

When several firms that produce similar goods come up in one locality, they enjoy external economies. Benefits of infrastructure, specialisation, marketing etc., are available to all the firms. If number of firms become too large it generates external dis-economies.

5.7 SUPPLY

Consumers demand goods and services to satisfy their wants. To meet this demand of consumers, producers have to supply the goods to the market. Supply of goods depend upon several factors. Among these, price is an important factor in the supply of goods. Therefore, supply is defined as the quantity of goods producers can supply at different prices during a period of time. While speaking about supply, two things- price and time period are considered. For example, a farmer supplies 10 kgs of vegetables at Rs.20 per week. The total output produced by the firm may not be supplied to the market. A part of it may be kept as a stock in the godown. In the total output, the quantity offered for sale at a given price is called supply. Although price is a crucial factor in determining supply, there are other factors that affect the supply of goods.

To meet the demand of consumers in the market, producers supply goods. Supply is the quantity of goods offered for sale at different prices during a period of time.

5.7.1 Determinants of supply

Producers make decisions about supply depending upon several factors, which are known as determinants of supply. The main factors that cause changes in supply are price of the goods, input prices, technology, natural factors, government policy etc.,

1. **Price of the Goods:** Price of the goods is crucial to the producer in making a decision about supply. It is the price that decides the profit of the firm. Producers supply more goods as price goes up in the market to get higher profits.
2. **Input prices:** Production takes place with the help of inputs. A rise in input prices leads to higher cost of production. Producers supply more, when input prices are low i.e., at lower cost of production. At higher input prices they supply less.
3. **Technology:** Changes in technology or methods of production affect supply. Technology decides the inputs to be used, quality of the product. New technology generally helps to save inputs and reduce costs and time to produce output. An improved technology enhances the supply of goods.
4. **Natural factors:** Supply of goods depends on favourable weather conditions. Conditions like drought, floods, extreme weather, pests and diseases disturb crop production and raw material supply. This will affect the supply of goods.

5. **Government policies:** Government policy of taxes and subsidies on goods brings about changes in supply. Higher taxes on goods discourage producers and their supply will be less. On the other, subsidies from government encourage producers to supply more.

Producers make decisions about supply depending upon several factors. The determinants of supply include price of the good, input prices, technology, weather etc.,

5.7.2 Supply function

As mentioned above, producers decide the supply of goods based on several factors. The relation between the supply and the factors that decide the supply is explained in the form of an equation known as supply function.

$$S_x = f(P_x, P_I, T, W, G_p)$$

In the above equation:

S_x: Supply of good

P_x: Price of x

P_I: Prices of inputs

T: Technology

W: Weather conditions

G_p: Government policy

In the equation supply is a dependent variable on many factors. Any change in one of these factors will bring about a change in the supply of goods. Of all these factors, price of the good is considered to be an important factor.

Supply function describes the relation between the supply and the factors that decide the supply of a good.

5.7.3 Law of supply

We have learned that supply of goods depend upon several factors. Among these, price is the crucial factor for a producer. Like the demand, supply also depends on price of the good. It is the general tendency of the sellers to supply more quantities when the prices increase in the market. Law of supply explains the relation between price and supply of goods. The law of supply states that, when other factors remain the same, the quantity supplied increases with a rise in price and decreases with a fall in price. Thus, the quantity supplied by producer is directly proportional to the price. The relation between price and supply is positive. This relation exists only when there is no change in other factors. It assumes that there are no changes in technology, price of inputs, weather etc.,

The law is illustrated with the help of supply schedule and supply curve. A supply schedule presents two kinds of information i.e., a list of prices and the quantities supplied by the producers at those prices during a period. These are based on the imaginary data.

Supply schedule: 5.3

Price of oranges	Quantities supplied
1	10
2	15
3	20
4	25
5	30

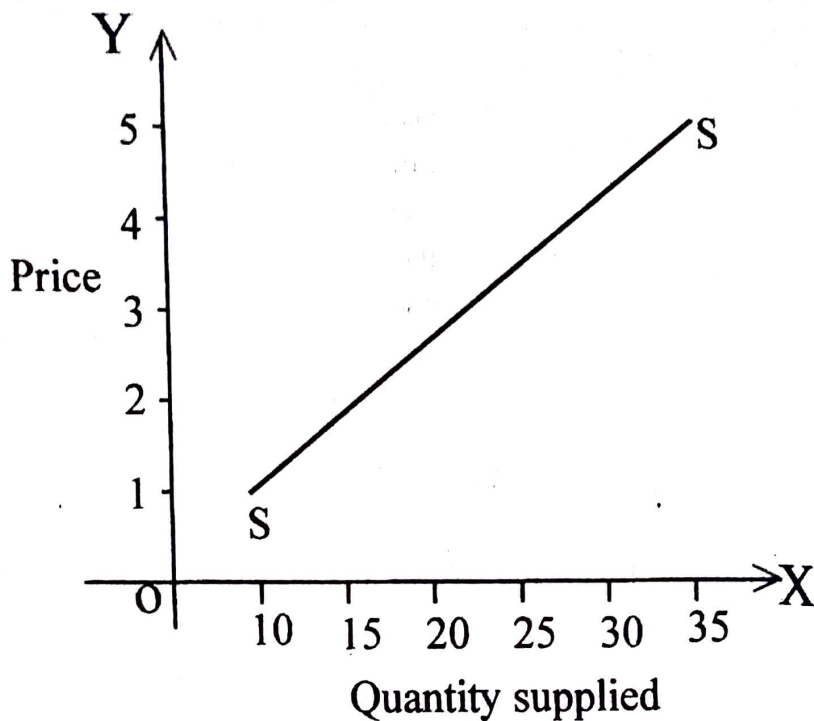


Fig. 5.3

From the supply schedule 5.3, it can be observed that as price increases, quantities supplied by producers are directly proportional to the prices. At lower prices, quantity supplied is less. Price of the goods and quantity supplied have positive relation. Supply curve is constructed with the information from supply schedule. Price is measured on Y-axis and quantities supplied on X-axis. The shape of the supply curve is upward sloping. It shows that at a higher price more quantity is supplied and at lower prices less quantity is supplied by the producers. Supply curve begins at price Rs.1. It means, below this price the producers refuse to supply the goods. This minimum price is called reserve price. Any change in price brings about a change in the quantity supplied. Such changes take place along the supply curve. These movements along the curve are called expansion and contraction.

