

#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 business
- 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, sun rays
(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

*Weblens Goods: consumer goods violating law of demand
Demand ↑↑ with price ↑↑

↳ Price elasticity is negative

→ Transferable v/s Non-Transferable

→ Complementary v/s Substitute

→ Material v/s Non-material

Normal Goods - Demand ↑↑ with ↑↑ in income

↳ Price elasticity
is negative

→ Inferior goods.

↳ demand ↓↓ with

↑↑ in income

Substitution effect: more prominent

Price elasticity +ve

→ Public Good

→ Non-excludable

→ Non-rivalrous

v/s
1. Giffen goods - Violates law
Demand ↑↑ with demand
↑↑ in price
Income effect: more prominent
Price elasticity +ve
Private Good
→ Excludable
→ Rivalrous

Excludable

Rivalrous

Private good: Food,
House property

Non-rivalrous club good: Library
Theatre

Non-Excludable
common good: Timber
Mineral

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 time when it will be needed & valued more
- Possession utility - Transferring / changing ownership of good from a person with little use to other with more use.
- Service utility - Providing service to necessary clients.

Cardinal utility (Marshall)

Satisfaction derived from consumption of good can be expressed numerically

Quantitative
less
utils

Meaning

Approach

Realistic

Measurement

(Jevons)

Ordinal utility
Satisfaction; a consumer derives from good's consumption cannot be expressed numerically.

Qualitative

More

Rank

Marginal utility Analysis

Classical & Neo-classical Economists

Analysis

Indifference curve analysis

Promoted By modern Economists

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

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

$$\rightarrow MU = \frac{d(TU)}{dx}$$

[TU: total utility]

dx

[x: no. of units consumed]

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

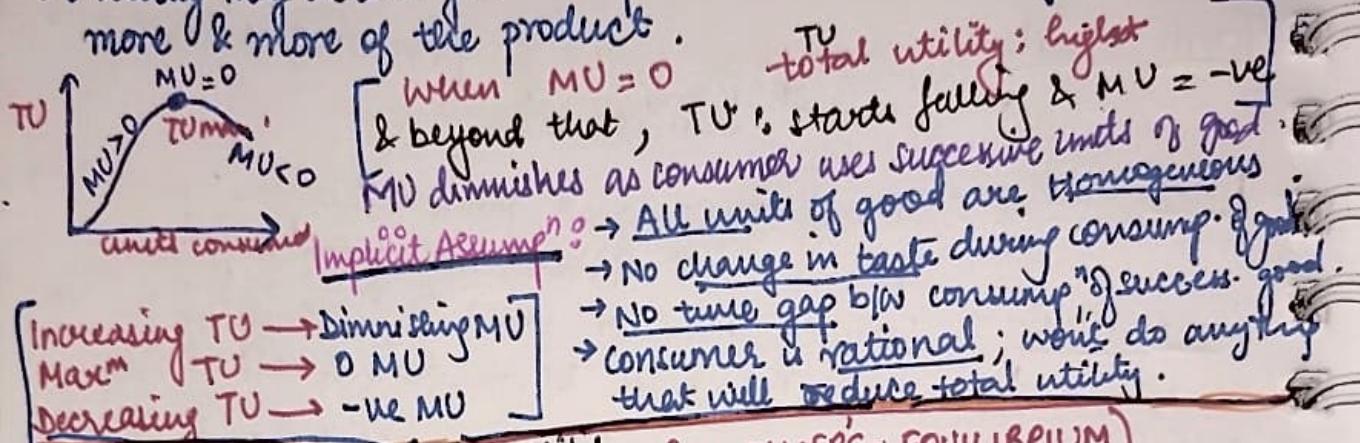
LAW OF UTILITY:

→ 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.



Law of Equi-Marginal Utility (CONSUMERS' EQUILIBRIUM)

↳ Explains behaviour of a rational consumer when he consumes 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 yields him equal marginal utility in order to get maximum satisfaction".

Principle: obtaining max^m 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.

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

↳ CONDⁿ for consumer equilibrium

$$P_L Q_L + P_m Q_m + \dots = Y \text{ (Income)}$$

ORDINAL UTILITY:

Indifference Curve Analysis

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

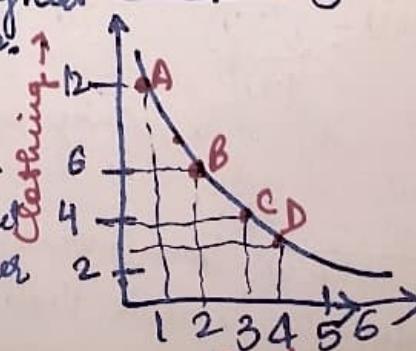
→ P_i : Price of commodity
→ Q_i : Quantity "

Characteristics: Is negatively sloped & convex to the origin.

→ 2 indifference curves don't intersect

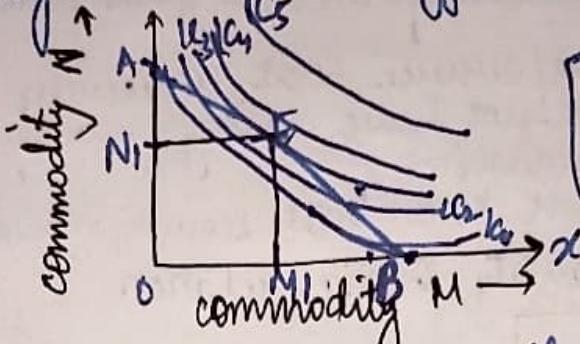
→ Are usually parallel to each other

→ Indifference curve towards x



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



$$M.R.S_{MN} = \frac{MU_N}{MU_M}$$

Budget constraint line - Shows different combⁿ 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 IC₃ → $M.R.S_{MN} = \frac{P_M}{P_N}$ it is cont.

→ 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_M ~~Substitution effect~~ \rightarrow ~~Demand~~ 2

→ Price Consumption Curve (PCC) - 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

Wish become a WANT → Substitute & complementary good if it is supported by ability to fulfil it

• WANTS → NECESSITIES → efficiency

→ COMFORTS → efficiency
→ LUXURY → conventional

→ One will like to fulfill 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

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

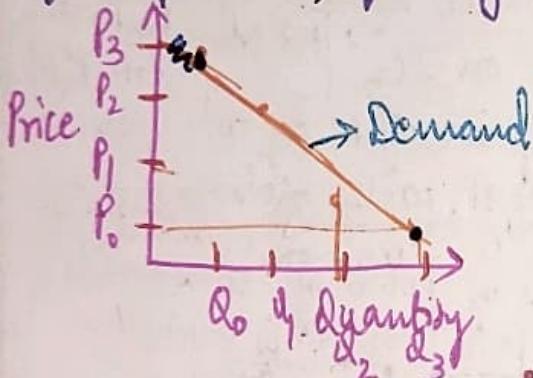
LAW OF DEMAND

- 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 $\uparrow\uparrow$; quantity for that product $\downarrow\downarrow$
 If the price $\uparrow\uparrow$, quantity demanded \downarrow



→ Price \uparrow from P_2 to P_3 ; quantity \downarrow from Q_1 to Q_2
 → Price \downarrow from P_3 to P_2 ; quantity \uparrow from Q_2 to Q_1

Contraction / Expansion in Demand: Price : same

But Demand $\downarrow\downarrow$ or $\uparrow\uparrow$ due to change in other factors

Exception to the Law of Demand

If Price $\uparrow\uparrow$; Demand $\uparrow\uparrow$; If price $\downarrow\downarrow$; Demand $\downarrow\downarrow$

(Inferior goods in which)
 ① Giffen goods: When price falls; Demand also falls
 customer/consumer switch to super subsidize.

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 $\uparrow\uparrow$.

Elasticity of Demand; Quality of demand by virtue of which it changes (i.e. ↑ or ↓) when the price changes, is called Elasticity of Demand.

① PRICE elasticity of demand ② CROSS elasticity of demand.

