Unit : One

Demand, Supply and Market Equilibrium

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Meaning of Demand

- The terms desire, wish, wants, demand are used as synonyms. In general, desire of getting some things is called demand. But in economics, there is a complete differences between them. Effective desire and ability backed by willingness to pay on desire is known as demand for a commodity or service.
- If a beggar wishes for a bungalow but can't afford it, it doesn't become his demand. For the existence of demand, the following components must be met.

Demand Contd…….

i) Effective Desire ii) Ability to pay

iii) Willingness to pay

- According to Prof. Marshall, "Demand refers to the quantities of a commodity that the consumers are able and willing to purchase at different market price during a given period of time".

Difference between Desire & Demand

Desire

- It refers to the wish or want to have.
- Desire could be exist without resource.
- Desire is unlimited.
- It doesn't consider place, time and price.

Demand

- It is a effective (potential) desire i.e. desire backed by ability and willingness to pay.
- Resource is compulsory for demand.
- Demand is limited.
- Place, time and price must be specified to be a demand.

Demand schedule

Thetabular presentation of various quantity of commodity at various prices is known as demand schedule.

Demand schedule is of two types.

a. **Individual Demand Schedule.**
b. **Market Demand Schedule.**

Individual Demand Schedule

The demand schedule which shows various quantity demanded of a commodity by an individual/household at various prices in a given period of time is known as individual demand schedule.

Price of X goods (Rs)	Quantity demand of X goods (kg)
20	45
40	30
60	15

In this schedule, a consumer preference for purchasing various units of goods at different price is presented. There is inverse relationship between price and quantity demand for a commodity
i.e. higher the price lower will be quantity demand and vice versa. This inverse relationship between price and demand is known as law of demand.

Market Demand Schedule

A table which shows the demand for a commodity in the whole/entire market at different prices in a given time period is known as market demand schedule. It is the sum total of demand of goods by all the consumers from the market at certain period of time. Let there are only three consumers A, B and C in the market and their preferences are listed in the following table.

Price of X goods (RS)	Quantity demanded by individual household (KG)			Market demand (A+B+C) kg
	A	B	C	
20	30	45	60	135
40	20	30	40	90
60	10	15	20	45

Above table shows that quantity demanded for a commodity from market by various consumers at various price in a given time period.

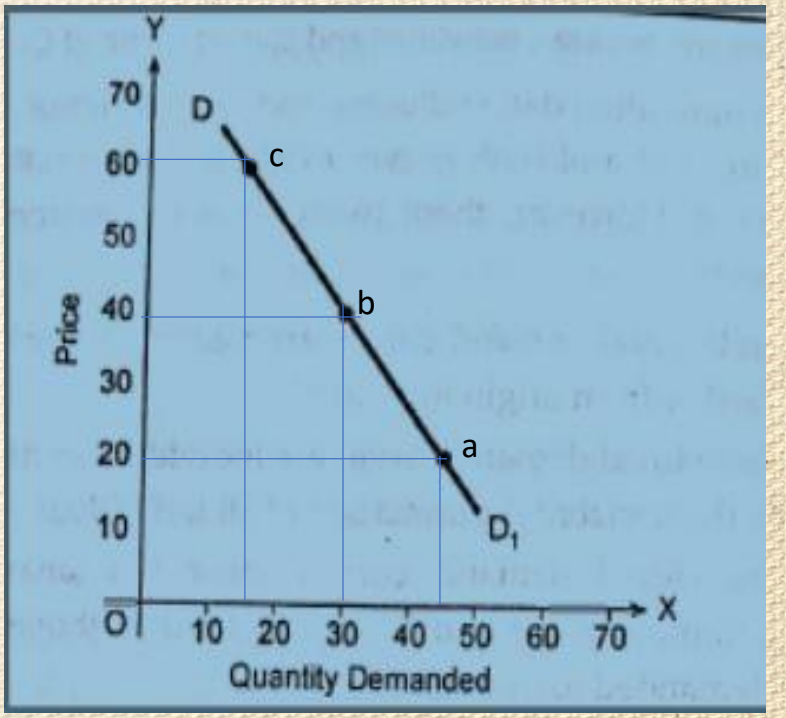
Demand Curve

If a demand schedule is plotted in the graph, it is called demand curve. Alternatively, geometrical expression of demand schedule is known as demand curve. So, **individual demand curve** and **market demand curve** are constructed on the basis of **individual demand schedule** and **market demand schedule** respectively.

