14

CONSUMER'S EQUILIBRIUM

318en14

Notes

We buy many goods and services to satisfy our wants. Using up of goods and services to satisfy wants is called consumption and the economic agent who buys goods and services is called a consumer. When a consumer buys any good or service, his/her main objective is to get maximum satisfaction from the quantity of the commodities purchased by spending his/her income at the given market price. How does a consumer maximize his/her satisfaction from spending his/her income on various goods and services is the subject matter of this chapter.

OBJECTIVES

After completing this lesson, you will be able to:

- understand the meaning of consumer's equilibrium;
- understand the meaning of utility, marginal utility and total utility;
- understand the relationship between total utility and marginal utility;
- explain the law of diminishing marginal utility;
- explain consumer's equilibrium, based on utility analysis;
- understand the meaning of indifference curve, indifference map, budget line, budget set and marginal rate of substitution; and
- derive consumer's equilibrium using indifference curve and budget line.

14.1 MEANING OF CONSUMER'S EQUILIBRIUM

Equilibrium means a state of rest from where there is no tendency to change. A consumer is said to be in equilibrium when he/she does not intend to change his/her level of consumption i.e., when he/she derives maximum satisfaction. Thus, **consumer's equilibrium refers to a situation where the consumer has achieved**

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maximum possible satisfaction from the quantity of the commodities purchased given his/her income and prices of the commodities in the market. As the resources are scarce in relation to unlimited wants, a consumer has to follow some principles or laws in order to attain the highest level of satisfaction.

There are two main approaches to study consumer's equilibrium. They are as follows:

1. Cardinal utility approach (or Marshall's utility analysis)
2. Ordinal utility approach (or indifference curve analysis)

14.2 CARDINAL UTILITY APPROACH

The theory of consumers behaviour by using utility approach was first given by the noted economist Alfred Marshall.

Before discussing how a consumer attains equilibrium , we need to understand the concept of utility, marginal utility and total utility.

(i) Utility

Utility is defined as the power of a commodity to satisfy a human want. Utility of a commodity is the total amount of psychological satisfaction that a person gets from consumption of a good or service, e.g. a thirsty person derives satisfaction from drinking a glass of water. So a glass of water has got utility for the thirsty person. Utility differs from person to person. Utility is subjective and cannot be measured quantitatively. Yet for the sake of convenience it is measured in 'utils'. Marshall suggested that the measurement of utility should also be done in monetary terms by converting 'util' into money by using the following formula Utility in Money = Utility in Util/Utility of a rupee. Utility of rupee can be assumed to be any number such as 1, 2, 3 ... . Let utility of a rupee is assumed to be 2 utils. Then 10 utils = $\frac{10}{2}$ = ₹ 5.

(ii) Marginal Utility (MU)

Marginal utility is the addition to the total utility derived from the consumption of an additional unit of a commodity. It can also be defined as the utility from the last unit of a commodity consumed. Let us explain the concept of marginal utility with the help of an example. Suppose, a consumer gets total utility of 10 utils from consumption of one orange and 18 utils from two oranges. He gets 8 utils from consumption of second orange. So, marginal utility of second orange is 8 utils. If total utility derived from three oranges is 24 utils then marginal utility of

three oranges is 6 utils (i.e. 24-18 utils). In this case third orange is the last orange. Thus marginal utility of 3 oranges is 6 utils. Marginal utility can be calculated by the following formula:

$$MU_n = TU_n - TU_{n-1}$$

or
$$MU = \frac{\Delta TU}{\Delta X}$$

Where MU_n = Marginal utility of nth unit of the commodity

TU_n = Total utility of n units

TU_{n-1} = Total utility of n–1 units

X_n = Quantity of nth unit of good X

X_{n-1} = Quantity or (n–1)th unit of good X

"n" takes the values 1, 2, 3, ...

(iii) Total utility

Total utility is the total satisfaction obtained from the consumption of all possible units of a commodity. For example, if the first orange gives you a satisfaction of 10 utils, second one gives you 8 utils and third one gives you 6 utils, then total utility from three oranges = 10 + 8 + 6 = 24 utils. Total utility can be obtained by summing up marginal utilities from consumption of different units of a commodity. Thus, total utility can be calculated as:

$$TU_n = MU_1 + MU_Z + MU_3 + ... MU_n$$

or
$$TU_n = \Sigma MU$$

where, TU_n = Total utility from n units of a given commodity

MU_1, MU_2, MU_3, MU_n = Marginal utilities from 1st, 2nd 3rd and nth unit of the commodity

14.3 RELATIONSHIP BETWEEN TOTAL UTILITY AND MARGINAL UTILITY

The relationship between total utility and marginal utility is explained with the help of following table 14.1 and Fig. 14.1.

