

S6 First Series MARATHON



**INDUSTRIAL ECONOMICS &
FOREIGN TRADE**

Module 1 22

HUT300

Q. What are the central problems of an economy

The central problems of an economy arise due to scarcity of resources and unlimited wants. They are:

1. What to produce? – Deciding which goods and services and in what quantities should be produced.
2. How to produce? – Choosing the technique of production (labour-intensive or capital-intensive).
3. For whom to produce? – Determining how the produced output is distributed among people.

Q. What is inelastic demand



Inelastic demand refers to a situation where the quantity demanded changes very little in response to a change in price.

Key points:

- Percentage change in quantity demanded < percentage change in price
- Price elasticity of demand (Ed) < 1
- Occurs in necessities like salt, medicines, and basic food items

Q. What do you mean by labour augmenting technical progress

Labour - augmenting technical progress refers to a type of technological improvement that increases the productivity of labour without increasing the amount of labour used.

Key points:

- Makes labour more efficient
- Same labour produces more output
- Represented as improvement in labour efficiency units
- Example: Better machinery, training, or tools used by workers

1) Labour
2) Capital
3) Neutral



It means that marginal product of labor increases faster than the marginal product of capital.



Q. What is margin of safety? What happens when margin of safety is low

Margin of Safety refers to the excess of actual (or expected) sales over break-even sales. It indicates the level of risk in a business.

Formula

$$\text{Margin of Safety} = \text{Actual Sales} - \text{Break-even Sales}$$

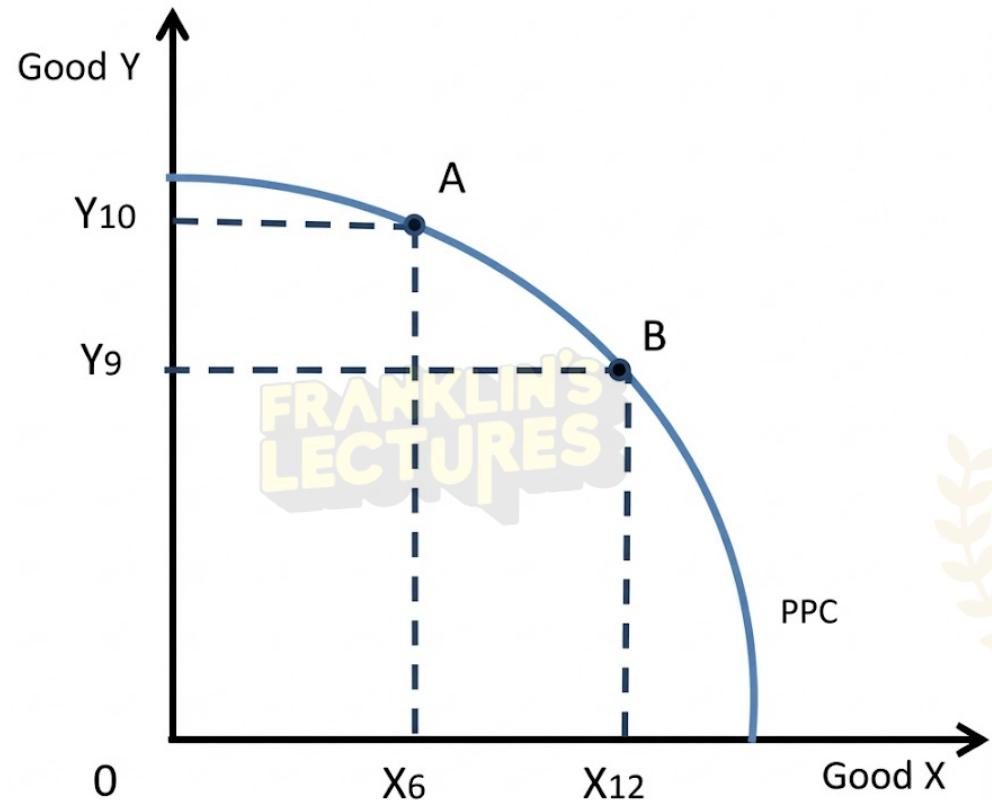
When margin of safety is low:

- Business is close to break-even
- High risk of loss if sales fall slightly
- Indicates unstable financial position



Q. a) Explain with a diagram the concept of opportunity cost and its linkage with the Production Possibility Curve (PPC)

Opportunity cost is the value of the next best alternative forgone when a choice is made.



Opportunity cost is illustrated by the downward sloping curve which shows that producing more of Good X means that more of Good Y must be sacrificed and vice versa.

