

Chapter 2: Demand, Supply and Market Equilibrium

Meaning of Desire:

The term desire means the wish of individuals to have some goods and services whether or not the/she has the paying capacity. It is just the interest of the consumers to have some goods and services. It is not supported by ability and willingness to pay.

Meaning of Demand:

In general sense, demand is the desire for something. The term demand in economics is not synonymous with desire; rather, it calls for desire for goods and services, backed by an ability to pay and a willingness to pay.

Demand = Desire + ability to pay + willingness to pay

Thus, both willingness and ability to pay are crucial to converting desire into demand. Human desire cannot be a demand without one component. For instance, if a person is willing to buy a branded car but does not have the ability to pay for it, he cannot convert desire into demand. However, a rich businessman's desire to buy a car is demanded due to his ability and willingness to pay.

According to Professor Marshall, "Demand refers to the quantities of a commodity that the consumer are able and willing to buy at each possible price during a given period of time, other things being equal."

From the above definition and concept, it is clear that demand is desire for goods and services that should be backed by:

- Ability to pay
- Willing to pay
- Price of the commodity
- Particular period of time and place

Difference between Desire and Demand

Desire		Demand	
a	Desire is only a hypothetical concept that may be fulfilled or not	a	Demand is an economically actual concept that may be fulfilled.
b	The quantity of goods and services that the individuals are just willing to have whether or not paying capacity is called desire	b	The quantity of goods and services that the consumers are willing and able to purchase from the market at various prices per period of time is called demand.
c	Desire depends upon the nature of a human being.	c	Demand depends upon various factor such as price , income, credit facilities, price of other related goods and others.
d	The will of beggar to purchase a newly NANO car from the market is an example of desire.	d	The willingness of a secretary of a ministry to purchase TOYATA car is an example of demand as it is supported by paying capacity

Determinants of Demand

(i) Price of the commodity: Price is the most important determinant of demand. Quantity demanded for a commodity increases when price of the commodity decreases, and vice versa. In other words, there is an inverse relationship between quantity and price of a commodity, other things remaining the same.

(ii) Income of the consumer:- When there is a change in income of the consumer, there is a change in demand of the consumer. In the case of normal goods, quantity demanded increases with an increase in income and vice versa. In the case of inferior goods, quantity demanded decreases with an increase in income and vice versa.

(iii) Price of related goods:- The demand for goods is determined by the price of related goods. There are two types of related goods they are:

a) Substitute goods:- In the case of substitute goods, if there is an increase in the price of one good then there is an increase in the demand for other goods and vice versa. For example, Tea and coffee, if the price of tea increases assuming the price of coffee as constant, the demand for coffee will increase and vice versa.

b) Complementary goods:- In the case of complementary goods, if there is a rise in the price of one good then the demand for other goods will decrease and vice versa. For example, Bike and petrol, if the price of petrol increases, assuming the price of Bike constant, the demand for Bike will decrease.

(iv) Taste and Preference of consumers: Demand is influenced by the taste and preference of the consumers. If the consumer's taste or preferences change, the consumer's demand will also change.

(v) Advertising: Advertisement also influences customer demand. Advertisements of particular goods usually increase demand for those products, and vice versa.

(vi) Consumer expectation:- If a consumer anticipates that the price of a commodity will rise in the future, he will demand that commodity in greater quantities and at a higher price. In contrast, if consumers expect that prices will fall in the future, they will buy less of a particular commodity.

(vii) Size and composition of population:- Demand also depends upon the size of population in the market. A large number of populations will create more demand for goods and services. When the size of population increases then demand for necessary goods increases and vice versa.

Composition of population means the proportion of male, female, young, old people in a country. Age distribution of the population determines the demand. If population determines the demand. If population mostly consists of aged people, there will be more demand for medicine and health services.

(viii) Distribution of income in the society: Distribution of income in the society also influences the demand for goods. When the income of people in the society is equally distributed, there will be a higher demand for goods. In the case of unequal income distribution, the relatively rich would favour luxury goods, whilst the economically disadvantaged would prefer necessities.

(ix) Availability of credit:- Customers are encouraged to buy more goods because banks, sellers, friends, etc. offer them some form of credit to buy things like television, cars, furniture, etc. This shows that there is a greater demand for durable goods in case of availability of credit.

(x) Climate and weather:- The demand for goods is also affected by climate and weather. The demand for warm clothes, hot drink, heater, etc. will increase in winter season. The demand for cold drink, ice-cream, etc. will increase in summer season.

