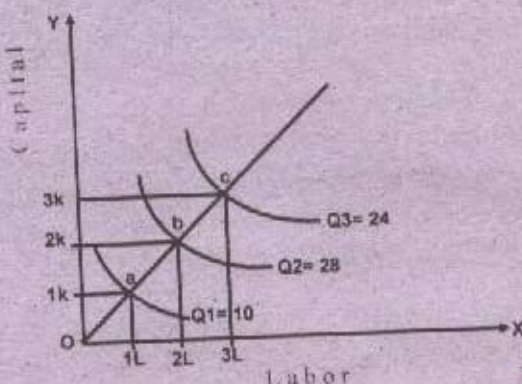$$2K + 2L = 2Q = 20$$
$$3K + 2L = 3Q = 30$$

This kind of input-output relationship exhibits the constant returns to scale.

DECREASING RETURNS TO SCALE

When output increases less than proportionately to increase in inputs, K and L, and the rate of rise in output goes on decreasing it is called decreasing returns to scale. Decreasing returns to scale is illustrated in following diagram.

As the diagram shows, when inputs, K and L, are doubled, i.e., capital increases from $1K$ to $2K$ and labour increases from $1L$ to $2L$, the output increases from 10 to 18 units, i.e., 80 percent increase, which is less than the proportionate increase in inputs. The movement from point b to c shows a 50 percent increase in the inputs. But, the output increases only by 33.3 percent. This show decreasing returns to scale.

LAWS OF VARIABLE PROPORTIONS AND RETURNS TO SCALE COMPARED

The basic difference between the **laws of returns to a variable factor** (law of variable proportions) and the **laws of returns to scale** lies in the assumptions on which these laws are based.

(a) In case of the laws of returns to variable factor, only one input is variable—all other inputs remaining constant—whereas in case of the laws of returns to scale, all the inputs are variable.

(b) The laws of returns to a variable factor is a short urn fact because supply of capital in the short run is fixed. On the contrary, the laws of returns to scale are long run fact because supply of all the inputs in the long run is elastic and more and more of all the inputs can be employed.

In nutshell, therefore, the law of returns to a variable factor uses a single-variable production function whereas the laws of returns to scale are based on a two-variable production function.

15. SCALE OF PRODUCTION

Scale of production is related to the volume of production. Whether goods are produced on limited scale or an extensive large scale is of utmost importance because it affects the cost.

DETERMINANTS OF SCALE OF PRODUCTION

The decision about the scale of production is made keeping in view the following factors:

1. FINANCIAL RESOURCES

Scale of production depends upon the extent and volume of financial resources. If the entrepreneur can acquire an extensive piece of land, build a modern building on it, buy and install ultra modern equipment, higher the services of trained skilled labor, spend enough amount on research, publicity, transport and communication, attain specialization with division of labor, he will choose large scale of business and vice versa.

2. TECHNIQUE OF PRODUCTION

Technical knowledge and its application in production is of utmost importance in production because it determines the scale of production. If the traditional tools and implements are used, the scale of production will remain small and vice versa.

While determining the scale and technique of production, the prices of factors of production are also taken into consideration. If labor is cheaper than capital, labor intensive technique is adopted and the scale of production is small. When capital is cheaper than labor, capital intensive technique is adopted and the scale of production is large.

3. EXTENT OF THE MARKET

Extent of the market plays a vital role in determining the scale of production. When the market is nation wide and international and the demand is durable, the scale of production is large. On the other hand, the scale of production is small when the market is local and the demand is seasonal and perishable.

4. ENTREPRENEURAL ABILITY

If the entrepreneur is equipped with administrative abilities, intelligence, business insight and experience, he will be willing to innovate and undertake business risks, the scale of production will be large and vice versa.

5. MEANS OF TRANSPORT

If the means of transport are cheap, quick, and efficient, transportation of raw material and equipment to the manufacturing units and the carriage of finished goods to the markets and households become easy and less expensive. The market in that case extended and the scale of production becomes large and vice versa.

16. LARGE SCALE PRODUCTION

Output is large under the large scale production. Machines are being commonly used in production now a days. Labor works diligently and efficiently in factories. Raw material, capital, technology are being used on quite a large scale. Large scale production has become the order of the day. From match stick to ships, everything is being produced on large scale in advanced countries of the world.

