

THEORY OF CONSUMER'S BEHAVIOUR : ORDINAL UTILITY APPROACH

**Prepared by:
Jyotika Minhas
Assistant Professor
Department of Economics
Hans Raj Mahila Maha Vidyalaya
Jalandhar
Punjab**

- I. Introduction** to Ordinal Utility Approach
- II. Indifference Curves:** Definition, Schedule, Shape, Map, Law of Diminishing MRS, Assumptions and Properties.
- III. Budget Line:** Definition, Shape and Effect of Price and Income changes
- IV. Consumer's Equilibrium or Maximization of Satisfaction :** First and Second order conditions
- V. Conclusion**

INTRODUCTION

- The technique of ordinal utility approach to consumer's behaviour, based on indifference curves, was originated by British economist **Francis Y. Edgeworth** in 1881. It was later refined by **Vilfred Pareto**, an Italian economist, in 1906 & by **Slutsky** in 1915. This technique attained perfection and systematic application in demand analysis at the hands of **John Richard Hicks** and **R.G.D. Allen** in 1934.
- Hicks discarded the Marshallian assumption of cardinal measurement of utility and suggested **ordinal measurement** which implies comparison and ranking without quantification of the magnitude of satisfaction enjoyed by the consumer.
- Hicks introduced the concept of scale of preferences of a consumer as the base of determining consumer's demand. The conceptual arrangement of different goods and their combinations in a set order of preferences is called the **scale of preferences**.
- Ordinal utility analysis makes use of the tool of Indifference Curves for explaining the consumer's behaviour & that is why this approach is also known as **Indifference Curve Analysis**.

CARDINAL VS. ORDINAL MEASUREMENT

COMBINATIONS	CARDINAL MEASUREMENT	ORDINAL MEASUREMENT (RANKS)
A	40 Units	Ist
B	30 Units	IIInd
C	20 Units	IIIrd
D	10 Units	IVth

Meaning of Indifference Curve :

- An indifference curve is the locus of points representing the different combinations of two goods which yield equal level of utility to the consumer. The consumer is indifferent towards all the combinations lying on the same indifference curve. In other words, the consumer gives equal preference to all such combinations. An indifference curve is a graphical presentation of an Indifference Schedule.

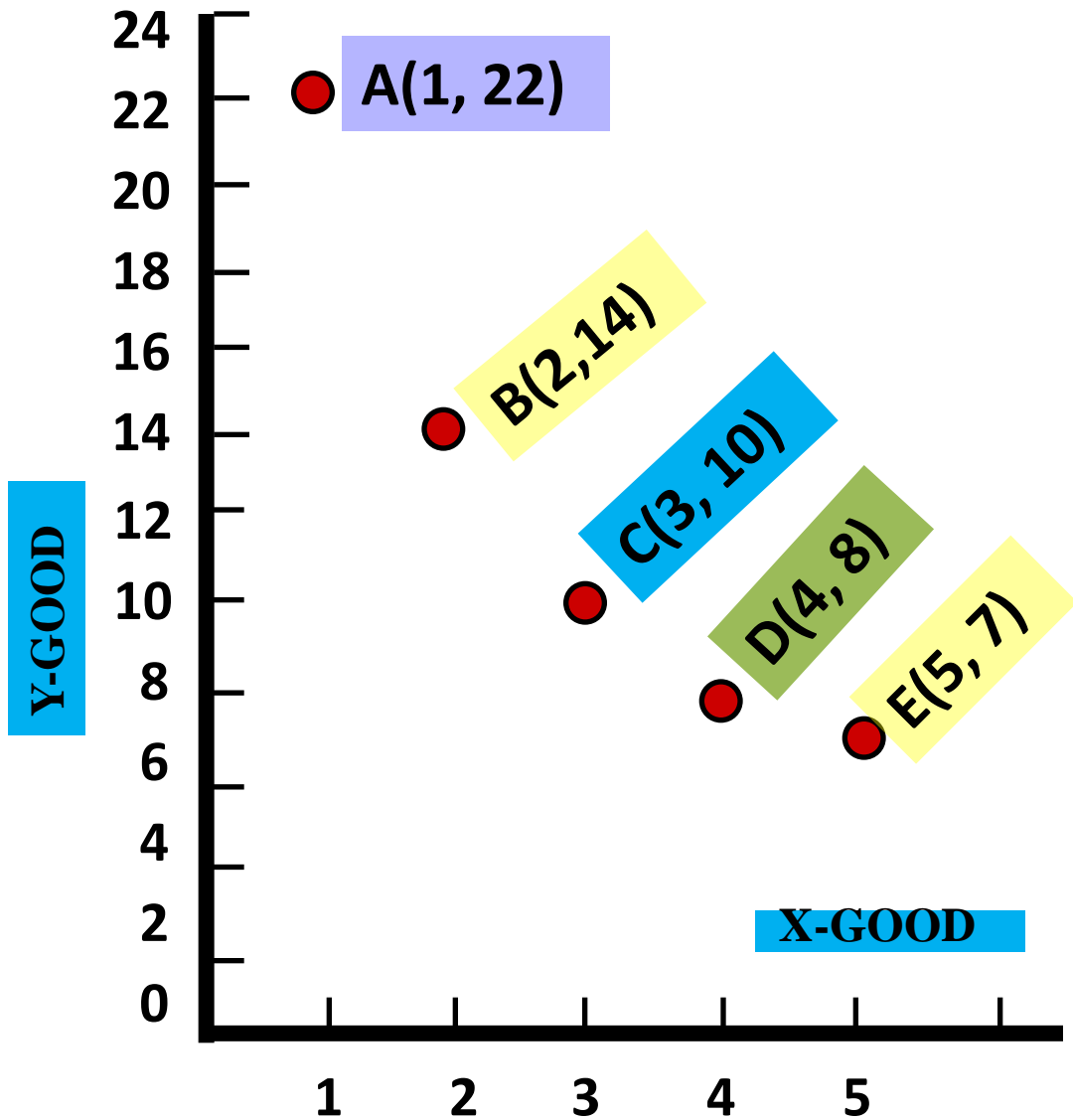
Indifference Schedule :

- Indifference schedule is a tabular presentation of various combinations of two commodities which give the same level of satisfaction to the consumer.

