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MBA

MANAGERIAL ECONOMICS

- **Course Code:** MBA601
- **Semester:** First
- **SLM UNIT :** 2
- **E-Lesson:** 2

MANAGERIAL ECONOMICS

OBJECTIVES

Student will be able to :

- Discuss meaning and definitions of elasticity of demand
- Explain the determinants of elasticity of demand
- Explain the concepts and measurements of price, income, cross-price and advertising
- Elasticity of demand and their applications in practice

INTRODUCTION

- Elasticity of demand is an important variation on the concept of demand. Demand can be classified as elastic, inelastic or unitary.
- An elastic demand is one in which the change in quantity demanded due to a change in price is large.
- The elasticity of demand tells us how sensitive the quantity demanded is to the good's price at a given point on a demand curve.

TOPICS TO BE COVERED

- The Concept of Elasticity of Demand
- Price Elasticity of Demand
- Types of Price Elasticity
- Measurement of Price Elasticity
- Income Elasticity of Demand
  - ✓ Types of Income Elasticity
- Cross Elasticity of Demand

THE CONCEPT OF ELASTICITY OF DEMAND

- Demand extends or contracts respectively with a fall or rise in price. This quality of demand by virtue of which it changes (increases or decreases) when price changes (decreases or increases) is called **Elasticity of Demand.**

- "The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price".

– Dr. Marshall.

- Elasticity means sensitiveness or responsiveness of demand to the change in price.

- This change, sensitiveness or responsiveness, may be small or great. Take the case of salt. Even a big fall in its price may not induce an appreciable extension in its demand. On the other hand, a slight fall in the price of oranges may cause a considerable extension in their demand. That is why we say that the demand in the former case is 'inelastic' and in the latter case it is 'elastic'.

THE CONCEPT OF ELASTICITY OF DEMAND

Based on the variable that affects the demand, the elasticity of demand is of the following types:

- **Price Elasticity of Demand**

The change in the quantity demanded of a product due to a change in its price is known as Price elasticity of demand. Thus, the sensitiveness or responsiveness of demand to change in price is called as price elasticity of demand.

- **Income Elasticity of Demand**

Income elasticity of demand refers to the sensitivity of the quantity demanded for a certain good to a change in real income of consumers who buy this good, keeping all other things constant. The formula for calculating income elasticity of demand is the percent change in quantity demanded divided by the percent change in income. With income elasticity of demand, you can tell if a particular good represents a necessity or a luxury.

- **Cross Elasticity of Demand**

In economics, the cross elasticity of demand or cross-price elasticity of demand measures the responsiveness of the quantity demanded for a good to a change in the price of another good, ceteris paribus. It is measured as the percentage change in quantity demanded for the first good that occurs in response to a percentage change in price of the second good.

Types Of Price Elasticity Of Demand

1) Perfectly elastic demand (Ed=Infinity)

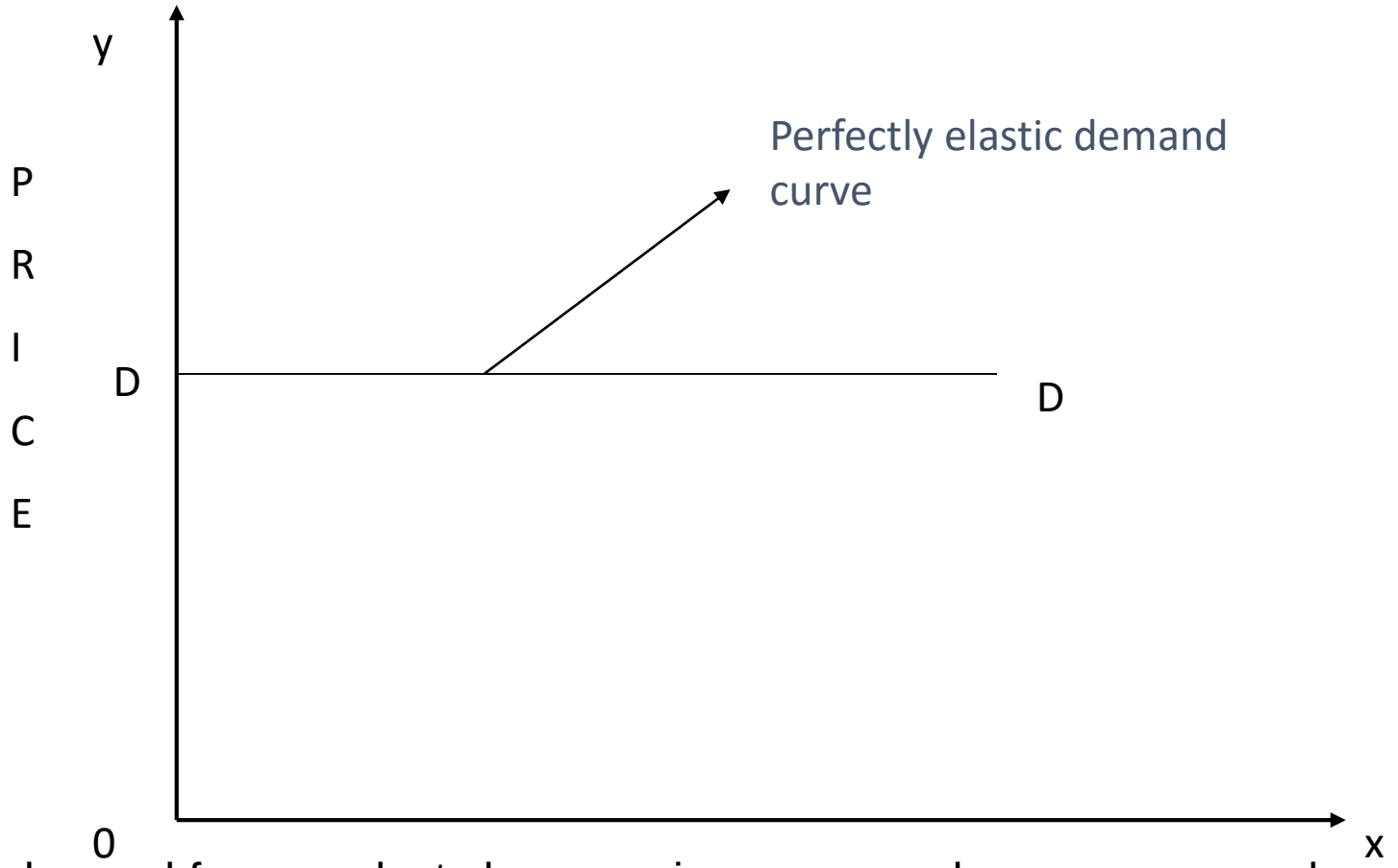
2) Relatively elastic demand (Ed>I)

3) Elasticity of demand equal to utility (Ed=I)

4) Relatively inelastic demand (Ed<I)

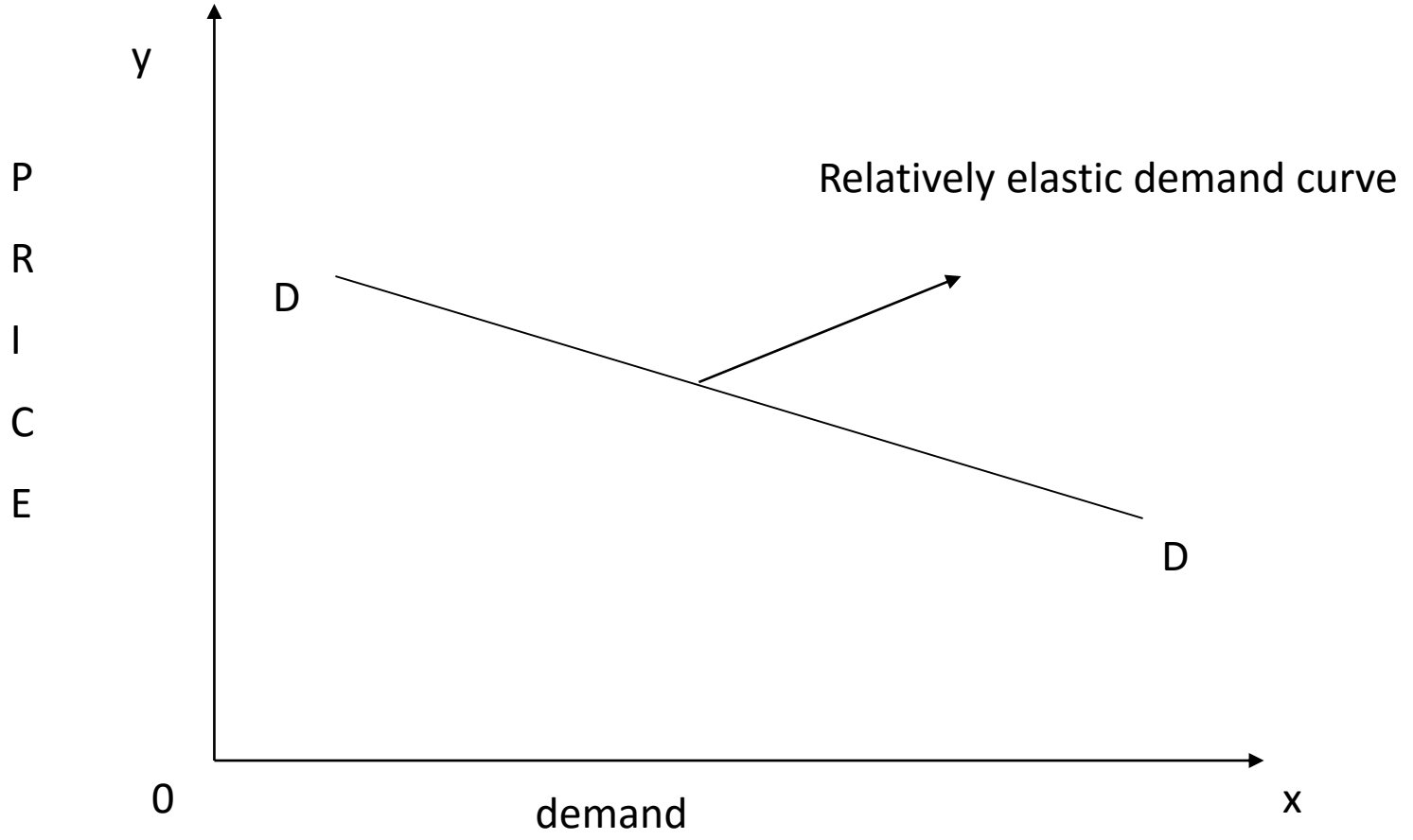
5) Perfectly inelastic demand (Ed=O)

