

INDIFFERENCE CURVE ANALYSIS
&
CONSUMER EQUILIBRIUM

DEFINITION: IC

An Indifference curve (IC) is the locus of all those **combination of two goods** which give the **same level of satisfaction** to the consumer.

Thus consumer is indifferent towards all the combinations lying on the same indifference curve. **In other words, consumer gives equal preference to all such combinations.**

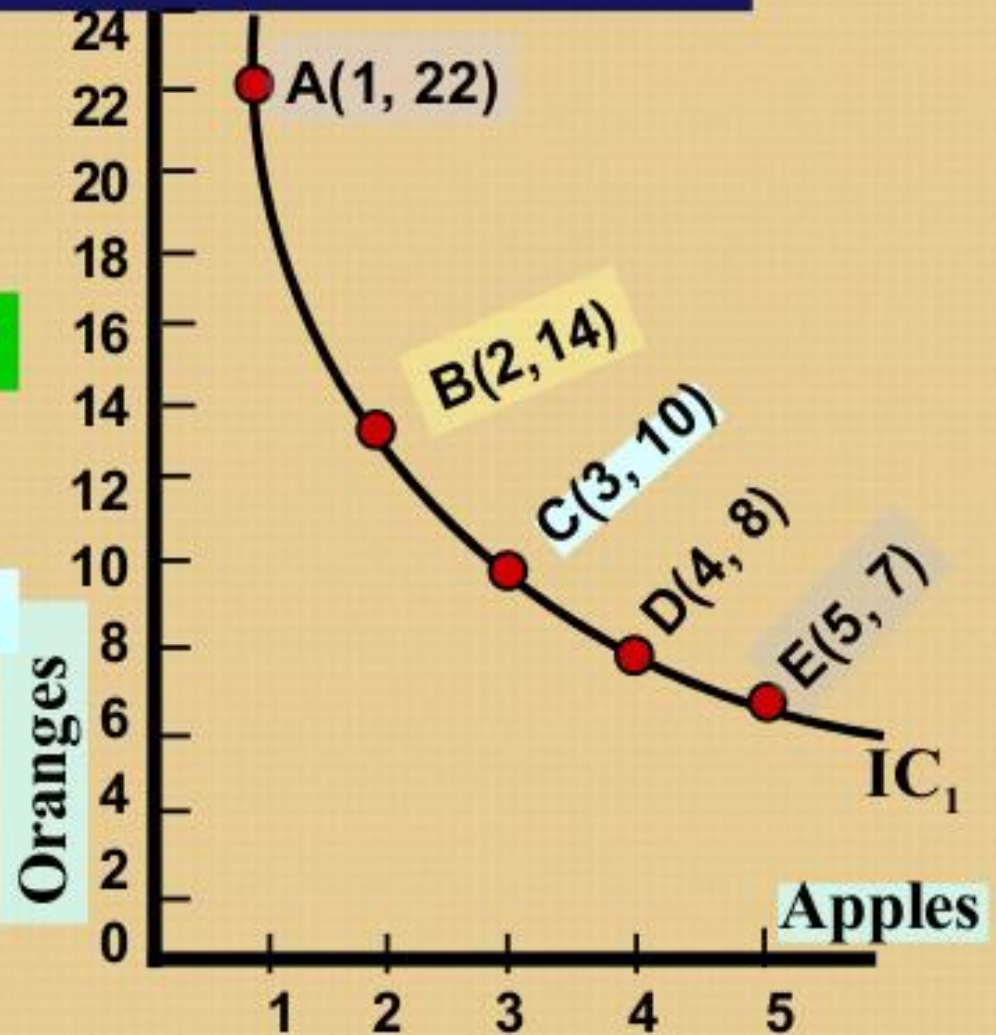
ASSUMPTIONS OF IC ANALYSIS

- Rational Consumer
- Ordinal Utility
- Non-Satiety (**More is Preferred to Less**)
- Diminishing Marginal Rate of Substitution.
- Consistency: **If a consumer prefer A to B in one period then he will not prefer B to A in another period.**
- Transitivity: **If a consumer prefer A to B and B to C, then he must prefer A to C.**

INDIFFERENCE CURVES

INDIFFERENCE SCHEDULE

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



PROPERTIES OF IC

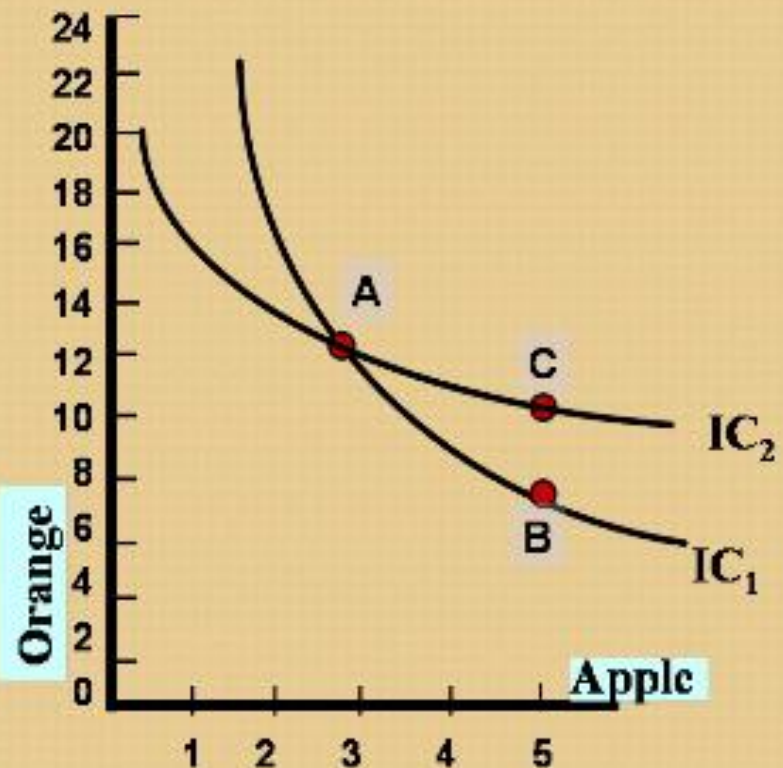
1. An Indifference curve has **negative slope** i.e. it slope downwards from left to right.
2. Indifference curve is always **convex to the origin**. This implies that two goods are **imperfect substitutes** and **MRS** between two goods **decreases** as a consumer move along an indifference curve. IC will be straight line if **MRS is constant** and **L shaped** in case of Complimentary.

PROPERTIES OF IC

3. Two Indifference curves never intersect or become tangent to each other.

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.

