ELASTICITY OF DEMAND

Elasticity of demand is defined as the rate of responsiveness in the demand of a commodity for a given change in any one of the determinants of demand.

$$\text{Elasticity of demand} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in any one of the determinants of demand}}$$

Types of Elasticity of Demand

There are four types of Elasticities of Demand:

1. Price Elasticity of Demand
2. Income Elasticity of Demand
3. Cross Elasticity of Demand
4. Promotional/Advertising Elasticity of Demand

Price Elasticity of Demand

"The extent of response of demand for a certain commodity to a given change in price, other demand determinants remaining constant, is termed as the price elasticity of demand".

$$\textbf{Price Elasticity of Demand } (E_p) = \frac{\textbf{Proportionate change in quantity demanded}}{\textbf{Proportionate change in price}}$$

$$E_p = \frac{\dfrac{Q_2 - Q_1}{Q_1}}{\dfrac{P_2 - P_1}{P_1}}$$

ILLUSTRATION:

The quantity demanded of a simple product X is 1000 units at a price of Rs. 100/- each.

The price reduced by 10%, and the quantity demanded increased to 1500 units.

From the above details, calculate Price Elasticity of Demand?

$$E_p = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P_1}{P_1}}$$

$$E_p = \frac{1500 - 1000/1000}{90\text{-}100/100}$$

Price Elasticity of Demand - Types

There are five types of Price Elasticity of Demand:

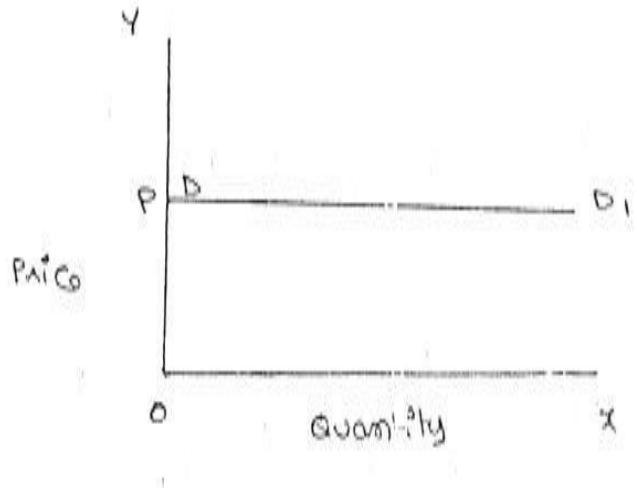
1. Perfectly Elastic Demand
2. Perfectly Inelastic Demand
3. Relatively Elastic Demand
4. Relatively Inelastic Demand
5. Unit Elasticity of Demand

Perfect Elasticity

In this state, at the given price demand is endless.

It implies that no change in price leads to an infinite changes in demand.

Perfect Elasticity: $E_p = \infty$

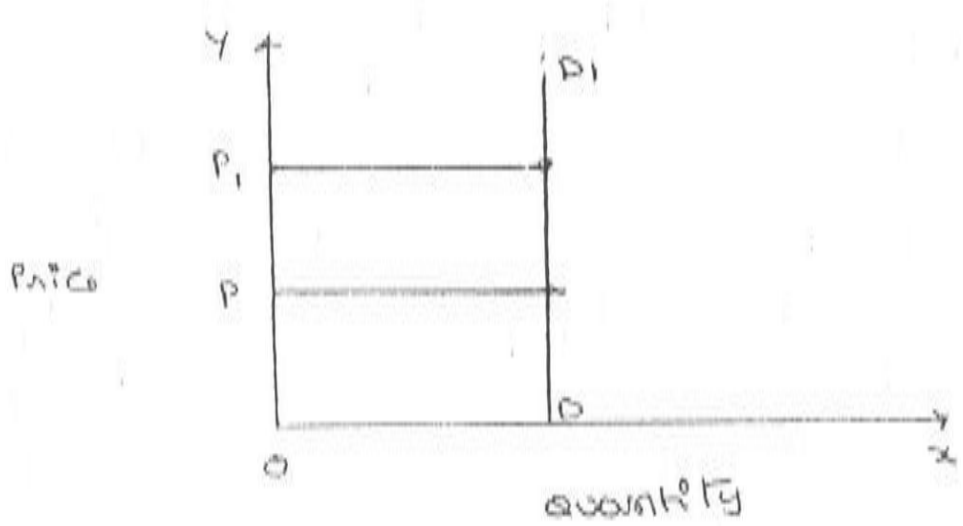


Perfect Inelasticity

In this stage, any change in price will not change the demand.

