Definition of Demand

Demand refers to different possible quantities of a commodity that the consumer is ready to buy at a given price and at a given time.

Demand Schedule

The table showing the relation between different quantities of a commodity to be purchased at different prices of that commodity is known as demand schedule.

Types of Demand Schedule

(a) **Individual Demand Schedule**

It refers to demand schedule of an individual buyer of a commodity in the market .It shows quantity of a commodity which an individual buyer buys at different possible prices of that commodity at a point of time.

	Price of Ice Cream (Rs.)	Quantity Demanded (units)
A	1	4
B	2	3
C	3	2
D	4	1

(b) **Market Demand Schedule**

It is a table showing different quantity of a commodity that all the buyers in the market are ready to buy at different possible prices of the commodity at a point of time.

	Price of Ice Cream (Rs.)	P's Demand	Q's Demand	Market Demand (P+Q)
A	1	4	5	9
B	2	3	4	7
C	3	2	3	5
D	4	1	2	3

DEMAND CURVE

Graphical representation of demand schedule is known as demand curve .It basically is a curve that shows how quantity demanded of a commodity is related to its price.

TYPES OF DEMAND CURVE

(a) Individual Demand Curve
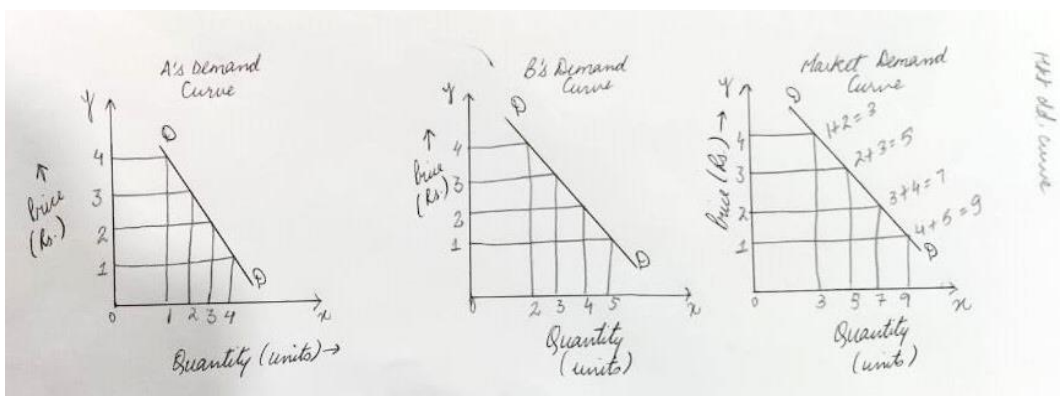
(b) Market Demand Curve

(a) Individual Demand Curve

- It is a curve showing different quantity of a commodity that one particular buyer is ready to buy at different prices of the commodity at a point of time.

- The Demand Curve slopes downward from left to right indicating inverse relationship between price of commodity and its quantity demanded.

(b) Market Demand Curve

- It shows various quantities of various commodities that all the buyers in the market are ready to buy at different possible prices of the commodity.

- It is horizontal summation of the Individual Demand Curve.

DEMAND FUNCTION

It shows the relationship between demand for a commodity and its various determinants (factors affecting demand).

$D_x = f (P,P_r,Y,T,E,N,Y_d)$

Here, D_x = Quantity demanded of commodity X.
P_x = Price of Commodity X.
P_r = Price of Related Commodity.
Y = Consumer's Income.
T = Taste and Preference.
E = Consumer's Future Expectation.
N = Number of Population (Size of Population)
Y_d = Distribution of Income.

DETERMINANTS OF DEMAND

(A) **Price of Commodity** :Other things being constant,with a rise in price of commodity,its demand contracts (reduces) and with a fall in price,its demand extends i.e. rises.

(B) **Price of Related Goods** : Demand for a commodity is influenced by change in price of related goods.They are of two types :

(i) **Substitute Goods** – The goods which can be used in place of each other or which can be substituted for each other .Example- Tea and Coffee ,Increase in price of Tea,decreases the demand for tea and eventually increase the demand for coffee as due to increase in price of tea,the consumers will shift to consumption of coffee.

