PRICE ELASTICITY OF DEMAND

Definition

It is the degree of responsiveness of quantity demanded of a commodity due to change in price, other things remaining the same.

In other words

The price elasticity of demand is the percentage change in quantity demanded due to certain percentage change in price

Mathematical Expression

Mathematically, it can be expressed as:

$$\text{Price elasticity of demand} = \frac{\%\text{change in quantity demanded}}{\%\text{change in price}}$$

Symbolically, it can be expressed as:

$$E_P = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

Where,

E_P = Price elasticity of demand

q = Original quantity demanded

Δq = Change in quantity demanded

p = Original price

Δp = Change in price

Practical Example

Suppose that price of a commodity falls down from Rs.10 to Rs.9 per unit.

Due to this, quantity demanded of the commodity increased from 100 units to 120 units.

What is the price elasticity of demand?

Solution

Give that,

p= initial price= Rs.10

q= initial quantity demanded= 100 units

Δp=change in price=Rs. (10-9) = Rs.1

Δq=change in quantity demanded= (120-100) units = 20 units

$$\therefore E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

$$= \frac{20}{1} \times \frac{10}{100}$$

$$= \frac{2}{1}$$

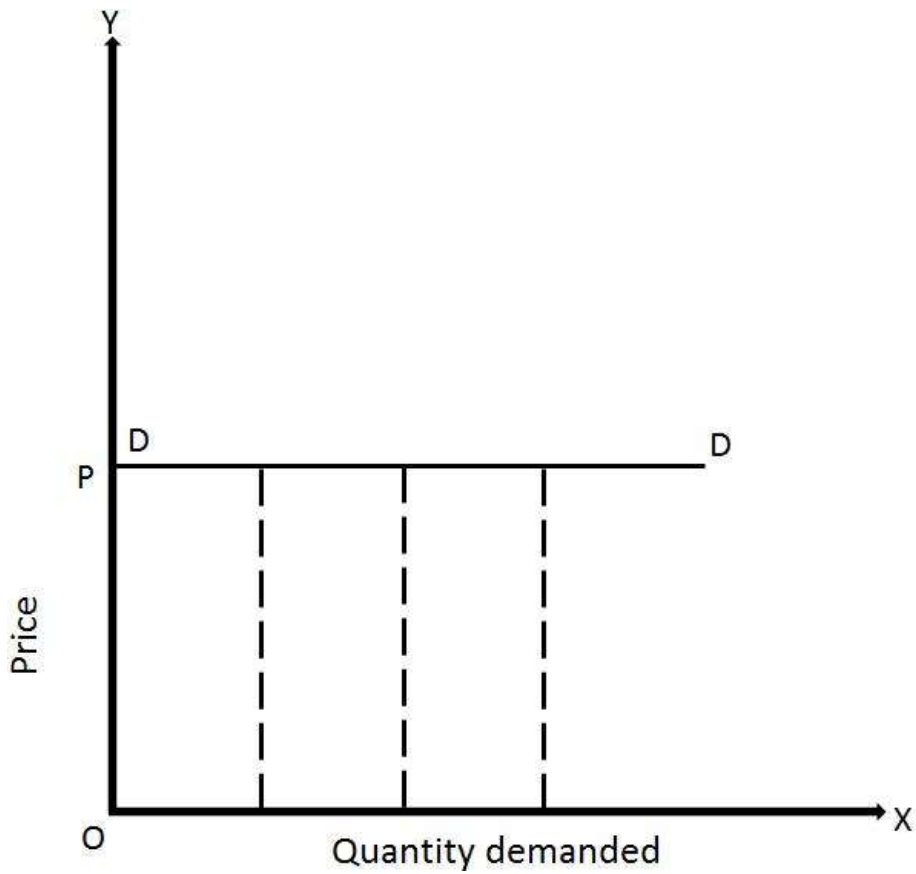
$$= 2\ \%$$

The quantity demanded increases by 2% due to fall in price by Rs.1.