ADVANTAGES/MERITS OF THE LARGE SCALE PRODUCTION

Economies of large scale are being enjoyed in capitalism. Following are the advantages of the large scale production.

1. ECONOMY IN LABOR AND SKILL

Large scale production is based on the principle of division of labor. Every worker is

assigned the duty which suits his aptitude, talent and skill. The repetition of assignments saves the time and improves efficiency of labor. The economical use of labor helps in lowering the cost of production.

2. ECONOMY IN BUYING AND SELLING
Raw material is bought in bulk which is had at competitive prices. It affects the cost of production. Finished goods are easily brought into the market. Lower carriage cost, saving of commission paid to brokers, low per head cost on publicity and advertisement cause reduction in the cost of production. Cheap goods are made available to the consumers at lower prices. It extends the demand and promotes investment. It also increases the margin of profit for the organizers.

3. EFFICIENT USE OF CAPITAL
Different types of machines are used in the large scale production. Due to division of labor, each machine is operated by an efficient hand. No plant remains un-operated and unattended. It leads to the economical use of capital which reduces the cost.

4. ECONOMY IN THE OVERHEAD CHARGES
Expenses of administration and distribution per unit of output in large scale production are lesser. Interest, rent, pay bill, and other overhead charges remain the same whatever the scale of production. The same amount of expenditures is distributed over a large output and thus the cost per unit falls.

5. ECONOMY IN THE USE OF RAW MATERIAL
Much of the waste raw material and the by-product is left with the firm after the manufacturing process. It is burnt or thrown away under the small scale production which pushes up the cost but properly utilized in the secondary supplementary industries in the large scale production which reduces the cost.

6. RESEARCH AND EXPERIMENTS
Due to vast financial resources, the entrepreneurs allocate a part of capital for research and experiments which greatly improve the technique of production. Inventions and innovations open the doors for the economical use of raw material. It extends the scope of internal economies. Better technology improves the quality of goods and reduces the cost of production.

7. ADVANTAGES OF INCREASING RETURNS
Research and experiments, inventions and innovations which bring about improvements in the technique of production and economy in the use of capital equipments, plants and raw material enable the entrepreneur to suspend the operation of the Law of Decreasing Returns and prolong the operation of the Law of Increasing Returns. Marginal cost declines with the expansion of enterprise.

8. ABILITY TO FACE ECONOMIC CRISES
Disparity between aggregate demand and aggregate supply creates economic crises. Small scale enterprises are unable to face the situation due to weak financial position and administrative set up. Large scale entrepreneur faces the situation boldly due to his business

insight, large financial resources and deep extensive knowledge about the market trend.

9. ECONOMY IN REPAIRS

The large scale enterprises usually maintain their workshops to repair and replace the outworn plants and equipments. The time and money both are saved when the repairing facilities are provided in the same premises.

10. PUBLICITY AND ADVERTISEMENT

Goods are produced much earlier and its demand is created later on through publicity and advertisement. A big concern can easily afford the huge expenditure on these items. The cost of publicity comes down when production is on a large scale.

11. ECONOMY IN SPECIALIZED SERVICES

Division of labor leads to specialization which results in more output and of better quality. The services of able managers are acquired who possess business insight to study the market trends. Goods are produced according to their studies, observations and recommendations.

12. ECONOMY IN FIXED COST

In a big concern, the fixed costs like rent, interest, salaries of specialized staff etc. are spread over large quantity which reduces the average cost.

DISADVANTAGES/DEMERITS OF LARGE SCALE PRODUCTION

Following are the disadvantages of the large scale production:

1. INDIFFERENCE TO DETAILS

A large scale entrepreneur is always engaged in major problems. He mostly fails to give any attention to the details of things. Cost is adversely affected due to the dishonesty of workers and wastage of raw materials. He leaves the matter to the paid staff which is least interested in his welfare.

2. LACK OF PERSONAL CONTACT

Hundreds and thousands of workers perform their duties in a factory. They are supervised by paid staff. The entrepreneur seldom turns up. There is no personal contact between the employer and the employees which creates several misunderstandings between them. Such mis-understandings lead to strikes and lock outs which are harmful for the enterprise.