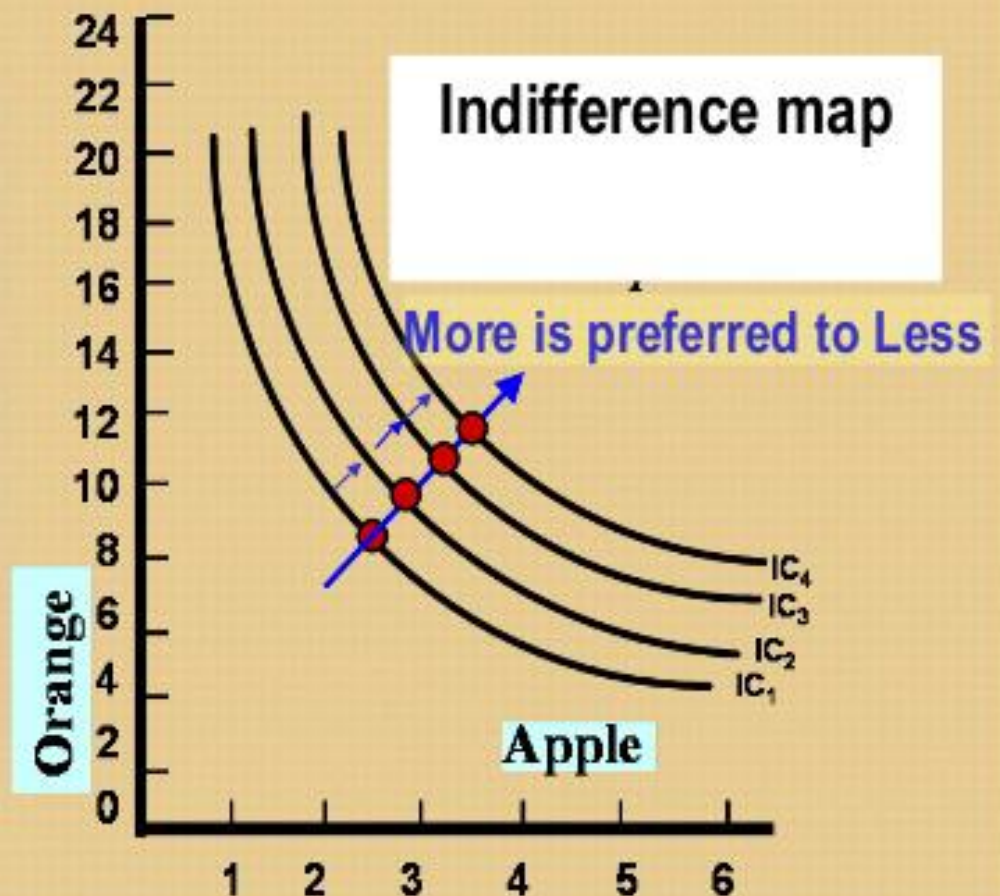
This implies B is equally preferred to C, which can not be because more is always preferred to less.



PROPERTIES OF IC

4. Higher indifference curve represents higher satisfaction.

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



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 just willing to give up to get one more unit of X and maintain the same level of satisfaction.

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

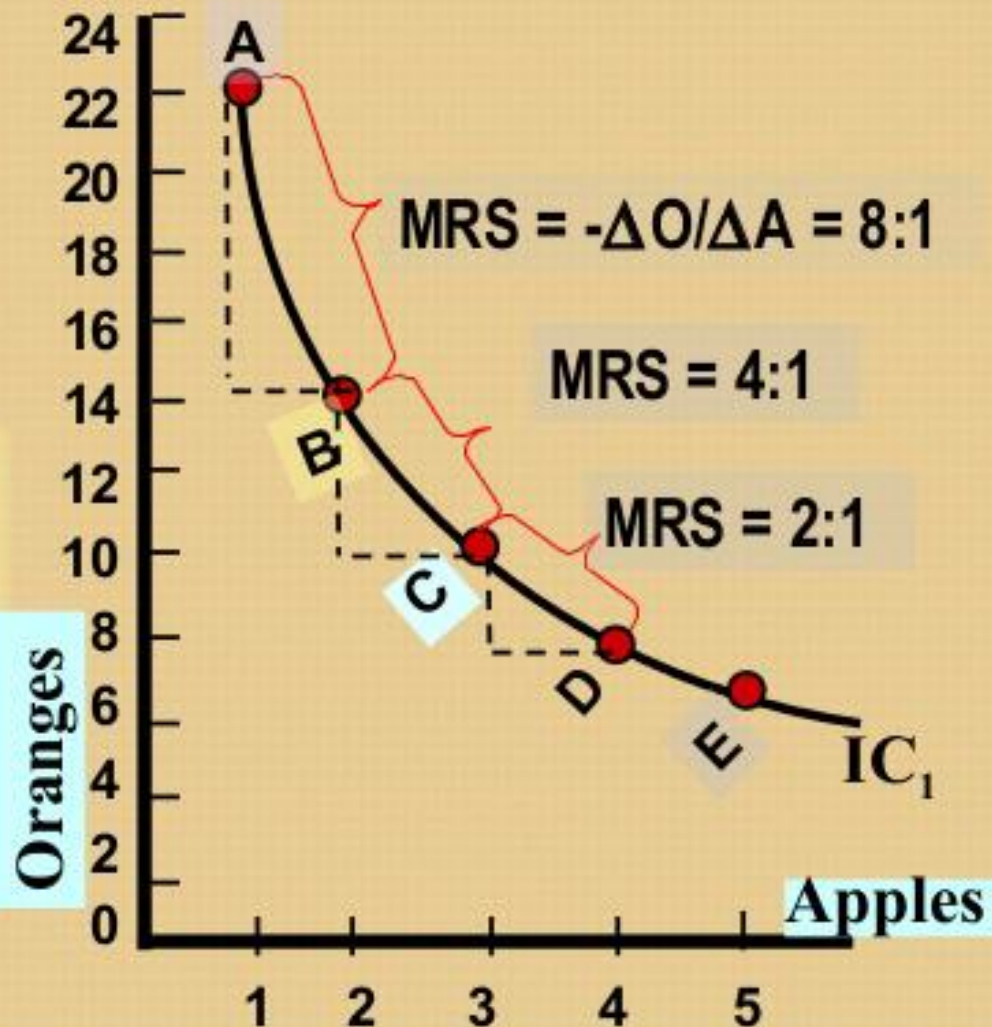
DIMINISHING MARGINAL RATE OF SUBSTITUTION

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

As the consumer increases the consumption of apples, then for getting every additional unit of apples, he will give up less and less of oranges, that is, 8:1, 4:1, 2:1, 1:1 respectively This is the Law of Diminishing MRS.