Types of Demand

- i) Price demand:- The change in quantity demand of product due to the change in price of product is called price demand. There is a negative relationship between price and quantity demand. If the price of one goods increases then the demand for other goods decreases and if the price of one goods decreases then the demand for other goods increases. Quantity demanded changes with change in price and all other factors are assumed to remain constant.
- ii) Income demand:- The relationship between income and demand is known as income demand. There is a positive relation between income and demand. If income of the consumer increases, there is increase in demand and if income of the consumer decreases, there is decrease in demand. Income demand can be clarified under the following two types of goods i.e. normal and inferior goods.
- iii) Joint demand:- The demand for several goods by a consumer to fulfill their single purpose is known as joint demand. The demand for complementary goods like pen and ink, bike and petrol, etc. In case of these goods, if price of one goods increases then the demand for other goods decreases.
- iv) Competitive demand:- The demand for substitute goods are known as competitive demand. In that demand, in the absence of one another can be used. For example, Tea and coffee, coke and Pepsi etc. In case of these goods, a rise in price of one goods leads to rise in demand of other goods.
- v) Derived demand:- The demand for the factors of production like land, labor, capital and organization are called derived demand because it is demanded for the production of goods and services.
- vi) Composite demand:- The commodity or service which can fulfill several needs, that is called composite demand. For example, electricity is demanded for cooking, heating, ironing, lighting, photocopying and running machines and other purposes. So, demand for electricity is called composite demand.
- vii) Direct demand:- The commodity which is directly consumed by a consumer is known as direct demand. The demands for normal goods like food, clothes, etc. are the example of direct demand.

Law of Demand

Law of demand is propounded by famous economist Alfred Marshall in his book “Principle of Economics” published in 1890 AD. Law of demand express about functional relationship between price and quantity demand of a commodity.

According to this law, there is inverse relationship between price of commodity and its quantity demand. Mathematically it can be expressed as

$$\begin{array}{ll} P(\uparrow) & Qd (\downarrow) \\ P(\downarrow) & Qd (\uparrow) \end{array}$$

(other things remaining the same)

Where:

P = Price of commodity

Qd = Quantity demand

Law of demand is based on the following major assumption:

Price (P)	Quantity Demand (Qd)
5	30
10	20
15	10

- No change in consumer's income.
- No change in taste and preference.
- No change in technology
- No change in fashion
- No change in price of related goods.
- No change in advertisement.

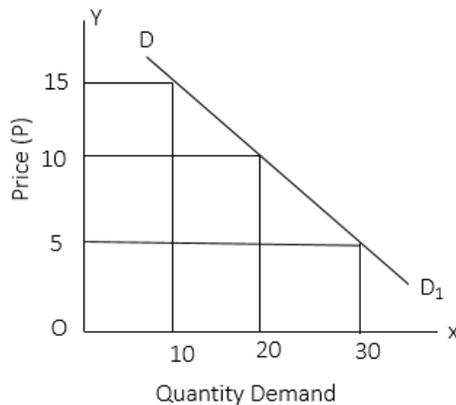
No change in time period.

From the above assumption, law of demand can be explained with the help of demand schedule and demand curve.

Demand Schedule

Demand Schedule is defined as a tabular presentation of various combinations of price of commodity and its quantity demanded at given period of time, other things remaining the same. The above table represents the relation in which the initial price is Rs.5 and the initial quantity demand is 30 units. As the price increases from Rs.10 to Rs.15 then the quantity demand decreases from 20 unit to 10 unit.

Demand curve is the graphical representation of demand schedule. When we plot all the combinations of price and corresponding quantity demanded in graph, we get the downward sloping demand curve as shown below:



If we plot all the combinations of price and quantity demanded exhibited in table we will get a downward sloping demand curve as shown as above. The downward sloping demand curve shows the buyer purchase more quantity of commodity at a lower price than at a higher price of it. Here, increase in quantity demand following the decline in price of the product is the law of demand. The inverse relationship between price and quantity demanded gives a downward sloping demand curve. Therefore, the downward sloping demand curve itself is the explanation of the law of demand.

Limitations of Law of Demand

a. Basic necessary goods

Law of demand doesn't apply to the basic necessary goods like salt, medicine, rice etc. The consumers demand remain unchanged whatever changes in the price of those commodity. In this situation law of demand doesn't hold.

b. Luxurious/ Prestigious goods

Those types of goods which are related to the prestige of buyers or users such as gold, diamond etc. Demand of prestigious goods increases even the price of such increases. In this situation law of demand doesn't hold.

c. Future price expectation

If the price of commodity is increasing and it is expected to increase still in future, then the consumer will buy more commodity even at the higher price in present situation. In this situation, law of demand does not hold.

d. Income Effect

If the income of consumer increases, then he will demand more units of goods even the price is rising and vice-versa. This is against the law of demand.

e. Out of Fashion

If the commodity is out of fashion then the consumer doesn't buy more units of goods even the price level is decreasing or vice – versa. In this situation law of demand doesn't hold.