The response of demand to a change in price is nil.

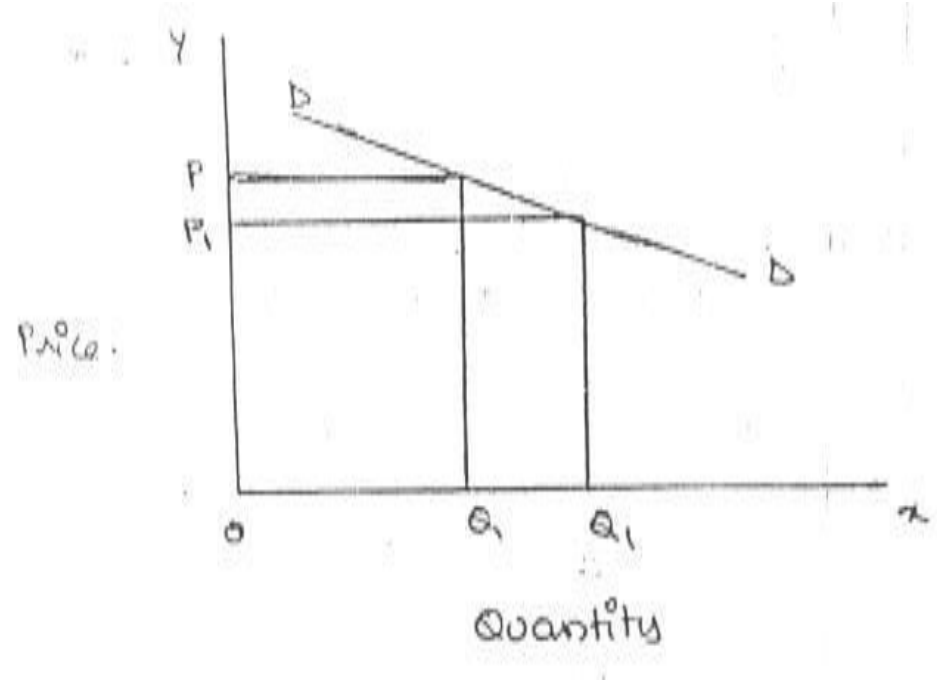
Perfect Inelastic state of Demand: $E_p = 0$



Relative Elasticity

During this state, the proportionate change in quantity demanded is greater than that of price.

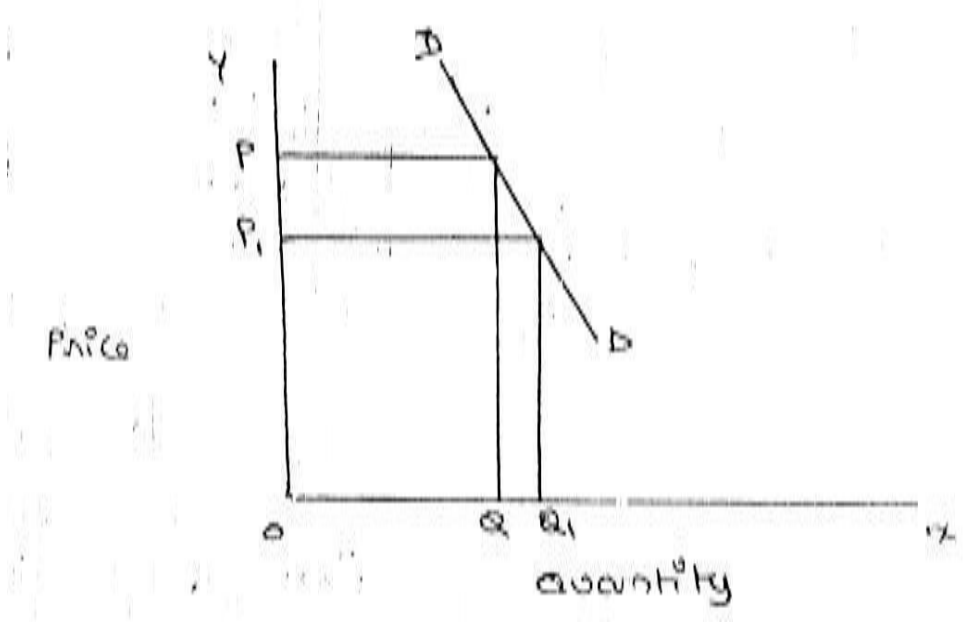
Relative Elastic state of Demand: E_p = >1



