Economics → use of scarce resources to satisfy unlimited human wants.

↳ derived from "Oikonomia"

Microeconomics

→ Study of economics at an individual level, group or company level.

eg - Consumer shop, Small Bussiness

→ Affects Individuals & companies

→ Analyses partial behaviour of economy.

→ Scope → less

→ Classical Economists supported this Economics

Macroeconomics

→ Study of national economy as a whole.

eg - National Income unemployment rate

→ Issues that affect whole economy.

→ Analyses the entire behaviour of economy

→ Scope → more

→ Modern Economists supports this Economics

Economics in Engineering:

1. Improves Efficiency & Productivity
2. Strategic Decision Making
3. Problem of choice confronted.
4. Cost - effective upgraded Technology
5. Forecasting fluctuations in Business Cycle.

#Goods : commodity or service which gives satisfaction to humans on consumption.

→ Free good : Supply > Demand eg - Air, sunrays (Non-Economic)

→ Economic good : Supply < Demand.
- Have an exchange value.
- Have a price

→ Capital Goods
Helps in production of other goods.
Eg: Machine & Raw materials

→ Consumer Goods
→ Directly consumed by Human.
Eg: Milk & Bread
→ Perishable & Non-perishable
→ Durable & Non-durable

*Veblens Goods : Consumer goods violating laws of Demand
Demand ↑↑ when price ↑↑

→ Transferrable v/s Non-Transferrable
→ Complementary v/s Substitute
→ Material v/s Non-material

Normal Goods - Demand ↑↑ with ↑↑ in income
↳ price elasticity is negative

→ Inferior goods
- Its demand ↓↓ with ↑↑ in income
- Substitute effect : more prominent
Price elasticity +ve

v/s

Giffen goods - (Violates laws of demand)
- Demand ↑↑ with ↑↑ in price
- Income effect : more prominent
Price elasticity +ve

→ Public Good
→ Non-excludable
→ Non-rivalrous

Private Good
→ Excludable
→ Rivalrous

Rivalrous	Excludable	Non-Excludable
	Private good : food, House Property	common good : Timber, Mineral
Non-rivalrous	club good : Library, Theatre	Public good : Air, Road, Water

→ Goods have utility for human Beings
Utility : "Want satisfying capacity"

Good :- Pre consumption - ∃ utility
Post consumption - Satisfaction

- Form utility - changing form of product to make it more serviceable.
- Place utility - Transporting good from a surplus place to a place where there is short supply.
- Time utility - Storing product when it is surplus for the time when it will be needed & valued more
- Possession utility - Transferring / changing ownership of good from a person with little use to other with most use.
- Service utility - Providing service to necessary client.

# Cardinal utility (Marshall)		Ordinal utility (Jevons)
Satisfaction derived from consumption of good can be expressed numerically	Meaning	Satisfaction; a consumer derives from good's consumption cannot be expressed numerically.
Quantitative	Approach	Qualitative
less	Realistic	More
Utils	Measurement	Rank
Marginal utility Analysis (Laws)	Analysis	Indifference curve Analysis
Classical & Neo-classical Economists	Promoted By	Modern Economists

Marginal Utility (MU) - Added satisfaction a consumer gets from having one more unit of a good or service

→ $MU = \frac{\Delta \text{ total utility}}{\Delta \text{ total quantity consumed}} = \frac{\Delta U}{\Delta Q}$

→ $MU = \frac{d(TU)}{dx}$ [TU : total utility, x : no. of units consumed]

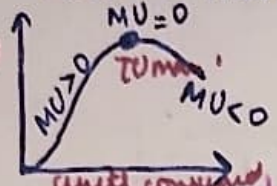
→ Intensity of a utility of a good ↓↓ as he consumes successive more units of product.

LAW OF UTILITY :
→ A rational consumer will like to consume the good whose intensity is more than the good whose intensity is less -

Law of Diminishing Marginal Utility

→ A person consumes more units of good, the marginal utility with the successive units of consumed good ↓↓ while total utility ↑↑ at falling rate, if other things remains same.

→ As a person consumes an item or a product, the satisfaction or utility they derive from the product wanes as they consume more & more of the product.



When MU = 0 → TU : total utility; highest
& beyond that, TU ↓ starts falling & MU = -ve

MU diminishes as consumer uses successive units of good.

Implicit Assumⁿ:
→ All units of good are homogeneous.
→ No change in taste during consump. of good.
→ No time gap b/w consump. of succes. good.
→ Consumer is rational; won't do anything that will reduce total utility.

Increasing TU → Diminishing MU
Maxᵐ TU → 0 MU
Decreasing TU → -ve MU

Law of Equi-Marginal Utility (CONSUMER'S - EQUILIBRIUM)

↳ Explains behaviour of a consumer when he consume more than one commodity.

→ It states "A consumer should spend his limited income on different commodities in such a way that the least rupee spent on each commodity yield him equal marginal utility in order to get maximum satisfaction."

Principle: obtaining maxᵐ satisfaction from limited income.

$$\frac{MU_L}{P_L} = \frac{MU_m}{P_m} = \frac{MU_n}{P_n}$$

A rational human spends his total income over a broad spectrum of goods ∀ MU derived from last unit of each good is equal.

↳ CONDⁿ for consumer Equilibrium

$$P_L Q_L + P_m Q_m + \ldots = Y \text{ (income)}$$

↳ constraint

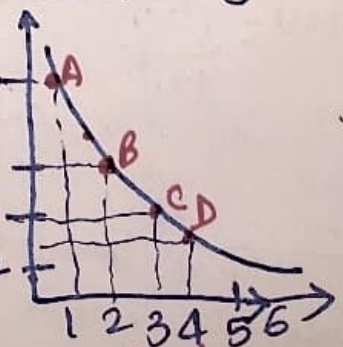
→ P_L : Price of commodity
→ Q_L : Quantity " "

Assumⁿ → Rational consumer
→ Cardinally measured utility
→ MU of money = constant
→ As more unit consumed, utility from each additional unit falls

ORDINAL UTILITY:

Indifference Curve Analysis

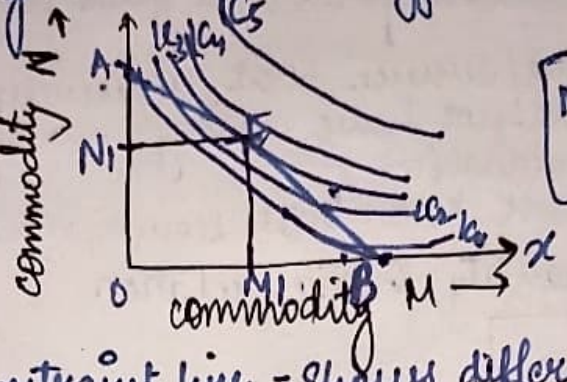
↳ Locus of points which represents combⁿ of 2 commodities M & N which yields equal satisfaction to the consumer.



Characteristics: Is negatively sloped & convex to the origin.

↳ 2 indifference curves donot intersect
↳ 2 are usually parallel to each other
↳ Indifference curve towards ∞

Marginal Rate of Substitution (MRS_{MN}) : Refers to amount of N that a user is willing to forego in order to gain 1 additional unit of M (& still have same level of satisfaction). On moving down the indifference curve, MRS_{MN} diminishes.



$$MRS_{MN} = -\frac{MU_M}{MU_N}$$

→ Budget constraint line - Shows different comb^n of commodities a consumer can purchase given his money, income & prices of commodities. (AB is the Budget line)

→ Consumer eqb^m - When his budget line reaches highest possible curve. Consumer eqb^m is reached at E on IC_3 → $MRS_{MN} = \frac{P_M}{P_N}$ or it is cont. falling

→ Price Effect - Impact of change in price of M on consumers demand & consumption, while keeping price of N, consumer's taste & money income constant. (Price) P_x → Q_x (Quantity demand)

→ Price Consumption Curve (PCE) - Locus of point of consumer's equilibrium resulting when only price of M is varied.

→ Consumer Demand Curve - Amount of M a consumer would purchase at various prices of M.

→ Price Effect = Income Effect + Substitution Effect.

Application of Indifference Curve :

* To calculate price elasticity of demand for product which has numerous close substitutes
* To differentiate b/w → Goods & luxury
  → Substitute & complementary good

Wish become a WANT if it is supported by ability to fulfil it

- WANTS → NECESSITIES → Existence
  → Efficiency
  → Conventional
  → COMFORTS
  → LUXURY

→ One will like to fulfil WANT with higher intensity of consumption first

→ One will like to have MORE of a good if price is less & less if price is MORE

A WISH is supported by ABILITY & WILLINGNESS to fulfil it, becomes a DEMAND

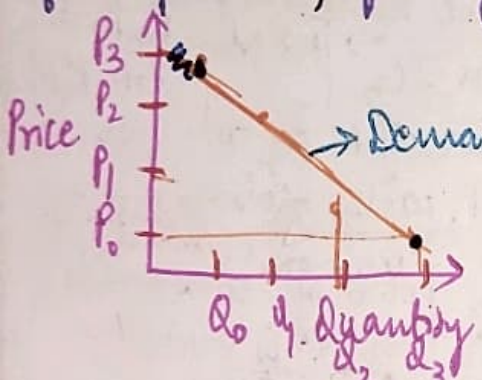
LAW OF DEMAND :-

- **Demand** - Amount of goods & services a consumer is willing and able to buy at various prices in a given period of time.
- **Latent demand** - Demand/service that consumers can't satisfy due to 1) Consumer doesn't have enough money
  2) Item is not available.
  3) Consumer doesn't know that service is available / not.

LAW OF DEMAND - Quantity & price relation

$$\text{Quantity demanded} \propto \frac{1}{\text{Price}}$$

As price of a product ↑↑; quantity demanded for that product ↓↓
If the price ↑↑, quantity demanded ↓



→ Price ↑ from P_2 to P_3; quantity ↓ from Q_1 to Q_0

→ Price ↓ from P_3 to P_2; quantity ↑ from Q_0 to Q_1

Contraction / Expansion in Demand : Price : same
But Demand ↓↓ or ↑↑ due to change in other factors

Exception to the Law of Demand
If Price ↑↑ ; Demand ↑↑ (Inferior goods in which) ; If price ↓↓ ; Demand ↓↓

① **Griffen goods** : When Price falls ; Demands also falls
└ customer/consumer switch to super substitutes

② **Velben Goods / Prestige / Conspicuous Consumption** :
Some people measure commodity purely by its price. "
"Higher priced good/items have more profit value.

③ **Ignorance & Illusion to Buyers/Customers** :

④ **Emergency** → war, flood, earthquake

⑤ **Necessities of life** → salt, food, milk, petrol.

Price Expectation : If prices are expected to rise further, the initial demand ↑↑.

Elasticity of Demand: Quality of demand by virtue of which it changes (i.e. ↑ or ↓) when the price changes, is called "Elasticity of Demand".
Demand extends or falls with rise or fall in price

Elasticity of Demand
① PRICE elasticity of demand ② INCOME elasticity of demand ③ CROSS elasticity of demand.