(ii) **Complementary Goods** – The goods which complete the demand for each other and therefore are demanded together , Example – Pen and Ink,Car and Petrol.In case of complementary goods a fall in price of one,causes increase in demand of the other and a rise in price of one causes decrease in demand for another.

Substitute Goods –

Price of Tea(Rs./kg)	Demand for tea(kg.) (When P_c = Rs. 250/kg.)	Demand for tea(kg.) (When P_c = Rs. 300/kg.)
250	5	10
225	8	14
200	11	18
175	14	22
150	17	26
100	20	30

Complementary Goods –

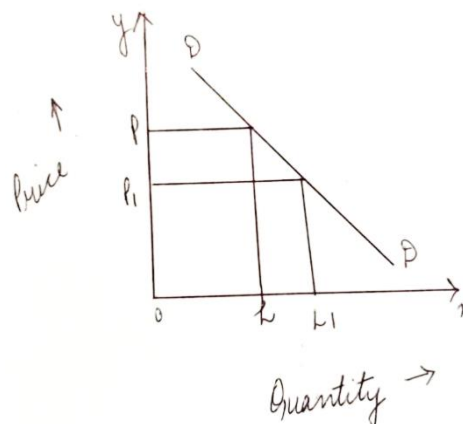| Price of Ink (Rs.)	Demand for ink (units) (When Price of pen = Rs. 50)	Demand for ink (units) (When Price of pen= Rs. 100)
30	5	2
25	8	4
20	12	6
18	16	8
15	20	10

(C) **Income of the Consumer** – The demand for a commodity may increase/decrease with a rise in income depending on nature of commodity .For this, the goods are divided into –

(i) **Normal Goods**: The goods whose demand increases with rise in income and decreases with fall in income are termed as normal income. They have positive effect related to income.
Eg. Rice, Wheat etc.

(ii) **Inferior Goods** : The goods whose demand decreases with rise in consumer's income and increases with the fall in income is termed as inferior goods.There is an inverse relation between income of consumer and demand for goods.The income effect is negative.
Eg. Jowar,Bajra,etc.

LAW OF DEMAND

Statement of Law –

The law of demand states that other things remaining constant (ceteris paribus) the demand for a commodity expands with fall in its price and contracts with a rise in its price .In short, it shows inverse relationship between price of a commodity and its demand.

WHY DOES DEMAND CURVE SLOPES DOWNWARD?

OR

WHY DOES THE LAW OF DEMAND OPERATE?

OR

WHY MORE OF A GOOD IS PURCHASED WHEN ITS PRICE FALLS?

The Law of Demand indicates more demand as price falls and less demand as price rises.The reasons are as follows :

1. **LAW OF DIMINISHING MARGINAL UTILITY :**
   According to this law the marginal utility of a good falls with an increase in its quantity or we can say that marginal utility decreases with increase in consumption of the commodity,Accordingly for every additional unit to be purchased the consumer is willing to pay less and less price because consumer would purchase a commodity where its marginal utility becomes equal to its price.Thus the diminishing marginal utility curve takes the form of a demand curve and slopes downward.

2. **INCOME EFFECT :**

   It refers to change in quantity demanded when real income of the buyer changes due to change in price of the commodity. In simple words, with a fall in price of commodity the real income increases and enables the consumer to purchase more of the commodity and thus demand expands.

3. **SUBSTITUTION EFFFECT :**
   It refers to substitution of one commodity for the other when it becomes relatively cheaper. In short ,when the price of commodity X falls it becomes cheaper in relation to commodity Y ,so the consumers now start substituting commodity X for Y .Thus with a fall in the price of X ,the demand for it increases.

4. **NEW CUSTOMERS :**
   When the price of commodity falls some new consumers start purchasing the commodity as now even they can afford to buy it. Contrary to it ,when price rises some old consumers might stop purchasing the good and thus demand decreases.