Relative Inelasticity

In Relative Inelastic state of Demand, the proportionate change in the quantity demanded is less than that of price.

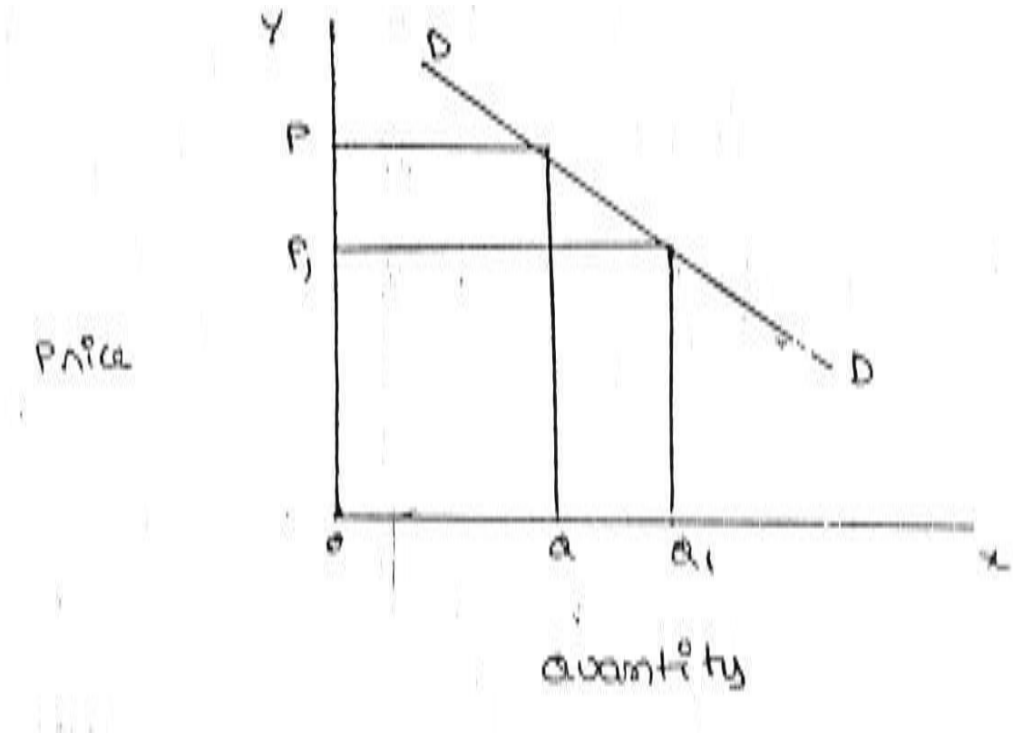
Relative Inelasticity: E_p is <1



Unit Elasticity

If the proportionate change in the quantity demanded is exactly same as the change in price, the demand is said to be Unitary elastic.

Unit Elasticity: $E_p = 1$



Income Elasticity of Demand

Income Elasticity of Demand measures the degree of responsiveness in quantity demanded due to change in income.