Notes

Table 14.1

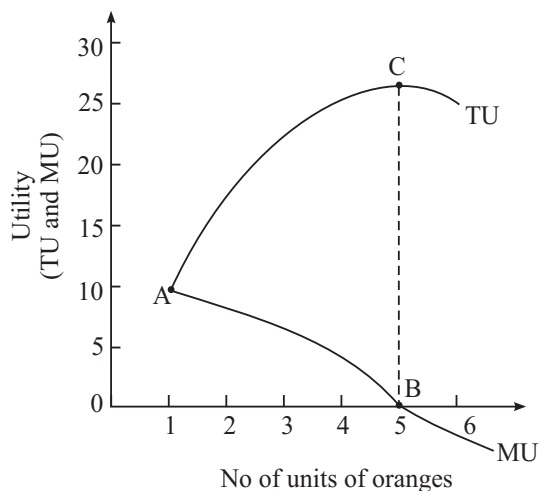| Units of Oranges Consumed	Marginal Utility (Utils)	Total Utility (Utils)	
0	–	0	TU increases at diminishing rate (MU is positive)
1	10	10	
2	8	18	
3	6	24	
4	2	26	
5	0	26	TU is maximum when MU is zero
6	–2	24	TU falls when MU is negative

Fig. 14.1

1. MU is the rate of change of TU. It means that Total Utility increases as long as marginal utility is positive. In the table 14.1 marginal utility is declining between the range AB but is positive. So total utility is increasing at decreasing rate.

2. Total Utility is maximum when marginal utility is zero. At point B, MU = 0, and the corresponding point on TU is C where TU is maximum.

3. Total utility starts declining when marginal utility becomes negative (i.e., less than zero)

14.4 LAW OF DIMINISHING MARGINAL UTILITY

It is a matter of common observation that as we get more and more units of a commodity, the intensity of our desire for that commodity tends to diminish. The law of diminishing marginal utility also explains the same thing. It states that **'as more and more units of a commodity are consumed, marginal utility derived from each successive unit goes on diminishing.'**

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The law can be explained with the help of an example. Suppose, a thirsty man drinks water. The first glass of water he drinks will give him maximum satisfaction (utility), say, 20 utils. Second glass of water will also fetch him utility but not as much as the first one because a part of his thirst is satisfied by drinking the first glass of water. Suppose he gets 10 utils from the second glass. It is just possible that he may get zero utility from the third glass because his thirst has now been satisfied. There will be negative utility from the fourth glass of water. Any rational consumer will not consume additional glass of water when it gives disutility or negative utility.

14.4.1 Assumption of Law of Diminishing Marginal Utility

The law of diminishing marginal utility operates under certain specific conditions. These are called assumptions of the law. Some important assumptions of the law are:.

1. It is assumed that utility can be measured and a consumer can express his satisfaction in quantitative terms like 1, 2, 3 etc. We have already said that unit of measurement of utility is 'util'. So utility is cardinal.

2. Quality of the commodity should not undergo any change. Take the above example of glass of water. From the quality point of view a consumer who drinks a glass of cold water must continue with the same. He or she cannot change its quality from cold to normal as normal water give different satisfaction.

3. Consumption should not proceed at intervals. It should be a continuous process. Continuing with the above example, second glass of water, if consumed two hours after the first glass of water was consumed, may give more, less or equal satisfaction.

4. Consumer should be a rational person. This means that he/she prefers more quantity to less quantity of a good.

5. Time period of consumption should not be too long. Consumer's tastes, habits, income etc. may change if the time gap is more.

6. The price of the substitute and complementary goods should not change. If these prices change, it may be difficult to predict about the utility derived from the commodity in question.

14.4.2 Exceptions to the Law of Diminishing Marginal Utility

Some of the important exceptions to the law are following:

(i)   A miser is not a good subject for this law. His desire for more wealth may in fact increase with every successive increase in the accumulation of wealth.