INDIFFERENCE SCHEDULE

Combination	X-GOOD	Y-GOOD
A	1	22
B	2	14
C	3	10
D	4	8
E	5	7

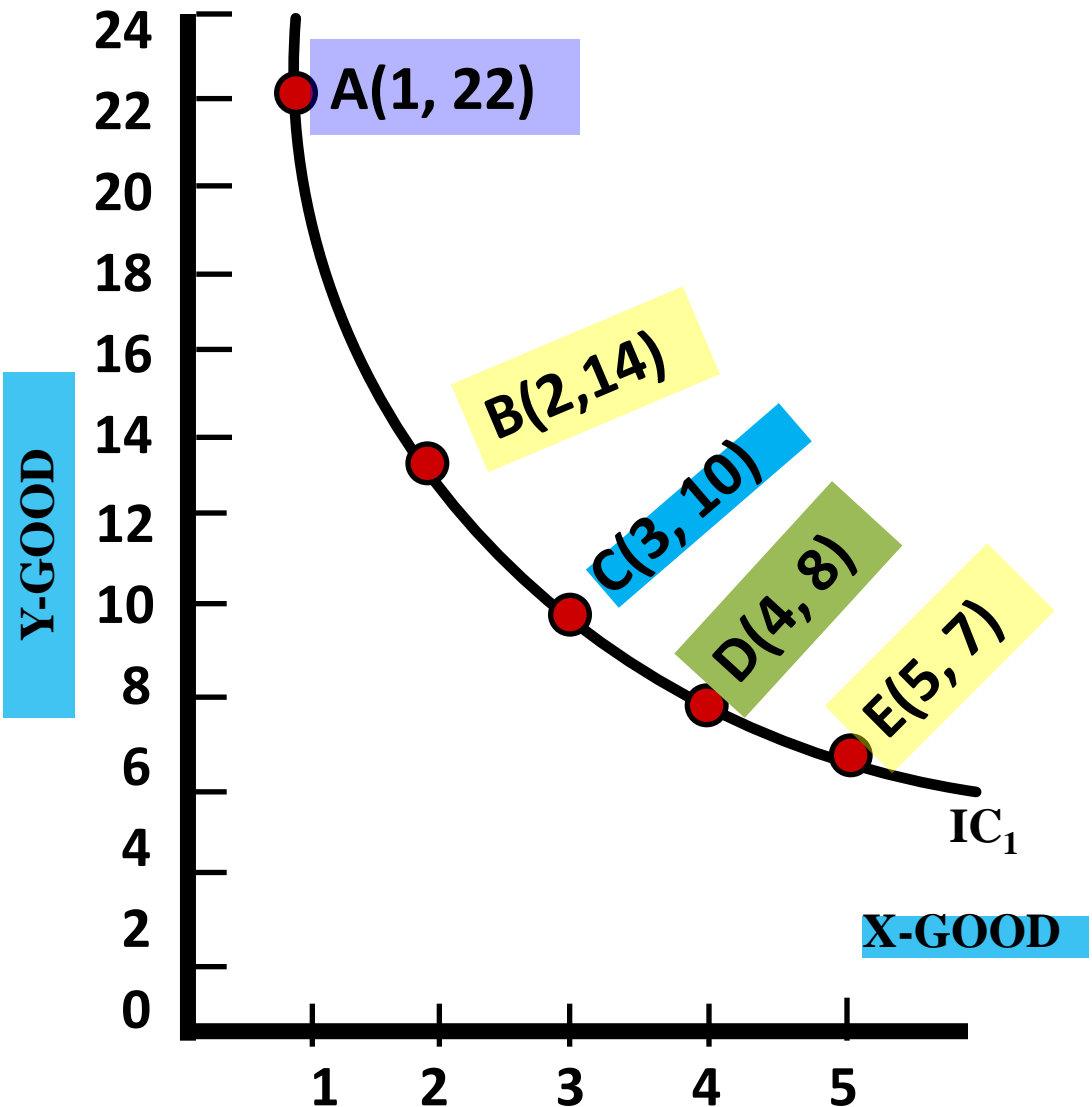
INDIFFERENCE CURVE



INDIFFERENCE SCHEDULE

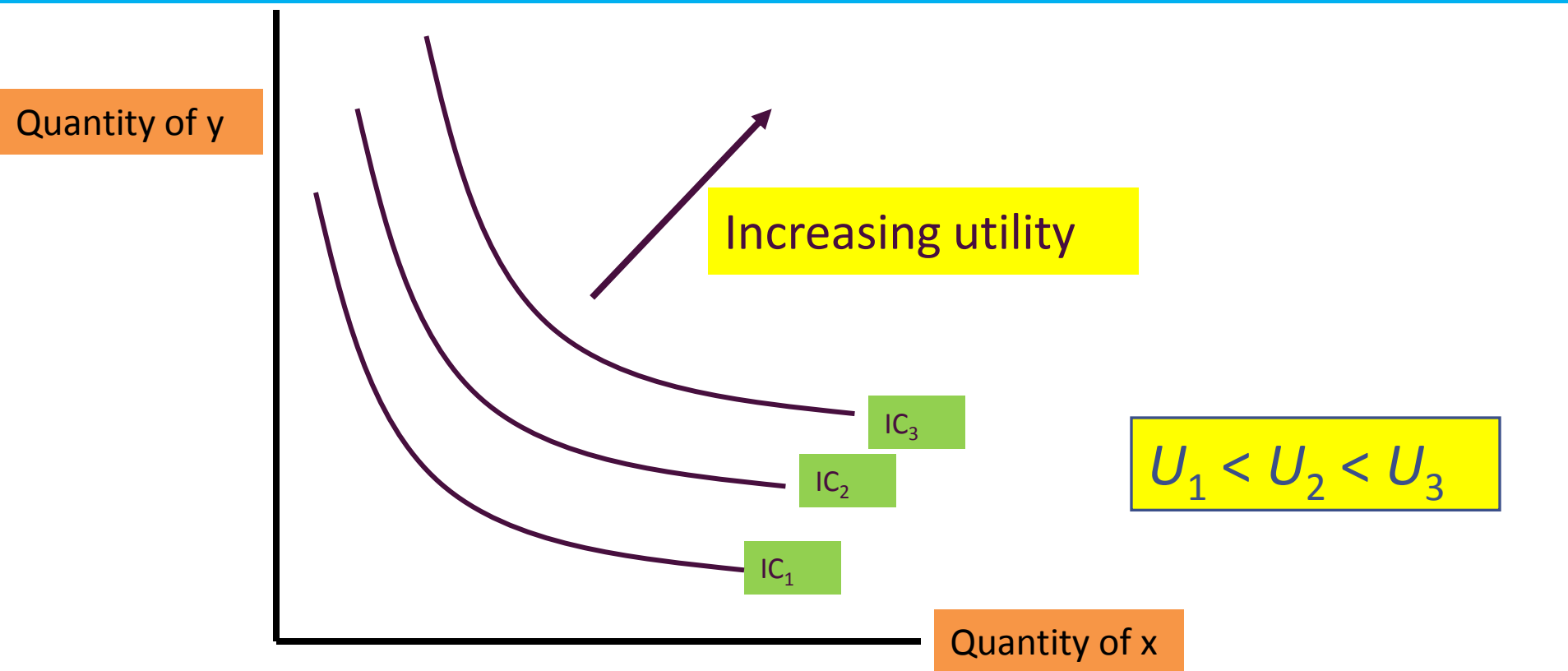
Combination	Apples	Oranges
A	1	22
B	2	14
C	3	10
D	4	8
E	5	7

INDIFFERENCE CURVE



INDIFFERENCE MAP

A graph showing a whole set of indifference curves is called an *indifference map*. An indifference map, in other words, is comprised of a set of indifference curves. All points on the same curve give equal level of satisfaction, but each point on higher curve gives higher level of satisfaction. Each successive curve further from the original curve indicates a higher level of total satisfaction.



LAW OF DIMINISHING MARGINAL RATE OF SUBSTITUTION (MRS)

The marginal rate of substitution of X for Y (MRS_{xy}) is defined as the amount of Y, the consumer is willing to give up, to get one more unit of X so that his level of satisfaction remains the same.

$$MRS_{xy} = \frac{\text{Decrease in the Consumption of Y}}{\text{Increase in the Consumption of X}} = (-) \frac{\Delta Y}{\Delta X}$$

LAW OF DIMINISHING MARGINAL RATE OF SUBSTITUTION

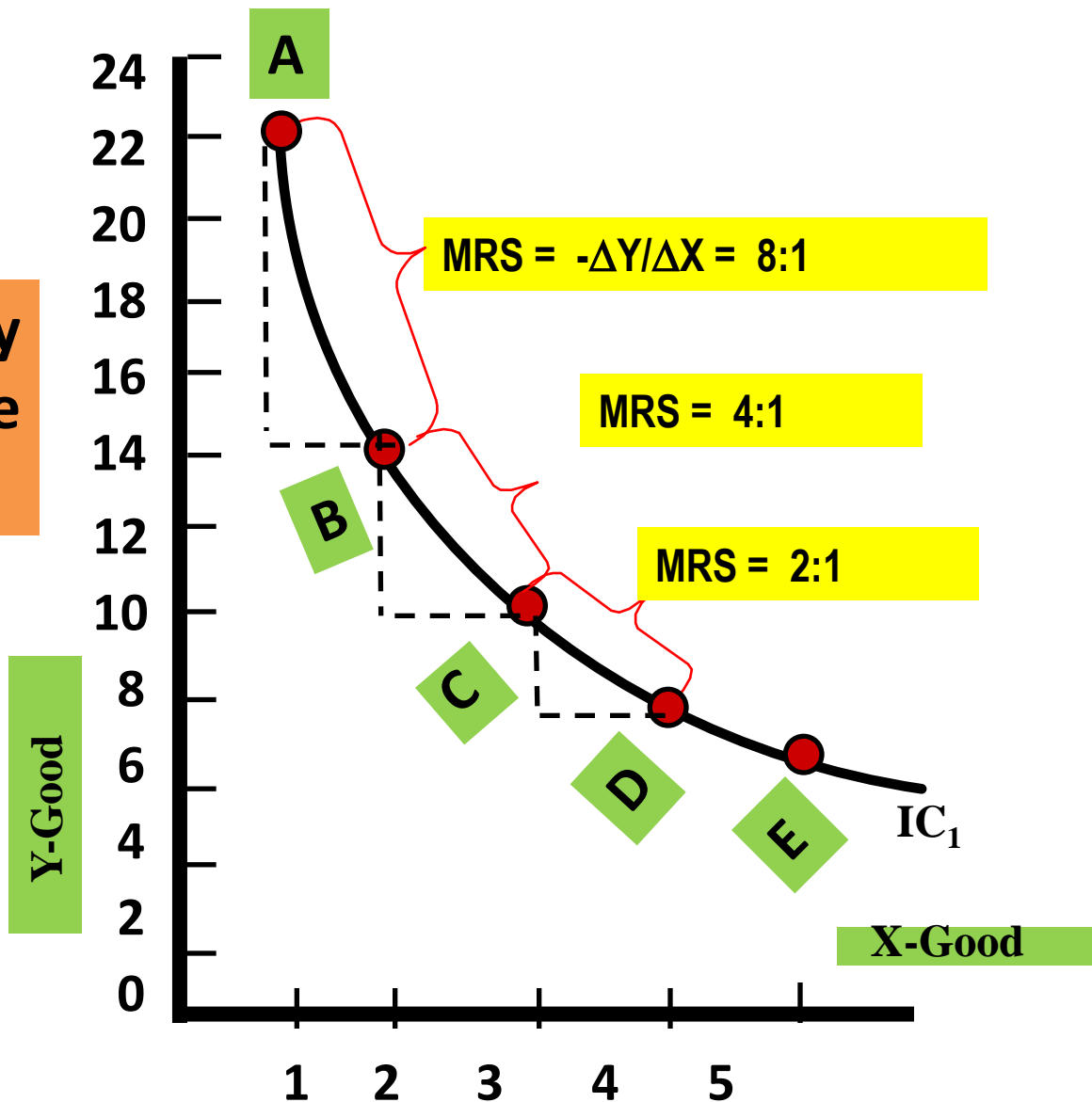
The Law of Diminishing MRS states that as a consumer increases the consumption of X-Good, he will give up less and less units of Y-Good so that the level of satisfaction remains the same. that is, 8:1, 4:1, 2:1, 1:1 respectively Thus, MRS will go on diminishing.