① PRICE elasticity of demand : $\frac{\% \Delta Q}{\% \Delta P}$

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

$$\text{price elasticity coefficient } \leftarrow ed = \frac{\frac{\text{change in demand}}{\text{original demand}}}{\frac{\text{change in price}}{\text{original price}}} = \frac{\Delta Q/Q}{\Delta P/P}$$

$$0 \leq ed < \infty$$

Factors affecting Price Elasticity:

- 1) Sustainability
- 2) Relative size of expenditure
- 3) Necessity v/s luxury
- 4) Time period

- # Application 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:

Effect of Increase in Price	Effect of change in price on change in total expenditure of Nature of Ed commodity		
	nature of change in expenditure	ed	ed
Increases	ed > 1	Elastic	
Decreases	ed < 1	Inelastic	
Constant	ed = 1	Unit Elastic	

② Arc method

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

$$\Delta P = P_1 - P_0$$

$$\Delta Q = Q_1 - Q_0$$

$$P = \frac{P_1 + P_0}{2}$$

$$Q = \frac{Q_1 + Q_0}{2}$$

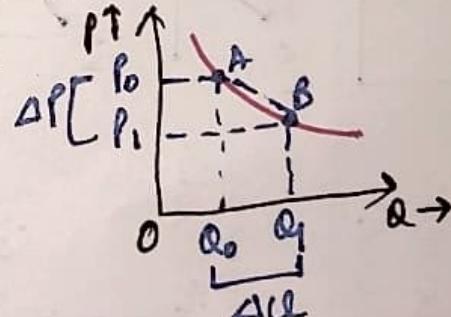
$$= - \frac{(Q_1 - Q_0)}{(P_1 - P_0)}$$

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

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

$$= - \frac{Q_1 - Q_0}{P_1 - P_0} \cdot \frac{P_1 + P_0}{Q_1 + Q_0}$$

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



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

③ Cross Plasticity of demand

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

decrease (-) / increase (+)

-ve : complement

+ve : substitute

$Cd^* > 0$: Substitute goods

$Cd^* < 0$: Complementary good

$Cd^* = 0$: Accommodities X & Y ; not related

$$Cd = \frac{dQ_x}{dP_y} \times \frac{Y}{X}$$

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 ↑ ↑ ↓ ↓

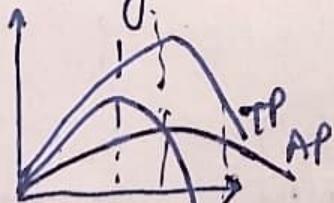
Price Supply

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

$$Es = \frac{ds}{dp} \times p$$

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

Law of Returns: Behaviour of physical output when only 1 input is changed & others remain constant.



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

• Return To Scale -

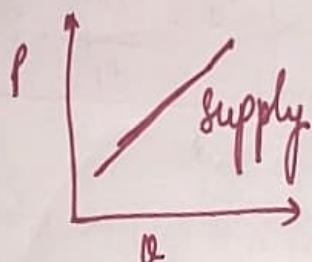
↳ Relationship b/w All Inputs & Resulting Output

• Economies of Scale: When large scale production is carried out, a single firm as well as whole industry avail certain benefits

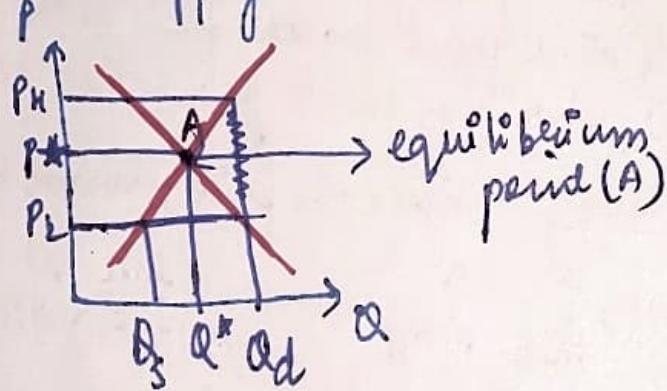
Linear Supply Func

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

↓ supply of good ↓ slope of supply → price of good
 when price = 0



Reln b/w demand & Supply



$$Q_d = Q_s \rightarrow \text{at equilibrium}$$

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 Returns:

Production Function: Transform "of physical input into physical output where O/P is func" of I/P.

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

Quantity of
O/P produced

func" depends
on

factors of production: I/P available to
producer supply goods &
services in economy

Cobb-Douglas func":

$$Q = b L^a K^{1-a}$$

Quantity of
product

Total
factor
productivity

I/P

Labour

Capital
I/P

a : produc² elasticities of
labour
 $1-a$: " capital

• Production process: A set of I/P transformed into a
(PP) 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

4) ENTERPRISE:

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

Returns to scale:

Production Possibility Curve



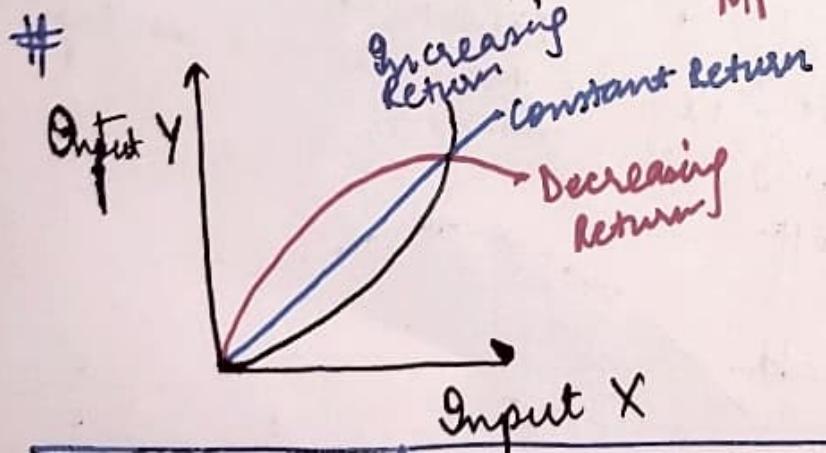
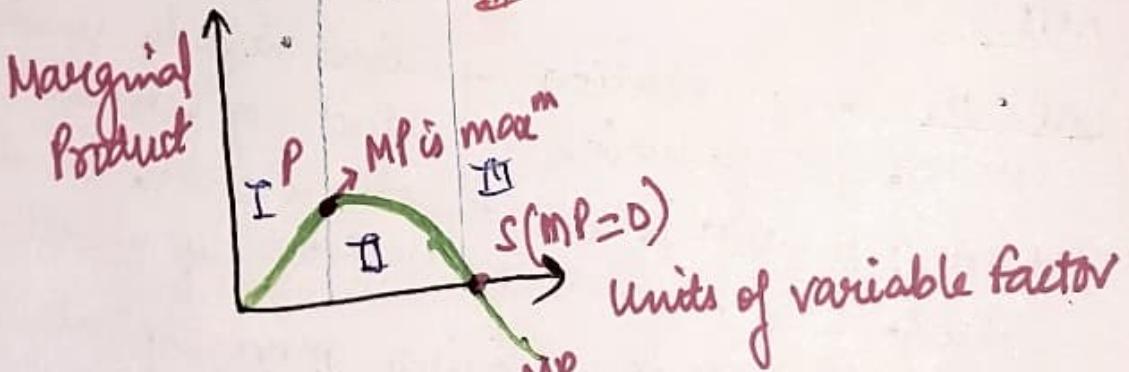
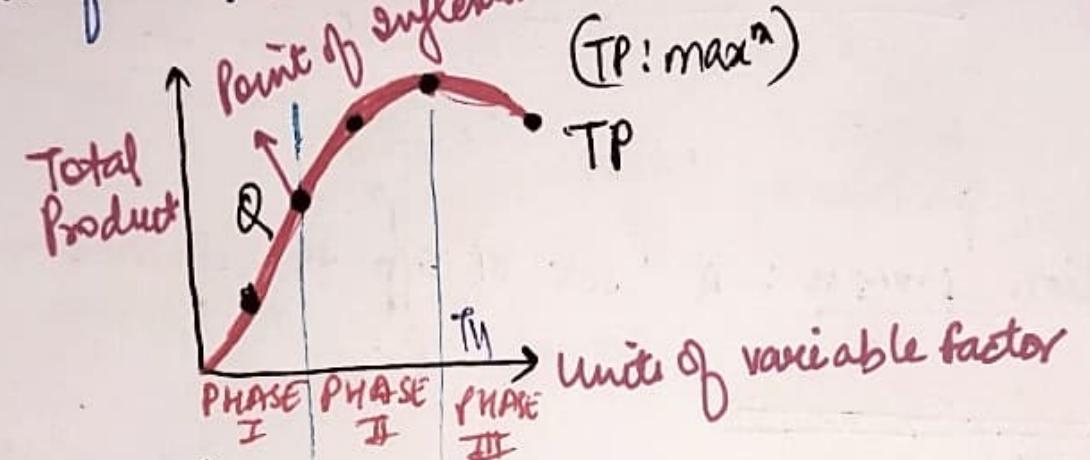
Law of Variable Proportion - As we ↑↑ the quantity of only one input while keeping other fixed, Total product initially at a increasing rate, then at a decreasing rate, & finally at a negative rate.