(ii)   A collector of rare articles like stamps, coins, paintings etc. may escape this law.

(iii) The law may not apply when it comes to a melody recital or a beautiful scenic view.

These are in fact the only real exceptions of the law and these too do not prove real hurdles to the application of the law. It is easy to visualize that a miser or stamp collector or a musician may find their marginal utilities increasing instead of decreasing as postulated by the law. But this tendency shall not last for long having reached a particular stage; the law must come into operation.

INTEXT QUESTIONS 14.1

1. What is meant by consumer's equilibrium?

2. Define the following:

   (i)   Utility   (ii) Marginal Utility   (iii) Total Utility

3. State the law of diminishing marginal utility.

4. What will be the total utility when marginal utility is zero?

14.5 CONSUMER'S EQUILIBRIUM IN CASE OF A SINGLE COMMODITY

Consumer's equilibrium in case of a single commodity can be explained on the basis of the law of diminishing marginal utility. How does a consumer decide as to how much to buy of a good? It will depend upon two factors.

(a)   The price she pays for each unit which is given and

(b)   The utility she gets

At the time of purchasing a unit of a commodity, a consumer compares the price of the given commodity with its utility. The consumer will be at equilibrium when marginal utility (in terms of money) equals the price paid for the commodity say 'X' i.e. $MUx = P_X$. (Note that marginal utility in terms of money is obtained by dividing marginal utility in utils by marginal utility of one rupee).

If $MU_X > P_x$, the consumer goes on buying the commodity because she is paying less for each additional amount of satisfaction. As she buys more, MU falls due to operation of law of diminishing marginal utility. When MU becomes equal to price, consumer gets maximum satisfaction and now she is at equilibrium. When MU_X

< P_x, the consumer will have to reduce consumption of the commodity to raise his total satisfaction till MU becomes equal to price. This is because she is paying more than the additional amount of satisfaction that she is getting.

Consumer's equilibrium (in case of single commodity) can be explained with the help of table 14.2. Suppose, the consumer wants to buy a good which is priced at ₹.10 per unit. Further, suppose, MU obtained from each successive unit is determined. Assumed that 1 util = Re. 1.

Notes

Table 14.2: Consumer's Equilibrium (in case of a single commodity)

Consumption (Units of X)	Price (₹) (P_X)	MU_X (Utils)	MU_X(₹) (1 Util = Re. 1)	Difference	Remarks
1	10	20	20/1 = 20	10	$MU_x > P_x$, consumer will
2	10	16	16/1 = 16	6	increase the consumption
3	10	10	10/1 = 10	0	$MU_x = P_x$, consumer's equilibrium
4	10	4	4/1 = 4	–6	$MU_x < P_x$, consumer will
5	10	0	0/1 = 0	–10	decrease the consumption
6	10	–2	–2/1 = –2	–12	

It is clear from the table 14.2 that the consumer will be at equilibrium when he buys 3 units of the commodity X. He will increase consumption beyond 2 units as $MU_x > P_x$. He will not consume 4 units or more of the commodity X as $MU_x < P_x$.

14.6 CONSUMER'S EQUILIBRIUM IN CASE OF TWO OR MORE COMMODITIES

The law of diminishing marginal utility applies in case of one commodity only. But in real life a consumer normally consumes more than one commodity. In such a situation, law of equi-marginal utility helps in optimum allocation of his income. Law of equi-marginal utility is based on law of diminishing marginal utility. According to the law of equi-marginal utility a consumer will be in equilibrium when the ratio of marginal utility of a commodity to its price equals the ratio of marginal utility of other commodity to its price.

Let a consumer buys two goods X and Y. Then at equilibrium

Notes

$MU_x/P_x = MU_Y/P_Y = MU$ of last rupee spent on each good, or simply MU of Money.

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} = \frac{MU_Z}{P_Z} = MU_{Money} - MU_{Money}$$

Similarly if there are three goods X, Y, Z then the condition of equilibrium will be simply MU Money.

Thus, to be in equilibrium

1. Marginal utility of the last rupee of expenditure on each good is the same.

2. Marginal utility of a good falls as more of it is consumed.

To explain the consumer's equilibrium in case of two goods let us take an example. Suppose a consumer has ₹ 24 with him to spend on two goods X and Y. Further, suppose price of each unit of X is ₹ 2 and that of Y is ₹ 3 and his marginal utility schedule is given in table 14.3.

