THEORY OF DEMAND AND SUPPLY

Enotes World

It Covers

- *Meaning of Demand*

- *Determinants of Demand*

- *Meaning of Demand Function*

- *Types of Demand Function (Linear and Non-linear Demand Function)*

- *Movement along a Demand Curve*

- *Shift in Demand Curve*

- *Meaning of Supply*

- *Determinants of Supply*

- *Supply Function and its Types*

- *Movement along a Supply Curve*

- *Shift in Supply Curve*

- *Market Equilibrium*

- *Effect of Changes in Demand and Supply on Market Equilibrium*

- *Consumer and Producer Surplus*

- *Measurement of Market Efficiency with Consumer and Producer Surplus*

- *Effect of Tax in Market Equilibrium*

- *Effect of Subsidy in Market Equilibrium*

- *Effect of Price Control Policies (Price Ceiling and Floor Price) in Market Equilibrium*

Meaning of Demand

- Commonly Desire and demand are the same and used synonymously. But in economics, it is the consumer's desire and ability to purchase a good or service. It means desire and ability, backed by a willingness to pay is known as demand for a commodity or service.

- Thus the demand for a commodity is its quantity which consumers are able and willing to purchase at each possible price during a given period of time, ceteris paribus.

- For the existence of demand, the following three major components must be considered;

  Desire + Ability to pay + Willingness to pay

- Therefore, demand is an economic term and it's the underlying force that drives economic growth and expansion. Without demand, no business would ever bother producing anything.

Determinants of Demand

Price of the Commodity

- There is an inverse relationship between the price of a commodity and demand for a commodity. In general, demand for a commodity is more at a lower price and less at a higher price and vice versa. But this relationship does not exist in Giffen goods. In the case of Giffen goods, there is a direct relationship between price and demand.

Price of the Related Goods

- The market demand for a commodity is also affected by the changes in the price of the related goods. The related goods may be a substitute or complementary goods.

- Substitute goods are those which are an alternative to one another in consumption such as tea and coffee, Pepsi and Coca-Cola, and so on. The demand for a good usually moves in the same direction to a change in the price of its substitutes.

- Complementary goods are those which are jointly used or consumed together to satisfy a want. The demand for good moves in the opposite direction to a change in the price of its complementary good.

Determinants of Demand…

Consumer's Income

Changes in the money of the consumer change the budget constraint facing the consumer, causing him to change his demand for goods. It is called income demand. How a change in the income will affect the demand for a good depends upon the type of the good.

Essential Consumer Goods

The essential goods are the basic necessities of life and are consumed by all the persons of society. Such as food grains, salt, cooking oil, clothing, housing, etc., the demand for such commodities increases with the increase in consumer's income but only up to a certain limit, although the total expenditure may increase with respect to the quality of goods consumed, other things remaining the same.

Inferior Goods

A commodity is deemed to be inferior if its demand decreases with the increases in the consumer's income beyond a certain level of income and vice-versa. For example, millet.

Normal Goods

Normal goods are those goods whose demand increases with the increase in the consumer's income, such as clothing, household furniture, automobiles, etc. It is to be noted that, demand for normal goods increases rapidly with the increase in the consumer's income but slows down with a further increase in the income.

Luxurious Goods

The luxurious goods are those goods that add to the prestige and pleasure of the consumer without enhancing the earnings. For example, jewellery, stone, expensive wine, an expensive watch, luxury cars, etc. The demand for such goods increases with the increase in the consumer's income.

Determinants of Demand…

Consumer's Tastes and Preferences

Any change in consumer's tastes causes demand to change. If there is a change in tastes in favour of a good, then it will lead to an increase in demand and any unfavourable change will lead to a decrease in demand.

Future Expectations of Buyers

The future expectation is also one of the factors which cause a change in demand. If it is expected by the consumer that the price of the commodity will rise in the future, he will start buying more units of the commodity in the present, at the existing price. Similarly, if he expects that price will fall in the future, he will buy less quantity of the commodity in the present, even if the price, in present is less than the price in past.

Advertisement Expenditure

Advertisement helps in stimulating demand for a product in four ways; by informing the prospective consumers about the availability of a product, by showing its superiority over the competitor's brand, by influencing the consumer's choice against the rival product, and by setting new fashion and changing tastes of the consumers. It is believed that increased advertisement expenditure helps to boost demand and vice versa.

Determinants of Demand…

Consumer-Credit Facility

The availability of credit to the consumer also determines the demand for a product. The credit extended by sellers, banks, friends, relatives, or from other sources induces a consumer to buy more than what would have not been possible in the absence of the credit. Thus, the consumers with more borrowing capacity consume more than the ones who borrow less.

The Population of the Country

The population of the country also determines the total domestic demand for a product of mass consumption. For a given level of per capita income, tastes and preferences, price, income, etc., the larger the size of the population the larger the demand for a product and vice-versa.

Distribution of National Income

Apart from the level of national income, the distribution pattern of the national income also determines the overall demand for a product. Such as, if the national income is unevenly distributed, then the market demand for the inferior goods will be more than the other category goods. Equal distribution of income results in a higher propensity to consume and thus increase in the market demand.

Demand Function: Meaning

- The demand is affected by several factors including the price of the commodity, income, price of related goods, taste, and preferences expected price, advertisement, etc. Thus we can sow such a relationship between the level of demand and its determinants in the form of an equation and such equation is called demand function.

- The demand function is an algebraic/mathematical expression that shows the functional relationship between the demand for a commodity and its various determinants affecting it.

- So, there are several factors that influence demand. The various factors have a positive or negative relationship with the demand for a commodity. Mathematically,

$$Qx = f(Px, Y, Py, Pop, Adv, TP, CT, PE……..)$$

Demand Function: Meaning

Where Q_X =quantity demanded of a commodity X; P_X = price of the commodity X; Y= income of the consumer,; P_y= price of related goods; Pop= population, Adv.= advertisement; TP = taste and preference; CT = customs and tradition; PE = price expectation, etc.

- For simplicity, the demand function is expressed in terms of the price of the commodity as it is the major determinant of demand. Thus, in short, demand function can be expressed as;

$$Q_X = f(P_X)$$

Where Q_X = Demand for commodity-X; P_X =Price of the commodity.

In the demand function, determinants work as independent variables whereas quantity demanded is the dependent variable. So, demand function explains the effect on quantity demand due to change in its determinants.
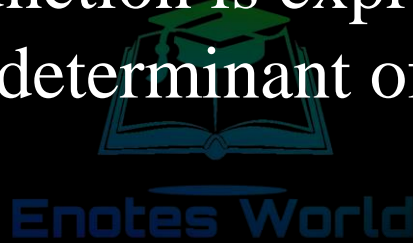
Demand Function: Types

Linear Demand Function

A demand function is said to be linear if the slope of the demand curve remains constant through the given demand curve. Mathematically linear demand function can be written as;

$Q_X = a - bP_X$

Where Q_X = Quantity demanded of X; P_X = Price of commodity X; 'a' = intercept of demand curve/autonomous demand; b = slope of the demand curve and which shows the relationship between Q_X and P_X and calculated as the ratio between the change in price to change in quantity demand.

Thus, $b = \Delta P / \Delta Q$

Where ΔP = Change in price ΔQ = Change in quantity demanded. In such case the demand curve is always a straight line.

Demand Function: Types

Linear Demand Function…
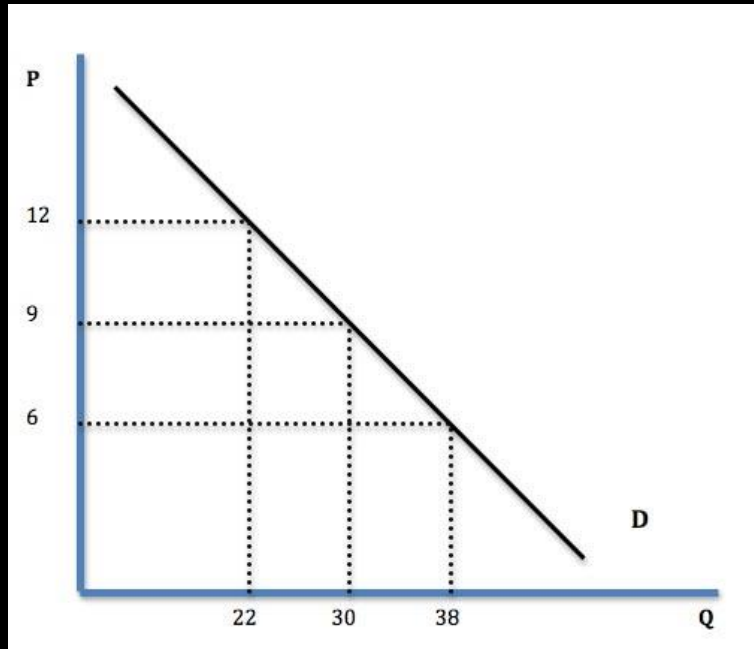
- ✓ The figure shows the linear demand curve as DD.
- ✓ The slope of the demand curve remains constant throughout its length.
- ✓ The constant rate of change in demand and price will give us a linear demand schedule, curve, and function.

Demand Function: Types

Non-Linear Demand Function

If the slope of the demand curve changes along the same demand curve this type of demand function is called the non-linear demand function. The non-linear demand function gives a demand curve instead of a demand line. Mathematically,
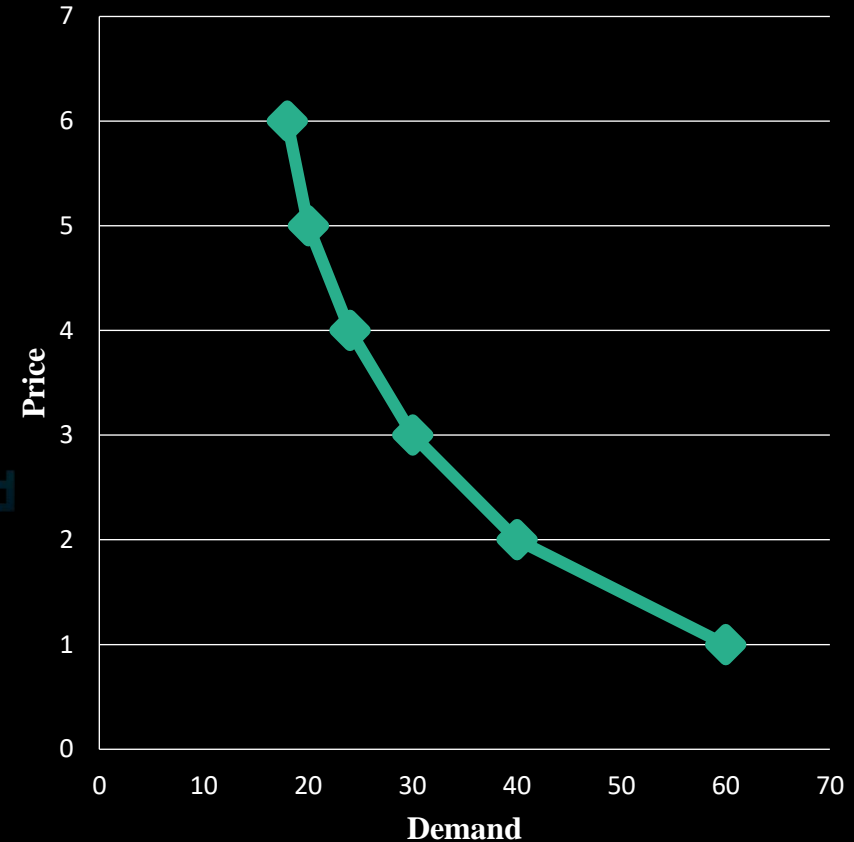
$$Q_X = aP_X^{-b} = \frac{a}{P_X^{\ b}}$$