Types or degrees of price elasticity of demand

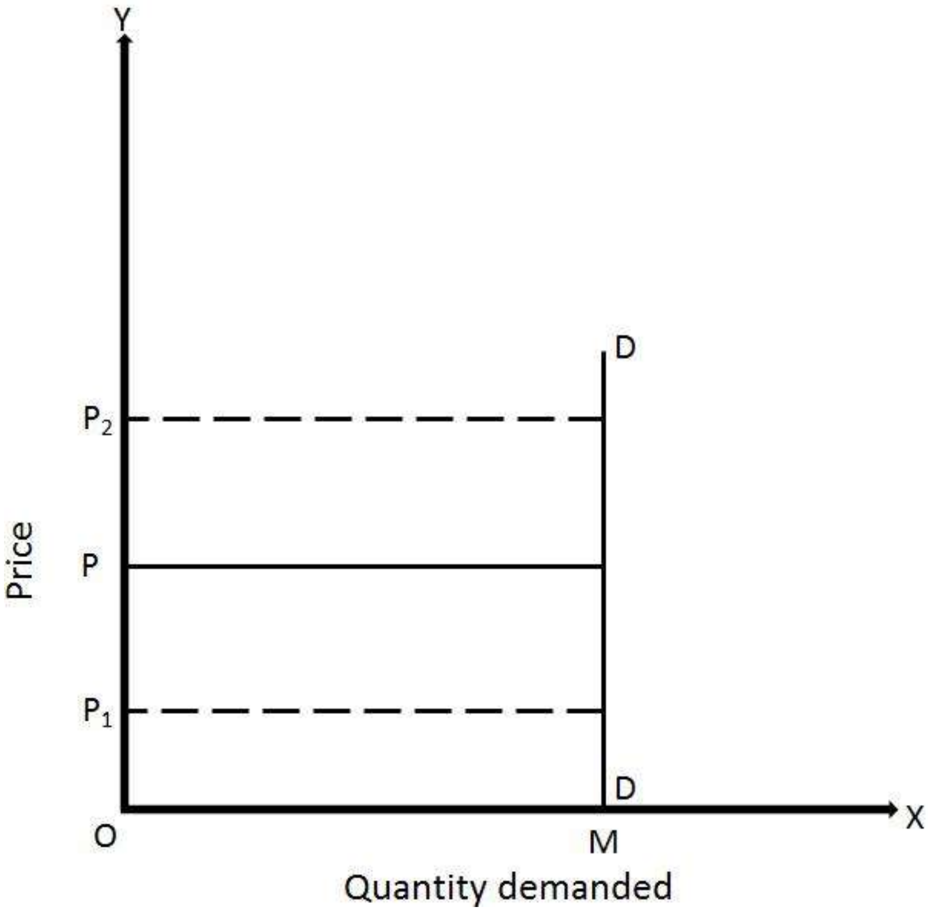
1. Perfectly Elastic Demand ($E_P = \infty$)
2. Perfectly Inelastic Demand ($E_P = 0$)
3. Relatively Elastic Demand ($E_P > 1$)
4. Relatively Inelastic Demand ($E_p < 1$)
5. Unitary Elastic Demand ($E_p = 1$)