LAW OF DIMINISHING MRS

MRS is measured by the slope of the indifference curve



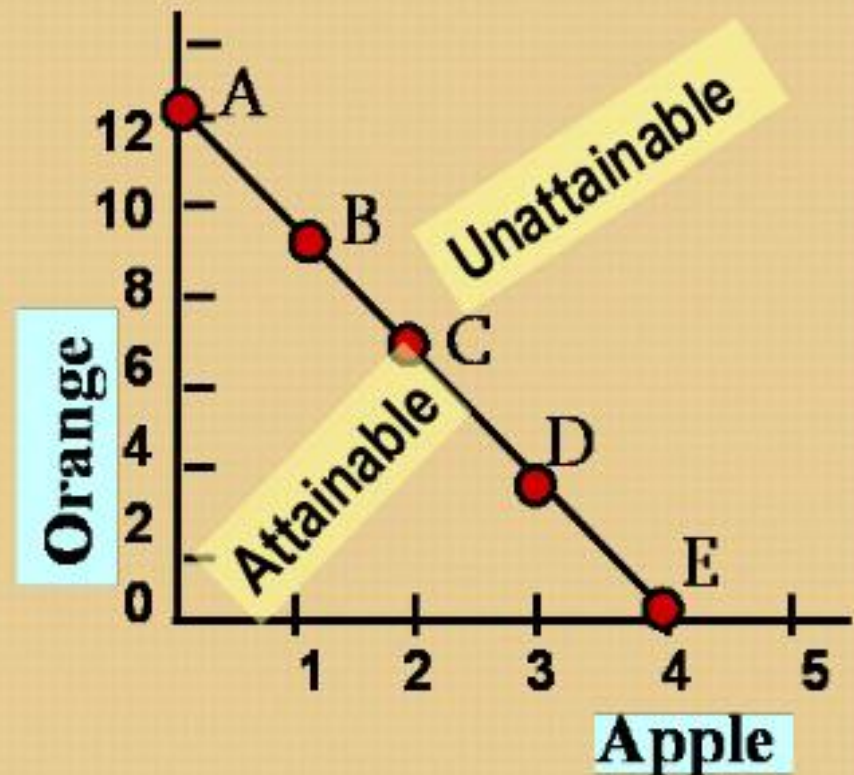
BUDGET CONSTRAINTS **(What is Attainable)**

Budget constraints limit an individual's ability to consume in light of the prices they must pay for various goods and services.

Budget line or Price Line: Shows all possible combinations of two goods that the consumer can buy if he spends the whole of his given sum of money on his purchases at the given prices.

BUDGET LINE

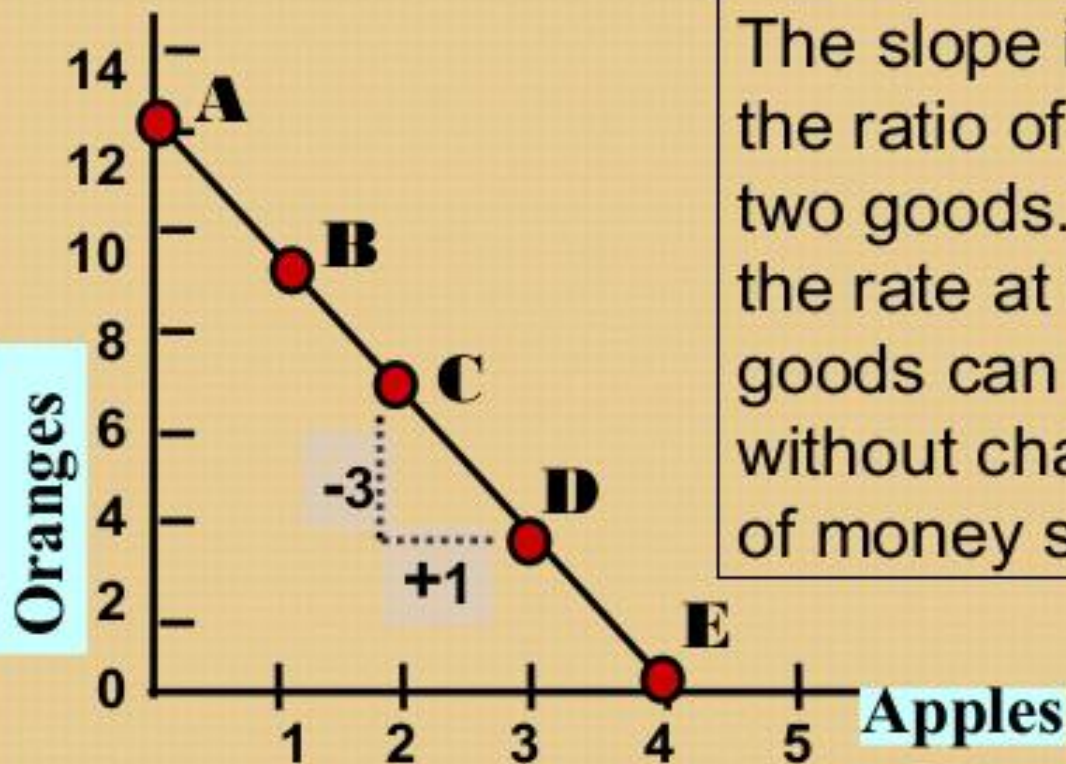
Combination	Apples (@ Rs. 6 per unit)	Oranges @ Rs. 2 Per unit	Total budget (Rs.)= $6x_A + 2x_O$
A	0	12	24
B	1	9	24
C	2	6	24
D	3	3	24
E	4	0	24



Budget line corresponding to budget of Rs. 24

BUDGET LINE

$$\text{Slope} = \Delta \text{Oranges} / \Delta \text{Apples} = (-) \frac{3}{1} = (-) \frac{P_{\text{apples}}}{P_{\text{oranges}}}$$



The slope is the negative of the ratio of the prices of the two goods. The slope indicates the rate at which the two goods can be substituted without changing the amount of money spent.

CONSUMER EQUILIBRIUM

Consumers choose a combination of goods that will maximize the satisfaction they can achieve, given the limited budget available to them.

The maximising combination must satisfy two conditions:

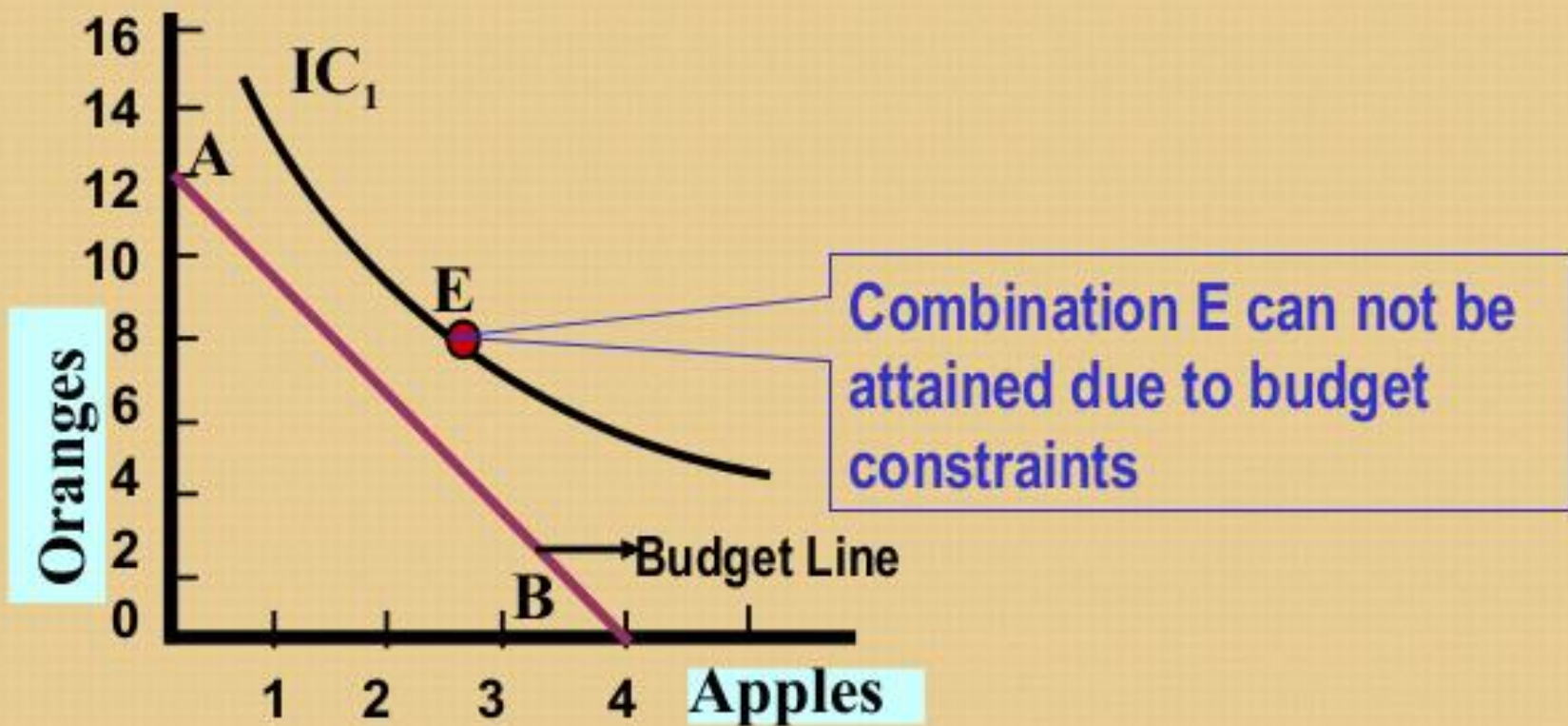
- 👉 It must be located **on the budget line**.
- 👉 Must give the consumer the **most preferred combination** of goods and services.

