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DEPARTMENT OF MODERN OFFICE MANAGEMENTLECTURER NOTES

SEMESTER-1st, PAPER- Micro Economics

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Unit-1

Elasticity is a concept in economics that talks about the effect of change in one economic variable on the other.

Elasticity of Demand, on the other hand, specifically measures the effect of change in an economic variable on the quantity demanded of a product. There are several factors that affect the quantity demanded for a product such as the income levels of people, price of the product, price of other products in the segment, and various others.

Let's begin our blog with a definition of Elasticity of Demand and then we will explore the different types of Elasticity of Demand.

Elasticity of Demand

Elasticity of Demand, or Demand Elasticity, is the **measure of change in quantity demanded of a product in response to a change in any of the market variables, like price, income etc.** It measures the shift in demand when other economic factors change.

In other words, the elasticity of demand is the **percentage change in quantity demanded divided by the percentage change in another economic variable**.

The demand for a commodity is affected by different economic variables:

1. Price of the commodity
2. Price of related commodities
3. Income level of consumers

"The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price".
– Alfred Marshall, British Economist

3 Types of Elasticity of Demand

On the basis of different factors affecting the quantity demanded for a product, elasticity of demand is categorized into mainly three categories: **Price Elasticity of Demand (PED), Cross Elasticity of Demand (XED), and Income Elasticity of Demand (YED)**.

Let us look at them in detail and their examples.

1. Price Elasticity of Demand (PED)

Any change in the price of a commodity, whether it's a decrease or increase, affects the quantity demanded for a product. For example, when there is a rise in the prices of ceiling fans, the quantity demanded goes down.

This measure of responsiveness of quantity demanded when there is a change in price is termed as the Price Elasticity of Demand (PED).

The mathematical formula given to calculate the Price Elasticity of Demand is:

PED = % Change in Quantity Demanded % / Change in Price

The result obtained from this formula determines the intensity of the effect of price change on the quantity demanded for a commodity.

2. Income Elasticity of Demand (YED)

The income levels of consumers play an important role in the quantity demanded for a product. This can be understood by looking at the difference in goods sold in the rural markets versus the goods sold in metro cities.

The Income Elasticity of Demand, also represented by YED, refers to the sensitivity of quantity demanded for a certain good to a change in real income (the income earned by an individual after accounting for inflation) of the consumers who buy this good, keeping all other things constant.

The formula given to calculate the Income Elasticity of Demand is given as:

YED = *% Change in Quantity Demanded% / Change in Income*

The result obtained from this formula helps to determine whether a good is a necessity good or a luxury good.

3. Cross Elasticity of Demand (XED)

In a market where there is an oligopoly, multiple players compete. Thus, the quantity demanded for a product does not only depend on itself but rather, there is an effect even when prices of other goods change.

Cross Elasticity of Demand, also represented as XED, is an economic concept that measures the sensitiveness of quantity demanded of one good (X) when there is a change in the price of another good (Y), and that's why it is also referred to as Cross-Price Elasticity of Demand.

The formula given to calculate the Cross Elasticity of Demand is given as:

XED = *(% Change in Quantity Demanded for one good (X)%) / (Change in Price of another Good (Y))*

The result obtained for a substitute good would always come out to be positive as whenever there is a rise in the price of a good, the demand for its substitute rises. Whereas, the result will be negative for a complementary good.

These three types of Elasticity of Demand measure the sensitivity of quantity demanded to a change in the price of the good, income of consumers buying the good, and the price of another good.

Apart from these three types, we have some other types of Elasticity of Demand which we would look at now.

5 other types of Elasticity of Demand

The effect of change in economic variables is not always the same on the quantity demanded for a product.

The demand for a product can be elastic, inelastic, or unitary, depending on the rate of change in the demand with respect to the change in the price of a product.

On the basis of the amount of fluctuation shown in the quantity demanded of a good, it is termed as **'elastic'**, **'inelastic'**, and **'unitary'.**

- An **elastic demand** is one that shows a larger fluctuation in the quantity demanded of a product, in response to even a little change in another economic variable. For example, if there is a hike of $0.5 in the price of a cup of coffee, there are very high chances of a steep decline in the quantity demanded.