In the table below, as the consumer goes on substituting X for Y, the MRS diminishes from 8:1 to 1:1.


Combination	X-Good	Y-Good	MRS
A	1	22	---
B	2	14	8:1
C	3	10	4:1
D	4	8	2:1
E	5	7	1:1


LAW OF DIMINISHING MARGINAL RATE OF SUBSTITUTION


MRS is measured by the slope of the indifference curve



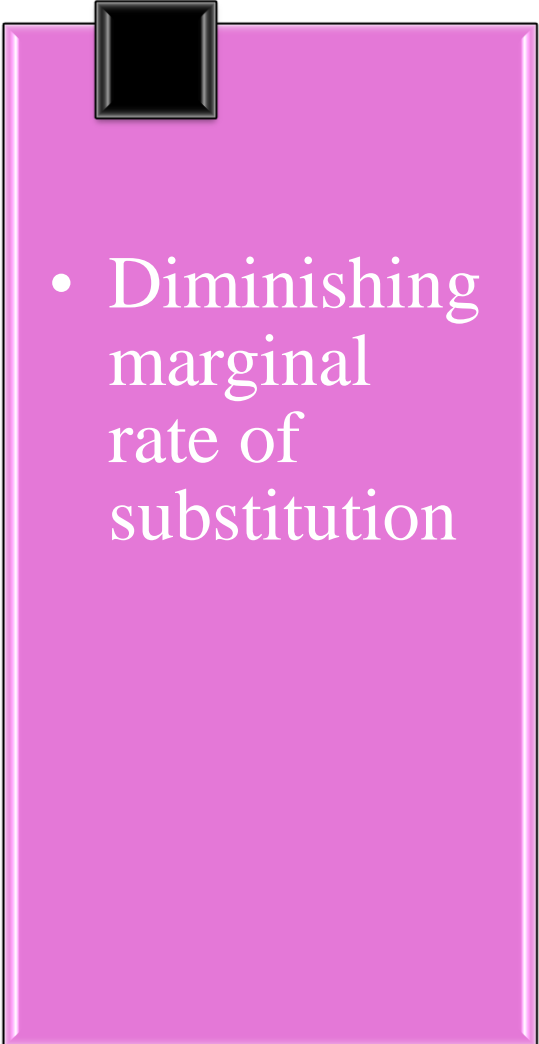
ASSUMPTIONS OF INDIFFERENCE CURVE ANALYSIS

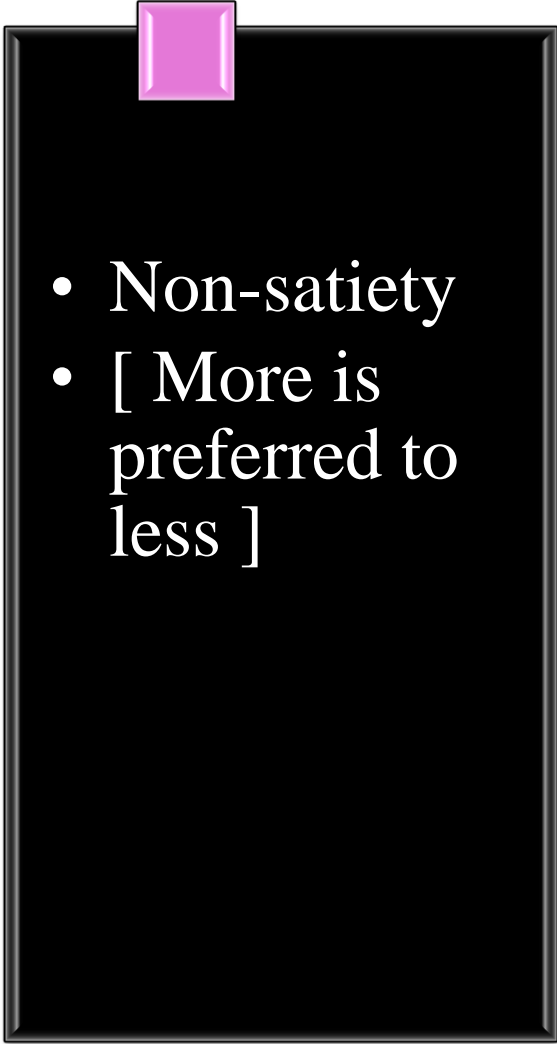
- 
- Rational consumer
 - [Maximum satisfaction]

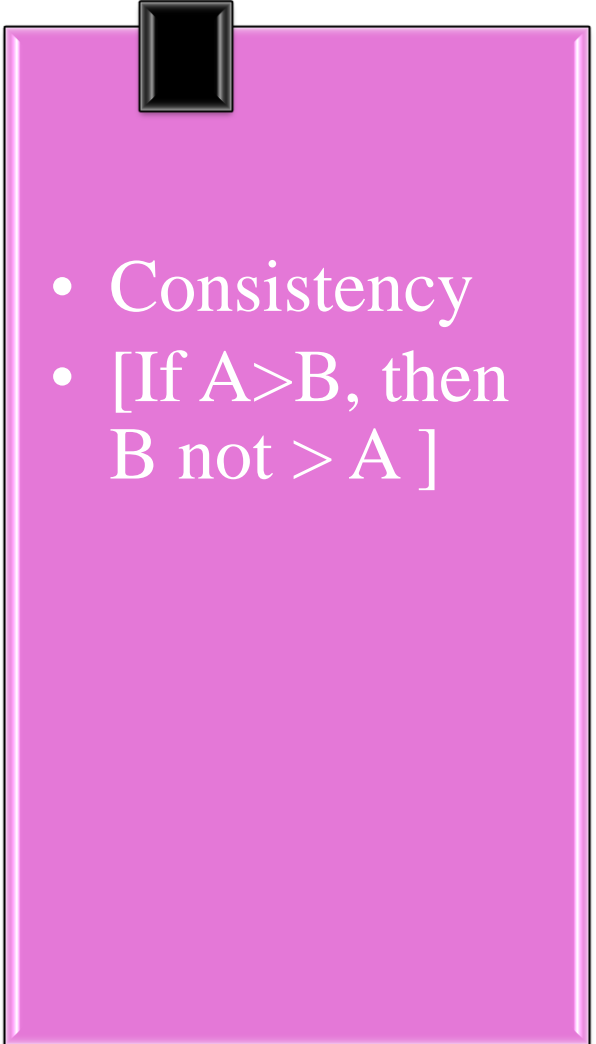
- 
- Ordinal utility
 - [Ranks as per scale of preferences]