PERFECTLY ELASTIC DEMAND



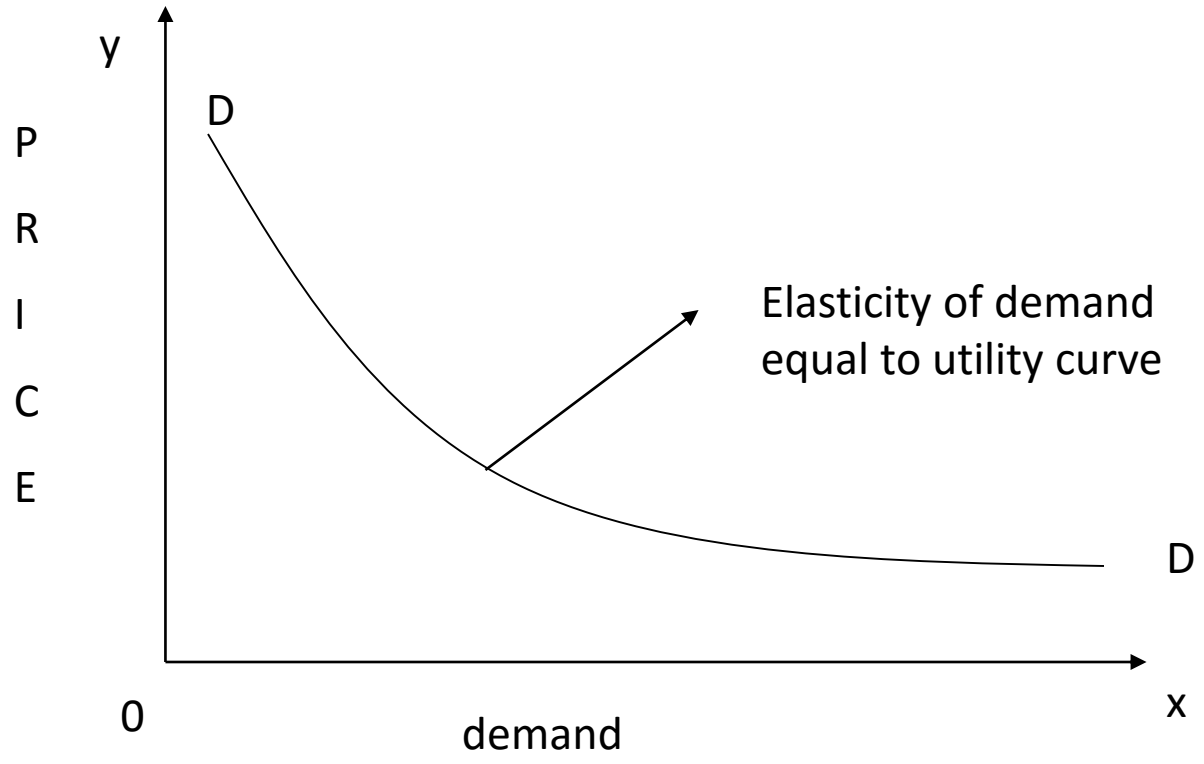
- When the demand for a product changes –increases or decreases even when there is no change in price, it is known as perfect elastic demand.

RELATIVELY ELASTIC DEMAND



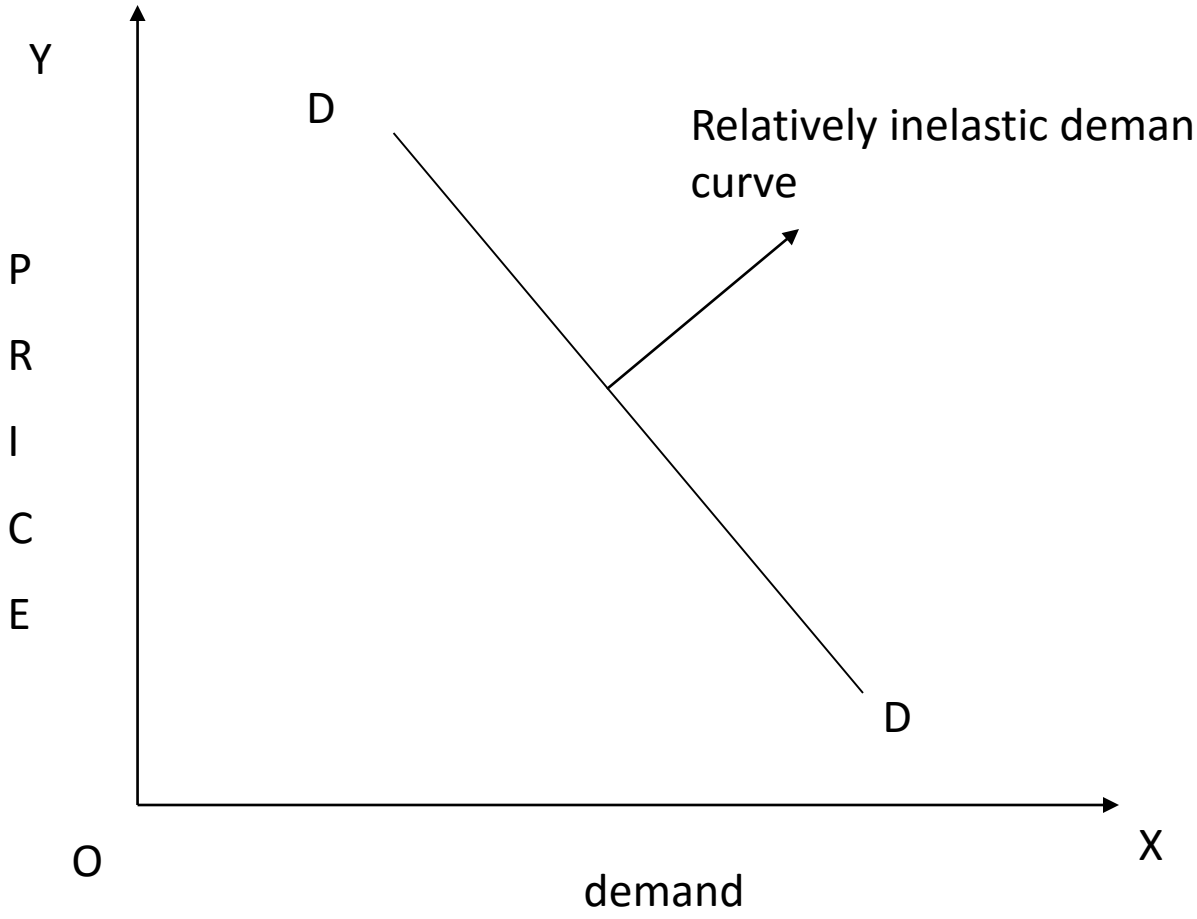
- When the proportionate change in demand is more than the proportionate changes in price, it is known as relatively elastic demand.

ELASTICITY OF DEMAND EQUAL TO RELATIVITY



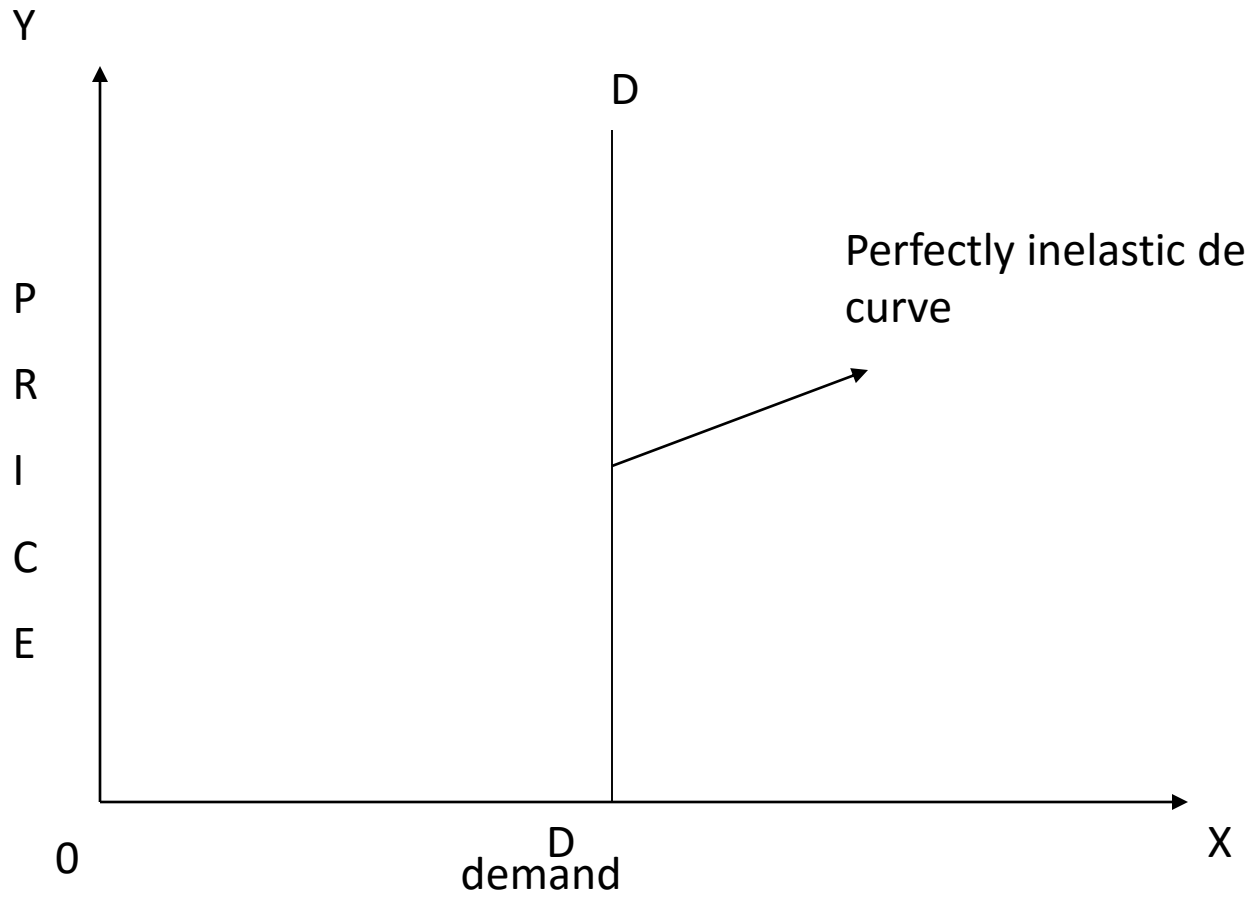
- When the proportionate change in demand is equal to proportionate changes in price, it is known as unitary elastic demand

