

# **METHOD TO MEASURE ELASTICITY OF DEMAND**

# Methods of Measuring E<sub>p</sub>

- **1. The Percentage Method:** The price elasticity of demand is measured by its coefficient (E<sub>p</sub>). This coefficient (E<sub>p</sub>) measures the percentage change in the quantity of a commodity demanded resulting from a given percentage change in its price.

$$E_p = \frac{\% \text{ change in } q}{\% \text{ change in } p} = \frac{\Delta q / q}{\Delta p / p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

- |          |          |  |
|----------|----------|--|
| <u>P</u> | <u>Q</u> |  |
| 10       | 40       |  |
| 30       | 10       |  |

$$E_{pd} = \frac{30/10 \times 100}{20/10 \times 100} = 1.5 > 1$$

**2.The Midpoint Method :** To calculate elasticity, we will use the average percentage change in both quantity and price. This is called the **midpoint method for elasticity** and is represented by the following equations:

$$\text{percent change in quantity} = \frac{Q_2 - Q_1}{(Q_2 + Q_1) \div 2} \times 100$$

$$\text{percent change in price} = \frac{P_2 - P_1}{(P_2 + P_1) \div 2} \times 100$$

$$= \frac{\Delta Q}{(Q_2 + Q_1)}$$

$$\frac{\Delta P}{(P_2 + P_1)}$$

$$= \frac{\Delta Q}{\Delta P} \times \frac{(P_2 + P_1)}{(Q_2 + Q_1)}$$

### 3.The Total Outlay/Expenditure Method:

measure of elasticity. By comparing the total expenditure of a purchaser both before and after the change in price, it can be known whether his demand for a good is elastic, unity or less elastic.

Total outlay or expenditure is price multiplied by the quantity of a good purchased: Total Outlay = Price x Quantity Demanded.

**Table. 3 : Total Outlay Method**

<i>Price Rs. per Kg.</i>	<i>Quantity in Kgs.</i>	<i>TE in Rs</i>	<i>Ep</i>
(1)	(2)	(1×2)=3	(4)
9	2	18	> 1
8	3	24	
7	4	28	= 1
6	5	30	
5	6	30	< 1
4	7.5	30	
3	8	24	< 1
2	9	18	
1	10	10	