- 
- Perfect knowledge
 - [Market conditions, prices, indifference curves]

ASSUMPTIONS OF INDIFFERENCE CURVE ANALYSIS

- 
- Diminishing marginal rate of substitution

- 
- Non-satiety
 - [More is preferred to less]

- 
- Consistency
 - [If $A > B$, then $B \text{ not } > A$]

ASSUMPTIONS OF INDIFFERENCE CURVE ANALYSIS

- Transitivity
- [If $A > B$ and $B > C$, then $A > C$]

- Divisibility
- [Choice of any combination]

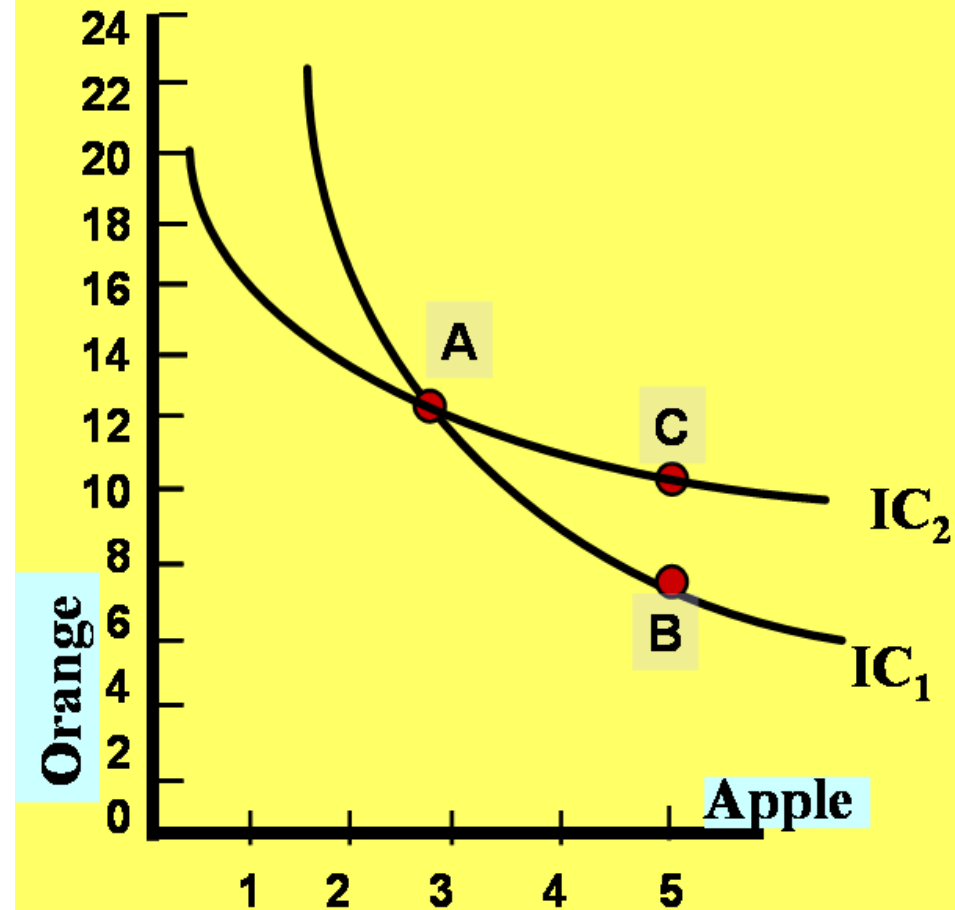
- Substitutability
- [Goods can be exchanged]

PROPERTIES OF INDIFFERENCE CURVES

- An Indifference curve has a **negative slope** i.e. it slopes downwards from left to right. It cannot be vertical, horizontal or an upward sloping curve because each combination on the curve gives equal level of satisfaction.
- Indifference curve is always **convex to the origin**. This implies that as a consumer moves along an indifference curve, MRS between two goods goes on diminishing. Indifference curve will be a downward sloping straight line in case of perfect substitutes and L- shaped in case of complementary goods.

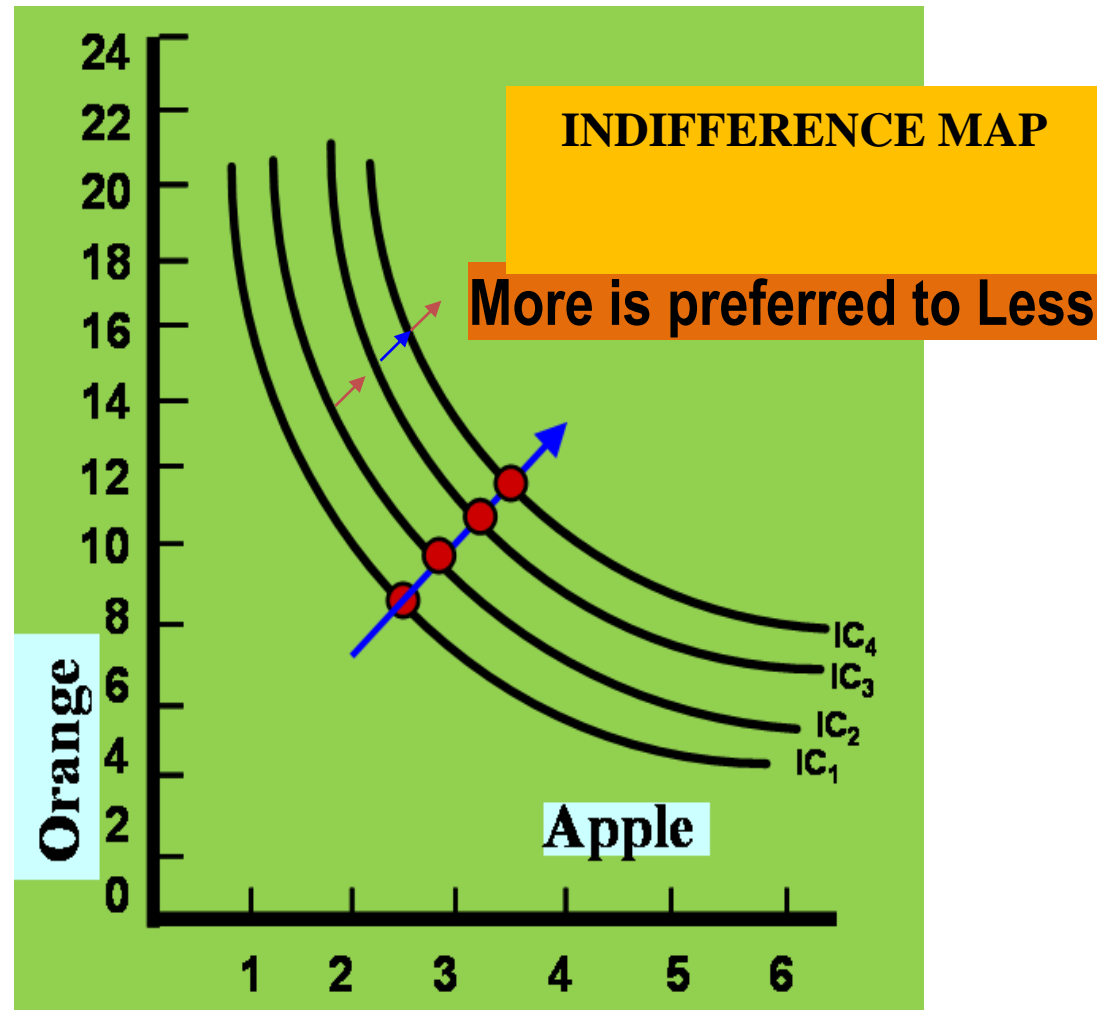
PROPERTIES OF INDIFFERENCE CURVES

- Two Indifference curves **never intersect each other** because each indifference curve represents a specific level of satisfaction. This will violate the rule of Transitivity because on IC_1 , A is equally preferred to B and on IC_2 , A is equally preferred to C. This implies that B is equally preferred to C, which is not possible because more is always preferred to less.