RELATIVELY INELASTIC DEMAND



- When the proportionate change in demand is less than the proportionate changes in price, it is known as relatively inelastic demand

PERFECTLY INELASTIC DEMAND



- When a change in price, howsoever large, leads to no changes in quantity demand, it is known as perfectly inelastic demand

MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are main methods like

1. Percentage method or proportionate method
2. Total revenue method
3. Geometric method or point method
4. Arc elasticity of demand
5. Total expenditure method

Percentage method or proportionate method

- Price elasticity of demand is measured by a ratio between the proportionate change in the quantity of a product demanded as a result of a proportionate change in its price
- Formula for calculate this is given further as following

$$\text{Price elasticity of demand} = \frac{\text{Proportionate change in Quantity demanded for x}}{\text{Proportionate change in Price for x}}$$

OR

$$\frac{\triangle Qx}{Qx} \Big/ \frac{\triangle Px}{Px}$$

Here,

$\triangle$ Qx = change in the quantity of x demanded

Qx = original quantity of x demanded

$\triangle$Px = change in the price of x

Px = original price of x

Percentage method or proportionate method

Implications:

- (a) This method should be used when there is a very small change in price and quantity demanded.
- (b) The coefficient of price elasticity of demand is always negative. It is because when price changes, demand changes in the opposite direction. But by convention, we ignore negative sign.
- (c) The elasticity of demand is relative. It is not expressed in any unit rather expressed in percentage or in fractions.

Total outlay/Total Expenditure method

- Total outlay method, also known as total expenditure method of measuring price elasticity of demand was developed by Professor Alfred Marshall. According to this method, price elasticity of demand can be measured by comparing total expenditure on a commodity before and after the price change.
- It will be clear with following table

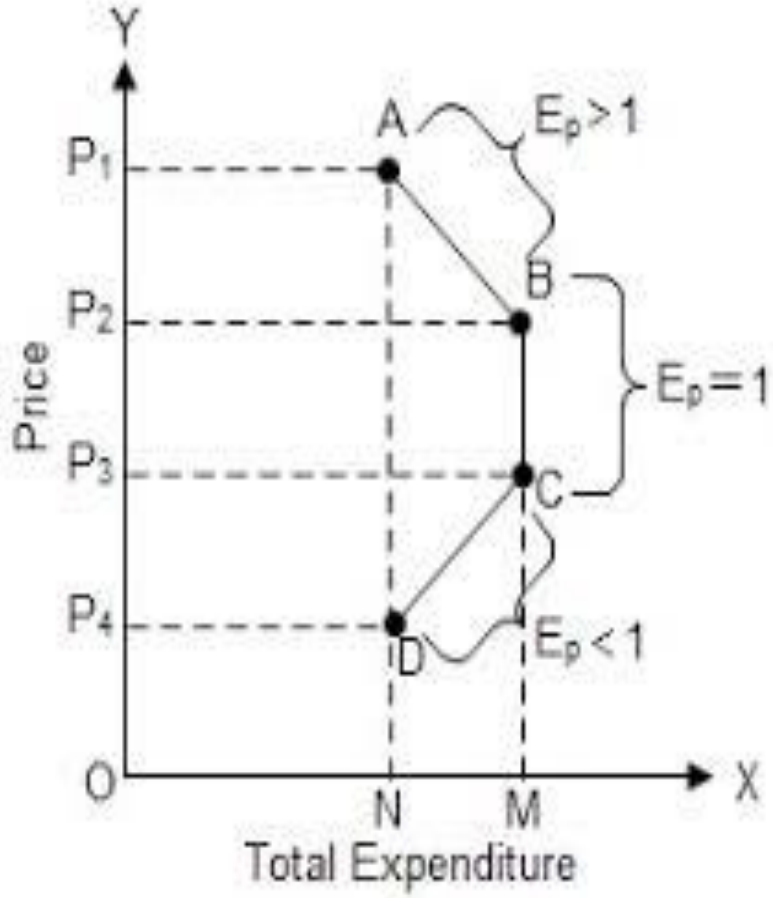
Cases	Price (P)	Quantity demanded (Q)	Total outlay or expenditure (E = PXQ)	Price elasticity of demand (PED)
I	6	1	6	PED > 1
	5	2	10	
II	4	3	12	PED = 1
	3	4	12	
III	2	5	10	PED < 1
	1	6	6	

While comparing the expenditure, we may get one of three outcomes. They are

- **Elasticity of demand will be greater than unity (Ep > 1)**
- When total expenditure increases with fall in price and decreases with rise in price, the value of PED will be greater than 1. Here, rise in price and total outlay or expenditure move in opposite direction.

- **Elasticity of demand will be equal to unity (Ep = 1)**
- When total expenditure on commodity remains unchanged in response to change in price of the commodity, the value of PED will be equal to 1.

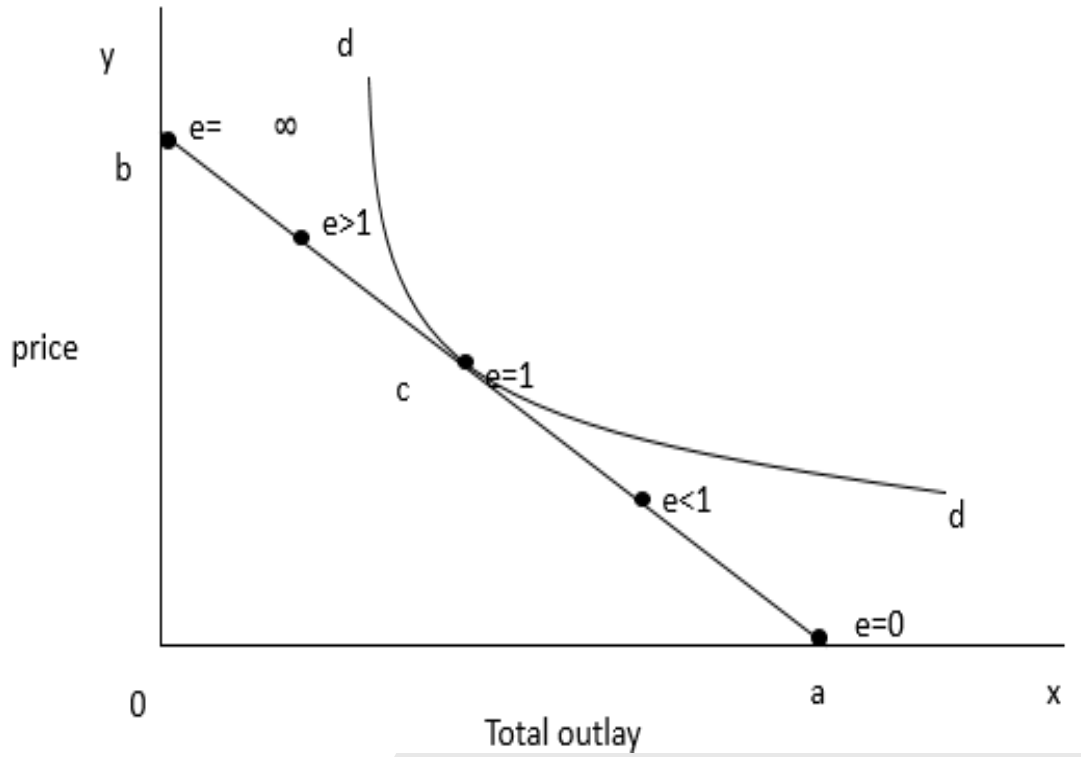
- **Elasticity of demand will be less than unity (Ep < 1)**
- When total expenditure decreases with fall in price and increases with rise in price, the value of PED will be less than 1. Here, price of commodity and total outlay move in same direction.



GEOMETRIC METHOD OR POINT METHOD

- This method attempts to measure numerical elasticity of demand at a particular point on the demand curve
- Price elasticity can be measure by following method

$$\text{Price elasticity of demand} = \frac{\text{Lower segment of the demand curve}}{\text{upper segment of the demand curve}}$$



ARC ELASTICITY OF DEMAND

- It is the use of middle points between old and new figures in the case of both price and quantity. This method is known as arc elasticity method. Any two points on a demand curve make an arc, and the coefficient of price elasticity of demand of an arc is known as arc elasticity of demand. This method is used to find out price elasticity of demand over a certain range of price and quantity.

