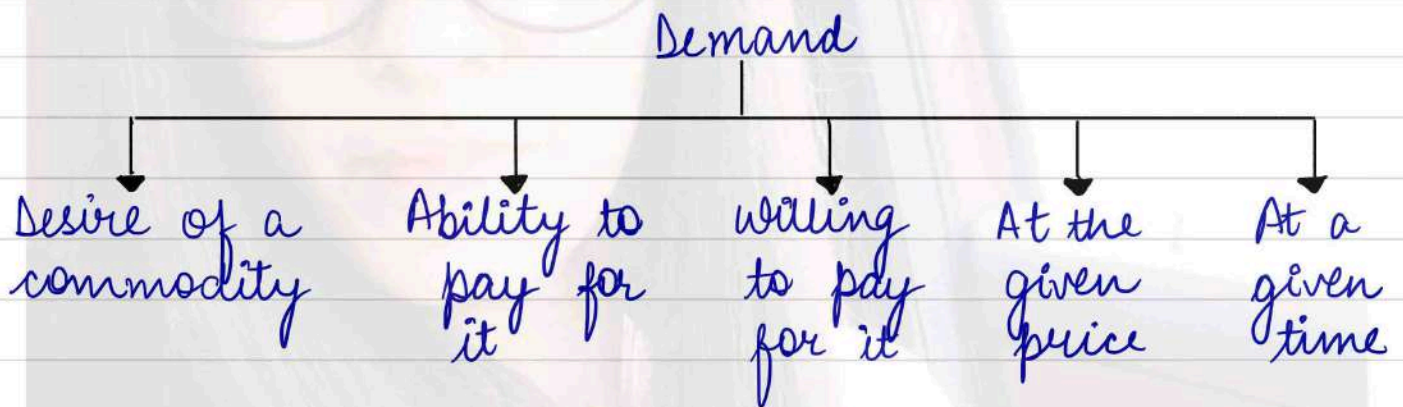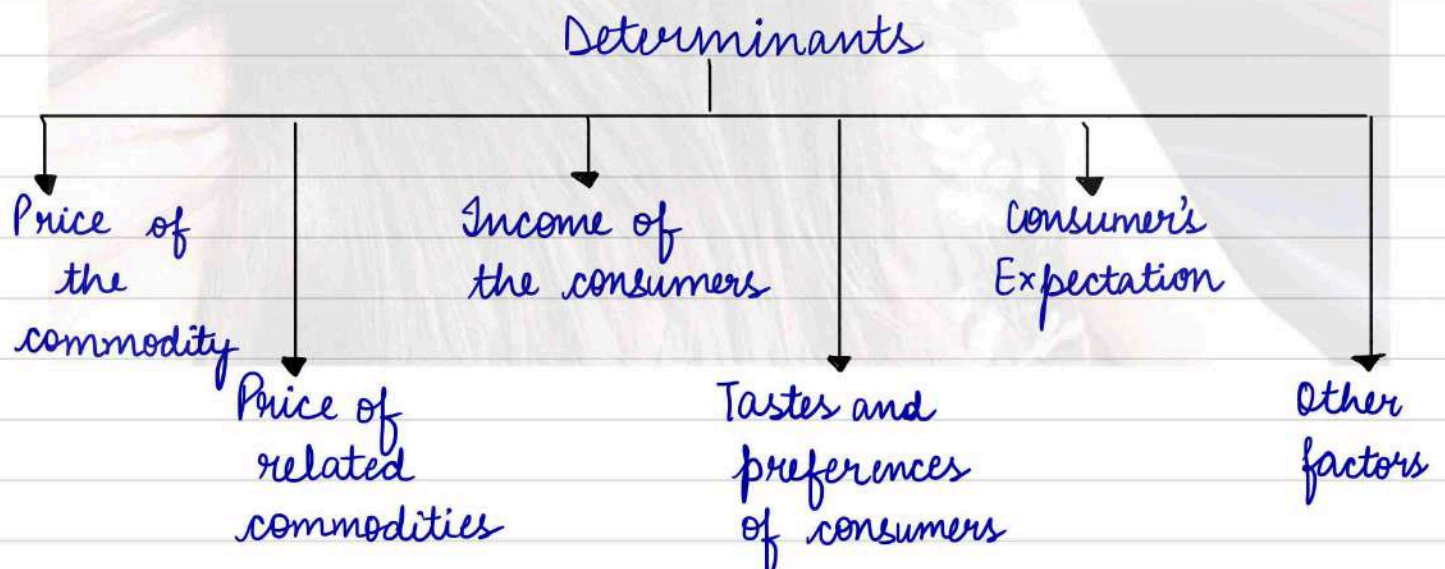# MEANING OF DEMAND

It refers to the quantity of a good or service that consumers are willing & able to purchase at various prices during a given period of time.

Demand

- Desire of a commodity
- Ability to pay for it
- Willing to pay for it
- At the given price
- At a given time

DETERMINANTS OF DEMAND

Determinants

- Price of the commodity
- Price of related commodities
- Income of the consumers
- Tastes and preferences of consumers
- Consumer's Expectation
- Other factors

(i) Price of the commodity

There is an *inverse relation* between price and demand for a good i.e., when price of a good is high, demand for it will be low and vice - versa.

(ii) Price of related commodities

Related goods can be divided into two categories:
- Complementary goods ⇒ Goods which are consumed together or simultaneously

- Competing or substitute goods ⇒ Good which can be consumed with equal ease & satisfaction in place of other good.

(iii) Income of the consumer

A change in income of consumer leads to a change in quantity demanded of good but demand for all commodities is not affected in same manner. For this purpose, we can divide into categories :-
- Normal goods ⇒ There is a direct or positive relation between income and demand for a normal good.

− Inferior goods ⇒ These are the goods for which demands falls and income rises.

(iv) Tastes and preferences of consumers

Demand for a commodity depends upon consumer's tastes & preferences i.e. occupation, age, family, composition etc. Any change in the taste of the consumer shall have a direct effect on the demand for a good.

'Demonstration effect' or 'Bandwagon effect' - These are the effects that are caused by observation of the actions of others and their consequences.

• When a product becomes common among all, some people decrease or altogether stop its consumption. This is called snob effect.

• Highly priced goods are consumed by status seeking rich people to satisfy their need for conspicuous consumption. This is called Veblan effect.
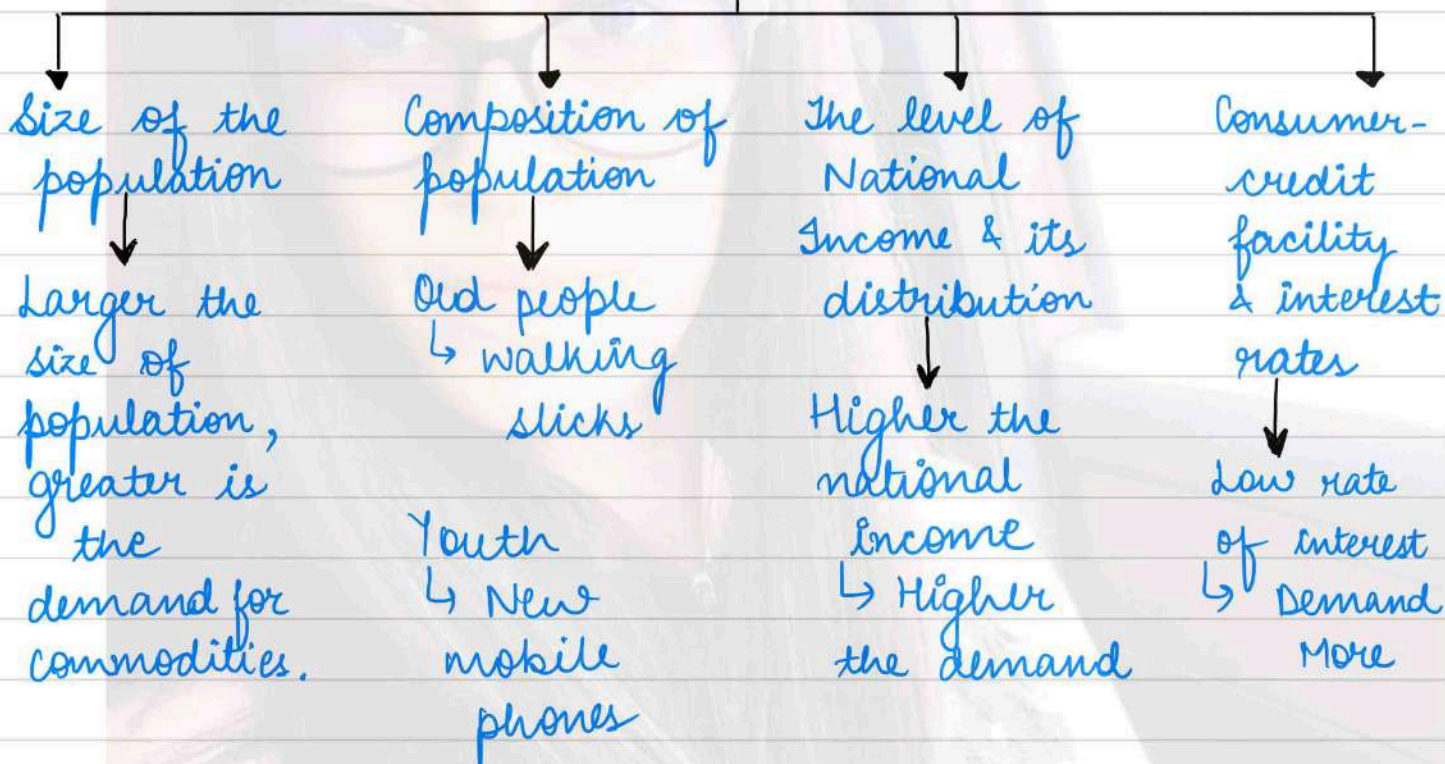
(v) Consumers Expectation

Consumers expectations regarding future prices, income, supply conditions etc. influence

current demand.