5. **DIFFERENT USES :**
   A commodity can be put to several uses amongst which some uses are important and others are less important.When the rice of commodity increases the consumer reduces the use of commodity for less important uses ,hence purchase is reduced.
   Eg. Milk is used for making different products like curd,cheese,butter,etc.If the price of milk reduces it will be used for different uses.

   EXCEPTIONS TO THE LAW OF DEMAND :

   When with the increase in price,more quantity of a commodity is purchased and with a decrease in price less of it is purchased this is something which is contradictory to the law of demand.This is known as exception to the law of demand.In this the demand curve slopes upwards from left to right.

Following are the exceptions:

1. **Articles of Distinction/Prestige Goods/Conspicious Goods** : Certain goods are purchased to emphasise status/prestige.Such goods will be purchased when sold at higher price and are demanded less at a lower price.Eg. Precious Diamonds,Vintage cars,etc.

2. **Giffen Goods** : They are highly inferior goods showing a very high negative income effect.As a result whenprice of such commodities falls,the demand also falls even when they happen to be relatively cheaper thanother goods.This is also known as Giffen Paradox.Eg. Bajra,Coarse grain,etc.

3. **Expectation of Further Change in Price** : When buyers expect a further rise in the price they purchase increased quantity of the commodity even at a higher price and vice versa.Eg. Gold Prices.

4. **Necessities** :Those goods which are a must for living and necessities of life for which a minimum quantity has to be purchased by the consumer irrespective of the price.Eg. Food Grains,Salt,etc.

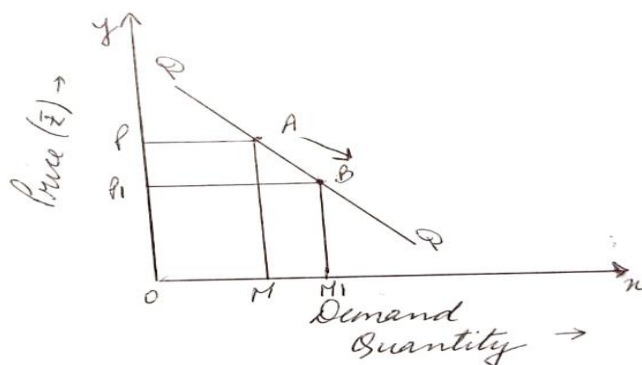**MOVEMENT ALONG THE DEMAND CURVE AND SHIFT IN DEMAND CURVE –**

1. **MOVEMENT ALONG DEMAND CURVE** – It refers to the situation when the demand extends or contracts due to fall/rise in the own prices of commodity.
2. **SHIFT IN DEMAND CURVE** – It refers to all such situations when demand for a commodity increases or decreases due to changes in other determinants of demand other than own price of commodity.
1. Movement along Demand Curve- It is of two types :
(a) Extension of Demand Curve.
(b) Contraction of Demand Curve.

(A) EXTENSION OF DEMAND
- Other things being equal when more quantity is purchased because of fall in its prices, it is called extension of demand.
- It is also known as Increase in quantity demanded.
- It is shown by downward/rightward movement along the same demand curve.
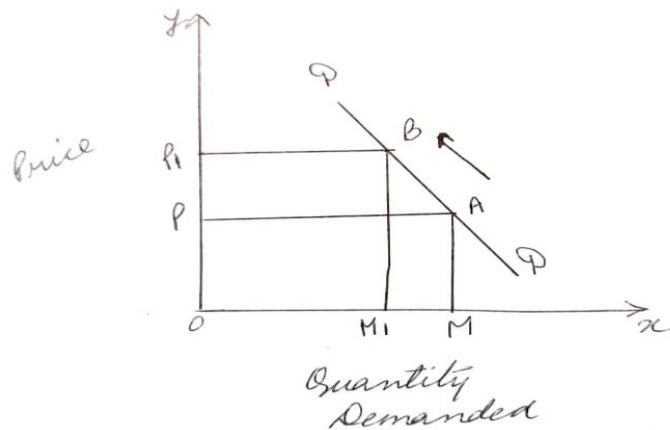- Example:

P_x	D_x
10	20
8	25

(B) CONTRACTION OF DEMAND

- Other things being equal when less quantity is purchased because of rise in its prices, it is called contraction of demand.
- It is also known as decrease in quantity demanded.
- It is shown by the upward or leftward movement along the same demand curve.
- Example:

Px	Dx
10	20
12	15

SHIFT IN DEMAND CURVE –

- It occurs due to change in other factors other than price of the commodity.
- Eg. Change in income, change in price of related goods, etc.

