**CBSEClass12Economics**

**NCERTSolutions**

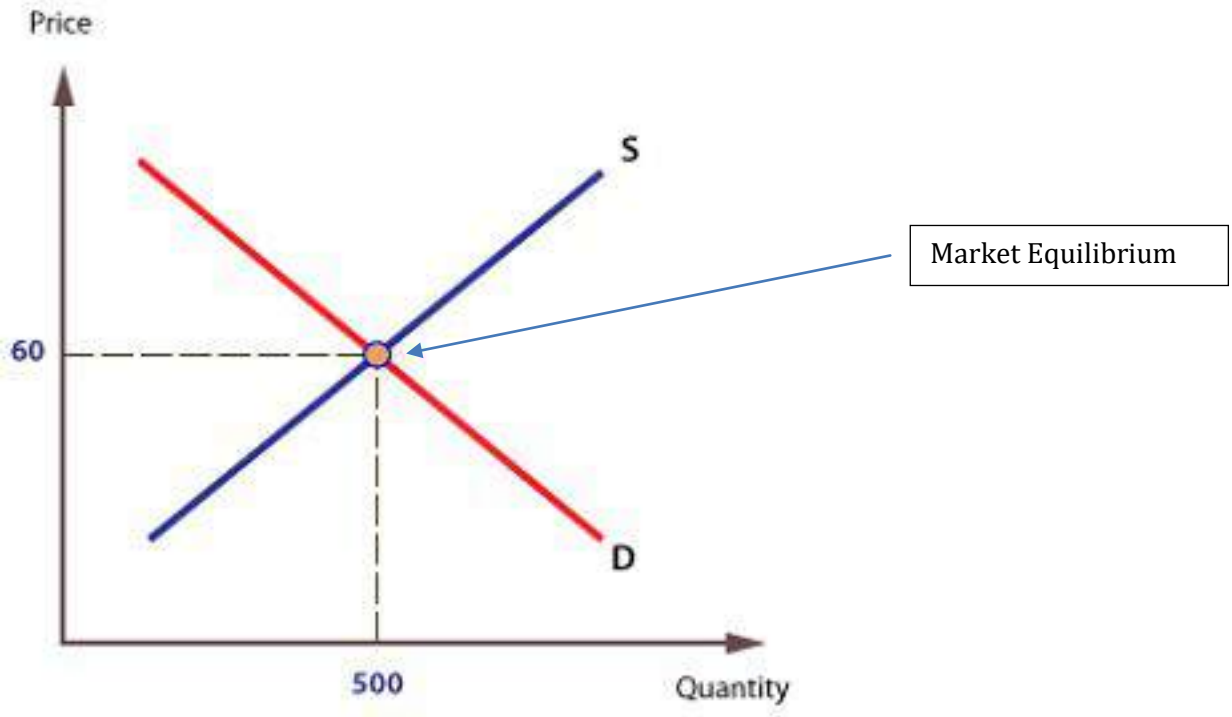
**Chapter-05 (Microeconomics)**

**Market Equilibrium**

**Question 1: Explain marketequilibrium.**

**Solution :**Market equilibrium is a market state where the supply in the market is equal to the demand in the market.Market equilibrium occurs where supply = demand. At this point, there is no tendency for prices to change. We say the market clearing price has been achieved.

In the diagram below, the equilibrium price is 60. The equilibrium quantity is 500..



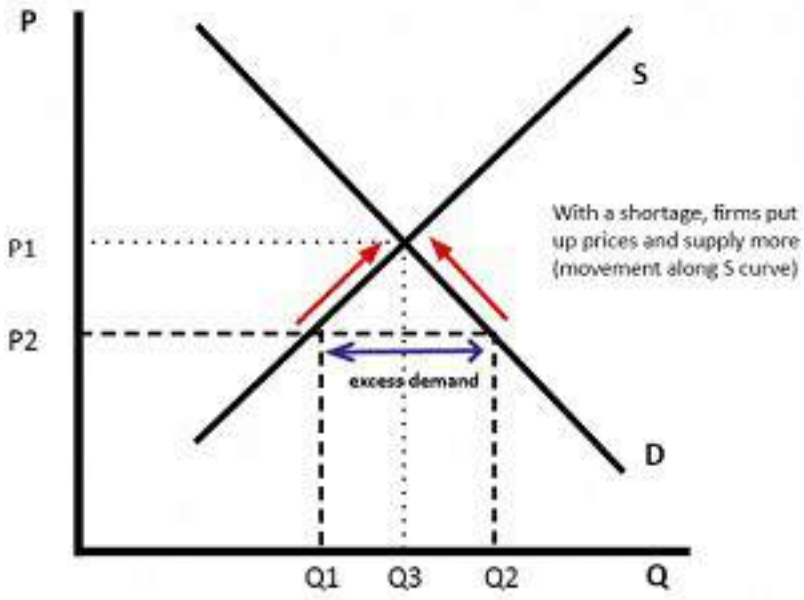

It also refers to a price at which both parties, producers and consumers are agreed to exchange.

**Question 2: Whendowesaythatthereisanexcessdemandforacommodityinthemarket?**

**Solution :When the market demand exceeds the market supply at a particular price, then the situation that arises is excess demand. Such situation is like if price is below the equilibrium**

- If price is below the equilibrium at P2 then demand would be greater than the supply. Therefore, there is a shortage of (Q2 – Q1)
- If there is a shortage, firms will put up prices and supply more. As price rises there will be a movement along the demand curve and less will be demanded.

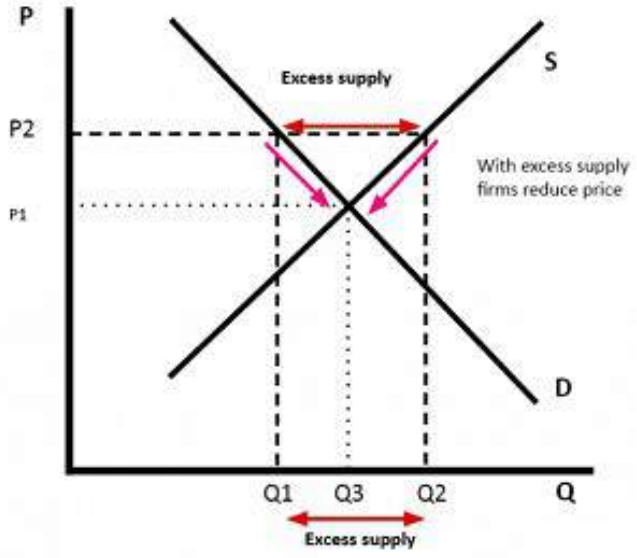
- Therefore, price will rise to Pe until there is no shortage and supply = demand




**Question 3: Whendowesaythatthereisanexcesssupplyforacommodityinthemarket?**

**Solution :**When the market supply of a commodity is greater than market demand at a given price, then there is an excess supply of commodity in the market. Such situation arises if price is above theequilibrium

- If price was above the equilibrium (e.g. P1), then supply (Q1) would be greater than demand (Q3) and therefore there is too much supply. There is a surplus.
- Therefore, firms would reduce price and supply less. This would encourage more demand and therefore the surplus will be eliminated. The market equilibrium will be at Q2 and Pe.

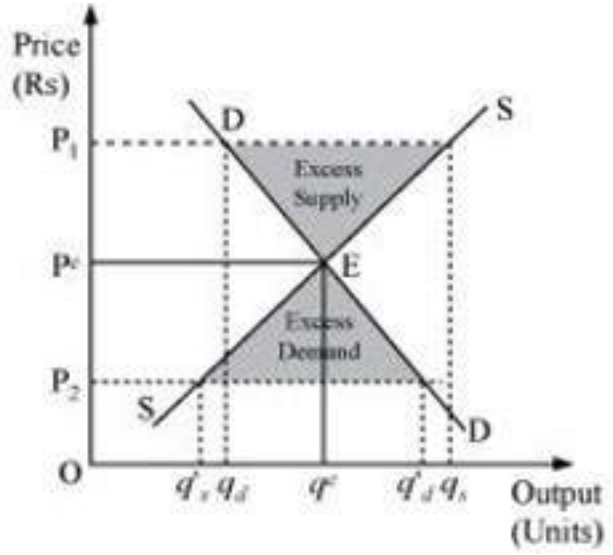



**Question 4: Whatwillhappeniftheprice prevailinginthemarketis**

**(i) above the equilibriumprice?**

**(ii) below the equilibriumprice?**

**Solution :(i)**Ifthemarketpriceisabovetheequilibriumprice,thereoccursthesituationof excess supply (where market supply> marketdemand). This leads to fall in market price driven by the excess supply,




In the given figure, the equilibrium price and quantity is demoted by $p^e$ and $q^e$.
Let us assume that the market price $P_1$ is above the equilibrium price $p^e$. Now, according to the demand curve, the quantity demanded is $q_d$. Whereas, according to the supply curve, the quantity supplied is $q_s$. Thus, there exists a situation of excess supply equivalent to $(q_d - q_s)$.