(vi) Other factors

Other factors

| Size of the population | Composition of population | The level of National Income & its distribution | Consumer-credit facility & interest rates |

Size of the population → Larger the size of population, greater is the demand for commodities.

Composition of population → Old people ↳ walking sticks

Youth ↳ New mobile phones

The level of National Income & its distribution → Higher the national income ↳ Higher the demand

Consumer-credit facility & interest rates → Low rate of interest ↳ Demand More

DEMAND FUNCTION

A function is a symbolic statement of a relationship between the dependent and independent variables.

Demand function ⇒ It states the relationship between the demand of a product (the dependent

variable) and its determinants (the independent or explanatory variables).

Demand Function $(D_x) = f(P_x, M, P_y, P_c, T, A)$

D_x = Quantity demanded of product X
P_x = Price of the commodity
M = Money income of the consumer
P_y = Price of its substitutes
P_c = Price of its complementary goods
T = Consumer tastes and preferences
A = Advertisement expenditure

LAW OF DEMAND

The law states the nature of relationship between the quantity demanded of a product and its price.
According to all of demand, other things being equal, if the price of a commodity falls, the quantity demanded of it will rise and if the price of a commodity rises, its quantity demanded will decline.
Thus, there is an inverse relationship between price and quantity demanded, ceteris paribus.

Definition of the Law of Demand

Alfred Marshall defined the law - "The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers or in other words the amount demanded increases with a fall in price and diminishes with a rise in price".

DEMAND SCHEDULE

A demand schedule is a tabular statement showing various quantities of good demanded at various prices during a given time period.

A demand schedule is drawn upon the assumption that all the other influences remain unchanged. It thus attempts to isolate the influence exerted by the price of the good upon the amount sold.

Demand Schedule

Individual demand Schedule

It shows various quantities demanded of a good at different prices by a single individual / family / household during a given time period.

Market Demand Schedule

It is an aggregate of individual demand schedules in a market

Demand schedule of an individual consumer

	Price (in Rupees)	Quantity demanded (units)
A	5	10
B	4	15
C	3	20
D	2	35
E	1	60

Market Demand

Price	Quantity demanded by			Total Market Demand
	P	Q	R	
5	10	8	12	30
4	15	12	18	45
3	20	17	23	60
2	35	25	40	100
1	60	35	45	140

DEMAND CURVE

A demand curve is a diagrammatic representation of a demand schedule.
It is obtained by plotting a demand schedule.
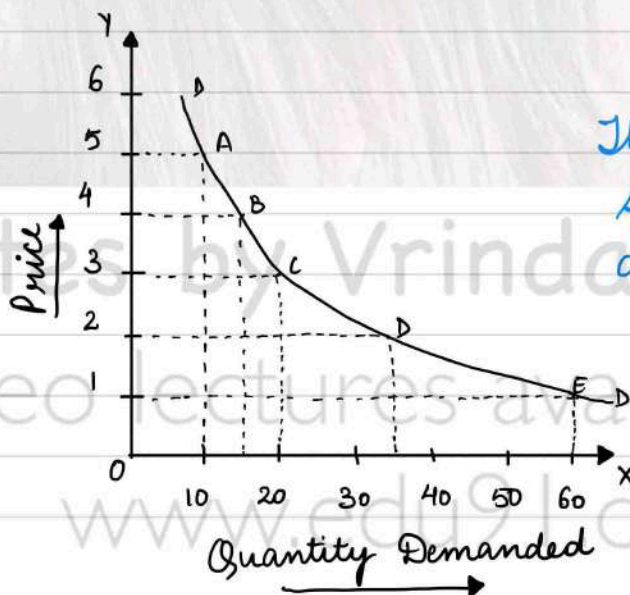
This downward sloping curve describes the inverse price - demand relationship
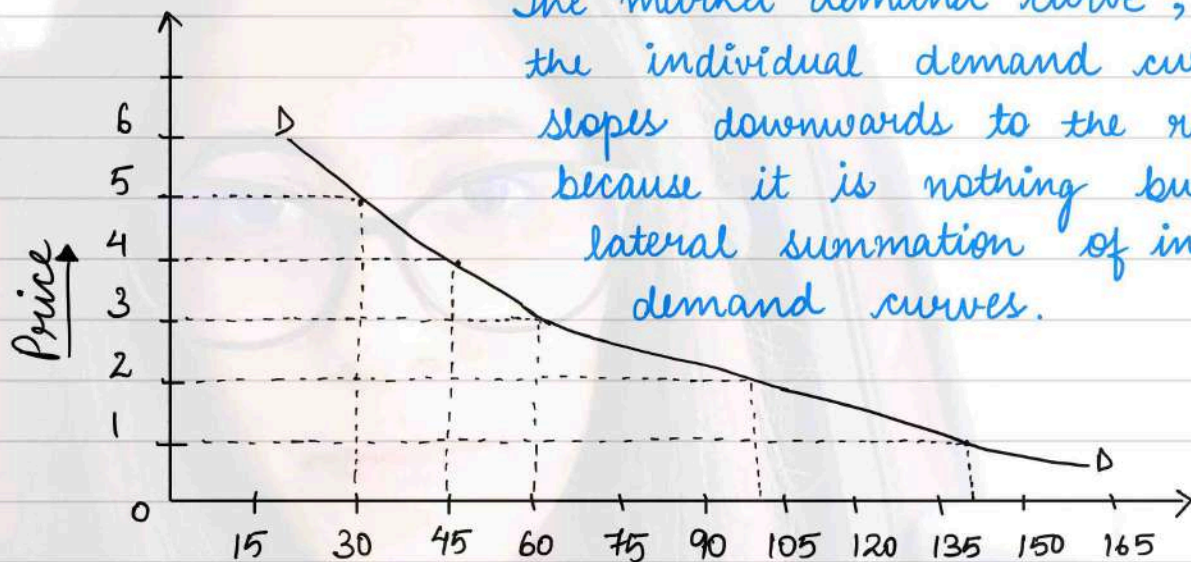
The market demand curve, like the individual demand curve, slopes downwards to the right because it is nothing but the lateral summation of individual demand curves.