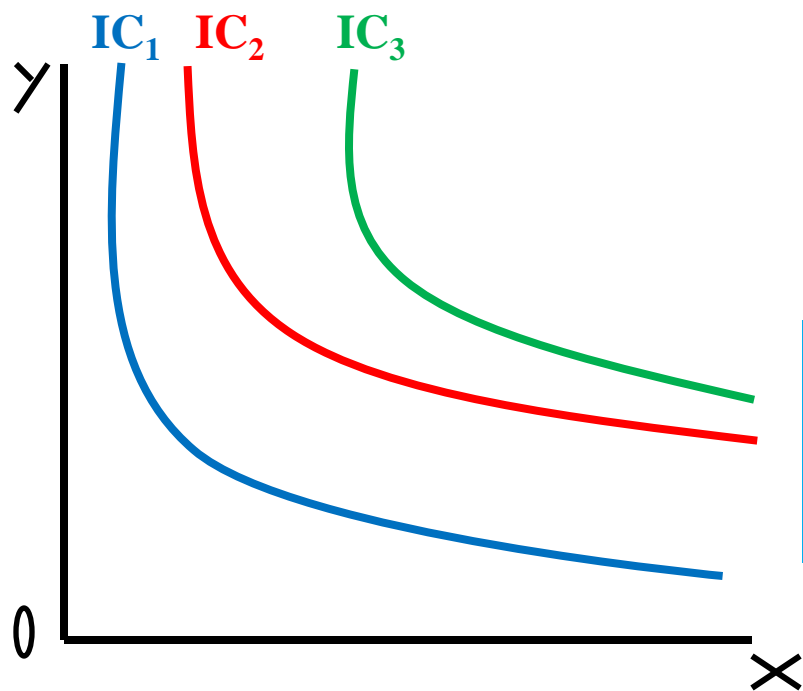
PROPERTIES OF INDIFFERENCE CURVES

• **Higher indifference curve represents higher level of satisfaction.** This is because the combinations lying on higher indifference curve contain more of either one or both the goods and more is always preferred to less.

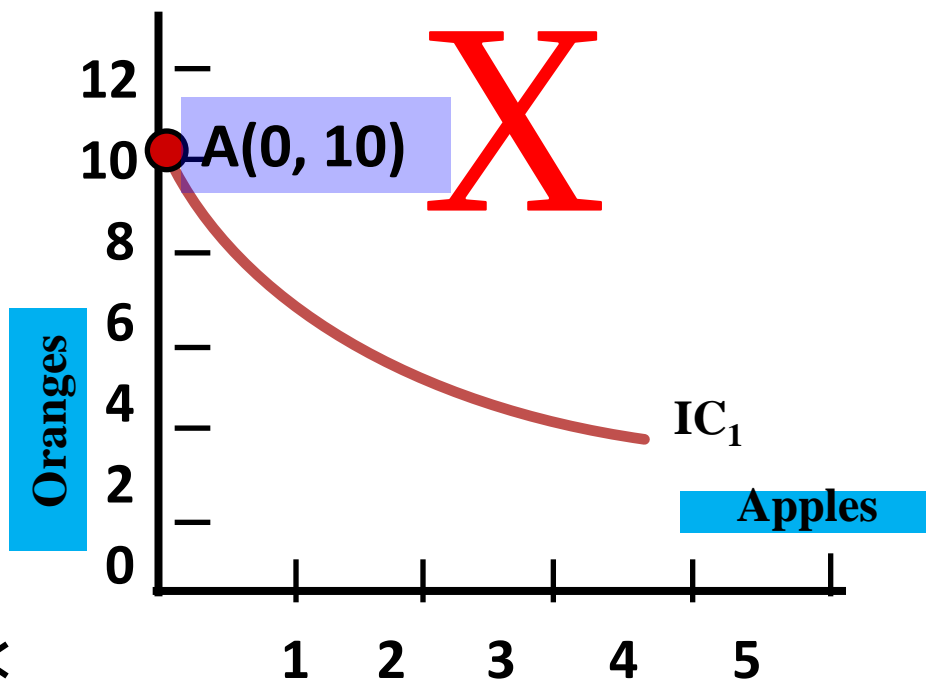


PROPERTIES OF INDIFFERENCE CURVES

- Indifference curves **need not be parallel to each other** (because of different MRS on different ICs).



- Indifference curve **touches neither X-axis nor Y-axis**. It is because by definition, an indifference curve represents combinations of two goods.



PRICE LINE OR BUDGET LINE

The concept of Price line has been used in the ordinal utility approach to determine a consumer's equilibrium. Price line shows the different combinations of two goods that a consumer can buy if he spends the whole of his given sum of money on his purchases at the given prices.

Price line is also known as Budget Line or Consumption Possibility line or Line of Attainable Combinations.

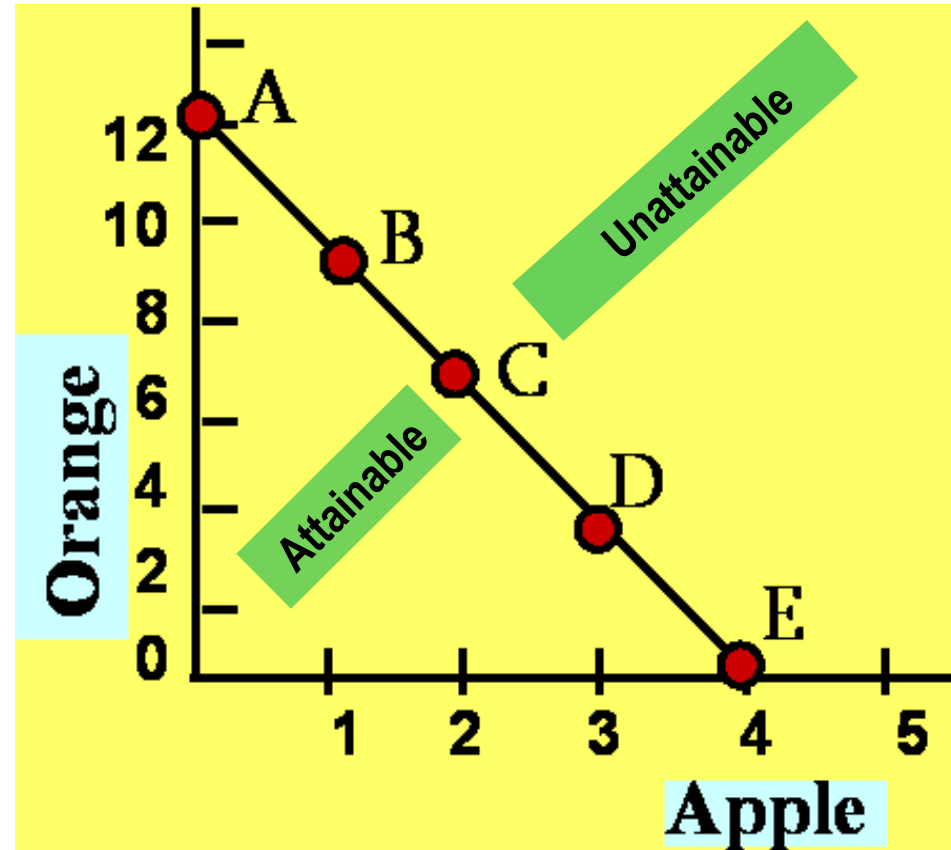
PRICE LINE

Income (Y) = Rs. 24

Price of Apple (P_x) = Rs. 6 per unit

Price of Orange (P_y) = Rs. 2 per unit

Combination	Apples @ Rs. 6 per unit	Oranges @ Rs. 2 per unit	Total budget (Rs.) = $6x_A + 2x_O$
A	0	12	24
B	1	9	24
C	2	6	24
D	3	3	24
E	4	0	24