(1) Increase in Demand

(A) When due to change in factors other than the price of commodity concerned,more quantity at same price or same quantity at higher price is demanded,this is termed as increase in demand.

(B) It is also known as forward shift.

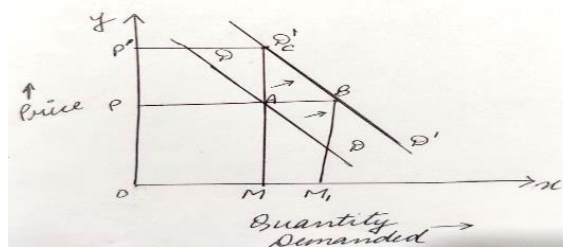(C) It is indicated by rightward shift or upward shift to new demand curve.

(D) The important causes of increase in demand are :

- When income of consumer increases.
- When price of substitute good increase.
- When price of complementary goods fall.
- When taste of consumer shifts in favour of the commodity.
- When availability of commodity is expected to reduce in near future.
- Example1:

Px	Dx
10	20
10	25

- Example2:

Px	Dx
10	20
12	20

(2) Decrease in Demand

(A) When because of factors other than the price of the commodity concerned less quantity at the same price or same quantity at a lower price is demanded this is termed as decrease in demand.

(B) It is also known as backward shift,

(C) The Demand Curve shifts to a new Demand Curve on its left or downward.

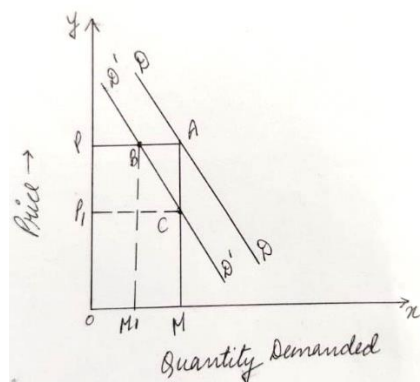(D) The causes for decrease in demand are :

- Fall in Consumer's income.
- Fall in price of substitute.
- Rise in price of compliment.
- Change in taste away from the commodity.
- Example1:

Px	Dx
10	20
10	15

- Example2:

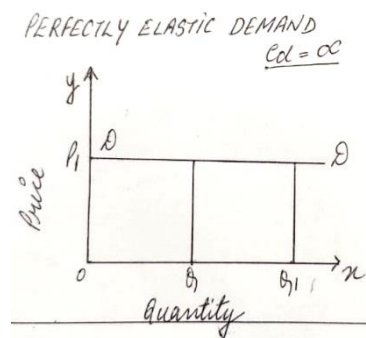| Px	Dx
10	20
8	20

PRICE ELASTICITY OF DEMAND :

- It is defined as a measurement of percentage change in quantity demanded in response to a given percentage change in own price of the commodity.
- It is denoted by 'E_d'.

DEGREES OF PRICE ELASTICITY OF DEMAND :

1. Perfectly Elastic Demand
2. Perfectly Inelastic Demand
3. Unitary Elastic Demand
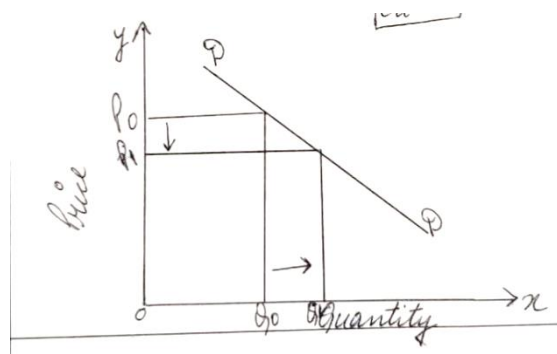4. More than unitary elastic demand
5. Less than unitary elastic demand