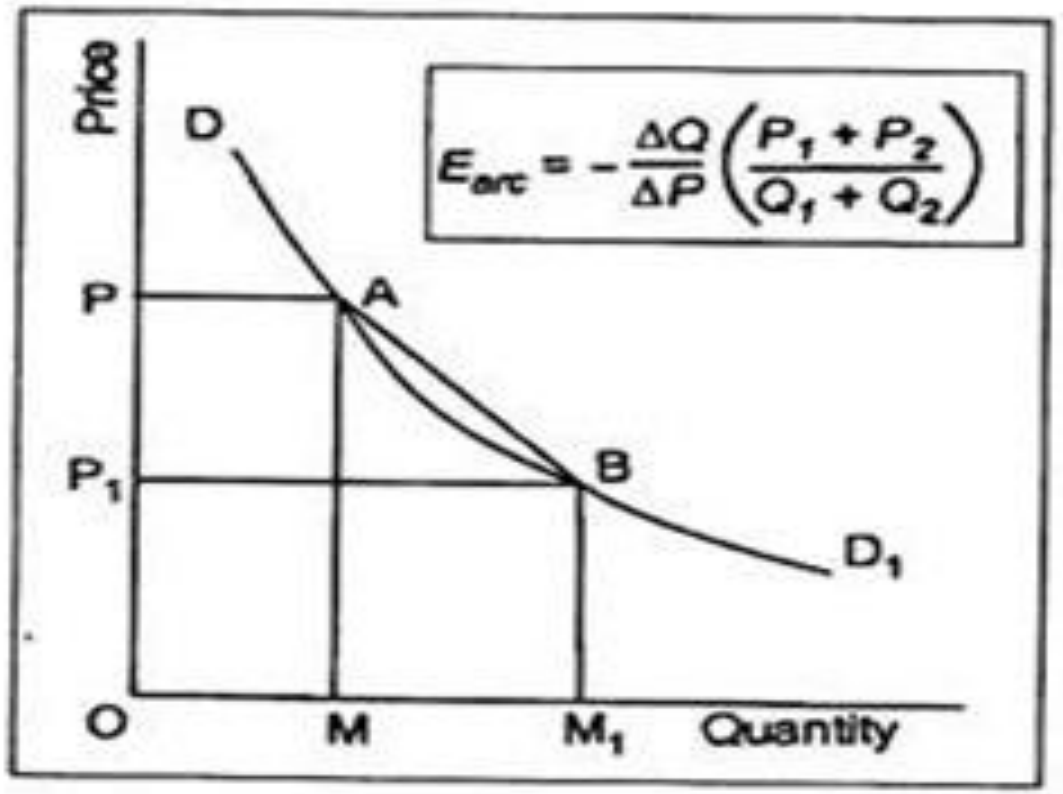


Fig. 2.53: Arc Elasticity

- Consider the price-quantity combinations P and M as given in Table and diagram

ARC ELASTICITY OF DEMAND

Point	Price (Rs.)	Quantity (Kg)
P	8	10
M	6	12

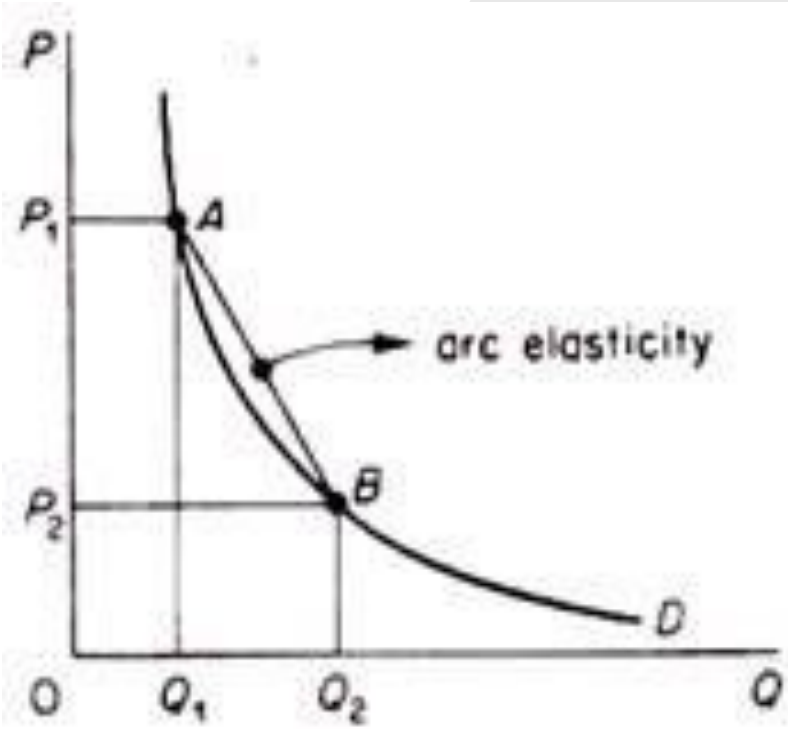
- Price elasticity of demand $= \frac{Q1-Q2}{Q1+Q2} / \frac{P1-P2}{P1+P2}$

- If we move from P to M, the elasticity of demand is:

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(12-10)}{(6-8)} \times \frac{8}{10} = \frac{2}{-2} \times \frac{8}{10} = \frac{4}{5}$$

- If we move in the reverse direction from M to P, then

$$E_p = \frac{(10-12)}{(8-6)} \times \frac{6}{12} = \frac{2}{2} \times \frac{6}{12} = -\frac{1}{2}$$



- Thus the point method of measuring elasticity at two points on a demand curve gives different elasticity coefficients because we used a different base in computing the percentage change in each case.
- To avoid this discrepancy, elasticity for the arc (PM in Figure 11.4) is calculated by taking the average of the two prices [(p_1, + p_2 1/2] and the average of the two quantities [(p_1, + q_2) 1/2]. The formula for price elasticity of demand at the mid-point (C in Figure 11.4) of the arc on the demand curve is

- E =

$$E_p^{arc} = \frac{\frac{q_2 - q_1}{(q_1 + q_2)/2}}{\frac{p_2 - p_1}{(p_1 + p_2)/2}} = \frac{q_2 - q_1}{q_1 + q_2} \cdot \frac{p_1 + p_2}{p_2 - p_1}$$

$$= \frac{p_1 + p_2}{q_1 + q_2} \cdot \frac{q_2 - q_1}{p_2 - p_1} = \text{negative} \qquad (2.3)$$

[$\because$ owing to law of demand, if $p_2 - p_1 \leqslant 0$, then we would have, $q_2 - q_1 \geqslant 0$]

Here (p_1, q_1) and (p_2, q_2) are the two extreme points of the arc concerned of the demand curve.

- On the basis of this formula, we can measure arc elasticity of demand when there is a movement either from point P to M or from M to P.
- From P to M at P, p_1 = 8, q_1, =10, and at M, P_2 = 6, q_2 = 12
- Applying these values, we get

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p_1 + p_2}{q_1 + q_2} = \frac{(12-10)}{(6-8)} \times \frac{(8+6)}{(10+12)} = \frac{2}{-2} \times \frac{14}{22} = -\frac{7}{11}$$

From M to P at $M, p_1 = 6, q_1 = 12$ and at $P, p_2 = 8, q_2 = 10$. Now we have

$$E_p = \frac{(10-12)}{(8-6)} \times \frac{(6+8)}{(12+10)} = \frac{-2}{2} \times \frac{14}{22} = \frac{-7}{11}$$

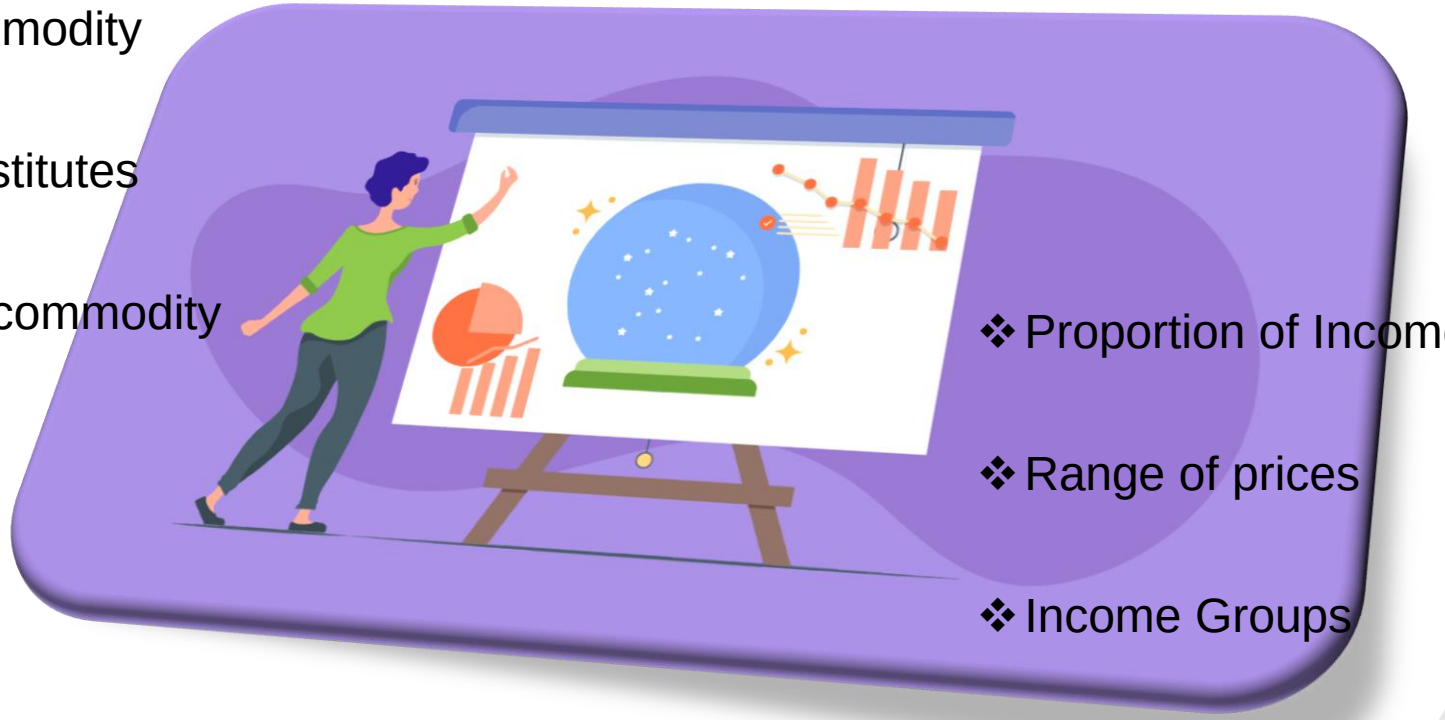
- Thus whether we move from M to P or P to M on the arc PM of the DD curve, the formula for arc elasticity of demand gives the same numerical value.
- The closer the two points P and M are, the more accurate is the measure of elasticity on the basis of this formula.
- If the two points which form the arc on the demand curve are so close that they almost merge into each other, the numerical value of arc elasticity equals the numerical value of point elasticity.