CONDITIONS OF CONSUMER EQUILIBRIUM

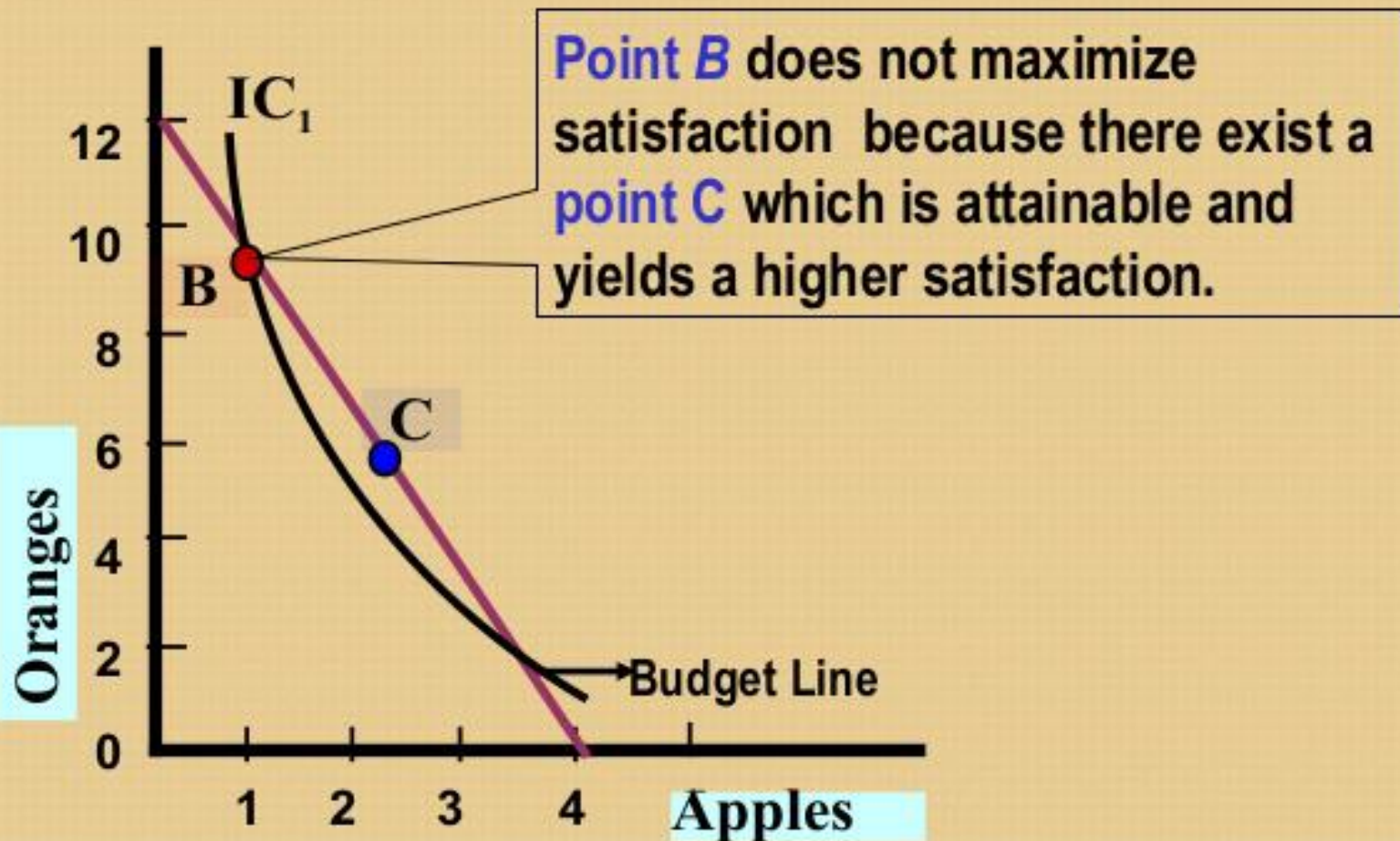
Condition-1:

Budget Line should be **Tangent** to the
Indifference Curve.