Price is considered to be the crucial factor in deciding supply. The law of supply states the relation between price and supply of goods. There is a positive relationship between price and supply of goods. Hence supply curve is upward sloping.

Increase and Decrease in supply

Changes in supply due to changes in price are explained with movements along a supply curve. We know that sometimes supply may change due to change in other factors like technology, input prices, weather etc. Such changes takes place on a new supply curve. It is called increase or

decrease in supply. In the figure 5.4, there are three supply curves SS, S_1S_1, S_2S_2 . The new supply curve S_1S_1 has resulted from change in other factors. Though price remained at OP , there is a change in supply from OQ to OQ_1 . Like wise, when there is a decrease, supply would change from OQ_1 to OQ_2 . It means the change in supply is not due to price change but due to changes in other factors. These changes are shown with different supply curves. An increase in supply moves the curve towards right and a decrease in supply moves the curve towards left. Supply changes due to other factors are called increase and decrease in supply.

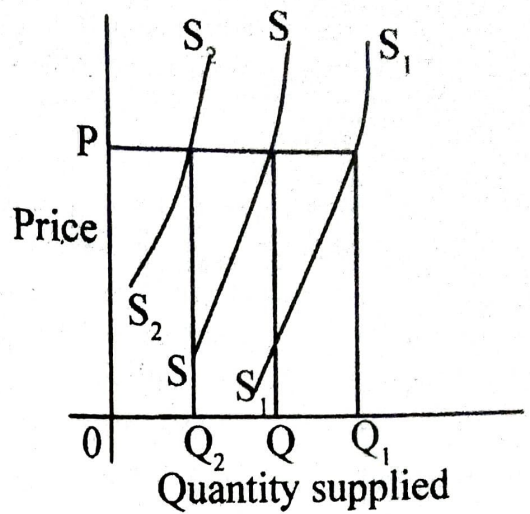


Fig. 5.4

Changes in supply due to price takes place along the supply curve. This is called expansion and contraction in supply. Changes in supply due to other factors brings a shift from one supply curve to other. This is called increase and decrease in supply.

5.8 Cost of Production

In the production function we have discussed the physical relation between inputs and output. The physical inputs and output when expressed in money terms become costs and revenue to the producer. Input prices paid to the factors of production is the cost, while output sold in the market gives the revenue. We now shift from theory of inputs and output to the theory of costs and revenues. Costs and revenues are crucial to make business decisions by the producer. Let us now first look into the costs of production.

This part explains the various cost concepts such as money, real, opportunity cost. It also discusses how costs are related to the output in different time periods.

5.8.1 Types of Costs

Money Costs

The cost of production is always related to output. Cost of production depends on factors of production necessary to produce some output and the factor prices in the market. Money costs refer to money payment made to different factors of production. These include rents on land, wages to the labourers, interest on capital, profits to the organiser. All the payments in money comprise money costs to the producer. Money costs to the producer may be explicit or implicit. The payments made to the factors borrowed from others are called explicit costs. Some of the factors used in production may not be hired from outside. He may use his own factors in production.

Unit - II

2.1 Theory of Consumption

Introduction

Consumption is the basis for entire economic activity. Satisfaction of wants by the consumer is the beginning and end of all economic activities. In order to satisfy our wants one has to consume goods and services which possess utility. The power of a commodity to satisfy human wants is generally considered as utility. The aim of this chapter is to understand the utility approaches and the consumer's behaviour with the help of Law of diminishing marginal utility and the law of equi-marginal utility.

- 2.1 *Cardinal and Ordinal utility*
- 2.2 *Law of Diminishing Marginal utility*
- 2.3 *Law of Equimarginal utility - Consumer's equilibrium*

Meaning of Utility

Utility is the basis of consumer's demand for a commodity.

Generally the want satisfying capacity or power of a commodity or service is known as utility.

The term utility is different from satisfaction. The consumer gets satisfaction only after the consumption of a commodity, where as utility is the calculation of want satisfying power of a commodity. Thus, utility refers to the 'expected satisfaction' where as satisfaction means 'realised satisfaction.'

At the same time utility has nothing to do with usefulness. A commodity may satisfy a human want but it may not be useful. For example, wine is dangerous for health. Yet it satisfies the want of a drunkard. Whether the commodity is useful or not, if it satisfies a human want we can say that it possesses utility.

Utility is a subjective concept. It varies from person to person, from time to time and place to place. For example a blind person cannot see the picture. So it has no utility for him. But for others it has utility. Further the same individual may get different utilities from the same commodity at different times. For example, a warm suit has greater utility in winter than in summer.

It should be noted that utility is different from satisfaction and utility is the power or capacity of a commodity or service to satisfy a particular want.

Now let us try to understand the approaches to the utility analysis.

2.1 Cardinal and Ordinal Utility

There are two different approaches of utility to analyse the consumer's behaviour.

A. Cardinal utility, B. Ordinal utility.

2.1.1 Cardinal Utility

Alfred Marshall followed Cardinal utility approach to explain the theory of consumer's behaviour. According to this analysis we can measure utilities derived from the consumption of different commodities in terms of arbitrary units called 'utils'. 1, 2, 3, 4 are called cardinal numbers. Further a person can compare the utilities of different commodities. He can say that the utility he gets from the consumption of one unit of apple is double the utility he obtains from the consumption of one unit of orange.

In simple terms cardinal utility analysis gives numerical expression to utility. The law of diminishing marginal utility and the law of equimarginal utility are based on cardinal utility approach.

According to cardinal utility approach, it is possible to measure and compare utilities derived from different commodities in numerical terms.

2.1.2 Ordinal Utility

Hicks, Allen and others have supported ordinal utility analysis while explaining the consumer's behaviour. According to this approach we cannot express utility in numbers precisely. The ordinal numbers are ranked. It means the utilities obtained by the consumer from different goods can be arranged in serial order such as 1st, 2nd, 3rd etc. These numbers only tell us that the second number is bigger than the first number and so on. If you take the example of a cup of tea and a cup of coffee we can only say that a consumer prefers a cup of tea to coffee but it is not possible to compare the quantities of utilities obtained from these two commodities. Hence utility possesses only ordinal magnitude and cannot be expressed in cardinal terms. The indifference curve analysis is based on ordinal utility approach.