Where Q_X = demand for commodity X; P_X = price of X; a = autonomous demand; b= slope of the demand curve

Demand Function: Types

Non-Linear Demand Function…

In the figure, the downward sloping curve is not a straight line or it is non-linear. It means the slope at different points of this demand curve is unequal.
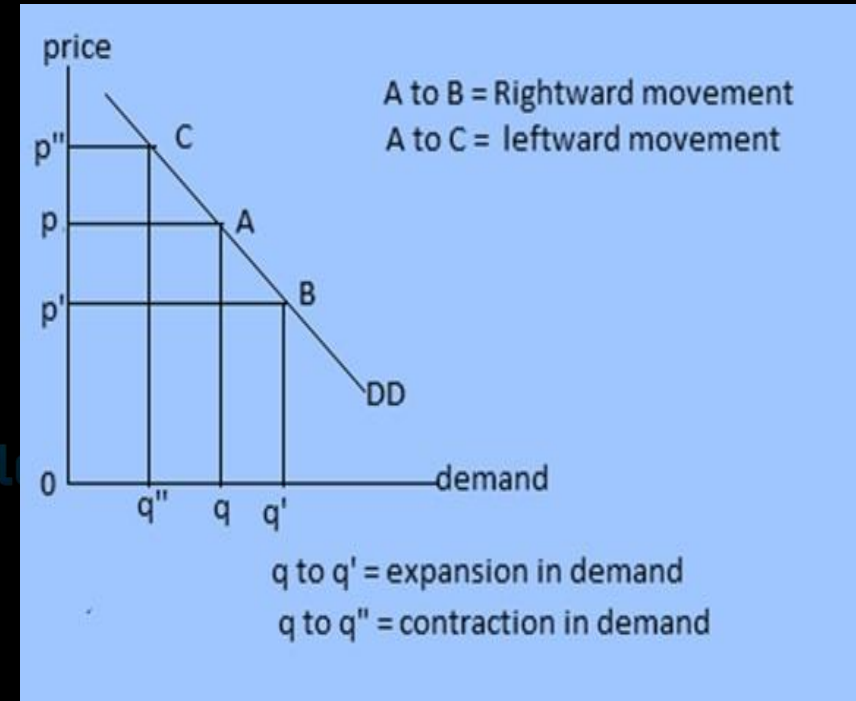
Movement: Change in Quantity Demanded

- Movement along the demand curve can be defined as a graphical representation of change in demand for a commodity due to change in its own price other things remaining constant.

- A movement along the demand curve is thus, caused by a change in the price of the good only. It is also called the change in quantity demanded of the commodity. Movement is always along the same demand curve, i.e., no new demand curve is drawn. Movement along a demand curve can bring about: (a) Expansion of demand, or (b) Contraction of demand

Movement: Change in Quantity Demanded…

- *Expansion or Extension of demand* refers to an increase in demand due to a fall in the price of the good. It is shown by movement from a point on the left side to another point on the right side of the same demand curve.

- *Contraction of demand* refers to a fall in demand due to rise in the price of the good. It is shown by movement from a point on the right side to another point on the left side of the same demand curve.

Movement: Change in Quantity Demanded

- Movement along the demand curve can be defined as a graphical representation of change in demand for a commodity due to change in its own price other things remaining constant.

- A movement along the demand curve is thus, caused by a change in the price of the good only. It is also called the change in quantity demanded of the commodity. Movement is always along the same demand curve, i.e., no new demand curve is drawn. Movement along a demand curve can bring about: (a) Expansion of demand, or (b) Contraction of demand

Shift: Change in Demand

- A shift of the demand curve is caused by changes in factors other than the price of the good. A change in non-price factors causes a shift in the demand curve. It is also called a change in demand. In a shift, a new demand curve is drawn. A shift of the demand curve can bring about:

1. Increase in demand/Rightward Shift in Demand Curve
2. Decrease in demand/Leftward Shift in Demand Curve

Shift: Change in Demand

Increase in Demand/Rightward Shift in Demand Curve

It refers to more demand at a given price. The causes of the increase in demand are:

- ✓ Increase in the income of the consumers in the case of normal goods.
- ✓ Decrease in the income of the consumers in case of inferior goods.
- ✓ Increase in the price of substitute goods.
- ✓ Fall in the price of complementary goods.
- ✓ Consumers' taste becoming stronger in favour of the good.

Shift: Change in Demand

Decrease in Demand/Leftward Shift in Demand Curve

It refers to less demand at the given price. It occurs due to unfavourable changes in factors other than the price of the good. The causes of decrease in demand are:

✓Fall in the income of the consumers in the case of normal goods.

✓Rise in the income of the consumers in case of inferior goods.

✓Fall in the price of substitute goods.

✓Rise in the price of complementary goods.

✓Consumers' taste becoming unfavourable towards the good.

Shift: Change in Demand

- ✓ The figure shows the rightward and leftward shifts in the demand curve.
- ✓ It is due to change in factors affecting price other than the price of the commodity.

A to C = rightward shift

A to B = leftward shift

let the factor causing shift be income (say)
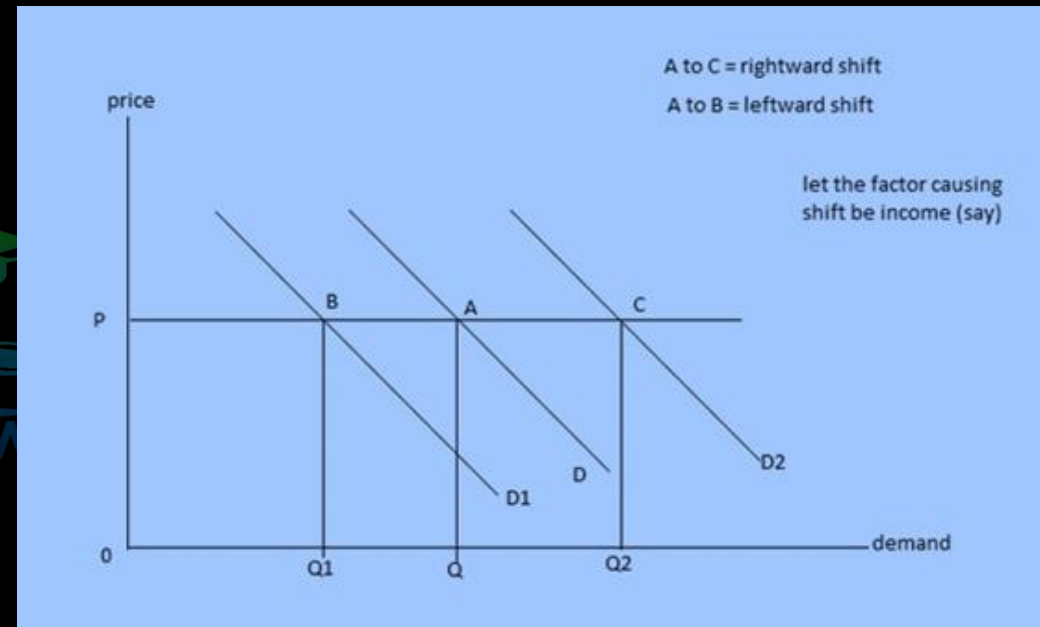
Shifting Factors

- A shift in demand may be an increase or decrease in demand based on the nature of the effect of change in determinants of demand other than the price of the product.

- If there is a favorable effect of change in determinants other than price, then the demand curve will shift towards the right from its original position (increase in demand).

- If there is an unfavorable effect of change in determinants of demand other than price, then the demand curve will shift to the left from its original position (decrease in demand).

Cause/Shift Factor	Rightward Shift	Leftward Shift
Income of Consumer	Increase in income	Decrease in income
Price of Substitutes	Increase in the price of substitute goods	The decrease in the price of substitute goods
Price of Complements	Fall in the price of complementary goods	The rise in the price of complementary goods
Taste and Preferences	Favourable or positive change in taste and preferences.	An unfavourable or negative change in taste and preferences.
Price Expectations	The expectation of a rise in price soon	The expectation of a fall in price soon
Population	Increase in population	Decrease in population
Advertisement	Positive effects of advertisement	Negative effects of advertisement
Credit Facilities	More availability of credit facilities	No or less availability of credit facilities

Difference between Movement along and Shift in Demand Curve or Change in Quantity Demand and Change in Demand

Movement along with a demand curve/Change in Quantity Demanded	The shift in the demand curve/Change in Demand
It is due to a change in the price of the commodity only.	It is due to change in all the determinants of demand other than price.
It is always shown along a similar demand curve. Thus there is no possibility of the formation of a new demand curve.	It is shown by drawing entirely a new demand curve.
The place of the demand curve remains the same.	The place of demand curve changes.
The effect on demand due to price change is reflected by expansion and contraction in demand.	The effect on demand due to change in other determinants except the price is reflected by an increase and decrease in demand.
Demand changes according to the law of demand.	Demand changes not according to the law of demand.
Price changes but all the other determinants remain constant.	Price remains constant but there is a change in all other determinants of demand.
Price-demand combinations move on different points of the same demand curve.	Price-demand combinations move on different points on different demand curves.

Meaning of Supply

- Supply is the quantity of a commodity offered for sale in the market. In an economic sense, supply is the quantity of a commodity offered for sale at a particular price during a given time period.

- Supply is always expressed in terms of price and time.

- The market supply is the quantity of a commodity that all its producers or sellers offer to sell at a given price, and per unit of time. Market supply like market demand is the sum of suppliers of a commodity made by all individual firms.

- According to Moyers, *"Supply is defined as a schedule of the quantity of goods that would be offered for sale at a possible price during any one period of time"*.

- In general, there is a positive or direct relationship between price and quantity supply. It means more goods are offered at higher prices and vice-versa.

Determinants of Supply

Price of the Commodity

At a higher price, the producer offers more quantity of the commodity for sale and at a lower price, less quantity of the commodity is offered for sale. There is a direct relationship between price and quantity supplied as shown by the law of supply.

Price of Related Good (Z)

The supply of a commodity depends upon the prices of its related goods, especially substitute goods. If the price of a commodity remains constant and the price of its substitute good Z increases, the producers would prefer to produce substitute good Z. As a result, the supply of commodity X will decrease and that of substitute good Z will increase. This will shift the supply curve of good X leftward. Thus, an increase in the price of substitute goods will lead to a decrease in the supply curve of the other good and vice-versa.

Determinants of Supply…

State of Technology

If there is a change in the technique of production leading to a fall in the cost of production, the supply of the commodity will increase. For instance, new photo stating technique, printing technique, computerized calculations, etc. Such advancement will lower the Marginal Cost (MC) at each level of output.

Prices of Inputs

A change in the cost of production, i.e., prices of factors of production also affects the supply of a commodity. If wages of labor or the price of raw materials increase, then the MC of production will rise. As a result, the supply of the good will fall because producers would prefer to produce some other commodities that can be produced at a lower cost.