① **PRICE elasticity of Demand**: Δ Demand / Δ Price

$$= \frac{\text{\% change in quantity demanded}}{\text{\% change in price}} = \frac{\%\,\Delta q}{\%\,\Delta p}$$

price elasticity coefficient ← $ed = \frac{dQ}{dP} \times \frac{P}{Q} = \frac{dQ/Q}{dP/P}$

(change in demand → original price; change in Price; original demand)

$0 \le ed < \infty$

Factors affecting Price Elasticity:
1) Sustainability
2) Relative size of expenditure
3) Necessity v/s luxury
4) Time period

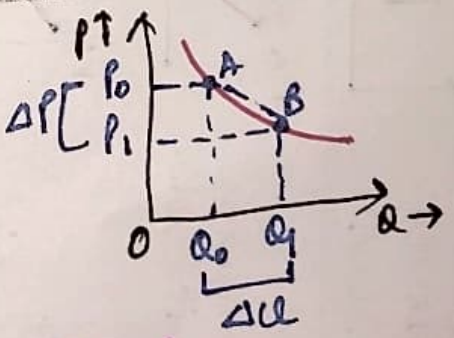
 # Applic^n of Price Elasticity:
1) As guide for setting prices
2) As guide for shifting tax burden in case of Indirect Tax
3) Discount Sales

 # Measurement of Price of Elasticity:

① Total outlay / Expenditure method
↳ Effect of change in price on change in total expenditure of commodity

Effect of Increase in Price	Nature of change in Expenditure	ed	Nature of ed
	Increases	$\lvert ed\rvert > 1$	Elastic
	Decreases	$\lvert ed\rvert < 1$	Inelastic
	Constant	$\lvert ed\rvert = 1$	Unit Elastic

② Arc method
Measure of average responsiveness of price change exhibited by demand curve over a finite stretch



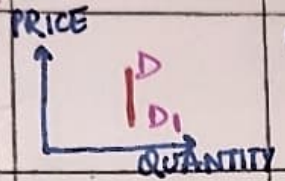
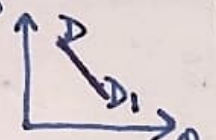
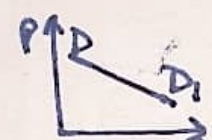
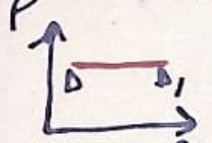
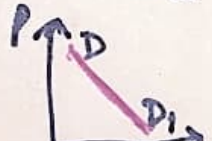
$\Delta P = P_1 - P_0$

$\Delta Q = Q_1 - Q_0$

$P = \frac{P_1 + P_0}{2}$ $\left(Q = \frac{Q_1 + Q_0}{2}\right)$ $ed = -\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

$= -\frac{(Q_1 - Q_0)}{(P_1 - P_0)} \frac{(P_1 + P_0/2)}{(Q_1 + Q_0/2)} = -\frac{Q_1 - Q_0}{P_1 - P_0} \cdot \frac{P_1 + P_0}{Q_1 + Q_0}$

$$ed = -\left(\frac{Q_1 - Q_0}{Q_1 + Q_0}\right) \cdot \left(\frac{P_1 + P_0}{P_1 - P_0}\right)$$

Elasticity of demand	Type of elasticity		Implication
1. $e_d = \frac{\%\Delta q}{\%\Delta p} = \frac{0}{\%\Delta p} = 0$	Perfectly Inelastic		change in Price doesn't affect Demand.
2. $\lvert e_d \rvert < 1$	less than unit elastic		% change in Demand < % change in Price $\%\Delta q < \%\Delta p$
3. $\lvert e_d \rvert = 1$	unit elastic		% change in Demand = % change in Price $\%\Delta q = \%\Delta p$
4. $\lvert e_d \rvert > 1$	more than unit elastic		% change in Demand > % change in Price $\%\Delta q > \%\Delta p$
5. $e_d = \infty$	Perfectly elastic		Any change in Price causes ∞ change in Demand
6. $e_d < 0$ -ve	Normal good		$D \propto 1/P$ ↑↑ in Price, Demand ↓↓
7. $e_d > 0$ +ve	Giffen good		$D \propto P$ ↑↑ in Price, Demand ↑↑

→ goods with low ey: Recession Proof.
→ If ey < 0 then Firm must expect decline in demand as economy grows.
→ ey info. is considered for planning location, keeping firm flexible.

① Price elasticity of demand

② Income elasticity of demand

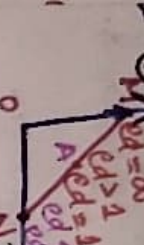
ey < 0 : Inferior good
ey > 0 : Normal good
ey < 1 : Necessity
ey > 1 : luxury

$e_y = \frac{dQ}{dY} \cdot \frac{Y}{Q}$; Y → Income

$= \frac{\%\text{ change in quantity demand}}{\%\text{ change in Income}} = \frac{Q_{new} - Q_{old}}{Q_{old}} \times \frac{I_{old}}{I_{new}}$

⇒ Ratio of proportionate change in demand with proportionate change in Income (ey)

③ Point Method - For more accurate i.e. d ≥ 0 or d ≤ 0 should not be taken into consideration



$e_d = -\frac{AN}{MA}$

- Total revenue $TR = P \times Q$
- Marginal revenue $= P\left[1 + \frac{1}{ed}\right]$ → Price elasticity of demand
- Average revenue $AR = \frac{P \times Q}{Q} = \frac{TR}{Q}$ = Price

③. CROSS Plasticity of demand

$$\text{Cross Plasticity } C_d^* = \frac{\%\ \Delta \text{ quantity demand for good X}}{\%\ \Delta \text{ price for good Y}}$$

decrease (−) / increase (+) — constant sign

-ve : complement
+ve : substitute

$$C_d = \frac{d l_x}{d l_y} \times \frac{Y}{X}$$

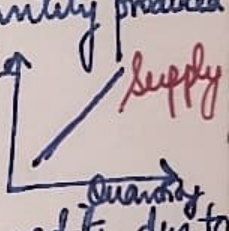
- $C_d^* > 0$ (+ve) : Substitute goods
- $C_d^* < 0$ (−ve) : Complimentary good
- $C_d^* = 0$: Accomodities X & Y ; not related

SUPPLY: Quantity of a product that producers are willing & able to provide at different market prices over a period of time
It is what they provide from scarce resources available

Law of Supply : Higher the price, larger the quantity produced

Price ∝ Supply ↑ PRICE ↑ SUPPLY

↓ PRICE ↓ SUPPLY

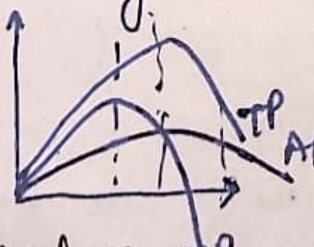


Price Elasticity of Supply : Change in supply of a commodity due to changes in economic variables such as price of that commodity, price of related goods, cost of production & seller's expectation

$$e_s = \frac{dS}{dP} \times \frac{P}{S}$$

- → RISK TAKING
- → TIME FACTOR
- → PRODUCTION COST
- → NATURE OF COMMODITY
- → COST, TECHNIQUE OF PRODUCTION

Law of Return - Behaviour of physical output when only 1 input is changed & others remains constant.



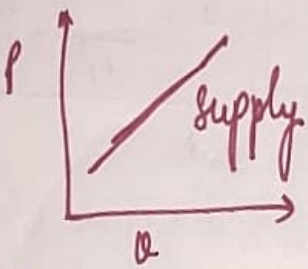
TP → Total Product
AP → Average Product
MP → Marginal Product

- Return To Scale - ↳ Relationship b/w All Inputs & Resulting o/p
- Economies of Scale - When large scale production is carried out, a single firm as well as whole industry await certain benefits

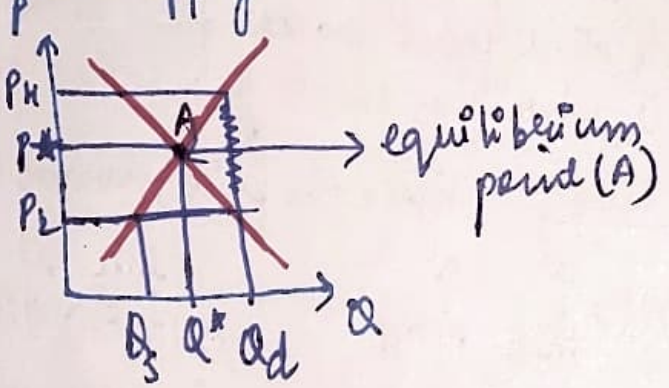
Linear supply func?

$$\text{Quantity Supply} = a + b\,P(x)$$

- a → supply of good when price = 0
- b → slope of supply
- $P(x)$ → price of good



- Rel^n b/w demand & supply



$Q_D = Q_S$ → at equilibrium

Quantity demand — Quantity Supply

→ Price is ↓ then P^* i.e. P_L then $Q_d > Q_s$

(Excess demand / shortage)

→ Bidding (Buyers trying/willing to pay more

→ Price is more than P^* i.e. P_H $Q_s > Q_d$

(excess supply / surplus)

Customers compete by lowering the price.

Law of Return°

Production Func^n: Transform^n of physical input into physical output where o/p is func^n of i/p!

$$Q = f(K, L \text{ etc.})$$

- Q: Quantity of o/p produced
- f: func^n depends on
- K, L: factors of production: I/p available to supply goods & services in economy

Cobb-Douglas func^n:

$$Q = bL^{a}K^{1-a}$$

- Q: Quantity of product
- b: Total factor productivity
- L: Labour i/p
- K: Capital i/p
- a: produc^n elasticities of labour
- 1-a: " " capital

] %

- **Production process (PP)**: A set of I/p transformed into a set of O/p.

Factors of Production

1) LAND

2) LABOUR: Any exertion of mind or body undertaken by a person for producing a product or service is labour.

3) CAPITAL: A part of wealth other than land, which is used for further production of wealth.

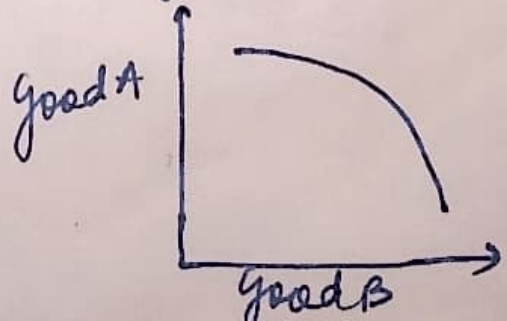
- Capital Intensive PP: Require more capital & less Labour.
- Labour Intensive PP: Require More Labour & less capital
  - ↳ eg: Indian economy

4) ENTERPRISE:

$$(\%)\ \eta = \frac{O/p}{I/p} \times 100$$

~~Return to scale:~~

Production Possibility Curve



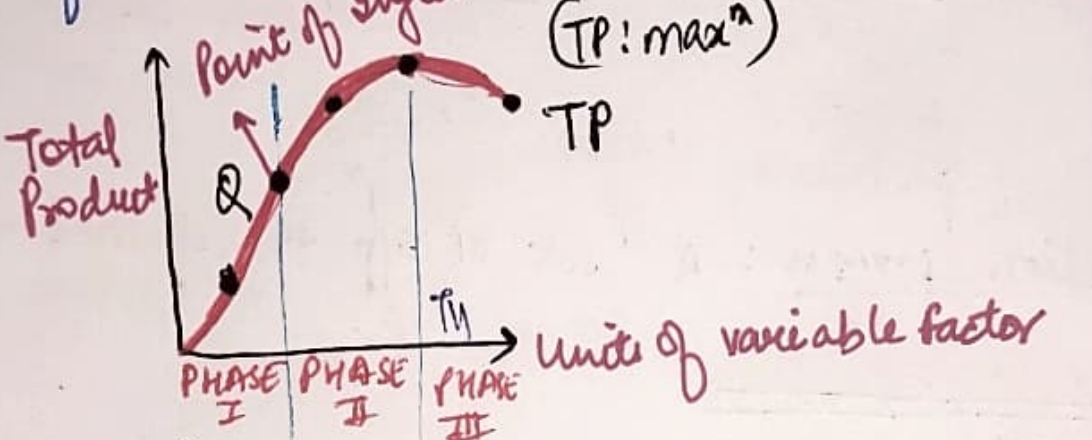
Law of Variable Proportions - As we ↑↑ the quantity of only one I/p while keeping other I/p fixed, Total product TP initially at a increasing rate, then at a decreasing rate, & finally at a negative rate.

