

CA Foundation – New Syllabus
Business Economics

Elasticity of Demand Handwritten Notes

by CA Mohnish Vora (MVSIR)

CA Mohnish Vora (MVSIR)

- **CA, CFA LEVEL 1, B.COM**
- **Faculty for**
 - **CA Foundation- Business Economics**
 - **CA Intermediate- Financial Mgt & Strategic Mgt**
- **4+ years of teaching experience**
- **Passionate about teaching, started teaching at a young age**
- **Known for making difficult concepts easy by innovative examples, charts, summary & tricks**
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ELASTICITY OF DEMANDExample 1 [Determinant → Price of Goods concerned]

Price of X ↑

30% ↑

QD of X ↓

$$30\% \times -2 = -60\%$$

↓ Direction
or 60% ↓

$$E_p = -2$$

$$\% \Delta P \times E_p = \% \Delta Q_D$$

$$\Rightarrow E_p = \frac{\% \Delta Q_D}{\% \Delta P}$$

Example 2 [Determinant → Price of Goods concerned]

Price of X ↓

20% ↓

QD of X ↑

$$-20\% \times -0.6 = +12\%$$

or 12% ↑

$$E_p = -0.60$$

$$\% \Delta P \times E_p = \% \Delta Q_D$$

$$\Rightarrow E_p = \frac{\% \Delta Q_D}{\% \Delta P}$$

Example 3 [Determinant → Income of consumer]

Income of consumer ↑

40% ↑

Demand for Mobile ↑

$$40\% \times 1.50 = +60\%$$

or 60% ↑

$$E_y = +1.50$$

$$\% \Delta Y \times E_y = \% \Delta Q_D$$

$$\Rightarrow E_y = \frac{\% \Delta Q_D}{\% \Delta Y}$$

Example 4 [Determinant → Price of Related Good]
(Substitutes)

Price of Coke ↑

25% ↑

Dem of Pepsi ↑

$$25\% \times 1.60 = +40\%$$

or 40% ↑

$$E_c = +1.60$$

$$\% \Delta P_c \times E_c = \% \Delta Q_p$$

$$\Rightarrow E_c = \frac{\% \Delta Q_p}{\% \Delta P_c}$$

Example 5 [Determinant → Price of Related Good]
[complementary]

Price of Pen ↑

35% ↑

Dem of Refill ↓

$$35\% \times (-2) = -70\% \text{ or } 70\% \downarrow$$

$$E_c = -2$$

$$\% \Delta P \times E_c = \% \Delta Q_R$$

$$\Rightarrow E_c = \frac{\% \Delta Q_R}{\% \Delta P}$$

Example 6 [Determinant → Advertisement Exp]

Advt Expense ↑

25% ↑

Demand ↑

$$25\% \times (+3) = +75\% \text{ or } 75\% \uparrow$$

$$E_a = +3$$

$$\% \Delta A \times E_a = \% \Delta Q_D$$

$$\Rightarrow E_a = \frac{\% \Delta Q_D}{\% \Delta A}$$

Thus, "Elasticity of Demand" is the responsiveness of Demand $\xrightarrow{\text{to a change in}}$ one of the Determinant of Demand.

When,

How many times will Demand respond, is shown by -

Price of the Good

Price EOD [E_p]

Income of Consumer

Income EOD [E_i]

Price of Related Good

Cross EOD [E_c]

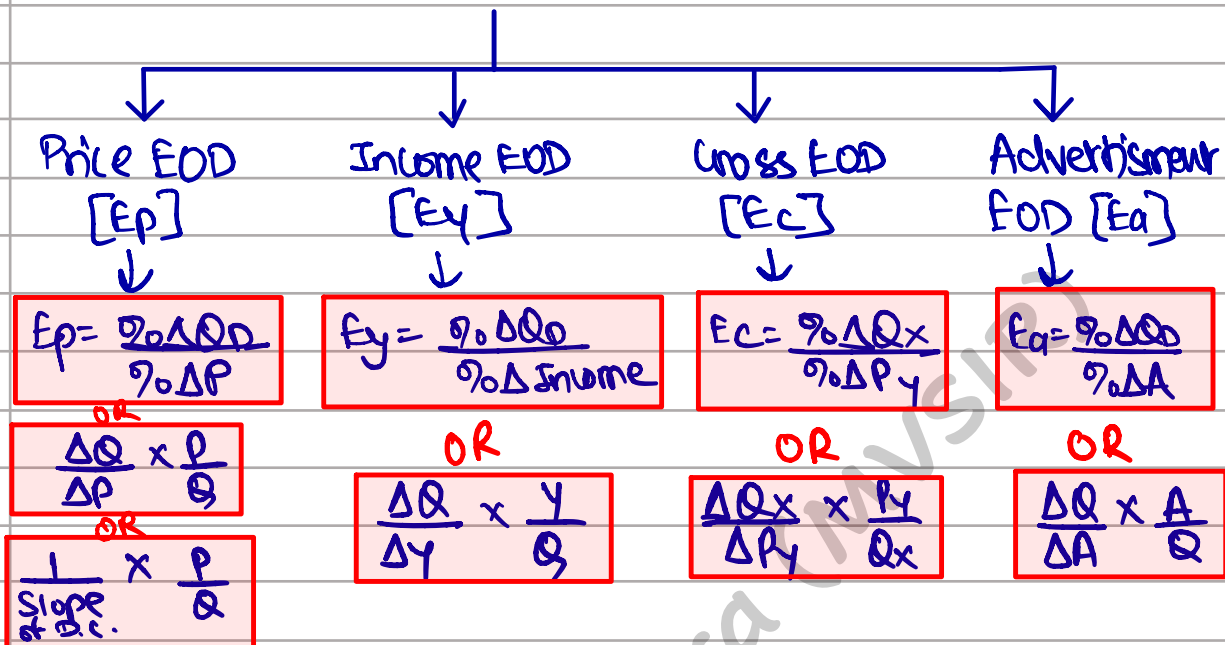
Advertisement Exp

Advt. EOD [E_a]

Changes



General formula of Elasticity of Dem = $\frac{\% \Delta \text{ Demand}}{\% \Delta \text{ in one of the Determinant of Demand.}}$



I/ DETAILED ANALYSIS OF PRICE ELASTICITY OF DEMAND [Ep]

- "Price EOD" is the responsiveness of -
Qty Demanded $\xrightarrow{\text{to a change in}}$ Price of the goods concerned
- Methods to calculate Ep
 - i) Percentage Method
 - ii) Point Method
 - iii) a) Derivative Method
 - iii) b) Geometric Method
 - iii) Arc Method or Mid-Point Method
 - iv) Total Outlay/Revenue/Expenditure Method.