Determinants of Supply…

Government Policy

The government's policy also affects the supply of a commodity. If heavy excise taxes are imposed on a commodity, it will discourage producers and as a result, its supply will decrease. If the government on the other hand provides subsidies in production, it will increase the supply in the market.

Number of Production Units

As the number of production units increases, the total supply of a product increases and vice versa.

Expectations of Producers

If producers expect a rise in the price of a product, they are likely to lower the quantity supplied and wait until the price goes up to sell the product at a higher price.

Determinants of Supply…

The Goal of the Firm

If the goal of the firm is to maximize the profit then the firm has to supply less quantity to sell it at higher prices and if the goal is to maximize the sales revenue or market size then the firm has to supply more quantity even at a lower price.

Expected Future Price

The current supply is negatively related to the future expected price.

Development of Infrastructure

Supply quantity is positively related to the development of infrastructure.

Random, Natural, and Other Factors

The supply of agricultural products is influenced by natural phenomena and weather conditions. Other factors affecting supply can be extended strikes, floods, political instability, etc.

Supply Function: Meaning

The supply function is the mathematical expression of the relationship between supply and factors that affect the willingness and ability of a supplier to offer goods for sale. It establishes the functional relationship between the quantity supply of a commodity(as a dependent variable) and determinants of supply(as independent variables). It can be expressed as

$$S_X = f(Px, Py, P_F, T, C, G, G_P \ldots \ldots)$$

Where S_X =quantity supplied of a commodity X; f= functional relationship; P_X = price of the commodity X, ; P_Y = price of related goods/other goods; P_F = price of factors of production; T= state of technology; C= cost of production; G= goals of the firm; G_P = government policY

Supply Function: Meaning…

For simplicity, the supply function is expressed in terms of the price of the commodity as it is the major determinant of supply. Thus, in short supply function can be expressed as;

$$S_X = f(P_X)$$

Where S_X= Supply of commodity-X; P_X= Price of the commodity.
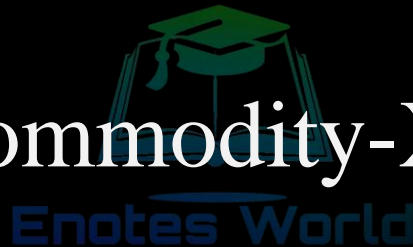
The supply function is based on the law of supply. It means that the quantity supply of a commodity is a function of the price of that commodity.

Supply Function: Types

Linear Supply Function

When the slope of supply remains constant throughout its length then such type of supply function is called linear supply function. It means a supply function is said to be linear if the slope remains constant throughout the given supply curve. It can be expressed as

$$S_X \text{ or } Q_X = a + b\, P_X$$

Where Q_X = Quantity supply of X; P_X = Price of commodity X; a= intercept of supply curve/autonomous supply or quantity supply at zero price; b= slope of the supply curve and which shows the relationship between Q_X and P_X and calculated as the ratio between the change in price to change in quantity supplied.
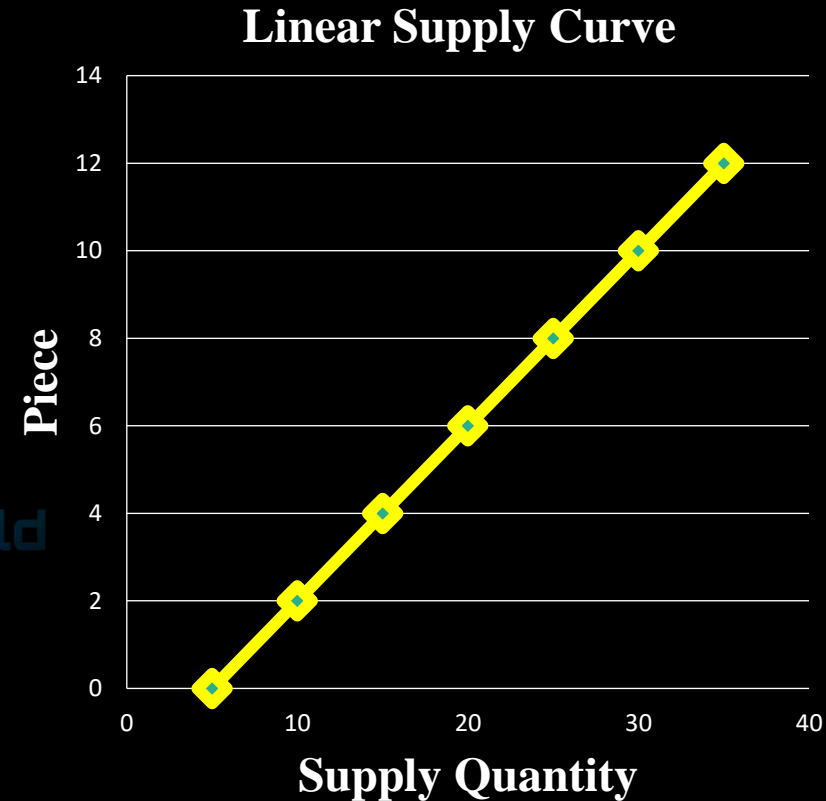
Supply Function: Types…

- ✓ The figure shows a linear supply function or the linear supply curve as SS.

- ✓ It shows the quantity supplied of 5 units at zero price. The quantity OS= a= 5 units are the autonomous supply.

- ✓ The slope of the supply curve remains constant throughout its length.

- ✓ Thus it is a linear supply function.

Linear Supply Curve

Supply Function: Types…

Non-Linear Supply Function

If the slope of the supply curve changes along the same supply curve this type of supply function is called non-linear supply function. The non-linear supply function gives a supply curve instead of a supply line. In a non-linear supply function, both the dependent and independent variables change t different rates. Mathematically,

$$Q_X = aP_X^b$$

Where Q_X = Quantity supply of X; P_X = Price of commodity X; a= intercept of supply curve/autonomous supply or quantity supply at zero price; b= slope of the supply curve
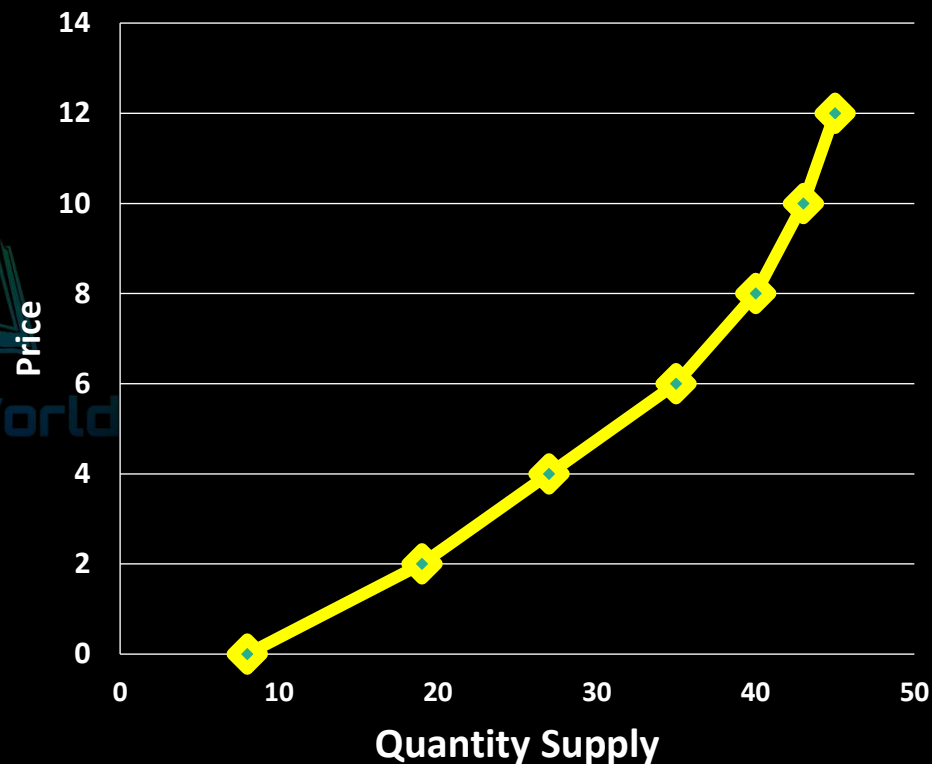
Supply Function: Types…

✓ In the figure, the upward sloping curve is not a straight line or it is non-linear.

✓ It means the slope of the given supply curve on its different points is different.

Non-Linear Supply Curve

Change in Quantity Supplied (Movement)

Movement along the supply curve is caused by changes in the price of the good, other things remaining constant. It is also called a change in the quantity supplied of the commodity. In a movement, no new supply curve is drawn. Movement along a supply curve can bring about:

1.   *Expansion or extension of supply, or*

2.   *Contraction of supply.*

Expansion or extension of supply refers to an increase in supply due to a rise in the price of the good.

Contraction of supply refers to a fall in supply due to a fall in the price of the good.

Change in Quantity Supplied (Movement)…

Expansion in Supply: A to B

Contraction in Supply: A to C

Price

Quantity Supply
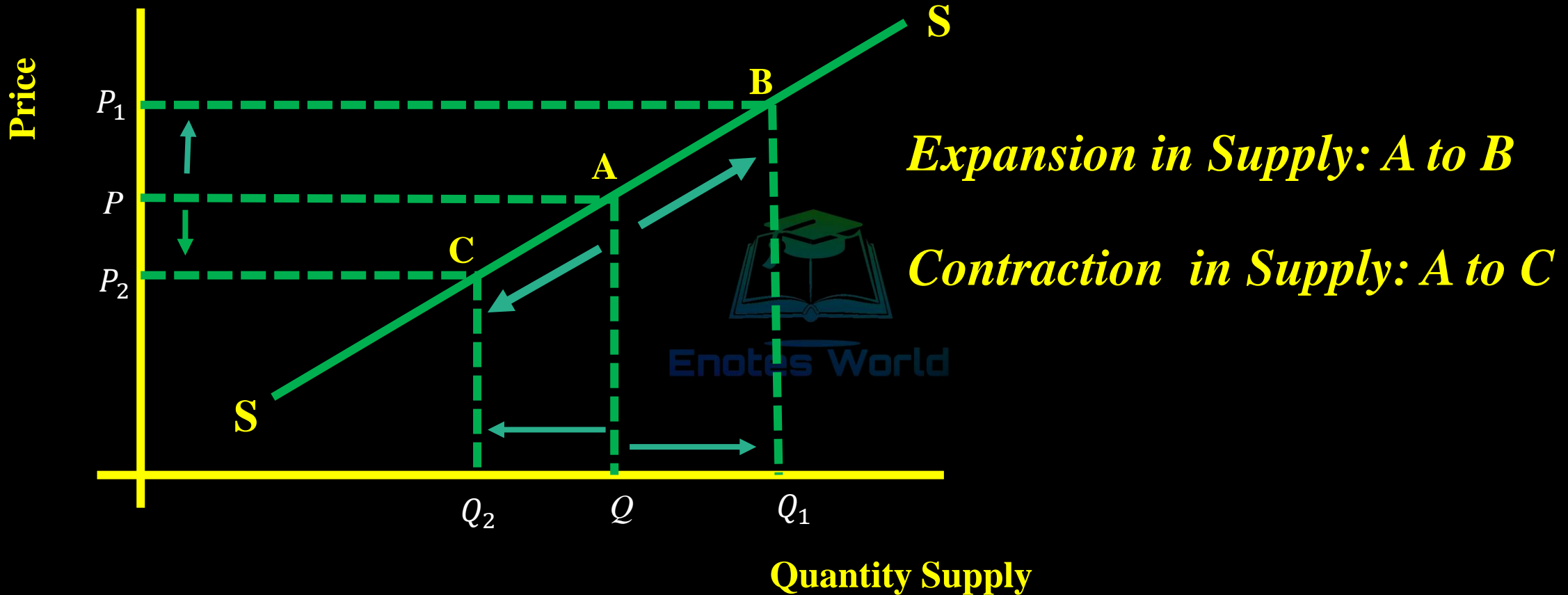
Change in Supply (Shift)