1. Perfectly Elastic Demand ($E_P = \infty$)



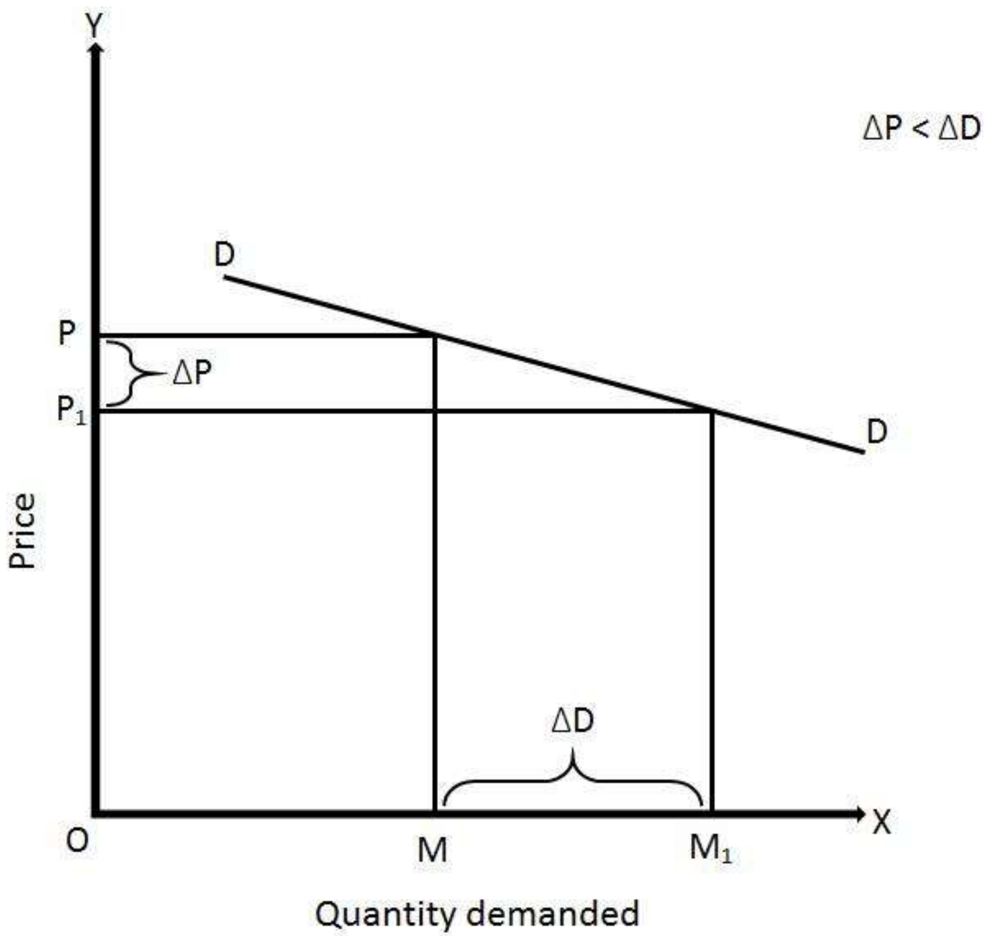
The quantity demanded increases infinitely (or by unlimited quantity) with a small fall in price
or
quantity demanded falls to zero with a small rise in price.

2. Perfectly Inelastic Demand ($E_P = 0$)



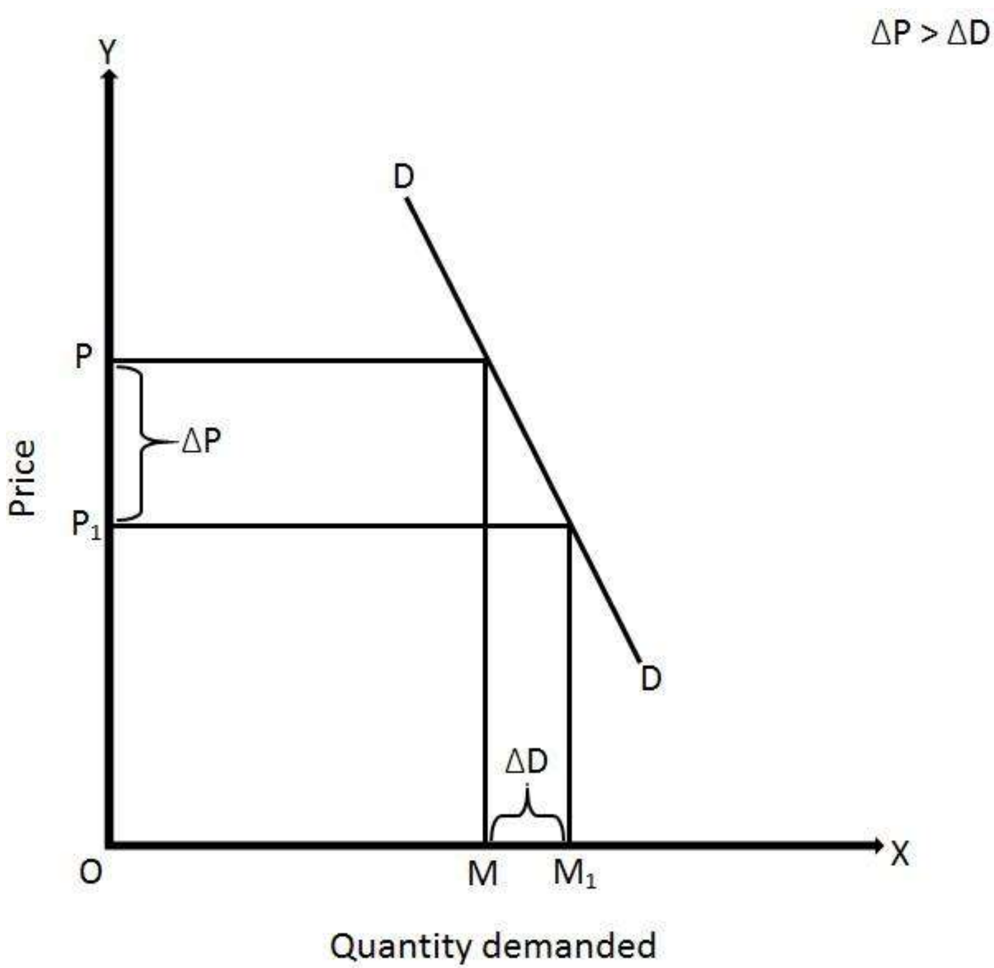
The demand remains constant whatever may be the price (i.e. price may rise or fall)