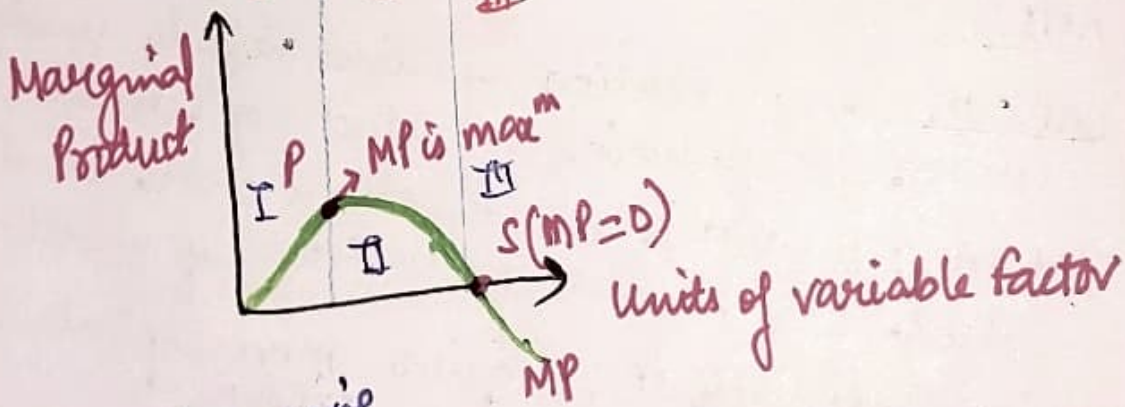
As per law of V.P.; changes in TP & MP in 3 phases

Phase 1) TP rises at ↑↑ rate, MP ↑↑.

Phase 2) TP rises at ↓↓ rate, MP ↓↓ & is +ve

Phase 3) TP falls, MP = -ve → pt. where slope of TP curve changes





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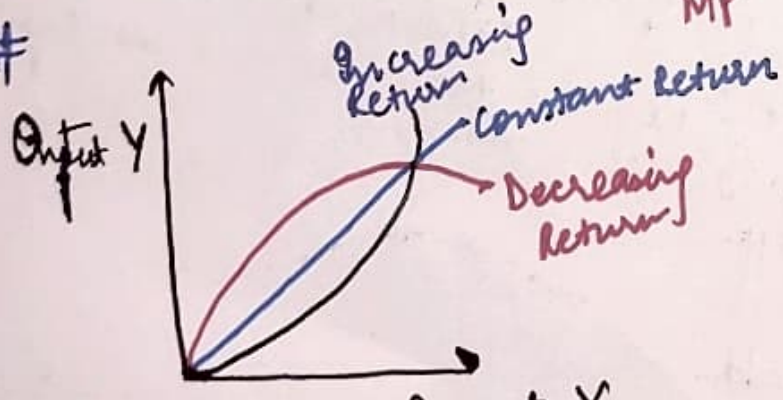


MARKET → Interface b/w Producer & Consumer
↳ Geographical space where producer & consumer of a product or service interact & negotiate for exchange.

Types of Market Structure

(1) Perfect competition - Large no. of buyers & sellers selling homogeneous product & price of product determined by the industry
- There are no barriers to entry & buyers have perfect knowledge about market.
→ Here; no. of sellers is so large that no single firm can influence price

(2) Monopoly market - Only a single seller of product where firms have full control over supply of product; there is absence of entry of firms & no close substitute are available
Natural monopoly: Market demand is not enough to accomodate two firms.

#Monopoly can last only if :-
→ It is legally created.
→ Obtained through ↔ Patent
→ ↔ Control over Raw material Supplies
→ Market demand not enough to accomodate 2 firms.

(3) Monopolistic market - Midway b/w Perfect Competition & Monopoly
↳ No. of buyers & sellers relatively low.
↳ Freedom of entry & exit of firms & buyers have no perfect knowledge about the market.

Number of firms	Nature of Product: Homogeneous	Heterogeneous / Differential Monopolistic Competition
MANY	Perfect competition	Oligopoly
FEW	—	—
ONE	Monopoly	

(4) Oligopoly - Market situation where no. of producers in industry is small & produce Heterogeneous products

Oligopoly
↓
Cartel, Price war, Price of leader

MACRO-ECONOMICS

→ Studies Economic Behaviour of Big Economic Activities.
a.k.a. "Aggregative Economics"

Macroeconomics
deal with (Theory of) → Distribution
- Income & Employment
- General price level & Inflation
- Economic growth

Barter System -
Monetary System
↳ Institutions by which a government provides Money in a Country's Economy.

#Money -
'CROWTHER' : "Money is anything that is generally acceptable as a means of exchange & at the same time, acts as a measure and as a store of value."

Money (4 func^n) → Standard of deferred payments (Future payments)
- Medium of Exchange
- Measure of value
- Store of value

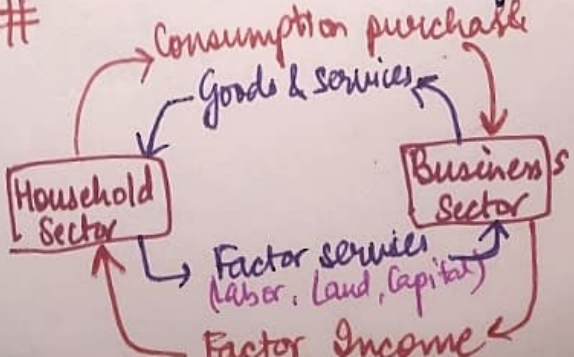
#Functions of Money
① Primary func^n
→ Medium of exchange
→ Measure of value

② Secondary func^n
→ Standard of deferred payments
→ Store of values
→ Transfer of values

③ Contigent
→ Basis of Credit
→ Liquidity
→ Distribut^n of National Income
→ Max^m satisf^n of customer

#Qualities of good money
- General Acceptability
- Durability
- Portability
- Homogeneity
- Malleability
- Stability of value

#



Classifⁿ of Money

- Metallic
  - Full-Bodied coins (Face Value of coin = Intrinsic value)
  - Token coins (Face value > Intrinsic value)
- Non-metallic / (Paper Money)
  - Representative Paper → Monetary authority or Central Bank of Nation e.g. gold reserve
  - Convertible Paper → Paper money into gold, silver
  - Inconvertible Paper Money
- Credit Money i.e. (Bank Money)
  - cheques
  - Bill of exchange
  - ATM
  - overdraft

- **VALUE OF MONEY** - Amount of good / services, which one unit of money can purchase.
- It keeps on fluctuating.
- **Index Number** - Series of figures by which changes in the size of economic phenomenon are measured from time to time
- **Supply of Money**

Total Money : Aggregate amount of money in circulation, which is owned by public in the country.

3 monetary institution responsible for Δ in money supply (in country)

1. The State
2. The Commercial Bank
3. The Central Bank

Money Demand (for reasons !?)

1. Transaction demand
2. Precautionary demand
3. Speculative demand

BANK - Financial Institution that deals in Money & Credit.

Bank

Commercial Bank
- → Earns from difference b/w what they pay & take as Intrest.
- → Accept deposit, Grant loan, Make Investment
- motive : earning Profit
- eg - SBI, PNB

Central Bank
- → Apex monetary & Banking Institution
- → Forms Banking Policies

Commercial Bank : offers basic Investment Products
↳ SAVINGS A/C, CURRENT A/C

→ Provides financial services to the public such as accepting deposits, granting loans etc. to the customers

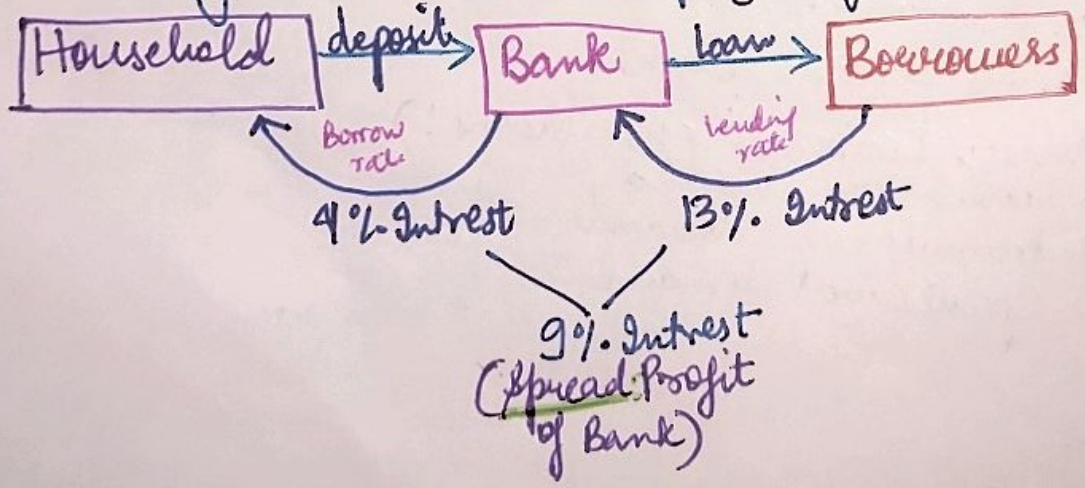
- Gives low Intrest to depositors.
- Charges High Intrest to Borrowers] Earns profit

#

Deposit

Demand deposit
→ Bank Money can be withdrawn anytime.

Time deposit
→ Withdrawn only after a period of time
→ Bank: pays higher Intrests.



Func" of Commercial Bank:

① Accepting deposit
- (1) current A/C (unlimited transac") - Businessman (0% Intrest) → 0% Intrest
- (2) Saving A/C (limited transac")
- (3) Fixed Deposit (FD) A/C → more Intrest

② Advancing Loan
- ① Long Term >1yr
- ② Demand Loan (usually Businessman)
- ③ Short Term" <1yr

③ Overdraft Facility - Businessman

④ Discounting Bill of Exchange

Secondary func":

1) Agency func"
- collecting checks
- collecting Income
- Paying Expenses - like Insurance, Premium Bill

2) General utility func":
- Providing locker facility for safekeeping of valuables.
- Issuing traveller's check.
- Dealing in Foreign Exchange - Import & Export → RBI permiss" needed
- Transfer of funds

3) other:
- debit card, credit card
- Internet Banking

Central Bank: (RBI) (Reserve Bank of India) (1 April, 1935) → became Central Bank

↳ "Independent" (SUPREME authority) national authority that conducts Monetary Policy, regulates banks & provides financial services.