A change (or shift) in the supply curve is caused by changes in factors other than the price of the good. A change in many factors causes a shift in the supply curve. It is also called a change in supply. In a shift, a new supply curve is drawn. A shift of the supply curve can bring about:

1. *Increase in supply, or*
2. *Decrease in supply.*

Increase in Supply (i.e., Rightward shift in supply curve)

When the supply of a commodity rises due to favourable changes in factors other than the price of the commodity, it is called the increase in supply. Favourable changes imply:

✓ Improvement in the technique of production

✓ Fall in the price of related goods

✓ Fall in the prices of inputs

✓ Fall in excise tax

Change in Supply (Shift)…

Decrease in Supply (i.e., Leftward shift in supply curve)

When the supply of a commodity falls due to unfavourable changes in factors other than its price, it is called a decrease in supply. The causes of the decrease in supply are:

- ✓ *Obsolete technique of production*
- ✓ *Increase in the price of related goods*
- ✓ *Increase in the prices of inputs*
- ✓ *Rise in excise tax.*

An increase in supply means more quantity supplied at the same price. A decrease in supply means less quantity is supplied at the same price.

Change in Supply (Shift)…

- Thus, an increase in supply means that the entire supply curve shifts to the right, demonstrating a larger amount of supply at every price. In the figure, it is represented by a shift from point S to S2.

- The decrease in supply means that the entire supply curve shifts to the left, signifying a fewer amount of supply at every price. . In the figure, it is represented by a shift from point S to S1.
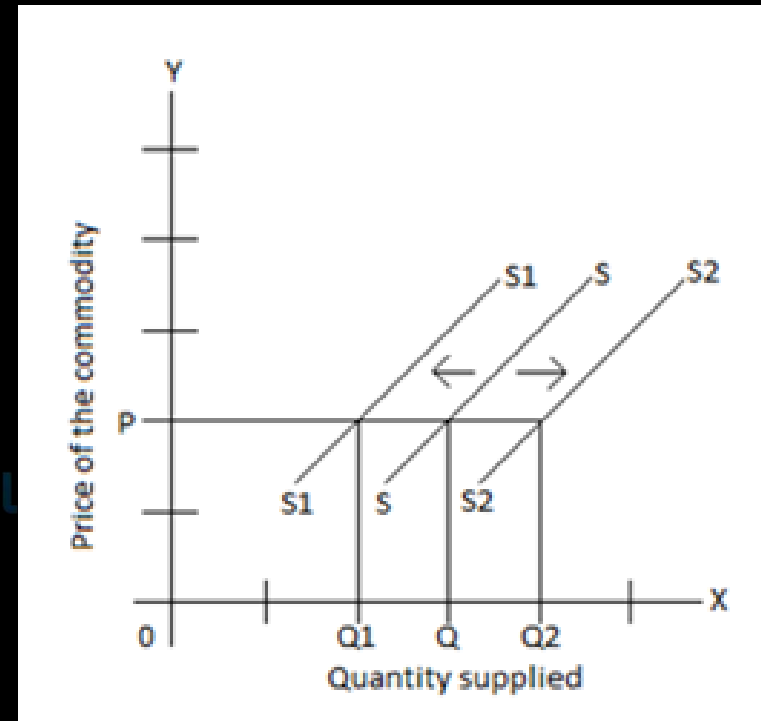
Shifting Factors

- Change or shift in supply may be an increase in supply or decrease in supply based on the nature of the effect of change in determinants of supply other than the price of the product.

- If there is a favourable or positive effect of change in determinants other than price then the supply curve will shift towards right from its original position (increase in supply).

- And if there is an unfavourable or negative effect of change in determinants of supply other than price then the entire supply curve will shift to the left from its original position (decrease in supply).

Shifting Factor	Rightward Shift	Leftward Shift
Technology	Improvement in production techniques	Use of less efficient technology
Price of Other Goods	The decrease in the price of other goods	The increase in the price of other goods
Price of Inputs	Fall in the price of inputs or factors of production	The rise in the price of inputs
Tax and Subsidies	The decrease in taxation and an increase in production subsidies	An increase in taxation and a decrease in production subsidies
Price Expectations of Producers	The expectation of a fall in price soon	The expectation of a rise in price soon
Number of Firms	Increase in the number of sellers	The decrease in the number of sellers.

Change in Quantity Supplied Versus Change in Supply

- The dissimilarity is similar to that between a change in quantity demanded and a change in demand.

- Change in quantity supplied refers to a movement along a given supply curve and this occurs because of a change in the own price.

- In contrast, a change in supply refers to a shift of an entire supply curve. For instance, a change in technology changes the supply.

- Essentially these distinguish the effect of own price on the supply of a good from the effects of other determinants.

Market Equilibrium and Efficiency
Part-II

Enotes World

Market Equilibrium: Meaning

- It indicates the state where the forces working in the opposite directions are in a state of balance.
- In the context of price determination, equilibrium refers to a situation in which the quantity demanded of a commodity equals the supplied quantity of the commodity
- It is a phenomenon of the competitive free market,
- If it occurs, there is no tendency to change unless there is a change in the forces affecting or influencing equilibrium.

Determining Equilibrium Price and Output-An Illustration

- In a perfectly competitive market, the price is determined through the interaction of market demand and market supply.

- The price where demand and supply are equal to each other is known as equilibrium price or a market-clearing price

- The process of measuring the equilibrium price in a perfectly competitive market is explained with the help of the following table.

Determining Equilibrium Price and Output-An Illustration

Price (Rs. Per Unit)	Quantity Demanded (in Unit)	Quantity Supplied (in Unit)	Market Position	Effect on Price
(1)	(2)	(3)	(4)	(5)
10	35	55	Excess Supply	Decrease
9	40	50	Excess Supply	Decrease
8	45	45	Equilibrium	Stable
7	50	40	Excess Demand	Increase
6	55	35	Excess Demand	Increase