Table 14.3: Consumer's Equilibrium (in case of two goods)

Units	MU_X	MU_X/P_x (A Rupee worth) of MU	MU_Y	MU_Y/P_Y (A Rupee worth) of MU
1	20	20/2 = 10	24	24/3 = 8
2	18	18/2=9	21	21/3=7
3	16	16/2 = 8	18	18/3=6
4	14	14/2 = 7	15	15/3 = 5
5	12	12/2 = 6	12	12/3 = 4
6	10	10/2=5	9	9/3=3

For obtaining maximum satisfaction from spending his income of ₹ 24, the consumer will buy 6 units of X by spending ₹ 12 (₹ 12 = 2 × 6) and 4 units of Y by spending ₹ 12 (₹ 12 = 2 × 6). This combination of goods brings him maximum satisfaction (or state of equilibrium) because a rupee worth of MU in case of good X is 5 ($MUx/Px = 10/2$) and in case of good Y is also 5

$$(MU_Y/P_Y = 15/3)$$

(= MU of last rupee spent on each good)

It should be noted that, consumer's maximum satisfaction is subject to-budget constraints i.e. the amount of money to be spent by the consumer (₹ 24 in this example)

What happens when the consumer is not in equilibrium?

Suppose, MUx/Px is greater than MUy/Py. This means that MU from last rupee spent on X is greater than the MU of the last rupee spent on Y. This induces the consumer to transfer his expenditure from Y to X. As a consequence, MUx falls and MU rises. The act of transfer of expenditure continues until MUx/Px becomes equal to MUy/Py.

14.7 LIMITATION OF UTILITY ANALYSIS

In the utility analysis, it is assumed that utility is cardinally measurable, i.e., it can be expressed in quantitative term. However, utility is a feeling of mind and there cannot be a standard measure of what a person feels. So, utility cannot be expressed in figures.

INTEXT QUESTIONS 14.2

1. State the necessary condition for consumer's equilibrium in case of a single good.

2. What are necessary conditions for consumer's equilibrium in case of two goods?

14.8 ORDINAL UTILITY APPROACH (INDIFFERENCE CURVE ANALYSIS)

You have already studied the utility approach which was based on the assumption that utility is measurable numerically (like 1 util, 2 utils, 3 utils). This is called cardinal utility approach. **Prof. J.R.** Hicks criticized the utility approach as unrealistic because satisfaction (utility) is a subjective phenomenon and so it can never be measured precisely. He, therefore, presented an alternative technique known as indifference curve approach (also called ordinal utility approach). It is based on the assumption that every consumer has a scale of preference in the form of assigning ranks (like 1st 2nd, 3rd rank) to different combinations of two goods called bundle and can tell which bundle he likes most.

Before we proceed to discuss the consumer's equilibrium through indifference curve approach, let us understand some useful concepts related to indifference curve analysis.

(i) Meaning of Indifference Curve

When a consumer consumes various goods and services, then there are some combinations (bundles) which give him same satisfaction. The graphical representation of such combinations is termed as indifference curve.

Notes

An indifference curve is a curve that shows all those combinations (bundles) of two goods which give equal satisfaction to the consumer.

Table 14.4 shows an indifference schedule showing all the combinations of good X and good Y giving 'equal satisfaction to the consumer.

Table 14.4: Indifference Schedule

Combinations	Good X (Units)	Good Y (Units)	Marginal Rate of Substitution ($\Delta Y/\Delta X$)
A	1	8	–
B	2	4	4Y: 1X
C	3	2	2Y: 1X
D	4	1	1Y : 1X

Combinations A, B, C and D of good X and Y viz. (1X + 8Y), (2X + 4Y), (3X + 2Y) and (4X + 1Y) give the consumer equal satisfaction. In other words, consumer is indifferent between these combinations of good X and good Y. When these combinations are represented graphically, we get an indifference curve as shown in Fig. 14.2.
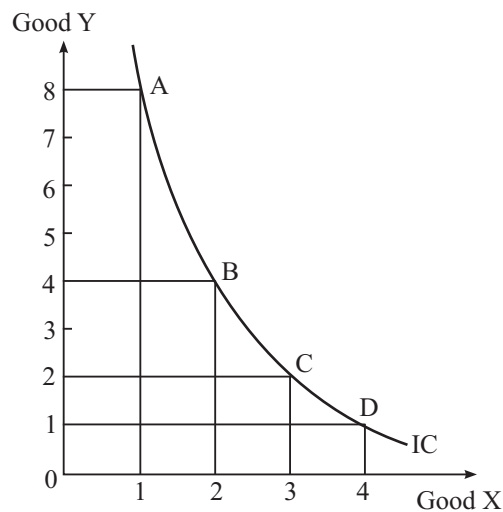