Demand Function

Demand function is defined as the functional relationship between demand for a commodity and its determinants. It is expressed as;

$$D_x = F (P_x, Y, P_r, T, A, P, D, E)$$

Where,

D_x = Demand for commodity x

F = Function

Y = Income of the consumer

P_r = Price of related goods

T = Taste and preference of the consumer

A = Advertisement

P = Population and its composition

D = Distribution of income

E = Expectation of consumer

Above given demand function is multi variable demand function. If we assume that there is only change in price other things remaining constant, we get single variable demand function which is as follow;

$$D_x = F(P_x)$$

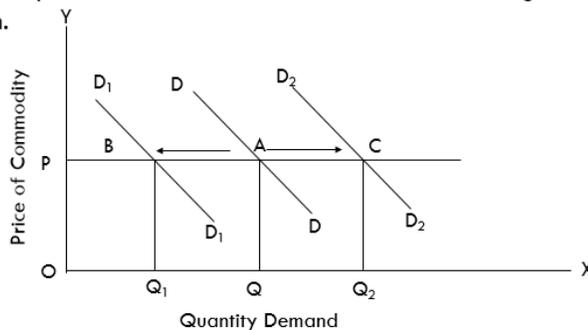
Reasons behind downward sloping of demand curve

Generally, the demand curve (i.e. price demand curve) slopes downwards from left to right due to the following reasons:

- i) **Income effect:-** When the price of commodity falls the purchasing power of consumer for that commodity will increase. So people will buy same product at less price. So when price decreases then demand increases. Hence the demand curve slopes downward from left to right.
- ii) **Substitution effect:-** When price of commodity falls, it becomes relatively cheaper than its substitute goods. So, consumer will prefer to buy more unit of cheaper commodity instead of expensive substitute goods. As, a result quantity demand increases when price decrease of other goods. In this situation demand curve slopes downward.
- iii) **Diminishing marginal utility:-** As we consume more and more unit of particular commodity the intensity of want for that particular commodity decrease. Therefore, people purchase that commodity only when price reduce. When price reduces the demand curve slopes downward from left to right.
- iv) **New consumer:-** When price is reduce, new consumers attracted for that particular commodity. Rich people can purchase more of a commodity even at high price but poor's cannot be able to purchase that commodity at high price. As there is fall in price of a commodity. It becomes cheaper than new consumers purchase more. So, fall in price increases demand and demand curve slopes downward from left to right.
- v) **Different uses:-** When price of composite demand falls, it will be used more for various purpose in different uses. For example, electricity, milk, etc. when the price of electricity fall, it will increase its use and so that the demand curve slopes downward from left to right.

Shift of Demand Curve

Change in demand for any commodity due to non-price factors which make the whole demand curve change its position. In this situation demand curve shift rightward and leftward from the initial position.



- A = DD = Initial point or initial demand curve
- DD to D2D2 or A to C = Increasing / Extension of Demand
- DD to D1D1 or A to B = Decreasing / Contraction of Demand

When there is change in quantity demand not because of price but because of some other reasons such as change in income change in fashion, etc. it is known as shift in demand curve, demand curve shift rightward or leftward from its original demand curve. It is also known as change in demand. There are two types of shift in demand. They are:

a) Rightward shift in demand curve (increase in demand):- Rightward shift in demand refers to more demand at same price of the commodity due to favorable change in other factors. In this situation, the initial demand curve shift rightward of the original demand curve. The factors that causes rightward shift in demand curve are increase in consumers income, increase in size of population, increase in price of substitute goods.

b) Leftward shift in demand curve (decrease in demand):- Leftward shift in demand refers to less demand at same price of the commodity due to unfavorable change in other factors. In this situation, the initial demand curve shift leftward of the original demand curve. The factors that causes leftward shift in demand curve are decrease in consumer income, decrease in size of population, decrease in price of substitute goods.

Factors Causing Shift in Demand Curve

Factors causing shift in demand curve are as follows:

i) Change in consumer's income

The demand of commodity changes along with the change in income of the consumer. Generally, demand increases with increase in income and vice – versa. Therefore, demand curve shift rightward with increase in income and leftward shift with decrease in income.

ii) Price of related goods

The related price of the commodity refers to the complementary and substitute good. If the price of Pepsi rises from the initial price then the demand of coke increases. In this situation demand curve shift rightward otherwise shift leftward. For the complementary goods petrol and bike, when price of petrol increases but the quantity demand of bike decreases. In this condition, demand curve shift leftward otherwise demand curve shift rightwards.

iii) Taste and preference of consumers

If the consumer's taste and preference increases towards any commodity then the quantity demand of consumer also increases. In this situation demand curve shift rightward. Otherwise demand curve shift leftward.

iv) Advertisement:- When there is increase in advertisement for a particular commodity, the demand for it will increase and demand curve shift rightward of the original demand curve.

v) Expectation of consumer:- When a consumer expects that there will be fall in price in near future, the consumer will postpone their demand due to which demand will decrease and demand curve shift leftward of the original demand curve.

vi) Availability of credit:- When a consumer gets credit facilities from sellers, bank, friends and relatives etc. the demand for commodity increases and demand curve shifts rightward of the original demand curve.

vii) Size and composition of population:- When there is increase in size of population, the demand for commodity will increase and demand curve shifts rightward of the original demand curve. If population mostly consists of aged people above 60 years, there will be more demand for medicines and health services. In that case the demand curve shifts rightward of the original demand curve.

viii) Distribution of income:- If the income is equally distributed among the people, the demand for goods will be increases, and the demand curve shifts rightward of the original demand curve.