Ordinal utility approach says that utility can not be measured in numerical terms. It is a subjective concept.

In this lesson, the cardinal approach to utility is the basis for various laws.

Indifference Curves

4.0 Introduction

An alternative approach to Cardinal utility to explain consumer's demand is put forward in the form of Ordinal utility. This is the combined effort of Edgeworth, Fisher, Pareto, Slutsky, Hicks and Allen. But the two English Economists J.R.Hicks and R.G.D.Allen published a paper, "A Reconstruction of the Theory of Value", in which they not only refused the cardinal utility approach but also proposed the Indifference curves approach based on ordinal utility. Again in 1939 Hicks refined the indifference approach in his "Value and Capital".

Indifference curve is a technique based on ordinal utility, an alternative approach to Marshallian Cardinal Utility.

4.0	<i>Introduction</i>
4.1	<i>Criticisim on cardinal utility</i>
4.2	<i>Ordinal utility</i>
4.3	<i>Indifference Technique</i>
4.4	<i>Properties of Indifference curves</i>
4.5	<i>Budget or Price line</i>
4.6	<i>Consumer Equilibrium with the help of Indifference curves</i>
4.7	<i>Model Questions</i>
4.8	<i>Glossary</i>
4.9	<i>References</i>

4.0.1 Recall

Before we go into the details of ordinal utility to explain the consumer's demand, let's recall the main assumptions on which the Marshallian cardinal utility approach was built.

1. The goods and services has the power to satisfy human wants. This is called 'Utility'.
2. According to Marshall, utility derived from a good can be measured quantitatively.
3. Utilities of different commodities are independent of one another.
4. The Marginal Utility of money remains constant even though the quantity of money with the consumer is diminished by the successive purchases made by him.

4.1 Criticism on Cardinal Utility

Before talking about the ordinal utility approach it is important to know, why the Economists went for in search of an alternative. The Modern Economists pointed out the main drawbacks of the cardinal approach to Demand theory on the following grounds. They are:

1. The utility analysis assumes that utility is measurable in terms of 'utils' or units. But according to Hicks, it is not possible to measure utility, since it is a subjective factor.
2. The utility analysis assumes that the utilities of different commodities are independent of one another. But, in reality, this is not so. The marginal utility of a commodity depends not merely on its own consumption, but also on the consumption of some other commodities. This is so because the commodities may be complements or substitutes of one another. Example: white paper, pen, refill and coffee and tea.
3. Further, utility analysis is based on the assumption of constancy of marginal utility of money. Actually, the reduction in the quantity of money with the purchaser will increase the marginal utility of money.
4. Marshall explained the concept of constancy of marginal utility of money by taking 'single commodity'. But, in reality, the consumer will always try to satisfy his wants by purchasing a host of commodities instead of a single commodity.
5. The marginal utility analysis is restrictive in its scope. It does not split the price effect into its two components, the income and substitution effects. On the other hand, Hicks Allen's indifference curves are able to deduce a more general theorem of demand which covers the 'Giffin's Goods'.

In view of these shortcomings, the utility analysis has now been replaced by and large by the indifference curves or ordinal utility approach.

4.2 Ordinal Utility

According to the concept of ordinal utility, the utilities derived from the consumption of commodities cannot be measured, but can be compared. This means that the consumer prefers an apple to an orange. Here, the consumer will not specify how much utility he will be deriving from the consumption of an apple or an orange or both (combination of apple and orange). He will simply compare the satisfaction in the sense that whether one level of satisfaction is equal to, lower than or higher than the other. So, the ordinal utility analysis mainly states the following aspects of utility.

1. Utility cannot be measured cardinally.
2. It also states that the consumer compares the satisfaction levels from different combinations of goods.

4.3 Indifference Technique

In view of the shortcomings in the cardinal utility analysis, modern economists have developed a new technique called Indifference Curve Technique based on the ordinal utility. This technique mainly tells that 'utility' is not measurable. The consumer can compare the level of satisfaction from

different combinations of goods. Every consumer will have a definite 'scale of preference' of his/her own. Therefore, the technique says that the consumer cannot go beyond his/her preference or indifference.

4.3.1 Assumptions

The indifference curve technique is based on the following assumptions.

1. Rational Consumer:

The consumer always acts in a prudent way so as to derive maximum satisfaction from the use of his limited money at disposal.

2. Scale of Preference

Since utility is subjective, the evaluation is done by the consumer only. This means that a consumer has in his mind a definite 'Scale of Preference' which guides him in his purchases. This 'Scale of Preference' reflects the consumer's temperament and tastes.

3. Ordinal Method:

In ordinal method, it is possible to compare the satisfactions obtained by various combinations of goods in ordinal terms i.e., 1st, 2nd, 3rd, etc. One combination of goods may ordinally be ranked higher than another in the consumer's estimation.

4. Transitivity or Consistency

If a consumer regards A better than B and B better than C. Obviously the consumer prefers C to A, if his choice reflects his rationality. Consumer's choices have to be consistent.

5. Substitution

The consumer always wishes to have that combination which gives more goods. Example: out of two combinations say X and Y, if 'Y' give him more than 'X' in a combination, he substitutes Y for X.

6. Two - Goods Model

In reality, a consumer purchases many goods to satisfy his/her wants. But for the sake of convenience and simplicity, it is assumed here that the consumer buys two goods only. Various combinations of these two goods are taken for studying how the consumer reaches the point of equilibrium.

7. The consumer will have perfect knowledge about the prices of these two goods.

8. The tastes and habits of the consumer will remain the same.

9. There will be no changes in the income of the consumer.

4.3.2. Meaning of Indifference Curves

All desires of a consumer are not equally important and urgent. Because of the limited income at his disposal, the consumer is forced to 'select' the more important urgent want. The Indifference curves are drawn on the basis of his 'Scale of Preference'. The scale of preference reflects his tastes and preferences. A consumer, in the real world would be purchasing many goods to satisfy his wants. But, here we are restricting to two goods only. Therefore, an indifference curve represents satisfaction of a consumer from two goods. It is drawn on the assumption that for all possible combinations (points) of the two goods on an Indifference curve, the satisfaction level remains the same.

The consumer is indifferent as to the combinations lying on an indifference curve. So, an indifference curve is an iso-utility curve.