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



MARKET → Interface b/w Producer & Consumer
↳ geographical space where producer & consumers 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 products 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 accommodate two firms.

Monopoly can last only :-

→ It is legally created.

→ Obtained through → Patent

→ Control over raw material supply

→ Market demand not enough to accommodate 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.

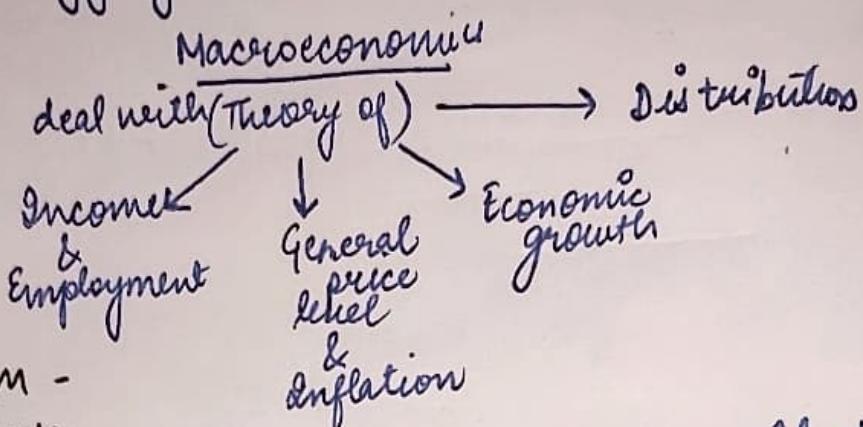
		Nature of Product
Numbers of firms	Homogeneous	Heterogeneous/Differentiated
MANY	Perfect competition	Monopolistic competition
FEW	-	Oligopoly
ONE	Monopoly	-

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



MACRO-ECONOMICS

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



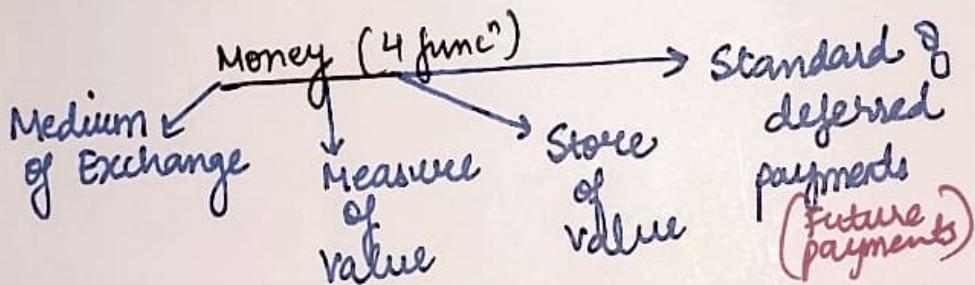
① Barter System -

② 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.



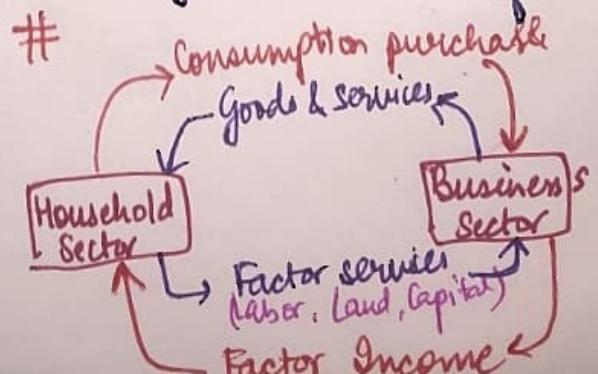
Functions of Money

- ① Primary func
- Medium of exchange
- Measure of value

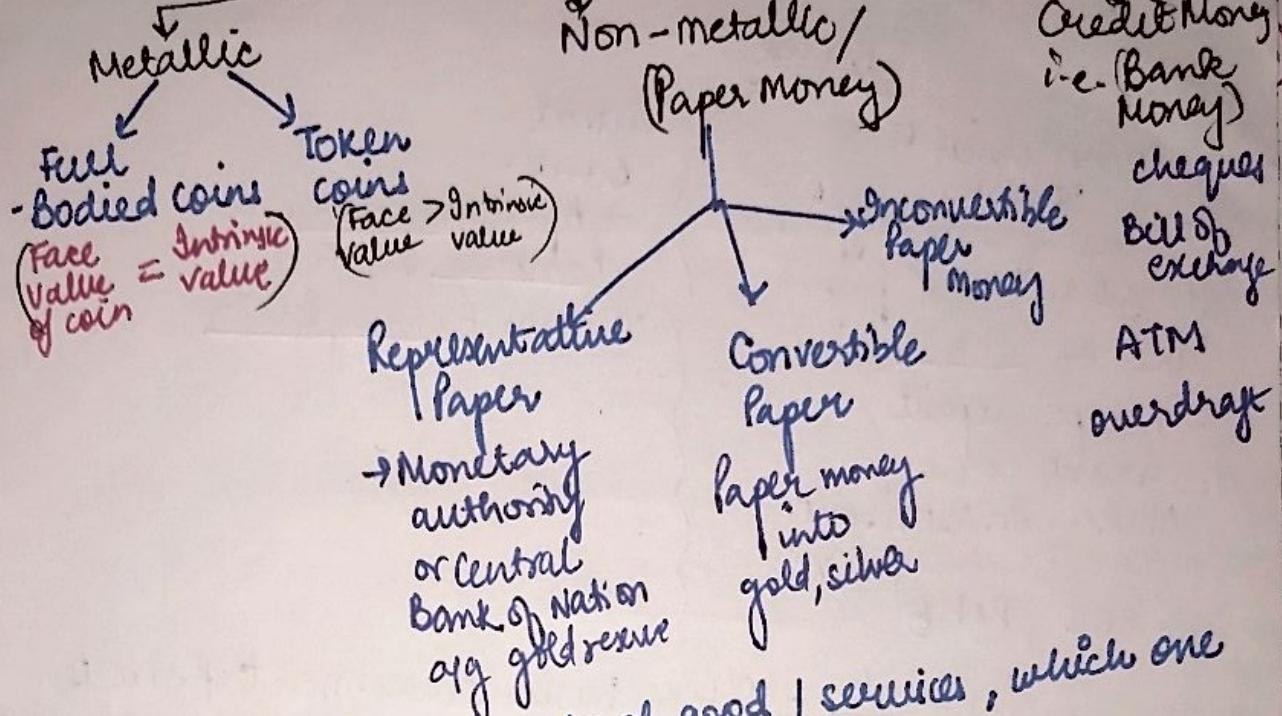
- ② Secondary func
- Standard of deferred payments
- Store of values
- Transfer of values
- ③ Contingent
- basis of credit
- Liquidity
- Distribution of National Income
- Maxm satisfaction of customers

Qualities of good money

- General Acceptability
- Durability
- Portability
- Homogeneity
- Malleability
- Stability of value