It is defined as the proportionate change in quantity demanded of a certain commodity due to the proportionate change in income level, while other determinants are constant.

$$\textbf{Income Elasticity of Demand } (E_i) = \frac{\textbf{Proportionate change in quantity demanded}}{\textbf{Proportionate change in Income}}$$

$$E_i = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{I_2 - I_1}{I_1}}$$

Income Elasticity of Demand-Types

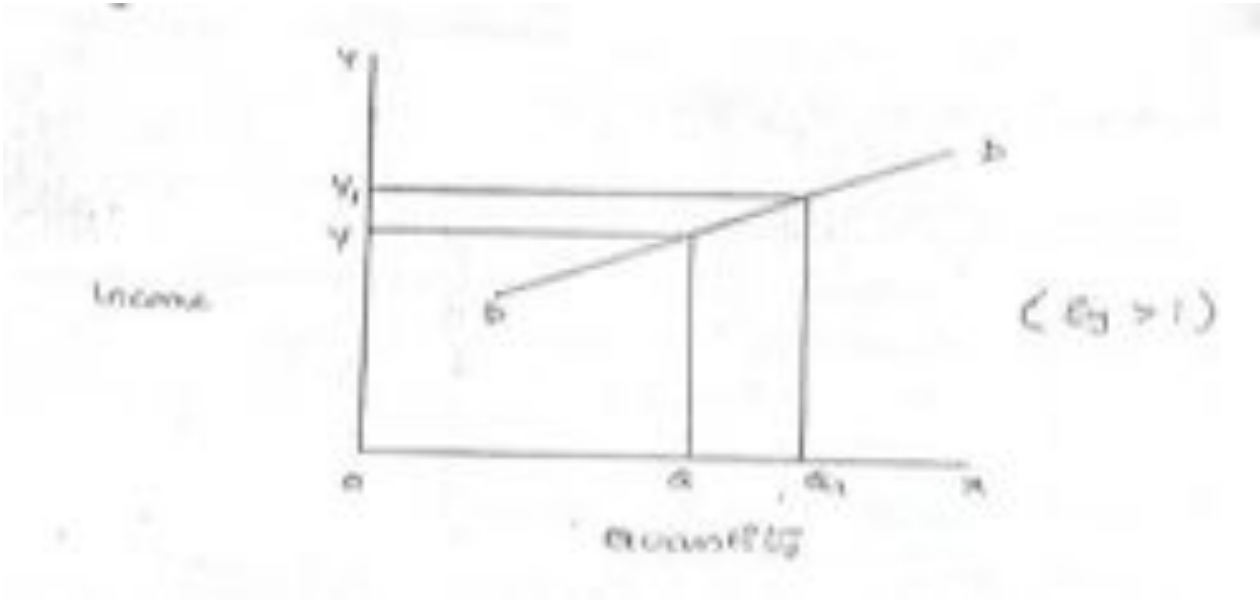
There are five types of Income Elasticity of Demand

1. High Income Elasticity of Demand
2. Low Income Elasticity of Demand
3. Unit Income Elasticity of Demand
4. Zero Income Elasticity of Demand
5. Negative Income Elasticity of Demand

High Income Elasticity

Here, an increase in income brings about a more than proportionate increase in quantity demanded.