1. Perfectly Elastic Demand:

(a) When the demand curve becomes zero with the slight rise in the price of commodity or when the demand is infinite at the given price,it is called as perfectly elastic demand.
(b) This curve is horizontal curve parallel to the x-axis.
(c) Hence the coefficient of elasticity of demand would be equal to infinity.
(d) It is an imaginary situation.
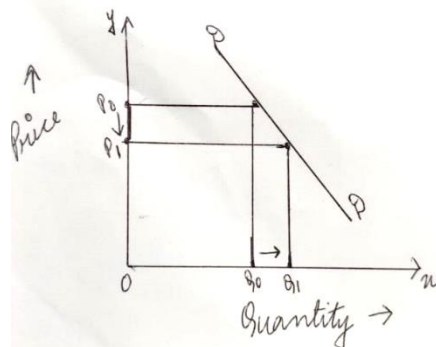

2. Relatively or Highly Elastic Demand:

(a) When the proportionate or percentage change in the quantity demanded is greater than the proportionate or percentage change in price,it is called as elastic or relatively elastic demand.
(b) Hence elasticity of demand is greater than one,i.e. $E_d>1$.
(c) Example : If the percentage change in quantity demanded is 30% while percentage change in price is 25% then it is case of elastic demand.
(d) Example of Highly elastic demand:
    - Want is not that urgent.
    - Luxury Goods.
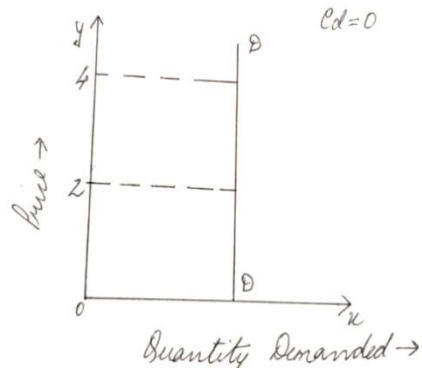   - Close substitutes are available.

3. **Unitary Elasticity of Demand**
   (a) When the proportionate change in quantity demanded and the proportionate change in price are equal it is termed as unitary elastic demand.
   (b) It is denoted by $E_d=1$.
   (c) The shape of unitary elastic demand will be a rectangular hyperbola.
   (d) Example : Percentage change in price =20% and Percentage change in quantity = 20%.
   (e) Example : Comfort Goods

4. **Perfectly Inelastic Demand**
   (a) When there is no change in the quantity demanded with the change in the price.
   (b) Its demand curve is vertical curve parallel to Y- Axis.
   (c) Example : Demand for rare medicines or demand for opium for the person who becomes addicted to it are examples of perfectly inelastic demand.
   (d) Example: When price is Rs. 2 ,demand is 4 units and when price rises to Rs. 4 still the demand remains constant at 4 units.

5. **Less Than Unitary Elastic Demand ($E_d<1$)**
   (a) When the proportionate percentage change in quantity demanded is less than proportionate percentage change in price.
   (b) For example : Due to decrease in price by 40% the demand increases by 10%.
   (c) Example : Necessity goods like salt,basic food items,etc.

MEASUREMENT OF PRICE ELASTICITY OF DEMAND :

   (1) Percentage or Proportionate Method.
   (2) Geometrical Method or Point Elasticity Method.
   (3) Total Expenditure Method /Total Outlay Method.
   (4) Arc Elasticity Method.

   (1) **Percentage or Proportionate Method** :
   - It is the most popular method of measuring E_d.
   - Under this method, elasticity is measured by the ratio of proportionate (percentage) change in quantity demanded to proportionate (percentage) change in price.