Individual Demand Curve

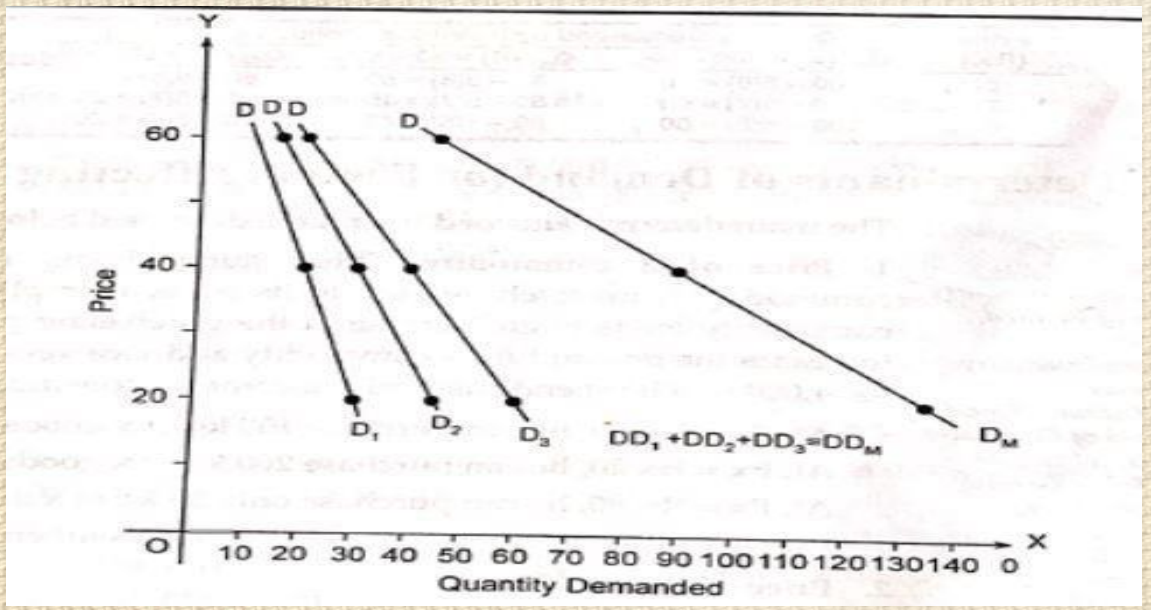
If a curve shows various quantities of demand of a commodity by an individual at various prices is called individual demand curve.

The slope of demand curve is always negative i.e, it slopes downward from left to right. From the above table here the adjoining figure or demand curve.



Market Demand Curve

- A curve which shows various quantities of demand for a commodity in a market at various prices is called market demand curve. To put it simply, market demand curve is the horizontal summation of all individual demand curves. If we plot market demand schedule in a graph, then we obtain market demand curve.



Demand Function

Many factors affect demand for any commodity. The mathematical and functional relationship between demand for a commodity and its' influencing factor is termed as demand function. In short, demand function is the functional/mathematical relationship between quantity demand and its determinants. It can be written as;

Qx = f(Px, Py, Y, Ta, Cl, Ad, F, Popn…….)

Where,

Px = price of X commodity

Py = price of Y commodity

Y= income level of consumer

Ta = taste and preference of consumers

Cl = climatic condition of place

Ad = advertisement

F = fashion

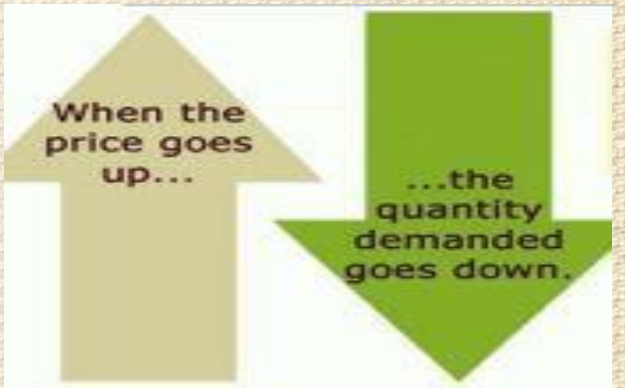
Popn = population (no. of consumers)

Contd.

For simplicity, demand function is expressed in terms of price (keeping other factors as constant) of the commodity because price is considered as a major determinant of demand

$P_X \uparrow \quad Q_X \downarrow$

$P_X \downarrow \quad Q_X \uparrow$



Here, price is called independent variable whereas demand is dependent variable. Other things keeping constant, it is the function of price.

i.e. $Q_X = f(P_X)$, $f<0$ (-ve function).

Qx = quantity demand for X commodity.

