CHAPTER 2- THEORY OF DEMAND AND SUPPLY

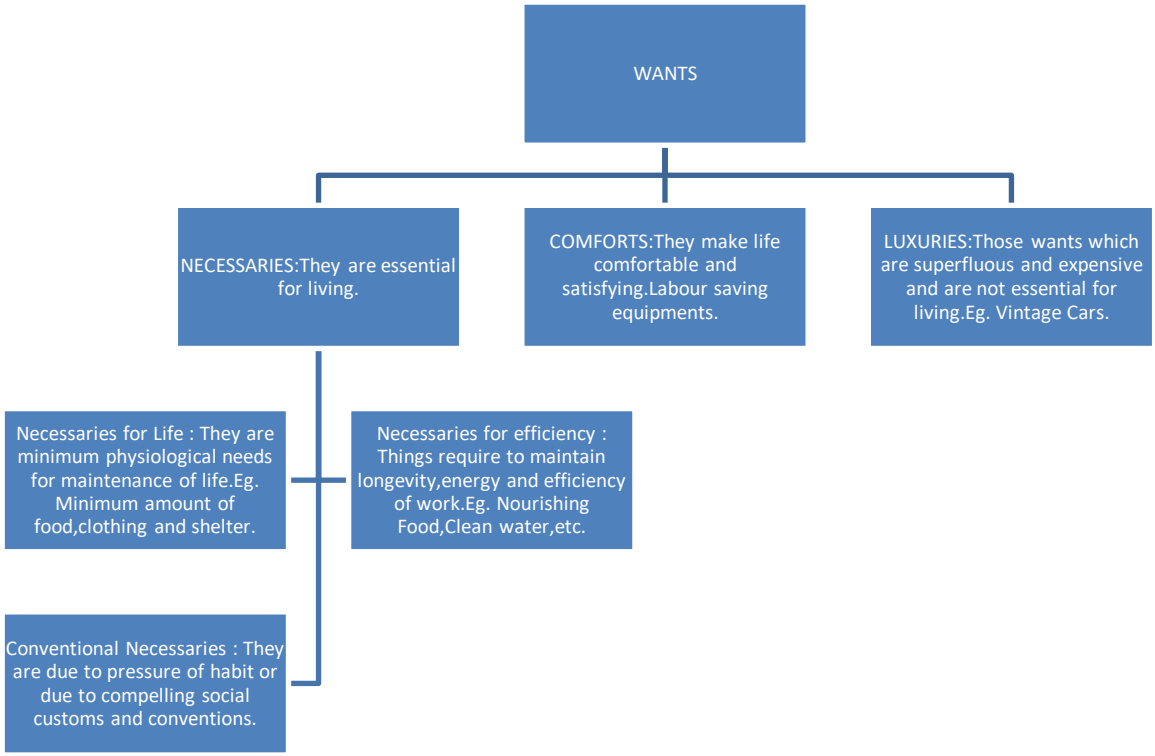
UNIT 2 THEORY OF CONSUMER BEHAVIOUR

NATURE OF HUMAN WANTS

WANT:

- It means wish, desire or motive to own or/and use goods and services that give satisfaction.
- They are unlimited in number.
- They are competitive.
- They are complementary.
- They are subjective and relative.
- They may become habits and customs.

CLASSIFICATION OF WANTS:



WHAT IS UTILITY?

- It is want satisfying power of a commodity.
- It is a measure of the satisfaction that the consumer expects to obtain from consumption of goods and services when he spends money on a stock of commodity which has the capacity to satisfy his want.
- Subjective and relative entity and varies from person to person.
- From economic standpoint, even harmful things like liquor may be said to have utility because people want them.
- Thus, in economics, the concept of utility is ethically neutral.

THEORIES TO EXPLAIN CONSUMER BEHAVIOUR AND CONSUMER DEMAND:

(a) Marginal Utility Analysis by Alfred Marshall

(b) Indifference Curve Analysis by J.R. Hicks and R.G.D. Allen.

A. THE MARGINAL UTILITY ANALYSIS:

- It is formulated by Alfred Marshall.
- It explains how a consumer choses to spend his income on different goods and services so as to maximize his utility.
- According to Marshall, utility is the numerical score in terms of utils representing the satisfaction that a consumer obtains from consumption of a particular good.
- Utils is hypothetical measuring unit of utility.