- Formula –

  E$_d$ = % Change in Quantity

        % Change in Price

  OR

  E$_d$ = Proportionate Change in Quantity Demanded

        Proportionate Change in Price

  OR

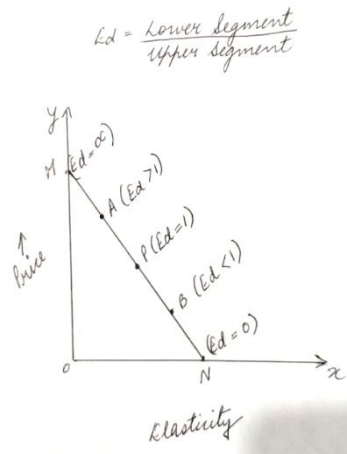 E$_d$ = $\dfrac{\Delta Q}{\Delta P}$ x $\dfrac{P}{Q}$

  Note: Price and Quantity move in opposite direction. Therefore elasticity of demand will always be negative, but for convenience minus sign is dropped.

Geometric Method/Point Elasticity:

1. Geometric method measures price elasticity of demand.
2. It is also called point method of measuring elasticity of demand.This method determines elasticity of demand at different points along the same DC.
3. For this method, the straight line DC needs to be expanded to the x and y axis.

The point at which ed is to be completed, divides the DC into 2 parts- (a) lower sector (b) upper sector.

4. Thus, ed = lower sector (i.e. lower segment)

         Upper sector (i.e. upper segment)

5. Following fig details about elasticity at diff points
   ➔ ed = 1(unity): if point P is at the middle of the DC, then lower segment = upper segment price

       Accordingly: PN = 1

              PM

   ➔ ed > 1 (greater than unity): At point A, ed = AN > 1 because AN > AM

                                     AM

   ➔ ed < 1 (less than unity): At point B, ed = BN < 1 because BN > BM

                                 BM

   ➔ ed = 0 (zero): At point N, where DC touches the x-axis, ed = O = 0

                                          NM

   ➔ ed = ∞ (infinity): At point M, where DC touches the y-axis, ed = MN = ∞

$$Ed = \frac{Lower\ Segment}{Upper\ Segment}$$

elasticity

* **Total Expenditure method or Total outlay method or Relationship between elasticity f demand & total expenditure.**

1. Total expenditure = The quantity demanded x Price of good

2. TE = q(x) x p(x)

3. According to this method, elasticity of demand is measured by comparing total expenditure of the commodity before and after the price undergoes change.

4. There may be 3 possibilities in this case:

a) → **Elasticity of demand is greater than unity (ed > 1) or demand is elastic.**

In this case, total expenditure increase with fall in price and decrease with rising price.

* Price & total expenditure move in opposite direction

b) **Elasticity of demand is equal to unity (ed=1) or demand is unitary elastic.**

When total expenditure remains the same with fall or rise in price, then ed derived = 1

In this case, the total expenditure does not change.
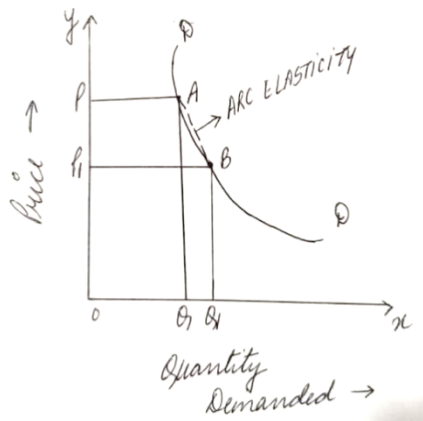

c) **Elasticity of demand is less then unitary (ed < 1) or demand is inelastic.**

When total expenditure decrease with fall in price and increase with rise in price.

The price and total expenditure move in same direction.