IFY IF Percentage Method [Ep]

$$E_p = \frac{\% \Delta Q}{\% \Delta P}$$

Example

	<u>Price</u>	<u>Qd</u>
<u>Old:</u>	£50	200 units
<u>New:</u>	£80	140 units

$\Delta P = 30$ $\Delta Q = -60$ units

Calculate E_p using percentage method!

Note:

- Change in Price = $\Delta P = \text{New P} - \text{Old P}$
- Percentage Change in Price
= $\% \Delta P = \frac{\text{New P} - \text{Old P}}{\text{Old P}} \times 100$
- Change in Qty = $\Delta Q = \text{New Q} - \text{Old Q}$
- Percentage Change in Qty Demanded
= $\% \Delta Q = \frac{\text{New Q} - \text{Old Q}}{\text{Old Q}} \times 100$

Solution

$$E_p = \frac{\% \Delta Q}{\% \Delta P}$$

$$\% \Delta Q = \frac{140 - 200}{200} \times 100 = -30\%$$

$$\% \Delta P = \frac{80 - 50}{50} \times 100 = 60\%$$



$$\therefore E_p = \frac{-30\%}{60\%} = -0.50$$

<u>Price</u>	<u>Q_d</u>
60% ↑	60% × -0.5 = <u>-30%</u>

↘ $E_p = -0.50$ ↗

Example

	<u>Price</u>		<u>Qty Dem</u>	
<u>Old:</u>	£40		90 units	
<u>New:</u>	£48	$\Delta P = £8$ $\% \Delta P = 20\%$	45 units	$\Delta Q = -45$ units $\% \Delta Q = -50\%$

Calculate E_p using percentage method.

Solution:

$$\begin{aligned}\% \Delta Q &= \frac{\text{New } Q - \text{Old } Q}{\text{Old } Q} \times 100 \\ &= \frac{45 - 90}{90} \times 100 = -50\%\end{aligned}$$

$$\% \Delta P = \frac{48 - 40}{40} \times 100 = 20\%$$

$$E_p = \frac{\% \Delta Q}{\% \Delta P} = \frac{-50\%}{20\%} = -2.50$$

Example

Price	Qd
£60	300 units
£72	180 units

$\Delta P = 12$
 $\% \Delta P = 20\%$

$\Delta Q = -120$ units
 $\% \Delta Q = -40\%$

What is E_p ?Solution

$$E_p = \frac{\% \Delta Q}{\% \Delta P} = \frac{-40\%}{20\%} = -2$$

- Another formula of E_p [derived from Percentage Method]

Suppose, $\Delta Q = \text{New } Q - \text{old } Q$
 $\text{Old } Q = Q$
 $\Delta P = \text{New } P - \text{old } P$
 $\text{Old } P = P$

Now, $E_p = \frac{\% \Delta Q}{\% \Delta P} = \frac{\frac{\text{New } Q - \text{old } Q}{\text{old } Q} \times 100}{\frac{\text{New } P - \text{old } P}{\text{old } P} \times 100}$

$$= \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P}$$

$$= \frac{\Delta Q}{Q} \times \frac{P}{\Delta P}$$

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} \quad \text{OR} \quad \frac{1}{\text{Slope of D.C.}} \times \frac{P}{Q}$$

SAME ANSWER

Example

	<u>Price</u>	<u>Q_D</u>
<u>Old:</u>	£50	200 units
<u>New:</u>	£80	140 units

$\Delta P = 30$ $\Delta Q = -60$ units

Calculate E_p using percentage method?

Solution:

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$$= \frac{140 - 200}{80 - 50} \times \frac{50}{200}$$

$$= \frac{-60}{30} \times \frac{1}{4} = \underline{\underline{-0.5}}$$

Example

Suppose Slope of Demand curve = -2
Calculate E_p , when Price = £100 & $Q_D = 400$ units.

Solution:

$$E_p = \frac{1}{\text{Slope of D.C.}} \times \frac{P}{Q}$$

$$= \frac{1}{-2} \times \frac{100}{400}$$

$$= \frac{100}{-800} = \underline{\underline{-0.125}}$$



* Negative Sign ka Matl in Ep

$$\underbrace{\text{Price}}_{+} \times \underbrace{Q_d}_{-} \quad \left\{ Ep = \frac{\% \Delta Q}{\% \Delta P} = \frac{-}{+} \right\} \text{Ans. } \textcircled{-ve}$$

OR

$$- \times + \quad \left\{ Ep = \frac{+}{-} \right\} \textcircled{-ve}$$

Thus, Price Elasticity of Demand is **ALWAYS** **NEGATIVE**

↓
HOWEVER

↓
While making **conclusions** & **comparing** value of Ep of 2 or more products, we should

↓
IGNORE "-ve sign"
[to be done ONLY in case of Ep]

Product A $\rightarrow Ep = -2 \rightarrow$ Less Elasticity

Product B $\rightarrow Ep = -5 \rightarrow$ More Elasticity

Thus, while making conclusions, we **IGNORE** **-ve sign of Price Elasticity of Demand.**

ONLY, ONLY, ONLY, ONLY,
ONLY, ONLY, ONLY, ONLY
ONLY, ONLY, ONLY, ONLY
in case of **Ep**

* what to do in exam?

Example

Price

£6

Qd

10 units

£4

15 units

Actual $\rightarrow$ logical Ans $\rightarrow E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

$$= \frac{15-10}{4-6} \times \frac{6}{10} = \underline{\underline{-1.50}}$$

Type of options in Exams

<u>Case I</u>	<u>Case II</u>	<u>Case III</u>	<u>Case IV</u>
a) 1.50	a) 1.50	a) 1.50	a) 1.50
b) 2	b) 2	b) 2	b) 2
c) -1.50	c) 2.50	c) 2.50	c) -1.50
d) -2	d) 3	d) None of the above	d) Both (a) & (c)

I/iiy POINT METHOD of calculating Price E.O.

$\rightarrow$ This method is used when there is **infinitesimal [VERY SMALL]** change in price.

$\rightarrow$ Point Elasticity makes use of **"Derivatives"** rather than finite changes in price & quantity.