**(ii)**Ifthemarketpriceisbelowtheequilibriumprice,thereoccursthesituationofexcess demand (where market demand > marketsupply). Now, the excess demand will increase the competition among consumers in the market. Thereby they consume the good at a higher price which leads to an increase in the price level.

Let us assume that the market price $P_2$ is below the equilibrium price $p^e$. According to the demand curve, quantity demanded is $q'_d$. Whereas, according to the supply curve, the quantity supplied is $q'_s$. So, it can be seen that there emerges the situation of excess supply
equivalent to $(q'_d - q'_s)$.

**Question 5: Explainhowpriceisdeterminedinaperfectlycompetitivemarketwithfixed number offirms.**

**Solution :** Equilibrium price is determined by the market forces of demand and supply in a

perfectly competitive market. Where market equilibrium is determined when market demand is equal to market supply, under perfect competition.

Market demand is the sum total of demand for a commodity by all the

(i) Buyers in the market. Its curve slopes downward due to law of demand,

(ii) (ii) Markel supply is the sum total of supplies of a commodity by all the firms in the market. Its curve slopes upwards due to law of supply

When the number of firms in a perfectly competitive market is fixed, the firms are operating in the short-run. The equilibrium price is determined by the intersection of market demand curveandsupplycurve.Itisthepriceatwhichthemarketdemandequalsmarketsupply.

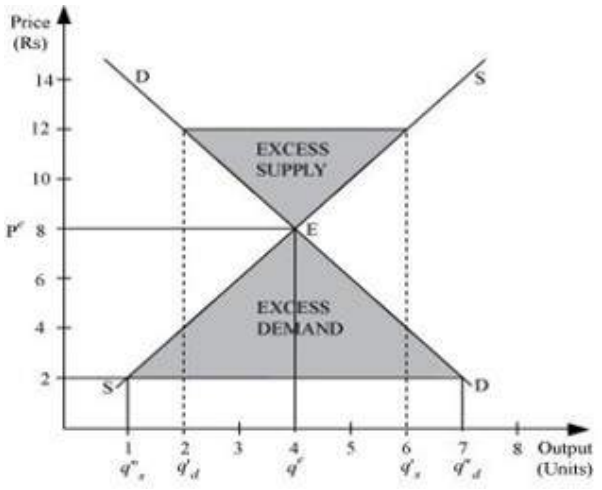
In the below figure, if at any price above $p^e$, let us say Rs 12, there will be an excess supply, which will increase the competition among the sellers and they will reduce the price in order to sell more output. This causes a fall in the price, finally to Rs 8$\left(p^e\right)$, where the demand equalssupply.

i.e., At $p^e$ price S>D fall in prices more demand (buyers) less supply (sellers)

If at any pricelowerthan $p^e$,letussayRs2,therewillbeanexcessdemandthatwillraise the competition among the buyers or consumers and they will be ready to pay higher price for the given output. This will increase the price to Rs 8 (equilibrium price), where the market will reach the equilibrium.

Thus, the invisible hands of market operate automatically whenever there exist excess demand and excess supply; ensuring equilibrium in the market.

i.e., D>S more buyers than sellers a rise in price higher price inspires sellers ultimately D=S

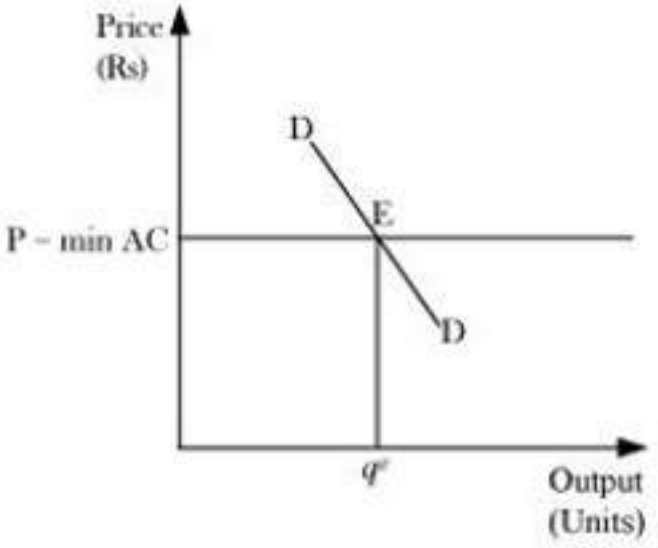



**Question 6: Supposethepriceatwhichtheequilibriumisattainedinexercise5isabovethe minimumaveragecostofthefirmsconstitutingthemarket.Nowifweallowforfree**

**entryandexitoffirms,howwillthemarketpriceadjusttoit?**

**Solution :**If the equilibrium price (Rs 8) in the above figure (of Q-5) is above the minimum of average cost, then it implies that the firm is earning supernormal profits. This situation will attract new firms in the market. As the new firms enter, the industry supply of output will also increase. New firms will continue to enter the industry that will lead the price to fall until it becomes equal to the minimum of the average cost. Thus, the supernormal profits are wiped out and all the firms earn normalprofits.

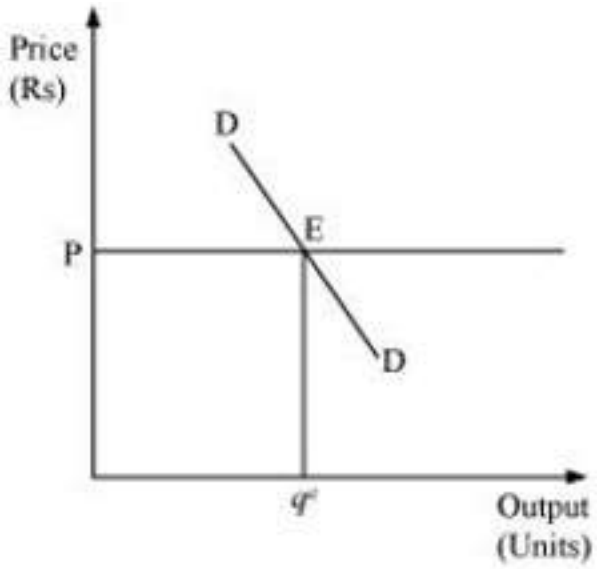
When the free entry and exit of firms is allowed, the equilibrium is determined by the intersection of demand curve and the 'P = min AC' line.




**Question 7: Atwhatlevelofpricedothefirmsinaperfectlycompetitivemarketsupplywhen free entry and exit is allowed in the market? How is the equilibrium quantity determinedinsuchamarket?**

**Solution :**In the long run, due to the free entry and exit of firms, all the firms earn zero economic profit or normal profit. They neither earn abnormal profits nor abnormal losses. Thus, the free entry and exit feature ensures that in the long run the equilibrium price will be equal to the minimum of average cost, irrespective of whether profits or losses are earned in the shortrun.

The equilibrium is determined by the intersection of consumers' demand curve and the 'P = minAC'line.AtequilibriumpointE,quantitysuppliedbyeachfirmis $q_e$ at the price (P).




**Question 8: Howistheequilibriumnumberoffirmsdeterminedinamarketwhereentryand exist ispermitted?**

**Solution :**The characteristic of free entry and exit of firms ensures that all the firms in a perfect competitive market earn normal profit, i.e. the market price is always equal to the minimum of LAC. No new firm will be attracted to enter the market or no existing firm will leave, if the price is equal to the minimum of LAC. Thus, the number of firms is determined by the equalityofpriceandtheminimumofLAC.Themarketequilibriumisdeterminedbythe intersection of market demand curve $(D_1D_1)$ and the price line. The equilibrium price is $P_1$ and the equilibrium output is $q_1$. At this equilibrium price, each firm supplies the same output $q_1 f$ , as it is assumed that all the firms are identical. Therefore, at the equilibrium,thenumberoffirmsinthemarketisequaltothenumberoffirmsrequiredtosupplyoutput $q_1$ atprice $p_1$ ,andeachinturnsupplying $q_1 f$ amountatthisprice.Thatis

$$n = \frac{q_1}{q_1 f}$$

Where,

n= number of firms at market equilibrium

$q_1$ = the equilibrium quantity demanded

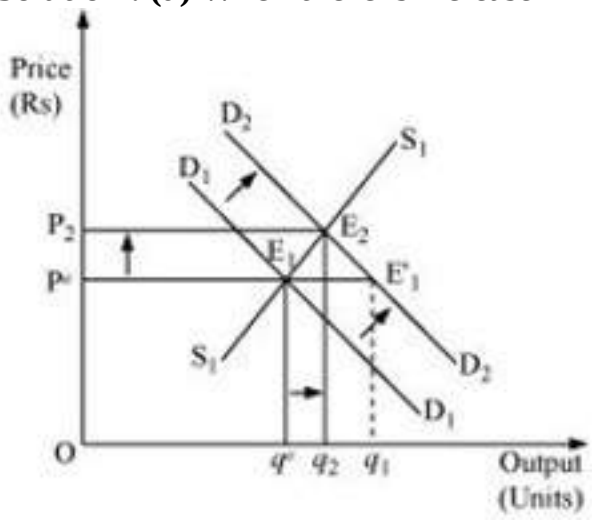
$q_1 f$ = the quantity of output supplied by each firm

**Question 9: How are equilibrium price and quantity affected when income of the consumers**

**(a) increase**

**(b) decrease**

**Solution : (a) When there is** increase in income of consumers:-



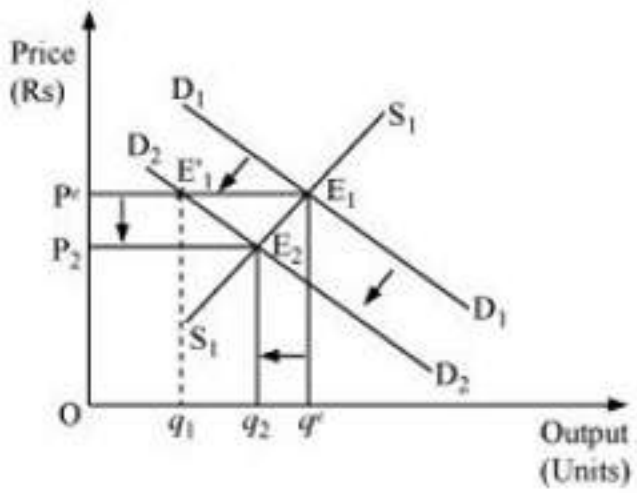

If the number of firms is assumed to be fixed, then the increase in consumers' income will lead to increase in demand of consumers which results in the equilibrium price to rise.