Goal: To stabilize the nation's currency, keep unemployment low & prevent inflation.

→ In every country, there is a central Bank.

→ The Central Bank is the "apex" institution of financial system which operates, controls, directs & regulates the Monetary & Banking structure of a country.

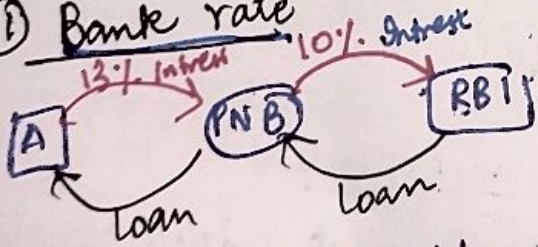
→ Func": Great Importance in Economy of a Country

Func^ of Central Bank :

1. Currency Authority or Note Issue
   - To print notes.
   - RBI prints notes.
   - uniformity in currency
   - protection & recognition of govt.
   - unit of currency
2. Bankers Agents & Adviser of Govt.
   - (controls credit creating power of central Bank)
   - controller
3. Manages govt. undertaking, funds, gives loan to the government.
4. Advices govt. on Monetary, Banking & Financial Matter.
5. custodian of cash reserve of commercial Bank.
6. custodian of foreign exchange
7. Lender of the last Resort.
8. Clearing House Function (Comm Bank)
9. Controller of Credit & Money supply

Quantitative

1. Bank rate



2. Open Market operation
   Buying & selling of Govt. Securities
   i.e. Money coming into RBI
3. Legal Reserve Ratio / Requirement
   - CRR (Cash Reserve Ratio)
   - SLR (Statutory Liquidity Ratio)

C.B. 1000 → 800 loan, 200 CRR → 100 RBI, 100 अपने पास SLR

Qualitative

1. Marginal requirement
   Bank, Margin कितने % loan दे
2. Moral suasion
   Work a/c to policy.
3. Selective Credit policy
4. collection of data

Commercial Bank	Central Bank
→ Objective : Earn profit	→ Objective : Simulate economic growth
→ Several commercial banks	→ Only 1 central bank
→ Can be private & nationalized commercialised bank.	→ An autonomous institution
→ Perform general banking & agency services for general public.	→ Perform general banking & agency services for government
→ Deal with public directly.	→ Deal with common banks, other financial institutions & govt.
→ eg- PNB, SBI, ICICI in India	→ RBI in India

MONETARY POLICY - Refers to measures taken to control & regulate money & credit supply in the economy.

. Rate of Interest : V. Imp here

To control volume of money in circul"
→ Bank loans intrest rate is ↑↑.
→ This reduces demand of Bank loan.
→ Ultimately, this reduced volume of money in circulation.

If there is large scale unemploy in economy :
→ Bank loan Intrest rates are decreased ↓↓
→ This creates demand for bank loans & advances.
→ This ultimately eradicates unemployment upto a certain extent

TAX : Compulsory contribution by government of a country to the govt. exchequer.
Eg: Income Tax, Sales Tax.

Type of taxes :

On Basis of Rate of Taxation
- Proportional Tax ← Same rate of tax
- → Progressive Tax : As Income ↑ → Rate of tax ↑

On Basis of Burden of Tax
- Direct Tax → Tax paid by same person on whom burden of tax falls. eg- Income tax
- → Indirect Tax : → Different persons pay the tax & bear its burden. eg- Sales tax

On Basis of Place of Production
- Excise duty ← Produced within a country, excise duty is imposed on product.
- → Custom duty : → Produced in foreign country & then Imported by a country. Then country imposes custom duty on product.

SUBSIDY - Part of cost of product paid by gov. to Industry with aim to keep price of product below its cost of production.

Reasons:

1. To lower price of product, if used by less well-off sections of society.
   eg - Food subsidy.
2. To promote eco-friendly product.
   eg - subsidy on CNG fuel.
3. As a counterbalancing measure to custom duty imposed by an importing country, govt. of native country may give subsidy.

FISCAL POLICY -

→ Management of volume of currency in circulation or purchasing power in hands of public through Tax & Subsidy.

→ Govt. can impose high rate of taxation to ↓↓ the purchasing power of people. Thus; controlling Inflation

⇒ eg: Subsidy is given of fertilizers to induce farmers to use fertilizers in farms; which will ↑↑ farm productivity.

Inflation - Sustained ↑↑ in price level of goods & services in an economy over a period of time.
↳ Reflects a reduction in purchasing power per unit of money.
eg. पहले आज 50₹ का समान, कल 90₹ का होगा ; तो Inflation.

Inflation

In Developed country
→ Inflation occurs after stage of full employment of resources.

In Developing country
→ Inflation may co-exist with under-employment of resources.
• This may be on a/c of shortage of capital, equipment, poor power facilities

Types of Inflation (on basis of)

→ **Rate**
- Galloping / Hyper-
- Running
- Creeping

→ **Cause**
- Demand Pull Inflation
- Supply Push Inflation

[Controlled by: (Tax ↑ & ↓↓ subsidies)]

① **Demand Pull Inflation** : When aggregate demand > aggregate supply.

② **Cost Push Inflation** : Production factor is expensive; then price ↑↑.
- ↑↑ in wages
- ↑↑ in profit margin → difficult to control
- Impo of heavy commodity taxes

③ **Currency Inflation** - more money becomes available without an ↑↑ in production & service.

④ **Credit Inflation** - Bank gives loan.
money supply ↑ ∴ demand ↑ ;
∴ Production ⇒ same

#Inflation
- Creeping = 3% p.a.] moderate
- Walking = 3-9% p.a.]
- Running = 10-20% p.a.
- Galloping / Hyper = >20% p.a.

• Single digit Inflation is good for economy.

Indian Inflation was < 25%.)

EFFECTS OF INFLATION:

1. In period of mild inflation, job seekers can be benefitted
2. In -ve Inflation; loan payers (borrowed) money will have less value :. benefitted.
3. Businessmen suffer as good becomes too expensive for people
4. Lower savings
5. Less Investment

STEPS to control INFLATION

→ Central Bank uses Monetary & Fiscal measures to avoid Inflation & Deflation

→ Govt. can ↑ taxes & Intrest rate on loan.

• Measurement of Inflation

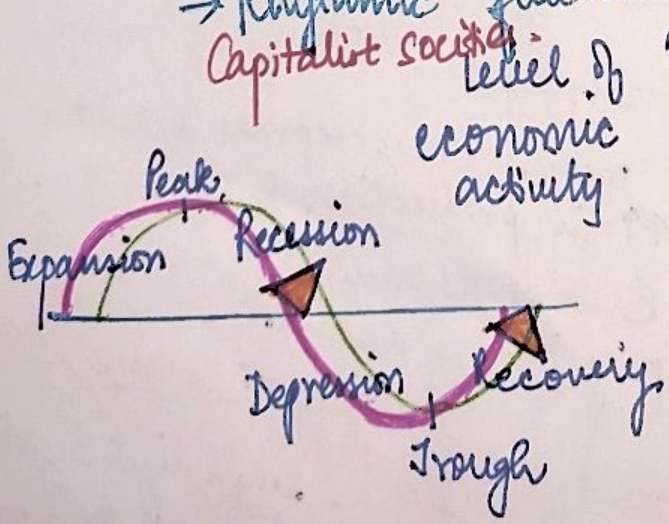
1. Consumer Price Index (CPI)
2. Personal ~~Consumy~~ Compsn Expenditure (PCE)

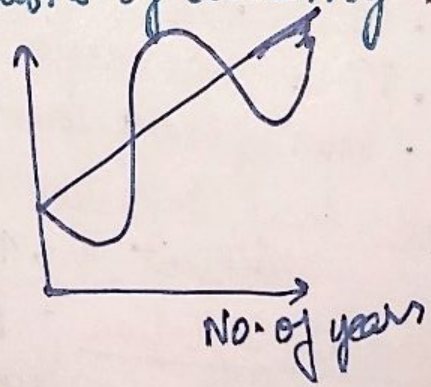
Business Cycle : /Trade Cycle/ Economic Cycle

↳ Upward & downward movement of GDP (Gross Domestic Product) along its long term nature growth rate.

→ Explains expansion & contraction in economic activity that economy experiences over time

→ Rhythmic fluctuations of economy in Capitalist society





(1) Expansion - ↑ in +ve economic growth / indicators
- employment
- Income
- o/p
- wages
- profit
- Demand & Supply of goods & services

→ Demand ↑; product expensive
→ Producer will invest more by taking loan.

(2) Peak -
→ Saturation point.
→ Maxm limit of growth is attained.
→ Economic indicators don't grow more & ∴ are at their highest. Producers Invest more
Point of Producer Invest ↓ Return ↓
↳ Marks reversal in trend of economic growth.

(3) Recession -
→ Follows peak phase.
→ Demands of goods start declining
→ Producers don't note decrease in demand & go on producing; ∴ excess supply ⇒ Price falls.
→ Economic Indicators begins to fall.

(4) Depression - (Economy growth rate become -ve)
↑ in unemployment
↓ in o/p, trade etc.
↓↓ in Demand ; Price ↓↓
← Demand of Loan ↓
∴ Overall economic growth ↓↓
Stage: Depression & falls below steady growth rate

(5) Trough - Depression: economic growth rate -ve.
Further decline in prices of factors
↳ in demand
↳ in supply of goods & services reach their lowest
[-ve Saturation for economy]

(6) Recovery - Economy starts recovering, -ve growth rate
→ Due to low prices, demand begins to ↑, produc^{n} ↑.
→ Employment given to rise. Producers invest more.
→ Govt. want to produc^{n}, ↑ in expenditure like make dams, metro stat^{n} roads, demand ↑ & producers get profit.

BOT
→ Balance of Trade
→ Only visible transac^{n}
→ Can be favourable/unfavourable.
→ BOT = Net Earning on Export − Net Payment for Import

BOP
→ Balance of Payment
→ All transac^{n} related to visible, Invisible & Capital Transfers
→ Always balances itself.
→ BOP = Current A/C + Capital A/C +or− Balancing item

Current A/C
→ Trade balance of country & also of country & also of direct payment & net Income.
→ Affects net Income of country
→ Deals with International Trade.
→ Goods, Services, Income, Transfers
deficit / surplus

Capital A/C
→ Representation of capital Investments & expenditure that don't affect country's trade.
→ Affects current / financial A/C
→ Deals with applic^{n} of capital & how they are sourced.
→ Investment, Loan, NRI A/C
surplus

Measures:
BOP
- Current A/C - Flow of good, services & income b/w country & world
- Capital A/C - Flow of capital, Investment, Loan
- Financial A/C - Change in ownership of financial Assets & Liabilities

Autonomous Transac"

- International transac"; undertaken for Profit motive.
- Undertaken by Private sector
- Undertaken irrespective of effect on BOP.