Determining Equilibrium Price and Output-An Illustration

- If the price increases to OP_1, the demand decreases from PE to P_1A.
- On the other hand, supply will increase to P_1B as the supplier would supply more with a higher price to earn more profit
- Such an increase in quantity supply and a decrease in quantity demand will generate a surplus or excess supply of the product in the market.
- The excess supply at price OP_1 is denoted by AB in the figure.
- This AB amount of excess supply will force the sellers to reduce the price to attract, more consumers to dispose of their surplus stock.
- Ultimately this competition between sellers sooner or later will reduce the piece and the market will come back to the equilibrium position.
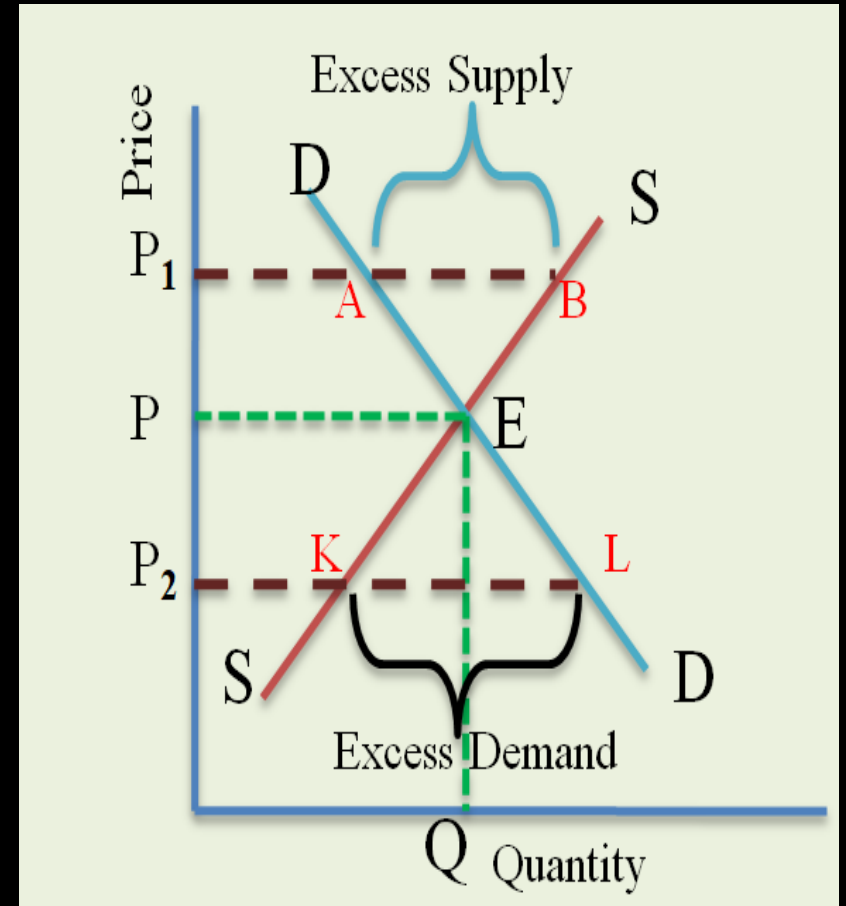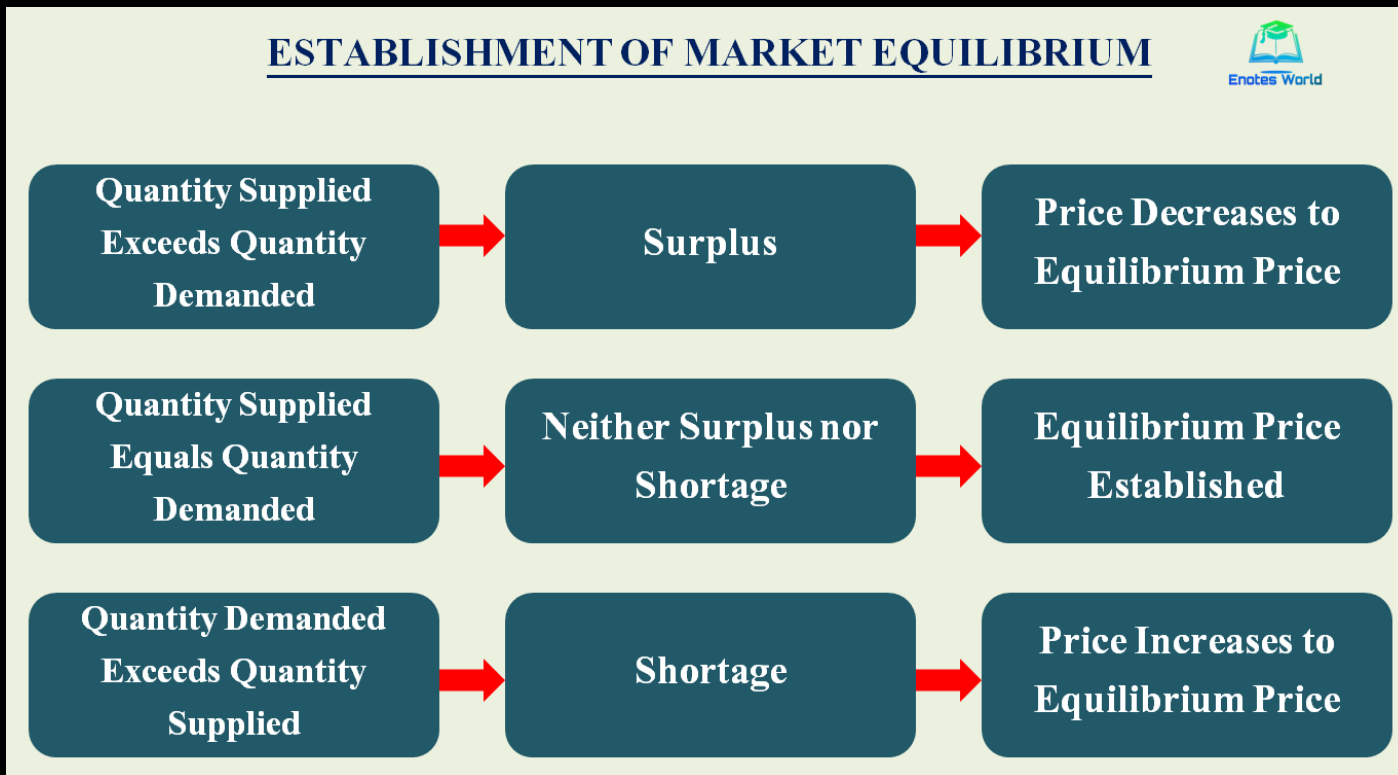
Determining Equilibrium Price and Output-An Illustration
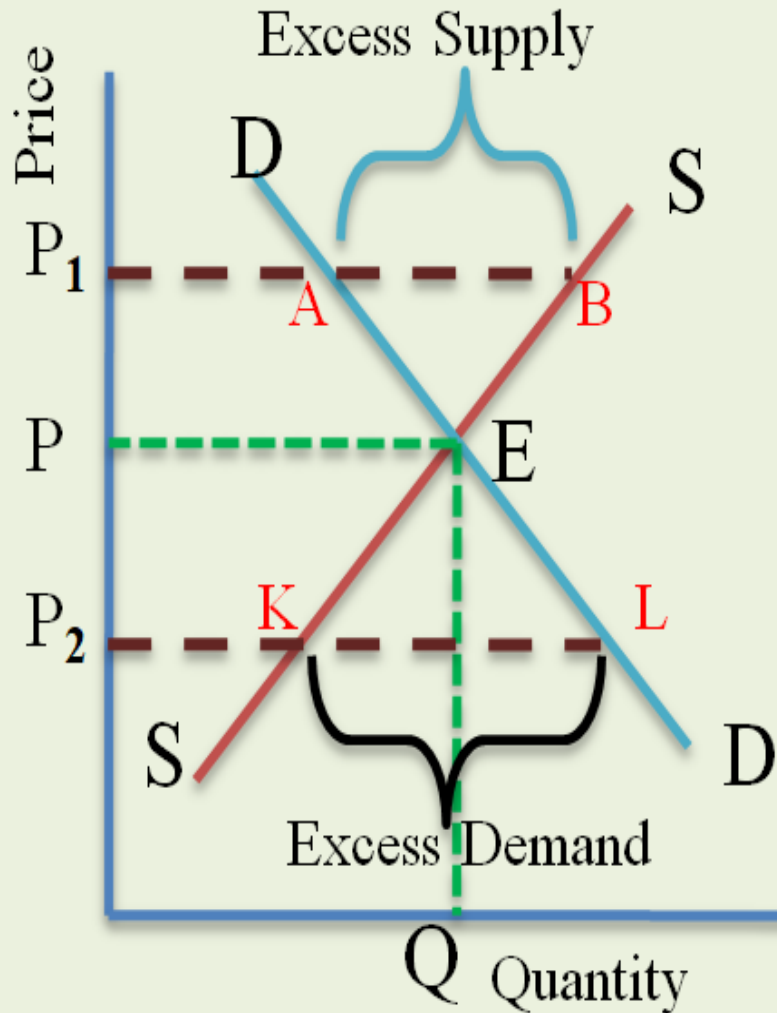
- On the other hand, when the price decreases to OP_2, the quantity demand will increase to P_2L.
- But the supply at such a price will decrease to P_2K.
- Here the demand is greater than quantity supply and such a situation is known as a shortage or excess demand in the market.
- This means consumers are not getting their desired units of the product and this will create competition between them to get the limited quantity of products.
- Ultimately this will increase the price until the market will reach equilibrium.
- *The adjustment between excess demand and excess supply ultimately invites the equilibrium price in the competitive free market. This denotes the situation of stable equilibrium.*

Determination of Market Equilibrium-An Illustration…

ESTABLISHMENT OF MARKET EQUILIBRIUM

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| Quantity Supplied Exceeds Quantity Demanded | → | Surplus | → | Price Decreases to Equilibrium Price |
| Quantity Supplied Equals Quantity Demanded | → | Neither Surplus nor Shortage | → | Equilibrium Price Established |
| Quantity Demanded Exceeds Quantity Supplied | → | Shortage | → | Price Increases to Equilibrium Price |

- From the discussion presented above, we can say that the price of a commodity is determined by the forces of demand and supply.

- It should be remembered that it is neither demand alone nor supply alone that determines the price of a product; both are necessary for determining the market price.

- In the summarized form, the following chart shows the equilibrium establishment process in a perfectly competitive market.

Change in Market Equilibrium/Effect of Changes in Demand and Supply on Market Equilibrium
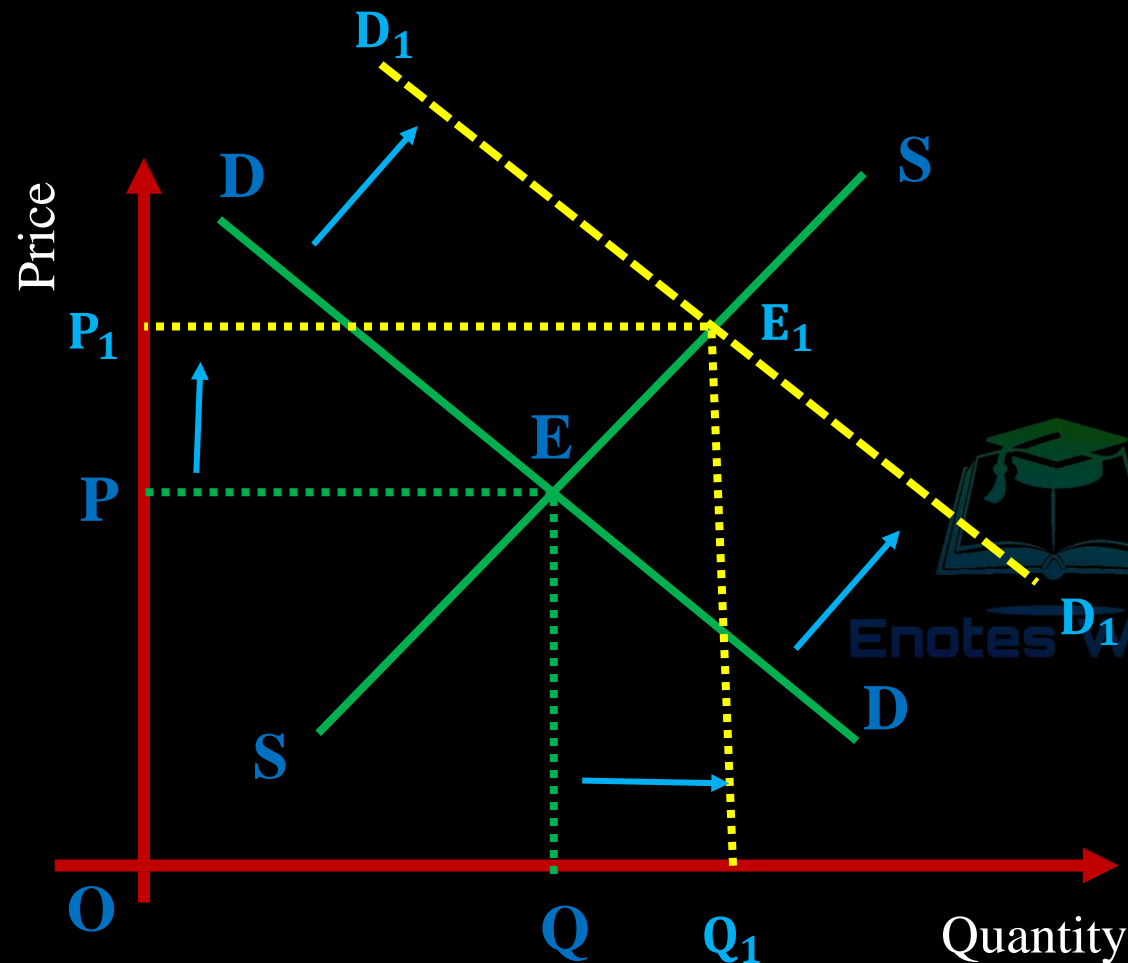
Market Equilibrium
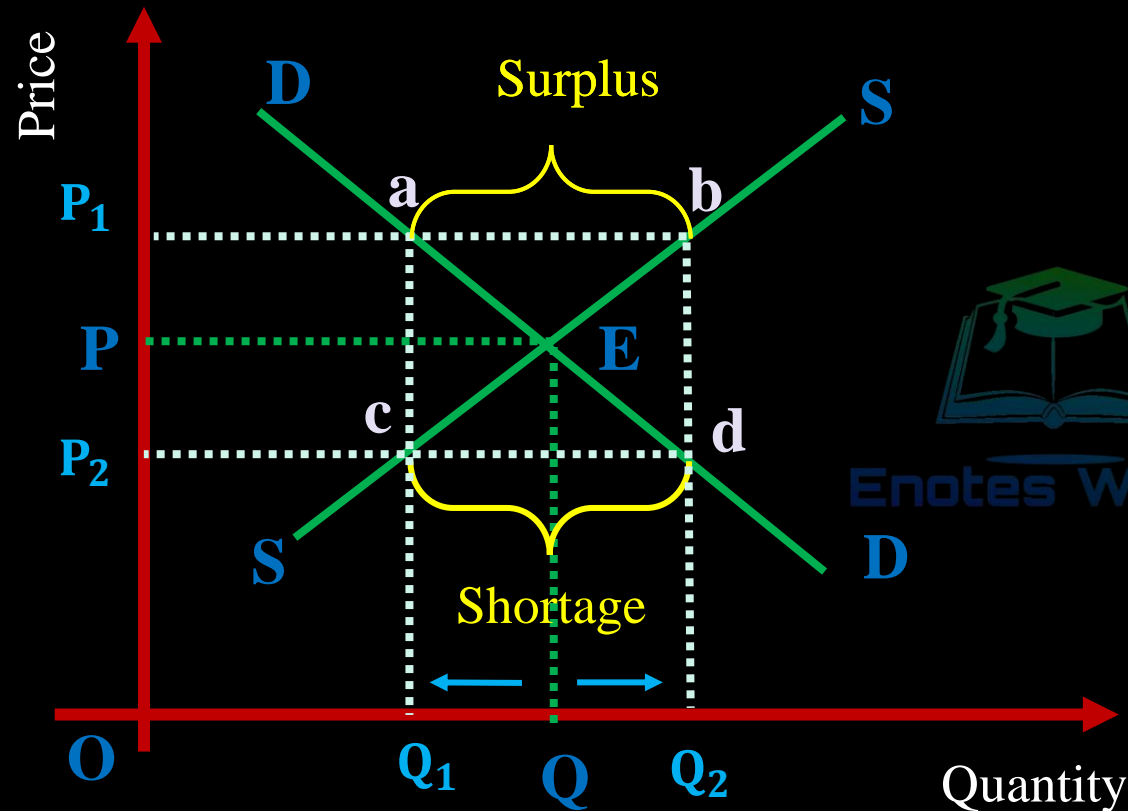
- It is a situation in which demanded quantities are exactly equal to supplied quantities and market is cleared.