We can also use "Geometric Method" to calculate E_p using point method.



POINT ELASTICITY

Derivative Method

$$E_p = - \frac{dQ}{dP} \times \frac{P}{Q}$$

where,

$\frac{dQ}{dP}$ = derivative of Qty
with respect to Price

[Used when data of
 Q_0 is given in equation
form]

Geometric Method

$$E_p = \frac{\text{Lower segment}}{\text{Upper segment}}$$

[Used when Qn says,
"demand curve is
meeting both the axis"]

* DERIVATIVE METHOD

How to calculate $\frac{dQ}{dP}$?

Example

Suppose $Q_D = 100 - 2P$

Price = ₹ 30.

Then calculate E_p using Point Method.

$$\begin{aligned} E_p &= - \frac{dQ}{dP} \times \frac{P}{Q} \\ &= \frac{d(100 - 2P)}{dP} \times \frac{30}{40} \\ &= \left[\frac{d(100)}{dP} - \frac{d(2P)}{dP} \right] \times \frac{3}{4} \\ &= (0 - 2) \times \frac{3}{4} = \frac{-6}{4} = -1.50 \end{aligned}$$

$$Q_D = 100 - 2P = 100 - 2(30) = 40 \text{ units}$$

IMP POINTS RELATED TO DERIVATIVES

- i) Derivative of Price with respect to (w.r.t) Price itself is $\rightarrow 1$ $\left[\frac{dP}{dP} = 1\right]$
- ii) Derivative of a constant number, w.r.t Price is $\rightarrow 0$. $\left[\text{Eg: } \frac{d(52)}{dP} = 0\right]$
- iii) Eg: $\frac{d(50P^3)}{dP}$ $\left\{ \begin{array}{l} \text{Power ko same karo, 4} \\ \text{Power se "1" subtract karo.} \end{array} \right.$
 $= 3 \times 50 \times P^{(3-1)} = 150P^2$

Eg: $\frac{d(12P^4)}{dP} \left\{ \begin{array}{l} = 4 \times 12 \times P^{(4-1)} = 48P^3 \end{array} \right.$

Eg: $\frac{d(2P^2)}{dP} \left\{ \begin{array}{l} = 1 \times 2 \times P^{(2-1)} = 2 \end{array} \right.$

Example

Suppose, $Q_D = 80 - 3P$

Price = ₹10.

Then calculate E_p using Point Method.

$$E_p = -\frac{dQ}{dP} \times \frac{P}{Q}$$

$$\begin{aligned} \Rightarrow E_p &= \frac{d(80-3P)}{dP} \times \frac{10}{80} \\ &= -3 \times \frac{10}{80} \end{aligned}$$

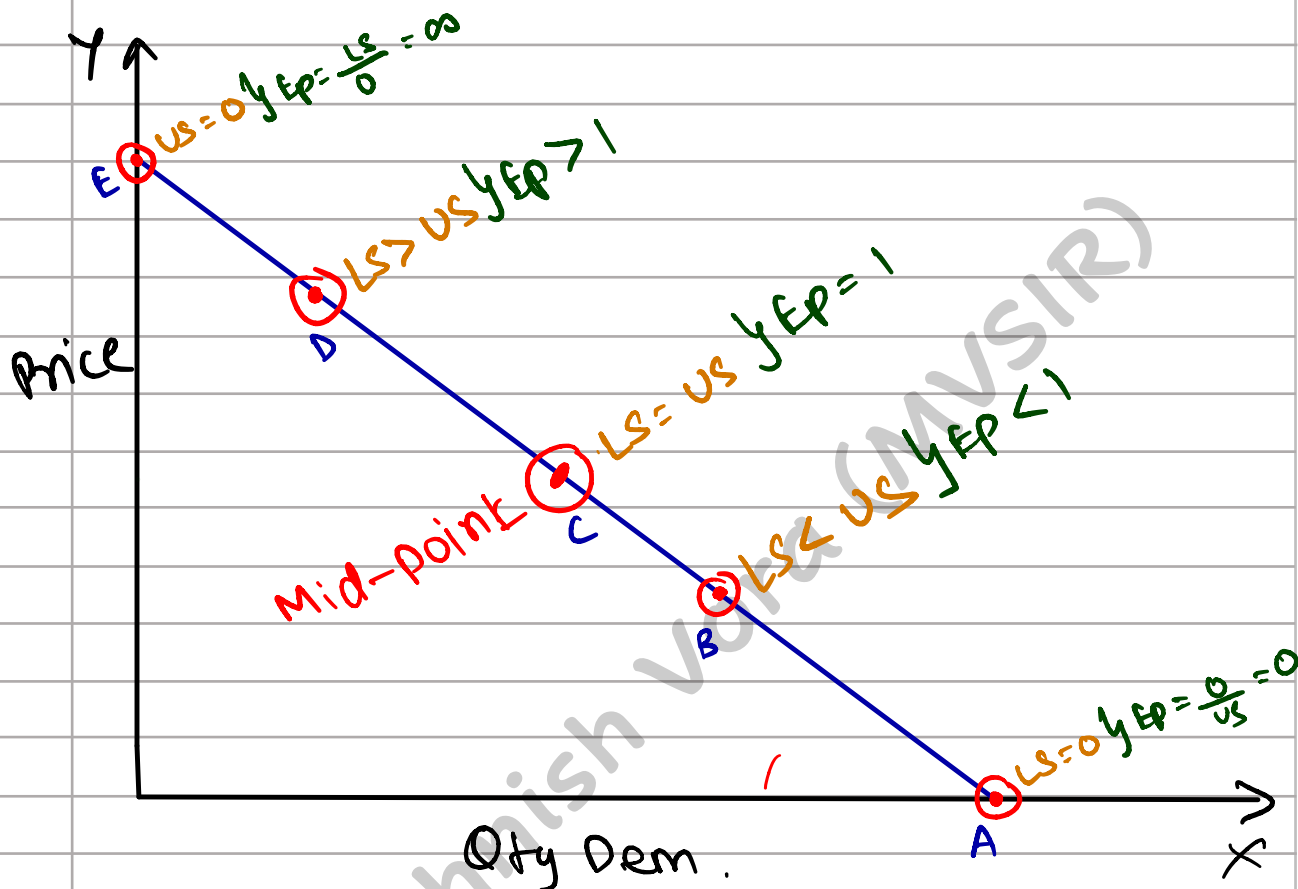
$$\Rightarrow E_p = -\underline{0.60}$$

$$\begin{aligned} Q_D &= 80 - 3(10) \\ &= 50 \text{ units.} \end{aligned}$$



* GEOMETRIC METHOD

$$E_p = \frac{\text{Lower Segment}}{\text{Upper Segment}}$$



As we move from point A to point D on the demand curve, the value of E_p increases