Market Demand

RATIONALE OF THE LAW OF DEMAND
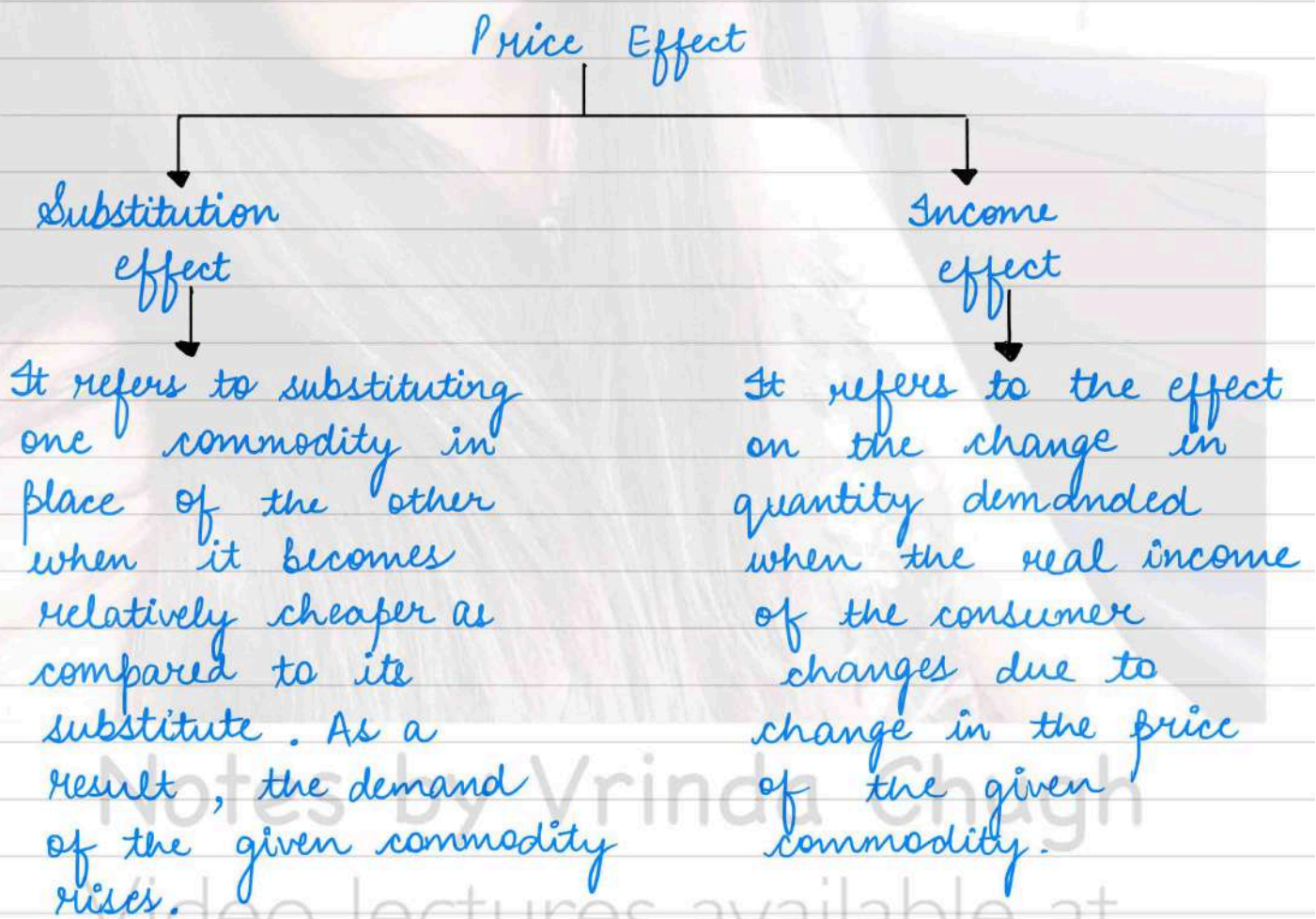
(i) Law of diminishing marginal utility

This law states that as a consumer goes on consuming more & more units of a particular good, the utility derived from the consumption of each additional unit goes on declining.

A consumer is in equilibrium (i.e. maximises his satisfaction) when the marginal utility of the commodity and its price equalize.

The operation of diminishing marginal utility and the act of the consumer to equalize the utility of the commodity with its price result in a downward sloping demand curve.

(ii) Price effect

The total fall in quantity demanded due to an increase in price is termed as Price effect. The law of demand can be dubbed as "Negative Price Effect" with some exceptions.

```
                    Price Effect
                         |
         ┌───────────────┴───────────────┐
         ↓                               ↓
   Substitution                       Income
      effect                          effect
         ↓                               ↓
```

It refers to substituting one commodity in place of the other when it becomes relatively cheaper as compared to its substitute. As a result, the demand of the given commodity rises.

It refers to the effect on the change in quantity demanded when the real income of the consumer changes due to change in the price of the given commodity.

Price effect = Substitution effect + Income effect

(iii) Arrival of new consumers

When the price of a commodity falls, more consumers start buying it because some of those who could not afford to buy it earlier may now be able to buy it. This raises the no. of consumers of a commodity at a lower price and hence the demand for the commodity in question.

(iv) Different uses

Certain commodities have multiple uses. If their prices fall, they will be used for varied purposes and therefore their demand for such commodities will increase. When the price of such commodities are high (or rises) they will be put to limited uses only.
Eg :- Olive Oil

EXPECTIONS TO THE LAW OF DEMAND

There are certain cases where law of demand is not applicable. Instead of being an inverse relation between price and demand of a good there is a direct relation between the two.

(i) Conspicuous goods

Some consumers measure utility of a commodity by its price i.e. if the commodity is expensive they think it has got more utility and vice versa. Therefore, they buy less at lower price and more of it at higher price.

Higher prices are indicators of higher utilities. A higher prices means higher prestige value and higher appeal and vice versa. Thus, a fall in their price would lead to fall in their quantities demanded. This is against the law of demand.

(ii) Giffen goods

In some cases, demand for a commodity falls when its price falls and vice versa.
Giffen goods - Goods which are inferior, with no close substitutes easily available and which occupy a

substantial place in consumer's budget.
In case of inferior goods like bajra, cheap bread etc. also called "Giffen goods".

(iii) Conspicuous necessities

The demand for some goods is guided by the demonstration effect of the consumption pattern of a social group to which the person belongs. Eg :- TV, refrigerators etc.
These goods due to their constant usage, become necessities of life.

(iv) Future expectations about prices

When the prices are rising, households tend to purchase larger quantities of the commodity, out of fear that prices may go up further and vice versa.

(v) Irrational behaviour of the consumers

At times consumers make impulsive purchases without any calculation about price & usefulness of the product. In such cases the law of demand fails.

(vi) Demand for necessaries

The law of demand does not apply much in case of necessaries of life. Irrespective of price changes, people have to consume the minimum quantities of necessary commodities.

Eg :- Rice, wheat, clothes, medicines etc.

(vii) Speculative goods

In the speculative market, particularly in the market for stocks and shares, more will be demanded when the prices are rising and less will be demanded when prices decline.

EXPANSION & CONTRACTION OF DEMAND — Movement along demand curve

The law of demand, the demand schedule and the demand curve all show that
- when the price of a commodity falls its quantity demanded rises or expansion takes place and
- when the price of a commodity rises its quantity demanded fall or contraction takes place.

Expansion of demand → When price of a commodity falls, its quantity demanded rises.

Contraction of demand → When price of a commodity

rises, its quantity demanded falls.

As other determinants of price like income, tastes, price of related goods etc. are constant, the position of the demand curve remains the same. The consumer will move upwards or downwards on the same demand curve.
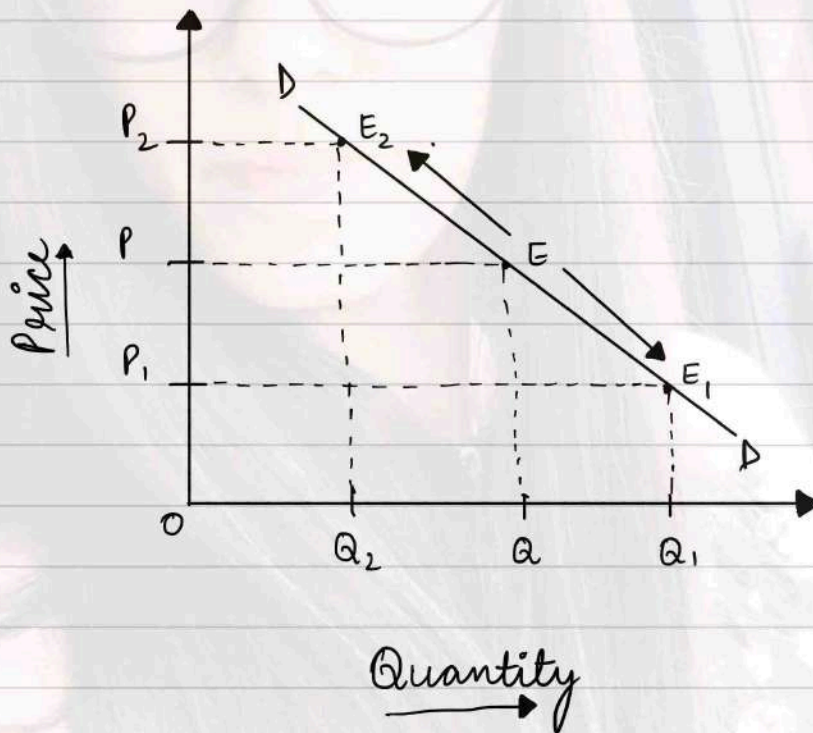

FIGURE :- Expansion & Contraction of Demand

- At price OP quantity demanded is OQ.
- With the fall in price to OP_1, the quantity demanded rises from OQ to OQ_1. The coordinate point moves down from E to E_1. This is called 'expansion of demand' or 'a rise in quantity demanded' or

'downward movement on the same demand curve'.

- At price OP quantity demanded is OQ.
- With a rise in price to P_2, the quantity demanded falls from OQ to OQ_2. The coordinate point moves up from E to E_2. This is called 'contraction of demand' or 'a fall in quantity demanded' or 'upward movement on the same demand curve'.

Thus, the downward movement on demand curve is known as expansion in demand and the upward movement on demand curve is known as contraction of demand.

INCREASE AND DECREASE IN DEMAND — Shift in demand curve

When there is change in demand due to change in factors other than price of the commodity, it is called increase or decrease in demand.

- Price remaining the same when demand rises due to change in factors other than price, it is called increase in demand.