- An **inelastic demand** is one that shows a very little fluctuation in the quantity demanded with respect to a change in another economic variable. An example of this can be petrol or diesel.

- **Unitary elasticity** is one in which the fluctuation in one variable and quantity demanded is equal.

We can further classify these elastic and inelastic types of demand into five categories.

Demand Curves

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1. Perfectly Elastic Demand

When there is a sharp rise or fall due to a change in the price of the commodity, it is said to be perfectly elastic demand.

In perfectly elastic demand, even a small rise in price can result in a fall in demand of the good to zero, whereas a small decline in the price can increase the demand to infinity.

However, perfectly elastic demand is a total theoretical concept and doesn't find a real application, unless the market is perfectly competitive and the product is homogenous.

The degree of elasticity of demand helps to define the slope and shape of the demand curve. Therefore, we can determine the elasticity of demand by looking at the slope of the demand curve.

A Flatter curve will represent a higher elastic demand. Thus, the slope of the demand curve for a perfectly elastic demand is horizontal.

2. Perfectly Inelastic Demand

A perfectly inelastic demand is the one in which there is no change measured against a price change.

Like perfectly elastic demand, the concept of perfectly inelastic is also a theoretical concept and doesn't find a practical application. However, the demand for necessity goods can be the closest example of perfectly inelastic demand.

The numerical value obtained from the PED formula comes out as zero for a perfectly inelastic demand.

The demand curve for a perfectly inelastic demand is a vertical line i.e. the slope of the curve is zero.

3. Relatively Elastic Demand

Relatively elastic demand refers to the demand when the proportionate change in the demand is greater than the proportionate change in the price of the good. The numerical value of relatively elastic demand ranges between one to infinity.

In relatively elastic demand, if the price of a good increases by 25% then the demand for the product will necessarily fall by more than 25%.

Unlike the aforementioned types of demand, relatively elastic demand has a practical application as many goods respond in the same manner when there is a price change.

The demand curve of relatively elastic demand is gradually sloping.

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4. Relatively Inelastic Demand

In a relatively inelastic demand, the proportionate change in the quantity demanded for a product is always less than the proportionate change in the price.

For example, if the price of a good goes down by 10%, the proportionate change in its demand will not go beyond 9.9..%, if it reaches 10% then it would be called unitary elastic demand.

The numerical value of relatively inelastic demand always comes out as less than 1 and the demand curve is rapidly sloping for such type of demand.

5. Unitary Elastic Demand

When the proportionate change in the quantity demanded for a product is equal to the proportionate change in the price of the commodity, it is said to be unitary elastic demand.

The numerical value for unitary elastic demand is equal to 1. The demand curve for unitary elastic demand is represented as a rectangular hyperbola.

Price Elasticity of Demand

Price elasticity of demand is a measurement of the change in the consumption of a product in relation to a change in its price. Expressed mathematically, it is:

Price Elasticity of Demand = Percentage Change in Quantity Demanded ÷ Percentage Change in Price

Economists use price elasticity to understand how supply and demand for a product change when its price changes.1 Like demand, supply also has an elasticity, known as price elasticity of supply. Price elasticity of supply refers to the relationship between change in supply and change in price. It's calculated by dividing the percentage change in quantity supplied by the percentage change in price. Together, the two elasticities combine to determine what goods are produced at what prices.

KEY TAKEAWAYS

- Price elasticity of demand is a measurement of the change in consumption of a product in relation to a change in its price.
- A good is perfectly elastic if the price elasticity is infinite (if demand changes substantially even with minimal price change).
- If price elasticity is greater than 1, the good is elastic; if less than 1, it is inelastic.
- If a good's price elasticity is 0 (no amount of price change produces a change in demand), it is perfectly inelastic.
- If price elasticity is exactly 1 (price change leads to an equal percentage change in demand), it is known as unitary elasticity.
- The availability of a substitute for a product affects its elasticity. If there are no good substitutes and the product is necessary, demand won't change when the price goes up, making it inelastic.