Classification of Money

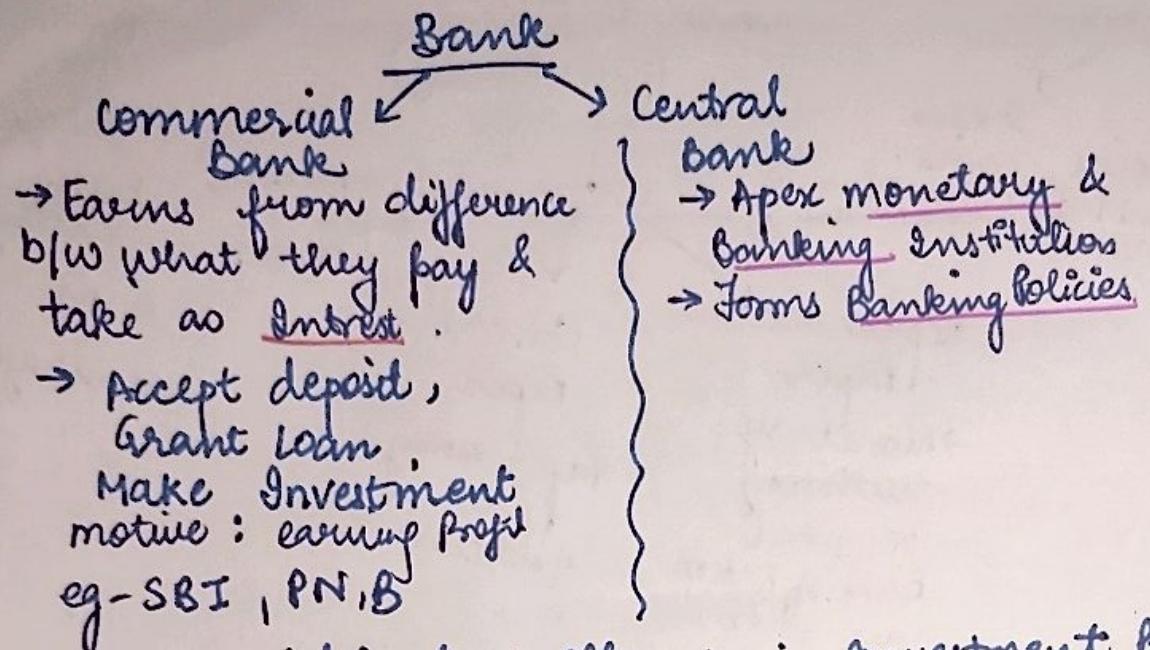


- VALUE OF MONEY - Amount of good / services, which one unit of money can purchase.
- It keeps on fluctuating.
- Index Number Series of figures by which changes in the size of economic phenomenon are measured from time to time
- Supply of Money
- Total Money: Aggregate amount of money in circulation, which is owned by public in the country.
- # 3 monetary institution responsible for Δ is money supply (in country)

1. The State
2. The commercial Bank
3. The central Bank

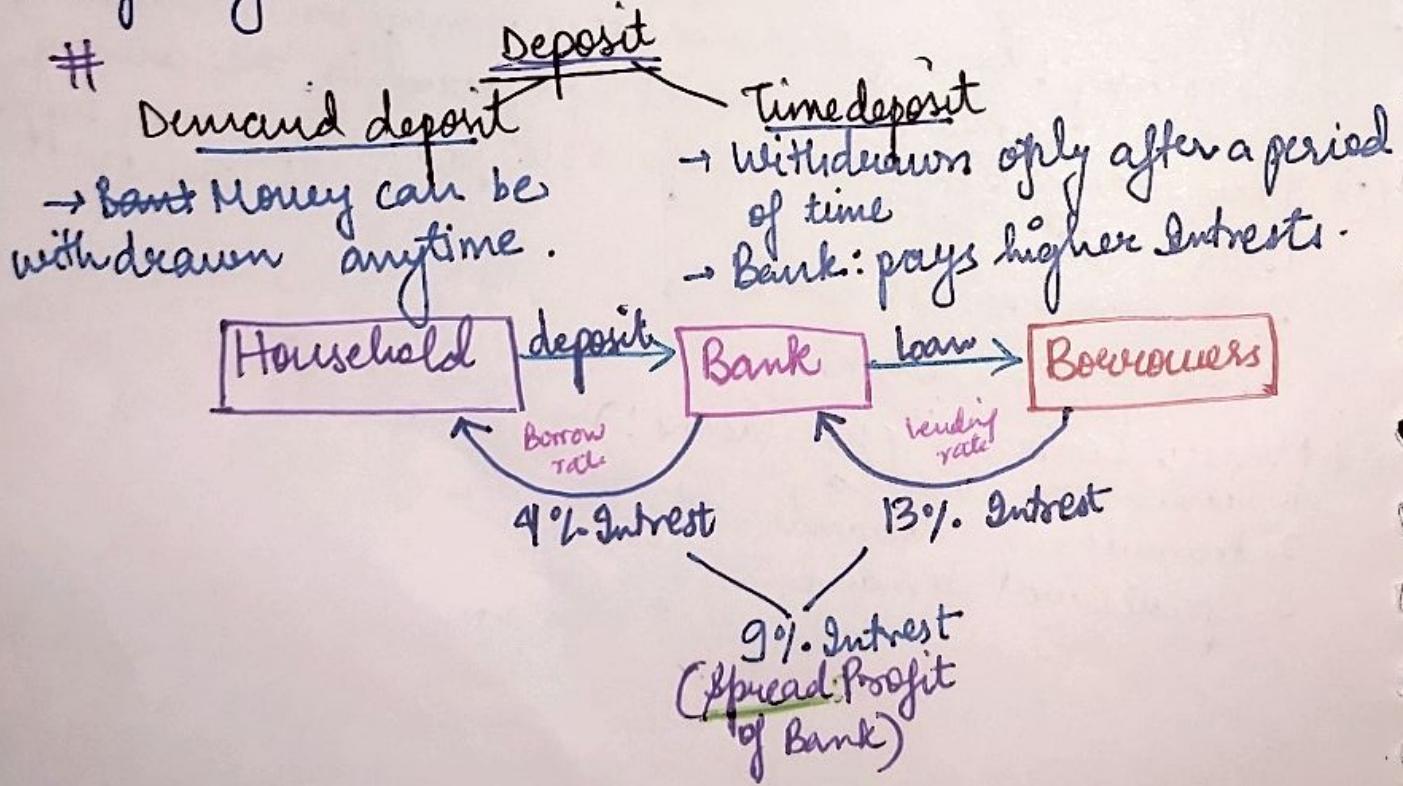
- # Money Demand (for reasons!?)
1. Transaction demand
 2. Precautionary demand
 3. Speculative demand

BANK - Financial Institution that deals in Money & Credit.



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 interest to depositors.
- Charges high interest to Borrowers] earns profit



funcⁿ of Commercial Bank:

- ① Accepting deposit →
 - ④ Current A/C (Unlimited transacⁿ) → 0% Interest
 - ② Saving A/C (Limited transacⁿ)
 - ③ Fixed Deposit A/C (FD) → more interest

- ② Advancing loan →
 - ① Long Term → 1 yr
 - ② Demand Loan (Businessman, usually)
 - ③ Short Term < 1 yr

- ③ Overdraft facility - Businessman

- ④ Discounting Bill of Exchange

Secondary funcⁿ:

- 1) Agency funcⁿ →
 - collecting checks
 - collecting Income
 - Paying expenses - like Insurance, Premium etc.

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

- 3) other:

- debit card, credit card
- Internet Banking

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

↳ Independent 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.

→ funcⁿ: 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.

② Bankers Agent & Advisor of Govt.

② Manages govt. undertaking, funds,
gives loan to the government.

↳ amt. of currency
(controls credit creation)

③ Advises govt. on Monetary, Banking & Financial Matter.

④ Custodian of cash reserve of commercial bank.

⑤ Custodian of foreign exchange

⑥ Lender of the last resort

⑦ Clearing House Functions

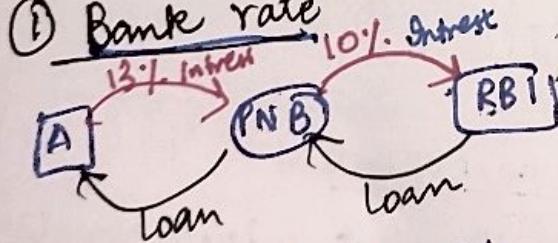
⑧ Controller of Credit & Money Supply

Quantitative

Qualitative

Qualitative

① Bank rate



① Marginal requirement
Bank, Margin call & issuing of loans

② Moral suasion

Work a/c to policy.

③ Selective credit policy

④ collection of data

② Open Market Operation

Buying & selling of Govt. securities

i.e. Money coming into RBI!

③ Legal Reserve Ratio / Requirement

CRR (Cash Reserve Ratio)

C.R. 1000

SLR (Statutory Liquidity Ratio)

200 L.R.

100 R.B.I. 100 S.I.R. 91.42 S.L.R.

Commercial Bank

Central Bank

→ Objective : Earn profit

→ Several commercial banks

→ Can be private & nationalized
commercialised bank.

→ Perform general banking &
agency services for general public.

→ Deal with public directly.

→ eg. PNB, SBI, ICICI in India

→ Objective : Stimulate economic growth

→ Only 1 central bank

→ An autonomous institution

→ Perform general banking &
agency services for government

→ Deal with common banks, other
financial institutions & govt.

→ RBI in India

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

. Rate of interest: ↗ Imp here

To control volume of money in circulation

If there is large scale unemployment in economy:

→ Bank loan interest rate is ↑↑.