- Price remaining the same when demand falls due to change in factors other than price, it is called decrease in demand.
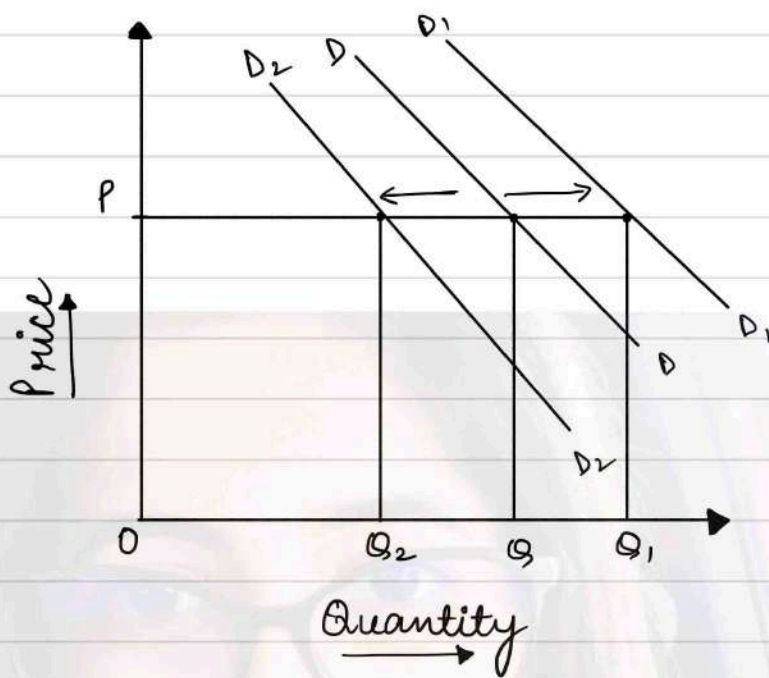
Figure: Increase and Decrease in Demand

In the figure
- Original demand curve is DD. At OP price OQ quantity is being demanded.
- As the demand changes, the demand curve shifts either to the right ($D_1 D_1$) or to the left ($D_2 D_2$).
- At $D_1 D_1$, OQ_1 quantity is being demanded at the price OP. This shows the increase in demand (rightward shifts in demand curve) due to factor other than price.
- At $D_2 D_2$, OQ_2 quantity is being demanded at the price OP. This shows decrease in demand (leftward shift in demand curve) due to a factor other than price.

\# When demand of a commodity INCREASES due to factors other than price, firms can sell a larger quantity at a prevailing price and earn higher revenue.

\# The aim of a advertisement and sales promotion activities is to shift the demand curve to the right and to reduce the elasticity of demand.

MOVEMENTS ALONG THE DEMAND CURVE VS. SHIFT OF DEMAND CURVE

A movement along the demand curve *indicates* changes in the quantity demanded because of price changes, other factors remaining constant.

A shift of the demand curve *indicates* that there is a change in demand at each possible price because one or more other factors, such as incomes, tastes or the price of some other goods, have changed.

ELASTICITY OF DEMAND

It is defined as the responsiveness of the quantity demanded of a good to changes in one of the variables on which demand depends.
It is basically a percentage change in quantity demanded divided by the percentage change in one of the variables on which demand depends.

\# It is the price elasticity of demand which is usually referred to as elasticity of demand.

PRICE ELASTICITY

Price elasticity of demand expresses the response of quantity demanded of a good to a change in its price, given the consumer's income, his tastes and prices of all other goods.

In other words, it is measured as the % change in quantity demanded divided by % change in price, other things remaining equal.

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

Or

$$E_p = \frac{\frac{\text{Change in qty}}{\text{Original qty}} \times 100}{\frac{\text{Change in price}}{\text{Original price}} \times 100}$$

Or

$$E_p = \frac{\text{Change in Qty}}{\text{Original Qty}} \times \frac{\text{Original Price}}{\text{Change in Price}}$$

In symbolic terms,

$$E_p = \frac{\Delta q}{q} \times \frac{p}{\Delta p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

E_p = Price elasticity
q = Quantity
p = Price
Δ = Change

\# The value of price elasticity varies from minus infinity to approach zero from the negative sign.

(1) The price of a commodity decreases from ₹6 to ₹4 and quantity demanded of the good increases from 10 units to 15 units. Find the coefficient of price elasticity.

(2) A 5% fall in the price of a good leads to a 15% rise in the demand. Determine the elasticity and comment on its value.

(3.) The price of a good decreases from ₹100 to ₹60 per unit. If the price elasticity of demand for it is 1.5 and the original quantity demanded is 30 units, calculate the new quantity demanded.

POINT ELASTICITY

In point elasticity, we measure elasticity at a given point on a demand curve.

The concept of point elasticity is used for measuring price elasticity where the change in price is infinitesimal.

Point elasticity makes use of derivative rather than finite changes in price and quantity.

$$Ep = - \frac{dq}{dp} \times \frac{p}{q}$$

where $\dfrac{dq}{dp}$ is the derivative of quantity with respect to price at a point on the demand curve.

p and q are the price and quantity at that point.

\# Point elasticity is, therefore, the product of price quantity ratio at a particular point on the demand curve and the reciprocal of the slope of the demand line.

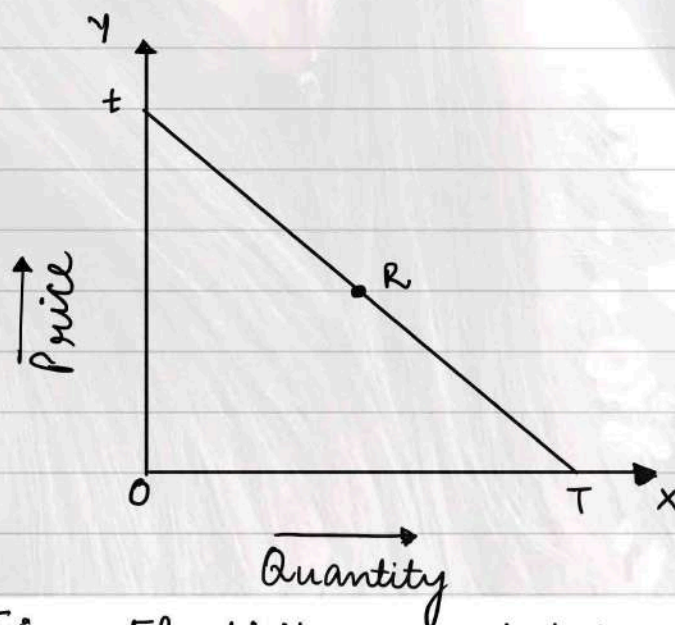Elasticity is different at different points on the same demand curve.

Fig :- Elasticity at a point on the demand curve

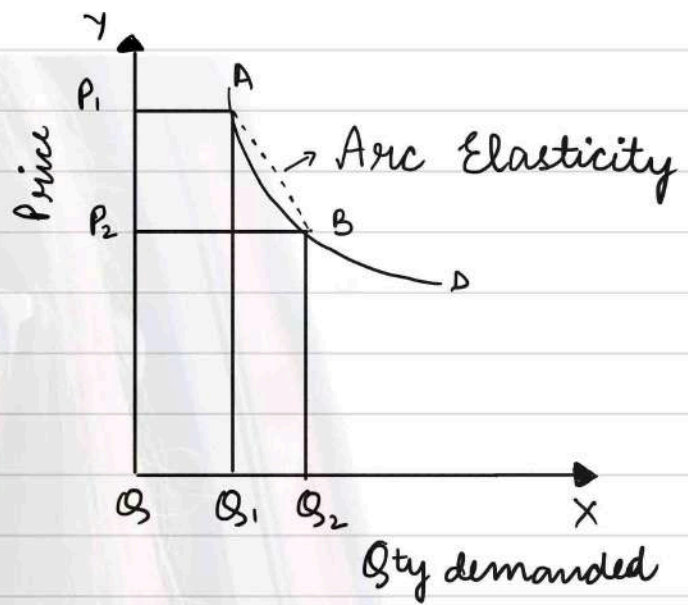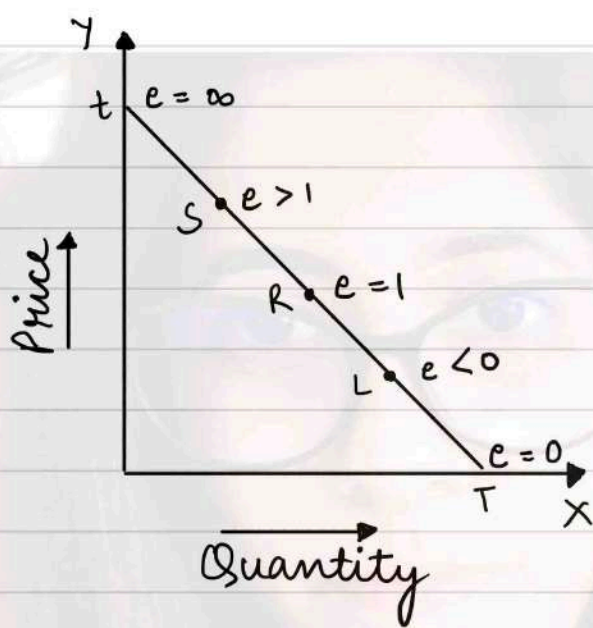$$\dfrac{RT}{Rt} = \dfrac{\text{lower segment}}{\text{upper segment}}$$

Fig: Elasticity at different points on the demand curve

ARC ELASTICITY

Arc elasticity of demand measures elasticity between two points on a curve - using a mid-point between the two curves.

$$E_p = \frac{q_1 - q_2}{q_1 + q_2} \times \frac{p_1 + p_2}{p_1 - p_2}$$

where, p_1 & q_1 are the original price & quantity
p_2 & q_2 are the new ones.