Each choice of the combination of goods to produce incurs an opportunity cost. Producing at A instead of B means that in order to increase production of Good Y from Y₉ to Y₁₀, the production of Good X falls from X₁₂ to X₆.

Explanation with PPC:

- A Production Possibility Curve (PPC) shows different combinations of two goods that an economy can produce with given resources.
- Moving along the PPC, producing more of one good requires sacrificing some quantity of the other good.
- This sacrifice represents opportunity cost.
- The downward slope of the PPC reflects opportunity cost.
- Increasing opportunity cost is shown by the concave shape of the PPC.

b) What is the Law of Diminishing Marginal Utility? Explain the law with the help of an empirical example





Law of Diminishing Marginal Utility/Theory of Consumer Behaviour

- **Law of Diminishing Marginal Utility** states that as a person consumes more units of a good, the additional satisfaction (marginal utility) from each successive unit decreases.

Explanation:

- The first unit of a good provides the highest satisfaction.
- As more units are consumed, the satisfaction gained from each additional unit (MU) decreases.
- Eventually, the consumer may reach a point where consuming more provides no satisfaction ($MU = 0$) or even dissatisfaction ($MU < 0$).



ASSUMPTIONS OF LAW OF DIMINISHING MARGINAL UTILITY (DMU)

- Homogeneous Units
- Continuous Consumption
- Rational Consumer
- No Change in Taste or Preference
- Constant Income and Price
- Single Utility





Units Consumed	Total Utility (TU)	Marginal Utility (MU)
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2

- TU becomes maximum when MU is zero.
- TU may start decreasing if consumption continues and MU turns negative.

Q. a) What are the types of price elasticity of demand? At an initial advertisement expenditure of Rs. 50,000, the demand for a firm's product is 80,000 units. When the advertisement budget is increased to Rs. 60,000, the sales value increased to 90,000 units. Calculate advertisement elasticity of demand.

Types of Price Elasticity of Demand with Examples

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

Demand changes infinitely with a small change in price.

Example: Shares traded in a perfectly competitive stock market at a fixed price. *Demand Curve → Horizontal*

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

Demand remains constant irrespective of price change.

Example: Life-saving drugs like insulin.

Demand Curve → Vertical

3. Relatively Elastic Demand ($Ed > 1$)

Percentage change in demand is greater than price change.

Example: Luxury goods such as cars, air conditioners.

D.C. → flatter but not horizontal

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

Percentage change in demand is less than price change.

Example: Necessaries like rice, wheat, salt.

D.C. → steeper but not vertical

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

Percentage change in demand equals price change.

Example: Goods where consumers spend a fixed proportion of income, e.g., clothing (approximate).

U.L.

D.C. → rectangular hyperbola

PE \rightarrow full change

PI \rightarrow no change

RE \rightarrow more change

RI \rightarrow less change

UI \rightarrow equal change

$$\text{Elasticity of demand} = \frac{\% \text{ change in qty demanded}}{\% \text{ change in price}}$$