What Is Elasticity

Economists have found that the prices of some goods are very inelastic.2 That is, a reduction in price does not increase demand much, and an increase in price does not hurt demand, either. For example, gasoline has little price elasticity of demand. Drivers will continue to buy as much as they have to, as will airlines, the trucking industry, and nearly every other buyer.

Other goods are much more elastic, so price changes for these goods cause substantial changes in their demand or their supply.2

Not surprisingly, this concept is of great interest to marketing professionals.1 It could even be said that their purpose is to create inelastic demand for the products that they market. They achieve that by identifying a meaningful difference in their products from any others that are available.

If the quantity demanded of a product changes greatly in response to changes in its price, it is elastic. That is, the demand point for the product is stretched far from its prior point. If the quantity purchased shows a small change after a change in its price, it is inelastic. The quantity didn't stretch much from its prior point.

Factors That Affect Price Elasticity of Demand

Availability of Substitutes

The more easily a shopper can substitute one product for another, the more the price will fall. For example, in a world in which people like coffee and tea equally, if the price of coffee goes up, people will have no problem switching to tea, and the demand for coffee will fall. This is because coffee and tea are considered good substitutes for each other.

Urgency

The more discretionary a purchase is, the more its quantity of demand will fall in response to price increases. That is, the product demand has greater elasticity.3

Say you are considering buying a new washing machine, but the current one still works; it's just old and outdated. If the price of a new washing machine goes up, you're likely to forgo that immediate purchase and wait until prices go down or the current machine breaks down.

The less discretionary a product is, the less its quantity demanded will fall. Inelastic examples include luxury items that people buy for their brand names. Addictive products are quite inelastic, as are required add-on products, such as inkjet printer cartridges.

One thing all these products have in common is that they lack good substitutes. If you really want an Apple iPad, then a Kindle Fire won't do. Addicts are not dissuaded by higher prices, and only HP ink will work in HP printers (unless you disable HP cartridge protection).

Duration of Price Change

The length of time that the price change lasts also matters.3 Demand response to price fluctuations is different for a one-day sale than for a price change that lasts for a season or a year.

Clarity of time sensitivity is vital to understanding the price elasticity of demand and for comparing it with different products. Consumers may accept a seasonal price fluctuation rather than change their habits.

Types of Price Elasticity of Demand

Price elasticity of demand can be categorized according to the number calculated by dividing the percentage change in quantity demanded by the percentage change in price. These categories include the following:

Types of Price Elasticity of Demand

If the percentage change in quantity demanded divided by the percentage change in price equals:	**It is known as:**	**Which means:**
Infinity	Perfectly elastic	Changes in price result in demand declining to zero
Greater than 1	Elastic	Changes in price yield a significant change in demand
1	Unitary	Changes in price yield equivalent (percentage) changes in demand
Less than 1	Inelastic	Changes in price yield an insignificant change in demand
0	Perfectly	Changes in price yield no change

Types of Price Elasticity of Demand

	inelastic	in demand

Example of Price Elasticity of Demand

As a rule of thumb, if the quantity of a product demanded or purchased changes more than the price changes, then the product is considered to be elastic (for example, the price goes up by 5%, but the demand falls by 10%).

If the change in quantity purchased is the same as the price change (say, 10% ÷ 10% = 1), then the product is said to have unit (or unitary) price elasticity.

Finally, if the quantity purchased changes less than the price (say, -5% demanded for a +10% change in price), then the product is deemed inelastic.

To calculate the elasticity of demand, consider this example: Suppose that the price of apples falls by 6% from $1.99 a bushel to $1.87 a bushel. In response, grocery shoppers increase their apple purchases by 20%. The elasticity of apples is thus: 0.20 ÷ 0.06 = 3.33. The demand for apples is quite elastic.