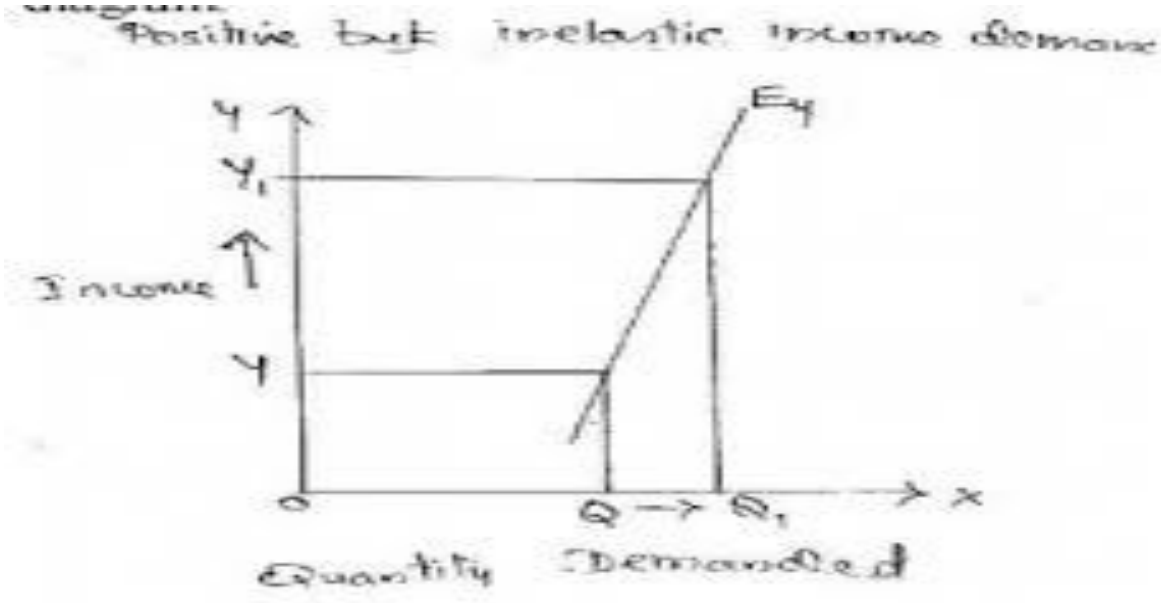
Symbolically it can be written as $E_y > 1$



Low Income Elasticity

When income increases quantity demanded also increases but less than proportionately.

Low Income Elasticity value E_y is < 1



Unit Income Elasticity

The rise in income is proportionate to the increase in the quantity demanded.

Unit Income Elasticity $E_y = 1$

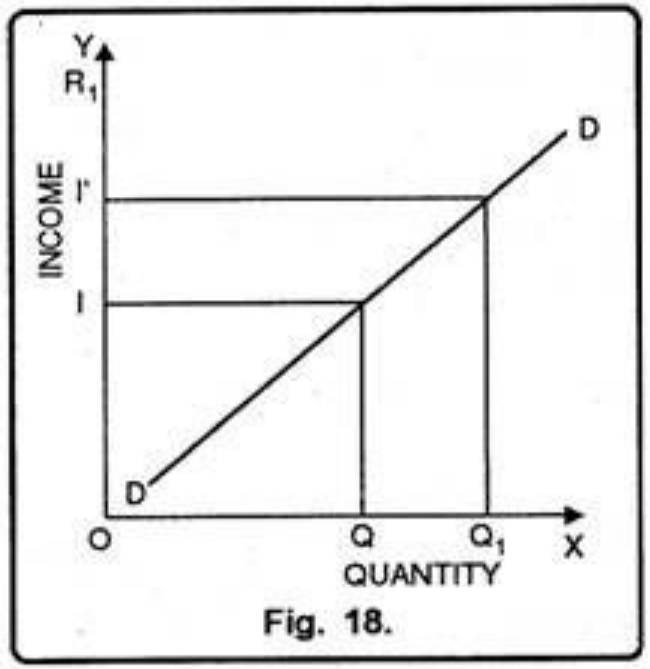
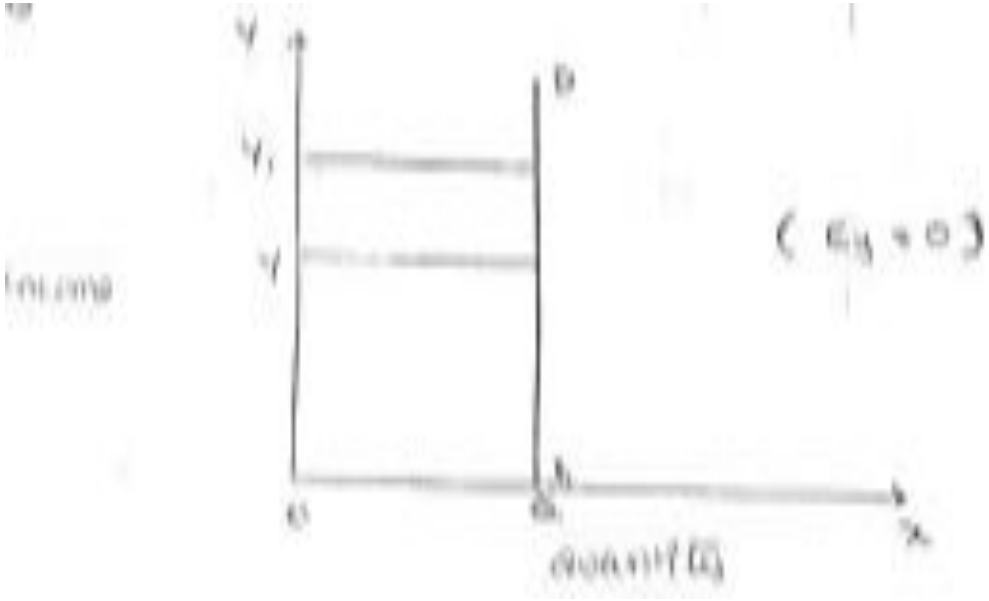