→ Bank loan interest rates are decreased ↓↓

→ This reduces demand of Bank loan.

→ This creates demand for bank loans & advances.

→ Ultimately, this reduces volume of
money in circulation.

→ 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

Progressive Tax

Same Rate of tax

As Income ↑ → Rate of tax ↑

On Basis of Burden of Tax

Direct Tax

Indirect Tax

→ Tax paid by same person
on whom burden of tax falls.
Eg- Income 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.

Customs duty

→ Produced in foreign country &
then imported by a country.
Then country imposes customs
duty on product.

SUBSIDY - Part of cost of product paid by govt. 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 & 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.
 e.g. यह आज 50 ₹ का खाना, तो 90 ₹ का भी होता; it inflation.

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

Inflation in Developing country

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

Types of Inflation (on basis of)

Cause

• Demand Pull Inflation

• Supply Push Inflation

Rate → Galloping / Hyper-
 Creeping Running

① Demand Pull Inflation : [Controlled by:
 (Tax ↑ & ↓ subsidies)]
 when aggregate demand > aggregate supply.

② Cost Push Inflation : Production factor is expensive; then
 • ↑↑ in wages → difficult to control
 • ↑↑ in profit margin
 • Impos. 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 ↑ ;
 ∴ Reduction ⇒ same

Inflation

→ Creeping = 3-4% p.a.	moderate	• Single digit inflation
→ Walking = 5-9% p.a.		is good for economy.
→ Running = 10-20% p.a.		
→ Galloping / Hyper = > 20% p.a.		

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 as well 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 & interest rate on loan.

Measurement of Inflation

① Consumer Price Index (CPI)

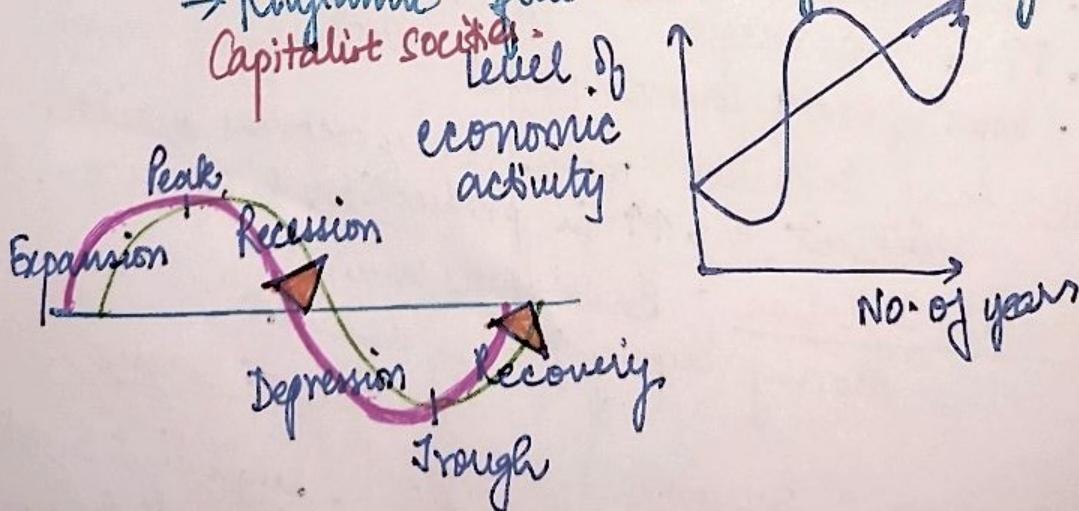
② Personal consumption Expenditure (PCE)

Business Cycle : / Trade Cycle / Economic Cycle

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

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

→ Rhythmic fluctuations of economy in Capitalist society.



(1) Expansion - ↑ in the economic growth / indicators
→ Demand ↑; product expensive
→ Producers will invest more by taking loan.
• employment
• Income ←
• O/P
• wages
• profit
• Demand
2. Supply of goods & services

(2) Peak -

→ Saturation point.
→ Maxm limit of growth is attained.
→ Economic indicators don't grow more & ∵ are at their highest. Producers Invest more
But Point of Producer Invest \approx 3rd Return \approx 3rd.
↳ 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 \Rightarrow Price falls.
→ Economic Indicators begin to fall.

(4) Depression - (Economy growth rate become -ve)

↑ in unemployment
↓ in O/P, trade etc.
↓↓ in Demand; Price ↓↓
↳ Demands of Loan ↓
↳ Overall economic growth ↓↓
Stage: Depressn & falls below steady growth rate

(5) Trough - Depressn: economic growth rate -ve.

further decline in prices of factors
↳ in demand
↳ in supply of goods & services
reach their lowest

[re saturation for economy]

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

BOT

- Balance of Trade
- Only visible transac'
- Can be favourable/unfavourable.

$$\rightarrow \text{BOT} = \frac{\text{Net Earnings on Export}}{\text{Net Payment for Imports}}$$

BOP

- Balance of Payment
- All transac' related to visible, Invisible & Capital Transfers
- Always balances itself.

$$\rightarrow \text{BOP} = \frac{\text{Current A/C}}{\text{A/C}} + \frac{\text{Capital A/C}}{\text{A/C}} + \text{Balance of Income}$$

Current A/C

- Trade balance of country & also of country & also of direct payment & net of income.

- Affects net income of country

- Deals with International Trade.

deficit
Goods - Services, Income, Transfers
Surplus

Capital A/C

- Representation of capital movements & expenditures that don't affect country's trade.

- Affects current / financial A/C

- Deals with applic' 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

Capital A/C - Flow of Capital, Investment, loans b/w world

Financial A/C - Change in ownership of financial Assets & Liabilities

Autonomous Transaction

- International transaction undertaken for profit motive.
- Undertaken by private sector
- undertaken irrespective of effect on BOP.

Accommodating Transaction

- International transaction 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.
- Strengthens political interest.

Protectionism

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

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

Tariff Barriers

Duties & Tax imposed on Imported goods.

- Attack on price of commodity
- Restricts Imports Indirectly

Non-Tariff Barriers

- Quantit. & exchange control restriction imposed to restrict imports.

- Attacks on quantity of commodity
- 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.

$$\bullet \text{Average cost} = \frac{\text{Total cost produced}}{\text{Quantity of O/P}}$$

Marginal cost (MC)

Addition Represen's change in total cost when produc' quantity ↑ by 1 unit.

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

→ It is total produc' cost divided by quantity of O/P produced.

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

→ 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 expenses material, labour, overhead cost.

- 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 statmt.

Fixed cost

- Costs that remains constant regardless of level of produc' / O/P

- Do not 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' or output.

- ↑↑ as produc' ↑↑
↓↓ as produc' ↓↓

- 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.
- includes both fixed & variable cost.

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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.

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 Informⁿ & Communcⁿ
- Infrastructure

Guiding Principles of India's 5 Year Plan -

- Socialist 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
Approved 5 yr plan

[Five Year Plans]:

① FIRST FIVE Year Plan (1951-1956) (Hazard - 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) (Neheru - Mahalanobis Model)

Focus: Rapid Industrialisation &

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 system established - 1st election

• State electricity boards & 2^o education boards : formed

Failed due to

Target growth - 5.6%

Achieved growth - 2.4%

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 varieties (HYV) seeds, fertilizers; "exploit" of soil conservation, irrigation potential

⑤ FOURTH Five Year Plan - (1969-74)

Focus: Self Reliance, Growth & Stability

→ Improve domestic food production

→ Nationalisation of 14 major Indian Banks
(of Banking)

→ Green Revolution in India : advanced

15 August 1969 - ISRO

Problem

→ 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) turned into 1978-1979 : concept by Gunnar Myrdal

→ 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

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

◦ PRDD Oct 1980 Target growth: 5.2%

◦ IVRED " Achieved growth: 5.7%

◦ RLEG P 15 Aug 1983

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: 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 Payments situations & high inflation in 1990-91.
Focus: Human resource development, private sector, modernis^u of industry
(Inflation ↓)

New Economic Policy (Liberalisation, Privatisation & Globalisation) - LPG launched
NEP Target growth: 5.6%. (Highest annual economic growth rate)
Achieved growth: 6.8%.

- Growth in exports & imports
- Improvement in Trade & Current Account deficit
- High growth of agriculture & allied sector, manufacturing sectr.

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

Target growth: 6.5%
Achieved growth: 5.5%

• Priority to agriculture & rural development to generate adequate productive employment & eradicate poverty

Problem: Kargil War (1999)

⑬ TENTH Five Year Plan (2002-07)

Focus: Reduc^u in Gender gap in literacy.