Accomodating Transaction

- International transac" undertaken to cover BOP surplus / Deficit.
- Undertaken by Monetary Authority (Central Bank, RBI)
- Undertaken after seeing Status of BOP surplus / Deficit

Free Trade

- Protects Jobs
- Prevents Dumping
- Provide access to more market.
- Strengthen political intrest.

Protectionism

- Protect Domestic Industries
- Protects national culture
- Add cost to consumer.
- ↑↑ Int. competition & η

Dumping: Exporting a product at a price that is lower in foreign market than price charged in exporter's domestic market.

International / Predatory

Tariff Barriers

Duties & Tax imposed on Imported good.

- Attack on price of commodity
- Restricts Imports Indirectly

Non-Tariff Barriers

Quantit. & exchange control restric" imposed to restrict imports.

- Attacks on quantity of comm
- Restricts imports Directly

Quotas: Import limits that prevent more than a set amount of specific good from being imported in a country.

Cost

(1) Average cost (AC)

Represent per-unit cost of producing a given level of output.

- Average cost = $\frac{\text{Total cost produc}^n}{\text{Quantity of o/p}}$

→ It is total produc^n cost divided by quantity of o/p produced.

→ Reflects overall cost efficiency of produc^n & includes both fixed & variable cost.

Marginal cost (MC)

Additional Represents change in total cost when produc^n quantity ↑↑ by 1 unit.

- MC = $\frac{\Delta \text{Total cost}}{\text{change in quantity}}$

→ It is additional cost incurred by producing 1 more unit of o/p.

→ Helps businessman make decision about how much to produce (as it indicate cost of next unit)

Actual cost

- Refers to real, out-of-pocket expenses incurred to produce or obtain a good or service.
- Includes intangible expens material, labour, overhead cos
- Recorded in company's financial statement.

Opportunity cost

- Value of the next best alternative that must be forgone when a choice is made
- Represents cost of not choosing the next best alternative when making decisions.
- Not recorded in company's financial stmt.

Fixed cost

- Costs that remains constant regardless of level of produc^n o/p
- Donot vary with changes in production volume or sales

eg - Rent, salary of permanent staff

Variable Cost

- Costs that change in direct proportion to changes in produc^n or output.
- ↑↑ as produc^n ↑↑
  ↓↓ as produc^n ↓↓

eg - Raw materials, direct labour

Short-Run Cost

→ Costs associated with production in immediate or near future.

→ Some factors of production, such as plant capacity, are fixed & cannot be easily changed.

→ Include both Fixed & Variable cost.

Long Run Cost

→ Costs associated with production when all factors of production can be adjusted or changed.

→ A business can vary its plant capacity, labor force & other inputs

→ Includes all costs as they can be adjusted to achieve desired level of production

14

CREDIT Creation :

1. Initial deposit :
2. Reserve Requirements :
3. Reserve Creation :
4. Loan Disbursement :
5. Multiplier Effect :
6. Repeat Cycle :
7. Money Supply Expansion :

Sa Indian Economy

Salient Features of Indian Economy:

→ Large Population Pressure
→ Income & Trade
→ High Dependence on Agriculture
→ Education
→ Health
→ Employment
→ Prevalence of Large Scale Unemployment & Underemployment
→ Environmental Pollution & Degradation
→ Business Environment
→ Science & Technology
→ Poverty & Malnutrition
→ Status of Inform^{n} & Communic^{n}
→ Infrastructure

Guiding Principles of India's 5 Year Plan -

- Socialistic Pattern of Society
- Self-Reliance
- Balanced Regional Development
- Public Sector Dominance
- Community Development
- Import Substitution
- Long-Term Perspective

Economic Planning : Long term plans of government for growth & development through efficient utilisation of resources.

→ It encompasses political measures that need to be taken to achieve predetermined objectives.

It started in 1950. Planning Commission set up by GOI.
National Development Council - 6 Aug 1952
↳ Approve 5 yr plan

Five Year Plans :

① FIRST FIVE Year Plan (1951-1956) (Harrod-Domar Model)

Focus : Rapid Agriculture Development
Achievement of food self-sufficiency & control of inflation

- Bhakra Nangal Dam, Hirakud Dam project started
- Five IIT's started as major technical institution.

Target growth - 2.1%
Achieved growth - 3.6%

② SECOND Plan (1956-1961) (Nehru-Mahalanobis Model)

Focus : Rapid Industralisation & Development of Basic & Heavy Industries

- 5 Steel plant of Bhilai, Durgapur & Rourkela Industry established
- Hydroelectric power projects established

Target growth - 4.1%
Achieved growth - 4.27%

③ THIRD-PLAN (1961-1965) (Gadgil Yojana)

Focus : Objective of self-Reliant & self-Generating Economy
: Industry, Transport, Communication
- Panchayat Raj System established - 1st election Rajasthan (Nagaur)
- State electricity boards & 2° education boards : formed

Target growth - 5.6%
Achieved growth - 2.4%

failed due to
- Indo-china War (1962)
- Indo-Pak war (1965)
- Droughts (1965-66)

④ Annual Plans (PLAN HOLIDAY) (1966-69).

↳ Due to Drought in the country & Inflation

Focus : Resolving crisis in Agriculture & food Shortage

"GREEN Revolution" was Implemented

→ Use of high-yielding varities (HYV) seeds, fertilizers; exploit" of irrigation potential
2-coil concept

⑤ FOURTH Five Year Plan - (1969-74)

Focus: Self Reliance, Growth & Stability
→ Improve domestic food produc°
→ Nationalisation of 14 major Indian Banks (of Banking)
→ Green Revolution in India : advanced
15 August 1969 - ISRO

Problems
↳ Indo-Pak war (1971)
↳ oil crisis (1972-73)

Target growth: 5.7%
Achieved growth: 3.3%

⑥ FIFTH Five Year Plan (1974-79) (DD Dhar Poverty Elimination - Garibi Hatao)

focus: Removal of Poverty
Attainment of Self-Reliance

Electricity Act : 1975

Target growth: 4.8%
Achieved growth: 4.4%

• Plan terminated in 1978 when Janata Govt. came to power

Problem → Emergency 1975

⑦ # Two Years Rolling Plan (1978-1980) framed

↳ 1978-1979 : (concept by Gunnar Myrdal)
1979-1980

→ Five Year plan will be revised every year in light of performance of every sector.
→ This plan worked till 1983 & then Congress removed it & come with again

⑧ SIXTH Five Year Plan (1980-85) (Janata Govt. Plan)

focus: Poverty eradication, Higher economic growth
Modernisation of technology

- Trickle down strategy discarded
→ Expansion of family Planning measures
  - IRDD Oct 1980
  - IVRED "
  - RLEGP 15 Aug 1983

Target growth: 5.2%
Achieved growth: 5.7%

⑨ SEVENTH Five Year Plan (1985-1990)

focus: Removal of poverty & self-sustain economy.
→ Increase employment opportunities → Raise productivity
→ Accelerate growth in food grains production

employment generation programmes: Jawahar Rozgar Yojana

Target growth rate = 5%
Achieved growth 6%

(10) Annual Plan (1990-1992): Two annual plans commenced for the year 1990-91 & 1991-92 due to political instability at the centre & economic crisis.

(11) EIGHTH Five Year Plan (1992-97) (Rao & Manmohan Plan)
Plan introduced against background of worsening Balance of Payment situations & high inflation in 1990-91.
Focus: Human resource development, Private sector; Modernisation of Industry
↳ (Inflation ↓)
#New Economic Policy (Liberalisation, Privatisation & Globalisation) - LPG launched
NEP
Target growth: 5.6%
Achieved growth: 6.8% (Highest annual economic growth rate)
: Growth in exports & imports
- Improvement in Trade & Current Account deficit
→ High growth of agriculture & allied sector, manufacturing sector.

(12) NINTH Five Year Plan (1997-2002)
Focus: Growth with social Justice & equity
Stressed upon 4 dimension:
→ Quality of life
→ Generation of productive employment
→ Regional balance
→ Self-reliance
• Priority to agriculture & rural development to generate adequate productive employment & eradicate poverty
Target growth: 6.5%
Achieved growth: 5.5%
Problem: Kargil War (1999)

(13) TENTH Five Year Plan (2002-07)
Focus: Reduction in Gender Gaps in Literacy.
→ Achieve 8% GDP growth rate
→ Reduce poverty ratio by 15% by 2012
→ Increase literacy rate in country by 75% by 2007
Target growth: 8.1%
Achieved growth: 7.7%
(India emerged as fastest growing economies by end of Tenth Plan)
• The savings & investment rates ↑↑ increased
• Industrial sector had responded well to face competition in global economy
• foreign Investors were keen to Invest in India.

(14) ELEVENTH Five Year Plan (2007-2012) (C. Rangarajan)
Focus: Faster & more Inclusive growth
- Gender equality
- Electricity
- Telephone to all villages
Target growth: 9%
Achieved growth: 7.8%
1st yr. growth rate = 9.1%; then fall to 6.7%
Problem: Global Financial Crisis (2008-09)

(15) TWELFTH PLAN (2012-2017)

Focus: Faster, Sustainable, more Inclusive growth.

Target growth: 8%

- 2014; NDA Government established NITI Ayog (as Planning commission)
(1 Jan, 2015) (National Institution for Transforming India)

vision: "Maximum Governance, Minimum Government, echoing the spirit of 'cooperative federalism'

Action Plan = 3 yrs
Strategy Plan = 7 yrs
Vision Plan = 15 years

Economic Planning | 5 Year Plans

→ 1st Five Year Plan (1951-56)
(Harrod Domar model)
• Agriculture development; food self sufficiency

→ 3rd Year Plan (1961-65)
(Gadgil Yojana)
• Self Reliant & self generating economy
- Panchayat Raj system
Problem: Indo-china war, Indo-Pak war, Drought

→ 4th Year Plan (1969-74)
• Self Reliance; growth & Stability
Nationalisation of Banking, ↑↑ food Product°
Problem: Indo-Pak war, Oil crisis

→ Rolling Plans (1978-80)
(3 yrs) Revising 5 yr plan of every yr

← 2nd Five Year Plan (1956-61)
(Nehru Mahalanobis model)
• Rapid Industrialisn; 5 steel plants, Hydroelectric power

← ~~4th Five Year Plan~~
Annual Plans (1965-69)
(Plan Holiday)
Brought in country & Inflation
Green Revol°

← 5th Year Plan (1974-79)
(DD Dhar - Poverty Elim° - Garibi Hatao)
• Remove poverty; attain self reliance
Problem - 1975 Emergency
(Plan terminated in 1978 by Janata Govt)

← 6th Year Plan (1980-85)
(Janata - Govt · Plan)
Poverty eradic°; Modernis° of technology
Highest economic growth; Family Planning measure

← 7th Year Plan (1985-90)
Removal of poverty; self sustain economy
Employment gener° programme: Jawahar Rozgar Yojana

→ Annual Plans (1990-1992)
Political Instability at centre & Economic crisis
• worsening Balance of Payments
• High Inflation

← 8th Year Plan (1992-97)
(Rao & Manmohan Plan)
Human Resource development; private sector modernisation of industry.
• NEP (LPG: Launched)
↑↑ in trade; imports - exports.
↓↓ in Inflation

