• Chapter 5 – Market Equilibrium

Question 1:

Explain market equilibrium.
Answer:
Market equilibrium is defined as the state of rest that is determined by the rational objectives of the consumers and the producers (i.e. maximisation of satisfaction and profit respectively). It is a state where the aggregate quantity that all the firms want to sell are purchased by consumers, i.e. market supply equals market demand. At this situation, there is no incentive or tendency for any change in quantity demanded, quantity supplied and price. That is: $y_d = y_s$.

Question 2:

When do we say that there is an excess demand for a commodity in the market?
Answer:

When the market demand exceeds the market supply at a particular price, then the situation that arises is excess demand. In other words, if at any price, the producers are willing to supply comparatively less than what is demanded by all the consumers in the market, then we face the situation of excess demand.

Question 3:

When do we say that there is an excess supply for a commodity in the market?
Answer:

Excess supply is a situation when the supply of a commodity in the market exceeds its demand at a particular price. In other words, if at any price level, all the consumers demand comparatively less quantity than what is being supplied by all the suppliers, then we face the situation of excess supply.

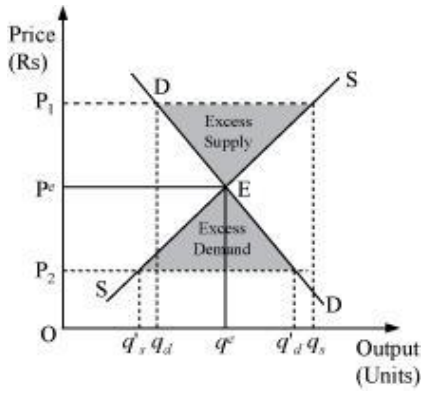
Question 4:

What will happen if the price prevailing in the market is

(i) above the equilibrium price?

(ii) below the equilibrium price?
Answer:

(i) If the market price is above the equilibrium price, there occurs the situation of 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 ($q_s - q_d$).

(ii) If the market price is below the equilibrium price, there occurs the situation of excess demand.

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 ($q'_d - q'_s$).

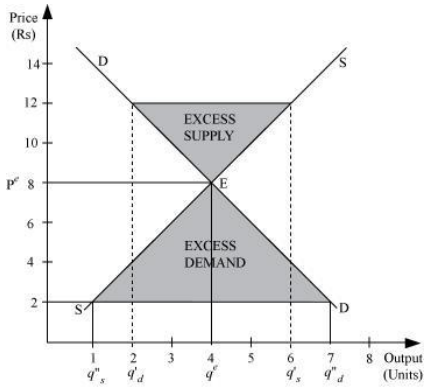
Question 5:

Explain how price is determined in a perfectly competitive market with fixed number of firms.
Answer:

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 curve and supply curve. It is the price at which the market demand equals market supply.

In the given 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 (P_e), where the demand equals supply.
If at any price lower than P_e , let us say Rs 2, there will be an excess demand that will raise 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.

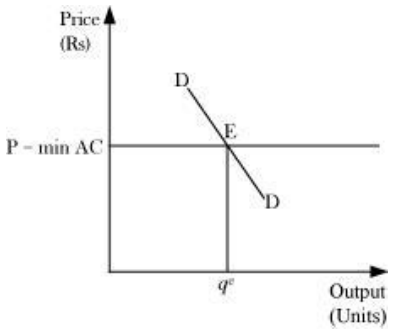


Question 6:

Suppose the price at which the equilibrium is attained in exercise 5 is above the minimum average cost of the firms constituting the market. Now if we allow for free entry and exit of firms, how will the market price adjust to it?
Answer:

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 normal profits.

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.

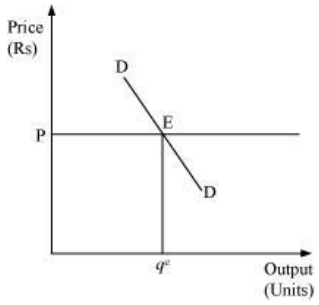


Question 7:

At what level of price do the firms in a perfectly competitive market supply when free entry and exit is allowed in the market? How is the equilibrium quantity determined in such a market?
Answer:

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 short run.