Let us understand how it happens:

$D_1D_1$ and $S_1S_1$ represent the market demand and market supply respectively. The initial equilibriumoccursat$E_1$,wherethedemandandthesupplyintersecteachother.Duetothe increase in consumers' income, the demand curve will shift rightward parallelly because of increase in the demand of the consumers while the supply curve will remain unchanged.

Hence,therewillbeasituationofexcessdemand,equivalentto $\left(q^e - q^1\right)$.Consequently, the price will rise due to excess demand. The price will continue to rise until it reaches $E_2$ (new equilibrium), where $D_2D_2$ intersects the supply curve $S_1S_1$. The equilibrium price increases from $P^e$ to $P_2$ and the equilibrium output increases from $q^e$ to $q_2$ and the equilibrium point shifts from E1 to E2.

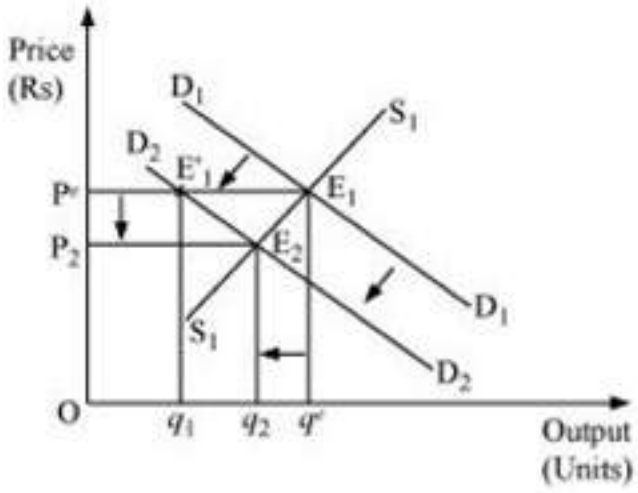
**(b)** When there is decrease in the income of consumers:-




Thedecreaseinconsumers'incomeisdepictedbyleftwardparallelshiftofdemandcurvefrom $D_1D_1$ to $D_2D_2$ becauseofthedecreaseinthedemandofconsumers.Consequently,at theprice $P^e$,therewillbeanexecssupply $\left(q^e - q^1\right)$,resultingthepricetofall.Atthenew equilibrium (E2), where D2D2 intersect the supply curve, the equilibrium price falls from $P^e$ to $P_2$ and the equilibrium quantity falls from $q^e$ to $q_2$ and the equilibrium points shifts from E1 to E2.
Above mentioned scenario is possible only in case of normal goods.

**Question 10: Usingsupplyanddemandcurves,showhowanincreaseinthepriceofshoesaffects thepriceofapairofsocksandthenumberofpairsofsocksboughtandsold.**

**Solution :Both** Shoes and socks are complementary to each other and are used together. Therefore, the increase in shoe price will discourage the demand for socks. Therefore, due to the decrease in demand for socks, the demand curve for socks will shift leftwards parallelly from $D_1D_1$ to $D_2D_2$ .Thesupplyremainingunchanged,attheequilibriumprice $P^e$,thereexists excess supply of socks, which reduces the price of socks and the new equilibrium will be at $E_2$, with equilibrium price $P_2$ and equilibrium quantity $q_2$.
Price decreases from $P_1$ to $P_2$ Demand decreases from $q^e$ to $q_2$ equilibriumpoint shifts from $E_1$ to $E_2$.



**Question 11: Howwillachangeinpriceofcoffeeaffecttheequilibriumpriceoftea?Explainthe effectonequilibriumquantityalsothroughadiagram.**

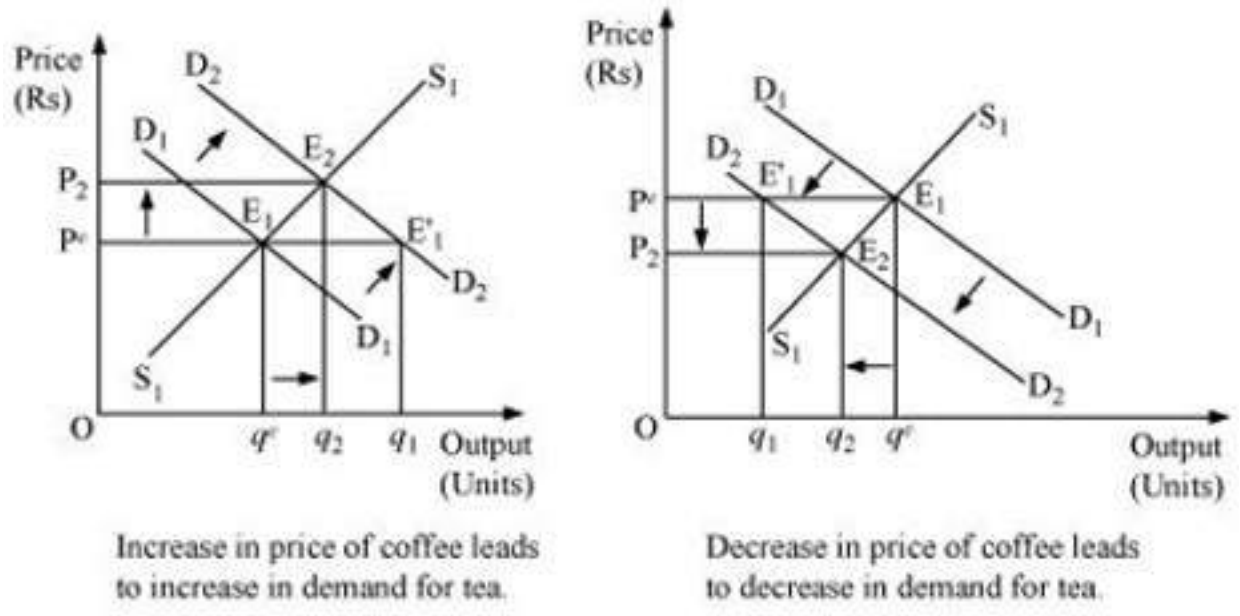
**Solution :**Coffee and tea are substitute goods, i.e. they are used in the place of each other. An increase or a decrease in the price of coffee will lead to an increase or a decrease in the demand for tea respectively.

The figure below depicts the equilibrium of the tea market. The initial demand and supply of tea is depicted by $D_1D_1$ and $S_1S_1$ respectively. The initial equilibrium is at E1, with the equilibrium price $P^e$ and equilibrium quantity $(q^e)$.

Now, if the price of coffee increases, thedemand for coffee decreases which will lead to an increase in the demand for tea (being asubstitute good), the demand curve of tea will shift rightward parallelly and the price of teawill rise. At the equilibrium price $(P^e)$, there will be an excess demand for tea; consequently,thepriceofteawillrise.Thiswillformthenewequilibriumat $E_2$,withthenew equilibrium price increases from $P^e$ to $P_2$ and the new equilibrium output $q_2$. Hence,an increase in the price of coffee, will lead the equilibrium price of tea to rise (due to excess demand). Further, the increase in the price of coffee will also lead to the increase in demand for tea as tea is the substitute good for coffee.

Now, if the price of coffee decreases, the demand for coffee increases and there will be a decrease in the demand for tea. The demand curve for tea will shift leftward parallelly to $D_2D_2$. At the equilibrium price $(P^e)$, there will be an excess supply.

Consequently, the price of tea will fall, which will form the new equilibrium at $E_2$, with the new equilibrium price falls from $P^e$ to $P_2$ and the new equilibrium output deceases from $q^e$ to $q_2$. Hence, a decrease in the price of coffee will lead to a decrease in the price of tea and a decreaseinthedemandfortea,aspeoplewillswitchovertoconsumptionofcoffee.




Increase in price of coffee leads to increase in demand for tea.