Px = price of X (same) commodity.

Contd…….

Demand function is the mathematical expression or the relationship between demand and its determinants. Mathematically, it is expressed as the following equation;

$$Qx = a - bpx$$

Where,

- Qx - is quantity demand for X good,
- a - is autonomous demand or demand at zero price.
- b - is the slope of demand.
- There is opposite and inverse relationship between price and quantity demand. Due to which, slope of demand curve is always negative i.e. slope of demand curve is (-b).

Types of Demand function

Demand function is of two types. They are;

A) Linear demand function:

A demand function is said to be linear if the slope remains constant throughout all the points of demand curve.

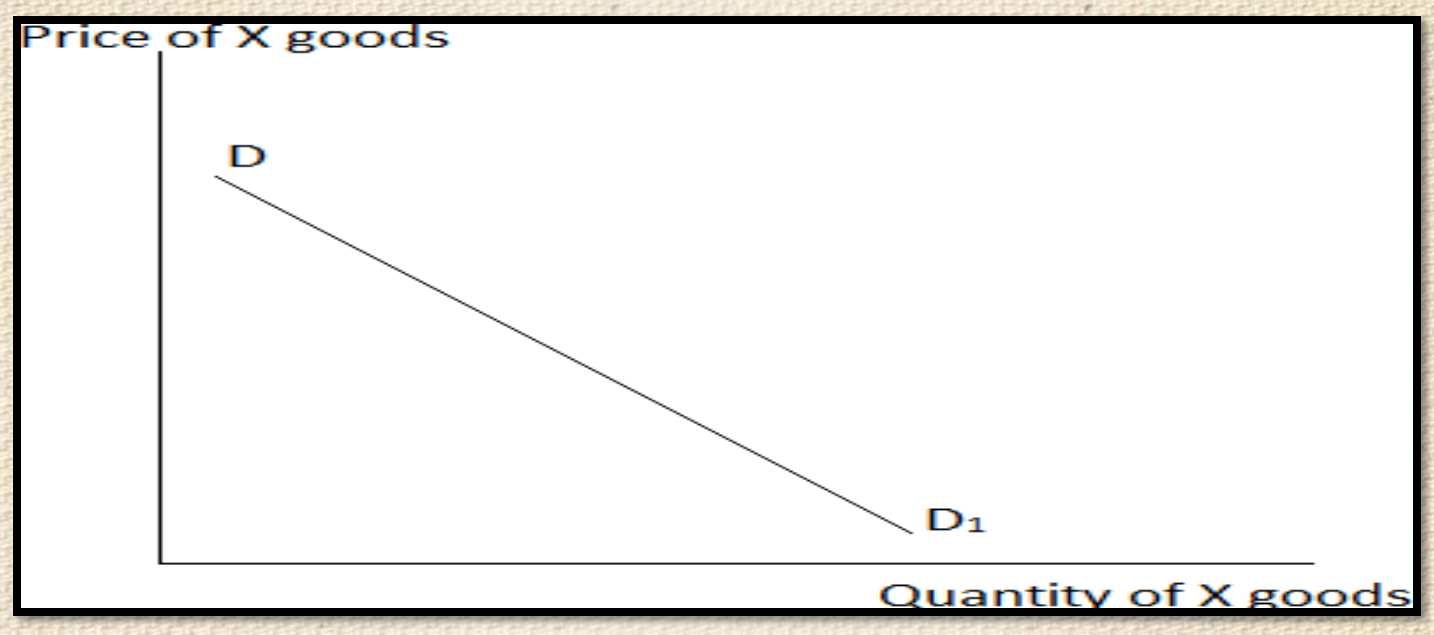
In other words, if the value of slope is constant even if price and quantity demand change along then it is called linear demand function. Mathematically, it is expressed as,

$$Q_X = a - b\,P_X$$

Where, a = intercept (autonomous demand or demand at zero price),

b = slope of demand curve(induced demand)

P_X = price of X goods



In the above figure, DD_1 is downward sloping linear demand curve. It represents the same slope at any point of the demand curve. The negative value (-b) of equation represents the downward sloping nature of DD_1.