BUDGET EQUATION

$$P_x * X + P_y * Y = M$$

M : Income of the consumer

P_x : Price of good X

P_y : Price of good Y

X : Quantity of good X

Y : Quantity of good Y

SLOPE OF PRICE LINE

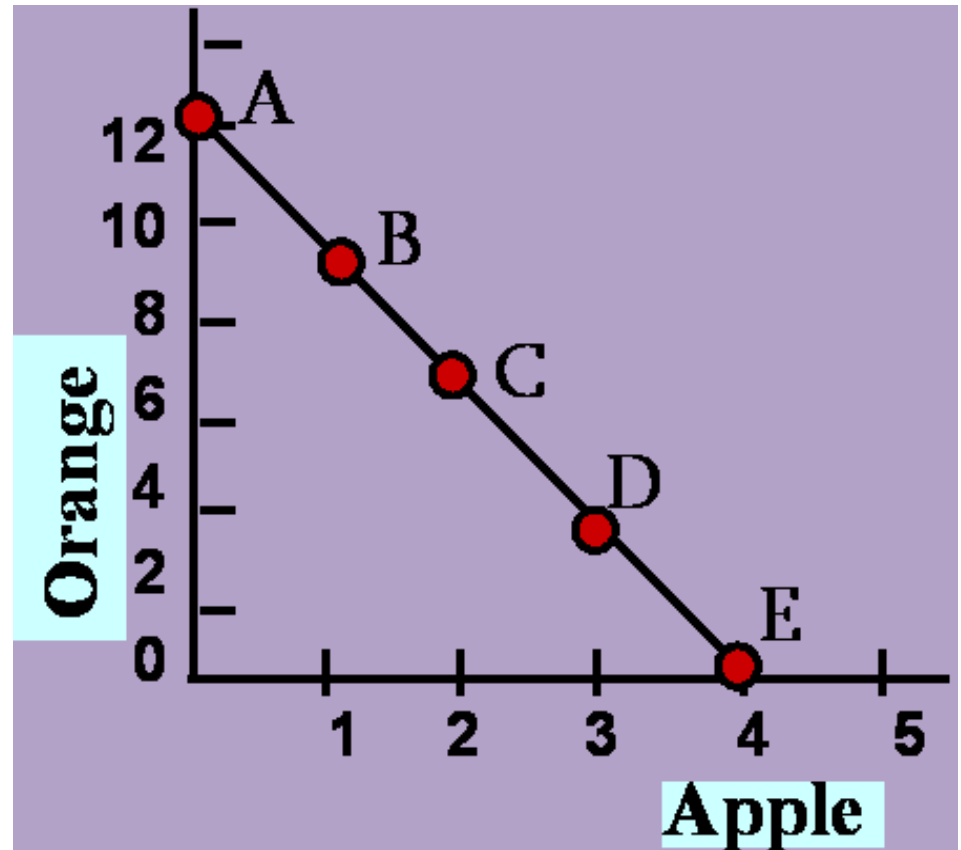
Slope of price line is equal to the ratio of prices of two goods.

Slope of Price line AE

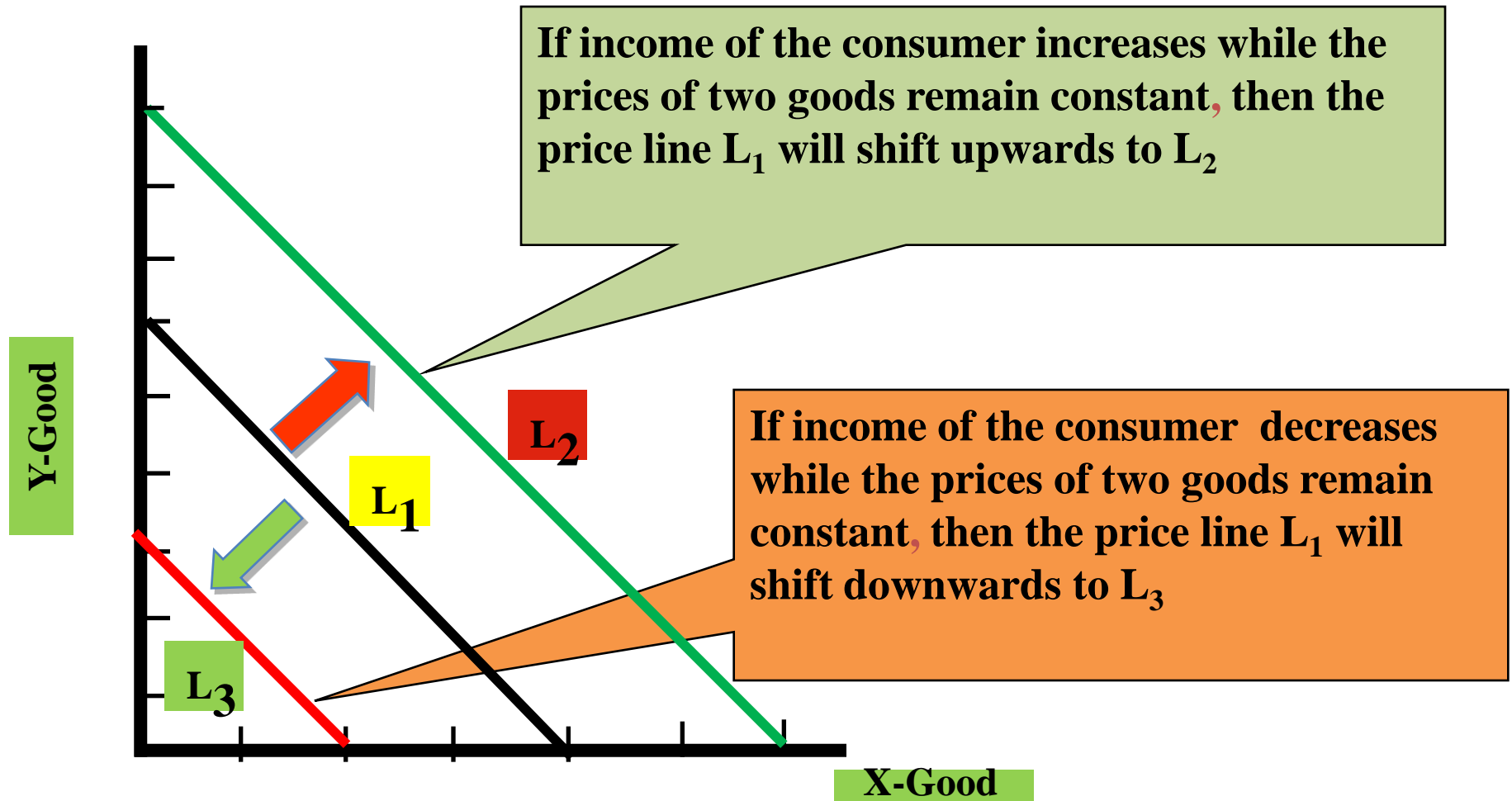
$$= OA/OE$$

$$= \frac{M/P_y}{M/P_x}$$

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



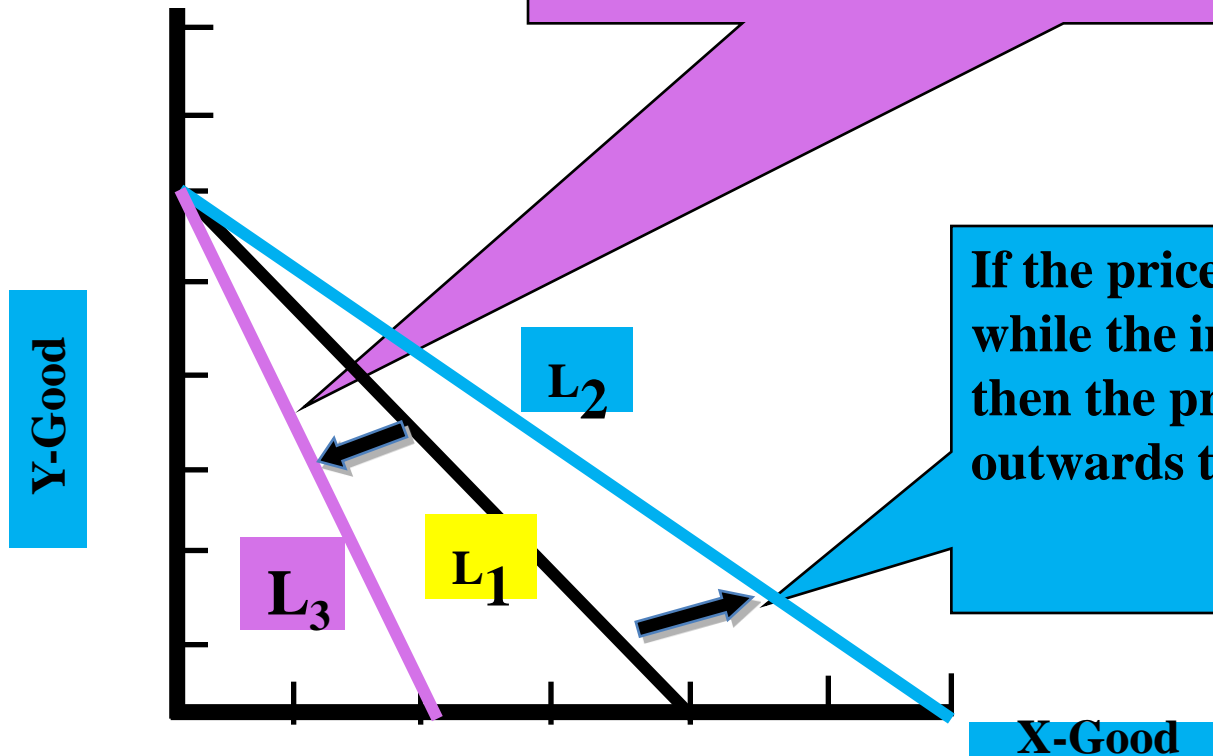
EFFECT OF CHANGE IN INCOME ON PRICE LINE



EFFECT OF CHANGE IN PRICE OF A GOOD ON PRICE LINE

If the price of X-Good increases while the income remains constant, then the price line L_1 will shift inwards to L_3

If the price of X Good decreases while the income remains constant, then the price line L_1 will shift outwards to L_2



CONSUMER'S EQUILIBRIUM

The term '*consumer's equilibrium*' refers to that point where the consumer gets maximum satisfaction with his given income and at given prices of goods in the market and he has no tendency to change his position.