- Achieve 8% GDP growth rate
- Reduce poverty ratio by 15% by 2012
- Increase literacy rate in country by 7.5% by 2007
- India emerged as fastest growing economies by end of Tenth Plan
- The savings & investment rates ↑↑ increased
- Industrial sectors had responded well to face competition in global economy
- foreign investors were keen to invest in India

Target growth: 8.1%
Achieved growth: 7.7%

⑭ ELEVENTH Five Year Plan (2007-2012) (C. Rangarajan)

Focus: Faster & more inclusive growth

- Gender equality

- Electricity

- Telephone to all villages

1st yr. growth rate = 9.1%; then fall to 6.3%

Target growth: 9.8%
Achieved growth: 7.8%

Problem: Global Financial Crisis (2008-09)

15. 11TH PLAN (2012-2017)

Focus: Faster, Sustainable, more Inclusive growth.
Target growth: 8%

• 2014; NDA Government established NITI Aayog (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
Visionary Plan = 15 years

Economic Planning | 5 Year Plans

2nd Five Year Plan (1956-61)

(Nehru Mahalanobis model)
• Rapid Industrialisation; 5 steel plants, hydroelectric power

3rd Five Year Plan (1961-65)

Annual Plans (1965-69)
Brought in country & inflation
Green Revolution

5th Year Plan (1974-79)

(DDP - Poverty Elimn - Garibi Hatao)
• Remove poverty; attain self-reliance
Problem - 1975 Emergency

6th Year Plan (1980-85)

(Janata Govt. Plan)
Poverty eradication; modernization of technology
Higher economic growth; family planning measures

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

10th Year Plan (2002-2007)

Reduc in Gender Gap in literacy
Achieve 8% GDP; ↓ poverty by 15%.
Savings & Investment rates ↑

12th Year Plan (2012-2017)

Faster, Sustainable; more Inclusive Growth
Target growth: 8%

1st Five Year Plan (1951-56)

(Harrod Domar model)
Agriculture development; food self-sufficiency

3rd Year Plan (1961-65)

(Gandhi Yojana)
Self-reliant & self-generating economy
Panchayat Raj System
Problem: Indo-China war, Indo-Pak War, brought

4th Year Plan (1969-74)

Self-reliance; growth & stability
Nationalisation of Banking, IT, food products
Problem: Indo-Pak war, Oil crisis

Rolling Plans (1978-80)

(2 yrs) Revising 5yr plan of every yr

7th Year Plan (1985-90)

Removal of poverty; self-sustaining economy
Employment generation programme: Jawahar Rojgar Yojana

Annual Plan (1990-1992)

Political Instability at centre & Economic crisis
• worsening Balance of Payments
• High Inflation

9th Year Plan (1997-2002)

Growth with Social Justice & Equity
Agriculture; rural development for employment

Problem - Kargil war (1999)

11th Year Plan (2007-2012)

- faster & more inclusive growth
Gender equality, telephone to all villages

Problem - Global financial crisis (2008-09)

2014: NDA govt established NITI Aayog on 1st Jan, 2015
Planning committee

Growth rate (%)

Year	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	4.2	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, Timetaken 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 = $\frac{\text{Marginal cost}}{\text{Average cost}}$

$$\textcircled{1} \quad \frac{\text{MARGINAL COST}}{(P_g - 19)} / \text{AVERAGE COST}$$

$$\underline{\text{Eq 1}} \quad \text{Demand Function: } q = 25 - 4p + p^2$$

q : demand for commodity

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

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

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

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

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

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

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

Eg 2
Pg 19B

Demand Law : $q = 10 - p$ nearpt. $q = 4$ $p = Rs 6$

if price ↑ by 5%. ; % ↓ in demand ?

$\therefore ed$

$$\text{Ans.} \quad \uparrow \uparrow \text{ Price} = 6 + 6 \times \frac{5}{100} = 6.30$$

$$\text{Rise in Price} = 6.30 - 6 = 0.30 \text{ Rs}$$

Acc. to the Demand Law; the new demand is
 $q = 10 - 6.30 = 3.70$

Decrease in demand = $3.30 - 4 = \underline{0.7}$

∴ Rise in Price = 0.30

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

Fall in Demand

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



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

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

$$\therefore |ed| > 1$$

: NEW & OLD DEMAND & PRICE $\therefore |ed| > 1$

Eg 3
(Pg 199)

Milk : $|ed| = 1$

Old price = Rs 35/L

New price = Rs 40/L

Old demand = 70 L

New demand = ? L

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

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

$$10 = -(q - 70)$$

$$10 = -q + 70$$

$$10 - 70 = -q$$

$$-60 = q \quad \therefore$$

New demand = 60 L

Eg 4
(Pg 199)

$$|ed| = 1$$

Old demand = 5 kg

New demand = 6 kg

Old price = ₹ 80
? .

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

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

$$-16 = x - 80$$

$$x = -16 + 80$$

$$(x = \underline{\underline{64}})$$

∴ New price = ₹ 64.

USING CALCULUS : (ed)

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

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

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

At

$$p=4 \quad \therefore |ed| = \left| \frac{-4}{5} \right| ; |ed| < 1$$

CROSS ELASTICITY OF DEMAND :

Eg 6
(Pg 200)

q_1 Price Rs 60

Rs 75

Δ price = Rs 15

q_2 Quantity +kg
(Demand)

10 kg

Δ quantity = 10 - $\frac{7}{7}$
= 3 kg

dp_1 : change in price of q_1 product

dq_2 : change in quantity demand of q_2 product

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

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

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

Project Planning

A project consists of the interrelated activities that need 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

- Selection of site
- Operation Planning
- Material Handling

Step 5 Execution

Factors affecting price

- Nature of market
- Government Policy
- Nature of sales
- Demand & Supply
- Price of competitors

- Public Utility Items
- Margin of rebate/concession
- Warranty & After Sale services

Revenue of a firm

Green Revolution - (mid 1960s)

→ Introduction of high yielding varieties by using pesticides & fertilizers + crop protection.

→ Introduce" to HYV seeds (1965)

→ ↑ use of chemical fertilisers & pesticides to agricultural production

→ Improvement in Irrigation Infrastructure production

• World: Norman Borlaug.

• India: M.S. Swaminathan

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

Main Features -

- ① Introduce" to new & High Yield variety seeds.
- ② ↑ use of ch. fertilisers, 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 varieties of crops so that produc" will enhance.
- ⑥ Gener" employment; ↑ income levels & improving standards of living

PROS crops:

- Grows faster
- Multiple Yields ($\times 3 \sim \times 4$ time)
- ↑ quality of food
- ↑ tolerance to disease, pests & weeds
- Reduction of Biodiversity

CONS

- Expensive seeds
- More fertiliser, water, req. pesticides required.
- Increase of class disparities
- Health impact from ↑ pesticides & fertilisers
- Soil Degradation, Water Pollution
- Sustainability concerns

- # White Revolution (~~mid 1970s~~)
- ↳ Aimed to transform India's dairy sector. by Ge
 - Operation Flood: make India self sufficient in
(component of white revolⁿ) milk production.

Father of White Revolution - Dr. Vergheese Kurien
(India)

Objectives -

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

Key Aspects :

- Cooperative Dairy Model
- Introducⁿ of crossbred cattle
- Infrastructure development
- Marketing & Distribution = (N DDB)

Impact :

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

Example 17 (Pg 233) : Perfect competition Firms

Demand Funcⁿ $P = 32 - q$ TR = P · q

Total cost funcⁿ $TC = q^2 + 8q + 4$

What level of op will maximise total prof? Calculate corresponding Total cost & prof (P)

Ans. For profit maximization, these two condⁿ must be satisfied

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

$$MR = MC$$

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

$$\pi = TR - TC$$

π : profit

TC: total cost

TR: total revenue

$$\rightarrow TR = P \cdot q = (32 - q)q = 32q - q^2$$

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

$$\rightarrow TC = q^2 + 8q + 4$$

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

1st order condⁿ:

$$\text{At eqb}^m; MR - MC = 0 \quad MR = MC$$

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

$$\therefore q = 6$$

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

On putting $q = 6$ in demand funcⁿ $P = 32 - q = 32 - 6 = 26$

Putting $q = 6$ in TR eqⁿ; $TR = P \cdot q = 26 \cdot 6 = 156$

$$TR = (32 - q)q \text{ from above } TR = (P + q - q^2)$$

$$P = 26$$

$$TR = 156$$

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

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

Example 18 Monopolistic market

(Pg 236) Linear Demand Funcⁿ $P = 80 - 6q$
 Linear Total Cost Funcⁿ $TC = 50 + 20q$.
eqbm level of 0/p, price & profit