IV/ ARC METHOD of calculating Price E.O. [aka. Mid-Point Method]

- When there is a large change in price [larger than point method]

OR

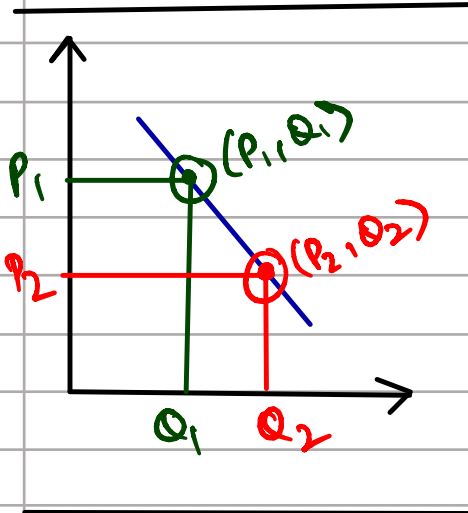
We have to calculate Price E.O. between 2 points on demand curve

1



We do NOT know what is the original [old] price & qty.

then we use **ARC METHOD**.



Formula of Arc Method

$$E_p = \frac{\% \Delta Q}{\% \Delta P}$$

$$= \frac{\frac{\text{Change in Qty}}{\text{Old Q}} \times 100}{\frac{\text{Change in Price}}{\text{Old P}} \times 100}$$

$$= \frac{\text{Change in Q}}{\text{Old Q}} \div \frac{\text{Change in P}}{\text{Old P}}$$

$$= \frac{\text{Change in Q}}{\text{Avg Q}} \times \frac{\text{Avg P}}{\text{Change in P}}$$

$$= \frac{Q_1 - Q_2}{\left(\frac{Q_1 + Q_2}{2}\right)} \times \frac{\left(\frac{P_1 + P_2}{2}\right)}{P_1 - P_2}$$

$$= \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_1 - P_2}$$

same
ans.

(OR)

$$\frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{P_2 + P_1}{P_2 - P_1}$$

Example

$$P_1 = ₹ 20$$

$$Q_1 = 80 \text{ units}$$

$$P_2 = ₹ 30$$

$$Q_2 = 64 \text{ units}$$

Calculate E_p using Arc Method.

Solution:

$$\begin{aligned}
 E_p &= \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_1 - P_2} \\
 &= \frac{80 - 64}{80 + 64} \times \frac{20 + 30}{20 - 30} \\
 &= \frac{16}{144} \times \frac{50}{-10} = -0.56
 \end{aligned}$$

OR

$$\begin{aligned}
 E_p &= \frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{P_2 + P_1}{P_2 - P_1} \\
 &= \frac{64 - 80}{64 + 80} \times \frac{30 + 20}{30 - 20} \\
 &= \frac{-16}{144} \times \frac{50}{10} = -0.56
 \end{aligned}$$

* INTERPRETATION OF VALUES OF E_p

• $E_p = 0$	Perfectly Inelastic Demand [$\% \Delta Q \rightarrow 0$]	Vertical Dem. curve
• $E_p = 1$	Unitary Elastic Demand [$\% \Delta Q = \% \Delta P$]	Rectangular Hyperbola
• $E_p = \infty$	Perfectly Elastic Demand [$\% \Delta P = 0$] $\rightarrow$ [only in PC]	Horizontal Dem. Curve
• $E_p < 1$	Relatively Inelastic Dem. [$\% \Delta Q < \% \Delta P$]	Steeper Dem. curve
• $E_p > 1$	Relatively Elastic Dem. [$\% \Delta Q > \% \Delta P$]	Flatter Dem. Curve

* Objective of Advertisement & Sales Promotion Activities
is to -

$\swarrow$ Shift Demand curve to the right $\neq$ $\searrow$ Reduce the price elasticity of demand

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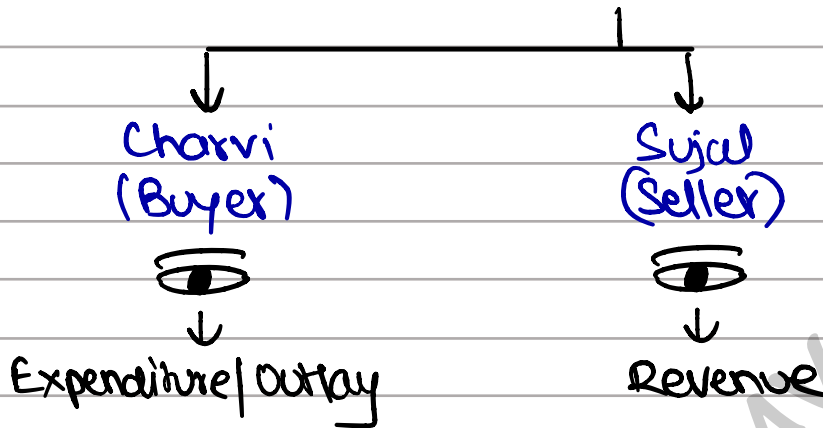
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I) iv) TOTAL OUTLAY/EXPENDITURE/REVENUE METHOD

- $\text{Price} \times \text{Qty} = \text{TOTAL OUTLAY/EXP./REVENUE}$
₹20 10 chocolates = ₹200



- $\text{Price} \times \text{Qty} = \text{T.E./T.O./T.R}$
When Price changes Qd will respond to price change Leading to changes in TE/TO/TR

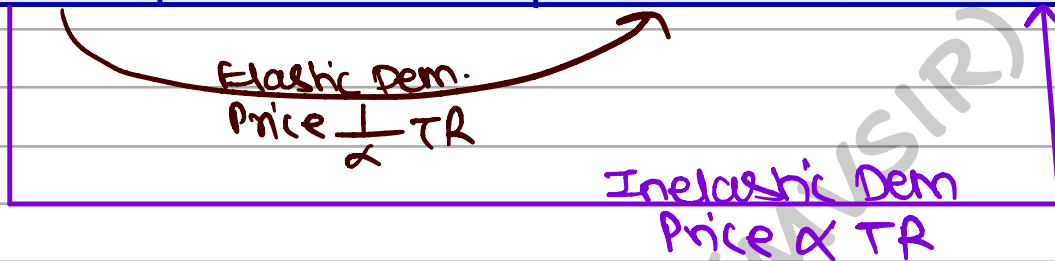
Under this method, we compare the Changes in Price to Changes in TE/TO/TR in order to calculate Price Elasticity of Demand.

