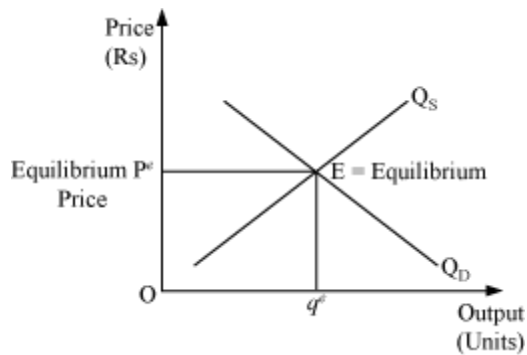

CHAPTER 5

MARKET EQUILIBRIUM

- ❖ **Market Equilibrium:** It is defined as the state of rest which is determined by the rational objectives of consumers and producers. The rational objective of consumers is to maximise their satisfaction, given their money income, while that of the producers is to maximise their profit, given their cost structure.
- ❖ **Equilibrium Price:** The price at which the market supply and market demand intersect each other gives equilibrium price and the corresponding quantity of output is called **equilibrium output**.



Symbolically Market Equilibrium is denoted as:

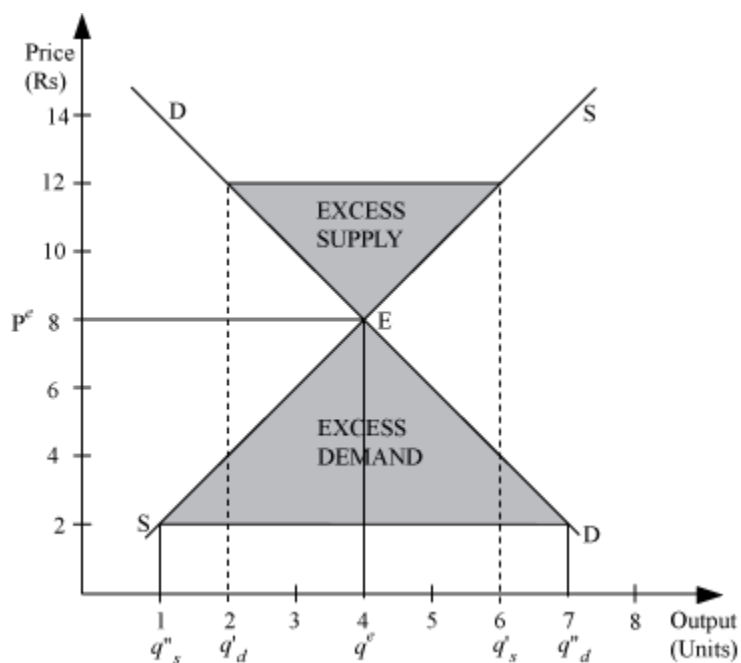
$$Q_s(P^e) = Q_d(P^e)$$

Q_s = Market supply at equilibrium price

Q_d = Market Demand at equilibrium price

P^e = Equilibrium price

- ❖ **Excess Demand** – It is defined as a situation where the market demand exceeds the market supply at a particular price.
- ❖ **Excess Supply** – It is defined as a situation where the market demand falls short of the market supply at a particular price.



Excess Demand = $q''_d - q''_s = 6$ units

Excess Supply = $q'_s - q'_d = 4$ units

Equilibrium Price = Rs 8

Equilibrium Output = 4 units

❖ Market Equilibrium under Fixed Number of Firms

Shift in Demand and Supply

The change in the equilibrium price and quantity with respect to shift in demand and supply is fragmented under three situations:

Changes in market demand only

Change in market supply only

Simultaneous changes in both – market demand and market supply.