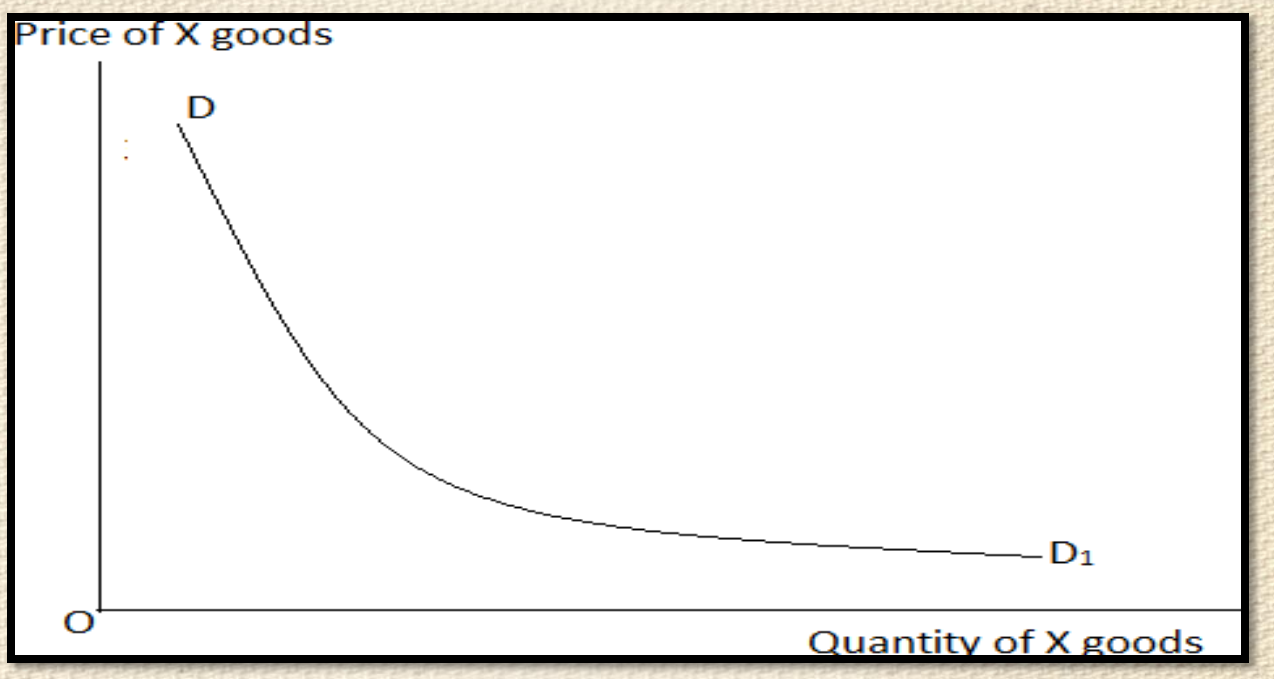
B) Non Linear Demand Function

A demand function is said to be non linear if the value of slope differs at each points on the given demand curve. In other words, the changes in price and quantity are unequal in different points of demand curve, then it is known as nonlinear demand curve. In mathematical equation, it is written as;

Qx = a/pxb.

$Q_X = a \, . \, Px^{-b}$

On the basis of the above equation, the shape of demand curve is a rectangular hyperbola.



In the adjoining figure, DD_1 is downward sloping nonlinear demand curve. Because the slope varies at every point of this demand curve.

Types of Demand

❑Price demand

It refers to the relationship between price and quantity demand. There is inverse relationship between price and quantity demand i.e. higher the price lower will be the quantity demand and vice versa.

Symbolically,

$Q_X = f(P_X)$, $f<0$ (P ↑ Q ↓)

❑Income demand

It refers to the relationship between consumer's income and quantity demand.

Generally, there is positive relationship between consumer's income and quantity demand i.e. an increase in consumer's income leads to the increase in quantity demand and vice versa.

Symbolically,

$Q_X = f(Y)$, $f>0$ (Y ↑ Q ↑)

Contd.

❑Cross demand

If two goods are related, there exist some relationship between price of one goods and demand of another goods. And this relationship is called cross demand.

P_{P1}= 40	**Q_{P1}= 55**	P_{P2}= 40	**Q_{P1}= 95**
P_{C1}= 40	Q_{C1}= 140	**P_{C2}= 50**	Q_{C2}= 60

❑Composite demand

If a goods can be used in several (various) purposes, then the collective (sum) form of demand is called composite demand. For example: Coal, electricity, diesel, petrol etc.

❑Direct demand

The goods and services that are demanded for direct consumption is known as direct demand.

Contd.

❑ Derived (indirect) demand

The goods which are not directly consumed but needed to make final product is called derived goods. For example; raw materials, labor, capital etc.

❑ Joint demand

If two or more goods are demanded together to satisfy a single wants, then it is called joint demand. For example; gas, milk, sugar, tea leaves are needed to make a cup of tea.