CONDITIONS OF CONSUMER EQUILIBRIUM

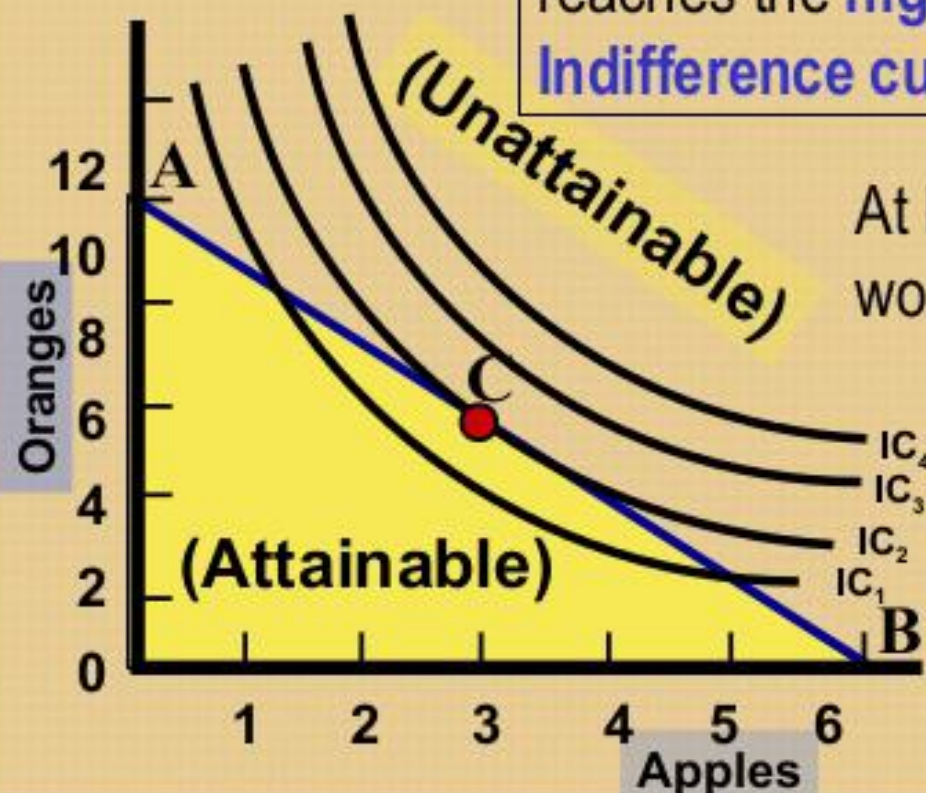


CONDITIONS OF CONSUMER EQUILIBRIUM



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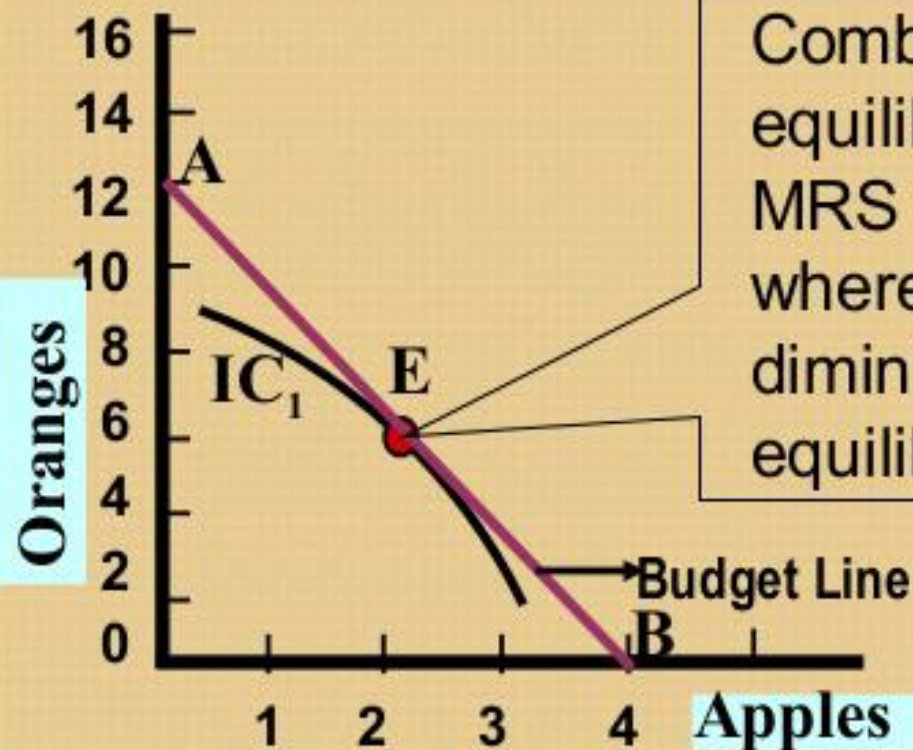
Equilibrium occurs (**Point C**) when the consumer selects the Combination which reaches the **highest attainable Indifference curve**.



At Equilibrium (**Point C**) we would have slope of Indifference Curve (MRS_{xy}) equal to the slope of Budget Line (P_x/P_y)

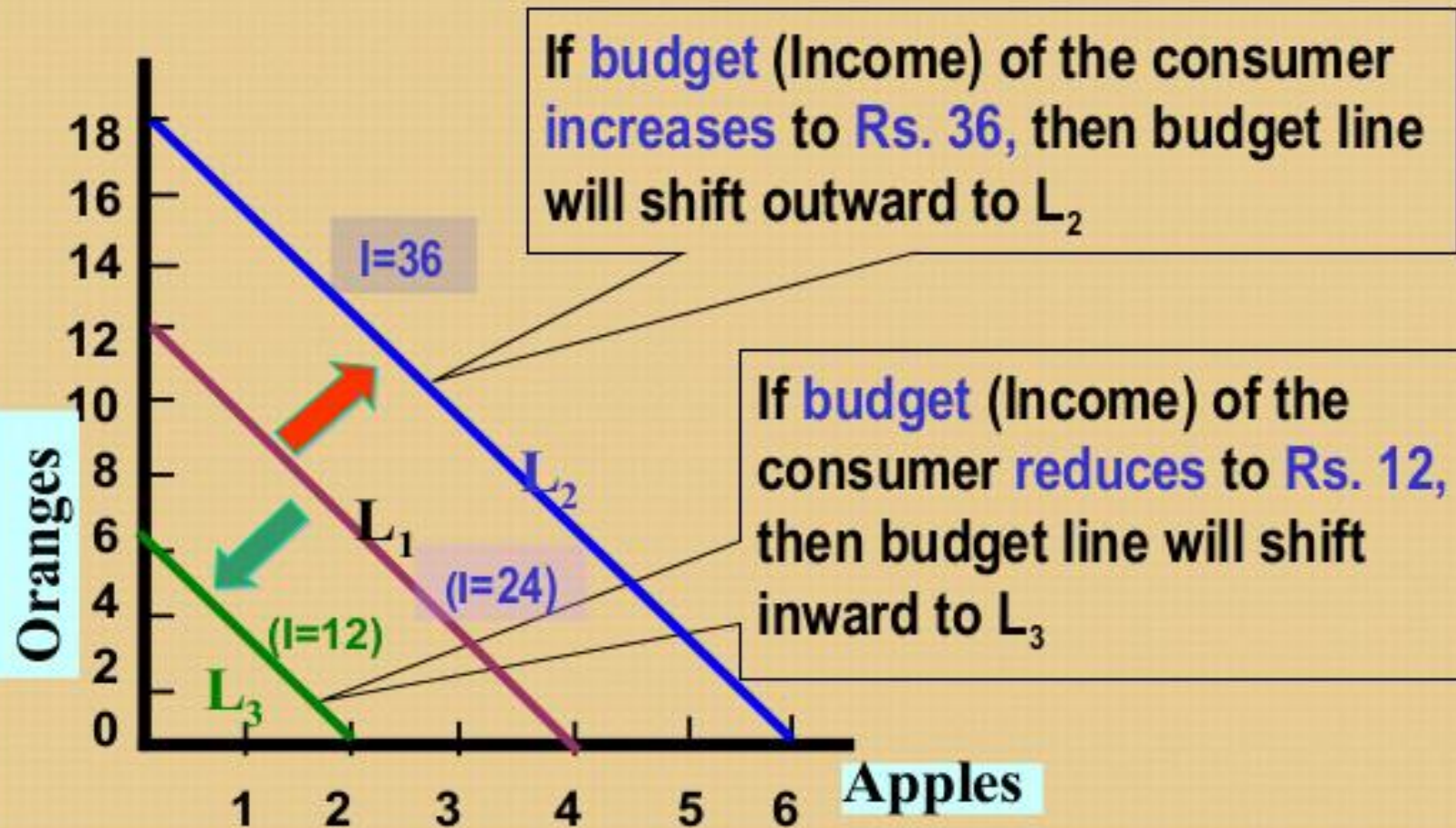
CONDITIONS OF CONSUMER EQUILIBRIUM

Condition-2: Indifference Curve must be **convex** to the origin.