4.3.3 Indifference Schedule:

An indifference curve is drawn on the basis of an 'Indifference Schedule'. The Indifference Schedule has several combinations of two goods from which he/she derives the same or equal satisfaction. So, the various combinations in the schedule are equally preferred. The whole discussion can be made clear by an example.

TABLE - 4.1
Indifference Schedule

Combinations	Number of Mangoes	Number of Oranges
A	1	20
B	2	15
C	3	11
D	4	8
E	5	6
F	6	5

In the above schedule, the consumer gets as much total satisfaction from combination A (1 mango + 20 oranges) and as well from other combinations i.e., B, C, D, E and F. The total satisfaction is the same in all these combinations.

Since all the combinations of Mangoes and Oranges give the consumer equal satisfaction, he is indifferent to select any one of the combinations. Therefore, this may be called as 'Weak Ordering'.

4.3.4 The Indifference Curve

With the help of an 'Indifference Schedule' we can draw an Indifference curve to study its properties.

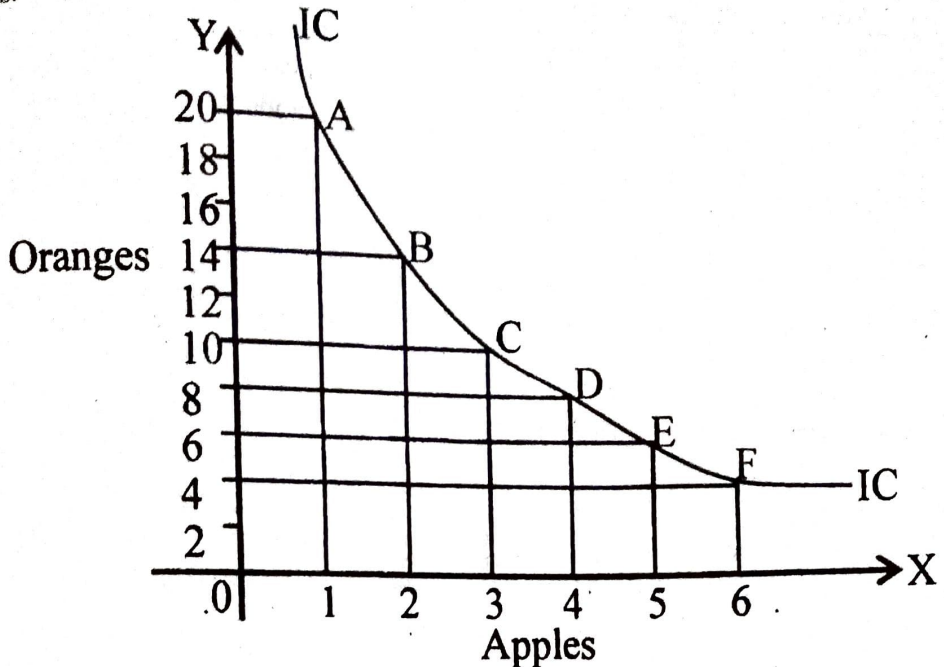


Fig. 4.1

In the above diagram, apples are shown on the OX-axis and oranges on the OY-axis. The various combinations of apples and oranges are shown by points A, B, C, D, E and F. So, when we join these points, we get a curve IC, which is known as an 'Indifference Curve'. Therefore, an indifference curve represents the preferences of a consumer. The points on the Indifference curve shows the various combinations of two commodities which give the consumer the equal level of total (satisfaction from the two) satisfaction. So, an indifference curve may therefore be defined as the locus of the various combinations of the commodities which yield the same total satisfaction to the consumer. So, we can say that on an indifference curve, the level of satisfaction at various points is the same that is curve, $A = B = C = D = E = F$. The curve is also known as the iso-utility or curve of equal utility.

4.3.5 Diminishing Marginal Rate of Substitution

The concept of MRS (Marginal Rate of Substitution) is the basis of 'indifference curves'. The MRS may be defined as the rate at which an individual will exchange successive units of one commodity for another. The entire process may be clear by the following example.

Table - 4.2
Diminishing MRS

Combinations	Mangoes (X)	Apples (Y)	MRS of X for Y
A	1	20	-
B	2	15	5:1
C	3	11	4:1
D	4	8	3:1
E	5	6	2:1
F	6	5	1:1

From the table it is clear that at the beginning the consumer has a small amount of mangoes (X) and a large amount of oranges (Y) in combination 'A'. So, he is willing to part with some (Y) apples to get an extra unit of mango (X). But this readiness on the part of the consumer to loose apples decreases as the units of consumption of mangoes increase. MRS is thus, the ratio between the marginal quantities of two commodities with which the consumer is concerned.

From the above, we notice the following important points.

1. Indifference curve is obtained with the help of an indifference schedule.
2. Indifference curve is a locus of points of various combinations of two commodities purchased by the consumer.
3. All combinations (from A to F) indicate equal total satisfaction. That's why an indifference curve is also called as 'iso-utility curve'.
4. An indifference curve always falls from left to right downwards or has a negative slope.
5. The consumer is indifferent towards all these A to F combinations, since $A = B = C = D = E = F$. He can select any one of the these combinations.
6. This indicates the consumer's 'weak ordering'.
7. The MRS of X for Y diminishes as the consumer goes on substituting X for Y.

4.3.6 Indifference Map

A set of indifference curves drawn for different income levels is called as 'Indifference Map'.