# Total Outlay Method

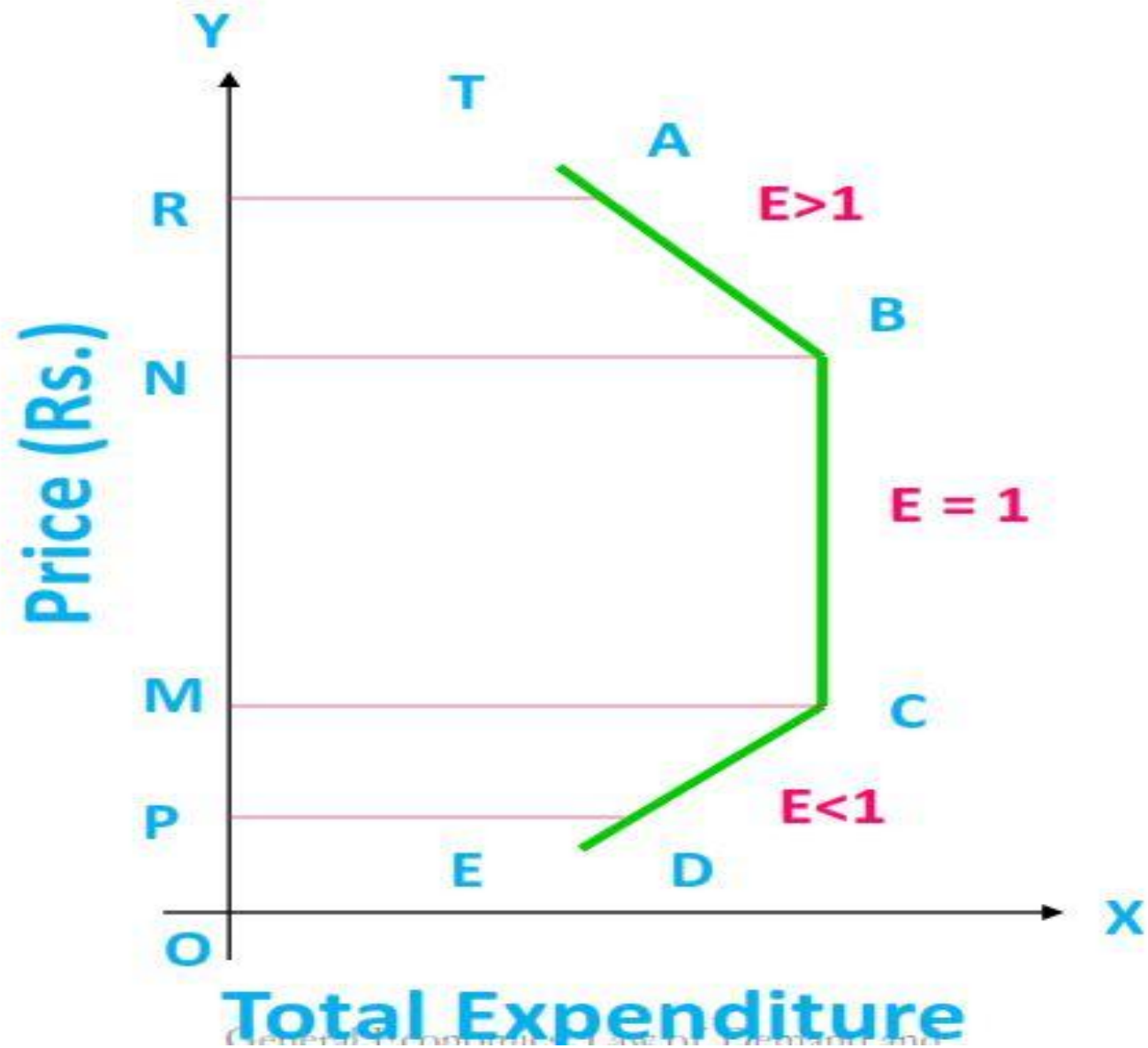
Unit Price (Rs)	Quantity	TE =P*Q (Rs)
A. 10	10	100
5 ↓	25	<b>125</b> $ep > 1$
B. 10	10	100
5 ↓	20	<b>100</b> $ep = 1$
C. 10	10	100
5 ↓	15	<b>75</b> ↓ $ep < 1$

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**Case-1:** With the change in price , there exist an inverse relationship between price and total expenditure ( $E_{pd} > 1$ )

**Case-2:** With the change in price , there is no change in total expenditure ( $E_{pd} = 1$ )

**Case-3:** With the change in price , there exist a direct relationship between price and total expenditure ( $E_{pd} < 1$ )



**4. The Arc Method:** when elasticity is measured between two points on the same demand curve and they are nearer to each other, it is known as arc elasticity.