REVENUE METHOD

- Mrs. Joan Robinson has given this method. She says that elasticity of demand can be measured with the help of average revenue and marginal revenue. Therefore, sale proceeds that a firm obtains by selling its products are called its revenue. However, when total revenue is divided by the number of units sold, we get average revenue.
- On the contrary, when addition is made to the total revenue by the sale of one more unit of the commodity is called marginal revenue. Therefore, the formula to measure elasticity of demand can be written as,
- $E_A = A/ A-M$
- Where E_d represents elasticity of demand, A = average revenue and M = marginal revenue.

FACTORS AFFECTING PRICE ELASTICITY OF DEMAND

- Nature of the Commodity
- Availability of Substitutes
- Variety of uses of commodity
- Postponement
- Influence of habits



- Proportion of Income spent on a commodity
- Range of prices
- Income Groups
- Elements of time
- Pattern of income distribution

INCOME ELASTICITY OF DEMAND

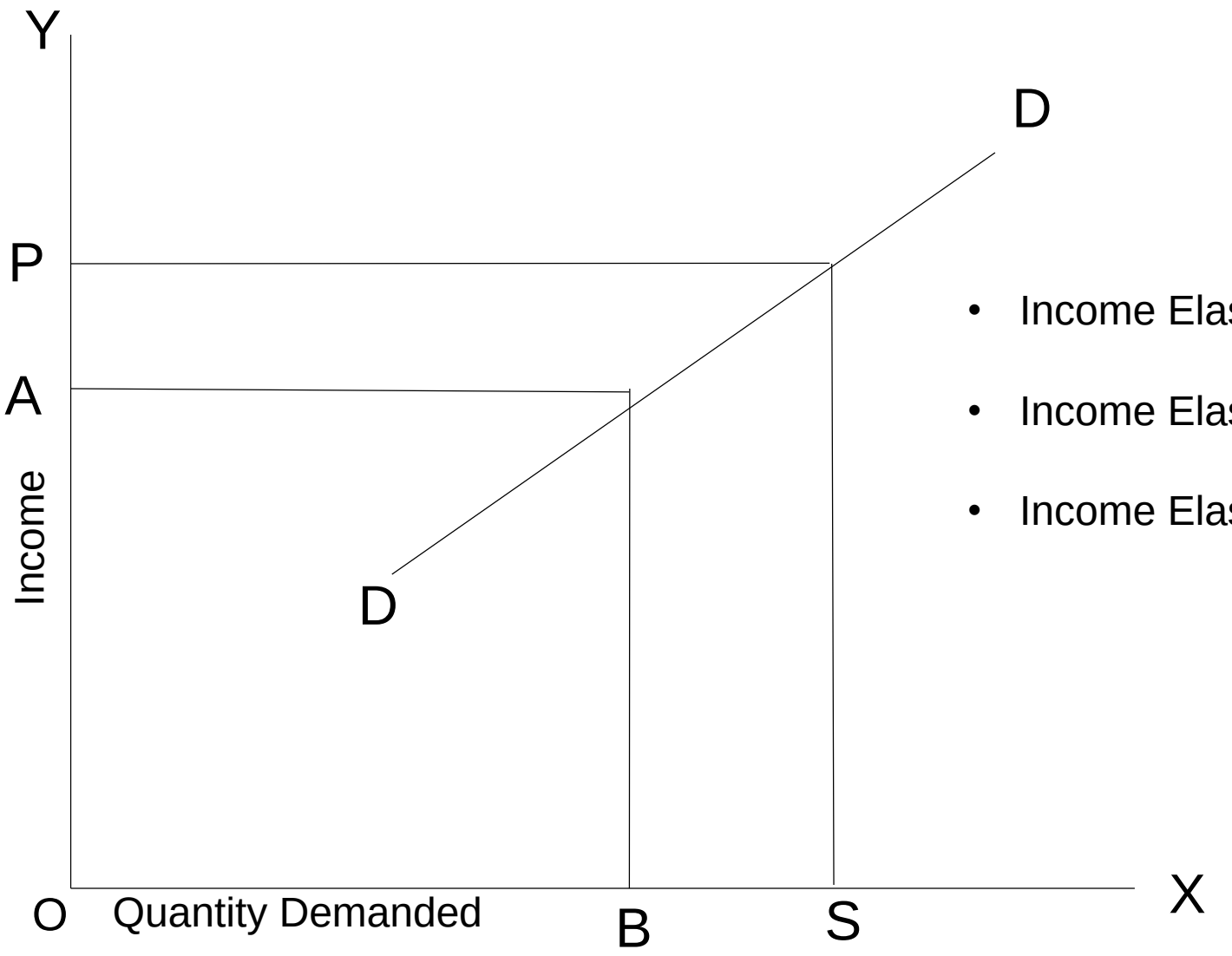
Income elasticity of demand measures the responsiveness of the quantity demanded for a good or service to a change in the income of the people demanding the good. It is calculated as the ratio of the percentage change in quantity demanded to the percentage change in income.

Types Of Income Elasticity Of Demand

- Positive Income elasticity of demand
- Negative Income elasticity of demand
- Zero Income elasticity of demand

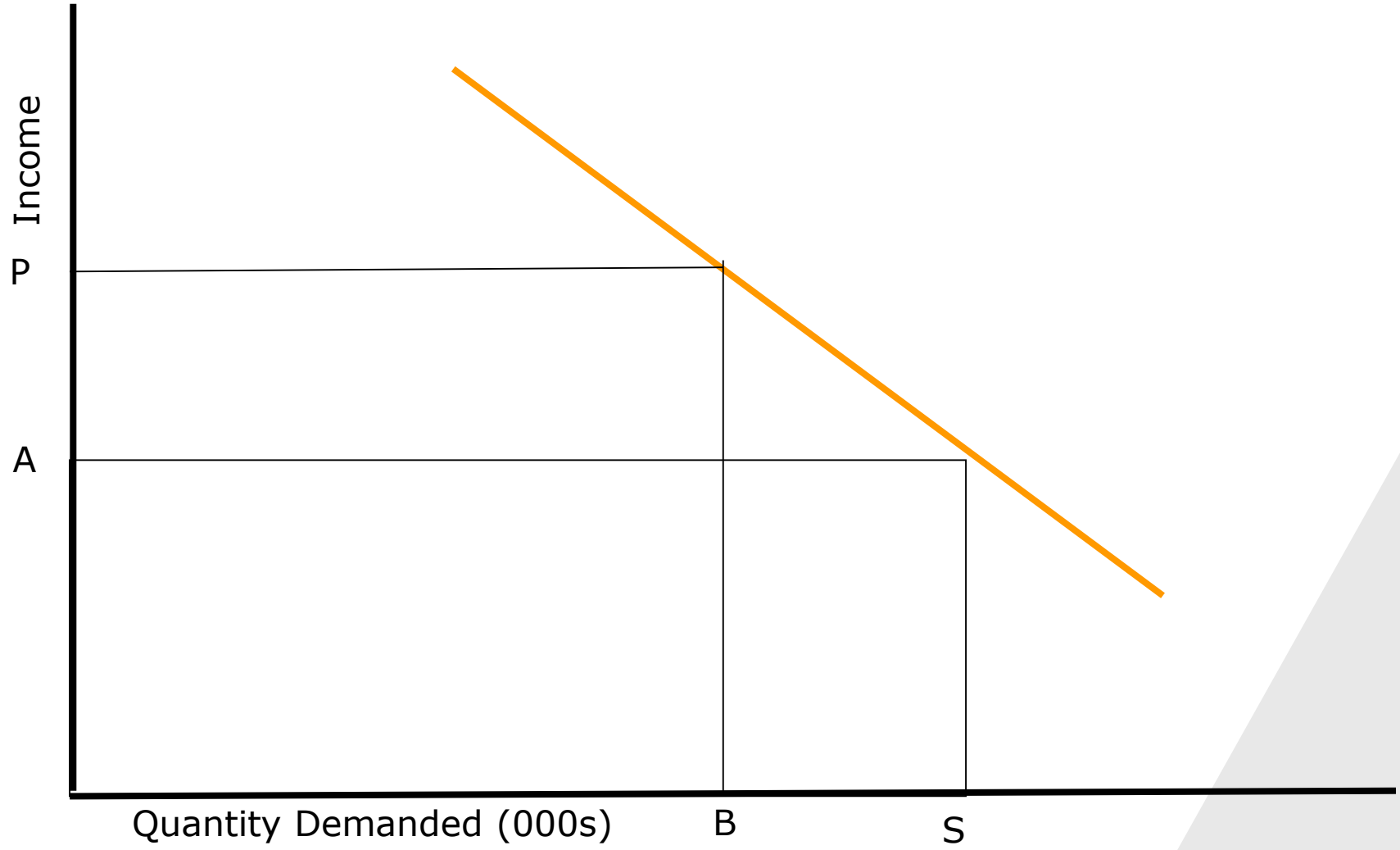
$$\text{income elasticity of demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