DIFFERENT DEGREES OF PRICE ELASTICITY OF DD

Price elasticity of demand is not the same for all types of commodities. The degree of change in DD to change in price varies for different commodities. The different degrees of price elasticity of DD are as follows :-

(i) Perfectly inelastic DD or $E_p = 0$
(ii) Inelastic DD or $E_p < 1$
(iii) Unitary elastic DD or $E_p = 1$
(iv) Elastic DD or $E_p > 1$
(v) Perfectly elastic DD or $E_p = \infty$

PERFECTLY INELASTIC DD

When there is no change at all in quantity demanded of a good due to change in its price, it is termed as perfectly inelastic or $E_p = 0$
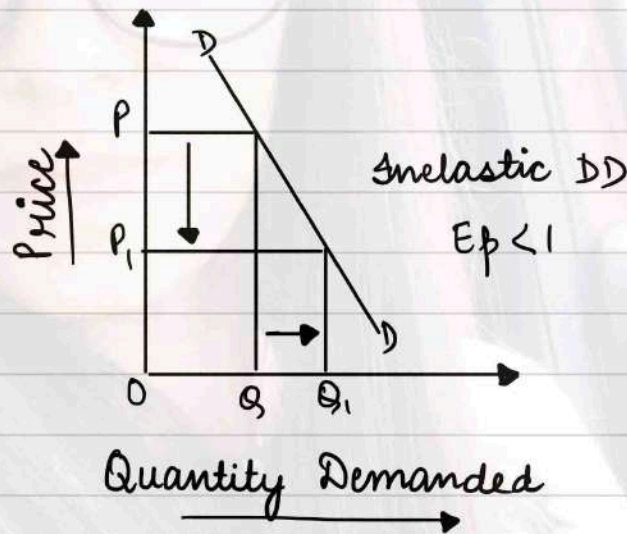
$E_p = 0$
Perfectly inelastic DD

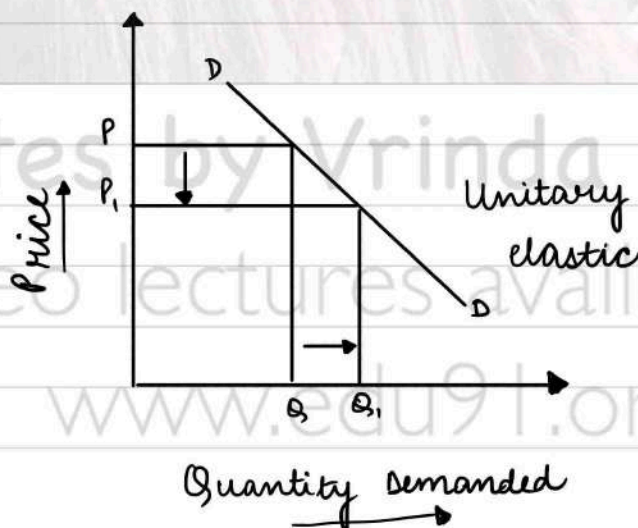Price of a good (Y-axis)

Qty demanded of a good (X-axis)
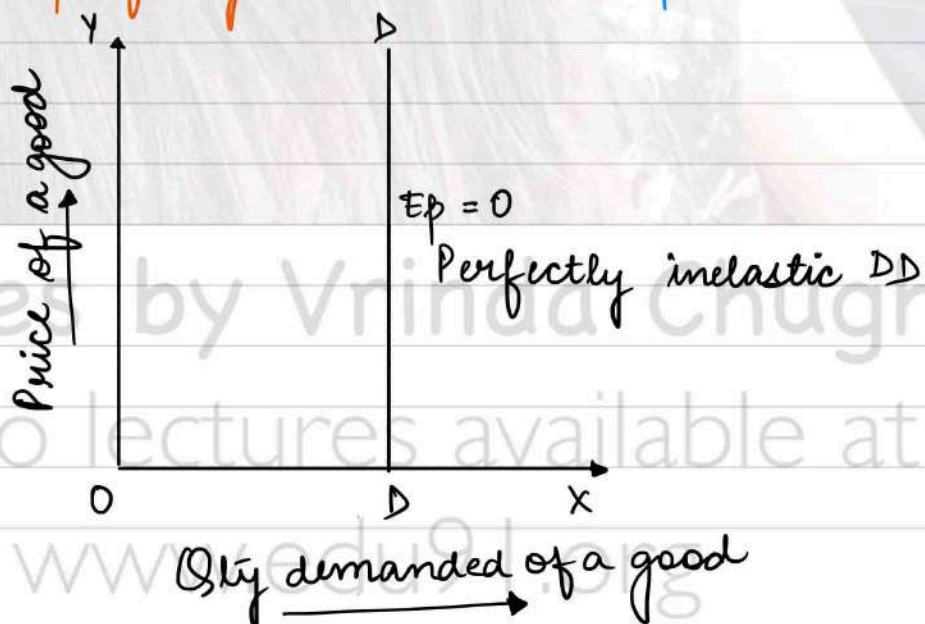
INELASTIC DEMAND

In the % change in quantity demanded is less then the % change in price, it is called as inelastic demand or Ep < 1

Inelastic DD

Ep < 1

Price

Quantity Demanded

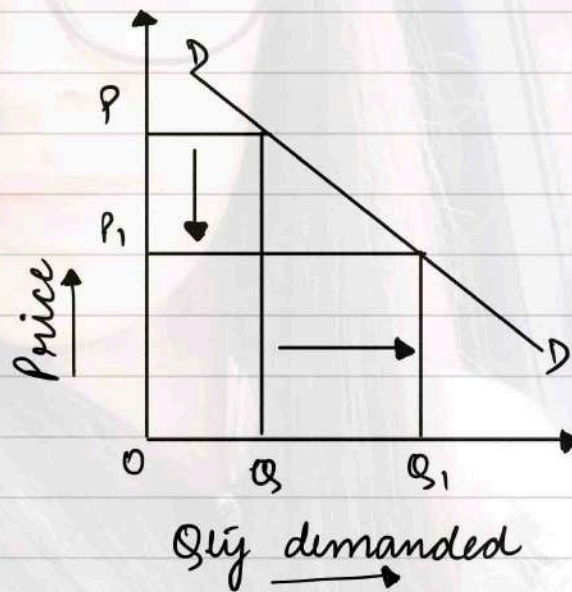## UNITARY ELASTIC DEMAND

When the % change in quantity demanded of a good is equal to % change in price, it is termed as unitary demand or Ep = 1

Unitary elastic

Price

Quantity Demanded

When the % change in quantity demanded is more then % change in the price of the good, it is termed as elastic demand or $Ep > 1$

Qty demanded

A demand curve is said to be perfectly elastic when it may increase or decrease to any extent irrespective of any change in price or a small change in price leads to infinite change in quantity demanded. So, elasticity of demand is ∞.

Perfectly elastic
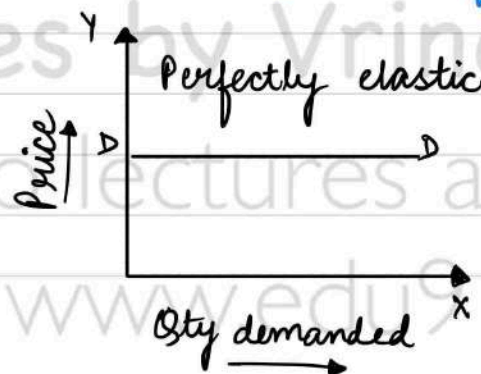
Qty demanded

Numerical Measurement	Verbal Description	Terminology
(i) 0	Quantity demanded of the good does not change at all with a change in price.	Perfectly inelastic
(ii) Less than one	Quantity demanded of a good change by a smaller % than the change in price	Inelastic
(iii) One	Quantity demanded of a good change by same % as the change in price.	Unitary elastic
(iv) More than one	Quantity demanded of a good change by a greater % than change in price.	Elastic
(v) Infinity	A small change in price produce an infinite change in quantity demanded of the good	Perfectly elastic

TOTAL OUTLAY METHOD

Price elasticity not only quantify the relationship between price and quantity demanded but it also indicates the direction in which total expenditure on a product changes with a change in price.