Fig. 14.2

(ii) Monotonic Preferences

Consumer's preferences are called monotonic if and only if between two bundles, consumer prefers the bundle which has more of at least one of the good and no less of other good as compared to other bundles. For example, between the bundles

(2X + 2Y), (1X + 2Y), (2X + 1Y) and (1X + 1Y), the consumer will prefer only bundle (2X + 2Y) to all the three bundles, if his preferences are monotonic.

(iii) Indifference Map

An indifference map is a collection of indifference curves that represent different levels of satisfaction. Higher indifference curves represent higher level of satisfaction because higher indifference curves represent more quantities of both the goods or same quantity of one good and more quantity of other good.
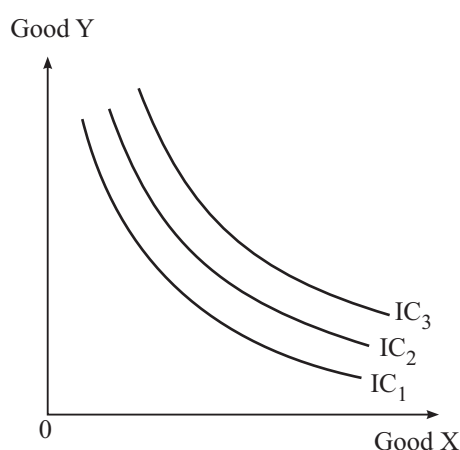
Good Y

Fig. 14.3 Indifference Map

An indifference map containing three indifference curves IC_1, IC_2 and IC_3, is drawn in Fig. 14.3. All the bundles on IC_2 give more satisfaction to the consumer in comparison to IC_1. Similarly, the bundles on IC_3 give more satisfaction to the consumer in comparison to IC_1 and IC_2. This is a result of monotonic preferences.

(iv) Budget Line

A budget line graphically represents all possible combinations of two goods which a **consumer can buy with his entire income at the prevailing market prices.** Anywhere on the budget line consumer is spending his entire income either on single or both the goods. Suppose, the consumer wants to buy good X and good Y; price of each unit of X is P and that of Y is P_2; Then

Accordingly the expenditure on X will be equal to P_1X and the same on Y will be equal to P_2Y.

Total expenditure on good X and Y will be $P_1X + P_2Y$. Let the money required to buy these goods is denoted as M. So we can write that

$$P_1X + P_2Y = M$$

Notes

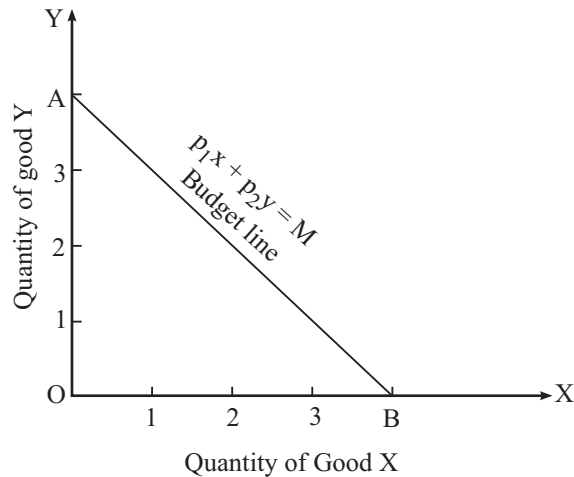This is called the equation for budget line.

This is shown in Fig. 14.4

Fig. 14.4

In the Fig. 14.4, AB is the budget line. Point A is located by dividing the entire income over quantity of good Y only. Similarly point B is located by dividing the entire income over quantity of good X only. At any point on the line AB other than, A and B, the consumer can buy certain combination of X and Y by using her income.

A budget line changes when either the prices of the goods or income of the consumer or both changes. A budget line is negatively sloped because to buy more units of a good, consumer must buy less units of other good as consumer's income is fixed.

