04.Ordinal approach - Indifference curve – characteristics – budget line – equilibrium of consumer.

Indifference Curve Analysis

The utility analysis suffers from a defect of subjective nature of utility i.e., utility cannot be measured precisely in quantitative terms. In order to overcome this difficulty, the economists have evolved an alternative approach based on indifference curves. According to this indifference curve analysis, the utility cannot be measured precisely but the consumer can state which of the two combinations of goods he prefers without describing the magnitude of strength of his preference. This means that if the consumer is presented with a number of various combinations of goods, he can order or rank them in a 'scale of preferences'. If the various combinations are marked A, B, C, D, E etc., the consumer can tell whether he prefers A to B, or B to A or is indifferent between them. Similarly, he can indicate his preference or indifference between any other pairs or combinations. The concept of ordinal utility implies that the consumer cannot go beyond stating his preference or indifference. In other words, if a consumer prefers A to B, he can not tell by 'how much' he prefers A to B. The consumer cannot state the 'quantitative differences' between various levels of satisfaction; he can simply compare them 'qualitatively', that is, he can merely judge whether one level of satisfaction is higher than, lower than or equal to another.

The basic tool of Hicks - Allen ordinal analysis of demand is the indifference curve that represents all those combinations of goods that give same satisfaction to the consumer. In other words, all combinations of the goods lying on a consumer's indifference curve are equally preferred by him. Indifference curve is also called Iso-utility curve. Indifference schedule is the tabular statement that shows the different combinations of two commodities yielding the same level of satisfaction.

Table 2.4 Indifference schedule

Combination	Rice (X)	Wheat (Y)
I	1	12
II	2	8
III	3	5
IV	4	3
V	5	2

Now the consumer is asked to tell how much of wheat (Y) he will be willing to give up for the gain of an additional unit of rice (X) so that his level of satisfaction remains the same. If the gain of one unit of rice compensates him fully for the loss of 4 units of wheat, then the next combination of 2 units of rice and 8 units of wheat will give him as much satisfaction as tha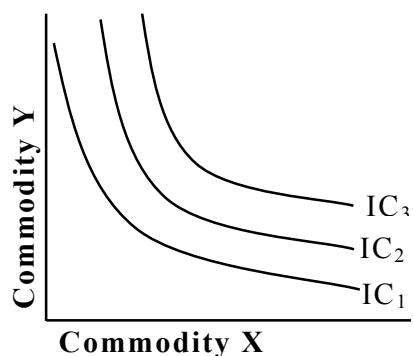t of initial or first combination. A set of indifference curves representing the scale of preference at different levels of satisfaction is known as indifference curve map (Fig 2.3). All combinations lying on indifference curve 3 (IC_3) provide the same satisfaction but the level of satisfaction on Indifference curve 3 (IC_3) will be greater than the level of satisfaction on indifference curve 2 (IC_2).

Fig 2.3 Indifference Curve Map

i) Properties of Indifference Curve

a) Downward sloping: Indifference curves slope downward from left to right. This means that when the quantity of one good in the combination is increased, the quantity of another good has to be necessarily reduced so that the total satisfaction remains constant. If the indifference curve is an horizontal straight line (parallel to x-axis) as could be seen in Fig. 2.4(a), that would mean as the amount of good X increases, while the amount of good Y remains constant, the consumer would remain indifferent between various combinations. This cannot be so, because the consumer always prefers larger amount of a good to smaller amount of that good. Likewise, indifference curve cannot be a vertical straight
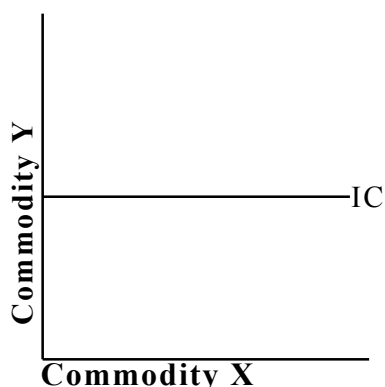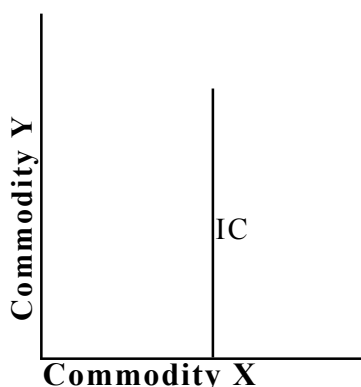
Fig.2.4 (a) Horizontal Indifference Curve

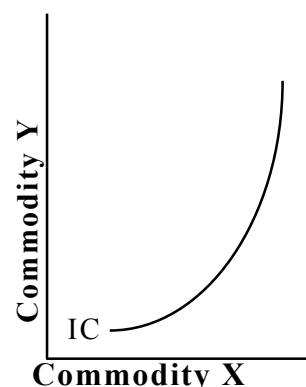**Fig.2.4 (b) Vertical Indifference Curve**