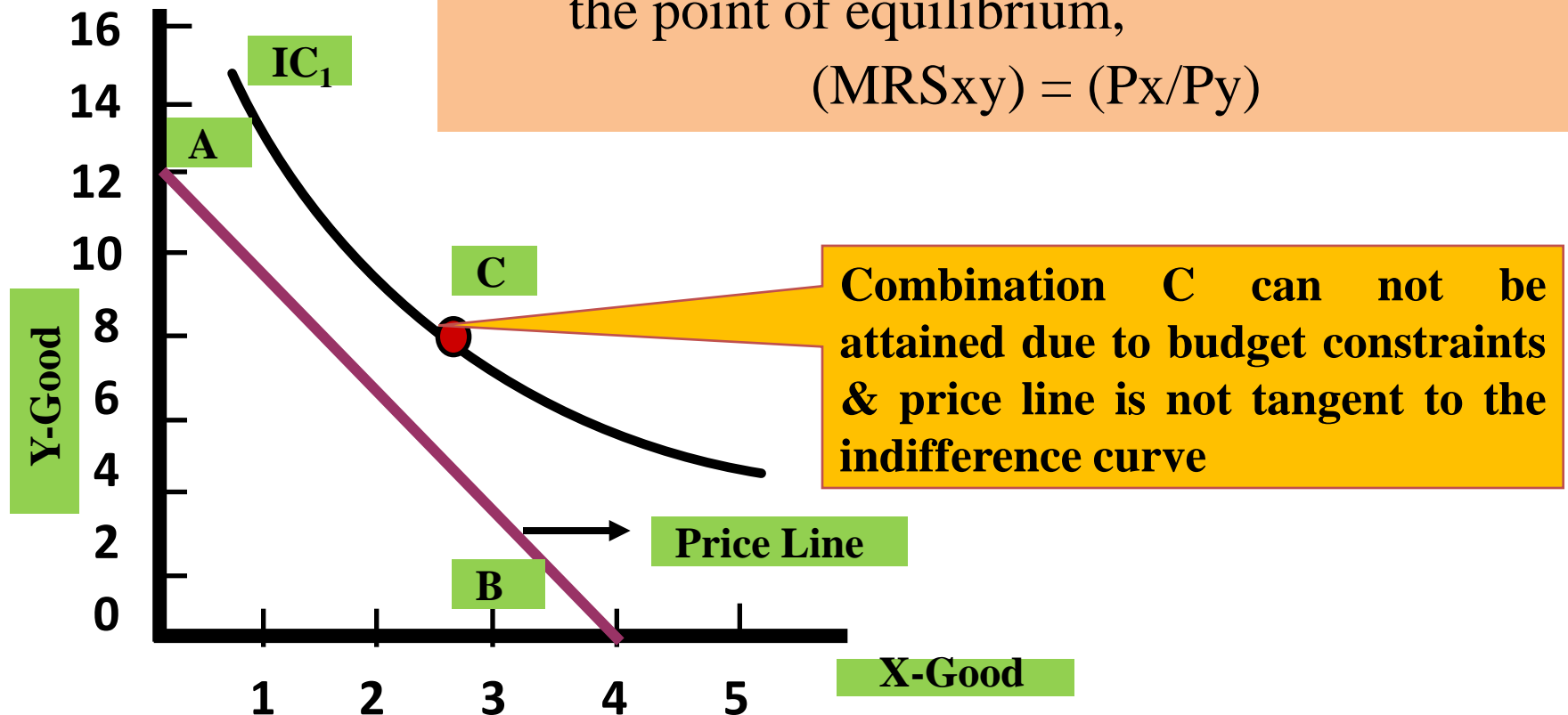
In the words of Scitovosky, "A consumer is in equilibrium when he regards his actual behaviour as the best possible under the circumstances and feels no urge to change his behaviour as long as circumstances remain unchanged."

CONDITIONS OF CONSUMER'S EQUILIBRIUM

Condition-1:

Price Line should be tangent to the Indifference Curve i.e. the slope of indifference curve (MRS_{xy}) should be equal to the slope of price line (P_x/P_y). Thus, at the point of equilibrium,

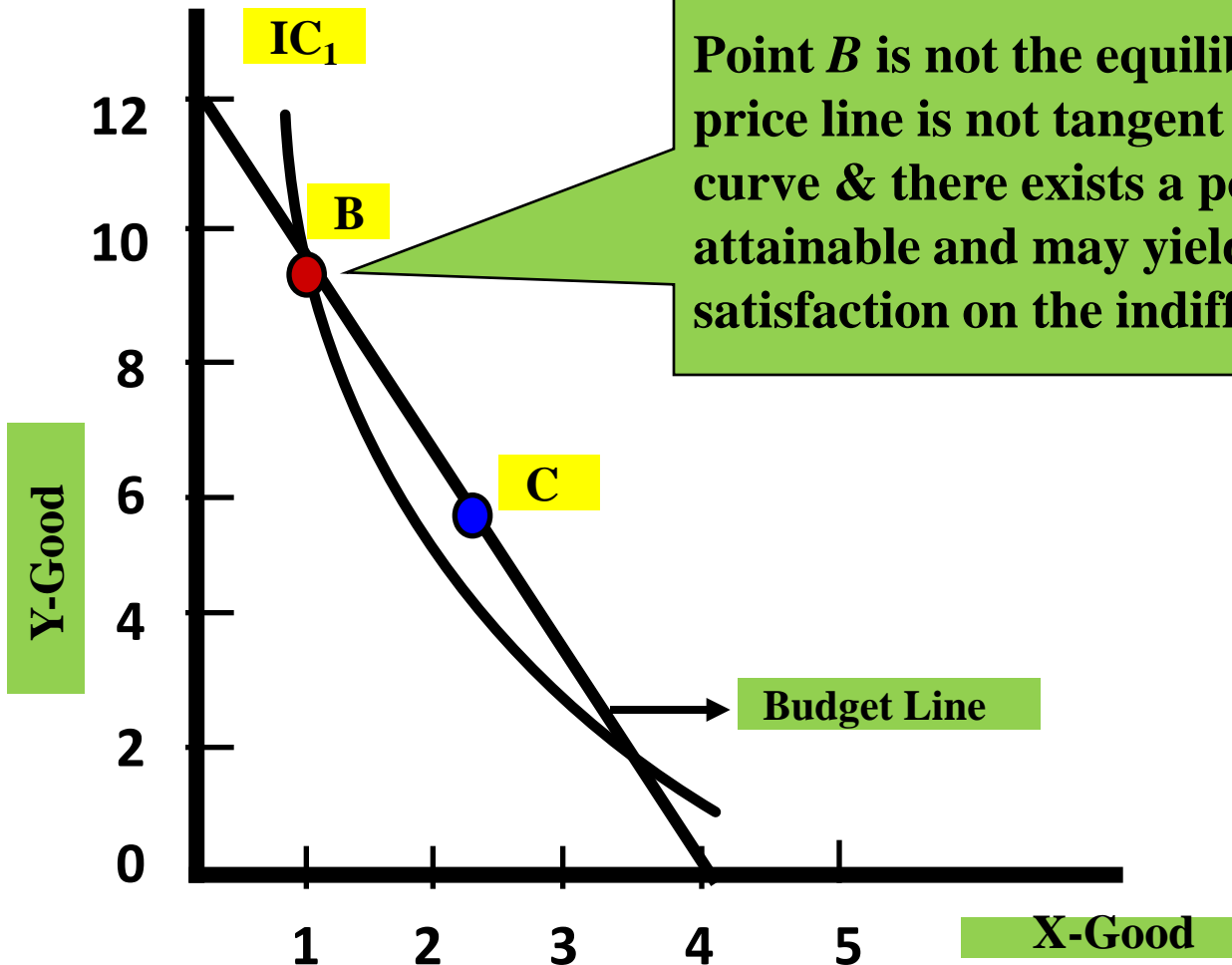
$$(MRS_{xy}) = (P_x/P_y)$$



CONDITIONS OF CONSUMER'S EQUILIBRIUM

Condition-1: (contd.)