What is price elasticity of demand

Price elasticity of demand is the ratio of the percentage change in quantity demanded of a product to the percentage change in price. Economists employ it to understand how supply and demand change when a product's price changes.

What makes a product elastic

If a price change for a product causes a substantial change in either its supply or its demand, it is considered elastic. Generally, it means that there are acceptable substitutes for the product. Examples would be cookies, luxury automobiles, and coffee.

What makes a product inelastic

If a price change for a product doesn't lead to much, if any, change in its supply or demand, it is considered inelastic. Generally, it means that the product is considered to be a necessity or a luxury item for addictive constituents. Examples would be gasoline, milk, and iPhones.

What is the importance of price elasticity of demand

Knowing the price elasticity of demand of a good allows someone selling that good to make informed decisions about pricing strategies. This metric provides sellers with information about consumer pricing sensitivity. It is also key for makers of goods to determine manufacturing plans, as well as for governments to assess how to impose taxes on goods.

Elasticity of Demand

A change in the price of a commodity affects its demand. We can find the elasticity of demand, or the degree of responsiveness of demand by comparing the percentage price changes with the quantities demanded. In this article, we will look at the concept of elasticity of demand and take a quick look at its various types.

Elasticity of Demand

To begin with, let's look at the definition of the elasticity of demand: "Elasticity of demand is the responsiveness of the quantity demanded of a commodity to changes in one of the variables on which demand depends. In other words, it is the percentage change in quantity demanded divided by the percentage in one of the variables on which demand depends."

The variables on which demand can depend on are:

- Price of the commodity
- Prices of related commodities
- Consumer's income, etc.

Let's look at some examples:

a. The price of a radio falls from Rs. 500 to Rs. 400 per unit. As a result, the demand increases from 100 to 150 units.
b. Due to government subsidy, the price of wheat falls from Rs. 10/kg to Rs. 9/kg. Due to this, the demand increases from 500 kilograms to 520 kilograms.

In both cases above, you can notice that as the price decreases, the demand increases. Hence, the demand for radios and wheat responds to price changes.

Types of Elasticity of Demand

Based on the variable that affects the demand, the elasticity of demand is of the following types. One point to note is that unless otherwise mentioned, whenever the elasticity of demand is mentioned, it implies price elasticity.

Price Elasticity

The price elasticity of demand is the response of the quantity demanded to change in the price of a commodity. It is assumed that the consumer's income, tastes, and prices of all other goods are steady. It is measured as a percentage change in the quantity demanded divided by the percentage change in price. Therefore,

$$\text{Price Elasticity} = E_p = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

Or,

Ep=Change in Quantity×100Original QuantityChange in Price×100Original Price

=Change in QuantityOriginal Quantity×Original PriceChange in Price

Income Elasticity

The income elasticity of demand is the degree of responsiveness of the quantity demanded to a change in the consumer's income. Symbolically,

EI=Percentage change in quantity demandedPercentage change in income

Cross Elasticity

The cross elasticity of demand of a commodity X for another commodity Y, is the change in demand of commodity X due to a change in the price of commodity Y. Symbolically,

$Ec = \frac{\Delta qx}{\Delta py} \times \frac{py}{qx}$

Where,

Ec is the cross elasticity,

Δqx is the original demand of commodity X,

Δqx is the change in demand of X,

Δpy is the original price of commodity Y, and

Δpy is the change in price of Y.

Unit-2

Law of Variable Proportions: Assumptions, Explanation , Stages , Causes of Applicability and Applicability of the Law of Variable Proportions!

Law of Variable Proportions occupies an important place in economic theory. This law is also known as Law of Proportionality.

Keeping other factors fixed, the law explains the production function with one factor variable. In the short run when output of a commodity is sought to be increased, the law of variable proportions comes into operation.

Therefore, when the number of one factor is increased or decreased, while other factors are constant, the proportion between the factors is altered. For instance, there are two factors of production viz., land and labour.