(Note: Factors causing the shift in demand curve are the same points mentioned as the determinants of the demand except the price of a commodity/ goods).

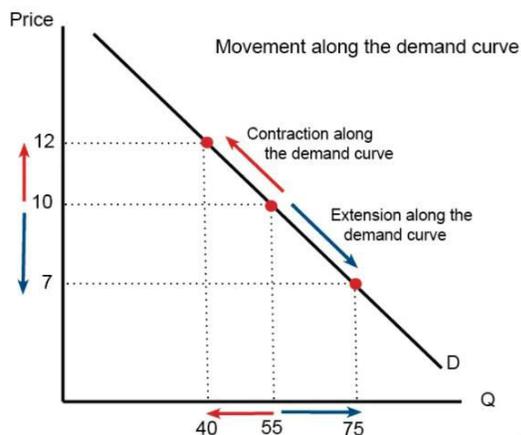
Movement along the Demand Curve

When there is change in quantity demanded only because of change in price other things remaining constant then it is known as movement along the demand curve. It explains how the price – quantity combination move from one point to another of the same demand curve.

When change in demand is caused by change in price then it is called extension or contraction in demand. It is also known as change in quantity demanded. The concepts of extension (expansion) or contraction in demand are explained below:

a) Extension in demand:- When quantity demanded for a commodity increases due to fall in price. It is known as extension in demand. It is also known as increase in demand. In this case the consumer moves downward along the same demand curve.

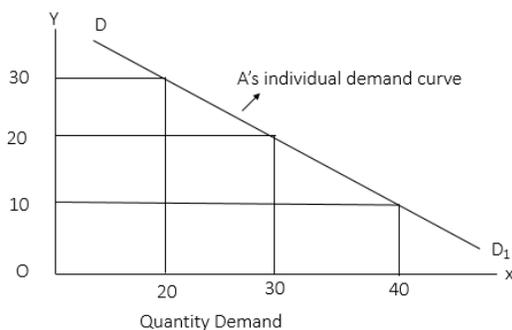
b) Contraction in demand:- When quantity demanded for a commodity decreases due to increase in price. It is known as contraction in demand. It is also known as decrease in quantity demanded. In this case, the consumer moves upward along the same demand curve.



Derivation of an Individual Demand Curve.

Various commodities demanded by a consumer at different prices is called individual demand. If the individual schedule is represented in the graphical figure, it is called individual demand curve. The following is the individual demand schedule and curve:

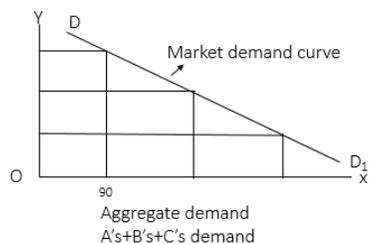
Price (P)	QD of 'A' consumer
10	40
20	30
30	20



Market Demand

Various commodities demanded by a different consumers at different prices, it is called market demand. In other words, market demand means aggregate demand of all the consumers.

Price(P)	QD of A's consumer	QD of B's consumer	QD of C's consumer	Aggregate Demand (A's+B's+C's)
5	40	50	60	150
10	30	40	50	120
15	20	30	40	90



Supply

Supply means quantities of commodity that a producer or a seller is ready to offer for a sale. It is the quantities for a commodity that a seller is able and willing to offer for sale of different prices, at particular period of time and place.

According to Professor Thomas, "the supply of goods is the quantity offered for sale in a given market at a given time at various prices."

Supply function

Supply function is defined as the functional relationship between supply for a commodity and its determinants. It can express as:

$$S_x = F(P_x, P_o, P_f, T, G_p, N, E, I, G)$$

Where,

S_x = Supply of commodity x

F = Function

P_x = Price of commodity x

P_o = Price of other goods

Pf= Price of factors of production

T= Improvement in technology

Gp= Government policy

N= Number of firm

E= Expectation of firm

I= Infrastructure development

G= Goal of firms

Above given supply function is multi variable supply function. If we assume that there is only change in price other things remaining constant, we get single variable supply function which is given below:

$$S_x = F (P_x)$$

Where,

S_x = Supply for commodity x

F = Function

P_x = Price of commodity x

Determinants of Supply

- i) Price of its own commodity:-When there is increase in price of its own commodity, there is increase in quantity supply. On the other hand, when there is decrease in price of it's own commodity there is decrease in quantity supply. This shows that there is positive relationship between price and quantity supply.
- ii) Change in price of factors of production:- when there is increase in price of factors of production, it increases cost of production. This leads to decrease in the quantity supply and vice versa.
- iii) Technological change:- When there is improvement in technology, it reduces the per unit cost and increases production. Therefore, quantity supply increases with the improvement in technology.
- iv) Change in government policy (Tax and subsidy):- When there is increase in tax rate, it increases cost of production due to which quantity supply decreases. When the amount of subsidy provided by government increase, it decreases cost of production due to which quantity supply increases.
- v) Number of firms:- When there is increase in number of firms/producer/sellers, it increases the production capacity due to which quantity supply increases.
- vi) Expectation of supplier about price:- When there is expectation that there will be increase in price in near future, the supplier will decrease the supply and vice versa.
- vii) Goal of the firms:- If the objective of the firm is profit maximization, supplier will supply less quantity at high price. If the objective of the firm is sales maximization, supplier will supply more quantity at less price.

viii) Price of other goods:- There is negative relationship between price of other goods. For example, A rise in price of rice will decrease the supply of wheat. This is because when there is increase in price of rice the producer will be encourage to produce more of rice and less wheat.

ix) Development of infrastructure:- When the infrastructure of a country is more develop, the supplier can supply more quantity of goods and services in the market. Therefore, with the development of infrastructure like transportation, electricity, communication etc. quantities supply increases.

Law of Supply

In economics, the law of supply describes the relationship between price and quantity supply. Other things remaining the same, quantity supply increases with price increase, and quantity supply decreases with price decrease.

Law of supply explain the functional relationship between price of commodity and its quantity supply. The law states that “other things remaining the same if the price of commodity falls, its quantity supplied also falls and if there is rise in price, quantity supplied also rises.

Mathematically it can be expressed as:

$P(\uparrow) \longrightarrow Q_s$

$P(\downarrow) \longrightarrow Q_s$

Where as :

P = Price of commodity

Qs = Quantity supply

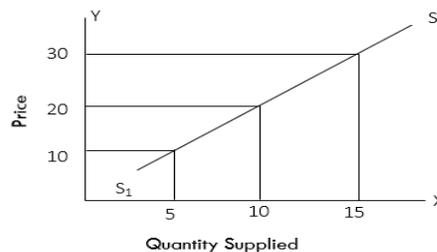
Law of Supply is based on the following major assumptions:

- No change in price of factors of production.
- No change in tax policy and subsidy policy in the government.
- No change in technology.
- No change in price of related goods.
- No change in time period.
- No change in price exception of seller.
- No change in selling cost.

On the basis of above assumption, law of supply can be explained by the following schedule and figure:

Supply Schedule

Price (P)	Quantity Supply (QS)
5	10
10	20
15	30



In the above schedule, when price of commodity increases from Rs.5 to Rs.10 and Rs.15 then the quantity supply also increases from 10 unit to 20 unit and 30 unit respectively. Also, in the above figure, price of commodity and quantity supply of commodity are measured along Y-axis and X-axis respectively. Supply curve (SS1) slopes left to right form upward. It shows there is possible or direct relationship between price of commodity and its quantity supply.

Exception/Limitations to the Law of Supply

Law of supply means higher the price, higher the supply and lower the price, lower the supply. But there are some cases where law of supply does not apply which is known as exceptions to the law of supply.

- i) Auction sales:- When a firm wants to clear it's old stock in that case he uses auction sale. In case of auction sale, supplier will supply more goods at a lower price. The main objective of auction sale is to clear the old stock. In this case law of supply does not apply.
- ii) Price expectation:- When a supplier expects that the price of commodity will increase in future, current supply of the commodity will decrease even at high price and vice versa. In this case law of supply does not supply.
- iii) Change in other factor:- Change in habit, taste, fashion, weather etc. also effect the supply of commodity.
- iv) Agricultural goods:- Law of supply is not applicable in agricultural goods. The supplies of such goods are operated by seasonal factor rather than price. So the farmers cannot wait for the application of law of supply.
- v) Perishable goods:- Goods which have very short life time and becomes useless after certain period of time are called perishable goods. Such goods must be supplied in the market at right time, whatever be the price. For example, vegetables like tomato, cauliflower, etc. The supply of perishable goods doesn't apply law of supply.
- vi) At the time of depression:- Depression is that situation in which the economic activities goes down side. For example, production, employment consumption, etc. decreases. So the supplier supplies more quantity even at law price due to fear of downfall in the economy.