3. Relatively Elastic Demand (E_P> 1)



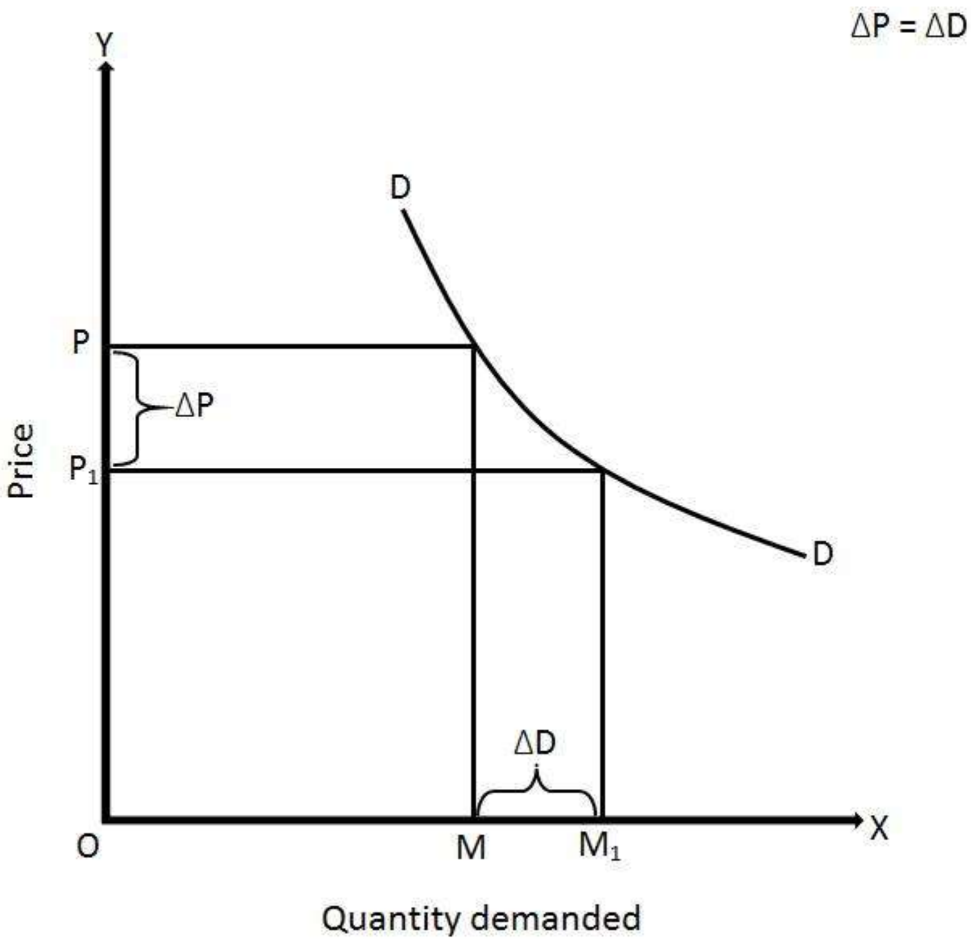
Percentage change in demand is greater than the percentage change in price

4. Relatively Inelastic Demand ($E_p < 1$)



Percentage change in quantity demanded is less than the percentage change in price

5. Unitary Elastic Demand ($E_p = 1$)



Percentage change in quantity demanded is equal to the percentage change in price

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