Land is a fixed factor whereas labour is a variable factor. Now, suppose we have a land measuring 5 hectares. We grow wheat on it with the help of variable factor i.e., labour. Accordingly, the proportion between land and labour will be 1: 5. If the number of laborers is increased to 2, the new proportion between labour and land will be 2: 5. Due to change in the proportion of factors there will also emerge a change in total output at different rates. This tendency in the theory of production called the Law of Variable Proportion.

Definitions:

"As the proportion of the factor in a combination of factors is increased after a point, first the marginal and then the average product of that factor will diminish." Benham

"An increase in some inputs relative to other fixed inputs will in a given state of technology cause output to increase, but after a point the extra output resulting from the same additions of extra inputs will become less and less." Samuelson

"The law of variable proportion states that if the inputs of one resource is increased by equal increment per unit of time while the inputs of other resources are held constant, total output will increase, but beyond some point the resulting output increases will become smaller and smaller." Leftwitch

Assumptions:

Law of variable proportions is based on following assumptions:

(i) Constant Technology:

The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

(ii) Factor Proportions are Variable:

The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

(iii) Homogeneous Factor Units:

The units of variable factor are homogeneous. Each unit is identical in quality and amount with every other unit.

(iv) Short-Run:

The law operates in the short-run when it is not possible to vary all factor inputs.

Explanation of the Law:

In order to understand the law of variable proportions we take the example of agriculture. Suppose land and labour are the only two factors of production.

By keeping land as a fixed factor, the production of variable factor i.e., labour can be shown with the help of the following table:

Table 1.

Units of Land	Units of Labour	Total Production	Average Production	Marginal Production	
10 Acres	0	–	–	–	
"	1	20	20	20	
"	2	50	25	30	1st stage
"	3	90	30	40	MP > AP
"	4	120	30	30	AP = MP
"	5	140	28	20	
"	6	150	25	10	2nd stage
"	7	150	21.3	0	MP=0 and TP Maximum
"	8	140	17.5	–10	3rd stage MP < 0

From the table 1 it is clear that there are three stages of the law of variable proportion. In the first stage average production increases as there are more and more doses of labour and capital employed with fixed factors (land). We see that total product, average product, and marginal product increases but average product and marginal product increases up to 40 units. Later on, both start decreasing because proportion of workers to land was sufficient and land is not properly used. This is the end of the first stage.

The second stage starts from where the first stage ends or where AP=MP. In this stage, average product and marginal product start falling. We should note that marginal product falls at a faster rate than the average product. Here, total product increases at a diminishing rate. It is also maximum at 70 units of labour where marginal product becomes zero while average product is never zero or negative.

The third stage begins where second stage ends. This starts from 8th unit. Here, marginal product is negative and total product falls but average product is still positive. At this stage, any additional dose leads to positive nuisance because additional dose leads to negative marginal product.

Graphic Presentation:

In fig. 1, on OX axis, we have measured number of labourers while quantity of product is shown on OY axis. TP is total product curve. Up to point 'E', total product is increasing at increasing rate. Between points E and G it is increasing at the decreasing rate. Here marginal product has started falling. At point 'G' i.e., when 7 units of labourers are employed, total product is maximum while, marginal product is zero. Thereafter, it begins to diminish corresponding to negative marginal product. In the lower part of the figure MP is marginal product curve.