$$AED = \frac{\% \text{ change in qty demanded}}{\% \text{ change in price}}$$

$$\% \text{ change in qty demanded} = \frac{90000 - 80000}{80000} \times 100$$

$$= \frac{10000}{80000} \times 100$$

$$= \underline{\underline{12.5\%}}$$

$$\% \text{ change in price} = \frac{60000 - 50000}{50000} \times 100$$

$$= \frac{10000}{50000} \times 100$$

$$= \underline{\underline{20\%}}$$

$$AEI = \frac{12.5\%}{20\%} = 0.625$$

Relatively Inelastic element

b) Diagrammatically explain deadweight loss of taxation

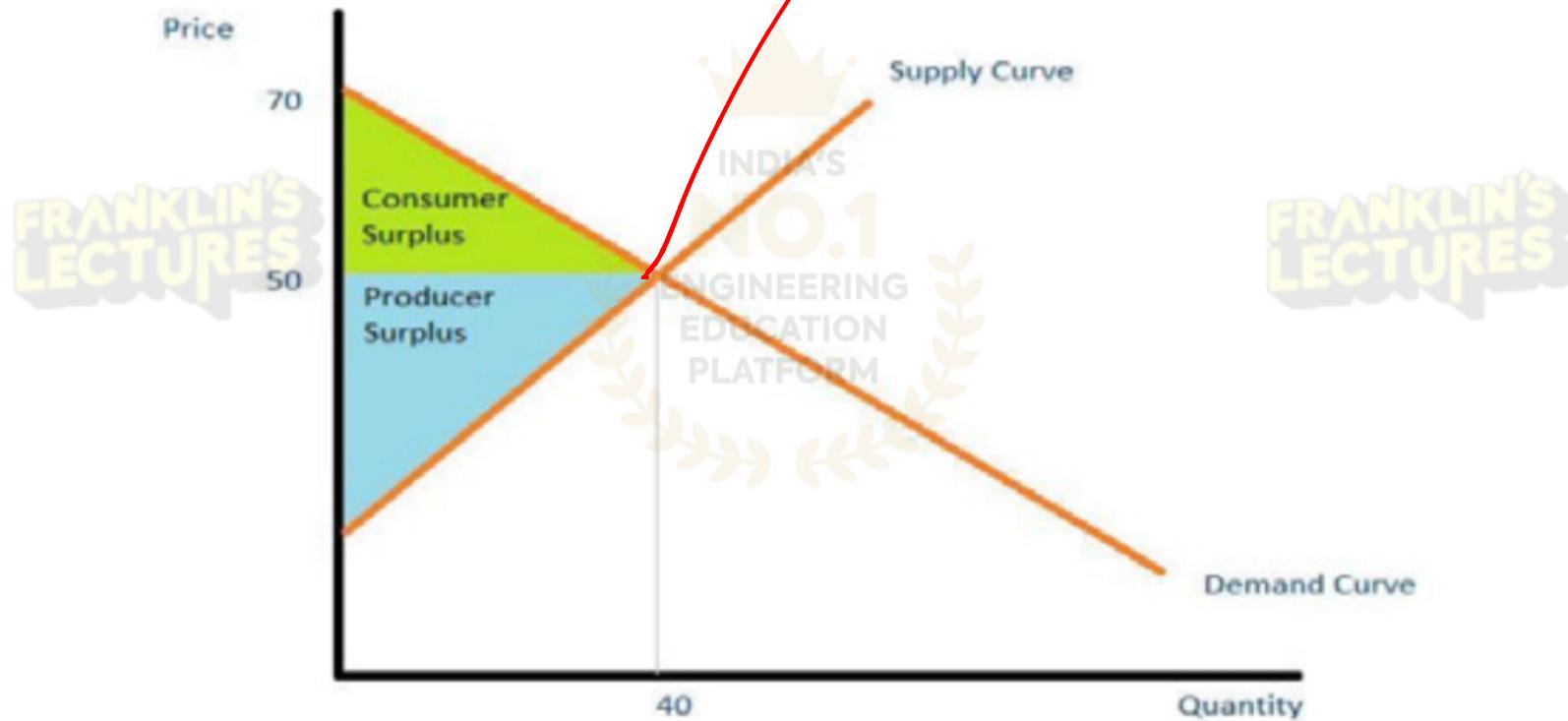
Deadweight Loss is the loss of total economic welfare (consumer + producer surplus) that occurs when market equilibrium is disturbed usually due to taxes, subsidies, price controls, or monopolies. It represents the missed trades that could have benefited both buyer and seller but no longer happen due to market distortion.