Total expenditure = Price × No. of units of goods purchased
= P × Q

DETERMINANTS OF PRICE ELASTICITY OF DEMAND

(i) Availability of substitutes

Demand of goods which have substitutes is relatively more elastic.

(ii) Position of a commodity in a consumer's budget

The greater the proportion of income spent on a commodity; generally the greater will be its elasticity of demand and vice-versa.

(iii) Nature of the need that a commodity satisfies

In general, luxury goods are price elastic while necessities are price inelastic.

\# If it is possible to postpone the consumption of a particular good, such good will have elastic demand. Consumption of necessary goods cannot be postponed and therefore, their demand is inelastic.

(iv) Number of uses which a commodity can be put

The more the possible uses of a commodity, the greater will be the price elasticity and vice-versa.

(5.) Time period

The longer the time-period one has, the more completely one can adjust.

(6.) Consumer habits

If a consumer is a habitual consumer of a commodity, no matter how much its price change, the demand for the commodity will be inelastic.

(7.) Tied demand

The demand for those goods which are tied to others is normally inelastic as against those whose demand is of autonomous nature.

(8.) Price range

Goods which are in very high price range or in very low price range have inelastic demand, but those in the middle range have elastic demand.

INCOME ELASTICITY OF DEMAND

Income elasticity of demand is the degree of responsiveness of quantity demanded of a good to changes in the income of consumers.

$$E_i = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}}$$

$$E_i = \frac{\Delta Q}{Q} \div \frac{\Delta Y}{Y}$$

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

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

E_i = Income elasticity of demand
ΔQ = Change in demand
Q = Original demand
Y = Original money income
ΔY = Change in money income

RELATIONSHIP BETWEEN INCOME ELASTICITY & INCOME SPENT

1.) If the proportion of income spent on a good remains the same as income increases, then income elasticity for the good is equal to one.

2.) If the proportion of income spent on a good increase as income increases, then the income elasticity for the good is greater than one.

3.) If the proportion of income spent on a good decrease as income rises, then income elasticity for the good is less than one.

CROSS ELASTICITY OF DEMAND

Price of related goods and demand

The demand for a particular commodity may change due to changes in the prices of related goods. These related goods may be either complementary goods or substitute goods. This type of relationship is studied under Cross Demand.

Cross Demand refers to the quantities of a commodity or service which will be purchased with reference to changes in price, not of that particular commodity, but of other inter-related commodities other things remaining the same.

It may be defined as the quantities of a commodity that consumers buy per unit of time, at different prices of a related article, other things remaining the same.

Substitute goods

In case of substitute commodities, the cross demand curve slopes upwards (i.e. positively) showing that more quantities of a commodity, will be demanded whenever there is a rise in the price of substitute commodity.

Qty demanded of tea
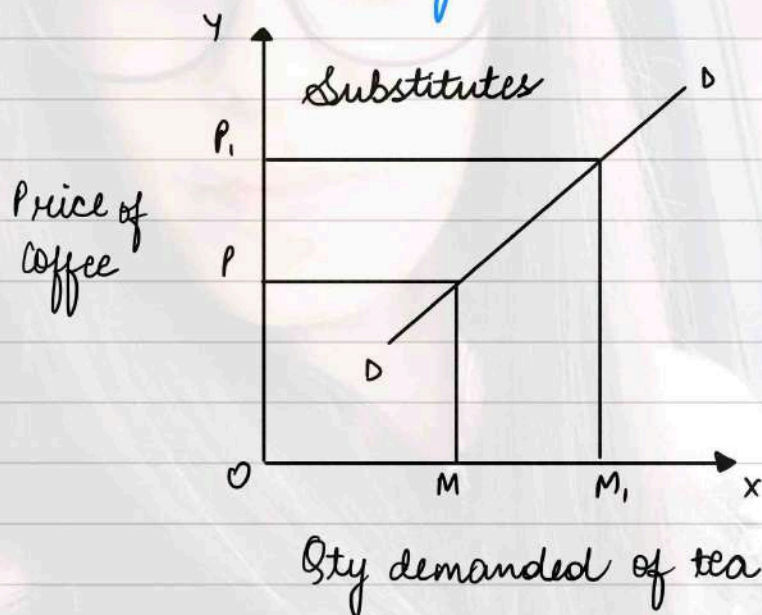
Complementary goods

In case of complementary goods, a change in the price of a good will have an opposite reaction on the demand for the commodity which is closely related or complementary.

Y

D

Price of
a Pen

P

P₁

M   M₁   X

D

Qty demanded of Ink
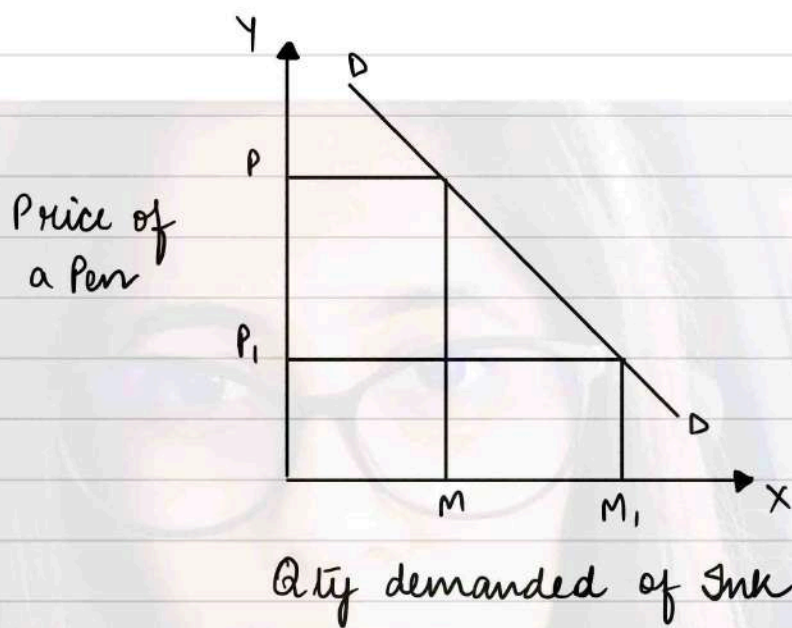
A change in the demand for one good in response to
a change in the price of another good represents
cross elasticity of demand of the former good for
the latter good.

The effect of changes in relative prices within a
market on the pattern of demand.

Symbolically,

$$E_c = \frac{\Delta q_x}{q_x} \div \frac{\Delta p_y}{p_y}$$

E_c = Cross elasticity

q_x = Original qty demanded of X

$$E_c = \frac{\Delta q_x}{\Delta p_y} \times \frac{p_y}{q_x}$$

Δq_x = Change in qty demanded of X

p_y = Original price of good Y

Δp_y = Small change in the price of Y.

\# If two goods are perfect substitutes for each other, the cross elasticity between them is infinite. Greater the cross elasticity, the closer is the substitute. If two goods are totally unrelated, cross elasticity between them is zero.

\# Substitute goods → Cross elasticity is +ve.
Complementary goods → Cross elasticity is -ve.

\# Cross elasticity of demand is useful for a manager while making decisions regarding changing the prices of his products which have substitutes and complements.
The firm can plan policies to safeguard against fluctuating prices of substitutes and complements.

Illustrations

(1.) The price of 1kg of tea is ₹30. At this price 5 kg of tea is demanded. If the price of coffee rises from ₹25 to ₹35 per kg, the quantity demanded of tea rises from 5 kg to 8 kg. Find out the cross price elasticity of tea.

(2.) The price of 1 kg of sugar is ₹50. At this price 10 kg is demanded. If the price of tea falls from ₹30 to ₹25 per kg, the consumption of sugar rises from 10 kg to 12 kg. Find out the cross price elasticity and comment on its value.

ADVERTISEMENT ELASTICITY

Advertisement elasticity of sales or promotional elasticity of demand is responsiveness of a good's demand to changes in firm's spending on advertising.

Advertising elasticity measures the effectiveness of an advertisement campaign in bringing about new sales.

Advertisement elasticity varies between zero & infinity.

$$E_a = \frac{\% \text{ change in demand}}{\% \text{ change in spending on advertising}}$$

$$E_a = \frac{\Delta Q_d / Q_d}{\Delta A / A}$$

$\Delta Q_d \rightarrow$ change in demand
$\Delta A \rightarrow$ change in expenditure on advertisement
$Q_d \rightarrow$ Initial demand
$A \rightarrow$ Initial expenditure on advertisement

DEMAND FORECASTING

Forecasting refers to knowing or measuring the status or nature of an event or variable before it occurs.

Demand forecasting is an estimate of the future market demand for a product. The process of forecasting is based on reliable statistical data of past and present behaviour, trends, etc.