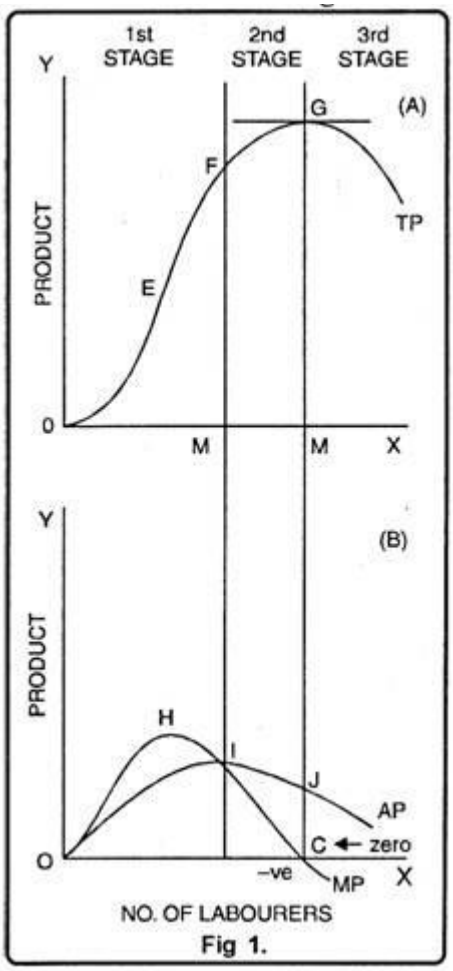

Fig 1.

Up to point 'H' marginal product increases. At point 'H', i.e., when 3 units of labourers are employed, it is maximum. After that, marginal product begins to decrease. Before point 'I' marginal product becomes zero at point C and it turns negative. AP curve represents average product. Before point 'I', average product is less than marginal product. At point 'I' average product is maximum. Up to point T, average product increases but after that it starts to diminish.

Three Stages of the Law:

1. First Stage:

First stage starts from point 'O' and ends up to point F. At point F average product is maximum and is equal to marginal product. In this stage, total product increases initially at increasing rate up to point E. between 'E' and 'F' it increases at diminishing rate. Similarly marginal product also increases initially and reaches its maximum at point 'H'. Later on, it begins to diminish and becomes equal to average product at point T. In this stage, marginal product exceeds average product (MP > AP).

2. Second Stage:

It begins from the point F. In this stage, total product increases at diminishing rate and is at its maximum at point 'G' correspondingly marginal product diminishes rapidly and becomes 'zero' at point 'C'. Average product is maximum at point 'I' and thereafter it begins to decrease. In this stage, marginal product is less than average product (MP < AP).

3. Third Stage:

This stage begins beyond point 'G'. Here total product starts diminishing. Average product also declines. Marginal product turns negative. Law of diminishing returns firmly manifests itself. In this stage, no firm will produce anything. This happens because marginal product of the labour becomes negative. The employer will suffer losses by employing more units of labourers. However, of the three stages, a firm will like to produce up to any given point in the second stage only.

The law of returns to scale explains the proportional change in output with respect to proportional change in inputs.

In other words, the law of returns to scale states when there are a proportionate change in the amounts of inputs, the behavior of output also changes.

The degree of change in output varies with change in the amount of inputs. For example, an output may change by a large proportion, same proportion, or small proportion with respect to change in input.

On the basis of these possibilities, law of returns can be classified into three categories:

i. Increasing returns to scale

ii. Constant returns to scale

iii. Diminishing returns to scale

1. Increasing Returns to Scale:

If the proportional change in the output of an organization is greater than the proportional change in inputs, the production is said to reflect increasing returns to scale. For example, to produce a particular product, if the quantity of inputs is doubled and the increase in output is more than double, it is said to be an increasing returns to scale. When there is an increase in the scale of production, the average cost per unit produced is lower. This is because at this stage an organization enjoys high economies of scale.

Figure-13 shows the increasing returns to scale:

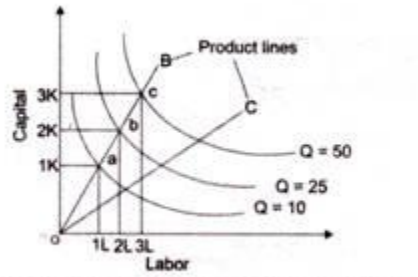

Figure-13: Increasing Returns to Scale

In Figure-13, a movement from a to b indicates that the amount of input is doubled. Now, the combination of inputs has reached to 2K+2L from 1K+1L. However, the output has Increased from 10 to 25 (150% increase), which is more than double. Similarly, when input changes from 2K-H2L to 3K + 3L, then output changes from 25 to 50(100% increase), which is greater than change in input. This shows increasing returns to scale.