- We determine equilibrium price, equilibrium quantity of demand and supply at the equilibrium point (Point E in the diagram)

Effect of Shift in Demand: Rightward Shift

- Equilibrium is changed from E to E_1

- At the new equilibrium, both the equilibrium price and quantities are increased

- P_1>P and Q_1> Q and it is due to *increase in demand* and *supply being constant* in the short-run

Effect of Shift in Demand: Leftward Shift
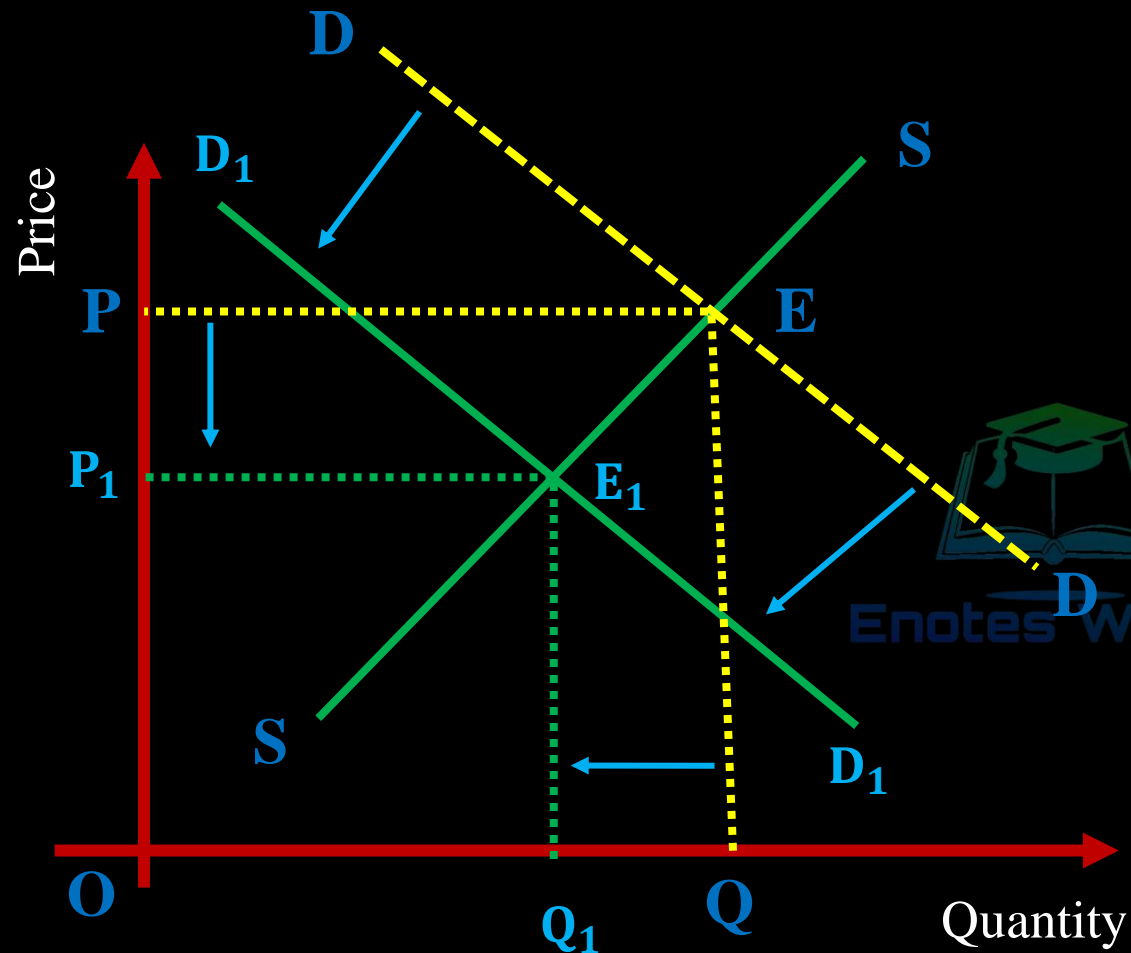
- Equilibrium is changed from E to E_1

- At the new equilibrium, both equilibrium price and quantities are decreased
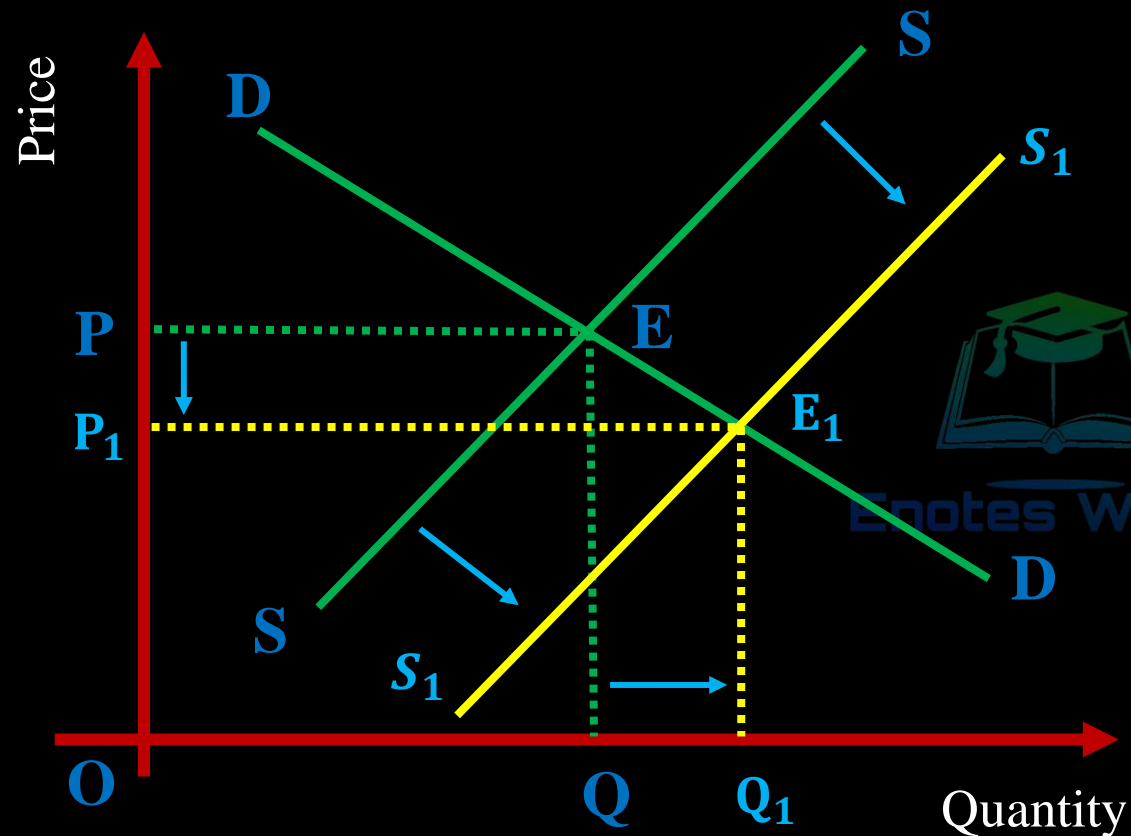
- P_1 <P and Q_1< Q and it is due to *decrease in demand* and *supply is constant* in the short-run

Effect of Shift in Supply: Rightward Shift

- Equilibrium is changed from E to E_1

- At the new equilibrium, the equilibrium price is decreased and the equilibrium quantity is increased

- P_1 <P and Q_1 > Q and it is due to *increase in supply* and *demand is constant* in the short-run

Effect of Shift in Supply: Leftward Shift

- Equilibrium is changed from E to E_1

- At the new equilibrium, the equilibrium price is increased and the equilibrium quantity is decreased

- P_1 >P and Q_1 < Q and it is due to *fall in supply* and *demand is constant* in the short-run

Effect of Shift in both Demand and Supply: Equally

- Equilibrium is changed from E to E_1

- At the new equilibrium, the equilibrium price is the same as before and the equilibrium quantity is increased

- Here $Q_1 > Q$ and it is due to *increase in both demand and supply is equal.*
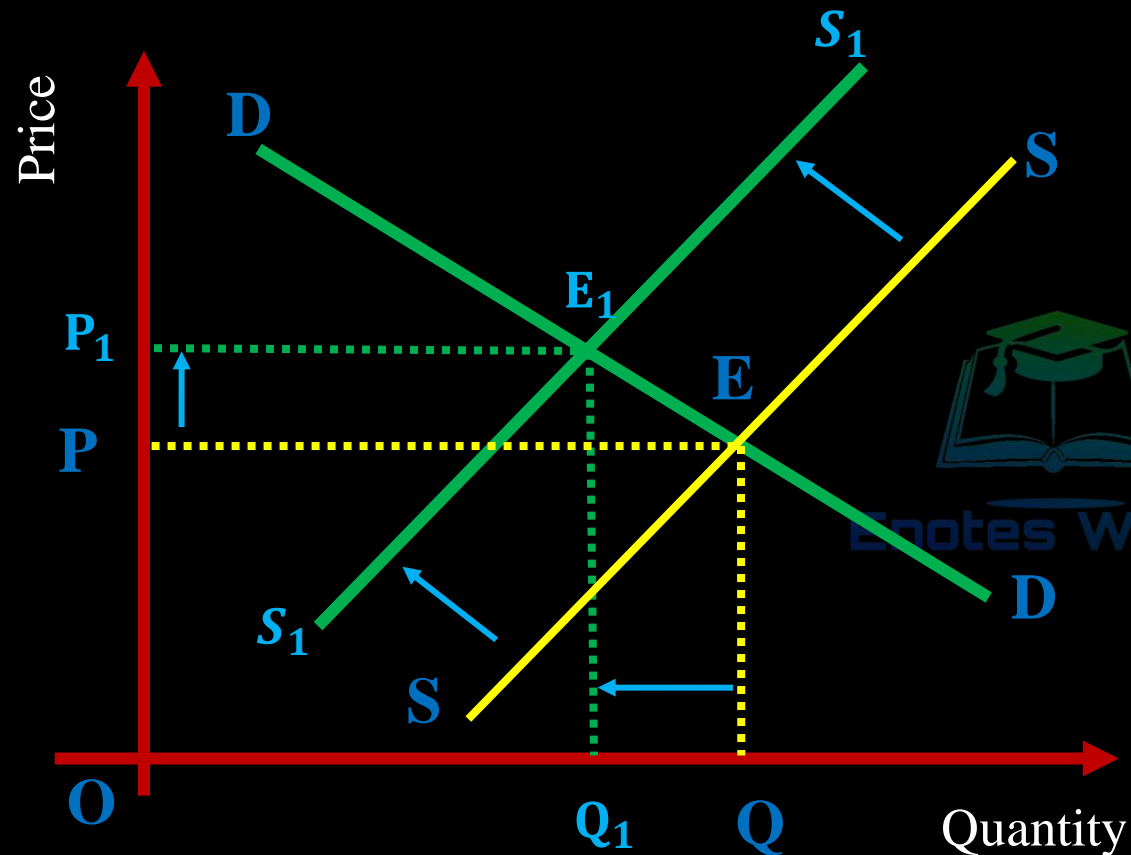
Effect of Shift in both Demand and Supply: D>S

- Equilibrium is changed from E to E_1

- At the new equilibrium, the equilibrium price and quantity both are increased.