Factors Causing Shift in Supply Curve

The major factors that causes shift of supply curve are as follows:

a. Cost of Production

Cost of production includes prices of raw materials, salaries of the workers, cost of energy and so on. If the overall cost of production increases then it reduces the production. In this situation supply curve shift leftward. On the other hand, decrease in cost of production then increase the production. In this situation supply shift rightward from the initial position.

b. Change in technology

If the producers are using modern tools and technology then it increases supply. In this situation supply curve shift rightward from the initial position. On the other hand, the old technology reduces the supply and supply curve shift leftward.

c. Tax policy of the government

If the government impose high rate of tax on the good and services then it reduces the supply and supply curve shift leftward. On the other hand low rate of tax provide intensive to increase output and it increases the supply. In this situation supply curve shift rightward.

d. Change in income of the consumer

If the income of consumer increases then the quantity supply also increases due to the increase in demand and vice – versa. In this situation, supply curve shift rightward otherwise supply curve shift leftward from the initial position.

e. Price of Substitute goods

Any change in the price of the substitute good effect the supply of related goods. If the price of substitute goods increases then the supply of substitute goods also increases. In this condition supply shift rightward otherwise supply shift leftward from the initial position.

f. No. of firms in the industry

g. Size of population

Interaction between demand and supply

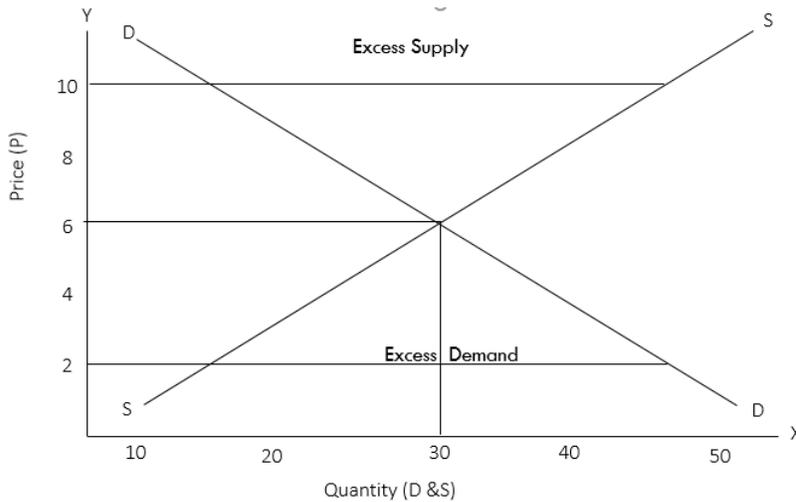
Demand and Supply are two major instruments of market economy. Demand for goods and services are inversely related with its price whereas supply is positively related with its price, other things remaining the same. The interactions between demand and supply means the equality between demand and supply. In free market economy or in perfect competition the equilibrium price and quantity are determined with the help of interaction between demand and supply. Equilibrium is that situation where demand and supply are equal.

The concept of interaction between demand and supply is explained with the help of following table below:

Price (Rs/ unit)	Quantity Demand	Quantity Supply	Result
10	10	50	Excess Supply
8	20	40	Excess Supply
6	30	30	Demand = Supply
4	40	20	Excess Demand
2	50	10	Excess Demand

Above table shows the relation between price of commodity, its quantity demanded and supply in market. Quantity demanded is inversely related with its price whereas price and supply are directly related. When price is Rs.6 per unit, quantity demanded is equal to quantity supply. So, the equilibrium price is Rs.6 and equilibrium quantity (i.e. Demand and supply is 30 units).

The process of equilibrium price and output determination or interaction between demand and supply is shown in figure below:



In the above figure, quantity and price are shown on X-axis and Y-axis respectively. DD1 is the demand curve which is drawn by plotting given combinations of price and quantity demanded from the schedule. Likewise, SS1 is the supply curve which is drawn by plotting the given combinations of various price and supply. Demand and supply curves are intersecting at point 'E' which is called the equilibrium point. The equilibrium price and quantity so determined are Rs.6 and 30 units (i.e. $D = S = 30$) respectively. At any point above the equilibrium point there is excess supply. But, at any point below the equilibrium point there is excess demand.

Elasticity of Demand

Elasticity

Elasticity refers to the flexibility or change in position of something.

Elasticity of Demand (E_d)

Elasticity of Demand means ratio between proportionate change in quantity demand and proportionate change in factors determinants of it.

i.e. Income, price, fashion etc. it is denoted by E_d mathematically it can be expressed as:

$$E_d = \frac{\text{Proportionate change in quantity demand}}{\text{Proportionate change in factors determinants of it}}$$

$$E_d = \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta Z}{Z} \times 100}$$

$$E_d = \frac{\Delta Q}{\Delta Z} \times \frac{Z}{Q}$$

Where:

ΔQ = Change in quantity demand

Q=Initial quantity demand

ΔZ =change in factors

Z=Initial factors

Price Elasticity of demand

price elasticity of demand means ratio between proportionate change in quantity demand and proportionate change in price of a commodity. It is denoted by E_p mathematically it can be expressed as;

$$E_p = \frac{\text{Proportionate change in price of a commodity}}{\text{Proportionate change in quantity demand}}$$

$$E_p = \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100},$$

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Where:

ΔQ =Change in quantity demand

Q=Initial quantity demand

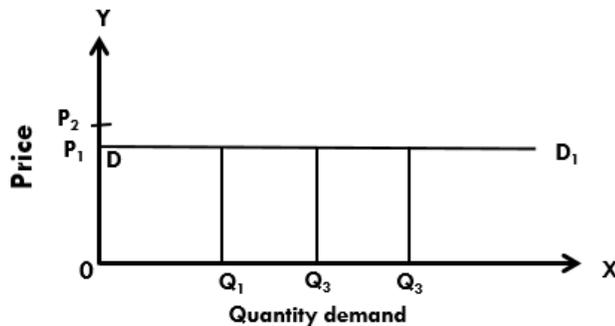
ΔP = Change in price of a commodity

P=Initial price of a commodity

Types of Price Elasticity of Demand

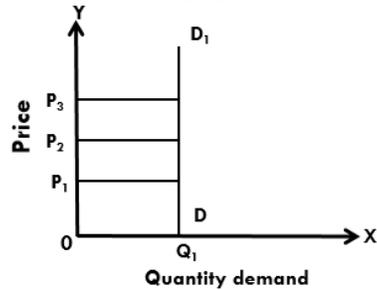
Perfectly elasticity of demand ($E_p = \infty$):

When negligible change in price of a commodity leads to infinite change in quantity demand it is called perfectly elasticity of demand which is denoted by $E_p = \infty$. This types of elasticity of demand can not be found in real world. It is clarified by the following figure.



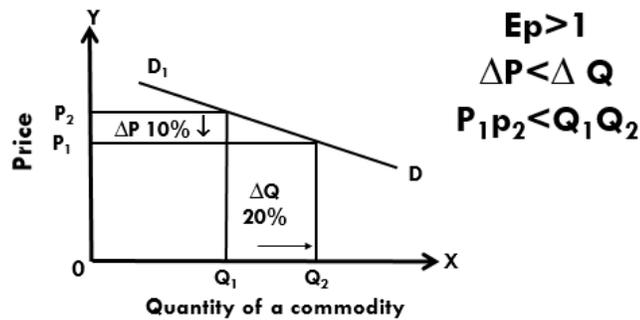
Perfectly Inelastic Demand ($E_p=0$)

Quantity demand is remained constant whatever change in price of a commodity, it is called perfectly inelasticity of demand, which is denoted by $E_p=0$. This type of price elasticity of demand is only found for basic necessary goods for e.g. demand of Medicine, salt etc. It is clarify by the following figure.



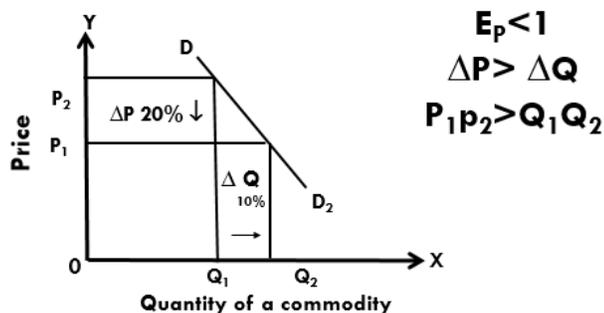
Relatively Elastic Demand ($E_p>1$)

If the percentage change in quantity demand is greater than the percentage change in price of a commodity, it is called relatively elastic demand, which is denoted by $E_p>1$. This type of price elasticity of demand is only found for luxurious goods. This type of elasticity of demand can be explained by the following figure.



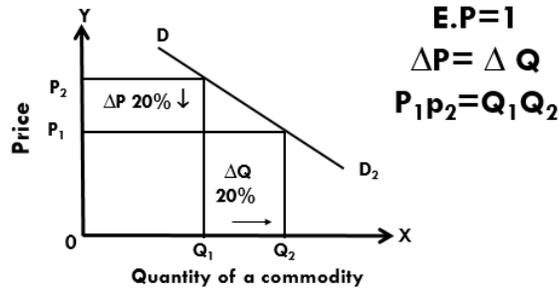
Relatively Inelastic Demand ($E_p<1$)

If the percentage change in quantity demand is less than the percentage change in price of a commodity, it is called relatively inelasticity of demand which is denoted by $E_p<1$ it is clarified by the following figure.



Unitary Elastic Demand ($E_p=1$)

If the percentage change in quantity demanded is just equal to the percentage change in price of a commodity, it is called unitary elasticity of demand, which is denoted by $E.P=1$. It is clarified by the following figure.