Law of Demand

- The law of demand explains (studies) the relationship between **price** and **demand**.
- According to this law there exists negative relationship between price and quantity demand.
- *According to Prof. Alfred Marshall, "Other things remaining the same, the demand increases with a fall in price and diminishes with a rise in price".*

Assumptions

- No change in consumer's income.
- No change in price of other product.
- No change in taste, fashion, habit and preference.
- No change in population size and composition.
- No change in climate and season etc.
- The law of demand is better explained with the help of following schedule and curve.

Contd.

Price (Rs)	Quantity demand (kg)
50	5
40	8
30	11
20	14

In the above table, initially the price is Rs. 50 and at this price, the quantity demand is 5 kg. Later on when price decreases from Rs 50 to Rs 40, quantity demand increases from 5kg to 8 kg. Similarly, price gradually decreases thereafter from Rs 40 to Rs 30 to Rs 20 at that time demand continuously increases from 8 kg to 11 kg to 14 kg. So from the above example, it is verified that when the price decreases quantity demand increases and vice versa.

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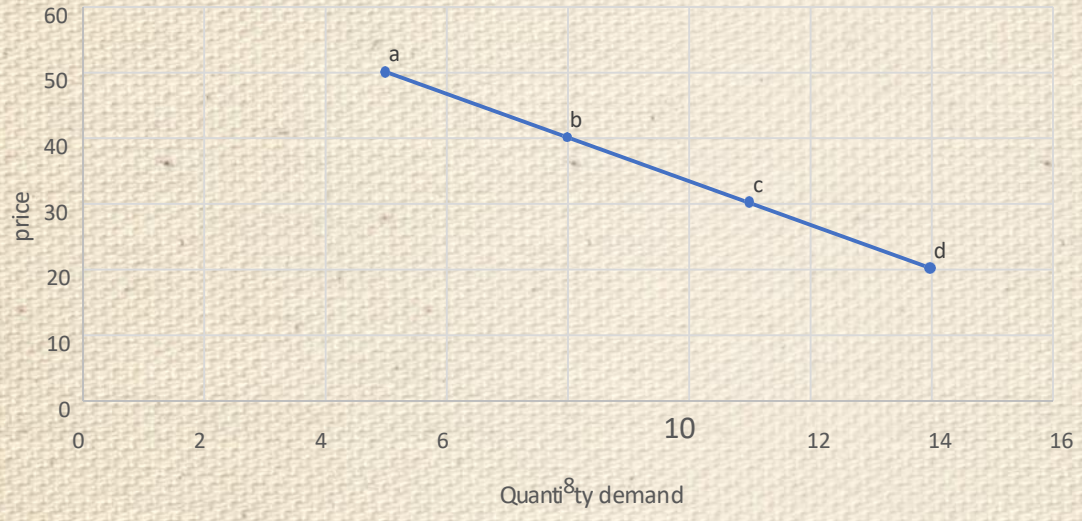


- In the figure, quantity demand and price are measured in X axis and Y axis respectively. By plotting the above data, we obtain various combination i.e. ‘a’, ‘b’, ‘c’ and ‘d’. When we join these points we get demand curve which is downward sloping from left to right whose slope is negative. Hence this evidences has proved the negative relationship between price and quantity demand.

Exceptions/Limitations of law of demand

- Expectations regarding the change in price in future.
- Ignorance of consumers.
- Change in fashion, habit and preference of consumers
- Prestigious goods.
- Giffen goods.
- Demand at the time of festivals.
- Shortage of goods in market.

Supply

Meaning of Supply

- Supply is the quantity of a commodity offered for a sale at a particular price during a given period of time.

- Supply doesn't mean the entire stock of the commodity but only those amount of goods which a producer/seller is willing and able to sale at a particular price and specified time is supply.

Supply Schedule and Supply Curve

The tabular presentation of various quantity of commodity that are supplied at its various prices is known as supply schedule.

A. Individual supply schedule states that the different quantities of a commodity that a producer is offering to sale at various prices.