IMPORTANT DEFINITIONS:

(a) **Total Utility:**

- It is sum of utility derived from different units of a commodity consumed by a consumer.
- It is sum of marginal utilities derived from consumption of different units ;i.e.
- $TU = MU_1 + MU_2 + MU_3 \ldots\ldots\ldots + MU_n$.
  HERE, MU_1, MU_2, MU3…….MU_n are marginal utilities of successive units of a commodity.

(b) **Marginal Utility:**

- It is the change of total utility generated by consuming one additional unit of that good or service.
- It is the utility derived from the marginal or one additional unit consumed or possessed by the individual.
- $MU_N = TU_N - TU_{N-1}$.

ASSUMPTIONS OF MARGINAL UTILITY ANALYSIS:

1. Consumer is rational.
2. Utility is a cardinal concept i.e. is measurable and quantifiable. Measurement of utility in unit is called utils.

3. Money is measuring rod of utility. The amount of money which a person is prepared to pay for a unit of good is a measure of utility which he derives from good.
4. Other factors like price of commodity, taste and preference, income, habits, etc. all are constant.
5. Theory assumes continuity in consumption and there is no time gap or interval between consumption of different units.
6. The different units of the commodity are assumed to be homogenous or identical in nature.
7. The different units consumed should consist of standard units.
8. It is assumed that marginal utility of money is constant.

THE LAW OF DIMINISHING MARGINAL UTILITY

- Also called 'Fundamental Law of Satisfaction' or 'Fundamental Psychological Law'.
- Law States :
  Law of Diminishing Marginal Utility states that after consuming a certain amount of a good or service the Marginal Utility from it diminishes as more and more is consumed. When units of other commodities remains constant.

  OR

  Law of Diminishing MU states the utility of each successive unit goes on diminishing as more and more units of commodity consumed ,when units of other commodity remains constant.

- **ASSUMPTIONS :**
  1. Rational Behaviour of consumer.
  2. Cardinal Measurability of utility. (Utility can be expressed in terms numbers).
  3. Utility can be measured by money and MU of money remains constant.
  4. Income and Mental Status of consumer is constant.
  5. Price of commodity, price of other commodity and other factors which affect utility are assumed to be constant.
  6. Standard units of commodity are consumed like a cup of tea and not spoon of tea.
  7. Consumption of commodity is continuous not with a gap of day or two.

- **EXPLANATION OF LAW:**
  As consumer increases the consumption of any commodity keeping units of other commodity keeping units of other commodity keeping units of other commodities as constant then the satisfaction derived from every additional units will go on diminishing.(As intensity of desire for a commodity tends to decrease as more and more of units of a commodity are consumed).
  After a certain unit, a consumer reaches to a point where utility from additional unit becomes zero. This represents the point of complete satisfaction .If consumer further increases the consumption of commodity then addition utility derived becomes negative.

  NOTE: MARGINAL UTILITY OF MONEY
  1. It refers to 'worth of a rupee'.
  2. Consumer defines it in terms of utility that consumer derives from a standard of goods he can buy with a rupee.
  3. Example: 1Re = Spent to Purchase 100 gm of salt which gives total utility of 4 utils.

4. MU_m = 4 utils.
5. This is a standard reference whenever person is buying any commodity.
6. Buying a unit of 'x' for a Rupee would mean consumer expects 4 utils from consumption of commodity 'x'.

It is explained with the help of an example. In this, the total utility and marginal utility derived is tabulated and we assume other factors constant that affect utility.

TOTAL AND MARGINAL UTILITY SCHEDULE:

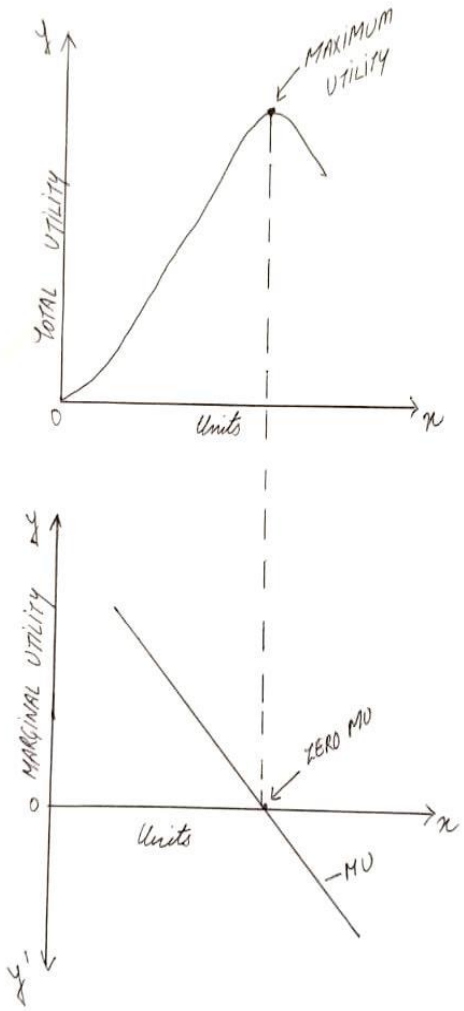
Quantity of chocolate bar consumed per day	TU	MU
1	20	20
2	34	14
3	45	11
4	50	5
5	50	0
6	46	-4