Positive Income elasticity of demand

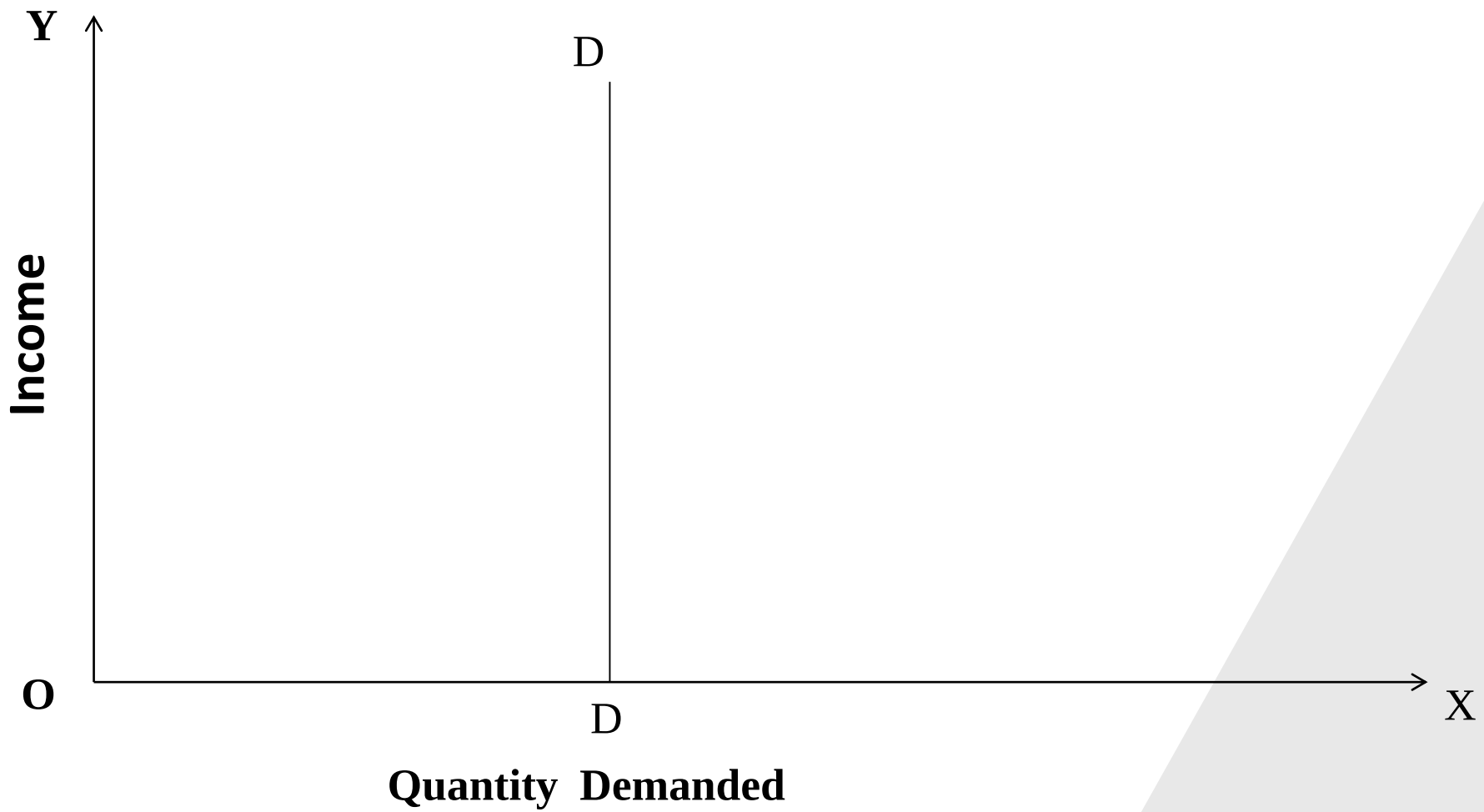


- Income Elasticity Equal to Unity or One
- Income Elasticity Greater Than Unity Or One
- Income Elasticity Less Than Unity or One

Negative Income elasticity of demand



Zero Income elasticity of demand



MEASUREMENT OF INCOME ELASTICITY OF DEMAND

$$\text{Income Elasticity Of Demand} = \frac{\text{Proportionate change in Demand}}{\text{Proportionate change in Income}}$$

i.e.

$$\text{Income Elasticity Of Demand} = \frac{\Delta Q}{Q} * \frac{\Delta y}{Y}$$

MEASUREMENT OF INCOME ELASTICITY OF DEMAND

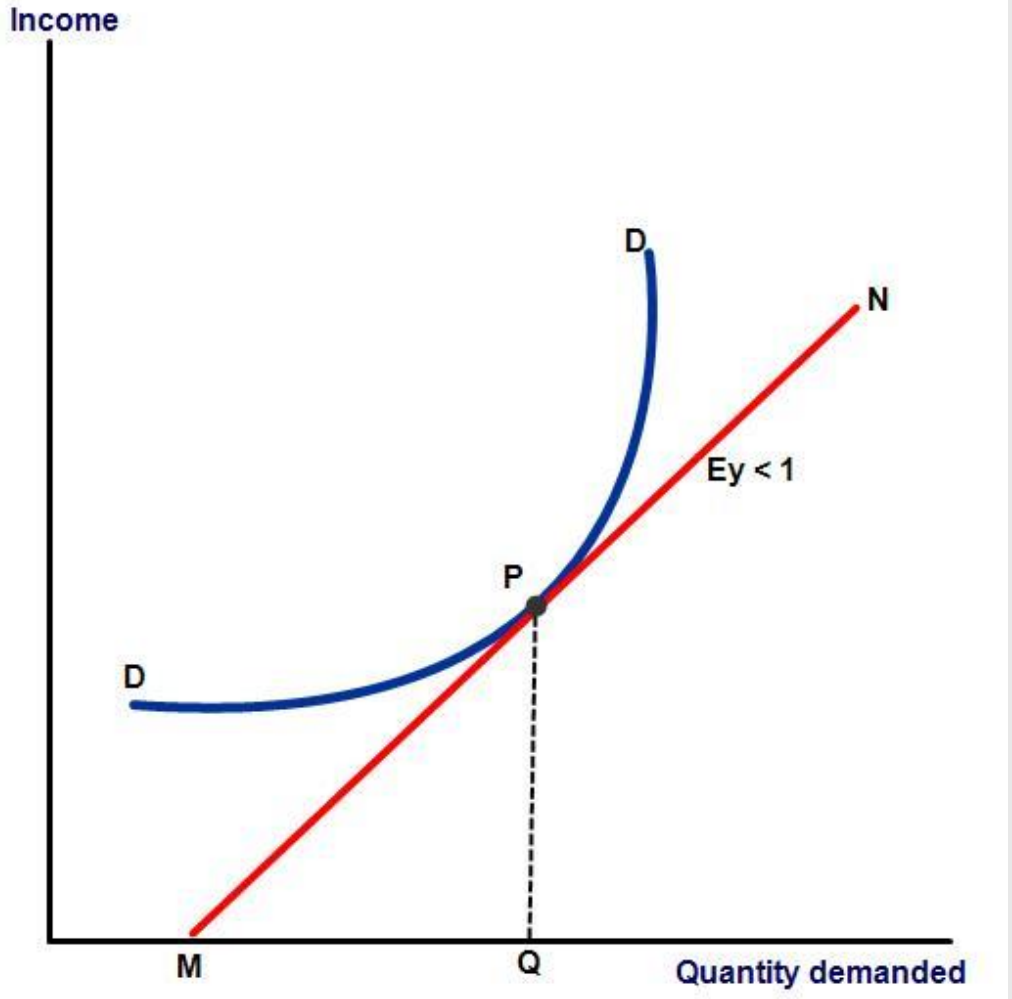
- Here , ΔQ = Change in the quantity demanded.

  Q = Original quantity demanded.

  Δy = Change in income.

  Y = Original income.