Fig.2.4(c) Upward Sloping Indifference Curve

line (Fig.2.4 (b)). A vertical straight line would mean that while the amount of good Y in the combinations increases, the amount of good X remains constant. A third possibility for a curve is to slope upwards to the right (Fig. 2.4(c)). Upward

sloping curve means that the combination, which contains more of both the goods, could give the same satisfaction to the consumer as the combination, which has smaller amounts of both the good. Therefore, it follows that indifference curve cannot slope upward to the right. The last possibility for the curve is to slope downward to the right and this is the shape, which the indifference curve can reasonably take.
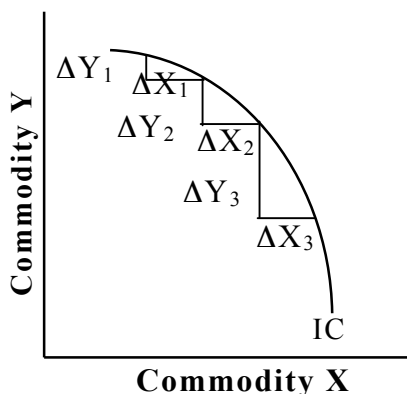

Fig 2.5 Concave Indifference Curve

level of satisfaction remains the same. Only a convex indifference curve can mean a diminishing marginal rate of substitution of X for Y. If the indifference curve is concave to the origin, as could be seen in the Figure 2.5, it would imply

Table 2.5 Marginal Rates of Substitution of X for Y

Combination	Rice (X)	Wheat (Y)	MRS xy
I	1	12	4
II	2	8	3
III	3	5	2
IV	4	3	1
V	5	2	

that the MRSxy increases as more and more of X is substituted for Y. As more and more of X are acquired, for each extra unit of X the consumer is willing to part with more and more of Y. This violates the fundamental assumption about the consumer behaviour, which states that MRSxy declines as consumer su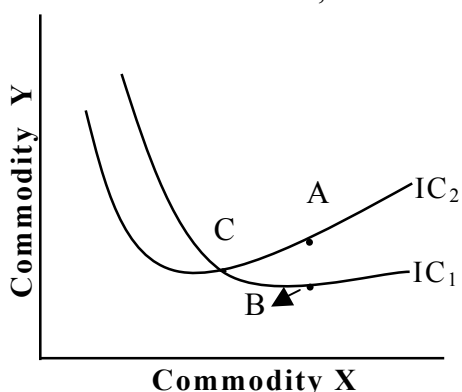bstitutes more and more of X for Y. As a consumer consumes more and more of one good (X), he shall be prepared to forego less and less of the other good (Y). This is due to the fact that the desire for the former (good X) becomes less and less intense with more and more of it.

Fig 2.6 Indifference Curve-Intersecting each other

c) Non-intersecting: Indifference curves cannot intersect each other. Since

indifference curve represents those combinations of two goods, which give equal satisfaction to the consumer, the combinations represented by points A and C will give equal satisfaction as they lie on the same indifference curve (IC_2). Likewise, the combinations B and C will give equal satisfaction as they lie on IC_1. If combination A is equal to combination C and combination B is equal to combination C, it follows that the combination A will be equivalent to B in terms of satisfaction. But this is an absurd conclusion, as the consumer will definitely prefer A to B (This is because of the fact that A contains more of good y and it lies on IC_2). Hence, indifference curves cannot cut each other.

ii) Price Line or Budget Line: The price line shows all those combinations of two goods which the consumer can buy by spending his given money income on the two goods at their given prices. Suppose, a consumer has Rs.50 to spend on goods X and Y. Let the prices of goods X and Y be Rs.10 per unit and Rs. 5 per unit respectively. If he spends his whole income (Rs.50) on X, he would buy 5
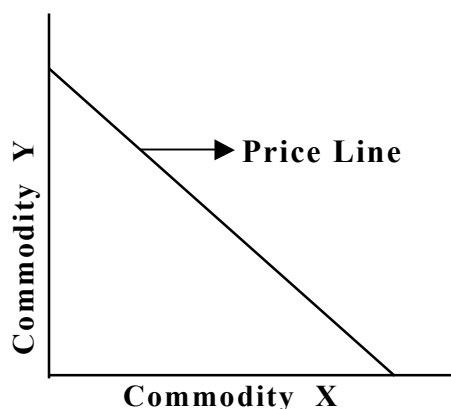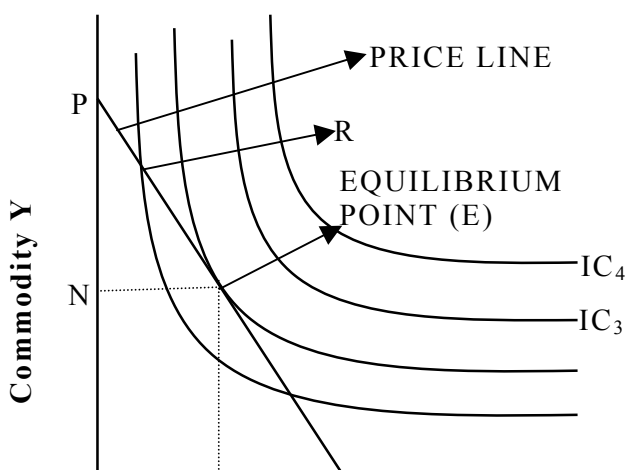