- Here $P_1 > $ P and $Q_1 > $ Q and it is due to *increase in demand* is *relatively greater than that of supply*.
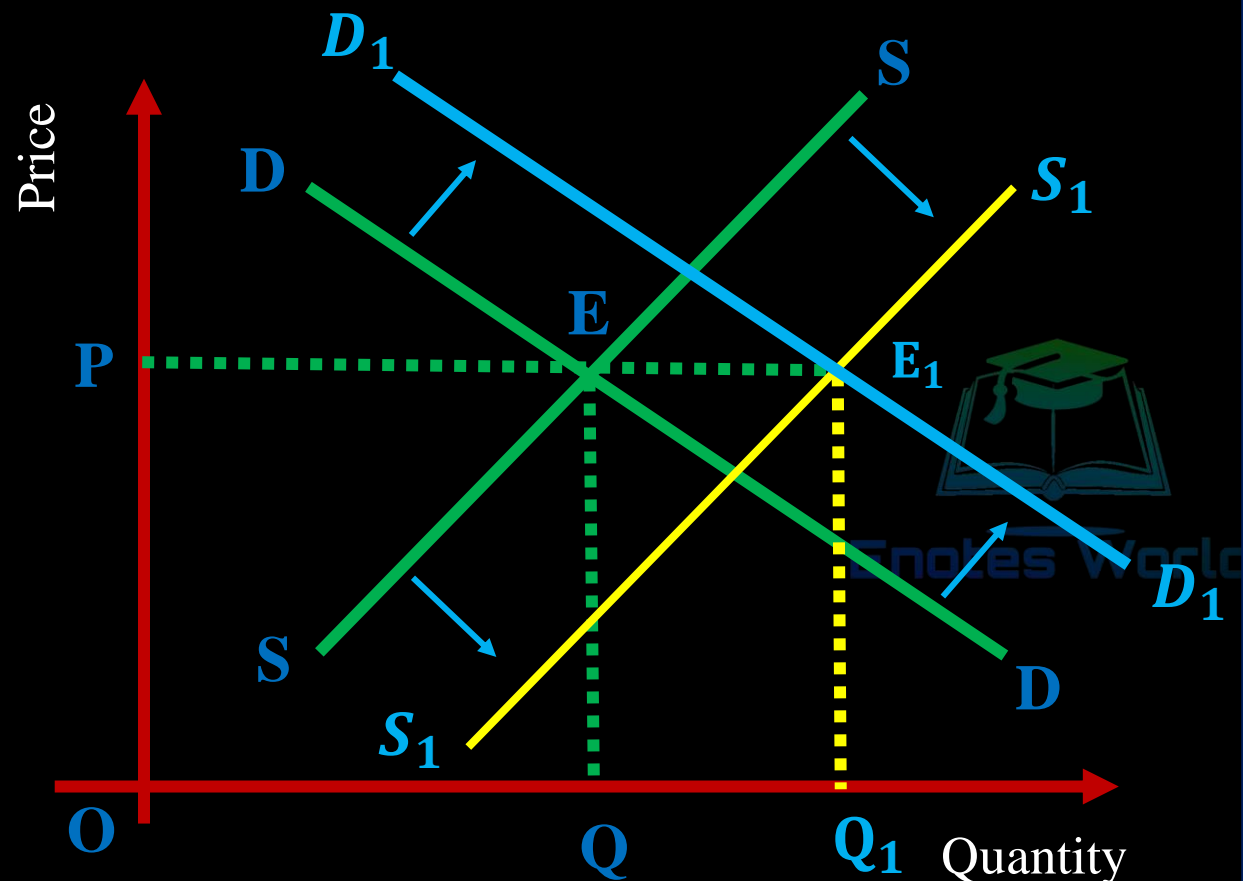
Effect of Shift in both Demand and Supply: S>D

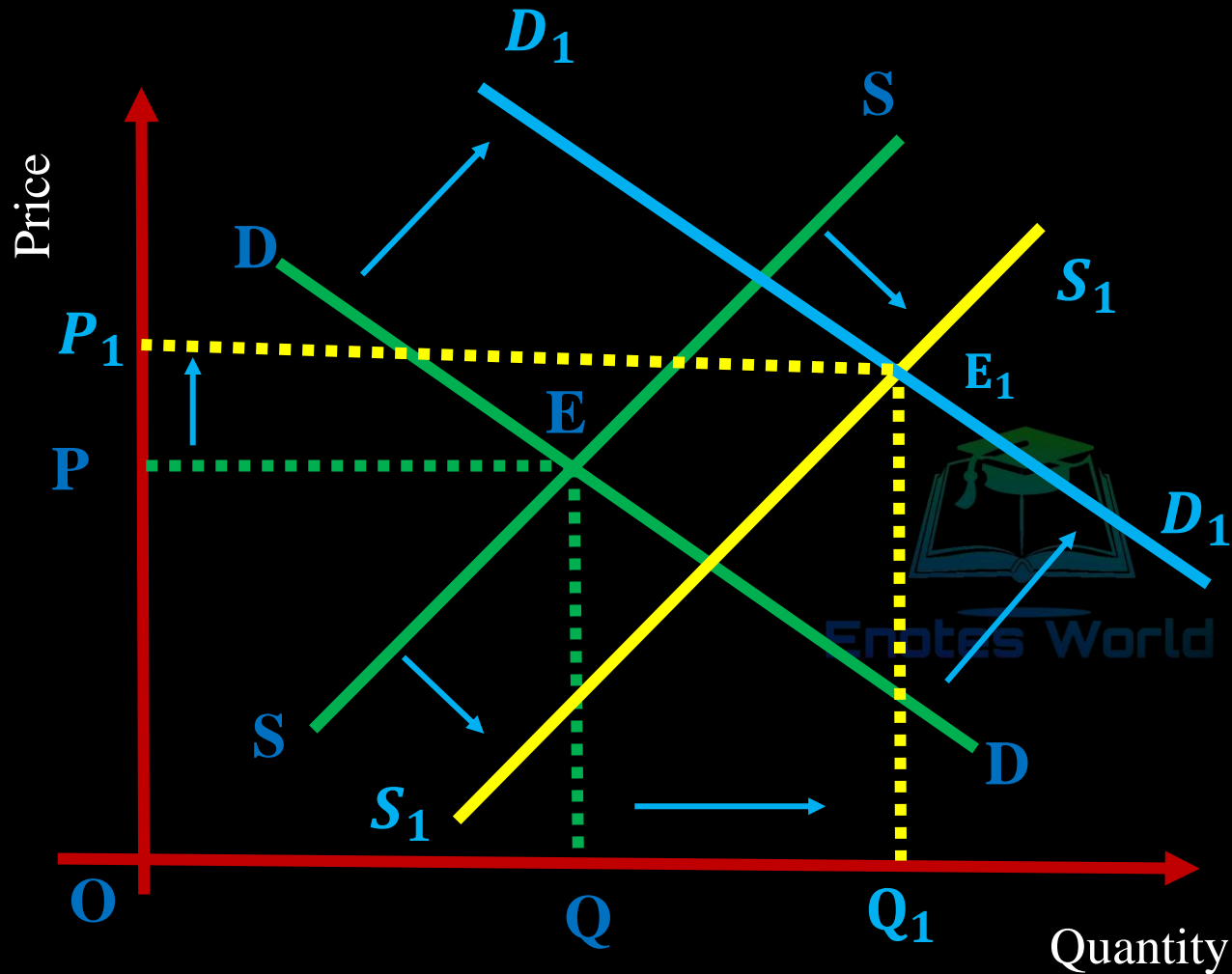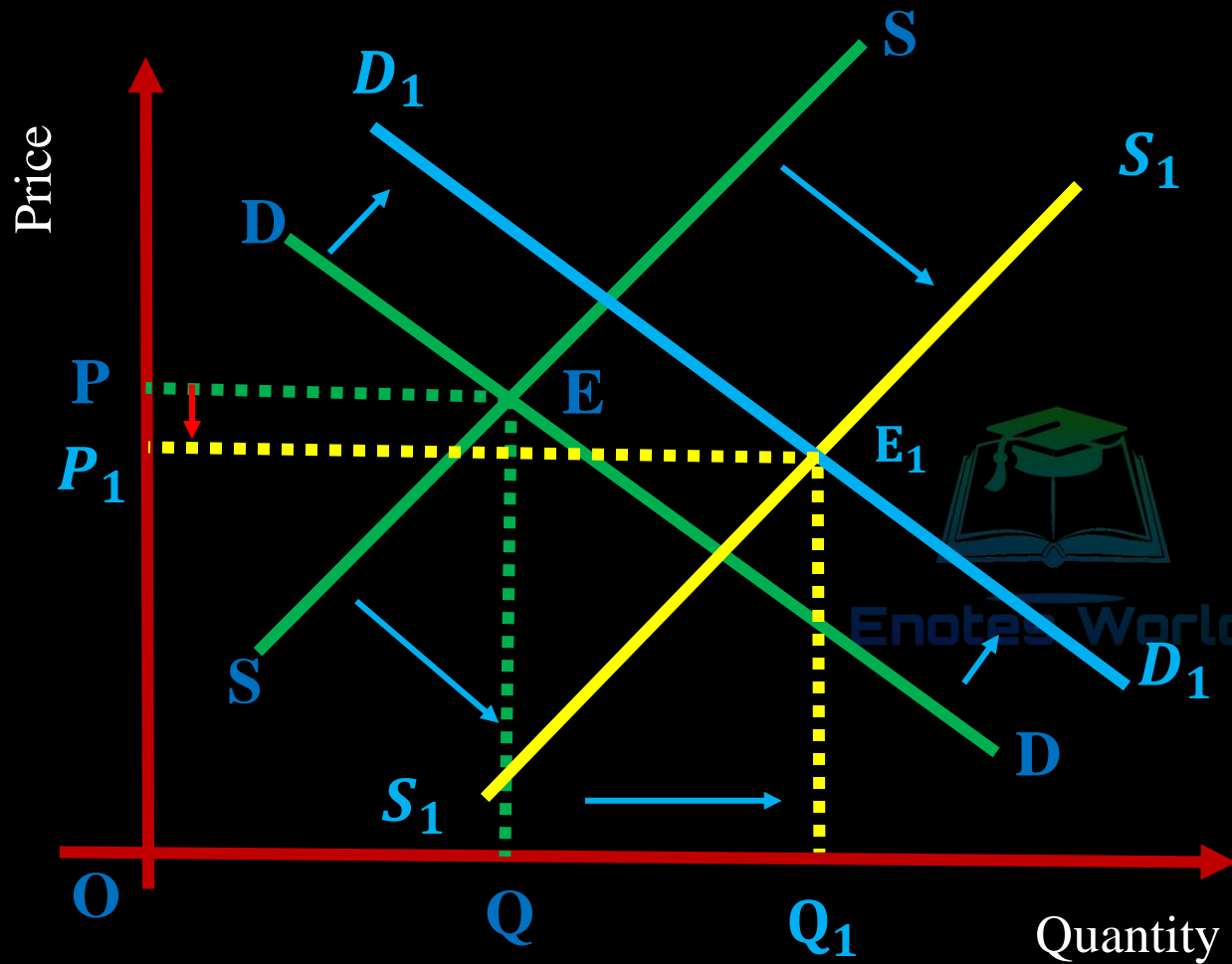- Equilibrium is changed from E to E_1

- At the new equilibrium, the equilibrium price is decreased and the equilibrium quantity is increased.