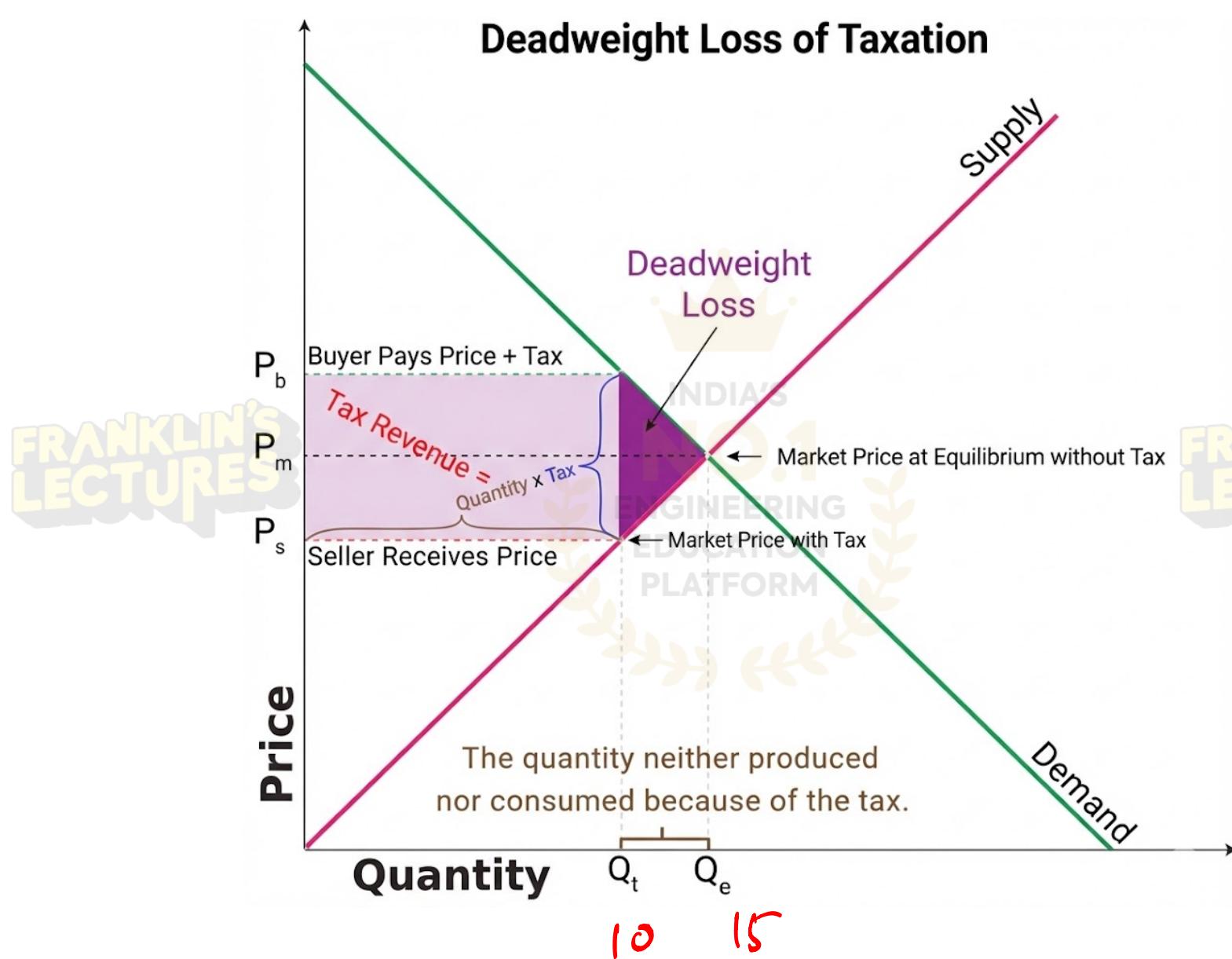
Explanation

- In a free market, equilibrium price and quantity are determined by demand and supply.
- When the government imposes a tax:
 - The price paid by consumers increases
 - The price received by producers decreases
- Quantity traded falls
- The reduction in output results in a loss of consumer surplus and producer surplus that is not fully transferred to the government as tax revenue.
- This unrecovered loss is called deadweight loss.