ARC ELASTICITY METHOD:

- When Price elasticity is to be found between two prices or two points on demand curve then generally mid point method is used i.e. averages of two prices and quantities are taken (i.e original and new) base.
- The Arc Elasticity can be found using formula:
- $ep = \dfrac{q1-q2}{q1+q2} \; x \; \dfrac{p1+p2}{p1-p2}$

Factors affecting elasticity of demand

a) **Nature of commodity**
    A) Necessity of goods: they are less than unitary elastic or inelastic demand eg: salt, kerosene ec.
    B) Luxuries: they are greater than unitary elastic demand eg: AC, costly furniture etc.
    C) Comforts: They are neither very elastic nor very inelastic demand, eg. Cooler, furniture etc.

b) **Availability of substitutes**
    A) Goods which have closer substitutes: Here, the elasticity of demand is higher i.e. more elastic as when price of a commodity rises, the consumer has options of drifting to its substitutes eg. Tea and coffee.
    B) Goods without close substitutes: These goods are less elastic in demand s the consumer has no other option than that good eg. Cigarette, liquor.

c) **Diverse/variety of uses**
    A) Goods with many uses: The commodities which can be put to a variety of uses have elastic demand as if the price of such good ↑, the demand is restricted for important purposes eg. electricity, if its price increases, it's use may be restricted to important uses such as lighting.
    B) Goods with less use: Its demand is likely to be less elastic eg. Paper

d) **Postponement of use**
    A) The consumption of good which can be postponed, the demand will be elastic, eg: demand for residential houses is postponed when interest rates on loans are high.
    B) When consumption cannot be postponed, then it has less elastic demand.

e) **Income level of the buyer:**
   A) Consumers with high level of income will not be bothered by a rise in price of commodity. Thus ed is expected to be low, eg: demand for luxury cars by multi-billionaires.
   B) The demand of middle income consumer is more elastic, eg: demand for small cars by middle class people in India.

f) **Habit of consumer**
   If the consumer becomes accustomed/habitual for a commodity, then the demand will be inelastic as he cannot reduce the demand even when the goods are highly taxed, eg: cigarettes, liquor.

g) **Proportion of expenses/proportion of Income spent on commodity**
   A) Goods on which consumer does not spend higher proportion of income, they will have inelastic demand, eg: needle, matchbox/
   B) Goods on which the consumer spends a larger proportion of their income, then the elasticity is high, eg: clothes etc.

h) **Price Level**
   Elasticity of demand will be high at higher level of price and lower at the lower level of price.

i) **Time period**
   A) Long period: It is more elastic as consumer can change his consumption habits more conveniently.
   B) Short period: The demand is inelastic as the consumer cannot change the consumption very easily.

Income Elasticity of dd

E_i = % Change in Quantity
     % Change in Price

$$\Rightarrow \quad \frac{\Delta Q}{Q} \; x \; \frac{\Delta Y}{Y}$$

$$= \frac{\Delta Q}{\Delta Y} \; x \; \frac{Y}{Q}$$

CROSS ELASTICITY OF DEMAND

➔ Cross dd refers to quantity of commodity or service which will be purchased with reference to change in price, not of that particular commodity but of other inter-related commodities, other things remaining the sme.

➔ Change in dd for one good in response to change in price of another good represents cross elasticity of dd

$$ec = \frac{\Delta qx}{\Delta py} \; x \; \frac{py}{qx}$$

eg, Price of tea = Rs.30/kg

At this price 5Kg of tea is dd. If price of coffee rises from Rs.25 to Rs.35/kg, the quantity dd of tea rises from 5 kg to 8kg. Find cross price elasticity of tea.

$$\text{Cross elasticity} = = \frac{\Delta qx}{\Delta py} \; x \; \frac{py}{qx}$$

$$\frac{8-5}{35-25} \; x \; \frac{25}{5}$$

$$\frac{3}{10} \; x \; \frac{25}{5}$$

$$= +1.5$$

Advertisement elasticity

Advertisement elasticity of sales/promotional elasticity of demand.

➔ Responsiveness of goods dd to changes in firms spending on advertising

➔ It measures the effectiveness of an advertisement campaign in bringing about new sales

➔ Increase in advertisement value, therefore greater will be responsiveness of demand

e_a =   % change in dd

% change in spending on advertisement

$$e_{a\,=} \; \frac{\Delta qd}{qd} \; x \; \frac{\Delta A}{A}$$

$$= \; \frac{\Delta qd}{\Delta A} \; x \; \frac{A}{qd}$$

Demand Forecasting

Meaning

➔ Forecasting of dd is art and science of predicting probable dd for product/service at some future date on basis of certain past behaviour patterns.