Price of goods (Rs.)	Quantity supplied (kg)
5	100
10	200
15	300
20	400

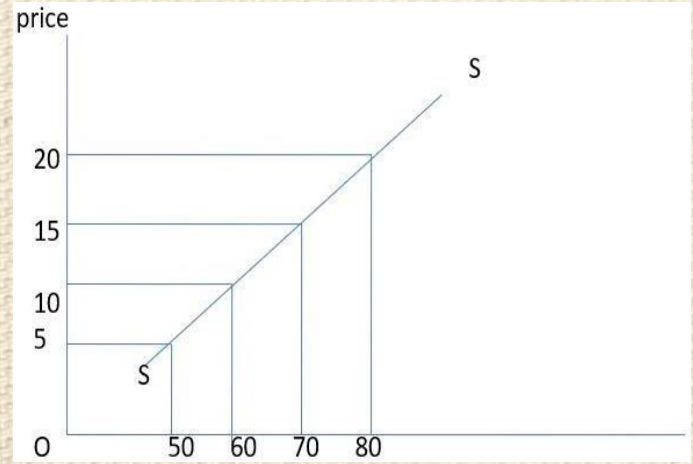
Supply schedule reflects the law of supply i.e. higher the price higher will be supply and vice versa.

Contd.

Individual Supply Curve

The graphical representation of individual supply schedule is known as individual supply curve.

Fig; Individual supply curve



Supply Curve(SS) is upward sloping from left to right which shows law of supply i.e. supply is positively associated with price.

Contd.

B. Market supply schedule

The schedule/table that shows the quantity supply of a whole market for a commodity at different prices which is also known as market supply schedule. In other words, it is the sum of all individual suppliers' quantity supply from market in different price at a given period of time.

Price (Rs)	Firm A S_A	Firm B S_B	Firm C S_C	Market supply (S_M)
5	50	85	120	255
10	60	95	130	285
15	70	105	140	315
20	80	115	150	345

Contd.

Fig; Market supply curve

Market supply curve is the horizontal summation of all individual supply curve.

Supply Function

Supply function is defined as the functional relationship between supply of commodity and its determinants. Mathematically, it is expressed as;

Sx = f(Px, Py, Te, Nf, Pf, Gp, ……., etc.)

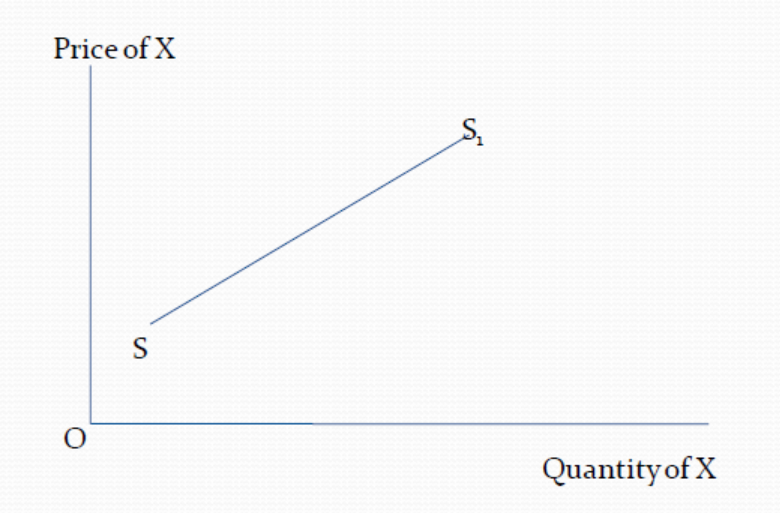
Supply function is of two types.

Linear supply function

- A supply function is said to be linear if the slope remains constant throughout the supply curve.
- In other words, the slope of supply curve remains same even if price and quantity supply change along a linear supply function. i.e.

$Q_x = a + bP_X$

Where, a = autonomous supply.
b = Slope of supply curve.