Decrease in price of coffee leads to decrease in demand for tea.

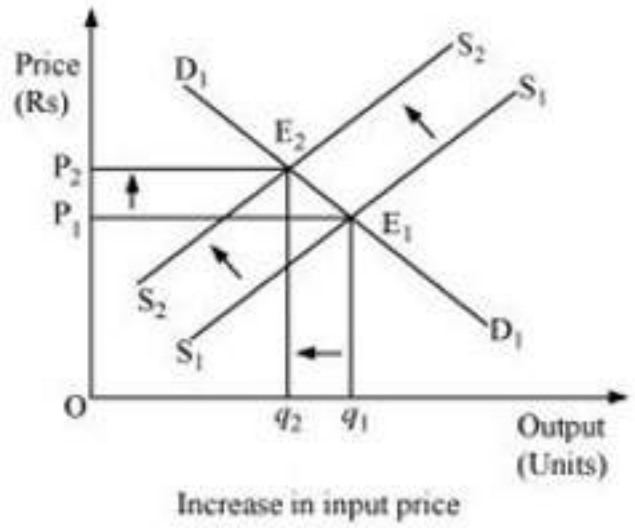
**Question 12: Howdotheequilibriumpriceandthequantityofacommoditychangewhenpriceof inputusedinitsproductionchanges?**

**Solution :**The change in the price of input alters the cost of production of a commodity. It directly affects price equilibrium and quantity of goods.

Let us analyze the two different cases.

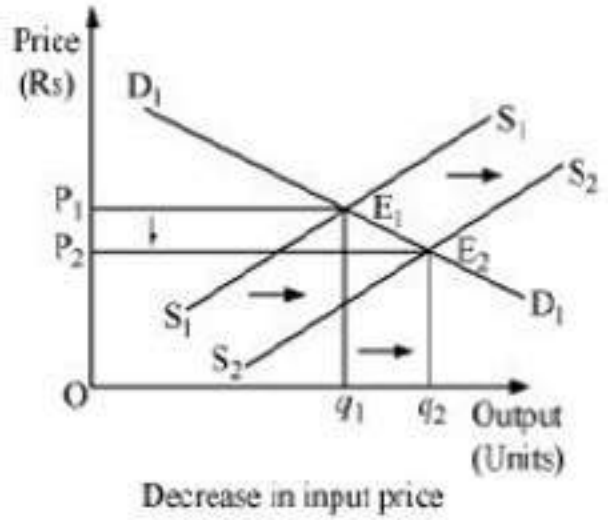
(a) **Increase in input price**: If the input price of a firm increases, the cost of production will also increase.As a result, the supply of product will decrease and the profit margin will also fall which will discourage the firm's incentive to produce and supply the commodity. This will lead to a left upward shift of the marginal cost curve, which further will lead to a leftward parallel shiftofanindividualfirm'ssupplycurveandfinallyaleftwardshiftofthemarketsupplycurve.Thedemandcurveremainingthesame,thenewequilibriumwilloccurat $E_2$ withhigherequilibriumprice $(P_2)$ and lower quantityofoutput $(q_2)$.

The same is mentioned in the below figure.



Increase in input price

(b) **Decrease in input price**: If an input price of a firm decreases, then the cost of production will decrease, the supply of product will increase and the profit margin will also rise. This will shift the marginal cost curve rightward, which implies that the firm's supply curve will also shiftrightward.Consequently,themarketsupplycurvewillshiftrightwardparallellyfrom $S_1S_1$ to $S_2S_2$ .Demandcurveremainingthesame,thenewequilibriumwilloccurat $E_2$ withlowerequilibriumprice $(P_2)$ andhigherquantitylevelofoutput $(q_2)$. This can be understood from the diagram below.



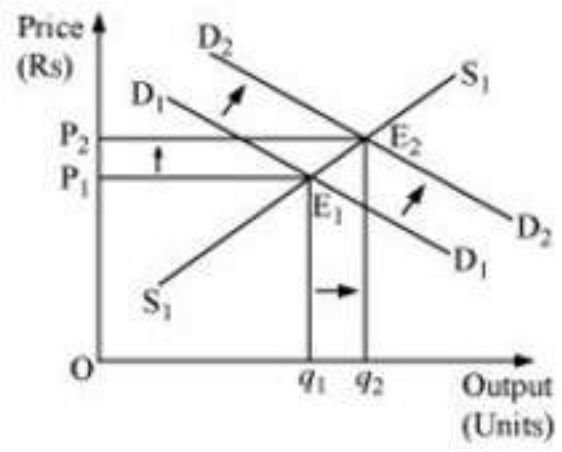
Decrease in input price

**Question 13: IfthepriceofasubstituteYofgoodXincreases,whatimpactdoesithaveonthe equilibriumpriceandquantityofgoodX?**

**Solution :**X and Y being substitute goods, if the price of Y increases, then it will reduce the demand for Y and people will switch to commodity X, which will raise the demand for X therefore the priceofXwillincrease.Increase or decrease in prices of substitute goods always directly affect the equilibrium price and quantity of goods.
Thus,thedemandcurvewillshiftfrom $D_1D_1$ to $D_2D_2$ . Atthe existing price $P_1$, there will be an excess

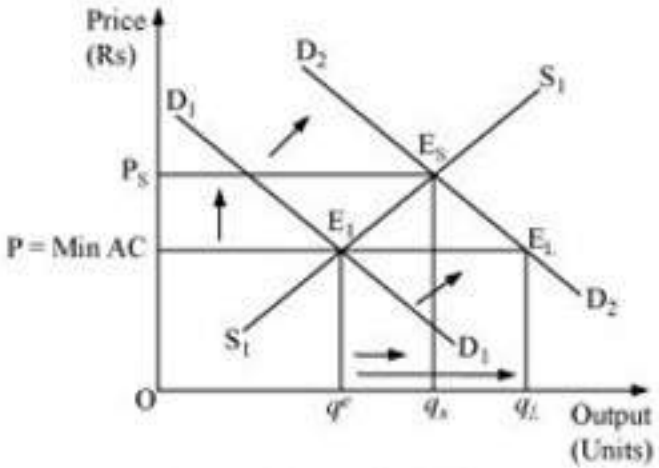
demand. Due to the pressure of excess demand, the existing price will increase. Consequently, the new equilibrium occurs at $E_2$, where the new demandcurve $D_2D_2$ intersects thesupplycurve $S_1S_1$. The new equilibrium price is $P_2$, which ishigherthan $P_1$ and equilibriumquantityis $q_2$, which is higher than $q_1$.Therefore,

duetotheincreaseinthepriceofsubstitutegoodY,theequilibriumpriceofXwillriseand equilibrium output of X will also behigher.




**Question 14: Compare the effect of shift in the demand curve on the equilibrium when the numberoffirmsinthemarketisfixedwiththesituationwhenentry-exitispermitted.**

**Solution :**




Increase in demand when free entry and exit is allowed and when not allowed

The above figure depicts the cases when the number of firms is fixed (in the short run) and when the number of firms is not fixed (in the long run). 'P = min AC' represents the long runprice line, $D_1D_1$ and $D_2D_2$ represent the demands in the short run and the long run. The point $E_1$ representsthe

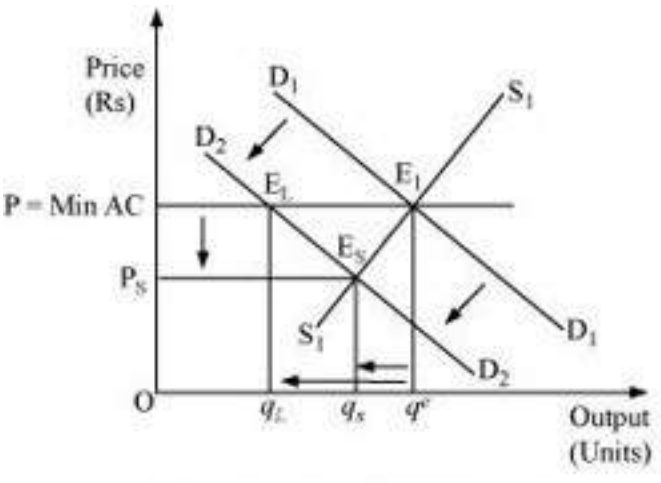
initial equilibrium where the demand curve and the supply curve intersect each other. Now, let us suppose that the demand curve shifts under the assumptionthat the number of firms are fixed; thus, the new equilibrium will be at $E_s$ (in the short run), where the supply curve $S_1S_1$ and the new demand curve $D_2D_2$ intersect each other. The equilibrium price is $P_s$ and equilibrium quantity $q_s$.

Now let us analyses the situation under the assumption of free entry and exit.

The increase in demand will shift the demand curve rightwards to $D_2D_2$. The new equilibrium will be at $E_2$. It is the long run equilibrium with equilibrium price (P) = min AC and equilibrium quantity $q_1$.

Therefore, on comparing both the cases, we find that when the firms are given the freedom of entry and exit, the equilibrium price remains the same and the price is lower than the short run equilibrium price $(P_s)$; whereas, in the case of long run equilibrium quantity $q_L$ is more than that of the short run $(q_s)$.