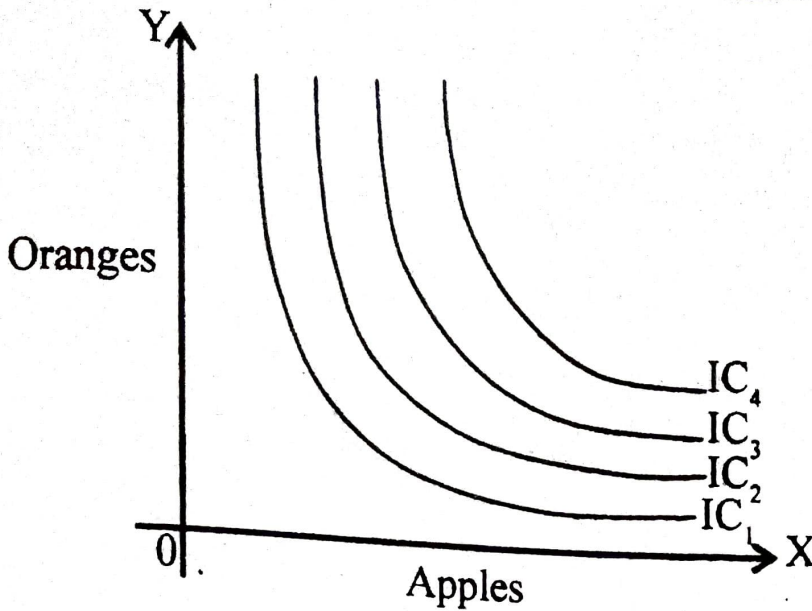


Fig. 4.2

From the above diagram, it is clear that an indifference map of IC₁, IC₂, IC₃ and IC₄, where each curve shows a certain level of satisfaction to the consumer. The different indifference curves are always arranged and numbered in ascending order.

As one moves from IC₁ to IC₄ on an Indifference map, the IC labelled higher number (IC₄) is preferred to the IC labelled lower number (IC₁).

4.4 Properties of Indifference Curves

The foregoing discussion helps us to list out the important properties of an Indifference curve.

1. The indifference curves slope negatively or slope downwards from left to right.
2. They are convex to origin.
3. No two indifference curves can intersect (cut) each other. If they intersect each other, the point of intersection shows two levels of satisfaction, which is contrary to the assumption that a higher level of satisfaction is represented by an indifference curve which lies above the indifference curve showing lower level of satisfaction.
4. Every indifference curve to the right represents higher level of satisfaction than that of the preceding one.
5. An indifference curve will never touch either of the axis.

4.5 Budget/Price Line:

So far, we have been considering the different combinations of the two commodities that the consumer would like to have with given tastes and preferences. But which particular combination of the two goods he can actually get depends on two factors. They are:

1. Consumer's money income
2. Prices of two goods.

So, the budget line shows all possible combinations of two goods that a consumer can buy, with the given income of the consumer and prices of the two goods.

The concept of budget/price line will be very clearly understood with the following example. Suppose that a consumer has Rs.150 (income) to buy two goods namely X and Y, whose prices are Rs.15 and Rs.30 each. With the given information, now, we can draw the budget or price line as shown in the diagram.

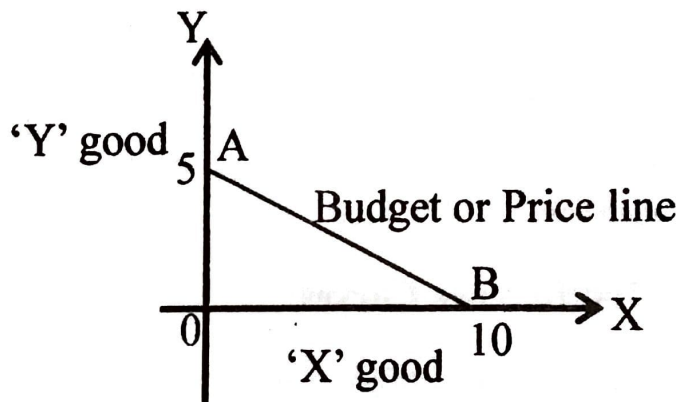


Fig. 4.3

In the above diagram 'AB' is the 'budget or price line'. The slope of the line AB represents the ratio of the prices of X and Y in such a manner that 10 of X will be equal to 5 of Y.

The budget or price line has some interesting aspects to note. When a consumer is given with some income say (Rs. 150) and the prices of the two commodities are also given (price of X is Rs. 15 and the price of Y is Rs.30), then the following are the opportunities available before him/her.

1. The one possibility is that, if the consumer spends his total amount of Rs.150 on 'X' alone, he gets 10 units of X and none of Y.
2. On the other hand, if he spends the total amount of Rs.150 on 'Y' alone, he gets 5 units and none of 'X'.

3. But the consumer being rational individual wants to have both (X and Y) the goods. Here, the budget line guides him to have both X and Y i.e., he can move with in 'OAB'.
4. The budget line also tells us that the consumer cannot go or make his purchases beyond 'AB'.

4.5.1 Shifts in the Budget Line

The position of the budget line depends upon size of money income of the consumer. If his income increases and the prices of the two commodities remaining the same, the consumer can buy more of both the commodities. On the other hand, if his income decreases, the prices of the two commodities remaining the same the consumer now had to reduce his purchase. As a result of (increase or decrease) changes in the consumer income there will be shifts in the budget line also. The same is shown in the following diagram.

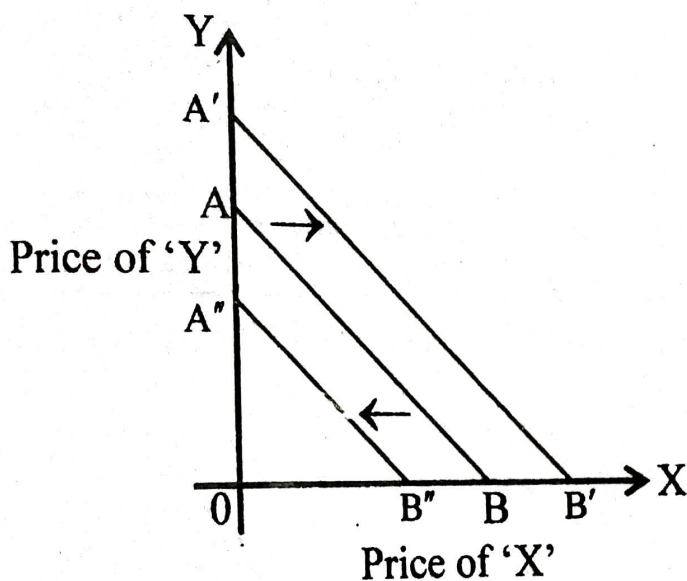


Fig. 4.4

1. When the income of the consumer increases, the budget line moves towards right from the original AB to A'B'.
2. When the income of the consumer decreases, the budget line moves to the left from the original / initial AB to A''B''.

4.5.2 Changes in Price Line

The slope of the price line depends on the prices of both the commodities. There will be a change in the slope of the price line, when there is a change in the price of either of the two commodities.