Fig. 18.

Zero Income Elasticity

The Quantity bought or demanded is the same even if income changes

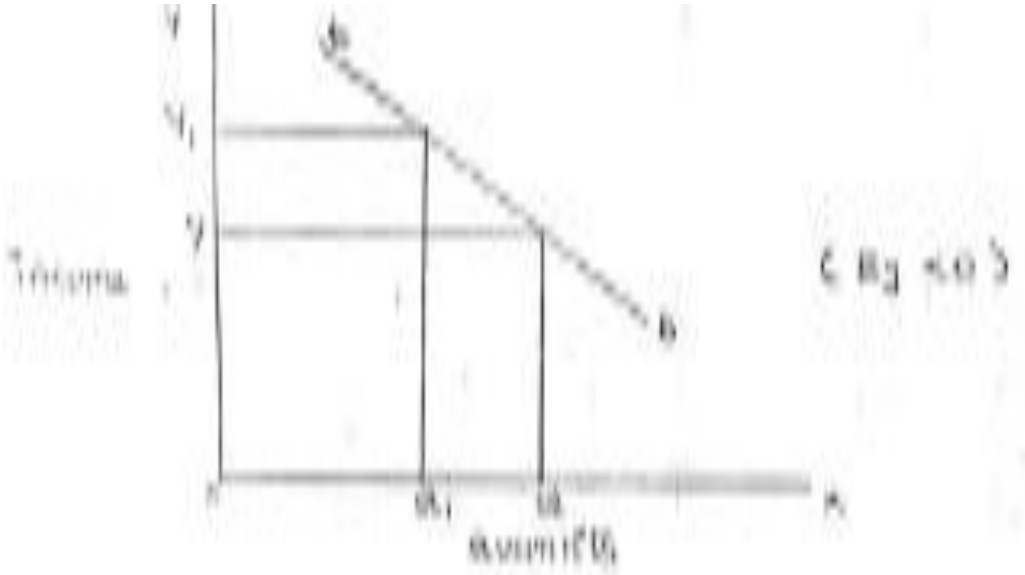
Zero Income Elasticity $\mathbf{E_y = 0}$



Negative Income Elasticity

An increase in incomes comes with a decrease in the quantity demanded.

Negative Income Elasticity E_y is less than 0



Cross Elasticity of Demand

Cross Elasticity of Demand is defined as "The proportionate change in the quantity demanded of a particular commodity in response to a change in the price of a related good, which might be a substitute or complementary good".