In the above table, we observe that as we increase the quantity consumption we observe that with the extra units we consume the TU keeps on increasing but the MU that we derive keeps on diminishing. At the unit 5 ,the consumption does not gives us any extra utility and thus the Total utility is same leading to MU as 0.Also the consumption of the 6^{th} unit leads to decrease in Total utility from Rs.50 to Rs. 46 thus reducing the MU from 0 to -4.Thus we see that the consumption of 6^{th} unit leads to discomfort or disutility.

With the above table we can note some important relationship between Total Utility and Marginal Utility:

1. TU rises as long as MU is positive, but at a diminishing rate because is MU diminishing.
2. MU diminishes throughout.
3. When MU is zero, the TU is maximum. It is a satiation point.
4. When MU is negative, TU is diminishing.
5. MU is the rate of change of total utility or it is slope of TU Curve.
6. MU can be positive, zero or negative.

The relationship can be shown diagrammatically as under:



LIMITATIONS AND EXCEPTIONS OF THE LAW OF DIMINISHING MARGINAL UTILITY:

1. This law is based on assumptions like cardinal measurability of utility, continuous consumption, etc. The law would operate only when these unrealistic assumptions are met.
2. The utility will get affected by the presence or absence of articles which are substitutes or complements.
3. The law is not universal like in case of prestigious goods, gold, cash, hobbies, habit etc.

CONSUMER'S EQUILIBRIUM IN CASE OF SINGLE COMMODITY:

CONSUMER EQUILIBRIUM:

It refers to a situation of maximum satisfaction while he is spending his given income across different goods and he has no tendency to make any changes in his existing consumption.

ASSUMPTIONS:

Consumer's Equilibrium is based on following assumptions:

(a) The consumer is assumed to be rationale. His aim is to achieve maximum satisfaction through his limited income.
(b) Utility is commodity can be expressed in numbers such as 1, 2, 3, 4, 5 etc.

(c) It is assumed that utility of commodity can be measured by money and MU of money remains constant.
(d) Income of consumer remains constant.
(e) Price of commodity and Price of other commodity remains constant.
(f) Assumed that law of diminishing marginal utility operates for commodities consumed.

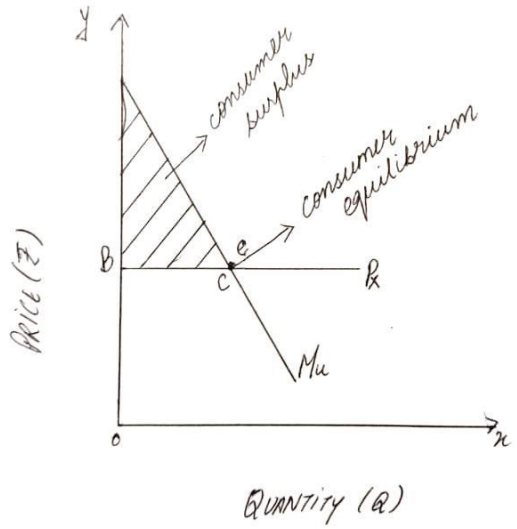
EXPLANATION OF LAW:

Suppose price of X Commodity = Rs. 10/unit.

MU of Re.1 = 5 Utils.

Q	P_x (In Rs.)	MU_x(In Utils)	P_x(In Utils)
1	10	70	50
2	10	60	50
3	10	50	50
4	10	40	50
5	10	30	50

(i) MU_x is downward sloping curve showing that MU_x declines as consumption of X increases due to law of diminishing marginal utility.
(ii) P_x indicates market price of commodity 'X'. It is fixed for consumer and is taken to be Rs. 10.
(iii) Each point of MU_x curve shows MU_x in terms of money. It indicates the consumer is willing to pay for each successive units of commodity.
(iv) Equilibrium at Point C where the price the consumer is willing to pay is exactly equal the price he actually pays. In a state of equilibrium, the consumer buys 3 units of commodity X.
(v) When the consumer is willing to pay a price greater than what he actually pays, the consumer makes a gain which is called as consumer surplus.
(vi) In a state of equilibrium, consumer surplus is maximum which is equal to area ABC.