- (i) Suppose that the price of 'X' falls, while the price of 'Y' and money income of the consumer remaining the same.

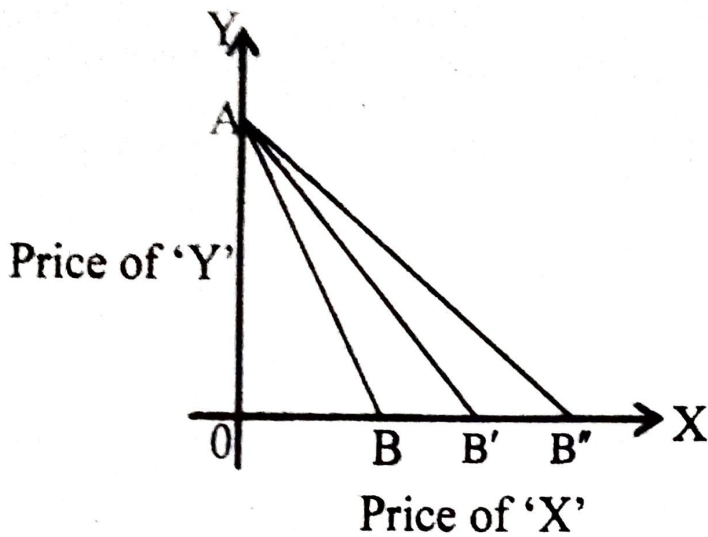


Fig. 4.5

In the above diagram 4.5, the initial price line is AB, before change in the price of 'X'. Suppose that the price of 'X' has fallen and the price of 'Y' remaining the same (money income of the consumer also remain constant).

As a result of fall in the price of 'X', now the consumer is able to buy more of X. The same is shown by a change in the price line from AB to AB' and AB''.

(ii) Suppose that the price 'Y' falls, while the price of 'X' and money income of the consumer remaining the same.

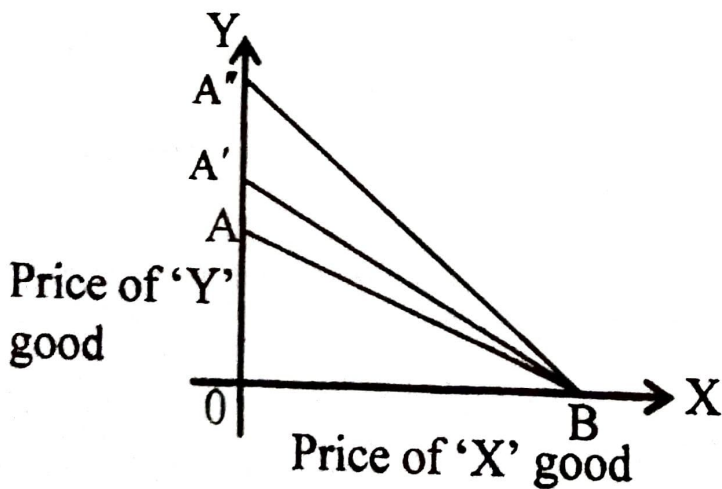


Fig. 4.6

In the above diagram 4.6 the initial price line is AB that is before a change in price of Y.

As a result of fall in the price 'Y', now the consumer is able to buy more of Y than before. The same is shown by the change in the price line from AB to A'B and A''B.

4.6 Consumer's Equilibrium

A consumer is said to be in equilibrium when given his tastes and prices of the two goods, he spends a given money income on the purchase of two goods in such a way as to get the maximum satisfaction.

Now, how the consumer reaches the point of equilibrium under ordinal utility analysis with the help of an indifference map and budget price line is explained.

4.6.1 Assumptions

The following assumptions are made for explaining, how a consumer reaches equilibrium position.

1. The consumer has an 'indifference map' showing his 'scale of preferences' that will remain constant throughout the explanation.
2. There will be no change in the money income of the consumer.
3. The prices of the two goods will also remain unchanged.
4. There is no change in the tastes and habits of the consumer.
5. Goods are Homogeneous and Divisible.
6. The consumer is rational and thus maximises his satisfaction from the purchases of two goods.

4.6.2 Conditions

The consumer is said to be in equilibrium, when he maximises his satisfaction with given income and prices of two goods. Two conditions must be satisfied for the consumer to be in equilibrium. They are:

1. The budget or price line must be tangent to the indifference curve.

2. The equality between the consumer's MRS and the price-ratio i.e., $MRS_{XY} = \frac{P_X}{P_Y}$

4.6.3 Illustration of Consumer's Equilibrium

Given the indifference map of the consumer and the budget/price line, the equilibrium is defined as a position from which the consumer does not want to move, other things being equal.

The point where the consumer gets maximum possible satisfaction, where the budget/price line is tangent to the indifference curve and the MRS is equal to the price ratio of the two goods will be defined as equilibrium of the consumer.

The following diagram explains the above aspects.

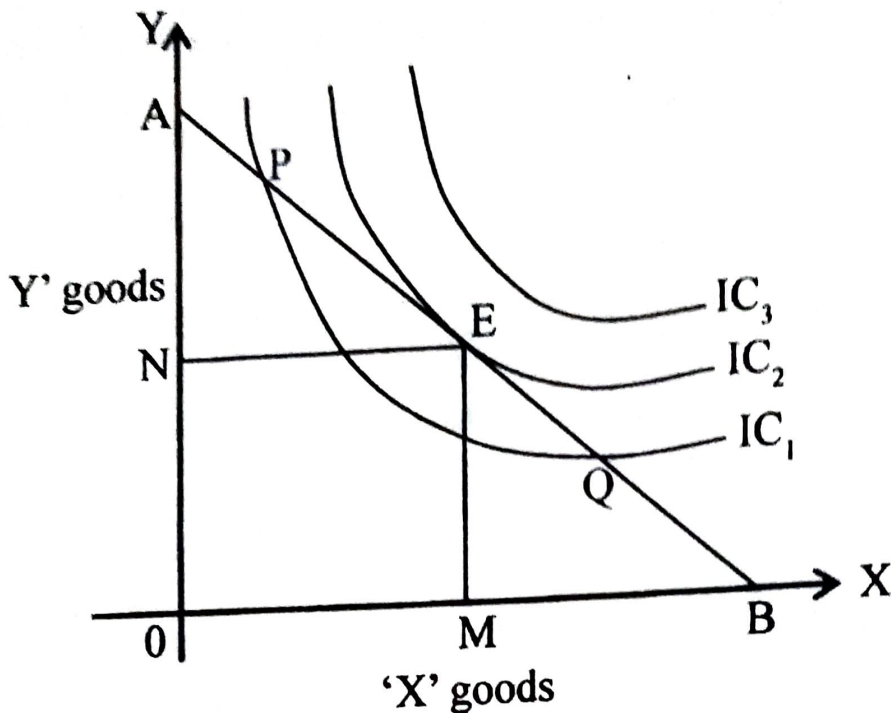


Fig. 4.7

In the above diagram, 'AB' is the consumer's budget/price line. IC_1 , IC_2 and IC_3 , a set of indifference curves (Map). With the help of these two important tools, we notice the following:

1. Of the three IC_1 , IC_2 , IC_3 indifference curves, our consumer can reach IC_2 , with the given income.
2. His budget line 'AB' restricts him to IC_2 .
3. 'E' lies on the highest possible indifference curve IC_2 and yields maximum possible satisfaction and therefore the consumer will be in equilibrium at point 'E'.
4. At 'E' the budget line 'AB' is tangential to the IC_2 .
5. Here, there is also equality between the MRS_{xy} and the ratio of prices of X and Y.
6. The points other than 'E' that is P and Q are not considered as equilibrium points, because at both the points the 'AB' budget line is not tangential, but intersecting the IC_1 .
7. Moreover, the consumer being rational would like to reach a higher indifference curve (IC_2) than a lower indifference curve (IC_1) with the given income and price of two goods.
8. It is also clear from the diagram that the consumer cannot reach IC_3 , with his limited money income i.e., AB.

Wishes :- Wants which are Superfluous
Expensive.

* Utility :-

- * The Demand of a commodity depends on the utility of that commodity to a consumer.
- * The want satisfying capacity or } utility
power of a commodity

* Study of consumer behaviour :- (cardinal)

- (a) Marginal utility analysis - Alfred Marshall
- (b) Indifference Curve analysis - Hicks & Allen

* marginal utility Analysis Assumption :-

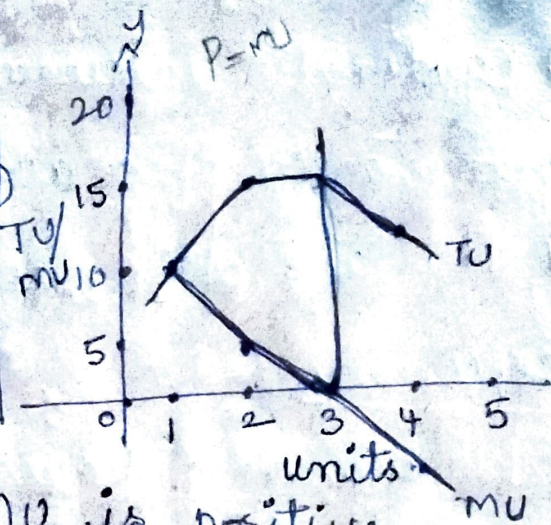
- (a) Cardinal measurability of utility.
- (b) Constancy of marginal utility of money.
- (c) Independent utilities.
- (d) Rationality.

* The law of Diminishing marginal utility :-

- (a) Human wants are unlimited.
- (b) Each separate human want is limited.
- * The additional utility which he derives from an additional unit of commodity goes on falling.

"The additional benefits which a person derives from a given increase in stock of a thing diminishes with every increase in the stock that he already has."

Units	TU	MU. ($TU_n - TU_{n-1}$)
1	10	10
2	15	5
3	15	0
4	13	-2



- TU is increasing MU is positive
- TU is highest MU is zero.
- Marginal utility becomes negative, TU starts falling
- He keep on purchasing commodity till $MU > P$.
- Consumer is Equilibrium $MU_x = P_x$.

$$MU_x = P_x \cdot MU_{\text{money}}$$

$$\frac{MU_x}{P_x} = MU_{\text{money}}$$

"In reality a consumer spends his money income to buy different commodities. In case of many commodities, consumer equilibrium is explained with law of Equi-marginal utility."

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_{\text{money}} \quad \text{or} \quad \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

DMU Assumption :-

- ① Homogenous units.
- ② Continuous Consumption
- ③ Rationality
- ④ Cardinal measurement
- ⑤ Constancy of marginal utility of money.
- ⑥ The tastes of consumer should be constant

Exceptions :-

1. Hobbies and Rare Collection.
2. Abnormal person
3. Indivisible Goods.

Limitations :-

1. Cardinal measurement unrealistic.
2. Unrealistic conditions.
3. Constant marginal utility of money
4. Inapplicable to indivisible Goods.
5. Single Commodity model.

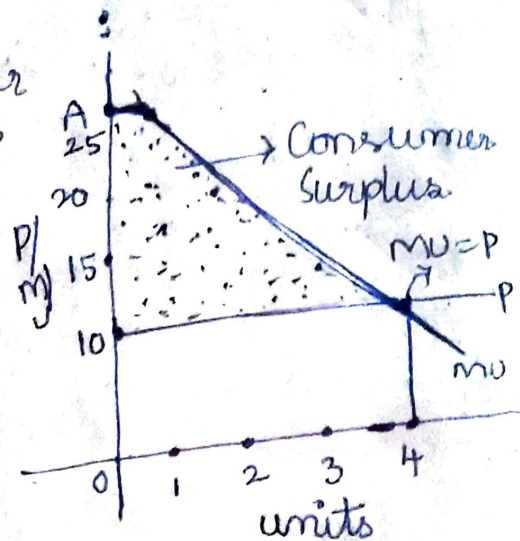
Consumer Surplus :-

In our daily expenditure, we often find that the price we pay for a commodity is less than the satisfaction derived from its consumption.

From the purchase of such commodities we derive a good deal of extra satisfaction or surplus over and above the price that we pay for them — Consumer's Surplus.

Consumer Surplus = What a consumer is ready to pay — what he actually pays

units	MU	P	Consumer Surplus
1	25	10	15
2	20	10	10
3	15	10	5
4	10	10	0
<u>TU=70</u>		<u>Spent=40</u>	<u>30</u>



Indifference Curve:-

A curve which represents combination of two commodities that gives same level of satisfaction to the consumer.