The equilibrium is determined by the intersection of consumers' demand curve and the '*P* = min AC' line. At equilibrium point E, quantity supplied by each firm is q_e at the price (*P*).



Question 8:

How is the equilibrium number of firms determined in a market where entry and exist is permitted?
Answer:
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 equality of price and the minimum of LAC. The market equilibrium is determined by the 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_1f, as it is assumed that all the firms are identical. Therefore, at the equilibrium, the number of firms in the market is equal to the number of firms required to supply output q_1 at price P_1, and each in turn supplying q_1f amount at this price. That is

$$n = \frac{q_1}{q_{1f}}$$

Where,

n = number of firms at market equilibrium
q_1 = the equilibrium quantity demanded
q_1f = the quantity of output supplied by each firm

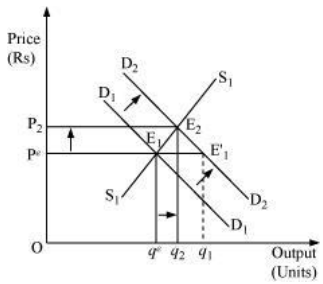
Question 9:

How are equilibrium price and quantity affected when income of the consumers

(a) increase

(b) decrease
Answer:

(a) Increase in income of consumers

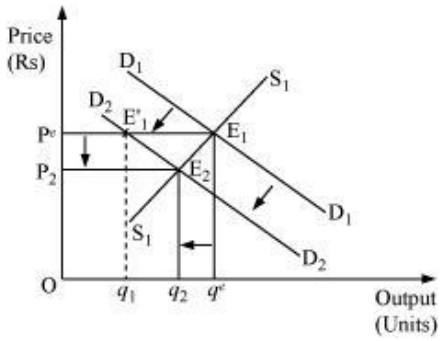


If the number of firms is assumed to be fixed, then the increase in consumers' income will lead the equilibrium price to rise.

Let us understand how it happens:

D_1D_1 and S_1S_1 represent the market demand and market supply respectively. The initial equilibrium occurs at E_1, where the demand and the supply intersect each other. Due to the increase in consumers' income, the demand curve will shift rightward parallelly while the supply curve will remain unchanged. Hence, there will be a situation of excess demand, equivalent to ($q_e - q_1$). 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.

(b) Decrease in the income of consumers



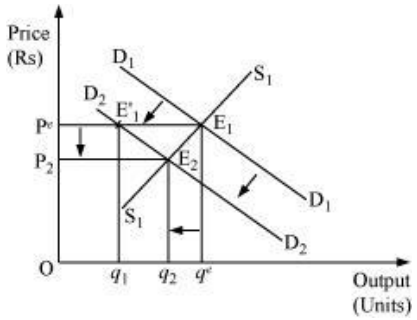
The decrease in consumers' income is depicted by leftward parallel shift of demand curve from D_1D_1 to D_2D_2. Consequently, at the price P_e, there will be an execs supply ($q_e - q_1$), resulting the price to fall. At the new equilibrium (E_2), where D_2D_2 intersect the supply curve, the equilibrium price falls from P_e to P_2 and the equilibrium quantity falls from q_e to q_2.

Question 10:

Using supply and demand curves, show how an increase in the price of shoes affects the price of a pair of socks and the number of pairs of socks bought and sold.

Answer:

Shoes and socks both 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. The supply remaining unchanged, at the equilibrium price P_e, there exists 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.



Question 11:

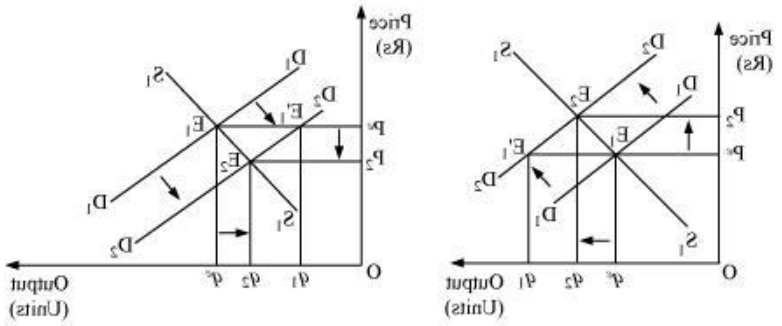
How will a change in price of coffee affect the equilibrium price of tea? Explain the effect on equilibrium quantity also through a diagram.