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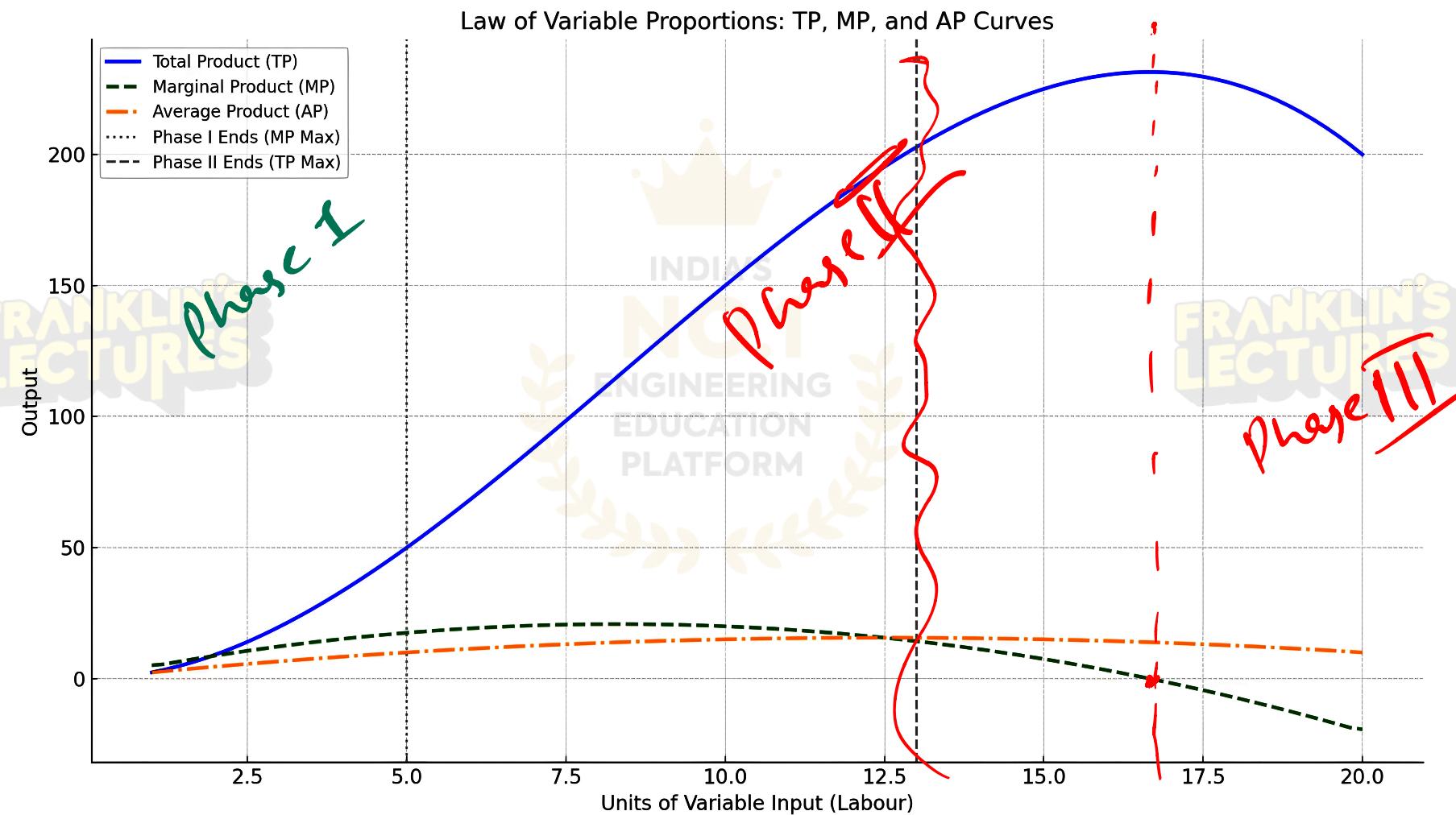


Before Tax Diagram



Q. a) Explain the Law of Variable Proportion with a diagram

The Law of Variable Proportions states that as we increase the quantity of only one input while keeping other inputs fixed, the total product increases initially at an increasing rate, then at a decreasing rate, and finally at a negative rate.



Phase I

Increasing Returns

TP increases at an increasing rate

MP also increases

Phase II

Diminishing Returns

TP increases at a decreasing rate

MP starts falling but remains positive

This stage ends when $MP = 0$

Phase III

Negative Returns

TP starts declining

MP becomes negative

Overloading of labour

In the diagram:

- X-axis: Units of variable factor (labour)
- Y-axis: Output
- TP curve first rises steeply, then slowly, and finally declines
- MP curve rises, reaches maximum, then falls & becomes negative

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Combination	Good X (Units)	Good Y (Units)	Marginal Opportunity Cost (MOC)
A	0	100	
B	10	90	$10Y \rightarrow 10X \rightarrow 1Y$ per 1X
C	20	70	$20Y \rightarrow 10X \rightarrow 2Y$ per 1X
D	30	40	$30Y \rightarrow 10X \rightarrow 3Y$ per 1X
E	40	0	$40Y \rightarrow 10X \rightarrow 4Y$ per 1X

b) Explain Marginal Revenue (MR) & Average Revenue (AR) in perfect competition and imperfect competition with graphs

Meaning of Revenue Concepts

Average Revenue (AR):

Revenue earned per unit of output.

$$AR = TR/Q$$

Marginal Revenue (MR):

Additional revenue earned by selling one more unit of output.

$$MR = \Delta TR / \Delta Q$$

1. Perfect Competition

Explanation

- Firms are price takers
- Price is fixed by the industry
- Each additional unit is sold at the same price