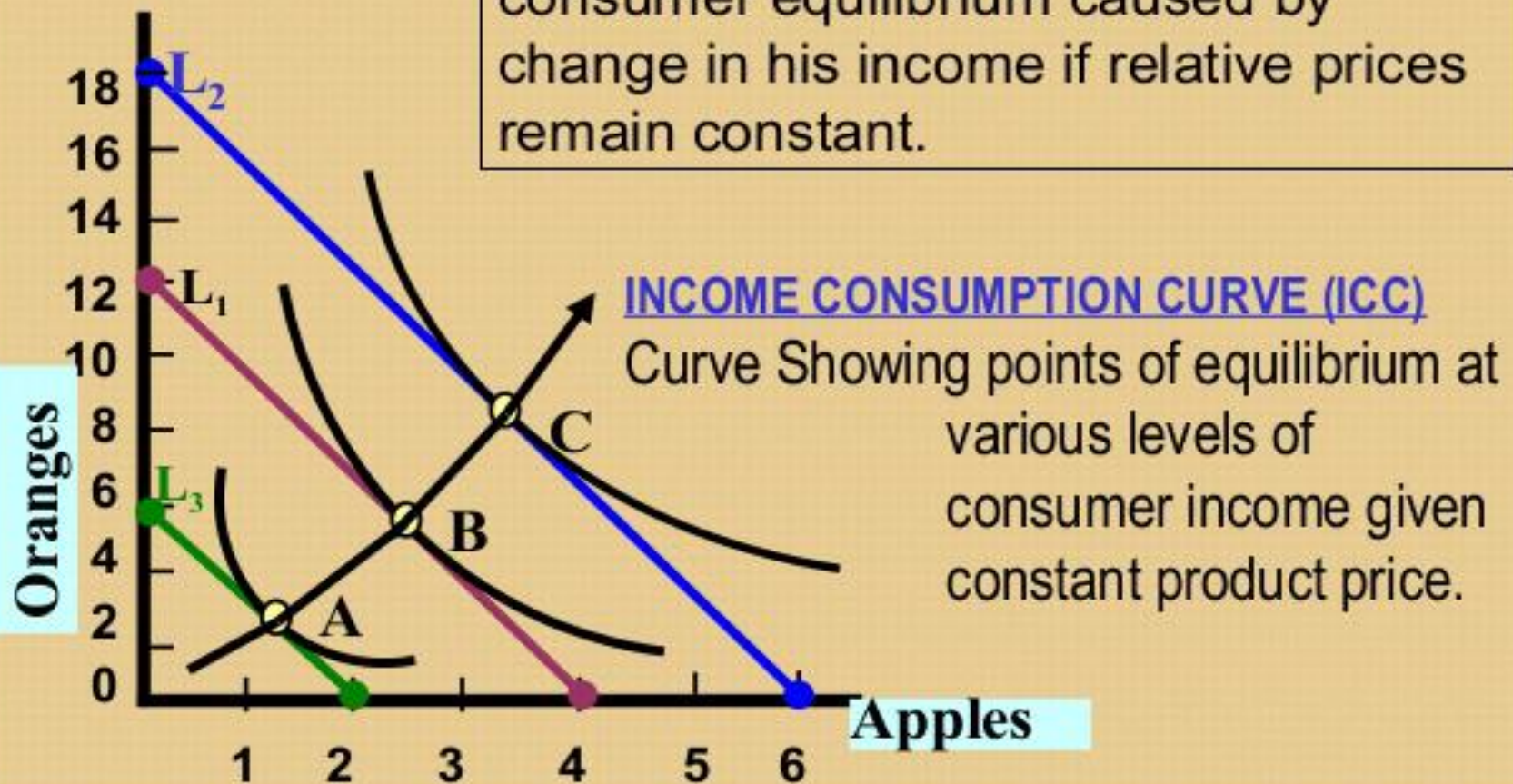
Combination E can not be equilibrium point because MRS will be increasing at E whereas it should be diminishing at the equilibrium point.

EFFECT OF CHANGE IN THE BUDGET/INCOME



UNDERSTANDING INCOME EFFECT

INCOME EFFECT: Effect on the consumer equilibrium caused by change in his income if relative prices remain constant.