CONSUMER SURPLUS:

It refers to the excess of price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay.

Consumer Surplus = What a consumer is ready to pay – What he actually pays.

Application of Consumer Surplus:

1. It is helpful to understand which product will be purchased back by the consumer.
2. Helps business managers to make better decisions about setting prices.
3. Large scale investment decisions involve cost benefit analysis which takes into account the extent of consumer surplus which the projects may fetch.
4. Consumer surplus knowledge is important when a firm considers raising its product prices.
5. It acts as a guide to finance ministers when they decide on the products on which taxes have to be imposed and the extent to which commodity tax is to be raised.

LIMITATIONS:

1. It can't be measured precisely.
2. In case of necessities the marginal utilities of earlier units is infinitely large and thus consumer surplus is always infinite.
3. The consumer surplus is affected by the availability of substitutes.
4. There is no rule for deriving the utility scale of articles which are used for their prestige value.
5. The concept can be accepted only if it is assumed that utility can be measured in terms of money or otherwise. Many modern economists believe that this cannot be done.

CONSUMER EQUILIBRIUM IN CASE OF TWO COMMODITIES:

In case of two commodities or several commodities:

When a consumer is buying commodities X and Y (assumed) with his given income the concept of Consumer equilibrium is known as Law of Equi Marginal Utility.

The Principle of Equi Marginal Utility states that a consumer maximum satisfaction when the ratios of MU's of all commodities and their price is equal. In other words, that consumer should incur expenditure on different commodities in such a manner that marginal utility on the last rupee spent on each one of them is equal.

CONDITION OF CONSUMER EQUILIBRIUM:

1. $\frac{MU_x}{P_x} = \frac{MU_x}{P_y} = MU_m$ of a Rupee spent on a good.

   Where, MU_x = Marginal Utility of X.
   MU_y = Marginal Utility of Y.
   P_x=Price of Good X.
   P_y=Price of Good Y.

2. Consumer Income = Expenditure on Good X +Expenditure on Good Y.
   $Y = (P_x * Q_x) + (P_y + Q_y)$

SCHEDULE:

Unit of Commodity	MU_x	MU_y	MU_x/P_x	MU_y/P_y
1	50	80	10	8
2	45	70	9	7
3	40	60	8	6
4	35	50	7	5
5	30	40	6	4

P_x=5 and P_y=10

1. Assume that the consumer has Rs. 40 to spent across Good X and Y.The consumer has to make a combination of Good X and Good Y in such a way that he obtains maximum utility within his income constraint.
2. There are three combination of goods X and y where the MU of both goods are equal with the proportion of price but only one combination is suitable according to law.
3. When the consumer consumes 4 unit of X and 2 units of Y.This is the point where two conditions related to law are satisfied such as :
   $\frac{MU_X}{P_x} = \frac{MU_y}{P_y}$

AND
Expenditure on Good X +Expenditure on Good Y = Consumer Budget.

Above example both conditions are being satisfied :
Condition 1 : On consumption of 4th unit of X = $\frac{MU_X}{P_x}$ =7.
On consumption of 2nd unit of Good Y = $\frac{MU_y}{P_y}$ = 7.

Condition 2 : Consumer Budget = Rs. 40

CONSUMER EQUILIBRIUM –INDIFFERENCE CURVE ANALYSIS

Cardinal Concept of Utility: When utility is measured in terms of unit like 2,4,6,etc. is known as Cardinal Concept.

Ordinal Concept of Utility: Comparison of utility in terms of higher or lower level of satisfaction refers to ordinal concept of utility. Here the utility can be ranked.

Indifference Set – It is set of those combination of two goods which offer the consumer the same level of satisfaction. So that the consumer is indifferent across any number of combinations in his indifference set.

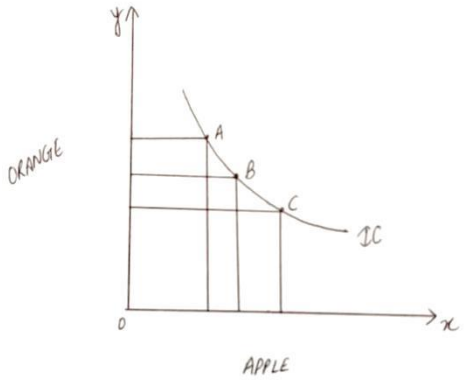
Table showing Indifference Set :

Combination	No. of Apple	No. of Oranges
A	1	10
B	2	7
C	3	5
D	4	4

All the above combination i.e. A, B, C, D offer same level of satisfaction to the consumer. They should that consumer is indifferent across all these combination.