Relationship

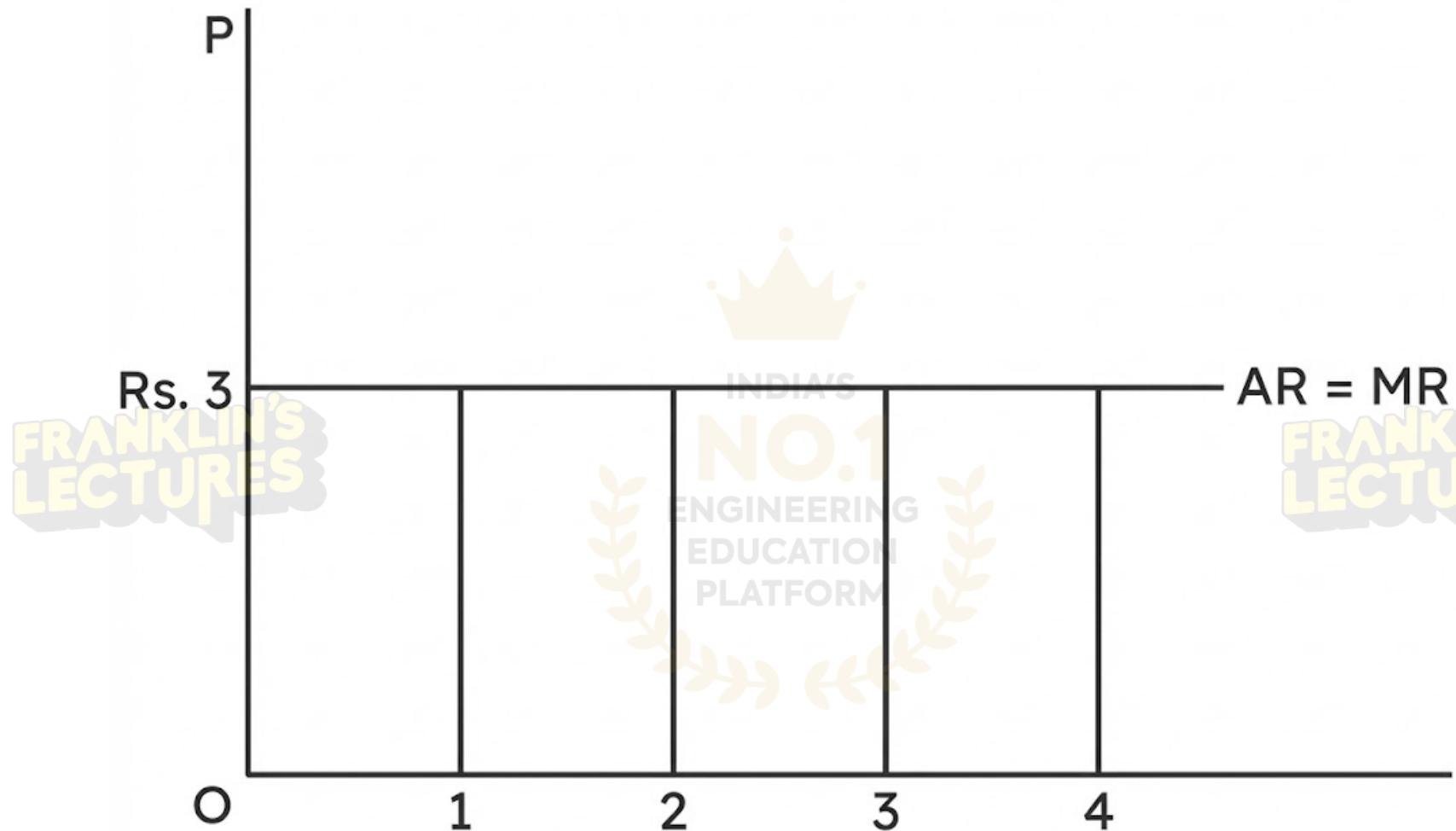
- $AR = MR = \text{Price}$
- Both AR and MR are horizontal straight lines

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$$\begin{aligned}9 \text{ unit } &\rightarrow 10 \rightarrow 90 & \rightarrow AR = 10 \\10 \text{ unit } &\rightarrow 10 \rightarrow 100\end{aligned}$$

$$MR = 10$$

$$\boxed{AR = MR = \text{Price}}$$



Horizontal AR curve & MR curve

2. Imperfect Competition (Monopoly / Monopolistic Competition)

Explanation

- Firm is a price maker
- To sell more output, price must be reduced
- Same price applies to all units sold

Relationship

- AR curve slopes downward
- MR curve lies below AR
- MR falls faster due to price reduction on previous units