- For e.g. ,when Income of the consumer = 2,500/- , he purchases 20 units of X, when income = 3,000/- he purchases 25 units of X



MEASUREMENT OF INCOME ELASTICITY OF DEMAND

- Thus

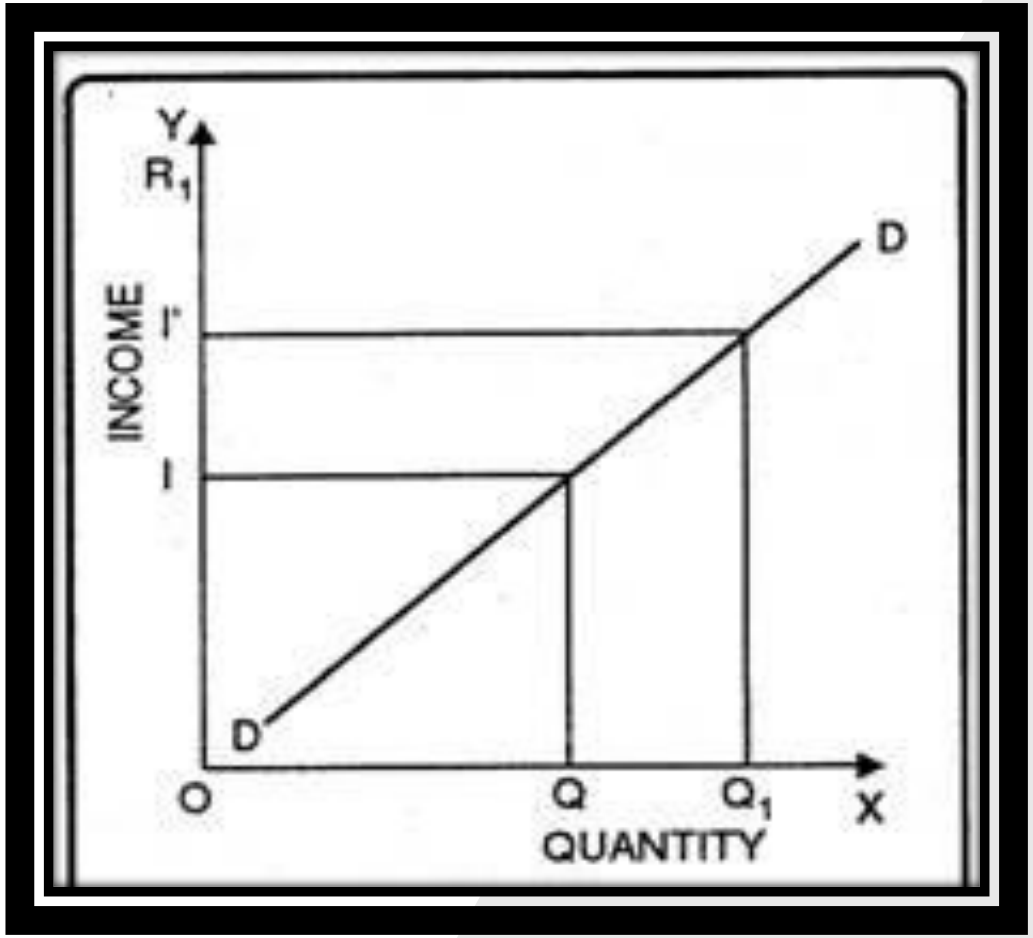
  Income Elasticity of Demand

$$\frac{\Delta Q}{Q} * \frac{\Delta y}{Y}$$

= (5/20) + (500/2500)

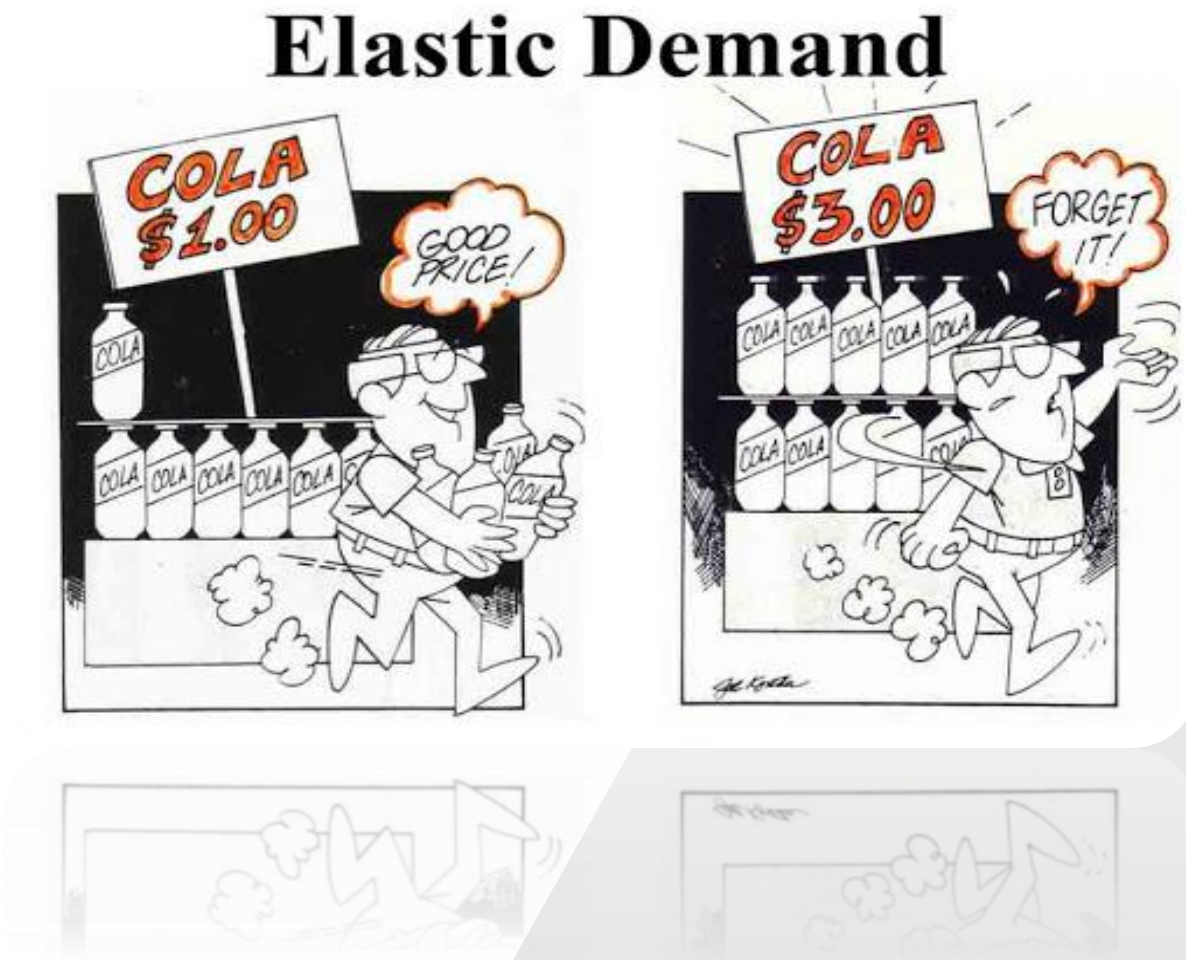
= 1.5

therefore here the IED is 1.5 which is more than one.



IMPORTANCE OF THE CONCEPT OF INCOME ELASTICITY OF DEMAND

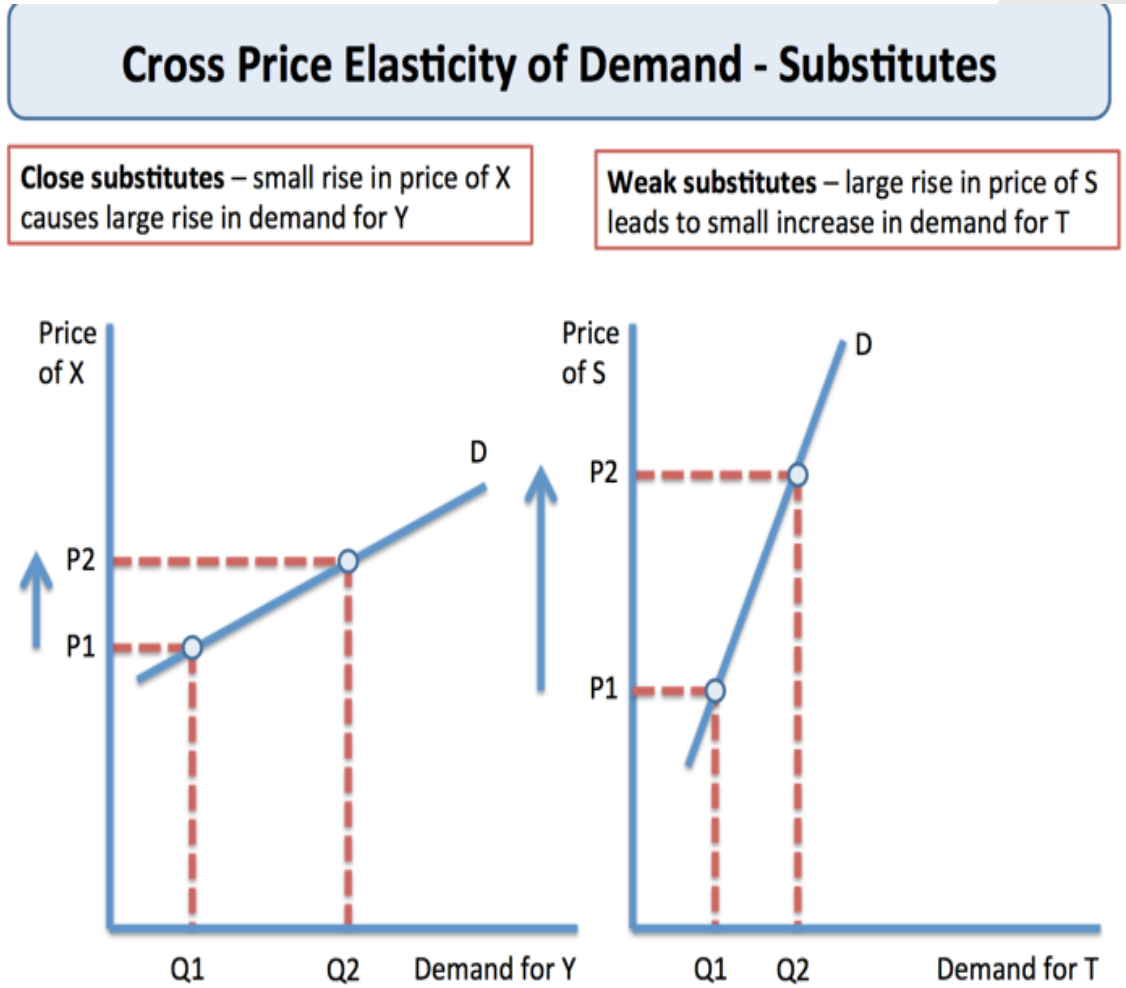
- In production planning and management
- In forecasting demand when change in consumers income is expected
- In classifying goods as normal and inferior
- In expansion and contraction of the firm by the figure of income elasticity of demand
- Markets situations could be studied with the help of IED



CROSS ELASTICITY OF DEMAND

❖ **Cross elasticity of demand express a relationship between the change in the demand for a given product in response to a change in the price of some other product**

- E.g. if the X tea demand reduces tremendously than it effect could be seen in demand of sugar and milk.