Indifference Curve:

Indifference curve is locus of all such points which shows different combination of two commodities (Apple and Oranges) yielding the same level of satisfaction to the consumers.It is a diagrammatic presentation of an indifference set of a consumer.



MONOTONIC PREFERENCE OF THE CONSUMER:

Monotonic Preference of the consumer is an underlying assumption of IC Analysis. It means the consumer preferences such that greater consumption of a commodity always offer him a greater level of satisfaction.

Monotonic Preference refers to those preference in which consumer always prefer the bundle having either more of both goods or more of atleast one and no less of the other good compared to another bundle .

Example: A (7, 7)
B (5, 5)
C (7, 6)
D (6, 7)

Preference of Consumer; A>B (Because both goods are more).
(A>C) (because more of Good 2).
Therefore, A Bundle is preferred in comparison to all bundles.

MARGINAL RATE OF SUBSTITUTION:

MRS shows the amount of Good Y that the consumer is willing to give up i.e. sacrifice for one more unit of Good X.

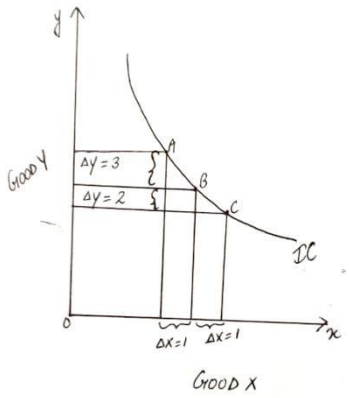
It is slope of IC.

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

Here,ΔY = Change in Quantity of Good Y.

ΔX = Change in Quantity of Good X.

MRS = Slope of Indifference Curve.

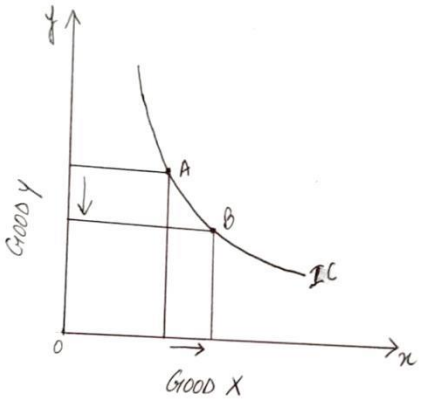


- **WHY SHOULD THE CONSUMER BE WILLING TO SACRIFICE LESS AND LESS AMOUNT OF GOOD Y FOR EVERY SUCCESSIVE UNIT OF GOOD X?**

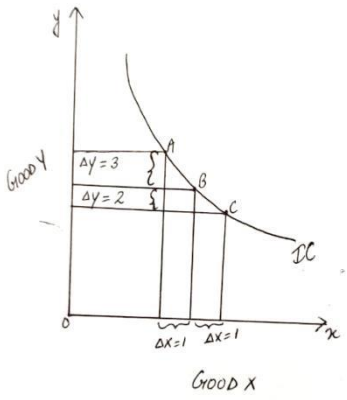
  As more and more unit of good X obtained by the consumer his intensity of desire for Good X tends to decline as marginal utility of good X tends to fall. Whereas as more and more unit of Good Y sacrificed his intensity of desire for good Y tends to rise. Thus leading to increase in marginal utility of Good Y. Thus we see ΔY/ΔX is sacrificing unit of Y for gain of per unit of X tends to fall as we move down the IC, showing that even MRS falls.

PROPERTIES OF INDIFFERENCE CURVE:

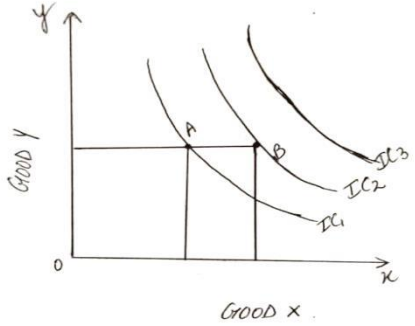
1. **<u>An IC Slopes downward from left to right (negatively) sloping:</u>**
   - IC always slopes downward from left to right i.e. it has negative slope.
   - It is because if consumer wants to have more unit of one good,he will have to reduce the number of another good, if his level of satisfaction remains unchanged.
   - IC slopes downward because of monotonic preference.