Ans. Price $p = 80 - 6q$ - ①

$TC = 50 + 20q$ - ②

$TR = pq$

$$TR = (80 - 6q)q = 80q - 6q^2 \quad \text{--- ③}$$

Profit: $\pi = TR - TC$

$$\pi = 80q - 6q^2 - 50 - 20q \quad \text{--- ④}$$

→ for profit maximisation

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

Dif next $\frac{d\pi}{dq}$:
 $\frac{d\pi}{dq} = 80 - 6q^2 - 50 + 20q = 0$

$$\frac{d\pi}{dq} = 80 - 12q + 20 = 0$$

$$\frac{d^2\pi}{dq^2} = -12$$

$$12q = 60$$

$q = 5 \rightarrow$ Put in ① eqⁿ

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

put $q = 5$ in ④ eqⁿ

$$\begin{aligned} \pi / p &= 80q - 6q^2 - 50 + 20q \\ &= 400 - 150 - 50 + 100 \end{aligned}$$

$$\pi / p = 3400 - 300$$

2nd order eqn for profit maximisⁿ $d^2p/dx^2 < 0$

$$\frac{d^2\pi}{dq^2} = -12 \text{ KQ proved}$$

Hence Proved

FORMULAS

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

PERFECT COMPETITION :

π : profit

TC: Total cost

TR: Total Revenue

Profit maximisn'

$$\left\{ \begin{array}{l} \frac{d\pi}{dx} = \frac{d(TR)}{dx} - \frac{d(TC)}{dx} = 0 \\ MR = MC \quad MR - MC = 0 \end{array} \right.$$

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

$$\pi = TR - TC$$

MONOPOLISTIC COMPETITION:

p: ~~price func~~ (Demand func)' difference rate = 0

TR = Demand. Demand Func' Calculate π (profit)

Br 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 + $\frac{\text{Variable cost}}{\text{unit}} \times \text{demand}$
- Contribution = Sales - Variable cost
- $\frac{\text{Contribution}}{\text{unit}} = \frac{\text{Selling price}}{\text{unit}} - \frac{\text{Variable cost}}{\text{unit}}$
- Profit = Contribution - fixed cost
- Margin of safety = Actual sales - Break even sales
- MS = $\frac{\text{Profit}}{\text{P/V ratio}} \times 100$
- Economical Advantage = $\left| \frac{\Delta \text{Total cost}}{\text{of 2 ways / methods}} \right|$

P: selling price / unit FC: Fixed cost
VC: Variable cost / unit x: volume of product $\therefore \text{Revenue} = P \times x$
- Break-Even Point = $\frac{\text{Fixed cost}}{\text{Selling price / unit} - \frac{\text{Variable cost}}{\text{unit}}} = \frac{FC}{\frac{P}{\text{unit}} - \frac{VC}{\text{unit}}}$
- $$\boxed{\text{BEP} = \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{\text{Sales} - \text{variable cost}}{\text{Sales}}}$$
- Total Revenue = Selling price / unit \times Vol. of product
- Break-Even Sales = $\frac{\text{Fixed cost}}{\text{Selling price / unit} - \frac{\text{Variable cost}}{\text{unit}}} \times \frac{\text{Selling price}}{\text{unit}}$

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

$$\text{Break-Even Sales} = (\text{Break even point}) \times \frac{\text{Selling price}}{\text{unit}}$$

Interest formulas:

$$\text{Simple Interest} = \frac{P \cdot R \cdot T}{100}$$

$$\text{Interest rate} = \frac{r}{100} \text{ or } r\%$$

$$\text{GP sum formula : } S_n = \frac{a(r^n - 1)}{r - 1}$$

F = Future Amount

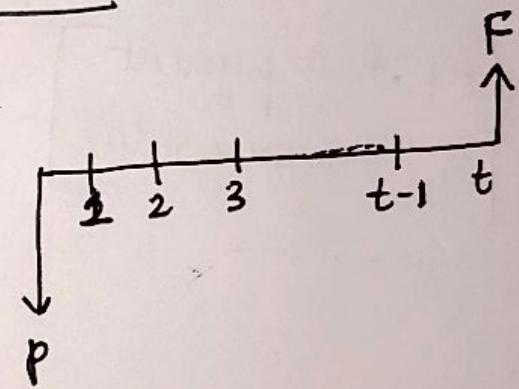
P = Present Amount

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

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

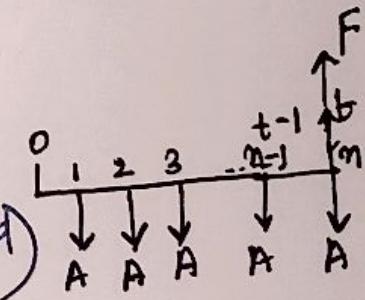
(Find compound amount)

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

(Find equal payment value)

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

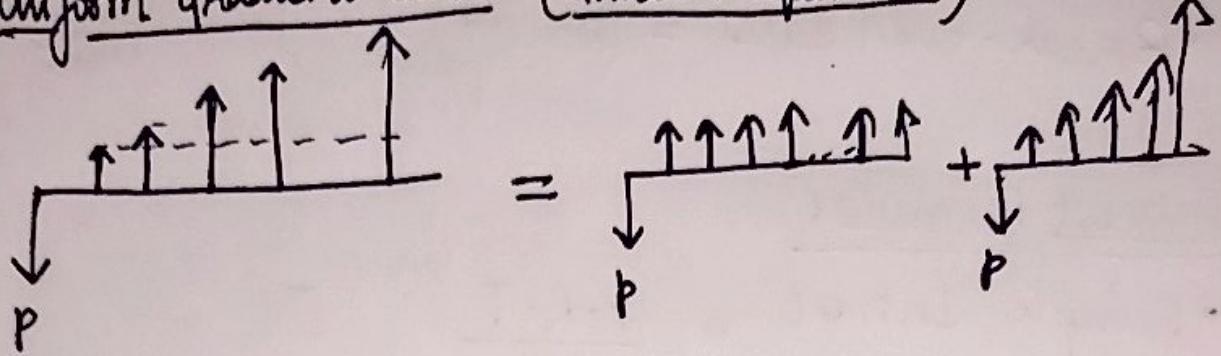
(Capital Recovery)



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

(Present worth)

Uniform Gradient Series (Annual Equivalent)



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

$$(A|G, r\%, t) = \frac{(1+r\%)^t - 1 - r\% \cdot t}{r\% ((1+r\%)^t - 1)}$$

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

A_1 : first payment
 G : increase value

Price Elasticity of Demand

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

$ed = 0$ = Perfectly Inelastic

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

$|ed| = 1$ = unit elastic

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

$ed = \infty$ = Perfectly elastic

$ed < 0$ = Normal good

$ed > 0$ = Giffen 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

(*) $e_y > 1$ - Luxury / elastic

Cross Elasticity of Demand

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

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

(-ve) $cd^* < 0$ - Complementary goods

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

Unsolved Exercise (Pg 238)

	Initial	Now
① Price =	₹ 10	₹ 9
Demand	100	115

$$|ed| = \left| \frac{115 - 100}{9 - 10} \right| \times \frac{10}{100}$$

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

$$\boxed{\therefore |ed| = 1.5}$$

④ Profit maximis^n

(i) Demand funcⁿ $q = 45 - 3p$

Total Revenue = Demand funcⁿ × Demand

$$\boxed{TR = q \cdot p} = (45 - 3p)p = \cancel{45p} - \cancel{3p^2}$$

Average Revenue = $\frac{\text{Total Revenue}}{\text{Demand func}^n} =$

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

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

when; $p = 12$; $q = 45 - 3p = 45 - 36 = \boxed{9 = q}$

$$p = 10; q = 45 - 3p = 45 - 30 = \boxed{15 = q}$$

$$|ed| = \left| \frac{15 - 9}{10 - 12} \right| \times \frac{12}{9} = \frac{2}{2} \times \frac{12}{9} = \boxed{|ed| = 4}$$