Similarly, for leftward demand shift, it can be noted that the short run equilibrium price $(P_s)$ islessthanthelongrunequilibriumpriceandtheshortrunequilibriumquantity $(q_s)$ is less than the long run equilibrium quantity $q_L$.




Decrease in Demand when free entry and exit is allowed and when not allowed

In short, when excess demand increases, it leads to price increase and supernormal profit. This attracts new entrants in the market and leads to minimum average cost.

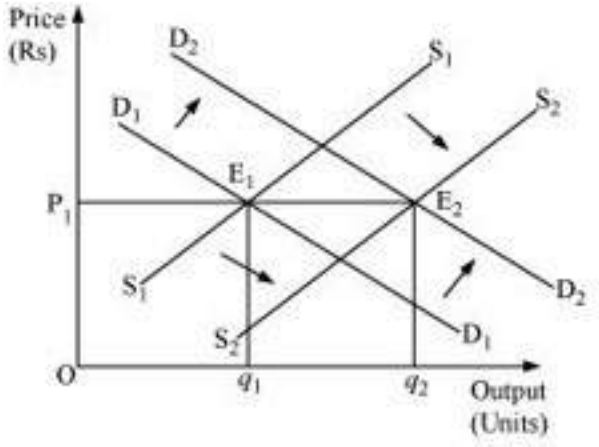
**Question 15: Explainthroughadiagramtheeffectofarightwardshiftofboththedemandand**

**supplycurvesonequilibriumpriceandquantity.**

**Solution :**When both demand and supply of a commodity increases, the equilibrium quantity will increase but there will not be any affect on equilibrium price.

Possibilities of following three situations can happen: -

(a) **When demand and supply increase in the sameproportion**:

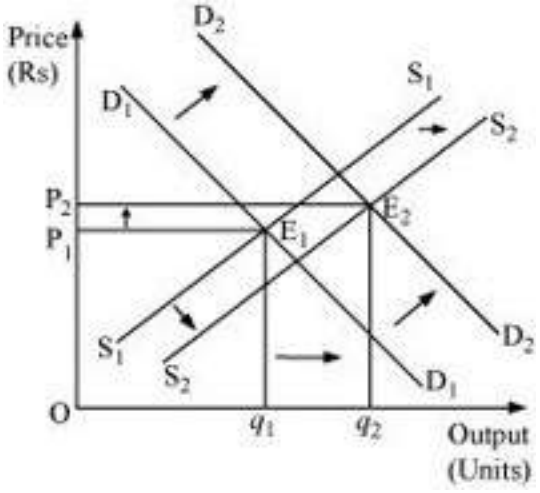



$E_1$ is the initial equilibrium with equilibrium price $P_1$ and equilibrium $q_1$.

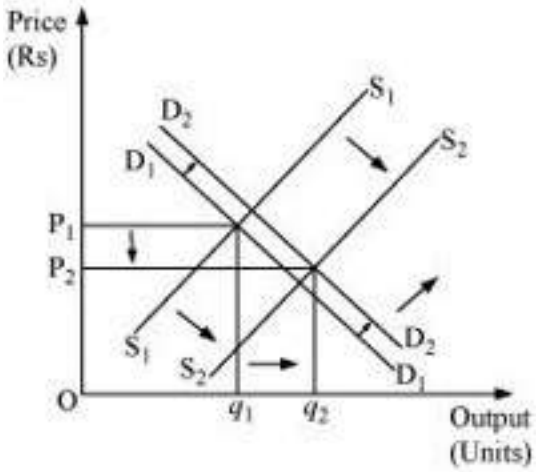
Now, let us suppose that the demand increases to $D_2D_2$ and the supply increase to $S_2S_2$ by the same proportion. The new demand and new supply curve intersect at $E_2$, which is the new equilibrium, with a new equilibrium output q2, but the same equilibrium price $P_1$.
Thus, an increase in the demand and the supply by the same proportion leaves the equilibrium price unchanged.

(b) **When demand increases more than the increase in supply**: The original demand and supply curves intersect each other at $E_1$ with initial equilibriumprice $P_1$ and initialequilibrium output $q_1$.

Now, let us suppose that the demand increases and thereby the demand curve shifts to $D_2D_2$ ;thesupplycurvealsoshiftsrightwardsto $S_2S_2$ .However,theincreaseinsupplyis less than the increase in demand. The new supply curve and the new demand curve intersect each other at point $E_2$ with higher equilibrium price $P_2$ and higher equilibrium output $q_2$ .




(c) **Whentheincreaseindemandislessthantheincreaseinsupply**:Lettheinitial equilibrium be at $E_1$ with the equilibrium price $P_1$ and equilibrium output $q_1$. Now, let us suppose that the demand increases to $D_2D_2$ and the supply increases to $S_2S_2$; where the increase in supply is more than that of demand. The new demand curve $D_2D_2$ and the newsupply curve $S_2S_2$ intersect at $E_2$. Thus, the greater increase in supply curve as compared to the demand curve will lead the equilibrium price to fall and equilibrium output to rise.



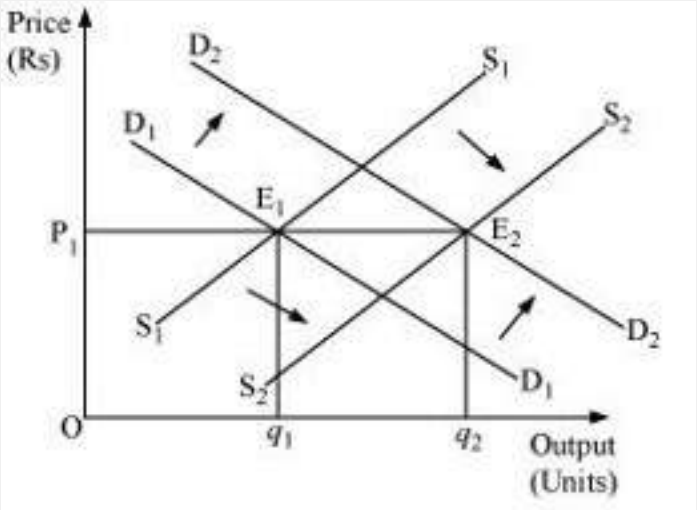
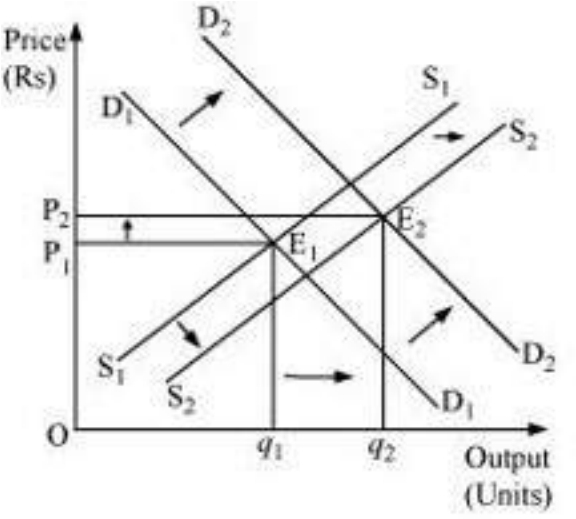
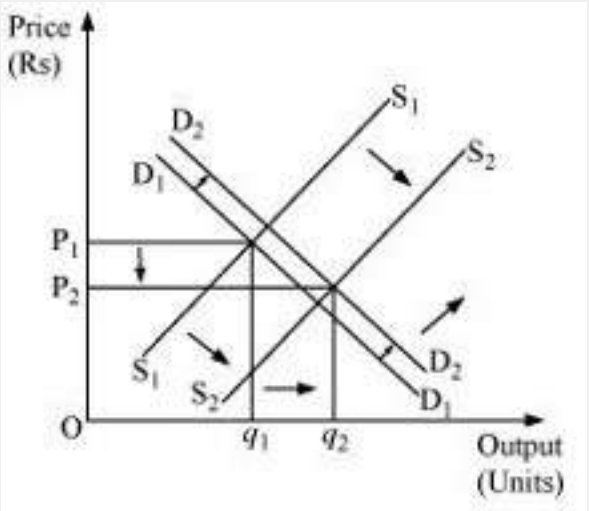