- Under this method, we CANNOT calculate the exact value of E_p , because there is No formula here.

Here, we can only tell, whether Elasticity is



Changes in Price	Unitary Elastic [$E_p = 1$]	Elastic [$E_p > 1$]	Inelastic [$E_p < 1$]
Increase	TR remain same	TR Decrease	TR Increase
Decrease	TR remain same	TR Increase	TR Decrease



Example ①

Charvi wants to buy 100 units of chocolate. Currently price of 1 chocolate is ₹ 30.

Case I			Case II		
Price	Qd	TR	Price	Qd	TR
₹30	100 units	₹3,000	₹30	100 units	₹3,000
↑ Incr		↓ TR same	↓ Decr		↓ TR same
	₹40	75 units		₹20	150 units

When,

Price Increases & TR remains same

OR

Price Decrease & TR remains same

UNITARY
ELASTIC
DEMAND
($E_p = 1$)

Example (2)

Charvi wants to buy 100 units of chocolate.
Currently price of 1 chocolate is ₹ 30.

<u>Case I</u>			<u>Case I</u>		
<u>Price</u>	<u>Qd</u>	<u>TR</u>	<u>Price</u>	<u>Qd</u>	<u>TR</u>
₹30	100 units	₹3,000	₹30	100 units	₹3,000
Incr ↗	↓	↓ Decc	Decc ↘	↓	↓ Incr
	₹40	50 units		₹20	180 units
		₹2,000			₹3,600

When,

Price Increases & TR Decreases

OR

Price Decrease & TR Increase

ELASTIC
DEMAND
(EP > 1)

Example (3)

Charvi wants to buy 100 units of chocolate.
Currently price of 1 chocolate is ₹ 30.

<u>Case I</u>			<u>Case I</u>		
<u>Price</u>	<u>Qd</u>	<u>TR</u>	<u>Price</u>	<u>Qd</u>	<u>TR</u>
₹30	100 units	₹3,000	₹30	100 units	₹3,000
Incr ↗	↓	↓ Incr	Decc ↘	↓	↓ Decc
	₹40	90 units		₹20	110 units
		₹3,600			₹2,200

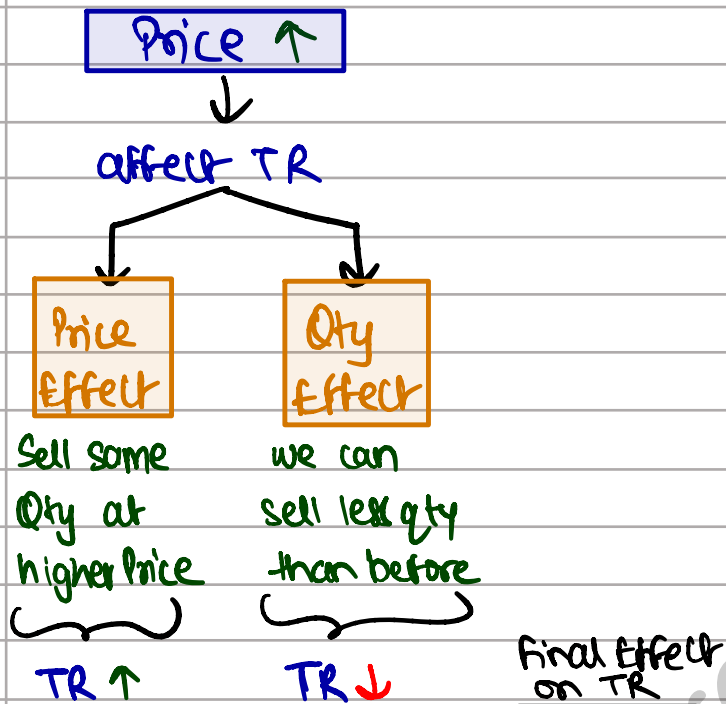
When,

Price Increases & TR Increase

OR

Price Decrease & TR Decrease

INELASTIC
DEMAND
[EP < 1]

NEW CONCEPT IN TOTAL OUTLAY METHOD

PE	>	QE	TR ↑	Inelastic Dem [$E_p < 1$]
PE	<	QE	TR ↓	Elastic Dem [$E_p > 1$]
PE	=	QE	TR same	Unit Elastic Dem [$E_p = 1$]

MCQ. 1

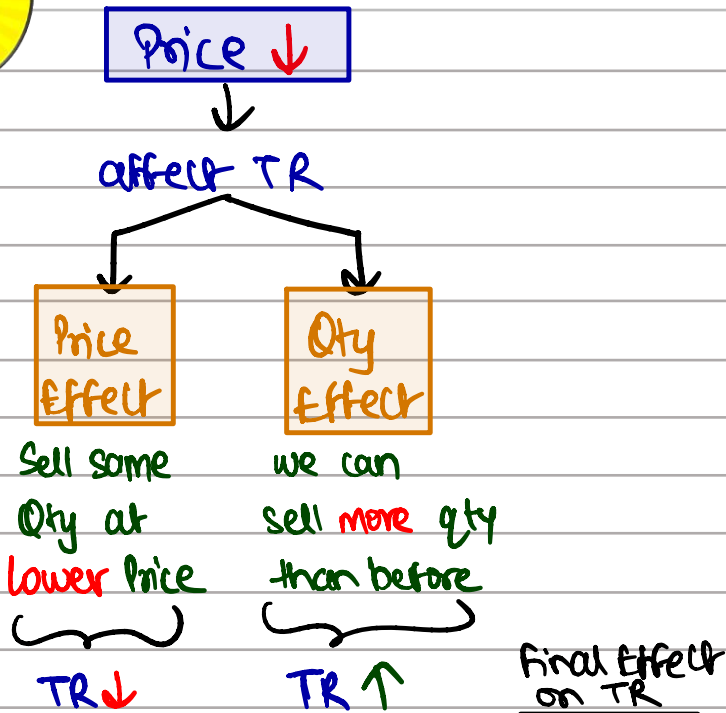
In case of inelastic demand, as per total outlay method, _____

- a) PE outweighs QE
- b) QE is stronger than PE
- c) PE is equal to QE
- d) All of the above.