INCOME EFFECT

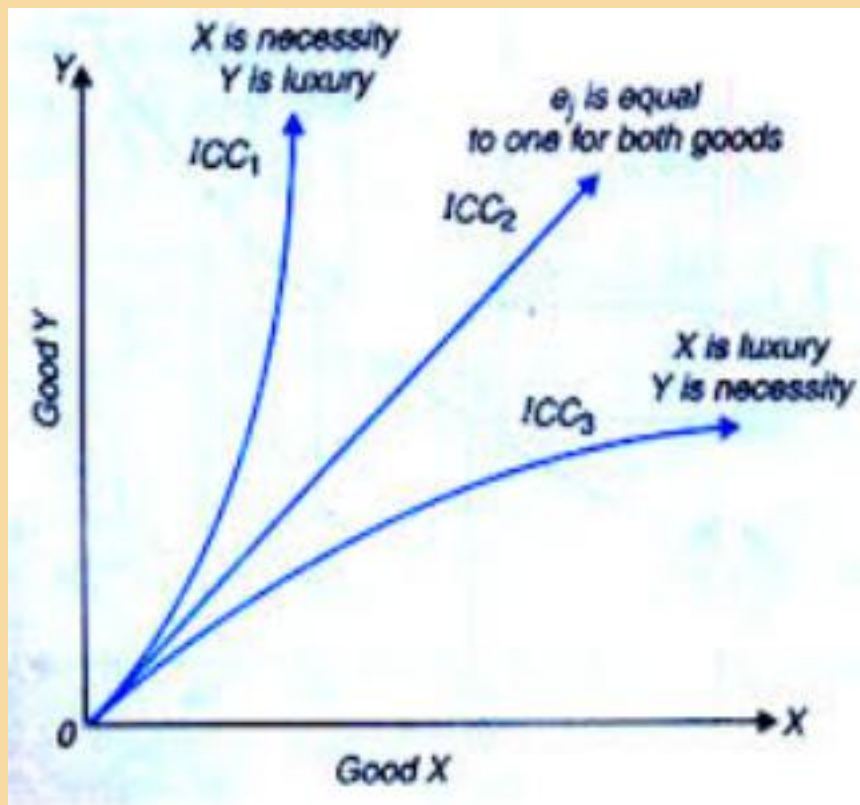


fig 1 Income Consumption Curves of Normal Goods

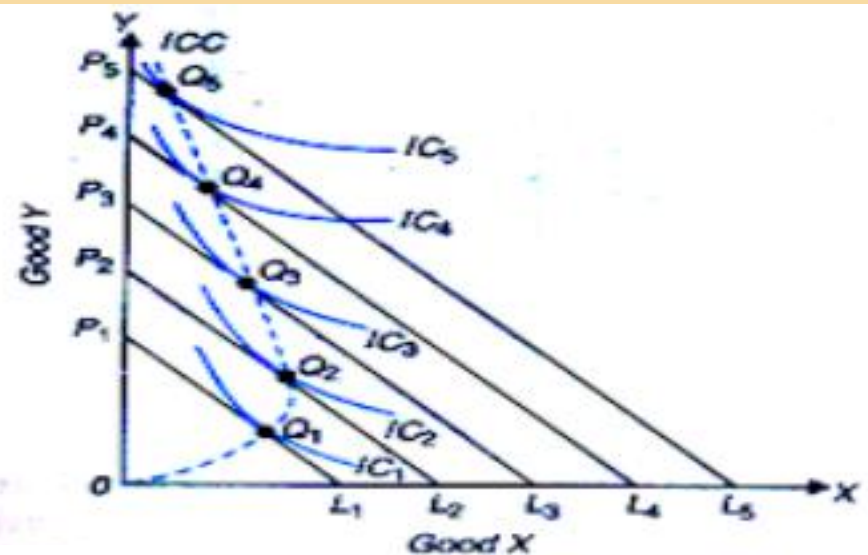


fig 2 Income Consumption Curve in Case of Good X being inferior Good

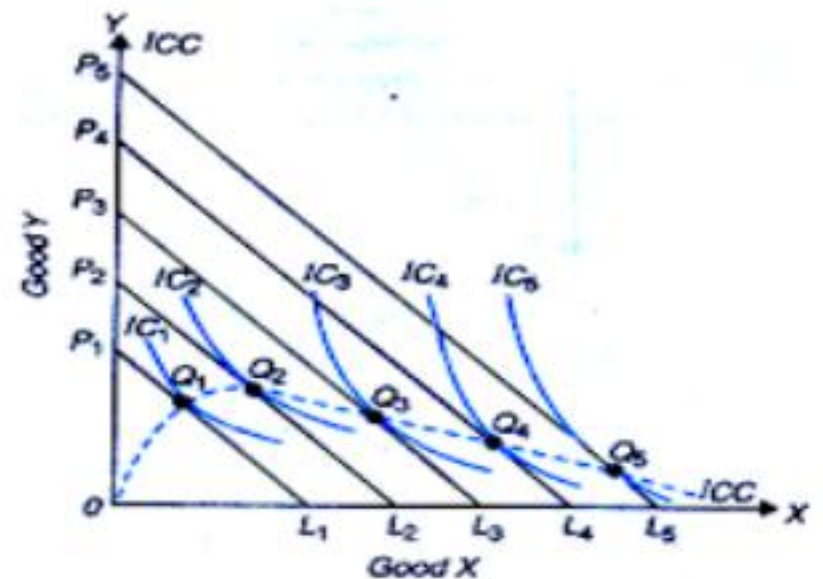


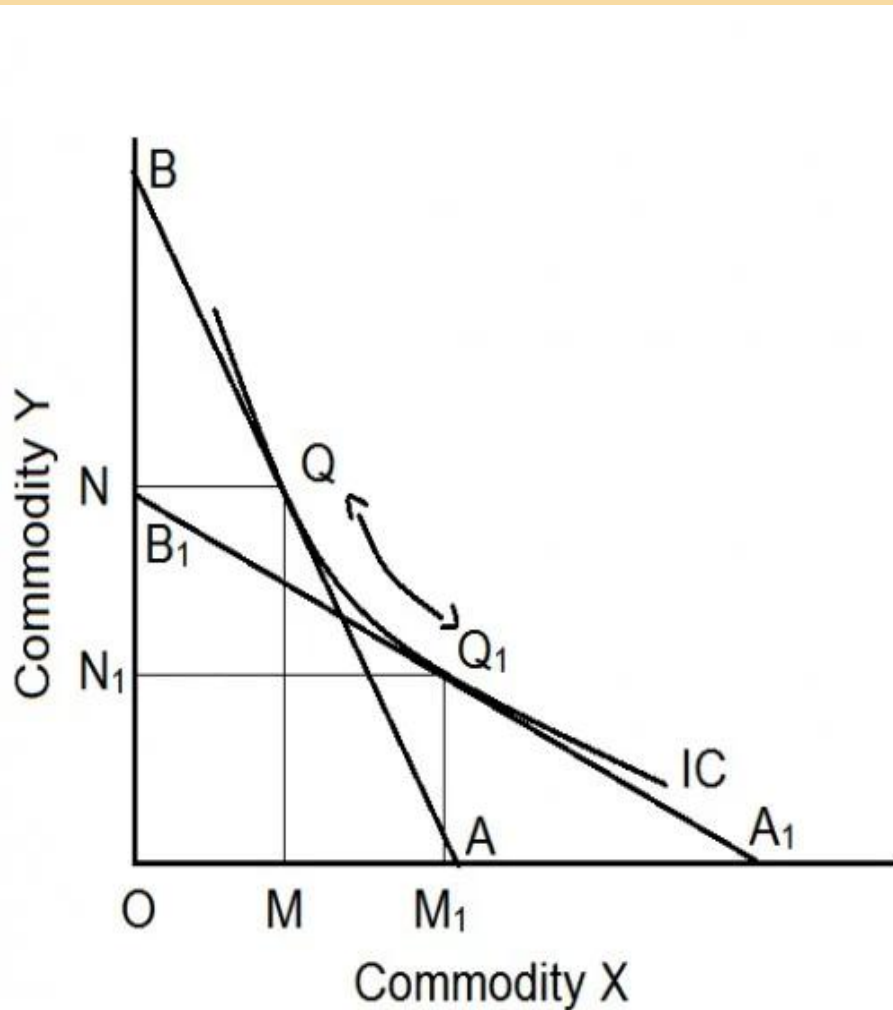
fig 3 Income Consumption Curve in Case of Good Y being inferior Good

SUBSTITUTION EFFECT

Substitution Effect refers to change in the amount of goods purchased due to change in their relative prices alone, while real income of the consumer remains constant.

The substitution of relatively cheaper good for a relatively expensive good is called substitution effect. There are two methods to measure substitution effect (i) Slutsky's Measure and (ii) Hicks Measure.