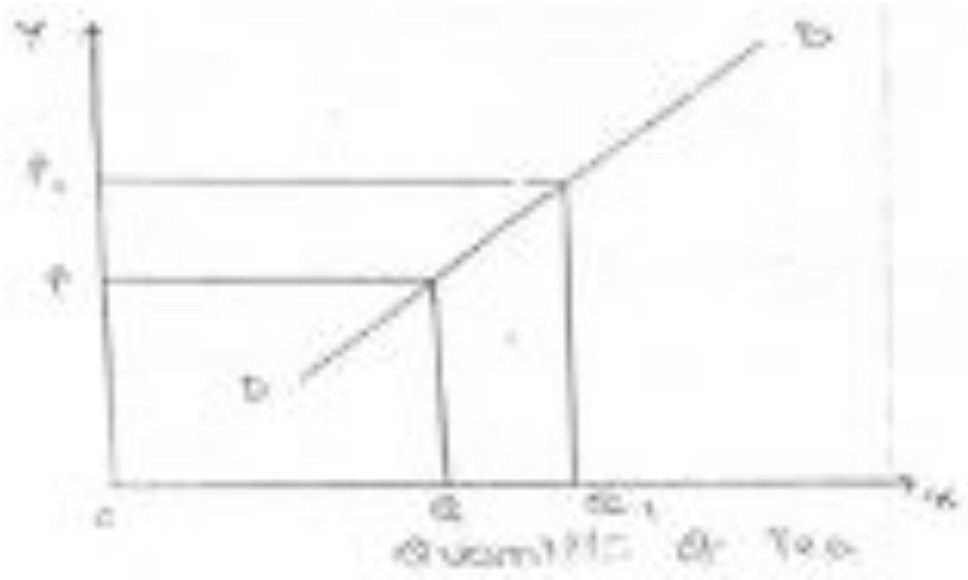
$$\text{Cross Elasticity of Demand } (E_c) = \frac{\text{Proportionate change in quantity demanded of commodity 'X'}}{\text{Proportionate change in the price of commodity 'Y'}}$$

$$E_c = \frac{Q_{2x} - / Q_{1x} / Q_{1x}}{P_{2y} - P_{1y} / P_{1y}}$$

A Case of Substitutes

In case of Substitutes, Cross Elasticity of Demand is positive

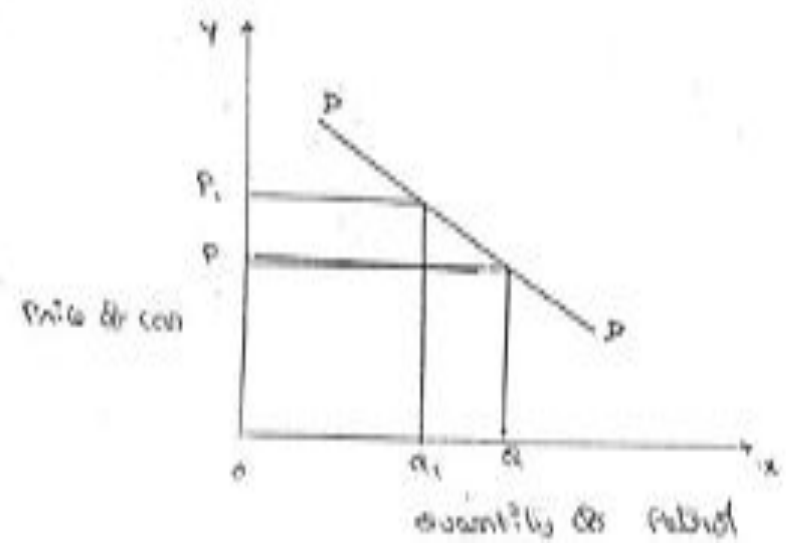
Ex: An increase in price of Coffee leads to an increase in demand for tea.



A Case of Complementaries

While dealing with Complementary goods, Cross Elasticity of Demand will be negative.

Ex: When price of car goes up, demand for fuel slightly slips.



$$E_d = \frac{\% \Delta Q_1}{\% \Delta P_1} \text{ (Negative)}$$

Promotional/Advertising Elasticity of Demand

Promotional / Advertising Elasticity of Demand is defined as "The proportionate change in quantity demanded of a certain commodity due to the proportionate change in advertising effort, while all other determinants are constant".

$$\textbf{Advertising Elasticity of Demand } (E_A) = \frac{\textbf{Proportionate change in quantity demanded}}{\textbf{Proportionate change in Advertising effort}}$$

$$E_A = \frac{Q_2 - / Q_1 \ / Q_1}{A_2 - A_1 \ / \ A_1}$$

Factors determining Elasticity of Demand

1. Nature of the Commodity
2. Availability of Substitutes
3. Income Level
4. Variety of uses
5. Proportion of Income spent on the commodity
6. Durability of a commodity
7. Possibility of postponement
8. Time period