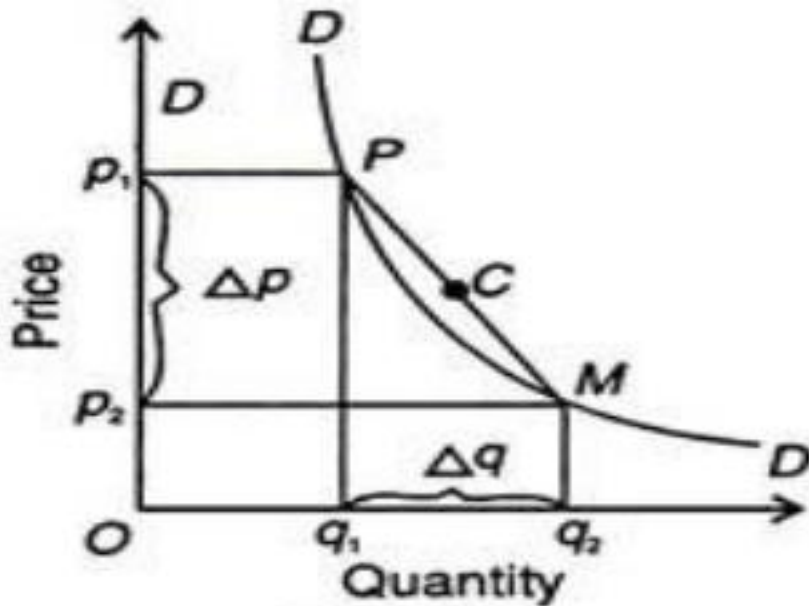


Fig. 4.

$$E_p = \frac{\frac{\Delta q}{(q_1 + q_2)^{1/2}}}{\frac{\Delta p}{(p_1 + p_2)^{1/2}}} = \frac{\Delta q}{(q_1 + q_2)^{1/2}} \times \frac{(p_1 + p_2)^{1/2}}{\Delta p} = \frac{\Delta q}{\Delta p} \times \frac{p_1 + p_2}{q_1 + q_2}$$

**5.point method :** With the help of the point method, it is easy to point out elasticity at any point along a demand curve.

$E_{pd} = \frac{\text{Lower segment}}{\text{Upper segment}}$

at point N,  $E_{pd} = \frac{CN}{DN} = 1$

at M  $= \frac{CM}{DM} > 1$

P  $= \frac{PC}{PL} < 1$

C  $= \frac{0}{QL} = 0$

L  $= \frac{QL}{0} =$

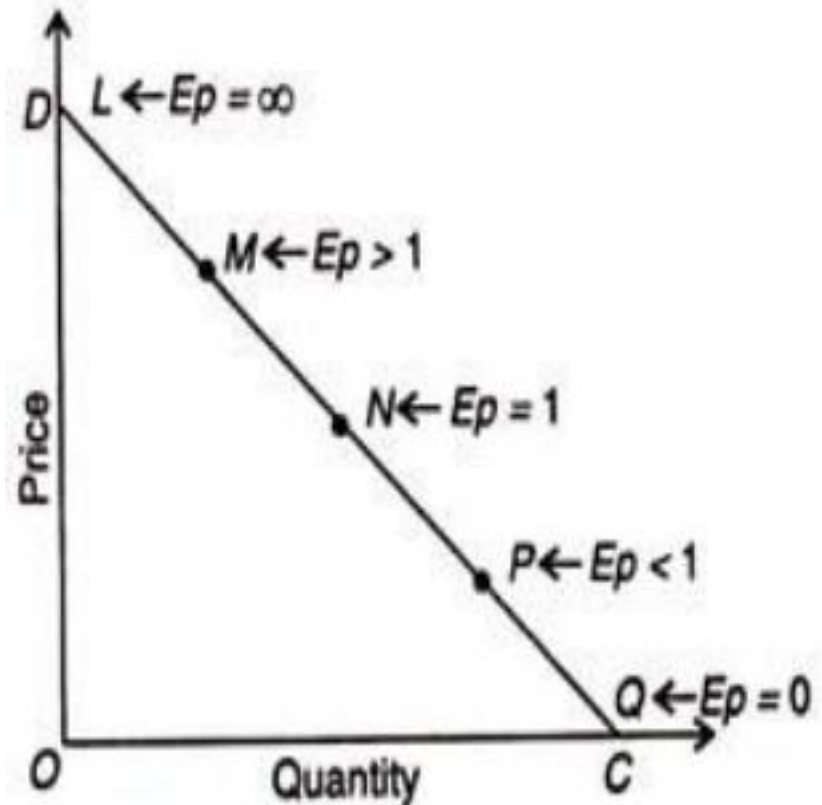


Fig. 3