→ 9th Year Plan (1997-2002)
• Growth with Social Justice & equity
• Agriculture; rural develop for employ
Problem - Kargil war (1999)

← 10th Year Plan (2002-2007)
Reduc° in Gender Gap in literacy
Achieve 8% GDP; ↓↓ poverty by 15%.
Savings & Investment rates ↑↑

→ 11th Year Plan (2007-2012)
- Faster & more Inclusive Growth
• Gender equality, telephone to all villages
Problem - Global financial crisis (2008-09)

← 12th Year Plan (2012-2017)
Faster, Sustainable; more Inclusive Growth
target growth: 8%

2014: NDA govt established NITI Ayog on 1st Jan, 2015 (Planning committee)

Growth rate (%)

Year Plan	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Target	2.1	4.1	5.6	5.7	4.8	5.2	5	5.6	6.5	8.1	9	8
Achieved	3.6	4.27	2.4	3.3	4.4	5.7	6	6.8	5.5	7.7	7.8	—

Business Risk -

1) Economic Indicators to evaluate Business risks
2) Financial Indicators
3) Political Indicators
4) Social Indicators
5) Legal Indicators

- Economic Indicators : Macroeconomics - GDP, Inflation rate, unemployment rate, BOP
  Microeconomics - Infrastructure, electricity, road, raw materials
- Financial Indicators - Status of Money, Capital market
  Time taken in getting Bank Loan
  Devaluation of Local currency
- Political Indicators - Macro : External war, Terrorist indulgence, unstable govt., Law & order
  Micro : Dishonesty, Time taken in getting permission
- Social Indicators - social Cohesiveness
  acceptance to foreign citizen
  Law & order situation
  Institutional framework.
- Legal Indicators

Numericals : PRICE Elasticity of Demand

Price elasticity of demand $|e_d| = \frac{\text{Marginal cost}}{\text{Average cost}}$

① MARGINAL COST / AVERAGE COST

(Pg-197)

Eg 1

Demand Function : $q = 25 - 4p + p^2$

q : demand for commodity

Marginal func^n $= \frac{dq}{dp} = -4 + 2p$

Average func^n $= \frac{q}{p} = \frac{25 - 4p + p^2}{p}$

$\therefore |e_d| = \frac{\text{Marginal func}^n}{\text{Average func}^n} = \frac{-4+2p}{\frac{25-4p+p^2}{p}}$

$$|e_d| = \frac{(-4+2p)p}{25-4p+p^2}$$

If $p = 4$; $|e_d| = \frac{(-4+8)\times 4}{25-16+16} = \frac{16}{25} = 0.64$; $|e_d| < 1$

If $p = 5$; $|e_d| = \frac{(-4+10)\times 5}{25-20+25} = \frac{30}{30} = 1$; $|e_d| = 1$

If $p = 8$; $|e_d| = \frac{(-4+16)8}{25-32+64} = \frac{96}{57} = 1.7$; $|e_d| > 1$

Eg 2 (Pg-198)

Demand Law : $q = 10 - p$ near pt. $q = 4$ $p = Rs\,6$

If price ↑ by 5%. ; % ↓↓ in demand = ?

& ∴ e_d

Ans. ↑↑ Price $= 6 + \frac{6\times 5}{100} = 6.30$

Rise in Price $= 6.30 - 6 = 0.30$ Rs

Acc. to the Demand Law; the new demand is

$q = 10 - 6.30 = 3.30$

Decrease in demand = 3·30 − 4 = 0·7

∴ Rise in Price = 0·30

% rise = $\frac{0.30}{6} \times 100 = 5\%$

Fall in Demand

$= -\frac{0.70}{4} \times 100 = 17.5\%$

$$|ed| = \frac{\%\text{ change in demand}}{\%\text{ change in price}}$$

$\therefore |ed| = \frac{17.5\%}{5\%} = 3.5$

$\therefore |ed| > 1$

: NEW & OLD DEMAND & PRICE

Eg 3 (Pg-199)

Milk : $|ed| = 1$

Old price = Rs 35/L — Old demand = 70 L

New price = Rs 40/L — New demand = ? q

$$|ed| = \frac{\text{New demand} - \text{old demand}}{\text{New price} - \text{old price}} \times \frac{\text{Old price}}{\text{Old demand}}$$

$$1 = -\left(\frac{q - 70}{40 - 35} \times \frac{35}{70}\right)$$

$10 = -(q - 70)$

$10 = -q + 70$

$10 - 70 = -q$

$-60 = q$

∴ New demand = 60 L

Eg 4 (Pg 199)

$|ed| = 1$ — Old demand = 5 kg — Old price = 80₹

New demand = 6 kg — ?

$$|ed| = -\left(\frac{6\text{kg} - 5\text{kg}}{x - 80} \times \frac{80}{5}\right) = 1$$

$$= -\left(\frac{1}{x - 80} \times \frac{16}{1}\right) = 1$$

$-16 = x - 80$

$x = -16 + 80$

$x = ₹64$

∴ New price = ₹64

USING CALCULUS : $|e_d|$

Eg 5 (Pg 200) Demand law : $x = \frac{20}{p+1}$; price at point where $p = 4$

$$|e_d| = \frac{dx}{dp} \times \frac{p}{x} = \frac{-20}{(p+1)^2} \times \frac{p}{\frac{20}{(p+1)}}$$

$$|e_d| = \frac{-20}{(p+1)^2} \times \frac{p(p+1)}{20} = \frac{-p}{p+1}$$

At $p = 4$ $\therefore |e_d| = -\frac{4}{5}$; $|e_d| < 1$

CROSS ELASTICITY OF DEMAND :

Eg 6 (Pg 200)

q_1 (Price) — Price — Rs 60 — Rs 75 — Δ price $\uparrow\uparrow$ = Rs 15 (75-60)

q_2 (Demand) — Quantity — 7kg — 10 kg — Δ quantity $\uparrow\uparrow$ = 10-7 = 3kg

dp_1 : change in price of q_1 product

dq_2 : change in quantity demand of q_2 product

$$e_d^* = \frac{dq_2}{dp_1} \times \frac{p_1}{q_2} = \frac{3}{15} \times \frac{60}{7} = \frac{12}{7} = +1.7$$

$e_d^* > 1$; commodity q_1 & q_2 : COMPETITIVE

$$e_d^* = \frac{\text{change in quantity demand of (B)}}{\text{change in money price (A)}} \times \frac{\text{old price (A)}}{\text{old quantity demanded (B)}}$$

Project Planning

A project consists of ~~the~~ unbroken related activities that needs to be performed in a logical sequence to maximize the return

Step 1: Market Survey & Forecasting - It is commercial survey to assess the feasibility of the business proposal. It provides necessary statistical information to know its demand function to take effective short-run operating decision & long run planning decision.

- Elasticity of demand
- Price elasticity of demand

→ Business Risk Analysis

Forecasting - Estimation of future demand of a product under given market conditions.

- Criteria for selection
- Evaluating a forecast
- Criteria for demand forecast

Methods:

→ Survey of Budget opinion

→ Sales person polling

→ Delphi method

- Trends through Regression Methods

Step 2: Planning & Budget Preparation

- Decision Analysis
- Decision Making Environment
- Condition of Risk
- for taking decision under risk

↳ Expected Monetary Value (EMV)

- Budget Preparation

Step 3 : Managing Finance

- Fixed Capital
- Working Capital
- Source of Financing

Capital Budgeting

Step 4 : Assembling The Inputs

- Selec" of site
- Operation Planning
- Material Handling

Step 5 Execution

Factors affecting price

- → Nature of market → Public Utility Items
- → Government Policy → Margin of rebate/concession
- → Nature of sales → Warranty & After Sale service
- → Demand & Supply
- → Competitor's price

- Revenue of a firm

Green Revolution - (mid 1960s)

⇒ Introduction of high yielding varities by using pesticides & fertilizers to ↑↑ crop protection.

→ Introduc" to HYV seeds (1965)
→ ↑↑ use of chemical fertilisers & pesticides
→ Improvement in Irrigation Infrastructure
} to ↑↑ agricultural production

- World: Norman Borlaug.
- India: M.S. Swaminathan

End result: To make India self-sufficient in food grains.

Main Features -

1. Introduc" to new & High Yield variety seeds.
2. ↑↑ use of ch. fertilizers, pesticides to reduce agricultural loss.
3. use of latest agricultural machinery like tractor, seed drills, threshers & harvesters.
4. Expansion & Improvement of Irrigation facilities. Canals, Tubewells.
5. Use of disease-resistant varities of crops so that produc" will enhance.
6. Gener" employment; ↑↑ income levels & improving standards of living

PROS

Crops:
- → Grows faster
- → Multiple Yields (X3 ~ X4 time)
- → ↑↑ quality of food
- → ↑↑ tolerance to disease, pests & weeds
- → Reduction of Biodiversity

CONS

- → Expensive seeds
- → More ferti izer, water, req pesticides required.
- → Increase of class disparities
- → Health impacts from ↑↑ pesticides & fertilizer
- → Soil Degradation, Water Bllod
- → Sustainability concerns

White Revolution (~~mid~~ 1970s)

↳ Aimed to transform India's dairy sector. By Ge

- Operation Flood: make India self sufficient in milk production.
  (component of White Revol")

#Father of White Revolution – Dr. Verghese Kurie
(India)

Objectives –
- → To ↑↑ milk production
- → Augment rural incomes
- → Fair prices for consumers.

Key Aspects:
- → Cooperative Dairy Model
- → Introduc° of Crossbred Cattle
- → Infrastructure development
- → Marketing & Distribution =(NDDB)

Impact ;
- → ↑↑ milk Production
- → Rural Empowerment
- → Nutritional Impact
- → Export Capability

Markets: Numericals

Example 17 (Pg 233): Perfect competition Firms

Demand Func^n (price) $p = 32 - q$ $\quad TR = p \cdot q$

Total cost Func^n $TC = q^2 + 8q + 4$

What level of o/p will maximise total profit? Calculate corresponding Total cost & profit (P)

Ans. For Profit maximization, these two cond^n must be satisfied

I $\quad \frac{d\pi}{dx} = \frac{d(TR)}{dx} - \frac{d(TC)}{dx} = 0$

$MR = MC$

II $\quad \frac{d^2\pi}{dx^2} = \frac{d^2(TR)}{dx^2} - \frac{d^2(TC)}{dx^2} < 0$

$\pi = TR - TC$

π: profit
TC: total cost
TR: total revenue

→ $TR = p \cdot q = (32 - q)q = 32q - q^2$

$MR = \frac{d(TR)}{dq} = 32 - 2q$

→ $TC = q^2 + 8q + 4$ $\quad MC = \frac{d(TC)}{dq} = 2q + 8$

1st order cond^n:

At eqb^m: $MR - MC = 0$ $\quad MR = MC$

$32 - 2q - 2q - 8 = 0$

$\therefore q = 6$

for 2nd order cond^n: $\frac{d^2\pi}{dq^2} = \frac{d^2(TR)}{dq^2} - \frac{d^2(TC)}{dq^2} < 0$