1) Changes in market demand

The change in market demand can be:

- Increase in demand
- Decrease in demand

Effects of Change in Demand with Supply Unchanged on Equilibrium Price and Output

| Change in | Shift in | Equilibrium | Equilibrium | Figure |
|-----------|----------|-------------|-------------|--------|
|-----------|----------|-------------|-------------|--------|

| Demand | Demand Curve | Output | Price | |
|-----------------------|--------------|--------|-------|---|
| a) Increase in Demand | Rightwards | Rise | Rise | <p>The graph shows a supply curve S_1 and two demand curves, D_1 and D_2, where D_2 is to the right of D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to price P_1 and output q_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to a higher price P_2 and higher output q_2. Arrows indicate the rightward shift of the demand curve and the resulting changes in price and output.</p> |
| b) Decrease in Demand | Leftwards | Fall | Fall | <p>The graph shows a supply curve S_1 and two demand curves, D_1 and D_2, where D_2 is to the left of D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to price P_1 and output q_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to a lower price P_2 and lower output q_2. Arrows indicate the leftward shift of the demand curve and the resulting changes in price and output.</p> |

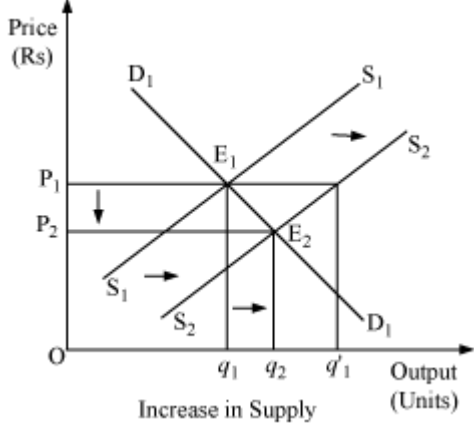
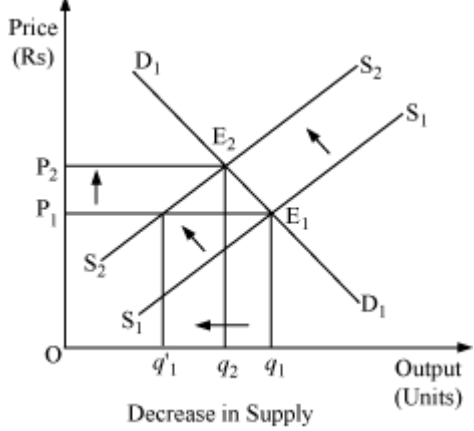
2) Change in Market Supply

The change in market supply can be:

a) Increase in Market Supply

b) Decrease in Market Supply

| Effects of Change in Supply with Demand Unchanged on Equilibrium Price and Output | | | | |
|---|-----------------------|--------------------|-------------------|--------|
| Change in Demand | Shift in Demand Curve | Equilibrium Output | Equilibrium Price | Figure |
| | | | | |

| | | | | |
|-----------------------|------------|------|------|--|
| a) Increase in Supply | Rightwards | Fall | Rise |  <p>Price (Rs)</p> <p>Output (Units)</p> <p>Increase in Supply</p> |
| b) Decrease in Supply | Leftwards | Rise | Fall |  <p>Price (Rs)</p> <p>Output (Units)</p> <p>Decrease in Supply</p> |

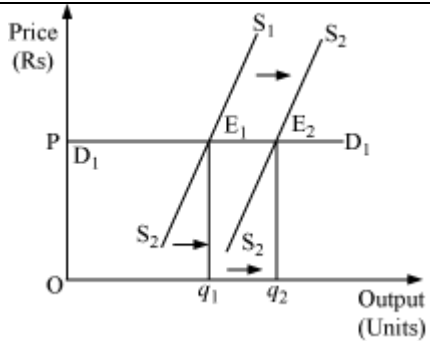
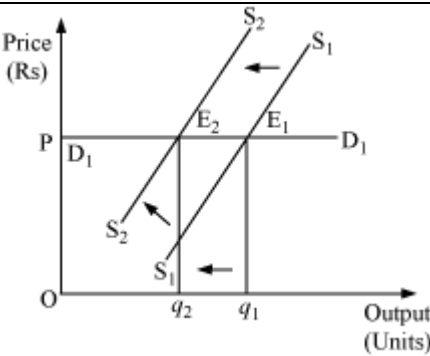
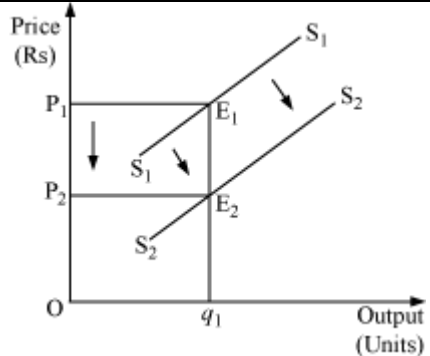
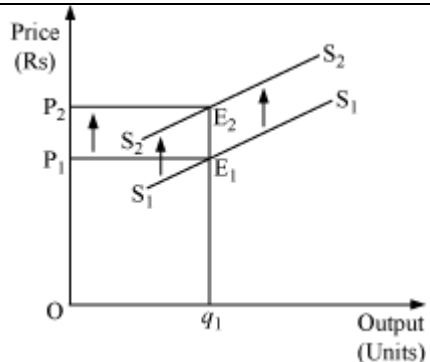
3) Simultaneous change in market demand and market supply.