Answer:

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 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 E_1, with the equilibrium price (P_e) and equilibrium quantity (q_e). Now, if the price of coffee increases, which will lead to an increase in the demand for tea (being a substitute good), the demand curve of tea will shift rightward parallelly. At the equilibrium price (P_e), there will be an excess demand for tea; consequently, the price of tea will rise. This will form the new equilibrium at E_2, with the new equilibrium price 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, 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 P_2 and the new equilibrium output q_2. Hence, a decrease in the price of coffee will lead to a decrease in the price of tea and a decrease in the demand for tea, as people will switch over to consumption of coffee.



Question 12:

How do the equilibrium price and the quantity of a commodity change when price of input used in its production changes?

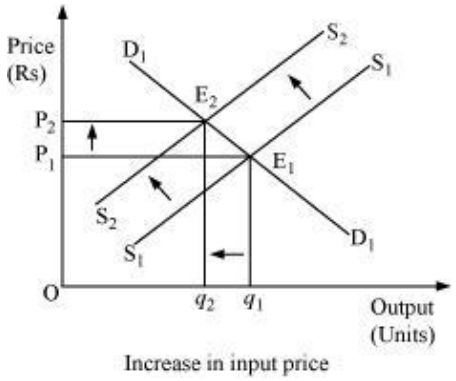
Answer:

The change in the price of input alters the cost of production of a commodity.

Let us analyze the two different cases.

1. Increase in input price

If the input price of a firm increases, the cost of production will also increase, 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 shift of an individual firm's supply curve and finally a leftward shift of the market supply curve. The demand curve remaining the same, the new equilibrium will occur at E_2 with higher equilibrium price (P_2) and lower quantity of output (q_2).

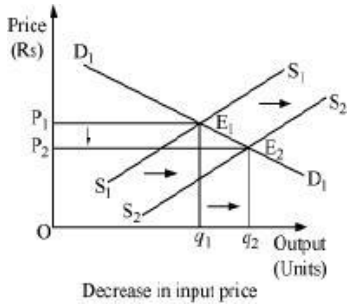


Increase in input price

2. Decrease in input price

If an input price of a firm decreases, then the cost of production will also decrease. This will shift the marginal cost curve rightward, which implies that the firm's supply curve will also shift rightward. Consequently, the market

supply curve will shift rightward parallelly from S_1S_1 to S_2S_2. Demand curve remaining the same, the new equilibrium will occur at E_2 with lower equilibrium price (P_2) and higher quantity level of output (q_2).



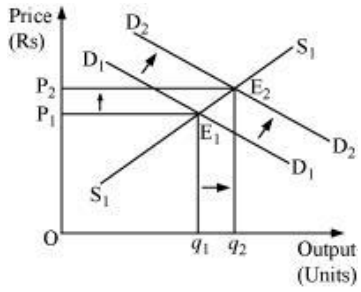
Decrease in input price

Question 13:

If the price of a substitute Y of good X increases, what impact does it have on the equilibrium price and quantity of good X?

Answer:

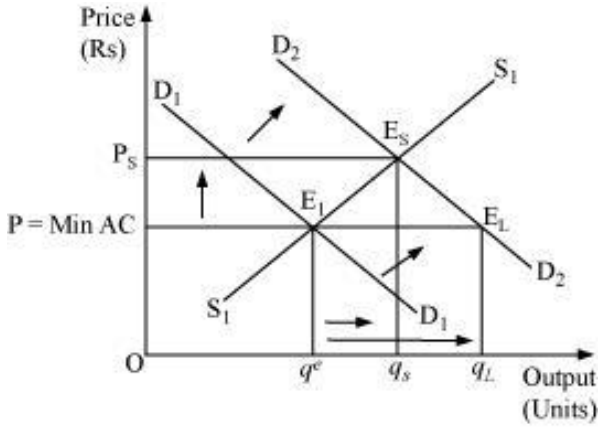
X and Y being substitute goods, if the price of Y increases, then it will reduce the demand for Y and people will switch to X, which will raise the demand for X. Thus, the demand curve will shift from D_1D_1 to D_2D_2 . At the existing price P_1, there will be an excess demand. Due to the pressure of excess demand, the existing price will increase. Consequently, the new equilibrium occurs at E_2, where the new demand curve D_2D_2 intersects the supply curve S_1S_1. The new equilibrium price is P_2, which is higher than P_1 and equilibrium quantity is q_2, which is higher than q_1. Therefore, due to the increase in the price of substitute good Y, the equilibrium price of X will rise and equilibrium output of X will also be higher.



Question 14:

Compare the effect of shift in the demand curve on the equilibrium when the number of firms in the market is fixed with the situation when entry-exit is permitted.

Answer:



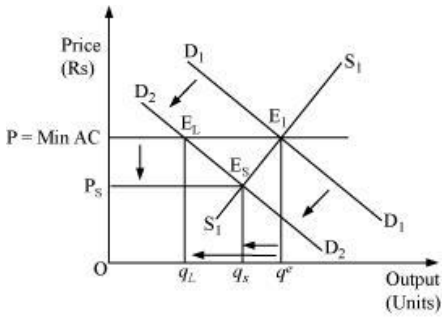
Increase in demand when free entry and exit is allowed and when not allowed

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 run price line, D_1D_1 and D_2D_2 represent the

demands in the short run and the long run. The point E_1 represents the initial equilibrium where the demand curve and the supply curve intersect each other. Now, let us suppose that the demand curve shifts under the assumption that 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 is q_s.

Now let us analyse 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_L.
Therefore, on comparing both the cases, we find that when the firms are given the freedom of entry and exit, the equilibrium price remains same and the price is lower than the short run equilibrium price (P_s); whereas, the long run equilibrium quantity (q_L) is more than that of the short run equilibrium (q_s).
Similarly, for leftward demand shift, it can be noted that the short run equilibrium price (P_s) is less than the long run equilibrium price and the short run equilibrium quantity (q_s) is less than the long run equilibrium quantity q_L.

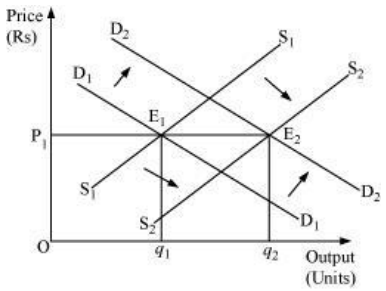


Decrease in Demand when free entry and exit is allowed and when not allowed

Question 15:

Explain through a diagram the effect of a rightward shift of both the demand and supply curves on equilibrium price and quantity.
Answer:

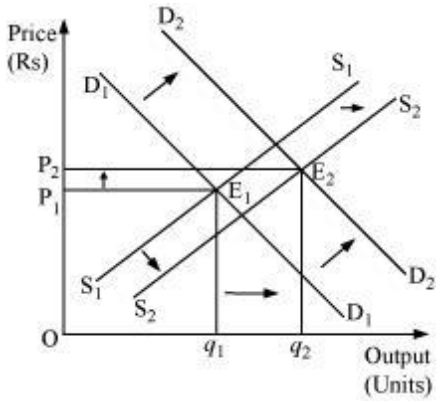
(a) When demand and supply increase in the same proportion:



E_1 is the initial equilibrium with equilibrium price P_1 and equilibrium output 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 q_2, 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 equilibrium price P_1 and initial equilibrium output q_1.
Now, let us suppose that the demand increases and thereby the demand curve shifts to D_2D_2; the supply curve also shifts rightwards to S_2S_2. However, the increase in supply is 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) When the increase in demand is less than the increase in supply:

Let the initial 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 new supply 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.