On putting q ($q=6$) in demand func^n $p = 32 - q = 32 - 6 = 26$

Putting q in TR eq^n; $TR = p \cdot q = 26 \cdot 6 = 156$

$TR = (32 - q)q$ from above ~~$TR = (p+q-q^2)$~~

$p = 26$

$TR = 156$

$TC = q^2 + 8q + 4 = (6)^2 + 8 \times 6 + 4 = 88$ $\quad TC = 88$

$\therefore \pi = TR - TC = 68$

Example 18 (Pg 236) **Monopolistic market**

Linear Demand Func^n $p = 80 - 6q$

Linear Tost Cost Func^n $TC = 50 + 20q$.

eqb^m level of o/p, price & profit

Ans: Price $p = 80 - 6q$ — ①

$TC = 50 + 20q$ — ②

$\boxed{TR = pq}$

$TR = (80 - 6q)\,q = 80q - 6q^2$ — ③

Profit; $\pi = TR - TC$

$\pi = 80q - 6q^2 - 50 - 20q$ — ④

→ for profit maximisation

$$\boxed{\frac{d\pi}{dq} = 0}$$

Diff wrt dq;

$\therefore \frac{d\pi}{dq} = 80q - 6q^2 - 50 + 20q = 0$ — ⑤

$d\pi/dq = 80 - 12q - 20 = 0$ $\qquad \boxed{d\pi^2/dq^2 = -12}$

$12q = 60$

$\boxed{q = 5}$ → Put in ① eq^n

Price $p = 80 - 6q = 80 - 30 = \underline{50 = p}$

put $q = 5$ in ⑤ eq^n

$\pi/ \quad \pi = 80q - 6q^2 - 50 - 20q$

$= 400 - 150 - 50 - 100$

$\pi/ \quad \pi = 400 - 300$

$\pi/ \quad \underline{\pi = 100}$

2nd order eq^n for Profit maximis^n $d^2p/dx^2 < 0$

$\boxed{d^2p/dx^2 = -12 < 0}$ proved $\therefore$ Hence proved

FORMULAS

- Price elasticity of demand $|e_d| = \frac{\text{Marginal cost}}{\text{Average cost}}$
- $|e_d| = \frac{\text{Marginal Func}^n}{\text{Average Func}^n}$ i.e. $\left[\frac{(dq/dp)}{(q/p)}\right]$
- $|e_d| = \frac{\%\text{ change in Demand}}{\%\text{ change in Price}}$ [Fall in demand = -ve]
- $|e_d| = \frac{\text{New demand} - \text{old demand}}{\text{New Price} - \text{Old Price}} \times \frac{\text{old Price}}{\text{old demand}}$
- $|e_d| = \text{Diff. demand law} \times \frac{P}{\text{Demand law}}$ (-ve in formula if demand ↑ or price ↓)
- $e_d^* = \frac{\text{change in quantity demand (of B)}}{\text{change in Money/Price (of A)}} \times \frac{\text{old price (A)}}{\text{old quantity demanded (B)}}$

PERFECT COMPETITION :

π: profit
TC: Total cost
TR: Total Revenue

Profit maximisⁿ

$\frac{d\pi}{dx} = \frac{d(TR)}{dx} - \frac{d(TC)}{dx} = 0$

MR = MC MR − MC = 0

$\frac{d^2\pi}{dx^2} = \frac{d^2(TR)}{dx^2} - \frac{d^2(TC)}{dx^2} < 0$

$\pi = TR - TC$

TR = Demand . Demand Funcⁿ

MONOPOLISTIC COMPE MARKET :

p : ~~price funcⁿ~~ (Demand Funcⁿ) differentiate = 0

TR = Demand . Demand Funcⁿ

Calculate π (profit)

B. Economic Analysis -

- Profit-Volume (P/V ratio) = $\frac{\text{Contribution}}{\text{Sales}} \times 100$
- P/V ratio = $\frac{\text{Sales} - \text{Variable cost}}{\text{Sales}} \times 100$
- Total cost = Fixed cost + $\frac{\text{Variable cost}}{\text{unit}}$ x demand
- Contribution = Sales - Variable cost
- $\frac{\text{Contribution}}{\text{unit}} = \frac{\text{Selling point}}{\text{unit}} - \frac{\text{Variable cost}}{\text{unit}}$
- Profit = Contribution - fixed cost
- Margin of safety = Actual Sales - Break even sales
- MS = $\frac{\text{Profit}}{\text{P/V ratio}} \times 100$
- Economical Advantage = | Δ Total cost of 2 ways | methods |

P: selling price/unit
VC: Variable cost/unit
FC: Fixed cost.
x: volume of production
∴ Total Revenue = Px

- Break-Even Point = $\frac{\text{Fixed cost}}{\text{Selling price/unit} - \text{Variable cost/unit}} = \frac{FC}{P/\text{unit} - VC/\text{unit}}$

$$\boxed{BEP = \frac{\text{Fixed cost}}{\text{P/V ratio}} \quad \left| \quad = \frac{\text{Sales} - \text{variable cost}}{\text{sales}} \right.}$$

- Total Revenue = Selling price/unit x vol. of production
- Break-Even Sales = $\frac{\text{Fixed cost}}{\frac{\text{Selling price}}{\text{per unit}} - \frac{\text{Variable cost}}{\text{per unit}}} \times \frac{\text{Selling price}}{\text{per unit}}$

$= \frac{FC}{P - VC} \times P$

- Break-Even Sales = (Break even point) × Selling price / unit

---

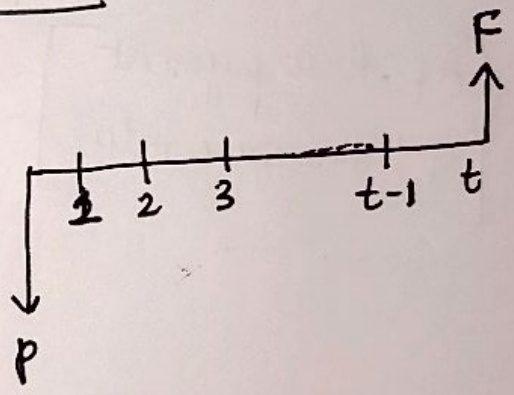
Interest formulas:

- Simple Interest = $\frac{P \cdot R \cdot T}{100}$
- Interest rate = $\frac{r}{100}$ or $r\%$
- GP sum formula : $S_n = \frac{a(r^n - 1)}{r - 1}$

F = Future Amount
P = Present Amount
A = Installment Amount

Single Payment Compound Amount

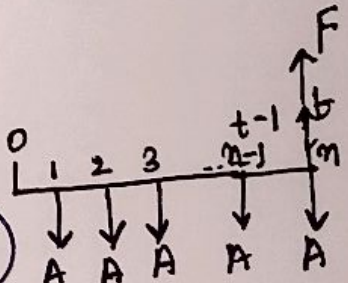
- $F = P(1 + r\%)^t$
(Find Compound Amount)



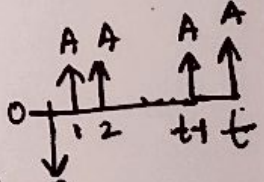
- $P = \frac{F}{(1 + r\%)^t}$
(Find Initial funding)

Equal Payment Series

- $f = A\frac{((1+r\%)^t - 1)}{r\%}$ (Find Compound Amount)



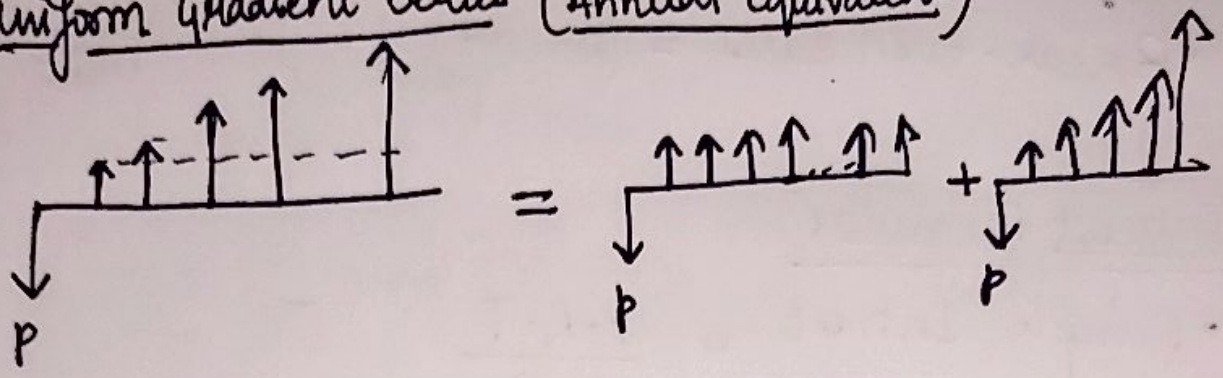
- $A = F\frac{r\%}{((1+r\%)^t - 1))}$ (Find Equal Payment Value)



- $A = \frac{P \cdot r\% \cdot (1+r\%)^t}{((1+n\%)^t - 1)}$ (Capital Recovery)

- $P = \frac{A \cdot ((1+r\%)^t - 1)}{n\% \cdot (1+n\%)^t}$ (Present worth)

Uniform Gradient Series (Annual Equivalent)



$$A = A_1 + G \times (A/G, r\%, t)$$

$$(A/G, r\%, t) = \frac{(1+r\%)^t - 1 - r\% \times t}{r\%\left((1+r\%)^t - 1\right)}$$

$$\therefore A = A_1 + G\left[\frac{(1+r\%)^t - 1 - r\% \cdot t}{r\%\left((1+r\%)^t - 1\right.}\right]$$

[A_1 : First payment
G : Increase value]

Price Elasticity of Demand

$$e_d = \frac{\Delta q\%}{\Delta p\%}$$

$e_d = 0$ = Perfectly Inelastic

$|e_d| < 1$ = less than unit elastic

$|e_d| = 1$ = unit elastic

$|e_d| > 1$ = more than unit elastic

$e_d = \infty$ = Perfectly elastic

$e_d < 0$ = Normal good

$e_d > 0$ = Griffen good

Income Elasticity of Demand

$$e_y = \frac{Q_{new} - Q_{old}}{Q_{old}} \times \frac{I_{old}}{I_{new} - I_{old}}$$

$$e_y = \frac{dQ}{dY} \cdot \frac{Y}{Q}$$

$e_y < 0$ - Inferior goods } Inelastic

$e_y > 0$ - Normal goods }

$e_y < 1$ - Necessity

(~~+ve~~) $e_y > 1$ - Luxury } elastic

Cross Plasticity of Demand

$$e_d^* = \frac{dQ_x}{dP_y} \times \frac{Y}{X}$$

(+ve) $C_d^* > 0$ - Substitute good

(-ve) $C_d^* < 0$ - Complimentary goods

$C_d^* = 0$ - Accomodities X & Y not related

Unsolved Exercise (Pg 238)