The simultaneous change in market demand and market supply affects the equilibrium price and output depends on the magnitude of the change in demand and supply.

| Effects of Simultaneous Change in Demand and Supply on Equilibrium Price and Output | | | |
|---|-------------------|----------------------|--------|
| Cases | Equilibrium Price | Equilibrium Quantity | Figure |
| Both demand and supply changes simultaneously in the same direction | | | |

| | | | |
|---|-----------|-----------|---|
| <p>a) Increase in Demand = Increase in Supply</p> | Unchanged | Increases | <p>Price (Rs)</p> <p>Output (Units)</p> |
| <p>b) Increase in Demand > Increase in Supply</p> | Increases | Increases | <p>Price (Rs)</p> <p>Output (Units)</p> |
| <p>c) Increase in Demand < Increase in Supply</p> | Falls | Increases | <p>Price (Rs)</p> <p>Output (Units)</p> |
| <p>d) Decrease in Demand = Decrease in Supply</p> | Unchanged | Falls | <p>Price (Rs)</p> <p>Output (Units)</p> |

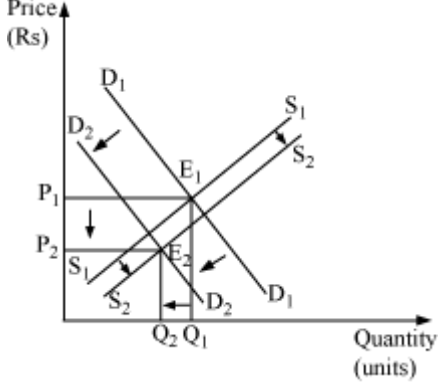
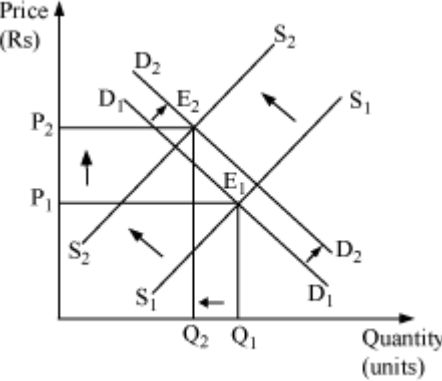
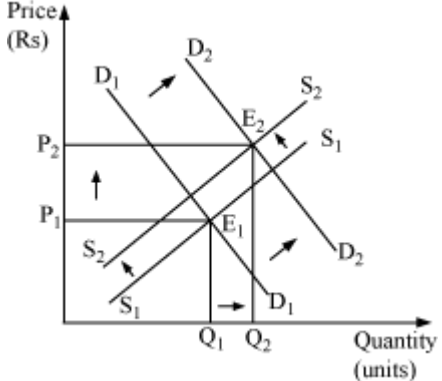
| | | | |
|--|-----------|-----------|--|
| e) Decrease in Demand > Decrease in Supply | Falls | Falls | |
| f) Decrease in Demand < Decrease in Supply | Increases | Falls | |
| g) Increase in Demand = Decrease in Supply | Increases | Unchanged | |
| h) Decrease in Demand = Increase in Supply | Falls | Unchanged | |
| Extreme cases | | | |