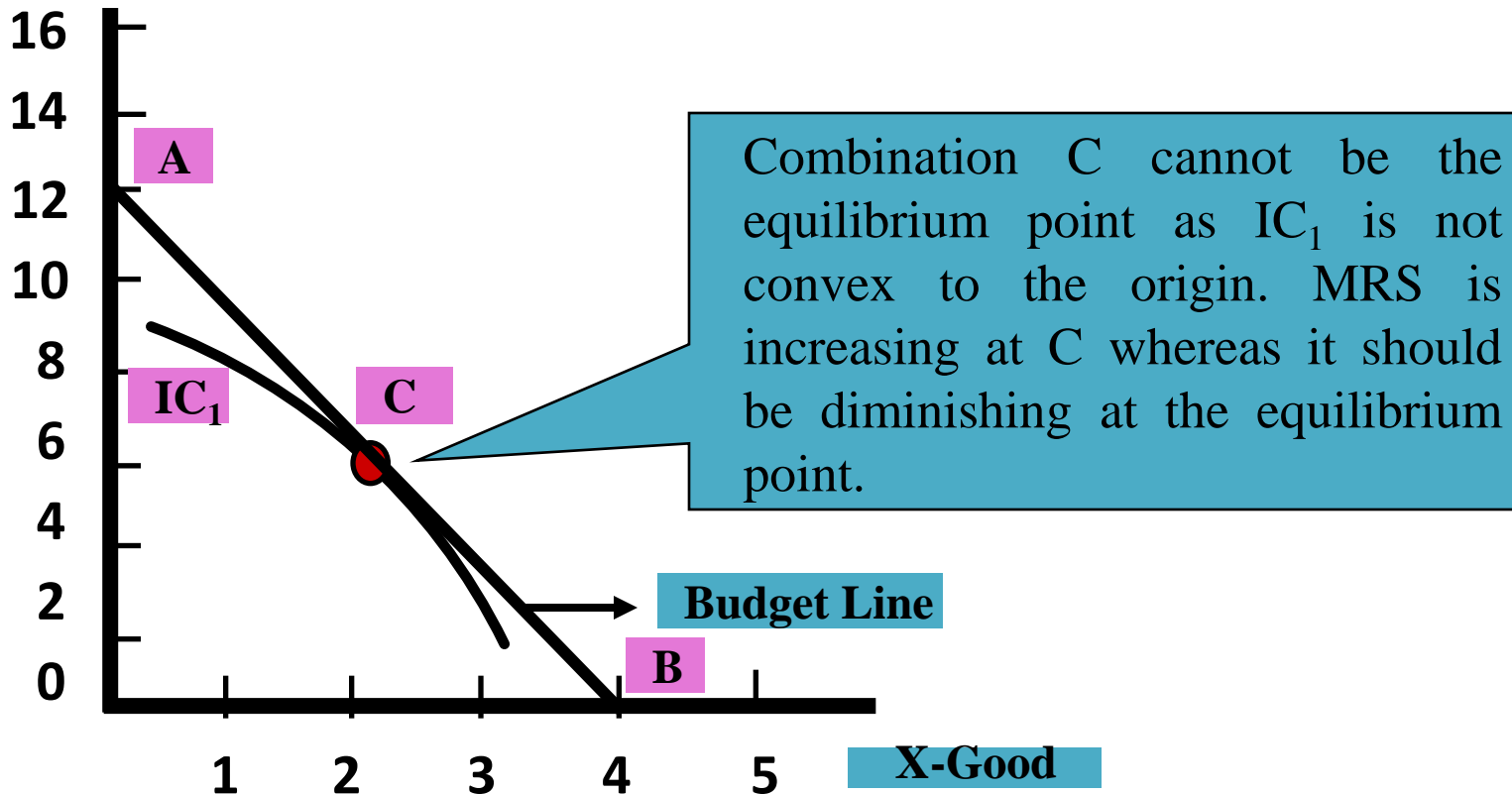
Point *B* is not the equilibrium point as price line is not tangent to the indifference curve & there exists a point *C* which is attainable and may yield a higher satisfaction on the indifference map.



CONDITIONS OF CONSUMER'S EQUILIBRIUM

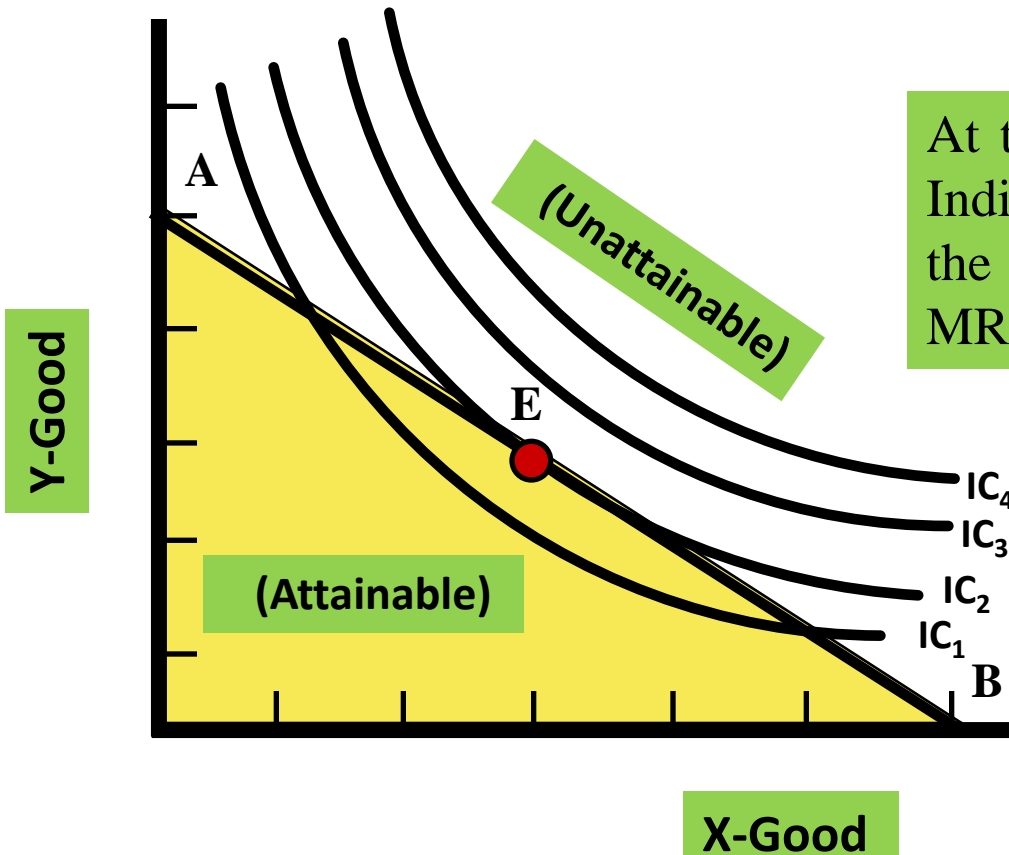
Condition-2:

Indifference curve should be convex to the origin. i.e. MRS_{xy} should be diminishing.



CONSUMER'S EQUILIBRIUM

Consumer's equilibrium occurs at point E where price line AB is tangent to the indifference curve IC_2 & IC_2 is convex to the origin. Thus, the consumer reaches the highest attainable Indifference curve & attains the maximum satisfaction.



At the equilibrium point E, the slope of Indifference Curve (MRS_{xy}) is equal to the slope of Price Line (P_x/P_y) & MRS_{xy} is diminishing.

SUMMING UP

Ordinal utility approach is an improved technique of analysing consumer's behaviour over the cardinal utility analysis. Besides explaining consumer's equilibrium, indifference curves are useful in the field of Production, Distribution, Exchange, Public Finance and Economic Welfare.

THANK YOU