❖ **Types of Cross Elasticity of Demand**

- Positive(In case of Substitutes)
- Negative(In case of Complementary Goods)
- Zero(When the goods are not related to each other)

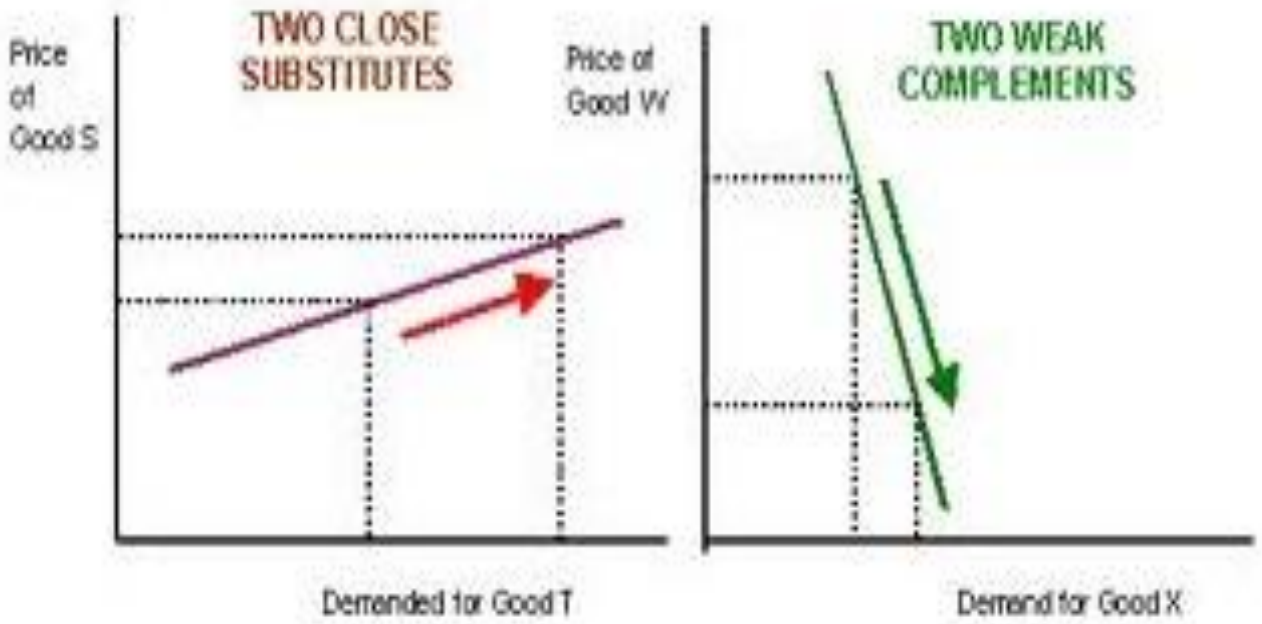
MEASUREMENT CROSS ELASTICITY OF DEMAND

$$\text{Cross Elasticity of Demand} = \frac{\text{Proportionate change in Demand for product X}}{\text{Proportionate change in Price of product Y}}$$

i.e.

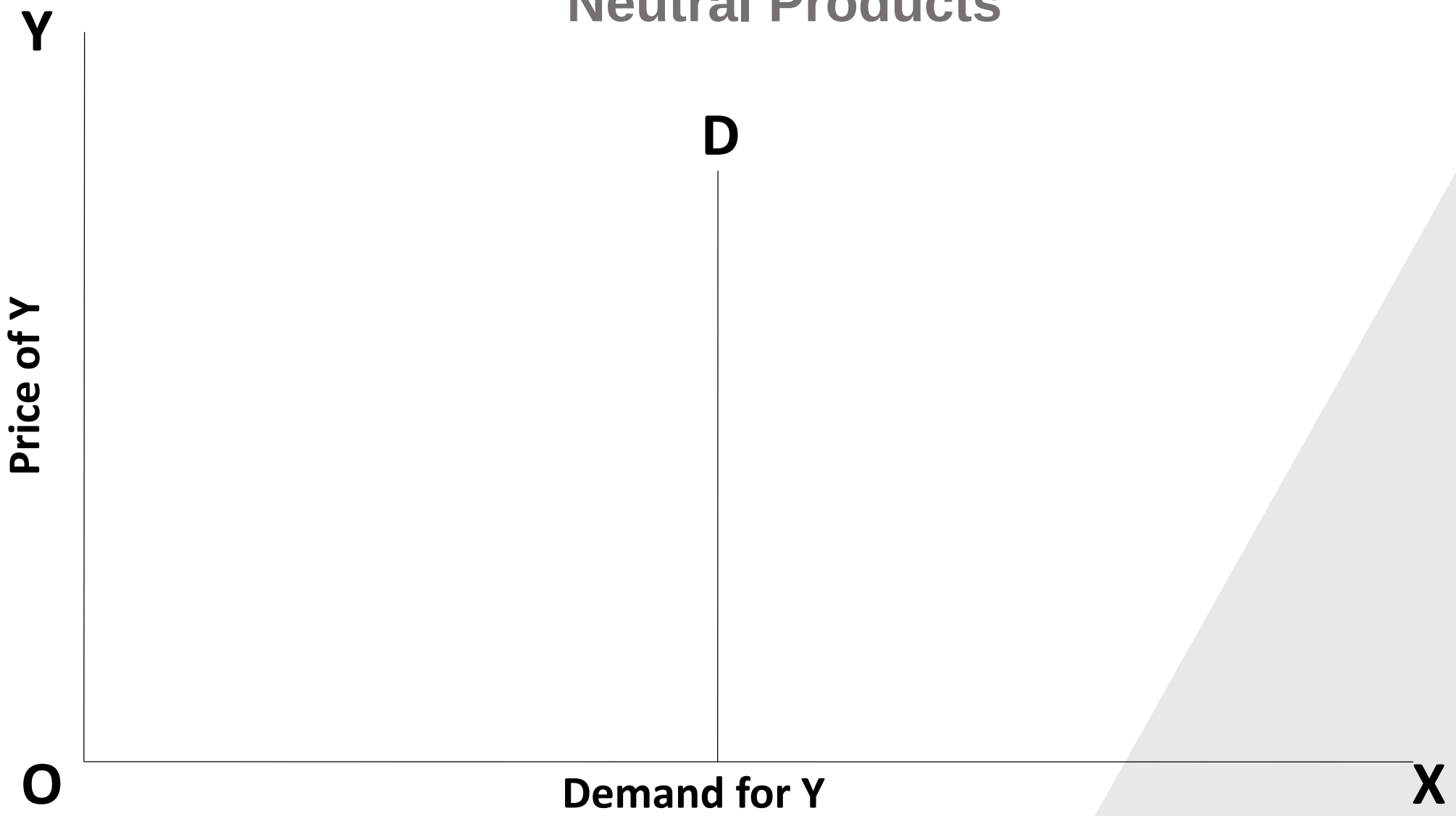
$$\text{Cross Elasticity of Demand} = \frac{\Delta qx}{Qx} * \frac{\Delta p\ y}{Py}$$

❖ Cross elasticity of demand for substitutes



❖ Cross elasticity of demand for Complementary Products

Cross Elasticity of Demand For Neutral Products



SUMMARY

- The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price.

- Price elasticity of demand: The ratio of the relative change in demand to the given price change.
- Unitary Elastic Demand: e = 1
- Elastic Demand: e > 1
- Inelastic Demand: e < 1
- Ratio method: Percentage change in demand/percentage change in price
- Unitary Elastic Demand: Total Revenue remaining unchanged against the price change.
- Relatively Elastic Demand: Total Revenue moves in opposite direction to the direction of the price change.
- Relatively Inelastic Demand: Total Revenue move in the same direction of the price change.
- Income Elasticity of Demand: Percentage change in demand/percentage change in income.
- Zero income elasticity of demand: Salt. Match-box.
- Substitutes: Positive cross elasticity of products demand.
- Complementary Goods: Negative cross elasticity of demand.

MULTIPLE CHOICE QUESTIONS

1.The responsiveness of demand to change in price is termed as

(a) Variation (b) Elasticity
(c) Price elasticity (d) Degree

2. Perfect elastic demand is a case of

(a) Practical consideration (b) Theoretical extremity
(c)motivation (d) Prosperity

3. Total revenue method of identifying price elasticity of demand was suggested by

(a) Pigon (b) Retention
(c) Marshall (d) Friedman

4. Income elasticity may be negative in the case of

(a) Superior goods (b) Cereal like Bajra
(c) Wheat (d) Sweet

5. When price elasticity coefficient is greater than unity, the product is considered to be

(a) Inelastic (b) Elastic
(c) High responsive (d) Business-oriented

Answers 1. (c), 2. (b), 3. (c), 4. (b). 5 (b)

FREQUENTLY ASKED QUESTIONS

Q1. Name the degrees of price elasticity of demand.

Ans: (1) Perfectly elastic demand (Ed=Infinity)

(2)Relatively elastic demand (Ed>I)

(3)Elasticity of demand equal to utility (Ed=I)

(4)Relatively inelastic demand (Ed<I)

(5)Perfectly inelastic demand (Ed=O)

For further detail please Refer to SLM.

Q2. Define Income Elasticity of Demand.

Ans: Income elasticity of demand measures the responsiveness of the quantity demanded for a good or service to a change in the income of the people demanding the good. It is calculated as the ratio of the percentage change in quantity demanded to the percentage change in income.

For further detail please Refer to SLM.

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THANK YOU

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