➔ it is estimated scientifically on basis of certain facts.

Usefulness

➔ helps in planning & decision-making

➔ its importance has increased due to mass production and production in response to demand

➔ good forecast enables firms to perform efficient business planning

➔ provides information for formulation of suitable pricing and advertisement strategies.

Types of Forecasts:

1. Macro Level Forecasting – It deals with general economic environment prevailing in the economy as measured by Index of Industrial Production.

2. Industry Level Forecasting – It is concerned with the demand for a particular industry's product as a whole, say the demand for cement in India.

3. Firm Level Forecasting –It refers to forecasting the demand of particular firm's product, e.g. Demand for ACC Cement.

    Based on Time Period:

    1. Short Term Demand Forecasting covers a short span of time, depending of the nature of industry. It is done usually for six months or less than one year.

    2. 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:

1. **Producer's Goods and Consumer's Goods** :
    *   Producer's Goods are those which are used for the production of other goods – either consumer goods or producer goods themselves. E.g. Machines, plants and machine, etc.
    *   Consumer's Goods are those which are used for final consumption. Eg.Readymade clothes.

2. **Demand for Durable Goods and Non-Durable Goods**:
    1. Non-Durable Goods are those which cannot be consumed more than once. Eg. Raw Material, Fuel, etc.
    2. Durable Goods do not quickly work out, can be consumed more than once and yield utility T a period of time. E.g. Building, Plant and machinery, etc.

3. **Derived demand and Autonomous demand:**
    *   The demand for a commodity that arises because of the demand for some other commodity called 'parent product' is called derived demand. For e.g. The demand for cement is derived demand related building activity.
    *   If the demand for a product is independent of the demand for other goods, it is called autonomous demand.

4. **Demand for firm's product and industry demand:**
    *   The term industry demand is used to denote the total demand for the products of a particular industry, e.g. total demand for steel in the country.
    *   The demand for firm's product denotes the demand for the products of a particular firm. Eg. Demand for steel produced by the Tata Iron and Steel Company.

5. **Short Run and Long Run demand:**
    *   This is distinguished on the basis of time.

METHODS OF DEMAND FORECASTING

1. SURVEY OF BUYER'S INTENTIONS :
- In this it is to be asked from the consumers what they are planning to buy during the year by following methods :
(a) Complete enumeration method.
(b) Sample Survey method.
(c) End-Use Method.
- In this method the burden of forecasting is on the customers.

2. Collective Opinion Method :
- It is known as sales force opinion method or grass root approach.
- Firms have wide network of sales personal who can use their knowledge, experience and skills of the sales force to forecast future demand.
- It is a simple method giving first hand information.
- This is a technique which can be used for short run.

3. **EXPERT OPINION METHOD:**
- Professional market experts and consultants have specialised knowledge about the numerous variables that affect demand.
- Information is elicited through them in the form of interviews and questionnaires.
- Experts are asked to provide forecasts and the reasons for forecast.

4. STATISTICAL METHOD :

(a) **TREND PROJECTION METHOD** :Also known as classical method, it is considered as a naïve approach. Such data when arranged chronologically is known as time series.
(i) **Graphical Method**: Also known as Free hand Projection method. The direction of curve shows the trend. Drawback is that the data shown may not be reliable.
(ii) **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 calculated and observed value is minimised.

(b) **Regression Analysis :** It is most popular method of forecasting demand.Under this method a relationship is established between the quantity demanded and the independent variables such as income,price of good,price of related goods,etc.The equation will be in form of Y = a+bX.

5. 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 expensive as well as time consuming. Also it is risky as they may lead to unfavourable reactions from dealers, consumers and competitors.

6. BAROMETRIC METHOD OF FORECASTING :
This method is based on past experience and try to project the past into the future. Such projections is not effective where there are economic ups and downs. This information is then used to forecast demand prospects of a product though not actual quantity demanded.Just as meteorologists use the barometer to forecast weather the economists use economic indicators to forecast trends in business activities.