Usefulness

- It is an important function of managers as it reduces uncertainity of environment in which decisions are made.
- It helps in planning for future level of production.
- It enables the firm to perform efficient business planning.
- It offers information for budgetary planning and cost control in functional areas of finance & accounting.
- Good forecasts help in efficient production planning, process selection, capacity planning, facility layout and inventory management.
- It also provides the necessary information for formulation of suitable pricing & advertisement strategies.

Scope of forecasting

The scope of the forecasting task will depend upon the area of operation of the firm in the present as well as what is proposed in future. Much would depend upon the cost and time involved in relation to the benefit of the information acquired through the study of demand.

Types of forecasting

(i) Macro-level forecasting deals with the general economic environment prevailing in the economy as measured by the Index of Industrial Production (IIP), national income and general level of employment, government expenditure, consumption level, consumers spending habits etc.

(a) Industry-level forecasting is concerned with the demand for the products as a whole. For example - demand for cars in India.

(b) Firm-level forecasting refers to forecasting the demand for a particular firm's product, say, the demand for Honda cars.

(ii) Based on time period, demand forecasts may be short-term demand forecasting and long term demand - forecasting.

(a) Short - term demand forcasting covers a short span of time, depending on the nature of industry. It is done usually for six months or less than one year and is generally useful in tactical decisions.

(b) Long-term forecasts are for longer periods of time, say two to five years and more. It provides information for major strategic decisions of the firm such as expansion of plant capacity.

Demand Distinctions

a)   Producer's goods   &   Consumer's goods

↓   ↓

Those which are used for the production of other goods - either consumer goods or producer goods themselves

Those which are used for final consumption

↓

Readymade clothes, Prepared food, residential houses etc.

↓

Machines, Plant & Equipment

b) Durable goods & Non-durable goods

Those which do not quickly wear out, can be consumed more than once and yield utility over a period of time

Those which cannot be consumed more than once. Non-durable are purchased for current consumption only.

Beverages, Bread, Milk.

Cars, Refrigerators, Mobile Phones etc.

NOTE → There may be semi-durable goods like clothes, umbrella.

(c) Derived demand & Autonomous demand

Demand for a commodity that arises because of the demand for some other commodity called 'Parent Product'.

Demand for a product is independent of the demand for other goods. It arises on its own out of an innate desire of the consumer to consume or to possess the commodity.

Demand for Complementary goods, demand for some consumer goods

NOTE → This distinction is purely arbitrary, and many times, it is very difficult to find out which product is entirely independent of other products.

(d)   Industry demand   &   Company demand

↓   ↓

It is the total demand   It is the demand for the
for the products of a   product of a particular
particular industry   firm i.e. the quantity
                             that a firm can dispose
↓   at a given price over a

Total demand for air   period of time.
conditioners in the
country   ↓

                           Demand for Hitachi Air
                           Conditioners.

NOTE → The demand for a firm's product when expressed
as a percentage of Industry demand signifies
the Market Share of the firm.

(e)   Short run demand   &   Long run demand

↓   ↓

It refers to demand with   It refers to demand
its immediate reaction to   which ultimately exist
changes in product price   over a long period, as a
and prices of related   result of changes in
commodities, income   pricing, promotion or
fluctuations, ability of the   product improvement, after
consumer to adjust their   enough time is allowed
consumption pattern, their   to let the market adjust
susceptibility to advertisement   to the new situation.
of new products etc

Factors Affecting Demand

(a) Producer Goods

Producer's goods or Capital Goods help in futher production, and hence the demand for them is derived demand, i.e. derived from the demand of consumer goods they produce.

Some factors that drive the demand for Producer Goods include —

Rate of profitability	Size of the market	Increase in the price of		Financing opportunities for Capital expansion
Growth prospects	Growth rate of technology	Complementary goods	Forecast demand for the goods produced	

(b) Non Durable Consumer Goods

- **Disposable income**
  - Personal income less personal taxes

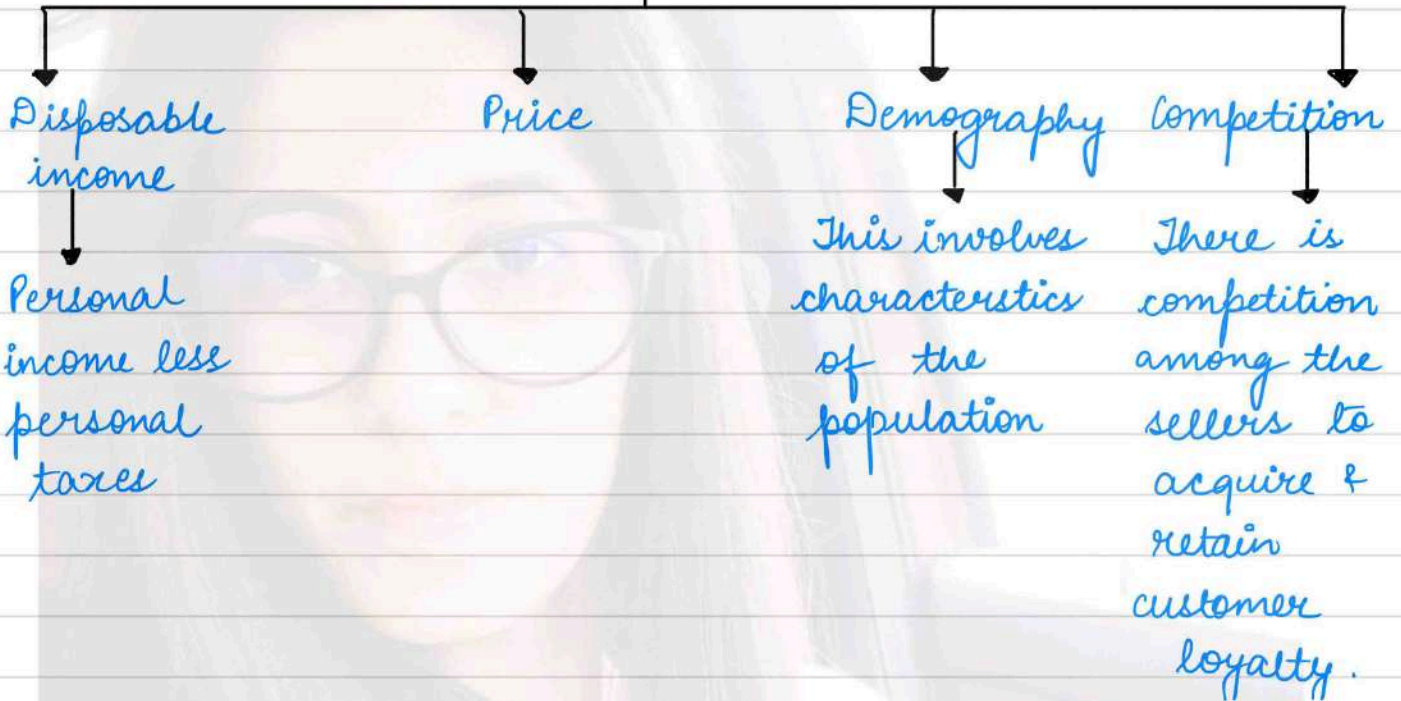- **Price**

- **Demography**
  - This involves characterstics of the population

- **Competition**
  - There is competition among the sellers to acquire & retain customer loyalty.

(c) Durable consumer goods

- **Special facilities**
  - Some durable goods req. special facility/ infra for their use

- **Family**
  - As consumer durables are used by more than one person, the decision to purchase may be influenced by family characterstics

- **Current holding**
  - Replacement demand is an imp. comp. of total dd for durables. Greater the current holdings, greater will be the replacement demand.

- **Timing of replacement**
  - Go on using or replace

- **Others**
  - Demand for consumer durables is influenced by their prices & credit facilities available

Methods of Demand Forecasting

(i) **Survey of Buyers' Intentions:** The most direct method of estimating demand in the short run is to ask customers what they are planning to buy during the forthcoming time period, usually a year. This method involves direct interview of potential customers. Depending on the purpose, time available and costs to be incurred, the survey may be conducted by any of the following methods:

    a) Complete enumeration method where nearly all potential customers are interviewed about their future purchase plans

    b) Sample survey method under which only a scientifically chosen sample of potential customers are interviewed

    c) End–use method, especially used in forecasting demand for inputs, involves identification of all final users, fixing suitable technical norms of consumption of the product under study, application of the norms to the desired or targeted levels of output and aggregation.

Thus, under this method the burden of forecasting is put on the customers. However, it would not be wise to depend wholly on the buyers' estimates and they should be used cautiously in the light of the seller's own judgement. A number of biases may creep into the surveys. The customers may themselves misjudge their requirements, may mislead the surveyors or their plans may alter due to various factors which are not identified or visualised at the time of the survey. This method is useful when bulk of sale is made to industrial producers who generally have definite future plans. In the case of household customers, this method may not prove very helpful for several reasons viz. irregularity in customers' buying intentions, their inability to foresee their choice when faced with multiple alternatives, and the possibility that the buyers' plans may not be real, but only wishful thinking.