Fig. 2.7 Price Line or Budget Line

units of X, and if he spends his whole income on Y, he would buy 10 units of Y. If a straight line joining 5 units of X and 10 units of Y is drawn, we get what is called the price line or budget line.

iii) Consumer's Equilibrium (Maximum Satisfaction): The consumer reaches equilibrium position i.e., attains maximum satisfaction at the point of tangency between the indifference curve and the price line. This indifference curve is of the highest order in the consumer's scale of preference within his reach. At equilibrium point (E), the slopes of the indifference curve and the price line are same. Slope of the indifference curve shows the marginal rate of substitution of X for Y (MRSxy), while the slope of the price line indicates the ratio between the prices of two goods, i.e.,$\dfrac{Px}{Py}$ in Fig 2.8. Thus, at point E, consumers is in equilibrium, that is,

$$MRSxy = \frac{\text{Price of Good X}}{\text{Price of Good Y}}.$$

That is, $\dfrac{\Delta Y}{\Delta X} = \dfrac{Px}{Py}$

At the point R, the MRS_{xy} is greater than the given price ratio. Hence, the consumer will substitute good X for good Y and will come down along the price line PL. He will continue to do so till the MRS   becomes equal to
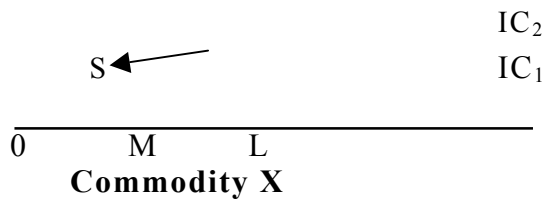
Commodity X

Fig. 2.8 Consumer's Equilibrium

indifference curve becomes tangent to the given price line, PL. At the point S, the MRS$_{xy}$ is less than the given price ratio. Therefore, it will be to the advantages of the consumer to substitute Y for good X and accordingly move up along the price line (PL) till the MRS$_{xy}$ rises so as to become equal to the given price ratio.

iv) Assumptions: In the indifference curve approach, the equilibrium position of the consumer is achieved under the following assumptions:

1) The consumer has a given indifference curve map exhibiting his scale of preferences for various combinations of two goods, X and Y.

2) The consumer has a fixed amount of money to be spent on two goods. He has to spend whole of his given money on the two goods.

3) Prices of goods are given and constant for him.

4) Goods are homogeneous and divisible.

5) Tastes and preferences of the consumer remain constant.

6) The consumer seeks maximum satisfaction.

v) Superiority of Indifference Curve Analysis over Marginal Utility Analysis

1) Indifference curve analysis adopts ordinal measure of utility in a more realistic way.

2) Indifference curve analysis uses the concept of marginal rate of substitution that is measurable. Moreover, in indifference curve analysis, demand can be analyzed without assuming constant marginal utility of money.

vi) Criticism on Indifference Curve Analysis

1) The indifference curve analysis has an unrealistic assumption that states that the consumer possesses complete knowledge of innumerable possible combinations of goods and their 'scale of preferences'.

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2) Sometimes, the consumer has to know and compare the desirability of absurd combinations such as 8 pairs of shoes and one shirt, and 10 kgs of sugar and 1 kg of rice.

Chapter 2: Questions for Review:

1.Fill up the blanks with appropriate words given in the brackets:

a) A good with negative utility has ———— (use/no use).

b) Wants change ———— over time (change/do not change).

c) Free goods are ———— (scarce/not scarce).

d) Indifference curves are ———— to the origin (concave/convex).

e) Gold ornaments are ———— goods (luxurious/comforts).

f) The consumer attains equilibrium when marginal utility equals ————

of the commodity.

g) According to indifference curve analysis, the consumer ranks the combinations of commodities using his ———— .

2.Differentiate the following:

a) Perishable and durable goods.

b) Cardinal and ordinal measure of utility.

c) Income and wealth.

d) Consumer goods and producer goods.

e) Real income and money income.

f) Free good and economic good.

g) Utility and value.

h) Satisfaction and utility.

3.Answer the following:

a) What are the characteristics of human wants?

b) Explain the different types of wants.

b) State and explain the law of diminishing marginal utility.

c) Explain the assumptions of the law of diminishing marginal utility.

d) Explain the importance of the law of diminishing marginal utility.

e) Define the law of equi-marginal utility. How consumer gets maximum satisfaction?

f) Define the indifference curve. Explain the properties of indifference curves.

g) How the consumer gets maximum satisfaction with indifference curve analysis?

h) What are the defects of utility analysis? How indifference curve analysis can remove them?