| 1) Demand Perfectly Elastic with | | | |
|------------------------------------|-----------|-----------|---|
| a) Increase in Supply | Unchanged | Increases |  |
| b) Decrease in Supply | Unchanged | Falls |  |
| 2) Demand Perfectly Inelastic with | | | |
| a) Increase in Supply | Falls | Unchanged |  |
| b) Decrease in Supply | Increases | Unchanged |  |

| 3) Perfectly Elastic Supply with | | | |
|------------------------------------|-----------|-----------|---|
| a) Increase in Demand | Unchanged | Increases | <p>The graph shows a horizontal supply curve S_1 at price P_1. Two downward-sloping demand curves, D_1 and D_2, are shown, with D_2 to the right of D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to output q_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to output q_2. The price remains at P_1.</p> |
| b) Decrease in Demand | Unchanged | Falls | <p>The graph shows a horizontal supply curve S_1 at price P_1. Two downward-sloping demand curves, D_1 and D_2, are shown, with D_2 to the left of D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to output q_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to output q_2. The price remains at P_1.</p> |
| 4) Perfectly Inelastic Supply with | | | |
| a) Increase in Demand | Increases | Unchanged | <p>The graph shows a vertical supply curve S_1 at output q_1. Two downward-sloping demand curves, D_1 and D_2, are shown, with D_2 above D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to price P_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to price P_2. The output remains at q_1.</p> |
| b) Decrease in Demand | Falls | Unchanged | <p>The graph shows a vertical supply curve S_1 at output q_1. Two downward-sloping demand curves, D_1 and D_2, are shown, with D_2 below D_1. The initial equilibrium E_1 is at the intersection of S_1 and D_1, corresponding to price P_1. The new equilibrium E_2 is at the intersection of S_1 and D_2, corresponding to price P_2. The output remains at q_1.</p> |

When both demand and supply changes simultaneously but in opposite direction

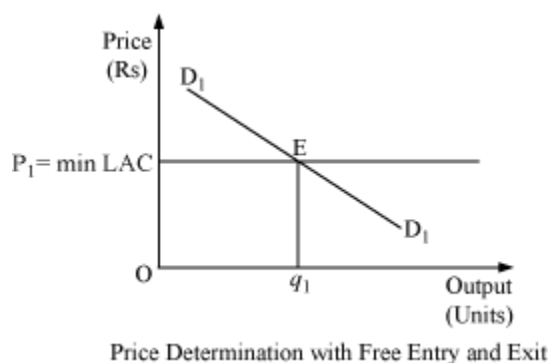
| Cases | Equilibrium Price | Equilibrium Quantity | Figure |
|--|-------------------|----------------------|---|
| a) Increase in Demand = Decrease in Supply | Increases | Unchanged | <p>The graph shows a coordinate system with Price (Rs) on the vertical axis and Quantity (units) on the horizontal axis. There are two downward-sloping demand curves, D_1 and D_2, where D_2 is to the right of D_1. There are two upward-sloping supply curves, S_1 and S_2, where S_2 is to the left of S_1. The initial equilibrium E_1 is at the intersection of D_1 and S_1, with price P_1 and quantity Q_1. The new equilibrium E_2 is at the intersection of D_2 and S_2, with price P_2 and quantity Q_1. Arrows indicate the shifts from D_1 to D_2 and from S_1 to S_2.</p> |
| b) Decrease in Demand = Increase in Supply | Unchanged | Increases | <p>The graph shows a coordinate system with Price (Rs) on the vertical axis and Quantity (units) on the horizontal axis. There are two downward-sloping demand curves, D_1 and D_2, where D_2 is to the left of D_1. There are two upward-sloping supply curves, S_1 and S_2, where S_2 is to the right of S_1. The initial equilibrium E_1 is at the intersection of D_1 and S_1, with price P_1 and quantity Q_1. The new equilibrium E_2 is at the intersection of D_2 and S_2, with price P_1 and quantity Q_2. Arrows indicate the shifts from D_1 to D_2 and from S_1 to S_2.</p> |
| c) Decrease in Demand < Increase in Supply | Decreases | Increases | <p>The graph shows a coordinate system with Price (Rs) on the vertical axis and Quantity (units) on the horizontal axis. There are two downward-sloping demand curves, D_1 and D_2, where D_2 is to the left of D_1. There are two upward-sloping supply curves, S_1 and S_2, where S_2 is to the right of S_1. The initial equilibrium E_1 is at the intersection of D_1 and S_1, with price P_1 and quantity Q_1. The new equilibrium E_2 is at the intersection of D_2 and S_2, with price P_2 and quantity Q_2. Arrows indicate the shifts from D_1 to D_2 and from S_1 to S_2.</p> |