Slope of budget line = Quantity of other good sacrificed/ Quantity of good obtained = $\Delta Y/\Delta X$

Suppose, price of good X is ₹.2 and that of good Y is Re.1. So, he has to sacrifice 2 units of good Y to obtain one unit of good X. In this example,

Slope of budget line = $\Delta Y/\Delta X$

$$= 2/1$$

2/1 is nothing but the price ratio between good X and good Y. So the price ratio indicates the slope of budget line. Thus,

Slope of budget line = P_x/P_y. This is also called market rate of exchange (MRE) because the two goods can be exchanged at this rate, given their prices in the market.

(v) Budget Set

Budget set is the set of all possible combinations of two goods which a consumer can afford, given his income and market prices of the two goods. So, a budget set includes all the bundles of two goods which consumer can afford even if her entire income is not spent.

(vi) Marginal rate of substitution (MRS)

Marginal rate of substitution refers to the rate at which consumer is willing to give up amount of other good to obtain one extra unit of the good in question without affecting total satisfaction. So, the rate of substitution of one commodity for another is called marginal rate of substitution. It is expressed as MRSxy of good X for good Y. Symbolically, MRSxy = Loss of good Y/ Gain of good X = $\Delta Y/ \Delta X$

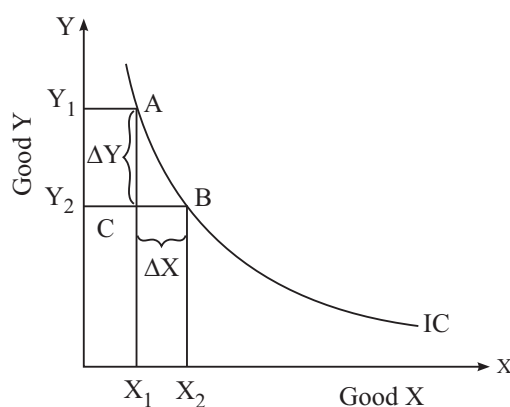MRS_{xy} can be explained with the help of Fig. 14.5.

Fig. 14.5

$MRS_{XY} = \Delta Y/\Delta X = AC/CB$

AC/CB is the slope off indifference curve, i.e. slope of indifference curve = MRS_{XY}. As the consumer gets more and more units of good X, marginal utility of good X goes on falling with every increase in units of good X. Simultaneously, the consumer is left with lesser units of good Y. So, marginal utility of Y rises. Therefore, he is willing to give up lesser quantity of good Y for obtaining additional units of good X. Hence MRS diminishes along an indifference curve when we move from upwards to downward.

14.9 PROPERTIES OF INDIFFERENCE CURVES

(i) Indifference Curves are always convex to the origin

Indifference curves are always convex to the origin because of diminishing marginal rate of substitution. As the consumer consumes more and more of one

good, his marginal utility of this good keeps on declining and he is willing to give up less of other good. Therefore, indifference curves are convex to the origin.

(ii) Indifference Curves slope downwards

It implies that as a consumer consumes more of one good, he must consume less quantity of the other good so that the total utility remains the same.

(iii) Higher Indifference Curves represent Higher level of satisfaction
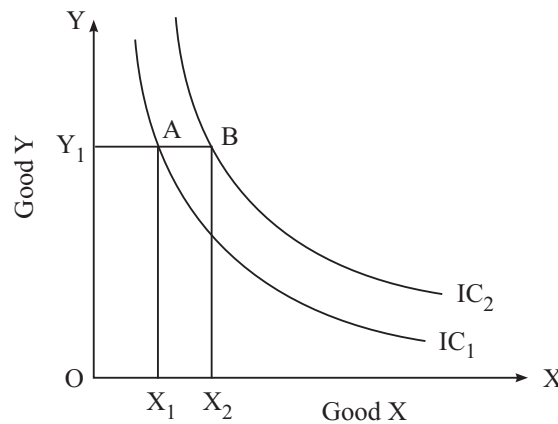
Consider Fig. 14.6

Fig. 14.6

Bundle A on indifference curve IC_1, contains OY_1 quantity of good Y and OX, quantity of good X. Bundle B on indifference curve IC_2 has same quantity i.e. OY_1 of good Y but more quantity i.e. OX_2 of good X. Since, the consumer's preferences are monotonic, he will prefer bundle B to bundle A. It means, higher indifference curves represent higher level of satisfaction.