MCQ 2

As per total outlay method, quantity effect is stronger than price effect, when _____

- a) Unitary Elastic Demand
- b) Perfectly inelastic Dem
- c) Elastic Demand
- d) Inelastic Demand



PE	>	QE	TR ↓	Inelastic Dem [$E_p < 1$]
PE	<	QE	TR ↑	Elastic Dem [$E_p > 1$]
PE	=	QE	TR same	Unit Elastic Dem [$E_p = 1$]

* DETERMINANTS OF PRICE ELASTICITY OF DEMAND

1) Availability of Substitutes

- If substitute is available → Elastic Dem.
If substitute is not available → Inelastic Dem.
- Goods considered as a group [generic good]
Petrol or Salt → Inelastic Dem.

Brand wise / company wise → Elastic Dem.
IOCL, Reliance, BPL Petrol or Tata Salt, Patanjali Salt



2) Position of a commodity in a consumer's budget

- Greater the proportion of income spent on a good } Greater will be the Price Elasticity of Dem.

Spend only a fraction of income on a product (Less proportion)



Eg- Salt, Matches, Button etc



Inelastic Demand

Spend major or good proportion of income on a product



Eg- Clothes, Rent etc



Elastic Demand

3) Nature of the need a commodity satisfies

Luxury Goods

Eg:- Sports Car, Expensive watch etc



It is possible to POSTPONE its demand



ELASTIC DEMAND

Necessities

Eg:- food, Medicines etc



It is NOT possible to POSTPONE its demand



INELASTIC DEMAND

4) Number of uses of a commodity

More the no. of uses → More elastic demand.
[Eg- Milk, Olive oil etc]



5) Consumer Habits

- Consumer is habitual for a product → **Inelastic Demand**
[Eg: Cigarette, Alcohol etc]

6) Tied Demand

It is seen in complementary goods

Eg → Pen & Refill ; Printer & Ink Cartridge

(Parent Product) ← demand of Refill is tied to Pen
(Parent Product) ← Tied to printer

Goods having tied demand → **Inelastic Demand**

7) Price Range

Very high Price
or

Very low Price
↓

Inelastic Demand

Middle Range
↓

Eg - clothes, Rent etc
↓

Elastic Demand

8) Minor complementary Items

Demand for cheap complementary item
used with costlier product
↓

Inelastic Demand

[Eg: iPhone & Cover,
Sports car & Petrol]

9) Time Period

Longer the time period, after a price change,
more we can adjust demand of the product.

Petrol Price ↑

- Short time period / Fewer trips → **Inelastic Demand**
- Long time period / Electric car purchase → **Elastic Demand**



II) DETAILED ANALYSIS OF INCOME ELASTICITY OF DEMAND [E_y]

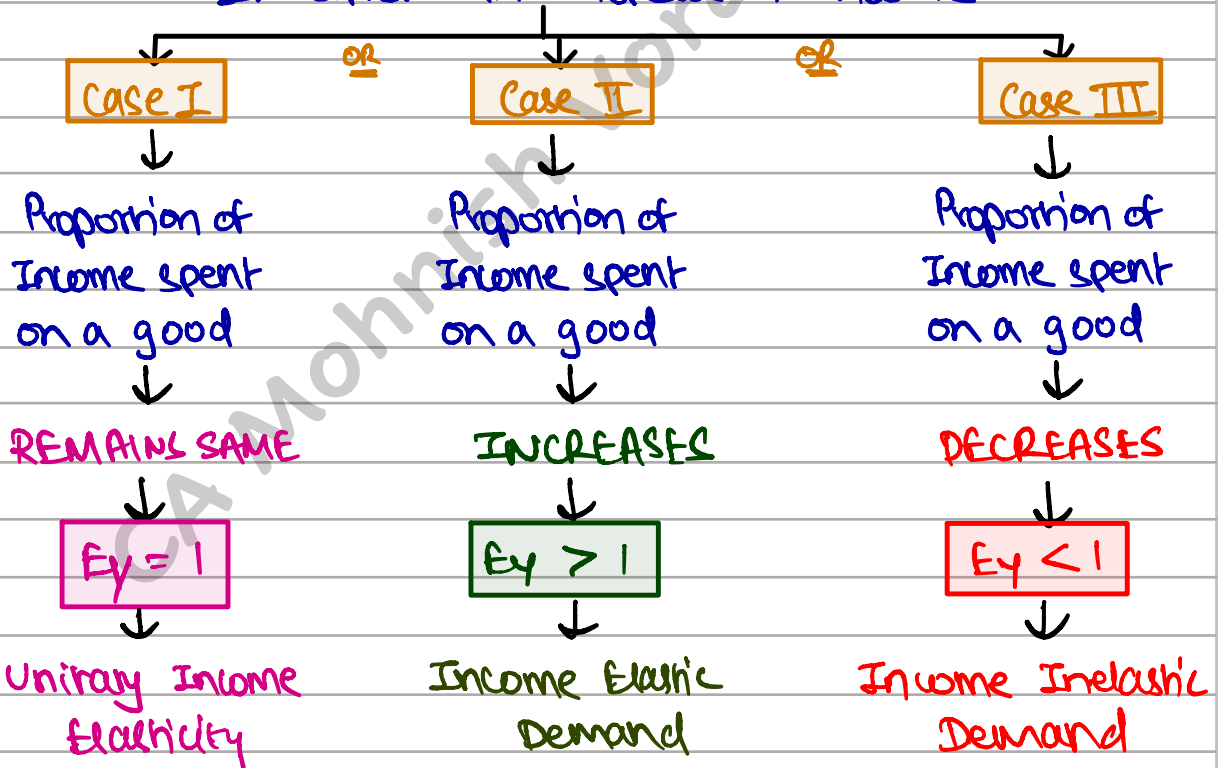
- "Income EOD" is the responsiveness of -
Demand $\xrightarrow{\text{to a change in}}$ Income of consumer

• Methods to calculate E_y

- i) Proportionate Method
- ii) Percentage Method
- iii) Arc Method

II/i) PROPORTIONATE METHOD

If after an increase in Income



In this method, we cannot tell the exact value of E_y , since there is no formula here.