(ii) **Collective opinion method:** This method is also known as sales force opinion method or grass roots approach. Firms having a wide network of sales personnel can use the knowledge, experience and skills of the sales force to forecast future demand. Under this method, salesmen are required to

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estimate expected sales in their respective territories. The rationale of this method is that salesmen being closest to the customers are likely to have the most intimate feel of the reactions of customers to changes in the market. These estimates of salesmen are consolidated to find out the total estimated sales. These estimates are reviewed to eliminate the bias of optimism on the part of some salesmen and pessimism on the part of others. These revised estimates are further examined in the light of factors like proposed changes in selling prices, product designs and advertisement programmes, expected changes in competition and changes in secular forces like purchasing power, income distribution, employment, population, etc. The final sales forecast would emerge after these factors have been taken into account.

Although this method is simple and based on first hand information of those who are directly connected with sales, it is subjective as personal opinions can possibly influence the forecast. Moreover salesmen may be unaware of the broader economic changes which may have profound impact on future demand. Therefore, forecasting could be useful in the short run, for long run analysis however, a better technique is to be applied.

(iii) **Expert Opinion method:** In general, professional market experts and consultants have specialised knowledge about the numerous variables that affect demand. This, coupled with their varied experience, enables them to provide reasonably reliable estimates of probable demand in future. Information is elicited from them through appropriately structured unbiased tools of data collection such as interviews and questionnaires.

The Delphi technique, developed by Olaf Helmer at the Rand Corporation of the USA, provides a useful way to obtain informed judgments from diverse experts by avoiding the disadvantages of conventional panel meetings. Under this method, instead of depending upon the opinions of buyers and salesmen, firms solicit the opinion of specialists or experts through a series of carefully designed questionnaires. Experts are asked to provide forecasts and reasons for their forecasts. Experts are provided with information and opinion feedbacks of others at different rounds without revealing the identity of the opinion provider. These opinions are then exchanged among the various experts and the process goes on until convergence of opinions is arrived at. This method is best suited in circumstances where intractable changes are occurring and the relevant knowledge is distributed among experts. Delphi technique is widely accepted due to its broader applicability and ability to address complex questions. It also has the advantages of speed and cheapness.

(iv) **Statistical methods:** Statistical methods have proved to be very useful in forecasting demand. Forecasts using statistical methods are considered as superior methods because they are more scientific, reliable and free from subjectivity. The important statistical methods of demand forecasting are:

(a) Trend Projection method: This method, also known classical method, is considered as a 'naive' approach to demand forecasting. A firm which has been in existence for a reasonably long time would have accumulated considerable data on sales pertaining to different time periods. Such data, when arranged chronologically, yield a 'time series'. The time series relating to sales represent the past pattern of effective demand for a particular product. Such data can be used to project the trend of the time series. The trend projection method assumes that factors responsible for the past trend in demand will continue to operate in the same manner and to the same extent as they did in the past in determining the magnitude and direction of demand in future. The popular techniques of trend projection based on time series data are;

a) graphical method and

b) Fitting trend equation or least square method.

(b) **Graphical Method:** This method, also known as 'free hand projection method' is the simplest and least expensive. This involves plotting of the time series data on a graph paper and fitting a free-hand curve to it passing through as many points as possible. The direction of the curve shows the trend. This curve is extended into the future for deriving the forecasts. The direction of this free hand curve shows the trend. The main draw-back of this method is that it may show the trend but the projections made through this method are not very reliable.

(c) **Fitting trend equation: Least Square Method:** It is a mathematical procedure for fitting a line to a set of observed data points in such a manner that the sum of the squared differences between the calculated and observed value is minimised. This technique is used to find a trend line which best fit the available data. This trend is then used to project the dependant variable in the future. This method is very popular because it is simple and inexpensive. Moreover, the trend method provides fairly reliable estimates of future demand.

The least square method is based on the assumption that the past rate of change of the variable under study will continue in the future. The forecast based on this method may be considered reliable only for the period during which this assumption holds. The major limitation of this method is that it cannot be used where trend is cyclical with sharp turning points of troughs and peaks. Also, this method cannot be used for short term forecasts.
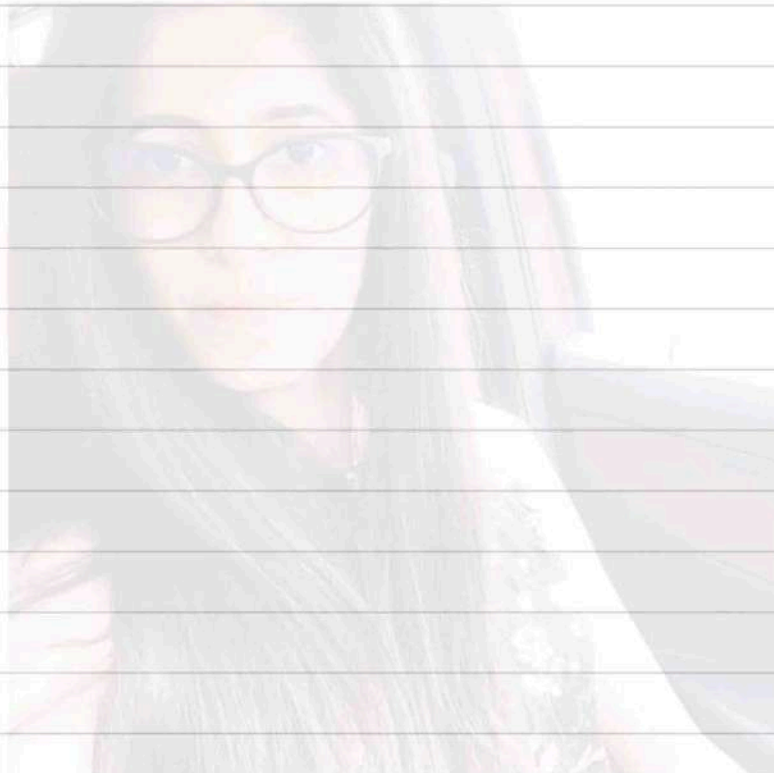
(d) **Regression analysis:** This is the most popular method of forecasting demand. Under this method, a relationship is established between the quantity demanded (dependent variable) and the independent variables (explanatory variables) such as income, price of the good, prices of related goods etc. Once the relationship is established, we derive regression equation assuming the relationship to be linear. The equation will be of the form $Y = a + bX$. There could also be a curvilinear relationship between the dependent and independent variables. Once the regression equation is derived, the value of Y i.e. quantity demanded can be estimated for any given value of X.

(v) **Controlled Experiments:** Under this method, future demand is estimated by conducting market studies and experiments on consumer behaviour under actual, though controlled, market conditions. This method is also known as market experiment method. An effort is made to vary separately certain determinants of demand which can be manipulated, for example, price, advertising, etc., and conduct the experiments assuming that the other factors would remain constant. Thus, the effect of demand determinants like price, advertisement, packaging, etc., on sales can be assessed by either varying them over different markets or by varying them over different time periods in the same market. The responses of demand to such changes over a period of time are recorded and are used for assessing the future demand for the product. For example, different prices would be associated with different sales and on that basis the price-quantity relationship is estimated in the form of regression equation and used for forecasting purposes. It should be noted however, that the market divisions here must be homogeneous with regard to income, tastes, etc.

The method of controlled experiments is used relatively less because this method of demand forecasting is expensive as well as time consuming. Moreover, controlled experiments are risky too because they may lead to unfavourable reactions from dealers, consumers and competitors. It is also difficult to determine what conditions should be taken as constant and what factors should be regarded as variable so as to segregate and measure their influence on demand. Besides, it is practically difficult to satisfy the condition of homogeneity of markets.

Market experiments can also be replaced by 'controlled laboratory experiments' or 'consumer clinics' under which consumers are given a specified sum of money and asked to spend in a store on goods with varying prices, packages, displays etc. The responses of the consumers are studied and used for demand forecasting.

(vi) **Barometric method of forecasting:** The various methods suggested till now are related with the product concerned. These methods are based on past experience and try to project the past into the future. Such projection is not effective where there are economic ups and downs. As mentioned above, the projection of trend cannot indicate the turning point from slump to recovery or from boom to recession. Therefore, in order to find out these turning points, it is necessary to find out the general behaviour of the economy. Just as meteorologists use the barometer to forecast weather, the economists use economic indicators to forecast trends in business activities. This information is then used to forecast demand prospects of a product, though not the actual quantity demanded. For this purpose, an index of relevant economic indicators is constructed. Movements in these indicators are used as basis for forecasting the likely economic environment in the near future. There are leading indicators, coincidental indicators and lagging indicators. The leading indicators move up or down ahead of some other series. For example, the heavy advance orders for capital goods give an advance indication of economic prosperity. The lagging indicators follow a change after some time lag. The heavy household electrical connections confirm the fact that heavy construction work was undertaken during the past with a lag of some time. The coincidental indicators, however, move up and down simultaneously with the level of economic activities. For example, rate of unemployment.