3. OVER-PRODUCTION AND UNEMPLOYMENT

Disparity between aggregate demand and aggregate supply has become a common feature in capitalism. When aggregate supply exceeds the aggregate demand, the prices and profits begin to fall which discourages investment. The entrepreneurs either cut down their output or close down the enterprise which leads to unemployment. Unemployment creates multiple social, economic, and political problems.

4. ABUSES OF MONOPOLY

Big concerns wipe out the small concerns by selling the goods below the cost of production. They make up the losses due to their vast financial resources. The small producer, with limited financial resources, cannot face the situation and soon collapses. After his exit from

the market, the big entrepreneur succeeds in establishing his monopoly over the market and makes up all the losses by overcharging and exploiting the helpless consumers.

5. LACK OF INITIATIVE AND DRIVE

Large scale production is a mass production. Goods of uniform quality are produced. Customers' preferences and tastes are ignored. Professions like embroidery work and wood and metal carving are wiping out because no machine can be used for such works. The initiative and drive of the labor are on the decline because of the monotony of the division of work. Specialization and division of work has done more harm to them than any benefit.

6. SOCIAL EVILS

Workers of all ages and sex work under the same roof which creates multiple social, moral, and ethical problems. Sexual provision, smoking and indifference to others are doing havoc in society.

7. DEPENDENCE ON FOREIGN MARKET

The big concerns mostly depend upon the foreign markets. They have to import capital goods from abroad. Spare parts, fuel, and industrial raw material are also imported from the foreign countries. During wars or other political disturbances, the foreign markets are cut off which suspend the economic activities.

8. CUT THROAT COMPETITION

Cut throat competition is very common in the large scale production which is harmful for the society. Many promising entrepreneurs are ruined due to such competition. When the competition is on international level, it leads to complications, conflicts and sometimes wars because every nation struggles to capture the market.

17. SMALL SCALE PRODUCTION

Output is small and limited under the small scale production. Method and technique of production beside the division of labor is simple. Labor is manual and tools are simple and traditional. Goods are produced for local markets.

ADVANTAGES/MERITS OF SMALL SCALE PRODUCTION

Following are the advantages of the small scale production:

1. PERSONAL INTEREST AND CONTACT

Personal contact of employer with the employees rules out the possibilities of strike. Peace prevails in the concern which means prosperity. Personal contact with the customers keeps them well satisfied. Custom is stable and demand is steady. This means absence of risk. As there is direct and close contact between the producer and the consumers, he produces according to the likes and dislikes of the consumers.

2. INDEPENDENCE AND RESPONSIBILITY

Small producer is independent and sovereign. He can handle the situation without any interference. He makes quick decisions and implement them quickly. He possesses more

initiate and drive. He has greater sense of responsibility. He does not need any checks to prevent fraud or eliminate waste of labor or material.

3. PRODUCTION ACCORDING TO DEMAND

Small producer can change the output according to demand. He manufactures according to fluctuating conditions. He cannot afford to produce disregarding the changing fashion. His personal likings and taste are dominant in the production decision. As the production is exactly according to demand, there is no danger of over-production which leads to slump and wide spread unemployment.

4. SELF INTEREST

Small entrepreneur is usually the sole proprietor. Self interest is a strong spur to all his activities. He works long and late, seven days a week. Hard work is bound to make a success of business.

DISADVANTAGES/DEMERITS OF SMALL SCALE PRODUCTION

Following are the disadvantages of the small scale production:

1. INTERNAL AND EXTERNAL DISECONOMIES

Small concern is mostly deprived of internal and external economies. Such economies are usually enjoyed by the large concerns.

2. LACK OF DIVISION OF LABOR

There is little scope for division of labor and specialization. There are a few labors who perform the whole process. It reduces there efficiency, hence the cost of production increases.

3. LACK OF CAPITAL

Shortage of capital is the main obstacle for the small concern to use modern equipment and labor saving devices. Due to weak financial position, social status and integrity, he fails to get loans on easy terms. Financial limitations do not enable him to face the economic crises.

4. COSTLY RAW MATERIAL AND HIGHER COST OF PRODUCTION

Small scale producer is not at an advantageous position to buy the raw material and other accessories at cheaper rates. Cost of rent, interest, publicity per unit is higher. He has to bear higher overhead charges. Outdated technique of production pushes up the cost and reduces the margin of profit.

18. ECONOMIES OF SCALE

Large scale business enjoys some sort of benefits only due to its volume. These benefits are called Economies of Scale. Prof. Alfred Marshall classified these economies of scale into Internal & External economies.