Combinations	Burger	Sandwiches
A	1	10
B	2	6
C	3	3
D	4	2
E	2	12
F	3	8
G	4	5
H	5	4

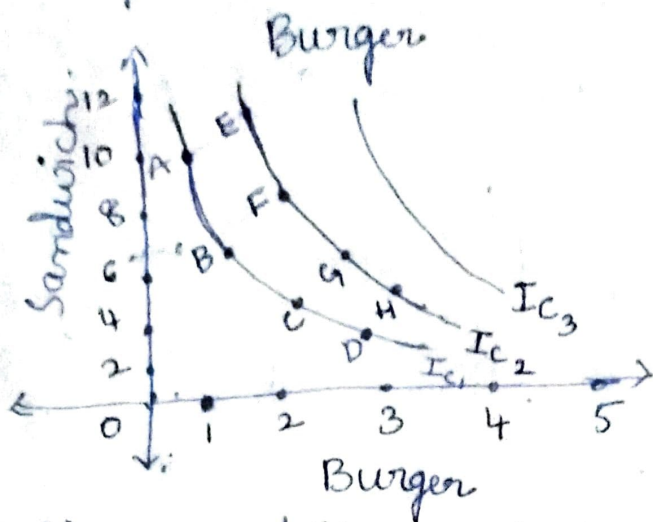
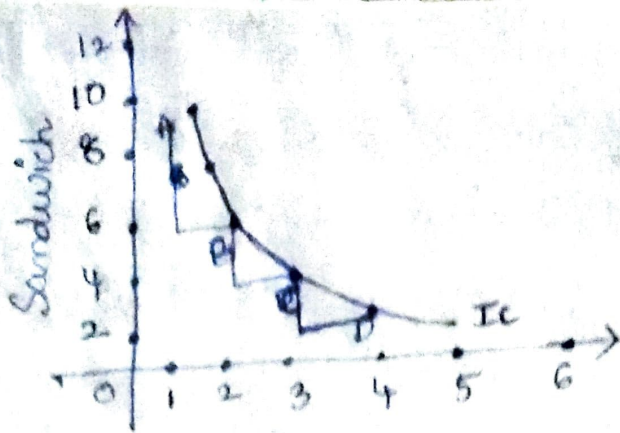


Figure 1:- The quantity of burger is measured on x-axis and quantity of sandwiches on y-axis. The various combinations A, B, C, D are plotted and on joining them, we get a curve known as indifference curve.

All combinations lying on the indifference curve give the same of satisfaction to the consumer. Hence, the consumer is indifferent among them.

Indifference curve system is based on ordinal approach. According to which utility cannot be quantified but can only be compared.

marginal rate of substitution

It may be defined as the rate at which a consumer will exchange successive units of one Good for another. till he gets ^{same} level of satisfaction of combination.

Combination	Good X	Good Y	marginal rate of Substitution = $\frac{\Delta Y}{\Delta X}$
A	1	10	—
B	2	6	4Y : 1X
C	3	4	2Y : 1X
D	4	3	1Y : 1X

Above schedule shows the combinations of two goods X and Y. Suppose the consumer wants more X, to do so he must sacrifice some units of Y - in order maintain same level of satisfaction.

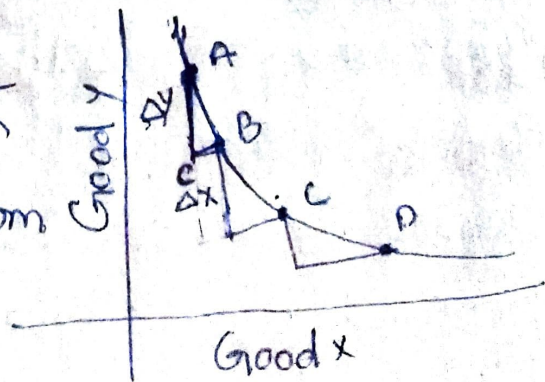
* This rate of sacrifice is technically called marginal rate of substitution.

$$MRS_{xy} = \frac{AC}{CB} = \frac{\Delta Y}{\Delta X}$$

① IC Slope downwards from left to right.

② IC Convex to origin

③ Higher IC Represents higher level of Satisfaction



- ① Indifference Curve Can't intersect each other.
- ② It will not touch either x-axis or y-axis.

* Budget line or price line or price opportunity line or Expenditure line or Budget Constraint or Consumption possibility line. :-

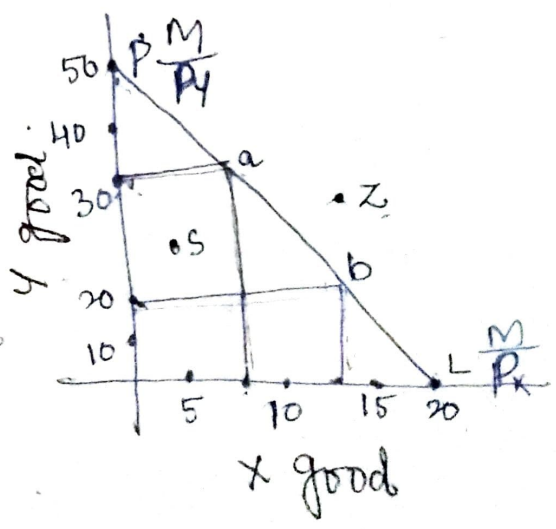
"The budgetary position of the consumer can be graphically shown by Budget line. A budget line or price line shows maximum quantity of different combinations of two goods that the consumer can purchase with his given money income and given market prices of goods."

$$\text{Equation} = P_x \cdot X + P_y \cdot Y = M.$$

P_x - price of x good P_y - price of y good's price
 X - quantity of x Y - quantity of y

M = Total Money Income.

Consumer choose the combination of the goods in point "S" region. It is region within the budget line."



Consumer Equilibrium

$$MRS_{xy} = \frac{MU_x}{MU_y}$$

Points a, b, d & e lie

on lower ICs and so are not the points of equilibrium as the consumer can get more satisfaction with same amount of money.

Point 'c' is the point of equilibrium as it lies on budget line and also on highest possible indifference curve IC_3 , giving maximum satisfaction.

Slope of IC = Slope of Budget line

$$MRS_{xy} = \frac{P_x}{P_y}$$