There a number of factors responsible for increasing returns to scale.

Some of the factors are as follows:

i. Technical and managerial indivisibility:

Implies that there are certain inputs, such as machines and human resource, used for the production process are available in a fixed amount. These inputs cannot be divided to suit different level of production. For example, an organization cannot use the half of the turbine for small scale of production.

Similarly, the organization cannot use half of a manager to achieve small scale of production. Due to this technical and managerial indivisibility, an organization needs to employ the minimum quantity of machines and managers even in case the level of production is much less than their capacity of producing output. Therefore, when there is increase in inputs, there is exponential increase in the level of output.

ii. Specialization:

Implies that high degree of specialization of man and machinery helps in increasing the scale of production. The use of specialized labor and machinery helps in increasing the productivity of labor and capital per unit. This results in increasing returns to scale.

iii. Concept of Dimensions:

Refers to the relation of increasing returns to scale to the concept of dimensions. According to the concept of dimensions, if the length and breadth of a room increases, then its area gets more than doubled.

For example, length of a room increases from 15 to 30 and breadth increases from 10 to 20. This implies that length and breadth of room get doubled. In such a case, the area of room increases from 150 (15*10) to 600 (30*20), which is more than doubled.

2. Constant Returns to Scale:

The production is said to generate constant returns to scale when the proportionate change in input is equal to the proportionate change in output. For example, when inputs are doubled, so output should also be doubled, then it is a case of constant returns to scale.

Figure-14 shows the constant returns to scale:

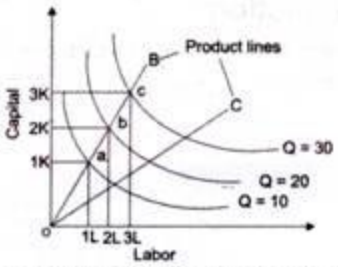

Figure-14: Constant Returns to Scale

In Figure-14, when there is a movement from a to b, it indicates that input is doubled. Now, when the combination of inputs has reached to 2K+2L from IK+IL, then the output has increased from 10 to 20.

Similarly, when input changes from 2Kt2L to 3K + 3L, then output changes from 20 to 30, which is equal to the change in input. This shows constant returns to scale. In constant returns to scale, inputs are divisible and production function is homogeneous.

3. Diminishing Returns to Scale:

Diminishing returns to scale refers to a situation when the proportionate change in output is less than the proportionate change in input. For example, when capital and labor is doubled but the output generated is less than doubled, the returns to scale would be termed as diminishing returns to scale.

Figure-15 shows the diminishing returns to scale:

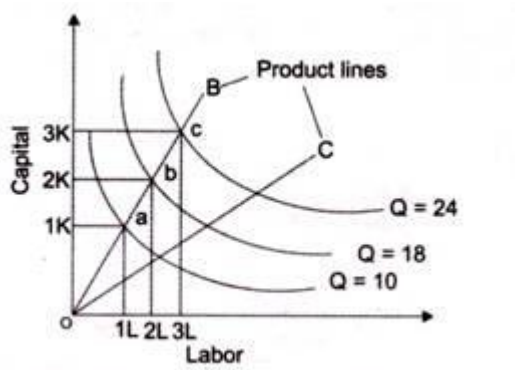

Figure-15: Constant Returns to Scale

In Figure-15, when the combination of labor and capital moves from point a to point b, it indicates that input is doubled. At point a, the combination of input is 1k+1L and at point b, the combination becomes 2K+2L.

However, the output has increased from 10 to 18, which is less than change in the amount of input. Similarly, when input changes from 2K+2L to 3K + 3L, then output changes from 18 to 24, which is less than change in input. This shows the diminishing returns to scale.

Diminishing returns to scale is due to diseconomies of scale, which arises because of the managerial inefficiency. Generally, managerial inefficiency takes place in large-scale organizations. Another cause of diminishing returns to scale is limited natural resources. For example, a coal mining organization can increase the number of mining plants, but cannot increase output due to limited coal reserves.