SUBSTITUTION EFFECT

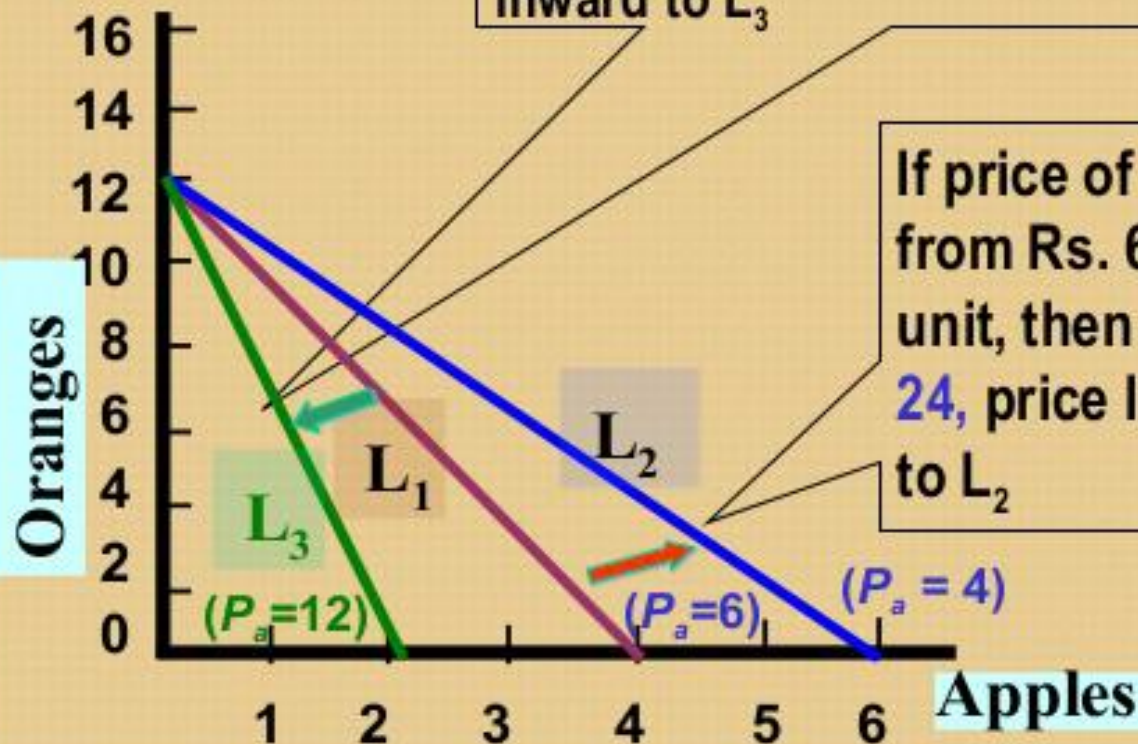


The consumer substitutes one commodity (its price is less) for the other (its price is more); it is known as the 'substitution effect.' It is represented in the given diagram movement from **Q to Q₁** due to decrease in price of X .

EFFECT OF CHANGE IN PRICE OF A GOOD

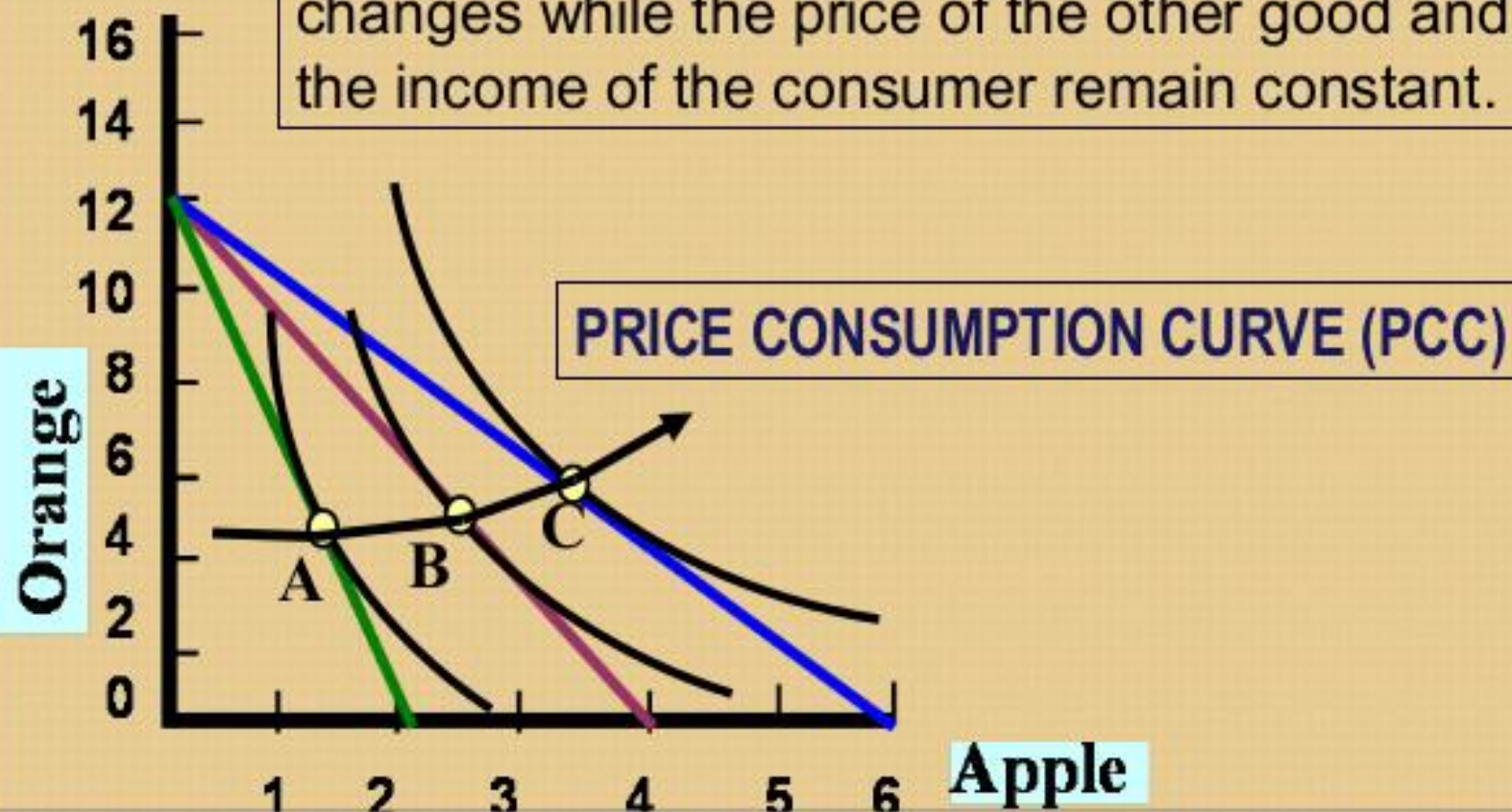
If price of Apples increases from Rs. 6 per unit to Rs. 12 per unit, then for a budget of Rs. 24, price line will shift inward to L_3

If price of Apples decreases from Rs. 6 per unit to Rs. 4 per unit, then for a budget of Rs. 24, price line will shift outward to L_2



UNDERSTANDING PRICE EFFECT

PRICE EFFECT: The price effect may be defined as the change in the consumption of goods when the price of either of the two goods changes while the price of the other good and the income of the consumer remain constant.



Equations and conditions to remember:

1. $\text{Income}(I) = P_x \cdot X + P_y \cdot Y$
2. $\text{Slope of } I_c (MU_x/MU_y) = \text{Slope of budget line } (P_x/P_y)$
3. If consumer will spend all his income on (X)
 $X = I/P_x$ or $I = P_x \cdot X$
4. If consumer will spend all his income on (Y)
 $Y = I/P_y$ or $I = P_y \cdot Y$
5. $MRS_{xy} = \Delta X / \Delta Y = MU_x / MU_y$ like that
 $MRS_{yx} = \Delta Y / \Delta X = MU_y / MU_x$