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

Total cost $TC = q^2 + 8q + 4$
func'

$$TR = p \cdot q$$

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

for profit maximis';

$$MR - MC = 0$$

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

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

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

$$32 - 2q = 2q + 8$$

$$2q = 4q$$

$$\boxed{q = 6}$$

\therefore 6 units

for $q = 6$

$$p = 32 - q$$

$$= 32 - 6$$

$$\boxed{\therefore p = Rs 26}$$

(iii) Demand func' $P = 20 - 4q$
 Total cost func' $TC = 8q + q^2$
 $\therefore 20 - 4q = 8q + q^2$

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

$$20 - 8q = 8 + 2q$$

$$12 = 6q \\ \boxed{q = 2}$$

$$\text{Price} = P = 20 - 4q \\ P = 20 - 4 \times 2$$

(iv) demand func' $\therefore P = 12$

$$P = 90 - q \\ TC = 10 + 2q + 3q^2$$

Monopolist firm

Before Tax: $P = 90 - q$
 $TR = P \cdot q = (90 - q)q = 90q - q^2 = TR$

$$\frac{d(TR)}{dq} = 90 - 2q \quad \text{profit} = TR - TC \\ = 90q - q^2 - 10 - 2q - 3q^2$$

$$\text{profit} = 88q - 4q^2 - 10$$

After Tax: $\text{Tax: } 8 \text{ p/unit}$

$$\frac{dp}{dq} = 0.$$

$$88 - 8q - 0 = 0$$

$$P = 88q - 4q^2 - 10 \quad \boxed{q = 11} \quad P = 90 - 11 \quad \boxed{79 = P}$$

$$= 88(11) - 4(11)^2 - 10 \\ = 968 - 476 = P$$

$$P = 79q + 87 = 88q - 10$$

~~10~~

$q = 11$

$$P' = 79 + 87 = 87$$

New profit func'

~~$P' = 87$~~

$$P = 90 - q$$

$q = 3$

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

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

~~$P = 218$~~

~~$\text{TR}(q) = 5q$~~

$$5q = 375 - 3P$$

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

$$TC = 500 + 13q + \frac{q^2}{5}$$

$$\text{TR} = q \cdot P = \cancel{q}P \cancel{q} \quad P = \frac{375}{3} - \frac{5q}{3}$$

$$P = \cancel{\text{TR}} - TC =$$

$$\text{TR} = q \cdot P = \cancel{q}P \cancel{q} \left(25 - \frac{5}{3}q\right)$$

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

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

$$\begin{aligned} \text{profit} \\ &= 3360 - 1680 \\ &= 1180 \text{ £} \end{aligned}$$

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

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

$$\frac{56}{15}q = 112 \\ q = 30$$

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/quintal
3.	MATERIAL COST	₹ 8150/quintal	₹ 5200/quintal

Ans

Nearby shop	Outside shop	Total Material cost
₹ 81,50,000	₹ 52,00,000	
$700 \times 4 \times 1000$ = ₹ 28,00,000	$700 \times 100 \times 100$ = ₹ 7,00,00,000	Transport
₹ 109,50,000	₹ 7,52,00,000	Total :

↳ economical

$$\text{Economical} = ₹ 7,52 \text{ Lakh} - ₹ 1,09,50,000,$$

$$\text{advantage} = ₹ 6,42,50,000/-$$

Eg 7

sheet : 60m²

Galvanized Iron	Aluminium
₹ 70/m ²	₹ 90/m ²
= 4200 Rs	= 5400 Rs
finishing ₹ 5000	₹ 6050
binding ₹ 1700	+ ₹ 1250 = ₹ 7300
$\frac{6000}{200} \text{ cu m}$	
8 kg × ₹ 850 ₹ = ₹ 1700	-
= ₹ 12,600	₹ 12,700
↳ economical	

Eg 8
1000 km.

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

⇒

	PVC	Reinforced
Weight	7×200 $= 1400 \text{ kg}$	200×10 $= 2000 \text{ kg}$
Cost of pipe	800×200 $= 160,000 \text{ ₹}$	950×200 $= 190,000 \text{ ₹}$
Transp. cost	$7 \times 1400 \times \frac{200}{50}$ $= 1400 \times 1400$ $= ₹ 196,000$	$10 \times 2000 \times 20$ $= ₹ 400,000$
Total	Rs 3,56,000	Rs 5,90,000
	∴ Economic advantage = <u>₹ 2,34,000</u>	

Eg 9

	Lime soda process	Zeolite
Price / kg	lime : Rs 755/kg soda : Rs 290/kg	Price / kg : Rs 890/kg $= Rs 5340$
for 100L	$3775 + 1170 = 4945 \text{ kg}$ 5 kg lime 3 kg soda	6 kg zeolite
Add"	$- Rs 6000 + 4945$ $= 10,945 \text{ ₹}$	$Rs 53900$ $= 5340 + 3900 = Rs 9240$

Pg 274

Eg 17

Make / Buy

$$\text{Sales} = ₹ 1,00,000$$

$$\text{Fixed cost} = ₹ 40,000$$

$$\text{Variable cost} = ₹ 45,000$$

(i) contributⁿ = sales - VC = 55k ₹

(ii) profit = contributⁿ - 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 = $\frac{\text{Profit}}{P/N} = \frac{315k}{5811} \times 100 = 27,272.73$

Eg 18
SP = Rs 4500/each

$$\text{F.C.} = \text{Rs } 40,00,000$$

$$\text{V.C.} = \text{Rs } 2000/\text{screen}$$

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

BEP > Annual demand

∴ Purchase from market.

Eg 19
cost fixed = 26,10,000

$$\text{V.C.} = 860 + 1400 = 2260/\text{tyre}$$

$$\text{SP} = 4500/\text{tyre}$$

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

Pg 289

Eg 27

$$A_1 = 10,00,000$$

$$G = \text{Rs } 10,000$$

$$r = 12\%$$

$$t = 10 \text{ yrs}$$

$$A = ?$$

$$F = ?$$

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

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

$$A = 10,00,000 + 10,000 \left[\frac{(1+12\%)^{10} - 1 - 0.12 \times 10}{(0.12) ((1+12\%)^{10} - 1)} \right]$$

$$A = 10,00,000 + 10,000 \times 3.5847$$

$$A = \text{Rs } 10,35,847 \quad] \text{ if all installments are of equal amt.}$$

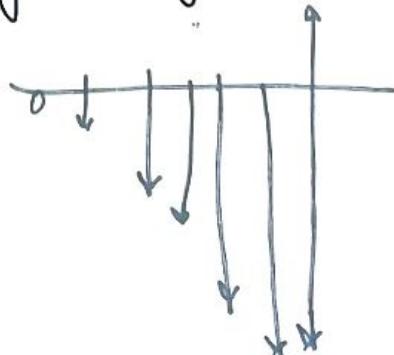
$$\text{future Amount } F = A \left(\frac{(1+r\%)^t - 1}{r\%} \right)$$

$$F = 10,35,847 \times \left(\frac{(1+12\%)^{10} - 1}{0.12} \right)$$

$$F = 10,35,847 \times 17.549$$

$$F = \text{Rs } 1,81,78,079$$

↳ Amount company will get.



~~Eg 28~~

$$A_1 = \text{Rs } 10,00,000$$

$$G = -\text{Rs } 10,000$$

$$t = 10 \text{ yrs}$$

$$r = 12\% = \frac{12}{100} \\ = 0.12$$

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

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

$$= \underline{\text{Rs } 964153}$$

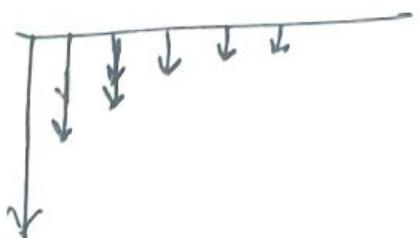
If installments are of same amount,

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

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

$$= 964153 \times 17.549$$

$$= \underline{\text{Rs } 16,919,921}$$



Production Funcⁿ - 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:

$$\text{when } M\text{Cost} = M\cdot \text{Profit } \rightarrow \max \pi$$

(3.) Negative Return →

- Sustainable Development → Development : Meets need of present w/o compromising the ability of future generaⁿ to meet their own needs.
- 1.) Clean energy solⁿ
 - 2.) Effective water mgmt.
 - 3.) Innovⁿ in Agriculture
 - 4.) Waste Management
 - 5.) Biodiversity conservⁿ
- Balancing prosperity & Environment Responsibility

Liberals: Reducing govt. control & restriction on various sectors; promoting competition encouraging private enterprise.

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

Globalists: opening economy to global markets