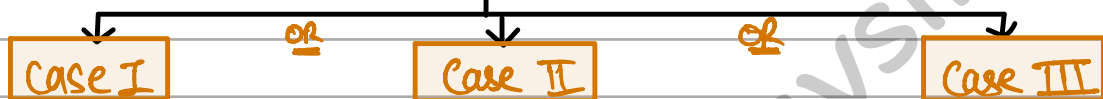


Example

- Vansh $\rightarrow$ Income = ₹10,000
- Vansh spends 30% of his income on clothes $\rightarrow$ ₹10,000 $\times$ 30% = ₹3,000
[1 Tshirt $\rightarrow$ ₹500]
- Suppose, Vansh's income increases to ₹15,000.



If after increase in income, the proportion of income spent on clothes



REMAINS SAME



$$15,000 \times 30\% = ₹4,500$$



Income	Dem
10,000	6 units
15,000	9 units

$$E_y = \frac{\% \Delta \text{Dem}}{\% \Delta Y}$$

$$= \frac{50\%}{50\%} = 1$$

$$(E_y = 1)$$

INCREASES



$$15,000 \times 50\% = ₹7,500$$



Income	Dem
10,000	6 units
15,000	15 units

$$E_y = \frac{\% \Delta \text{Dem}}{\% \Delta Y}$$

$$= \frac{150\%}{50\%} = 3$$

$$(E_y > 1)$$

DECREASE



$$15,000 \times 23.333\% = ₹3,500$$



Income	Dem
10,000	6 units
15,000	7 units

$$E_y = \frac{\% \Delta \text{Dem}}{\% \Delta Y}$$

$$= \frac{16.67\%}{50\%} = 0.33$$

$$(E_y < 1)$$

II/ii) PERCENTAGE METHOD $[E_y]$

$$E_y = \frac{\% \Delta Q_D}{\% \Delta Y}$$

OR

$$E_y = \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q}$$

II/iii) ARC METHOD $[E_y]$

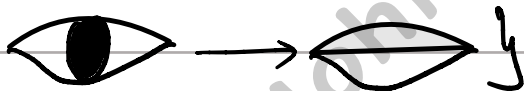
$$E_y = \frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{Y_2 + Y_1}{Y_2 - Y_1}$$

OR

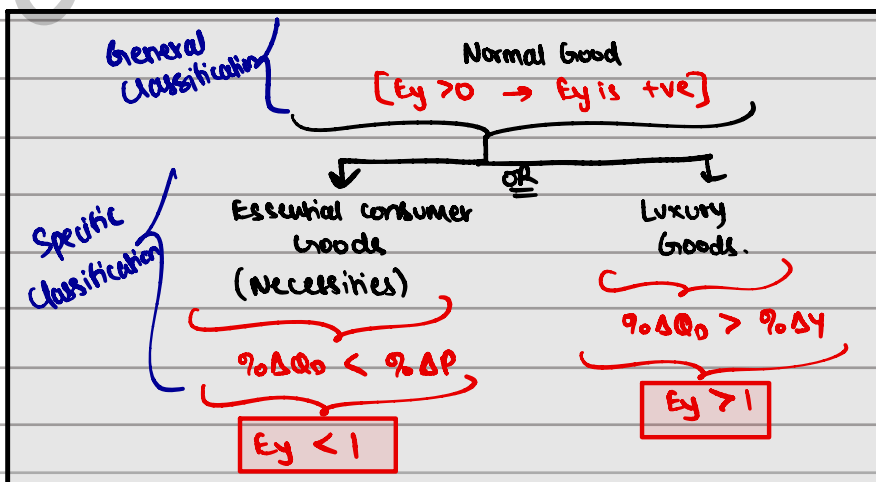
$$E_y = \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{Y_1 + Y_2}{Y_1 - Y_2}$$

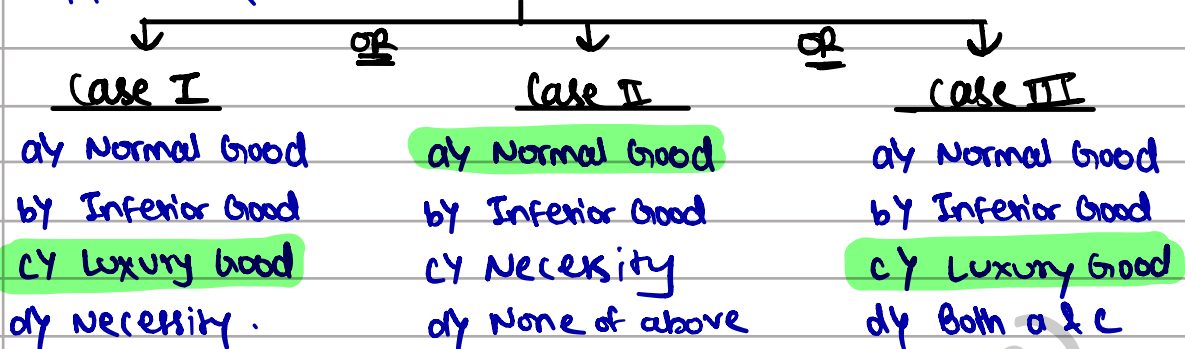
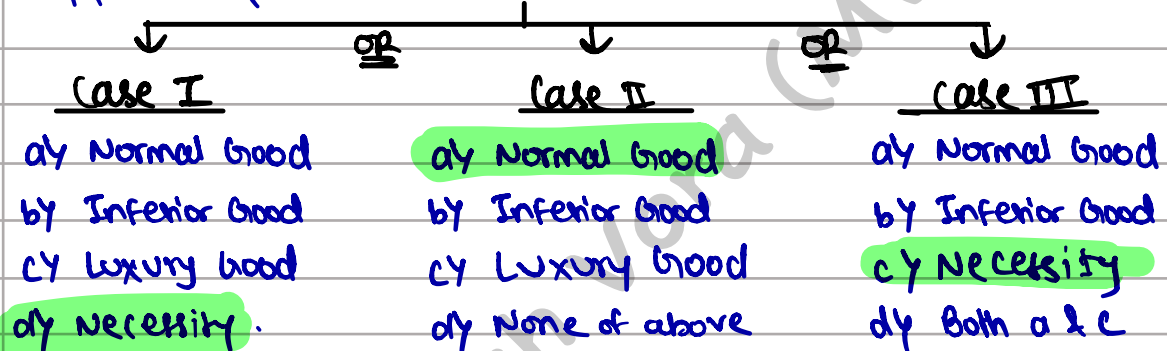


Value of Income Elasticity	Type of Good
$E_y = 0$ or $E_y \geq 1$	No separate type of good.
$E_y > 0$ or $E_y \rightarrow \text{Positive}$	Normal Goods $\% \Delta Y \uparrow \rightarrow \% \Delta Q \uparrow$
$E_y > 1$	Luxury Goods $\% \Delta \text{Dem} > \% \Delta Y$
$0 < E_y < 1$ [E_y is less than 1]	Necessities [E.G.G.] $\% \Delta \text{Dem} \uparrow < \% \Delta Y \uparrow$
$E_y < 0$ [Negative]	Inferior Goods $\% \Delta Y \uparrow \rightarrow \% \Delta \text{Dem} \downarrow$



If Qn asks about type of good using " E_y ", then give ans as per value of E_y & **IGNORE** the name of good.