Law of Diminishing Marginal Utility

The Law of Diminishing Marginal Utility states that all else equal as consumption increases the marginal utility derived from each additional unit declines. Marginal utility is derived as the change in utility as an additional unit is consumed. Utility is an economic term used to represent satisfaction or happiness. Marginal utility is the incremental increase in utility that results from consumption of one additional unit.

Law of diminishing Marginal Utility was propounded by German Economist Herman Heinrich Gossen (H.H. Gossen) in 1854 A.D. It is also known as first law of Gossen. Latter on this law was Modified and popularized by Alfred Marshall in his book " The principles of economics", published in 1890 A.D. This law is developed on consumer's psychology or behavior regarding consumption of a commodity.

Marginal utility may decrease into negative utility, as it may become entirely unfavorable to consume another unit of any product. Therefore, the first unit of consumption for any product is typically highest, with every unit of consumption to follow holding less and less utility. Consumers handle the law of diminishing marginal utility by consuming numerous quantities of numerous goods.

For example, the utility derived from the first glass of water is high, but with successive glasses of water, the utility would keep diminishing. The law of diminishing marginal utility is applicable to all kinds of goods such as consumer goods, durable goods, and non-durable goods.

Assumptions

Consumer must be rational.

Utility obtained from the consumption of any commodity can be expressed in number or numerical value.

No change in income of a consumer and per unit price of a commodity.

Marginal utility of a money must be constant.

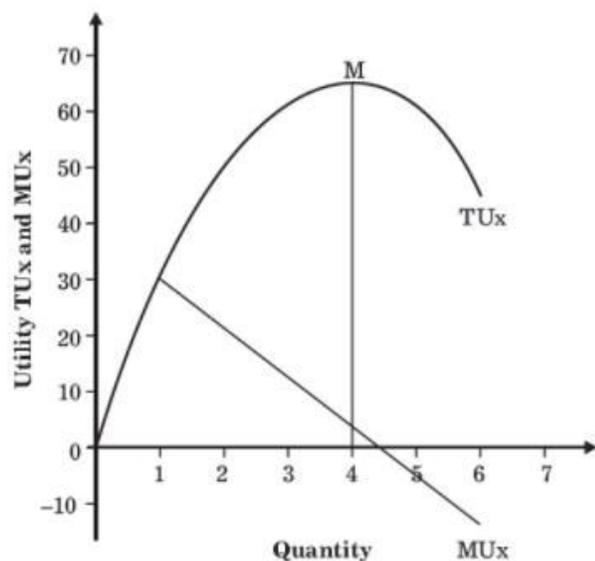
All the goods must be homogeneous.

Nature of consumer, fashion, habit must be same.

An individual consumes only one commodity X and its utility is measured quantitatively. The total utility and marginal utility schedules are as shown in Table 1.

UNITS OF COMMODITY X	TOTAL UTILITY (TU _x)	MARGINAL UTILITY (MU _x)
1	30	30
2	50	30
3	60	20
4	65	10
5	60	5
6	45	-5

The above table shows that as the number of units of commodity X consumed per unit of time increases, TU_x increases but at a diminishing rate while marginal utility MU_x decreases consistently. The rate of increase in TU_x as a result of increase in the number of units consumed has been depicted through the MU_x curve in the graph shown in Figure.



Law of Diminishing Marginal Utility

In the above figure, the downward sloping MU_x curve shows that the marginal utility of a commodity consistently decreases as its consumption increases. When the consumption reaches to 4 units of commodity X, TU_x reaches its maximum level (the point of saturation) marked as M. Beyond the point of saturation, MU_x becomes negative and TU_x begins to decline consistently. The downward slope of MU_x explains the law of diminishing marginal utility. Therefore, according to the law of diminishing marginal

utility, the utility gained from a unit of a commodity is dependent on the consumer's desire for the commodity.

When an individual continues to consume additional units of a commodity, the satisfaction that he/she derives from the consumption keeps decreasing. This is because his/ her need gets satisfied in the process of consumption. Therefore, the utility derived from successive units of the commodity decreases.

Law of Substitution/ Law of Equi-Marginal Utility

The law of substitution is also known as the law of equi-marginal utility or the law of maximum satisfaction. This law was first developed by Gossen. Therefore, this law is also known as second law of Gossen. Prof. Marshall has developed and given the present shape of this law.

According to this law, if a consumer is to use all the available resource in the consumption of a single commodity then marginal utility, derived from every additional unit will decrease successively. This law states that in order to get maximum satisfaction, a consumer should spend his limited income on different commodities in such a way that the last dollar spent on each commodity yield him equal marginal utility.

This law based on the following assumption:

- Consumer must be rational
- Cardinal measurement of utility is possible
- Income of a consumer is remains constant
- Price of commodity should be fixed and equal
- Commodity is divisible into small unit.
- Utilities are independent.

For example, let the income of the consumer be Rs 5. Also price of X (P_x) is Rs 1 and Price of Y (P_y) is also Rs 1.