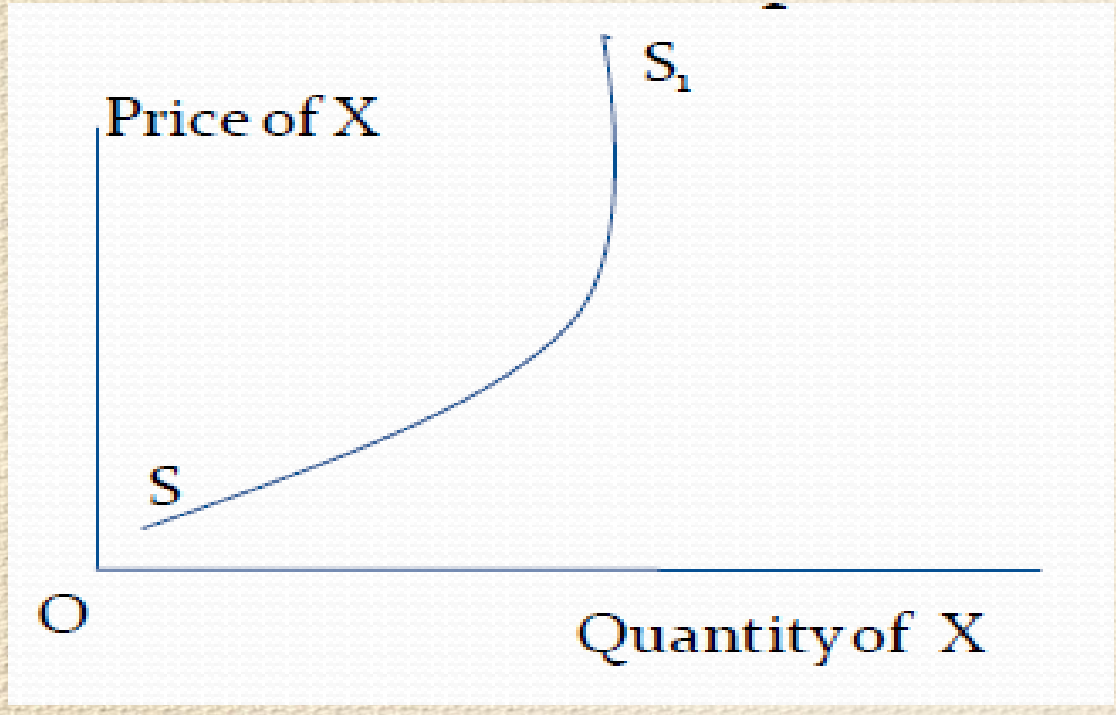


Since the supply curve is straight line upward sloping, the slope at every point of this curve is constant. So, it is called linear supply curve.

B. Non Linear Supply Function

- A supply function is said to be nonlinear if the value of slope differs at each points of the given supply curve.
- The nonlinear supply function can be expressed as

$$Q_X = a.P^{b_X}$$



Since the supply curve is not straight line, the slope varies at each point of this curve. So, it is called nonlinear supply curve.

Determinants of Supply

1. Price of the commodity.
2. Price of related goods.
3. Price of factors of production.
4. Technology.
5. Future expectation.
6. Taxes and subsidies (government policy).
7. Natural factors.
8. Number of the firms.
9. Development of infrastructure.

Law of Supply

"Other things remaining the same,there is always a positive relationship between price and quantity supplied of a commodity".

In other words, higher the price, higher will be the quantity supplied and vice versa.

i.e. $S_x = f(P_x), f > 0$

P ↑ Qs ↑

P ↓ Qs ↓

Assumptions

- No change in price of inputs or factor of production.
- No change in state of technology.
- No change in goal of producers/firms.
- No change in number of producers.
- No change in price of other goods.
- No change in policy (tax and subsidy) of the government.

Contd.

- The law of supply is further explained with the help of following schedule and supply curve.

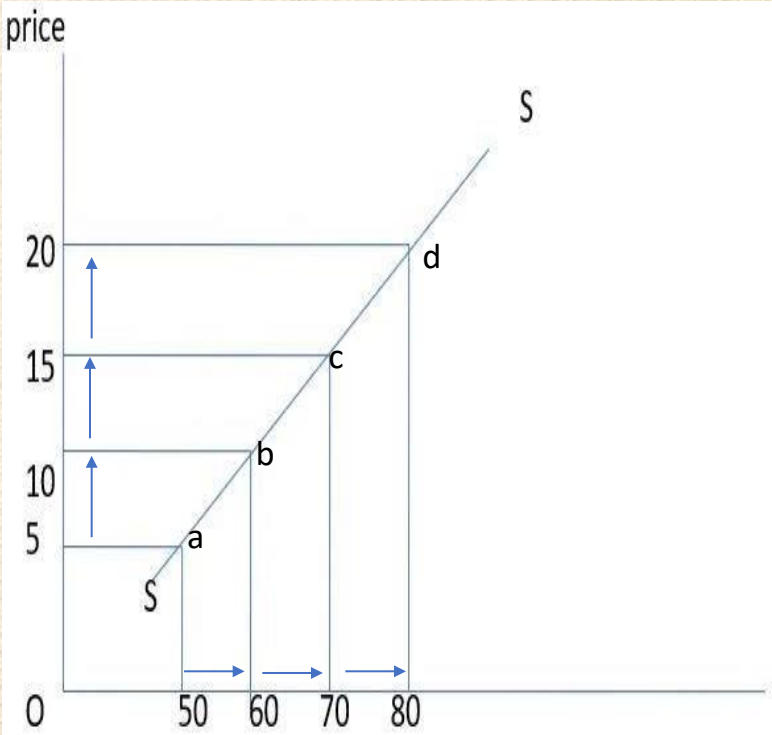
Price of goods (Rs.)	Quantity supplied (kg)
5	50
10	60
15	70
20	80

- In the above table, initially price is Rs. 5 at this time, a seller wants to sell 50 units of his product. When price gradually increases from Rs 5 to Rs 10 to Rs 15 to Rs 20, same seller wants to sells 50 units to 60 units to 70 units to 80 units respectively. A seller wants to sell more unit of his output when the price goes higher because higher price gives more profit to seller.