MCQ :Suppose E_d of Good X is **2.50**. Then Good X is _____MCQ :Suppose E_d of Good M is **0.75**. Then Good M is _____

III) DETAILED ANALYSIS OF CROSS ELASTICITY OF DEMAND [E_c]

- "**CROSS ^{Price} EOD**" is the responsiveness of -
 Demand $\xrightarrow{\text{to a change in}}$ Price of Related Good

• Methods to calculate E_c

- i) Percentage Method
- ii) Arc Method



CROSS ELASTICITY OF DEMAND

PERCENTAGE METHOD

$$E_c = \frac{\% \Delta Q_x}{\% \Delta P_y}$$

OR

$$E_c = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

ARC METHOD

$$E_c = \frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{P_2 + P_1}{P_2 - P_1}$$

OR

$$E_c = \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_1 - P_2}$$

where Goods x & y can be -

Substitute Goods

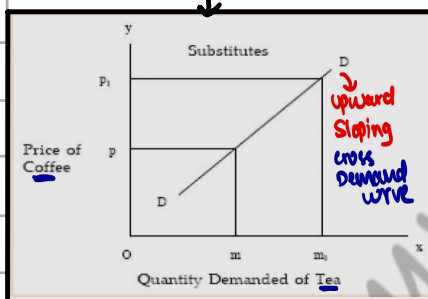
Goods which satisfy some want.

[Eg- Pepsi & Coke]

$$P_x \propto Q_y$$

$$P_{\text{Pepsi}} \uparrow \quad Q_{\text{Coke}} \uparrow$$

$$E_c = \frac{\uparrow \text{ or } \downarrow}{\uparrow \text{ or } \downarrow} = +ve$$



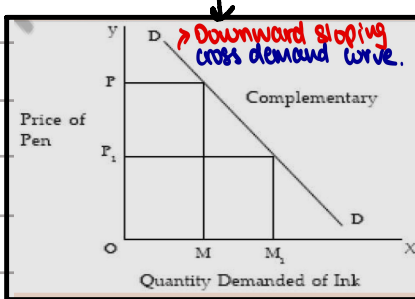
complementary Goods

Goods which are consumed together.
[Eg- Pen & Refill]

$$P_x \propto \frac{1}{Q_y}$$

$$P_{\text{Pen}} \uparrow \quad Q_{\text{Refill}} \downarrow$$

$$E_c = \frac{\downarrow \text{ or } \uparrow}{\uparrow \text{ or } \downarrow} = -ve$$



Unrelated Goods

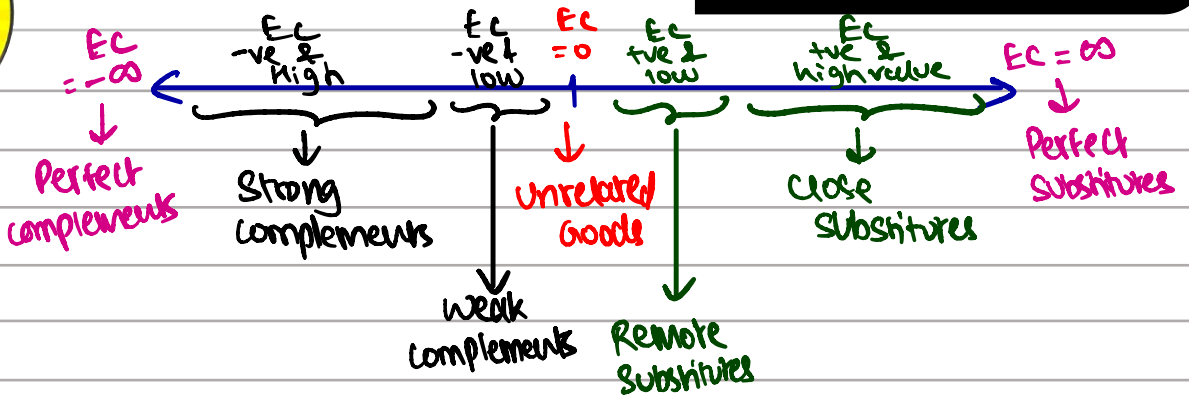
No relation between goods
[Eg: laptop & Burger]

(X)

$$P_{\text{laptop}} \uparrow \quad Q_B (X)$$

$$E_c = \frac{0}{\uparrow \text{ or } \downarrow} = 0$$

(X)

MCQ

Value of E_c is slightly below zero.
The goods will be -

- a) Remote substitutes
- b) Close substitutes
- c) Strong complements
- d) Weak complements

III) DETAILED ANALYSIS OF ADVERTISEMENT ELASTICITY OF DEMAND [E_a]

- "Advertisement EOD " is the responsiveness of -
Demand $\xrightarrow[\text{change in}]{\text{to a}}$ Advertisement Expenditure.
- Advt Exp $\uparrow \Rightarrow$ Demand $\uparrow \rightarrow$ Thus, E_a is always POSITIVE.
- Methods to calculate E_a

PERCENTAGE METHOD

$$E_c = \frac{\% \Delta Q_D}{\% \Delta A}$$

OR

$$E_c = \frac{\Delta Q}{\Delta A} \times \frac{A}{Q}$$

ARC METHOD

$$E_c = \frac{Q_2 - Q_1}{Q_2 + Q_1} \times \frac{A_2 + A_1}{A_2 - A_1}$$

OR

$$E_c = \frac{Q_1 - Q_2}{Q_1 + Q_2} \times \frac{A_1 + A_2}{A_1 - A_2}$$

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