**Question 16: Howaretheequilibriumpriceandquantityaffectedwhen**

**(a) bothdemandandsupplycurvesshiftinthesamedirection?**

**(b) demandandsupplycurvesshiftinoppositedirections?**

**Solution :**

(a) When both demand and supply curves shift in the samedirection

| Cases | Equilibrium Price | Equilibrium Quantity | Figure |
|---|---|---|---|
| 1) Increase in Dd = Increase in supply | Unchanged | Increases |  |
| 2) Increase in Dd more than increase SS | Increases | Increases |  |
| 3) Increase in Dd less than increase in SS | Falls | Increases |  |
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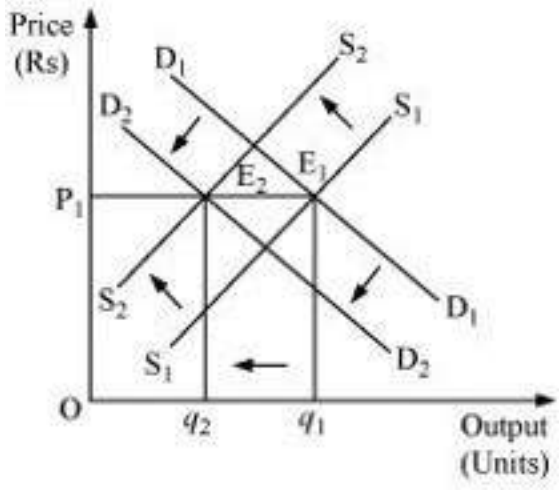
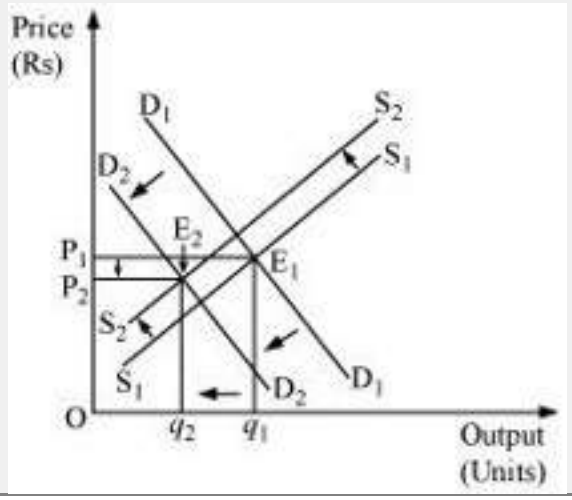
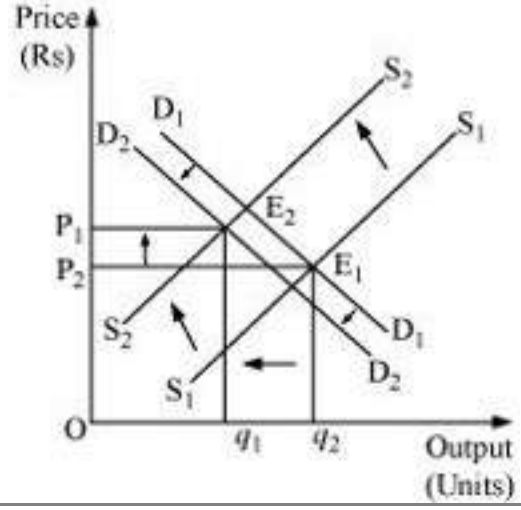
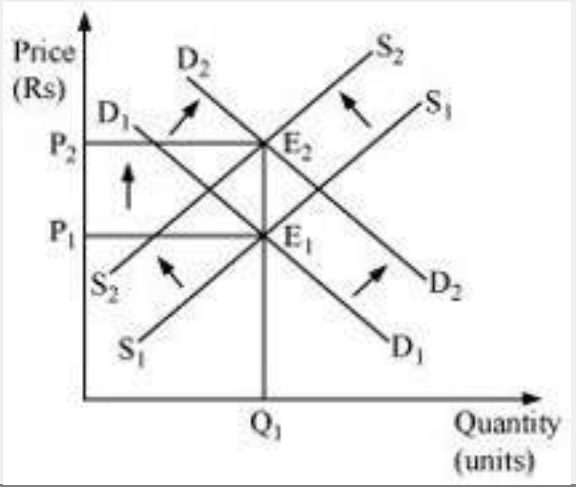
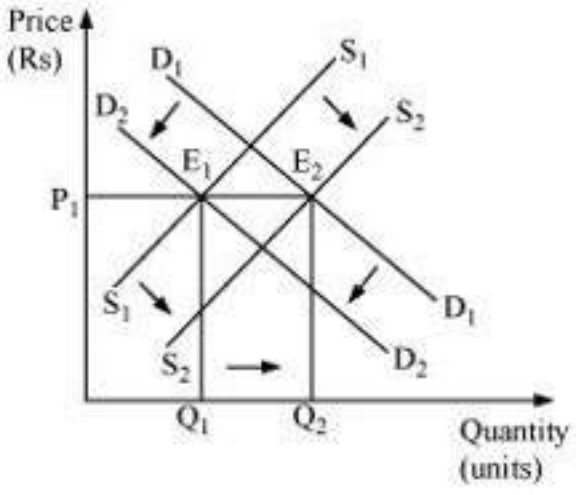
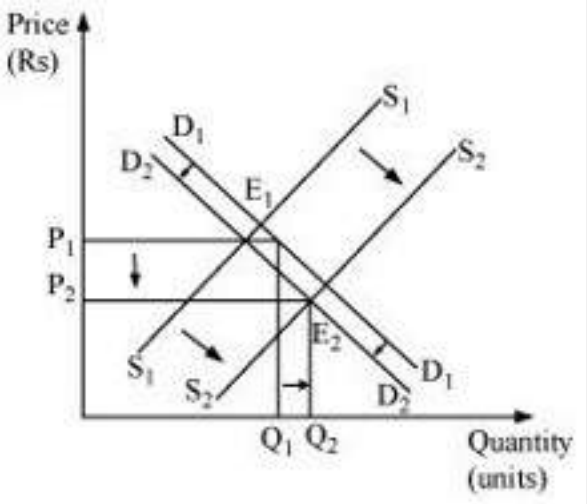
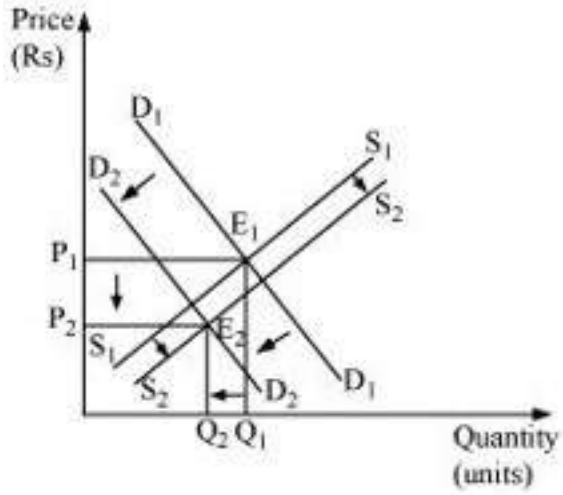
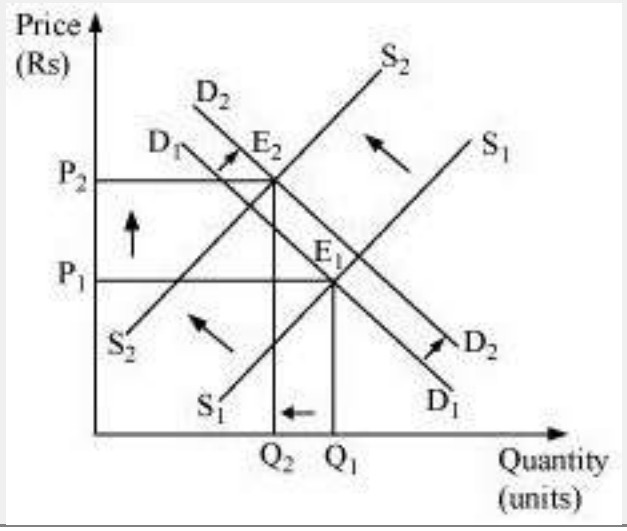
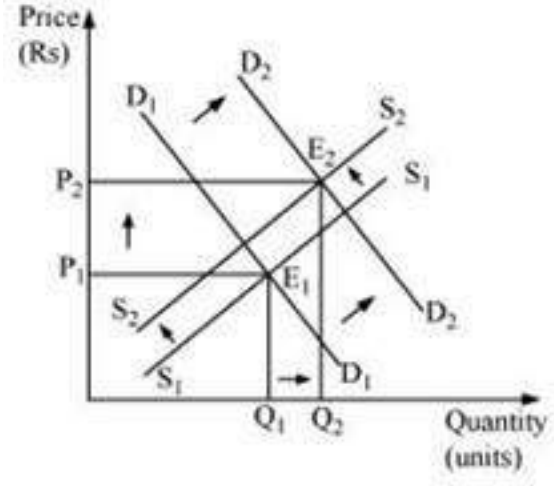
|---|---|---|---|
| 4) Decrease in Dd = decrease in SS | Unchanged | Falls |  |
| 5) Decrease in Dd more than decrease in SS | Falls | Falls |  |
| 6) Decrease in Dd less than decrease in SS | Increases | Falls |  |

(b) When demand and supply curves shift in oppositedirections

| **Cases** | **Equilibrium Price** | **Equilibrium Quantity** | **Figure** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1. Increase in Dd = decrease in SS | Increase | Unchanged |  |
| 2. Decrease in Dd = increase in SS | Unchanged | Increase |  |
| 3. Decrease in Dd < increase in supply | Decrease | Increase |  |
| | | | |

| | | | |
|---|---|---|---|
| 4. Decrease in Dd > increase in supply | Decrease | Decrease |  |
| 5. Increase in Dd < decrease in SS | Increase | Decrease |  |
| 6. Increase in Dd > decrease in SS | Increase | Increase |  |

**Question 17: Inwhatrespectdothesupplyanddemandcurvesinthelabourmarketdifferfrom thoseinthegoodsmarket?**

**Solution :**The supply and demand curves in the labour market differ from those in the goods market in the following ways:

i) In a goods market, the demand for goods is made by consumers or households; while in a labour market, the demand for labour is made byfirms.

ii) In a goods market, the supply of goods is made by firms; while in a labour market, the supply of labour is made byhouseholds.