AR = 10
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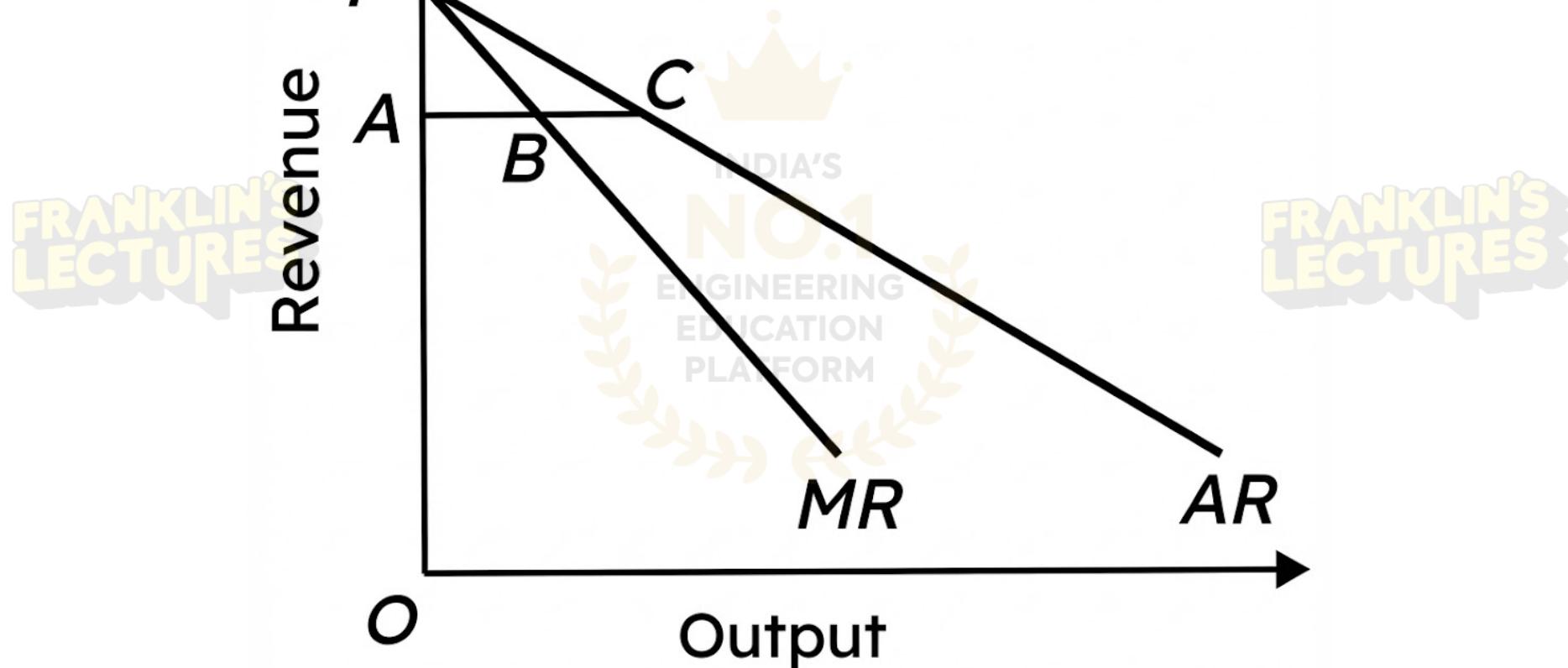
9 unit - ₹10 → ₹90

(0 unit - ₹9) → ₹99

AR < MR

AR = 9.9

MR = 9



Q. a) Define Isoquant curve. Explain the properties of an isoquant.

An Isoquant curve shows the different combinations of two factors of production (usually labour and capital) that produce the same level of output.

"Iso" = same

"Quant" = quantity (of output)

So, Isoquant = "same quantity"