(iv) Indifference Curves can never Intersect
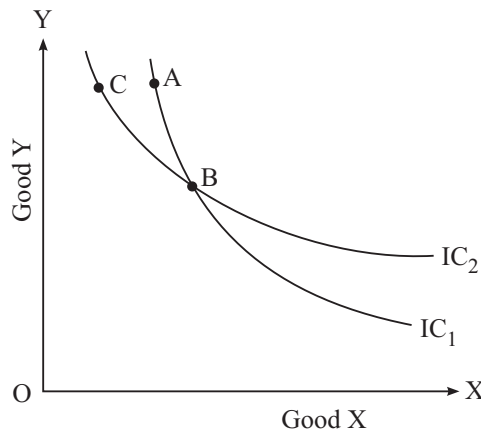
To analyze this, let us consider Fig. 14.7

Fig. 14.7

Notes

We have two indifference curves that intersect at point B. The consumer is indifferent between bundles A and B as they lie on the same indifference curve IC_1. Similarly, the consumer is indifferent between bundles C and B as they lie on the same indifference curve IC_2. This implies that bundles A and C give the consumer the same level of satisfaction. However, this is not possible as higher indifference curve represents higher level of satisfaction.

14.10 ASSUMPTIONS OF INDIFFERENCE CURVES

Indifference curve analysis is based upon the following assumptions:

(i)   It is assumed that the consumer has fixed amount of money whole of which is to be spent on two goods, given the market prices of goods.

(ii) It is assumed that the consumer has not reached the point of satiety. He always prefers more of both the commodities.

(iii) Consumer can rank his preferences on the basis of the satisfaction from each bundle of goods.

(iv) It is assumed that marginal rate of substitution is diminishing.

(v)   Consumer is a rational person i.e. he always aims to maximize his satisfaction.

14.11 CONSUMER'S EQUILIBRIUM BY INDIFFERENCE CURVE ANALYSIS

As stated earlier, consumer's equilibrium refers to a situation when he gets maximum satisfaction and he feels no need to change his position, subject to his income and market prices of two goods.

Condition of Consumer's Equilibrium

According to indifference curve approach, a consumer will be at equilibrium when:

(i)   Budget line is tangent to the indifference curve.

   i.e. slope of budget line = slope of indifference curve

   Or, $MRS_{XY} = P_x/P_Y$

Suppose, two goods consumed are X and Y. Further suppose the consumer wants to increase consumption of good X in place of good Y. MRS is the rate/at which consumer is willing to sacrifice amount of Y to get one more unit of X. Market rate of exchange (MRE) is the rate at which consumer has to sacrifice amount of Y to get one more unit of X.

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When MRS>MRE, it implies that in order to obtain one unit of X, the consumer is willing to sacrifice more units of Y than the market allows. This will lead to increase in consumption of X but decrease in consumption of Y. MRS starts falling. He continues to consume more of X till MRS becomes equal to MRE.

When MRS<MRE, it implies that inorder to get one more unit of X, the consumer is willing to sacrifice less units of Y than the market requires. He will reduce the consumption of X and increase consumption of Y. MRS Starts rising. He continues reducing consumption of X till MRS becomes equal to MRE.

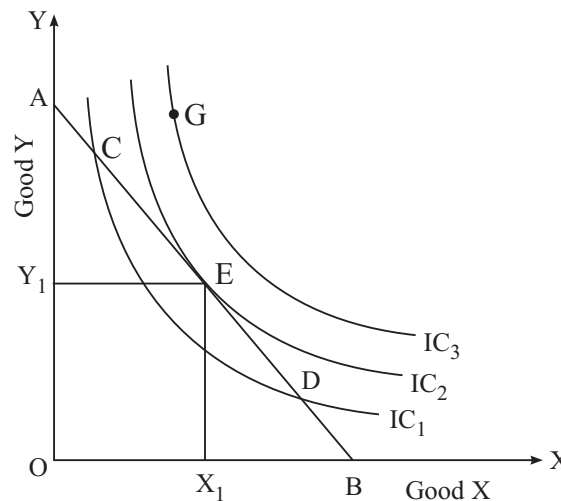To study consumer's equilibrium, let us study the Fig. 14.8

Fig. 14.8

Given the indifference map and the budget line, the consumer is at equilibrium at point E. The consumer obtains maximum satisfaction when, he consumes bundle E containing OX_1 quantity of good X and OY_1 quantity of good Y. At E point budget line is tangent to the indifference curve IC_2, i.e. MRS = MRE= Px/PY Note that the consumer can buy bundles C and D because they also lie on his budget line but these bundles lie on lower indifference curve which represents lower level of satisfaction. He will like to consume bundle G lying on indifference curve IC_3 which represents highest level of satisfaction but it is beyond his budget. So the consumer's equilibrium bundle is X_1, Y_1 at point E where the budget line is tangent to indifference curve.