	Initial	Now
(1.) Price =	₹10	₹9
Demand	100	115

$$|e_d| = -\left(\frac{115-100}{9-10}\right) \times \frac{10}{100}$$

$$|e_d| = \frac{15}{1} \times \frac{1}{10} = 1.5$$

$$\therefore |e_d| = 1.5$$

---

(4) Profit maximisⁿ

(i) Demand funcⁿ $q = 45 - 3p$

Total Revenue = Demand funcⁿ × Demand

$$TR = q \cdot p = (45-3p)p = 45p - 3p^2$$

Average Revenue = $\frac{\text{Total Revenue}}{\text{Demand funcⁿ}}$ =

$$= \frac{45p - 3p^2}{q} = \frac{45p - 3p^2}{45 - 3p}$$

Marginal Revenue = $\frac{d(TR)}{dq} = 45 - 6p$

when; $p = 12$; $q = 45 - 3p = 45 - 36 = 9 = q$

$p = 10$; $q = 45 - 3p = 45 - 30 = 15 = q$

$$|e_d| = -\left(\frac{15-9}{10-12}\right) \times \frac{12}{9} = \frac{2}{2} \times \frac{12}{3} 4 \quad \therefore |e_d| = 4$$

(ii) Perfect competition : demand func^n $p = 32 - q$

total cost func^n $TC = q^2 + 8q + 4$

$TR = p \cdot q$

$= (32 - q)q = 32q - q^2$

for profit maximisn;

$MR - MC = 0$

$\frac{d(TR)}{dq} - \frac{d(TC)}{dq} = 0 \quad \left(\because \frac{d(\pi)}{dq} = 0\right)$

$\frac{d}{dq}(32q - q^2) - \frac{d}{dq}(q^2 + 8q + 4) = 0$

$(32 - 2q) - (2q + 8) = 0$

$32 - 2q = 2q + 8$

$24 = 4q$

$\boxed{q = 6}$

$\therefore$ 6 units

for $q = 6$

$p = 32 - q$

$= 32 - 6$

$\boxed{p = Rs\ 26}$

(iii) Demand func^n $p = 20 - 4q$

Total cost func^n $TC = 8q - q^2$

$: 20q - 4q^2$

$\frac{d(TR)}{dq} = (20 - 8q)$ $\quad d(TC) = 8 - 2q$

$20 - 8q = 8 - 2q$

$12 = 6q$

$\boxed{q = 2}$

Price $= p = 20 - 4q$

$p = 20 - 4 \times 2$

$\therefore \boxed{p = 12}$

(iv) Demand func^n

$p = 90 - q$

$TC = 10 + 2q + 3q^2$

Monopolist firm

Before Tax: $\boxed{p = 90 - q}$

$TR = p \cdot q = (90 - q)q = \boxed{90q - q^2 = TR}$

$\frac{d(TR)}{dq} = 90 - 2q$ $\quad$ profit $= TR - TC$

$= 90q - q^2 - 10 - 2q - 3q^2$

profit $= 88q - 4q^2 - 10$

After Tax: $\boxed{\frac{dp}{dq} = 0.}$

$88 - 8q - 0 = 0$

$\boxed{q = 11}$. $\quad p = 90 - 11 = \boxed{79 = p}$

$p = 88q - 4q^2 - 10$

$= 88(11) - 4(11)^2 - 10$

$= 968 - \quad = \boxed{474 = p}$

$p = 79 + 8 = 88$ ₹ $= 87$ ₹

$q = 1$

$p' = 79 + 8$ ₹ $= 87$ ₹

New profit func^n

$p = 90 - q$

$q = 3$

$p = 88q - 4q^2 - 10$

$= 88(3) - 4(9) - 10$

$p = 218$

Q(V) $5q = 375 - 3p$ $\quad TC = 500 + 13q + \frac{q^2}{5}$

$q = 75 - \frac{3}{5}p$

$q = \frac{375}{3} - \frac{5q}{3}$

$TR = q \cdot p = \left(125 - \frac{5}{3}q\right) q$

$p = TR - TC =$

$TR = q \cdot p = \left(125 - \frac{5}{3}q\right) q$

$= 125q - \frac{5}{3}q^2$

$\pi = TR - TC = 125q - \frac{5}{3 \times 5}q^2 - 500 - 13q - \frac{q^{2 \times 3}}{5 \times 3}$

$\pi = -500 + 112q - \frac{28}{15}q^2$

$= 0 + 112 - \frac{56}{15}q$

$\frac{56}{15}q = 112$

$q = 30$

profit
$= 3360 - 1680 - 500$
$= 1180$ ₹

Pg 265 Economic Analysis

Eg 6 quintal : 1000

S.no.	Particular	Nearby shop	outside shop
1.	DISTANCE	4 km	100 km
2.	TRANSPORT COST	₹ 700/km/quintal	₹ 700/km/q
3.	MATERIAL COST	₹ 8150/quintal	₹ 5200/quin

Ans.

Nearby shop	Outside shop	
₹ 81,50,000	₹ 52,00,000	Total Material cost
700×4×1000 = ₹28,00,000	700×100×10.00 ₹ 1,00,00,000	Transport
₹ 1,09,50,000	₹ 7,52,00,000	Total

↳ economical

Economical advantage = ₹ 7,52 Lakh − ₹ 1,09,50,000.
= ₹ 6,42,50,000/-

Eg 7

Sheet : 60 m²

	Galvanized Iron	Aluminium
	Rs 70/m² = 4200 Rs	Rs 90/m² = 5400 Rs
	finishing } Rs 5000 Bending } + ₹ 1700 = 6700	₹ = Rs 6050 Rs + 1250 = ₹ 7300
	2 kg × 850 ₹ = 1700	-
	= ₹ 12,600	₹ 12,700

↳ economical

Eg8

1000 km.

Quantity	PVC pipe	Reinforced concrete
	200 m	200 m pipe
Weight/m	7 kg	10 kg
cost/m	800 Rs	950 Rs
Transport cost	₹7/kg/50km	₹10/kg/50km

⇒

	PVC	Reinforced
Weight	7 X 200 = 1400 kg	200 X 10 = 2000 kg
cost of pipe	800 X 200 = 1,60,000₹	950 X 200 = 1,90,000 ₹
Transp. cost	7 X 1400 X 1000/50 = 1400 X 1400 = ₹ 1,96,000	10 X 2000 X 20 = ₹ 4,00,000
Total	Rs 3,56,000/-	Rs 5,90,000

∴ Economic advantage = 2,34,000 ₹

Eg9

	Lime soda process	Zeolite
Price/kg	lime: Rs 755/kg soda: Rs 390/kg 3775 + 1170 = 4945 Rs	Price/kg: Rs 890/kg = Rs 5340
For 100L	5 kg lime 3 kg soda	= 6 kg zeolite
Add°	- Rs 6000 + 4945 = 10,945₹	Rs 3900 = 5340 + 3900 = Rs 9240

Pg 274 Eg 17

Make | Buy

Sales = ₹ 1,00,000

Fixed cost = ₹ 40,000

Variable cost = ₹ 45,000

(i) Contribut^n = Sales − VC = 55k ₹

(ii) Profit = Contribut^n − FC

= Sales − VC − FC = 55k − 40k

= 15k ₹

(iii) P/V ratio = $\frac{\text{Contribut}^n}{\text{Sales}} \times 100 = \frac{55k}{100k} \times 100 = 55\%$

(iv) BEP = $\frac{FC}{P/V \text{ ratio}} = \frac{40k}{55} \times 100 = 72,727.27$

(v) MS = $\frac{\text{Profit}}{P/V} = \frac{15k}{55\%} * 100 = 27,272.73$

Eg 18

SP = Rs 4500/each

F.C. = Rs 40,00,000

V.C. = Rs 2000/screen

BEP = $\frac{40,00,000}{4500 - 2000} = 1600$

BEP > Annual demand

∴ Purchase from market.

Eg 19

Cost fixed = 26,10,000

V.C. = 860 + 1400 = 2260/tyre

SP = 4500/tyre

BEP = $\frac{26,10,000}{4500 - 2260} = 1165.18$

Pg 289

Eg 27 $A_1 = 10,00,000$

$G = Rs\ 10,000$

$r = 12\%$

$t = 10\ yrs$

$A = ?$

$F = ?$

$$A = A_1 + G(A|G, r, t)$$

$$A = A_1 + G\left[\frac{(1+r\%)^t - 1 - r\%\cdot t}{r\%\,(1+r\%)^t - 1}\right]$$

$$A = 10,00,000 + 10,000\left[\frac{(1\cdot12)^{10} - 1 - 0\cdot12\times10}{(0\cdot12)\left((1\cdot12)^{10} - 1\right)}\right]$$

$$A = 10,00,000 + 10,000 \times 3\cdot5847$$

$A = \underline{Rs\ 10,35,847}$] If all installments are of equal amt.

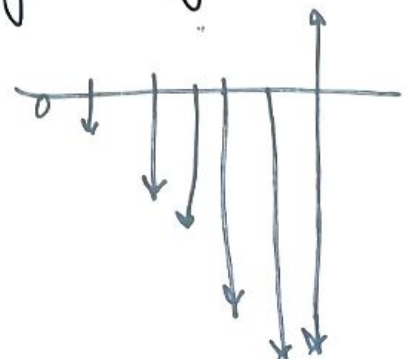
Future Amount $F = A\left(\frac{(1+r\%)^t - 1}{r\%}\right)$

$$F = 10,35,847 \times \left(\frac{(1\cdot12)^{10} - 1}{0\cdot12}\right)$$

$$F = 10,35,847 \times 17\cdot549$$

$F = Rs\ 1,81,78,079$

↳ Amount company will get.



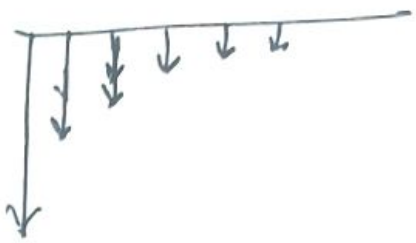
Eg 28

$A_1 = Rs\ 10,00,000$

$G = -Rs\ 10,000$

$t = 10\ yrs$

$r = 12\% = 12/100 = 0.12$



$$A = A_1 - G(A/G, r\%, t) = A_1 - G\left[\frac{(1+r\%)^t - 1 - r\%\cdot t}{r\%(1+r\%)^t - 1}\right]$$

$= 10,00,000 - 10,000 \times 3.5847$

$= Rs\ 964153$

If installments are of same amount;

$f = A(f/A, r\%, t)$

$$F = 964153 \times A\left(\frac{(1+r\%)^t - 1}{r\%}\right)$$

$= 964153 \times 17.549$

$= 16,919,921\ Rs$

Production Func^n - Relationship b/w Inputs (Labor, capital) & outputs (goods & services) in Production Process.

When I/p ↑↑ then effect on O/p -

(1.) **Law of Diminishing Marginal Returns**

↑↑ Marginal Return.

(2.) **Optimal O/p**:

When MCost = M. Profit } max η

(3.) **Negative Return**.

Sustainable Development :→ Development : Meets need of present w/o comprosing the ability of future gener^n to meet their own needs.

'Balancing Prosperity & Environment Responsibility'

1). Clean Energy Sol^n

2.) Effective water Mngmt.

3.) Innov^n in Agriculture

4.) Waste Management

5.) Biodiversity conserv^n

Liberalisⁿ - Reducing govt. control & restriction on various sectors; promoting competition & encouraging private enterprise.

Privatisⁿ : Reduce involvement of govt. in non-strategic sectors by selling off from public sector enterprise.

Globalisⁿ : Opening economy to global markets.