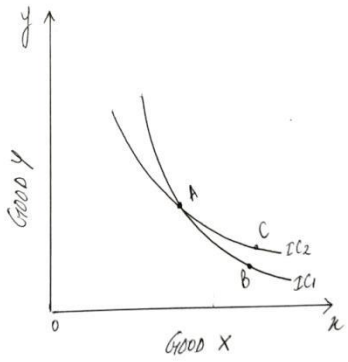
2. **<u>An IC is convex to the origin :</u>**
   - As the quantity of Good X increases, its MRS or slope of IC goes on diminishing.
   - They shows that to gain equal amount of good X, consumer will decline its sacrifice of Good Y.
   - It shows that its MRS between point A and B will be declining as we keep on moving downwards on curve to point C.



3. **<u>Every IC to the right represent higher level satisfaction.</u>**
   - Right side IC gives higher level of satisfaction than the left side IC.
   - This means IC_2 shows higher level of satisfaction than IC_1.
   - In the above diagram at Point A consumer gets 14 units of Good X and 5 units of Good Y. At Point B consumer gets 16 units of Good X and 5 units of Good Y. Thus consumer gets 2 more unit of Good X at point B even when amount of Good Y is same as point A.



4. **<u>Two IC never intersect each other.</u>**
   - Two IC indicates different level of satisfaction.
   - If we consume that IC_1 and IC_2 cut each other at point A, then, A & B are on IC_1 i.e. A=B (in terms of satisfaction level).
   - A & C on IC_c i.e. A=C (in terms of level of satisfaction).
   - If A=B and A=C we can conclude that B=C but this is not true. We note from the same from the diagram that C is to the right and above B. Therefore, must offer higher level of satisfaction and we can conclude that IC_1 &IC_1 do not intersect at each other.



5. <u>IC will not touch either axes :</u>

It is believed that the IC will not touch the X axis or Y axis. It is born out of assumption that the consumer is considering different combination of two commodities although in smaller or larger quantities.

<u>CONSUMER BUDGET, BUDGET SET & BUDGET LINE</u>

<u>Budget set</u> – It refers to attainable combination of a set of 2 goods, given prices of goods and income of the consumer. Example of budget set – income of consumer = Rs.60

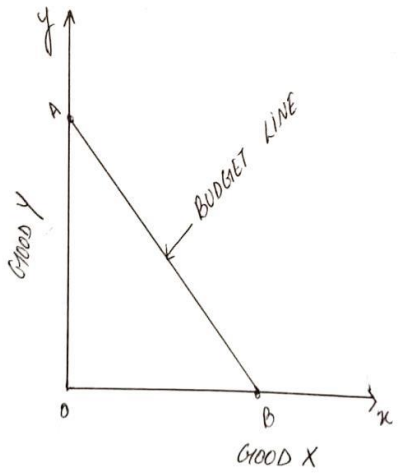
P_x = Rs. 2 per unit

P_y = Rs. 1 per unit

Combination	Good X	Good Y
A	0	60
B	10	40
C	20	20
D	30	0

<u>Budget Line –</u>

1. It is a line showing different possible combination of good X and good Y which a consumer can buy given his budget and prices of good X and good Y.
2. On the budget line a consumer spends his entire income either on good X or on good Y or on both good X and good Y.



CONSUMER EQUILIBRIUM USING INDIFFERENCE CURVE ANALYSIS

1. **Meaning** – Consumer equilibrium refers to optimum choice of the consumers.
2. In terms of indifference curve analysis the consumer reaches his optimum choice when 2 conditions are satisfied.

a. MRS = PX/PY
b. Budget Line should be tangent to IC.

3. Thus a consumer is said to be in equilibrium when he maximized his satisfaction given his income and the prices of commodity he consumes.
4. **Explanation** – In the above diagram, MN is the budget line and IC1, IC2, IC_3 and IC_4 are indifference curves. Consumer equilibrium is determined at the point where budget line touches the indifference curve. In the diagram MN budget line touches the IC_2 at point E, hence it is point of consumer equilibrium. Any point on budget line other than E lies on lower indifference curve, hence represents inferior bundle. Example, A or B. Any bundle represented by the point on IC which is above point E are not affordable. Example, S and R. Hence consumer equilibrium can't be on any point on IC_3 and IC_4. Thus 2 conditions essential for consumer equilibrium for IC are:

a. Budget line should be tangent to the IC.
b. The slope of IC should be equal to the slope of budget line.