Contd.

Supply curve

The adjoining figure is constructed on the basis of above data, by plotting the above schedule we have obtained four combinations, after joining these points we have obtained upward sloping supply from left to right curve which shows law of supply i.e. supply is positively associated with price.



Market Equilibrium

Market equilibrium is the position at which two opposite forces are equal to each other. It was the Prof. Alfred Marshall, who firstly explained the interaction between the two opposite force of market i.e, demand and supply to determine the equilibrium point of the market. Since, paper can't be cut only by upper or lower blade of the scissors, in the same way both demand and supply are required for determining equilibrium price.

Market equilibrium is a situation in which demand is equal to the supply at a particular price.

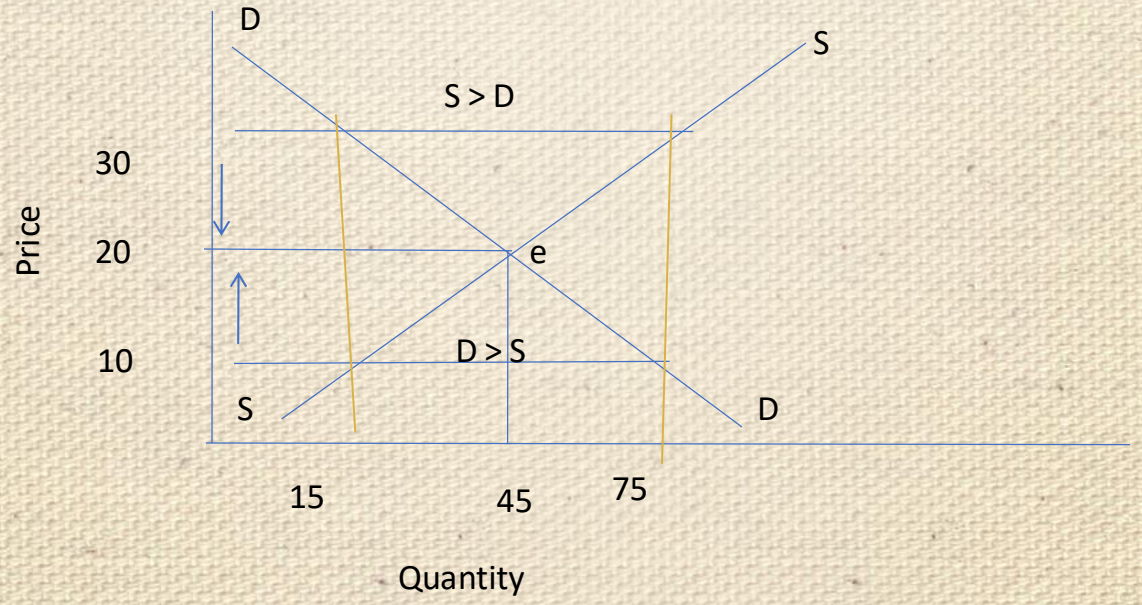
i.e. Demand (D) = Supply (S)

- If D>S, it is the case of disequilibrium with excess demand.
- If D<S, it is also the case of disequilibrium with excess supply.

Contd.

Price (Rs.)	Quantity Demand	Quantity Supply	Demand and supply condition
10	75	15	D>S
20	45	45	D=S
30	15	75	D<S

If we plot this table in the graph, we obtain following figure



Change in Market Equilibrium

- As previously explained, equilibrium price and quantity is determined on the basis of interaction between demand and supply. When demand and supply changes, it brings change in equilibrium price and quantity.
- There are 3 causes of change in equilibrium. They are explained below.

a. Effect in shift in demand curve

b. Effect in shift in supply curve

c. Effect in shift in both demand and supply curve.

Numerical Problem

Consider the following demand and supply function

$$Q_d = 300 - 5P$$

$$Q_S = -100 + 20P$$

a. Find equilibrium price and quantities.

b. Draw demand and supply curves and also show equilibrium.

Remember This

Relations are like electric current!

Wrong connection will give you shock throughout your life.

But right ones will light up you in whole life.

Thank you.