INTERNAL ECONOMIES OF SCALE

Internal economies consist of all such benefits and advantages which can be enjoyed by only a particular firm. These benefits are accrued to the firm only due to the personal efforts of its

entrepreneur. These economies are as follows:

1. MANAGERIAL ECONOMIES
Large firm enjoys the benefits of managerial economies because the ratio of increase in management remains lower than the ratio of increase in the size of the business. It is possible due to specialization.

2. SALE AND PURCHES ECONOMIES
A large firm has to buy raw material in huge quantity, so the firm gets it on concessional rates and in the same manner the firm sells a greater quantity of its production, so it pays commission on concessional rates.

3. FINANCIAL ECONOMIES
The larger firm can obtain loans from the banks on special discounted rate of interest due to its good-will in the market.

4. ECONOMIES OF FACTORS OF PRODUCTION
An efficient and experienced entrepreneur utilizes the factors of production in the way that the cost of production is minimized.

5. BY-PRODUCTS
The entrepreneur of the large firm can utilize the waste of the production by making by-products. In this way the firm can get extra benefit from the business.

EXTERNAL ECONOMIES OF SCALE
External economies are such benefits and advantages which are not particularly meant for any particular firm. They are open for all the firms and entrepreneurs. They equally derive benefits from them and reduce the cost. External economies are as follows:

1. TRANSPORT FACILITIES
In case of localization of industries, the government usually provides the means of transport and communication which are jointly utilized by all the firms.

2. BANKING FACILITIES
Localization and concentration of industries at a particular place induce the banks to establish their branches over there and provide easy and cheap credit facilities to the firms.

3. REPAIRING FACILITIES
Localization of industries also paves the way for opening of workshops for repairing the depreciated equipments. Machines, technicians and machine-men gather at one place to provide quick and efficient service which save the time and reduce the cost of repairing.

4. ESTABLISHMENT OF AUXILIARY INDUSTRIES
Concentration and localization of industries encourage the establishment of several auxiliary industries over there which facilitates production and reduce the cost. In the vicinity of car industry, rubber industry producing tyres and tubes, jacks and other allied industries are also set up.

5. ESTABLISHMENT OF SECONDARY INDUSTRIES

Waste raw material usually induces the establishment of many secondary industries which positively affect the cost of production. Wooden toys industry uses the waste of furniture industry.

6. RESEARCH CENTERS

Localization of industries also encourages the setting up of research centers which ultimately result some inventions and thereby improves the technique of production.

7. TRAINING FACILITIES FOR LABOR

Expansion of industries increases the importance of trained and skilled labor. Increase in their demand raises the wage level which induces the local population to acquire skill and education. The skilled trained persons get job. All the firms can get benefit from this trained skilled labor force.

QUESTIONS FOR REVIEW

Q No.1   What are the Factors of Production? What is the relative importance of factors of production?

Q No.2   State & explain the Law of Increasing Returns. What are its assumptions & exceptions? Also explain that why this law is called the Law of Decreasing Costs?

Explain the Law of Increasing Return with the help of table & diagram. Why it applies to manufacturing sector?

Explain Law of Increasing Returns. Whether this law operates in Industrial Sector only?

Q No.3   State & explain the Law of Constant Returns. Give its assumptions.

Q No.4   State & explain the Law of Decreasing Returns. Also give its assumptions, limitations & application in Agricultural Sector. Why this law is called the Law of Increasing Costs?   **OR**

Explain Law of Decreasing Returns. Whether this Law operates in agricultural sector only?

Explain the Law of Diminishing Returns.

Q No.5   State & explain the Law of Variable Proportions.

Q No.6   State & explain the Law of Variable Proportions with the help of schedule & diagram.

Q No.7   What is Iso-Quant? Discuss its various kinds. What are its properties?

Q No.8   Write short notes on the following:
- Marginal Rate of Technical Substitution
- Isocost Line

Q No.9   Explain the Equilibrium of the firm with the help of Iso-quant curves.

Q No.10   What is Scale of Production? How it can be determined?

Q No.11   Explain the Merits & Demerits of Large Scale Business.

Q No.12   Explain the Merits & Demerits of Small Scale Business.

Q No.13   What are the Economies of Scale? Explain the Internal & External Economies of Scale.