So, in a goods market, firms act as suppliers; in a labour market, households act as suppliers.

**Question 18: Howistheoptimalamountoflabourdeterminedinaperfectlycompetitivemarket?**

**Solution :**A profit maximising firm will employ labour up to the point where the extra cost incurred by employing the last unit of labour (wage) equals the additional benefit it earns by employing that unit of labour.

That is, Marginal cost of labour = Marginal benefit by labour Or,

Wage rate = Marginal Revenue Product

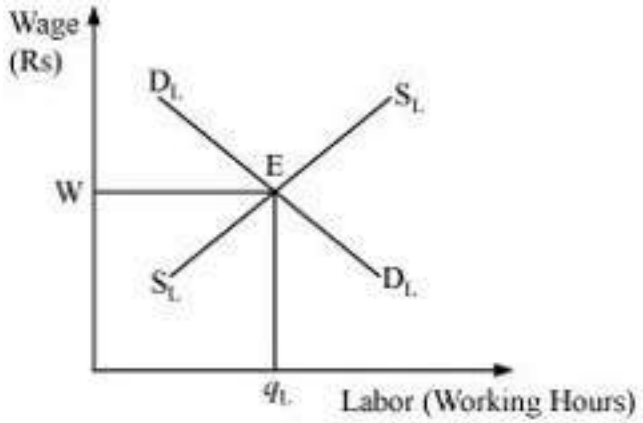
Or, w= $MRP_1$

Or, w = $MR \times MP_L$ (as $MRP_L = MR \times MP_L$)

Or, w = $P \times MP_L$ (in Perfect Competition Price = MR)

Or, w = $VMP_L$ (because $VMP_L = P \times MP_L$)

Thedemandforlabourisderivedfrom $VMP_L$ andthesupplyoflabourispositivelysloped. TheequilibriumexistsatE,wherethedemandforlabourandthesupplyoflabourintersect eachother.Theequilibriumwagerateiswandoptimalamountoflabouris $q_L$.

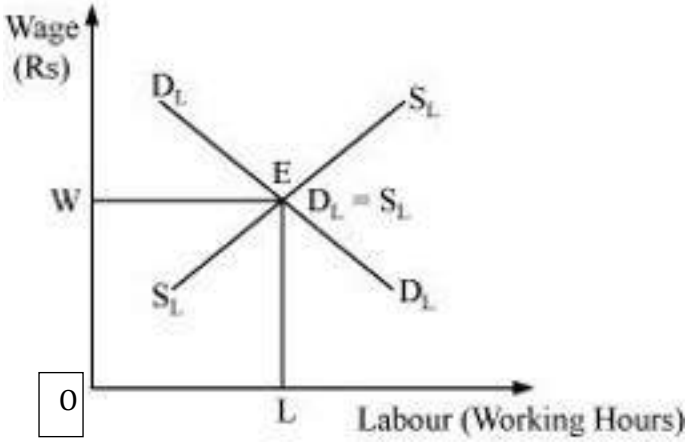



**Question 19: Howisthewageratedeterminedinaperfectlycompetitivelabourmarket?**

**Solution :**Similar to a goods market, wage rate in a labour market is determined by the intersection of demand and supply of labour. The rate at which the demand equals the supply is called the equilibrium wage rate. Corresponding hours of labour are demandedandsuppliedinthelabourmarketattheequilibriumwagerate.Thedemandforlabour is derived from the value of marginal product of labour $(VMP_L)$. We know that aparticular firm will employ labour up to a point where marginal cost of employing the last unit of labour hired equals the marginal benefit earned by the firm by hiring that unit of labour.

Labour is supplied by those households, who need to trade-off between working hours (labour) or leisure. The supply of labour is a positive function of wage up to a point beyond which the supply curve becomes backward bending supply curve.

Below diagram depicts the intersection of demand for labour and the supply of labourwhich is occurring at the wage rate w. Here, the equilibrium takes place at E where $D_LD_L$ equals $S_LS_L$ and the equilibrium units of labour supplied and demanded isL.




Hence, OW is the wage rate in a perfectly competitive market.

**Question 20: CanyouthinkofanycommodityonwhichpriceceilingisimposedinIndia?What maybetheconsequenceofprice-ceiling?**

**Solution :**Price ceiling means deciding lower prices as compared to market price of goods**.** In India, there are many goods on which government has imposed price ceiling, in order to keep them available within the reach of the BPL (below poverty line ) people. These goods are kerosene, sugar, wheat, rice, etc. which we generally get in Fair price shops or Ration Shops. It is generally maintained by Food Corporation of India which maintains the Public Distribution System in India.

The following are the consequences of price ceiling:

i) **Excessdemand**-Due to artificially imposed price, cutting lower than the equilibrium price leads to the emergence of the problem of excess demand.

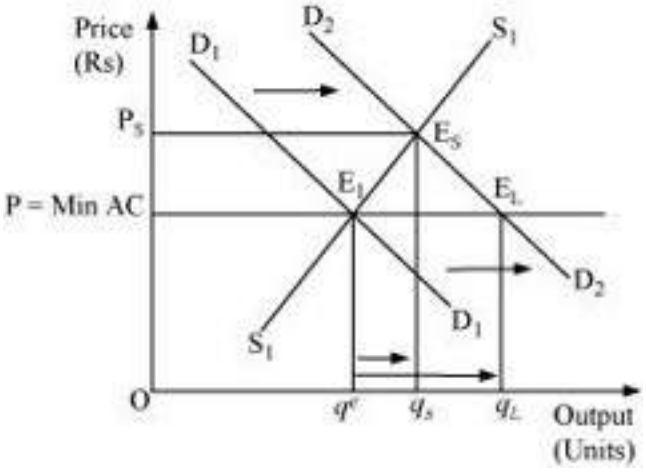
ii) **FixedQuota**-Each consumer gets a fixed quantity of good (as per the quota). The quantity often falls short of meeting the individual's requirements. This further leads to the problem of shortage and the consumer remains unsatisfied.

iii) **Inferiorgoods**-Often it has been found that the goods that are rationed are usually inferior / low quality goods and are adulterated.

iv) **Black marketing** - The needs of a consumer remain unfulfilled as per the quota laid by the government. Consequently, some of the unsatisfied consumers get ready to pay higher price for the additional quantity. This leads to black-marketing and artificial shortage in the market.

**Question 21: Ashiftindemandcurvehasalargereffectonpriceandsmallereffectonquantity whenthenumberoffirmsisfixedcomparedtothesituationwhenfreeentryandexist is permitted.Explain.**

**Solution :**




The above figure depicts both the cases when the number of firms is fixed (in short run) and when

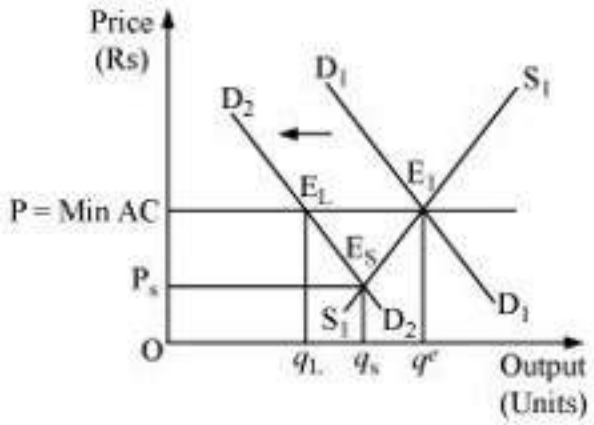
the number of firms is not fixed (in long run). P = min AC represents the long run price line; $D_1D_1$ and $D_2D_2$ represents the demand in the short run and the long run respectively.

The point E1 represents the initial equilibrium, where the demand and the supply intersect each other.

Let us suppose that the demand curve shifts, assuming that the number of firms is fixed. Now, the new equilibrium willbeat $E_s$ (as it is short run equilibrium), where thesupply

curve and the demand curve $D_2D_2$ intersect each other. The equilibrium price is $P_s$ and equilibrium quantity is $q_s$.

On the other hand, under the assumption of free entry and exit, an increase in demand will shift the demand curve rightwards to $D_2D_2$. The new equilibrium will be at $E_2$ (as it is along run equilibrium) with the equilibrium price P = min AC and equilibrium quantity $q_L$. Therefore, on comparing both the cases, we find that when the firms are given the freedom ofentryandexit,theequilibriumpriceremainsthesame.Thepriceislowerthanthatoftheshort run equilibrium price $(P_s)$; whereas, the long run equilibrium quantity $(q_L)$ is morethan that of the short run equilibrium quantity $(q_s)$similarly, for the leftward demand shift, it can be found that the short run equilibrium price $(P_s)$ islowerthanthelongrunequilibriumpriceandtheshortrunequilibriumquantity $(q_s)$in less than the long run equilibrium quantity $(q_L)$.