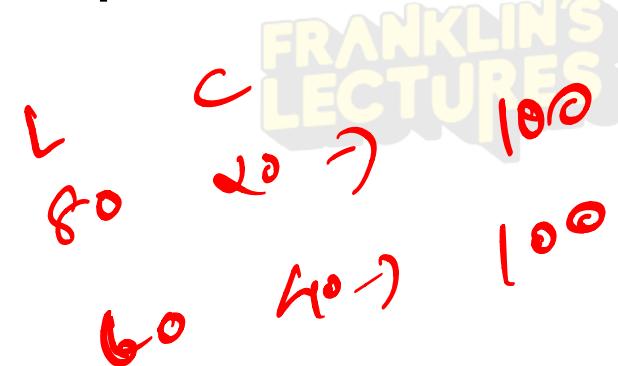
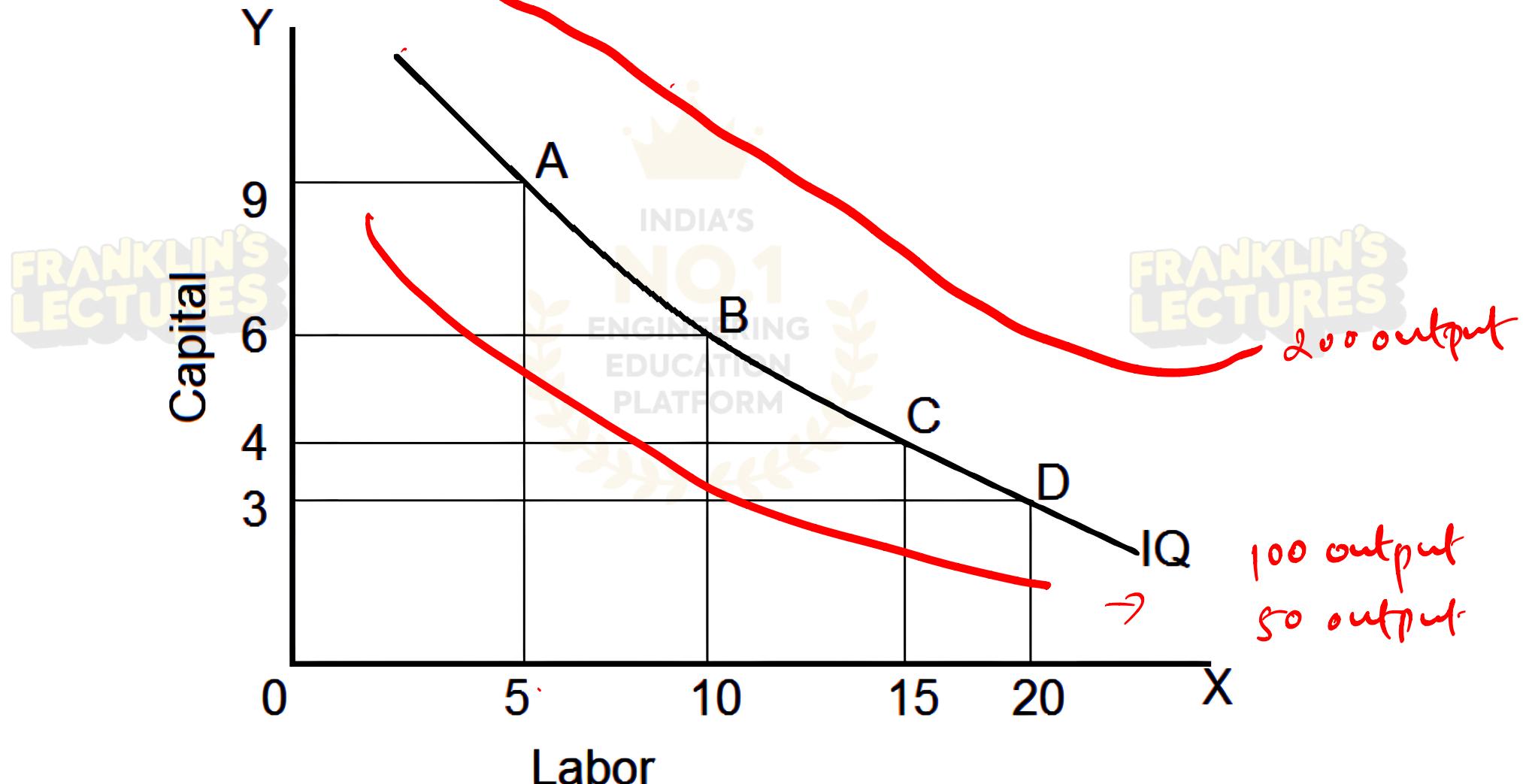


Figure 1



Properties of an Isoquant

1. Downward Sloping

- To maintain the same output, an increase in one factor requires a decrease in the other.

2. Convex to the Origin

- Due to diminishing Marginal Rate of Technical Substitution (MRTS).

3. Do Not Intersect

- Intersection would imply same output produced with different efficiency, which is impossible.

$MRTS \rightarrow 4 \rightarrow$ Adding 1 labour
replaces 4 capital

4. Higher Isoquant Represents Higher Output

- Isoquants farther from the origin indicate larger output levels.

5. Isoquants Never Touch the Axes

- Production requires both factors; output cannot be produced using only one factor.

6. Thin Curves

- Each isoquant represents one specific level of output.

b) A firm's total sales this year are Rs 20,000. Variable Costs Are Rs 8,000 & fixed costs are Rs 6,000. Find The Breakeven Point.

Breakeven Point = $\frac{\text{fixed cost}}{\text{P/V Ratio}}$

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$

$$\begin{aligned}\text{Contribution} &= \text{Sales} - VC \\ &= 20000 - 8000 \\ &= \underline{\underline{\text{Rs } 12000}}\end{aligned}$$

$$= \frac{12000}{20000}$$

$$\text{P/V ratio} = \frac{0.6}{\equiv}$$

$$\text{BEP} = \frac{6000}{0.6} = \underline{\underline{10000}}$$

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