INTEXT QUESTIONS 14.3

1. What is an indifference curve?

2. Define marginal rate of substitution.

3. What do you mean by monotonic preferences? Give example.

4. State the conditions of consumer's equilibrium in indifference curve approach.

WHAT YOU HAVE LEARNT

- Consumer's equilibrium refers to a situation when he/she spends his/her money income on purchase of a commodity/bundle in such a way that yields him/her maximum satisfaction and he/she feels no urge to change.

- Utility is the power of a commodity to satisfy a want.

- Marginal utility is the addition to the total utility derived from the consumption of an additional unit of a commodity, say good X.

$$MU_X = \frac{\Delta TU}{\Delta X}$$

- Total utility (TU) is the total satisfaction obtained from the consumption of all possible units of a commodity.

$TU_n = MU_1 + MU_2 + MU_3 + ... MU_n$

- (i)   TU increases when MU is positive

  (ii) TU is maximum when MU is zero

  (iii) TU falls when MU is negative

- Law of diminishing marginal utility states that 'as more and more units of a commodity are consumed, marginal utility derived from each successive unit goes on diminishing.'

- In case of a single commodity a consumer will be at equilibrium when marginal utility (in terms of money) equals the price paid for the commodity.

  i.e., $MU_X = P_X$, where X is the commodity.

- In case of two goods, a consumer will be in equilibrium when (i) the ratio of MU of a good to its price equals the ratio of MU of another good to its price, i.e. $MU_X/P_X = MU_Y/P_Y$ = MU of last rupee spent on each good. This is called law of equimarginal utility.

- An indifference curve is a curve that shows all those combinations of two goods which give equal satisfaction to the consumer

Notes

- An indifference map is a collection of indifference curves that represent different levels of satisfaction.-

- A budget line graphically represents all possible combinations of two goods which a consumer can buy with his entire income at the prevailing market prices.

- Budget set is the set of all possible combinations of two goods which a consumer can afford, given his income and market prices of the two goods.

- Marginal rate of substitution refers to the rate at which consumer is willing to give up amount of other good to obtain one extra unit of the good in question without affecting total satisfaction.

- Consumer's preferences are called monotonic if and only if between two bundles, consumer prefers the bundle which has more of at least one of the good and no less of the other good as compared to the other bundles.

- Properties of indifference curves are:

  (i) Indifference curves are always convex to the origin;

  (ii) Indifference curves always slope downwards;

  (iii) Indifference curves never intersect;

  (iv) Higher Indifference curves represent higher level of satisfaction.

- According to indifference curve approach a consumer will be in equilibrium when,

  (i) Budget line is tangent to the indifference curve

     or $MRS = P_X/P_Y$

     or   MRS = MIRE

TERMINAL EXERCISE

1. What is meant by consumer's equilibrium? Explain the condition of consumer's equilibrium in case of a single commodity using utility approach.

2. Explain the condition determining how many units of a good the consumer will buy at a given price.

3. Explain the relationship between total utility and marginal utility.

4. Explain the law of diminishing marginal utility with the help of a schedule.

5. A consumer buys two goods X and Y. Explain the conditions of his equilibrium using utility approach.

6. A consumer buys two goods X and Y. Explain the conditions of his equilibrium using indifference curve approach.

7. Explain the properties of indifference curves.

ANSWERS TO INTEXT QUESTIONS

Notes

14.1

1. Read section 14.1

2. (i) Read section 14.2(i)

   (ii) Read section 14.2(ii)

   (iii) Read section 14.2(iii)

3. Read section 14.3 (Maximum)

14.2

1. Read section 14.5

2. Read section 14.6

14.3

1. Read section 14.8(i)

2. Read section 14.8(vi)

3. Read section 14.8(ii)

4. Read section 14.11