**Question 22: SupposethedemandandsupplycurveofcommodityXinaperfectlycompetitive market are givenby:**

$q_D = 700 - p$

$q_e = 8 + 3p$ **for** $p \geq 15$

**= 0 or** $0 \leq p < 15$

**Assume that the market consists of identical firms. Identify the reason behind the marketsupplyofcommodityXbeingzeroatanypricelessthanRs15.Whatwillbethe equilibrium price for this commodity? At equilibrium, what quantity of X will be produced?**

**Solution :**If the government imposes price ceiling by Rent Control Act (the maximum price) that can be charged as the rent of apartment.

It results decline in equilibrium price due to (i) excess demand of apartments (ii) black marketing by builders

Now as per the question stated, It is given that;

$q_D = 700 - p$

$q_S = 500 + 3p$ for $p \geq 15$

= 0 for $0 \leq p < 15$

The market supply is zero for any price from Rs 0 to Rs 15, this is because, for price between0 to 15, no individual firm will produce any positive level of output (as the price is less than the minimum of AVC). Consequently, the market supply curve will be zero.

At equilibrium $q_D = q_S$ 700 -

p = 500 +3p

- p -3p = 500 – 700

- 4p = - 200

p = 50

Equilibrium price is Rs 50.

Quantity = $q_s$ = 500 +3p

= 500 + 3 (50)

= 500 + 150

= 650

Therefore, the equilibrium quantity is 650 units.

**Question 23: Considering the same demand curve as in exercise 22, now let us allow for free entryandexitofthefirmsproducingcommodityX.Alsoassumethemarketconsistsof identical firms producing commodity X. Let the supply curve of a single firm be explainedas**

$q_f^s = 8 + 3p$ **for** $p \geq 20$

**= 0for** $0 \leq p < 20$

**(a) Whatisthesignificanceofp=20?**

**(b) AtwhatpricewillthemarketforXbeinequilibrium?Statethereasonforyour answer.**

**(c) Calculatetheequilibriumquantityandnumberoffirms.**

**Solution :**As per the question:-

$q_f^s = 8 + 3p$ for $p \geq 20$

= 0 for $0 \leq$ p <Rs20.

$q_d = 700 - p$

(a) For the price between 0 to 20, no firm is going to produce anything as the price in this range is below the minimum of LAC. So, at the price of Rs 20, the price line is equal to the minimum ofLAC.

(b)As there exists the freedom of entry and exit of firms, the minimum of AVC is at Rs 20,also, the price of Rs 20 is the equilibrium price. This is because in the long run, all firms earn zero economic profit, which implies that the price of Rs 20 is the equilibrium price and at any price lower than Rs 20, the firm will move out of the market.

(c)At equilibrium price of Rs20

Quantity supplied = $q_S = 8 + 3p$

= 8 + 3 (20)

$q_S$ = 68 units

Quantity demanded $q_d = 700 - p$

= 700 – 20

$q_d = 680$ units

Number of firms (n)= $\frac{q_d}{q_f^s}$

n = $\frac{680}{68}$

n = 10 firms

Therefore,thenumberoffirmsinthemarketis10andtheequilibriumquantityin680units.

**Question 24: Supposethedemandandsupplycurvesofsaltaregivenby:**

$q^D = 1000 - p$

$q^S = 700 + 2p$

**(a) Findtheequilibriumpriceandquantity.**

**(b) Now,supposethatthepriceofaninputthatusedtoproducesalthasincreasedso, thatthenewsupplycurveis** $q^s = 400 + 3p$

**Howdoestheequilibriumpriceandquantitychange?Doesthechangeconformtoyour expectation?**

**(c) Supposethegovernmenthasimposedataxof Rs3perunitofsaleonsalt.Howdoes itaffecttheequilibriumricequantity?**

**Solution : As per the question:-**

$q^D = 1000 - p - (1)$

$q^S = 700 + 2p - (2)$

**(a) Atequilibrium price and quantity will be: -**

$q^d = q^S$

1000 - p = 700 + 2p

300 = 3 p

100 = p

p = Rs 100

$q^d$ = 1000 - 100 [Substituting the value of p in equation (1)]

= 900 units

So, the equilibrium price is Rs 100 and equilibrium quantity is 900 units.

**(b) New quantity supplied** $q'_s$

$q'_s = 400 + 2p$

At equilibrium $q^d = q'_s$ 1000

- p = 400 +2p

600 = 3p

200 = p

p = Rs 200

Prior to the increase in the price of input, the equilibrium price was Rs 100, and after the rise in input's price, the equilibrium price is Rs 200.

So, the change in the equilibrium price in Rs 100 (200 - 100).

$q^d$ = 4000 - 200 [Subtitling the value of p in equation (1)]

= 800 units

The change in the equilibrium quantity is 100 units (i.e. 900 - 800 units).

Yes,thischangeisobvious,asduetothechangeintheinput'sprice,thecostofproducingsalt has increased that will shift the marginal cost curve leftward and move the supply curve to the left. A leftward shift in the supply curve results in a rise in the equilibrium price and a fall in the equilibriumquantity.

(c) The imposition of tax of Rs 3 per unit of salt sold will raise the cost of producing salt. This willshiftthesupplycurveleftwardsandthequantitysuppliedequationwillbecome

$y^s = 700 + 2\ (p - 3)$

At equilibrium

$y^d = y^s$

1000 - p = 700 +2 (p - 3)

1000 - p = 700 +2p – 6

306 = 3p

$\frac{306}{3}$ = p

p = Rs 102

Substituting the value of p in equation (1)

$y^d$ = 1000 – p

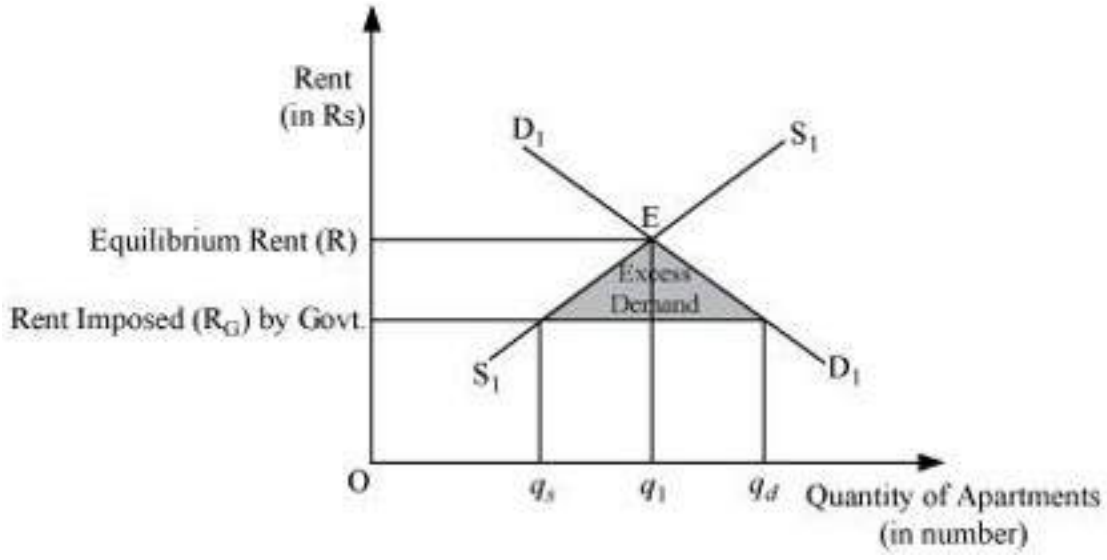
$y^d$ = 1000 – 102

$y^d$ = 898 units

Thus, the imposition of tax of Rs 3 per unit of salt sold will result in an increase in the price of salt from Rs 100 to Rs 102. The equilibrium quantity falls from 900 units to 898 units.

**Question 25: Supposethemarketdeterminedrentforapartmentsistoohighforcommonpeople toafford.Ifthegovernmentcomesforwardtohelpthose,seekingapartmentsonrent byimposingcontrolonrent,whatimpactwillithaveonthemarketforapartments?**

**Solution :**




The above figure depicts an equilibrium and an effect of price ceiling (maximum rent).

The market demand for apartments is depicted by the $D_1D_1$ curve and the supply of apartments is depicted by $S_1S_1$. The equilibrium price determined is R and the equilibrium quantity is q.

If the government steps in and imposes rent ceiling (maximum rent) equivalent to $R_G$, then atthisrent,therewillbeanexcessdemand.Thequantityofapartmentsdemandedwillbe

$q_d$ .Whereas, the quantity of apartments supplied is $q_s$. So, there exists an excess demand equivalentto $q_d - q_s$. At the rate $R_G$, common people can afford apartments to live in, which earlier they were not able to.

However, besides this positive effect of imposition of maximum rent, it might happen that some landlords indulge in the practice of black marketing and offer apartments for rent at comparatively higher price.