| | | | |
|--|-----------|-----------|--|
| d) Decrease in Demand > Increase in Supply | Decreases | Decreases |  |
| e) Increase in Demand < Decrease in Supply | Increases | Decreases |  |
| f) Increase in Demand > Decrease in Supply | Increases | Increases |  |

❖ Market Equilibrium with free Entry and Exit

This is a long run concept. The implication of free entry and exit of firm is that at the equilibrium point, no individual firm will be earning super-normal or abnormal profits or losses. This implicitly means that all firms will operate at a point where the minimum of long run average cost curve is equal to the price. Thus, all the firms earn zero economic profit or normal profit.

Thus, at Equilibrium, Price = Min LAC



❖ Number of Firms

The equilibrium number of firms is determined as

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

where,

n denotes the number of firms at market equilibrium point

q_1 denotes the equilibrium quantity demanded

q_{1f} denotes the quantity of output supplied by each firm

❖ Shifts in Demand with Free entry and Exit

1) Increase in Demand

| Equilibrium | Price | Output | No. of firms of Equilibrium | Figure |
|-------------|------------------|--------|-----------------------------|--------|
| At E_1 | $P_1 = \min LAC$ | q_1 | n_1 | |
| At E_2 | $P_1 = \min LAC$ | q_2 | n_2 | |

Such that $q_2 > q_1$ and $n_2 > n_1$

2) Decrease in Demand

| Equilibrium | Price | Output | No. of firms at Equilibrium | Figure |
|-------------|--------------------------|--------|-----------------------------|--------|
| At E_1 | $P_1 = \min \text{ LAC}$ | q_1 | n_1 | |
| At E_2 | $P_1 = \min \text{ LAC}$ | q_2 | n_2 | |

Such that $q_2 > q_1$ and $n_2 > n_1$

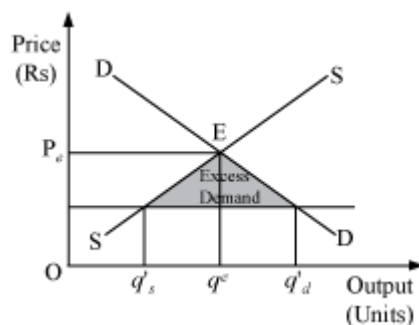
❖ The government intervention in the open market leads to:

Price Ceiling

Price Floor or Minimum Support Price

1) Price Ceiling

It is the legislated or government imposed maximum level of price that can be charged for a product or service. Usually government fixes this maximum price much below the equilibrium price, in order to preserve the welfare of poorer and vulnerable section of the society. For example, prices of wheat, rice, sugar and other goods of necessity.



The various undesired consequences of price ceiling are:

- Excess demand
- Inferior goods
- Black-marketing

d) Fixed quota and dissatisfied consumers.

2) Price Floor or Minimum Support Price

It implies the minimum price fixed by the government that should be charged by the seller. These minimum prices are fixed above the price at which the market clears. In India, minimum wages laws are fixed to safeguard the welfare of labourers, minimum support price to safeguard and protect the interests of farmers by ensuring minimum return. In the figure, Oq'_d output of wheat will be purchased in open market at price P^* and $q'_d q'_s$ output of wheat will be purchased by the government from the farmers at price P^* . The portion of wheat purchased by the government will kept as buffer stock.