- Here $P_1 <$ P and $Q_1 >$ Q and it is due to *increase in supply* is *relatively greater than that of demand*.

Measurement of Market Efficiency by Consumer Surplus and Producer Surplus

The Issue

✓Whether the allocation of resources determined by free-market is desirable or not?

✓Market is efficient or inefficient?

✓This can be measured by using the concept of Consumer Surplus and Producer Surplus

MARKET EFFICIENCY

✓Efficiency is the state in which resource allocation is maximizing the surplus received by all the members of the society

✓The market is said to be efficient, if the maximum output of goods and services is being produced with a given level of resources and if no additional output is possible without increasing the number of resources/inputs.

✓It is also known as *Pareto Efficient* state and in which it is *impossible to make at least one better off without making someone worse off.*

✓This is only possible in the perfectly competitive market

MARKET EFFICIENCY: MEASUREMENT

✓ Market efficiency is measured with the help of *total surplus*.

✓ Total surplus is the sum of consumer's surplus and producer's surplus

✓ If the existing allocation of resources maximizes total surplus, then the market is said to have efficiency.

MARKET EFFICIENCY: MEASUREMENT…

✓ *Total Surplus=Consumer Surplus+ Producer Surplus*

Consumer Surplus (C.S)=Willingness to Pay-Market Price

Producer Surplus (P.S) = Market Price-Minimum Supply Price

So, Total Surplus (T.S)=C.S +P.S

=(*Willingness to Pay-Market Price* + *Market Price-Minimum Supply Price*)

T.S. =Willingness to Pay-Minimum Supply Price

OR T.S. = Value to Buyers-Cost to Sellers

Thus, to maximize market efficiency, the total surplus should be increased. The measurement of the efficiency with the help of CS and PS is explained in the following diagram

MARKET EFFICIENCY: MEASUREMENT…

Price

A

T

P

M

C

Q

Quantity

Consumer's Surplus

Q_S/MC

E:MB=MC

Producer's Surplus

Q_d/MB
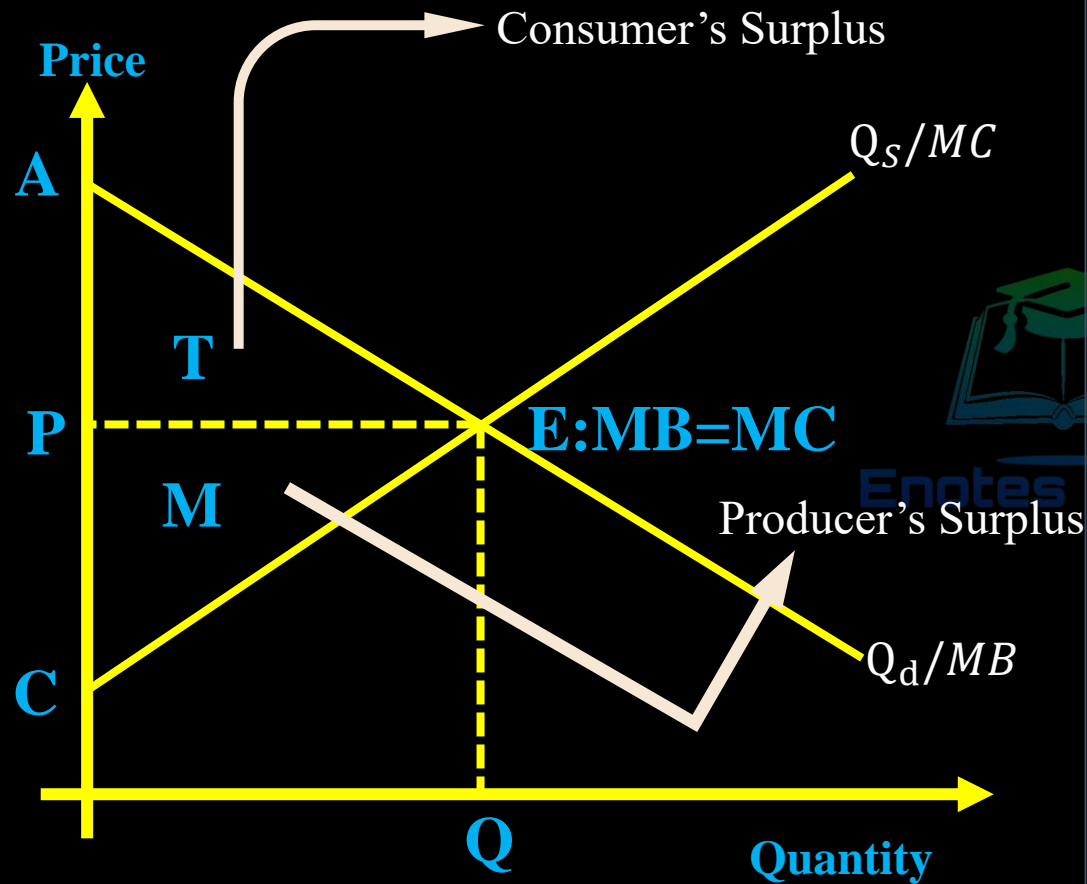
From the diagram:

✓ Consumer's Surplus (C.S)=ΔAPE

✓ Producer's Surplus (P.S)= ΔCEP

✓ Total Surplus (T.S)= C.S+P.S= ΔAPE+ ΔCEP= ΔACE

✓ Here ΔACE is the maximum total surplus obtained by consumer and producer.

✓ So, output OQ and price OP are determined in the free market and it represents market efficiency.

MARKET INEFFICIENCY: DEADWEIGHT LOSS

To show any price and output except OQ and OP, are inefficient assume price is increased above the equilibrium price.
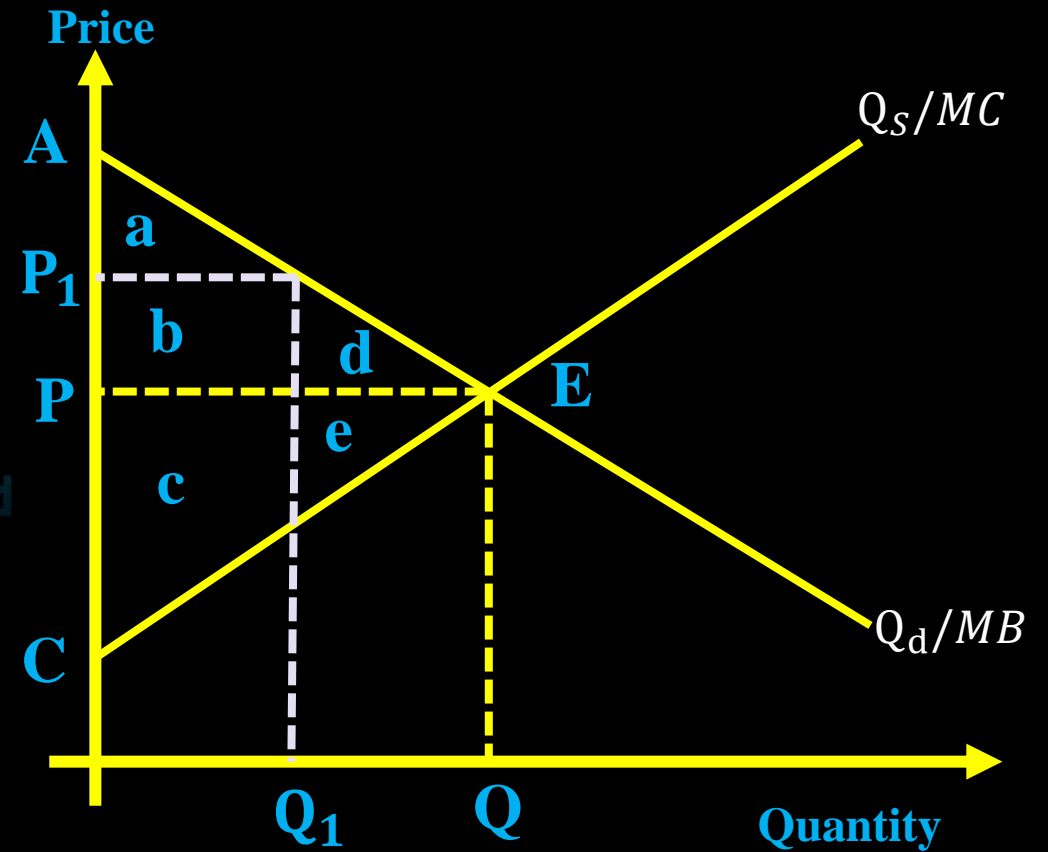
	At Competitive Equilibrium	At Increased Price
C.S	a + b + d	a
P.S	c + e	b + c
DWL	None	d + e

Effect of Tax in Market Equilibrium

Enotes World

Forms of Tax/Types of Tax

Direct Tax

Indirect Tax

- *Specific Tax/Per Unit Tax*
- *Ad-Valorem Tax*

Specific/Per Unit Tax: Effect in Market Equilibrium

It is the imposition of tax on physical commodities (per physical unit of production or per physical unit of import)

It is based on physical attributes like size, weight, capacity, etc. of the product

For example, specific tax is fixed as per length of cigarette or as per capacity of engine etc.

Specific/Per Unit Tax: Effect in Market Equilibrium…

This tax can be imposed on sellers and buyers both

When it is imposed on buyers, it causes a leftward shift in the demand curve by the amount of tax

When it is imposed on sellers then it causes the supply curve to shift upward to the left by the amount of tax

No matter to whom tax is imposed, it causes the price paid by the buyer to increase and the price received by sellers to fall

It also causes the equilibrium output to fall and the elasticity of demand and supply determines the burden of tax

Case-I: Specific Per Unit Tax on Seller of a Product
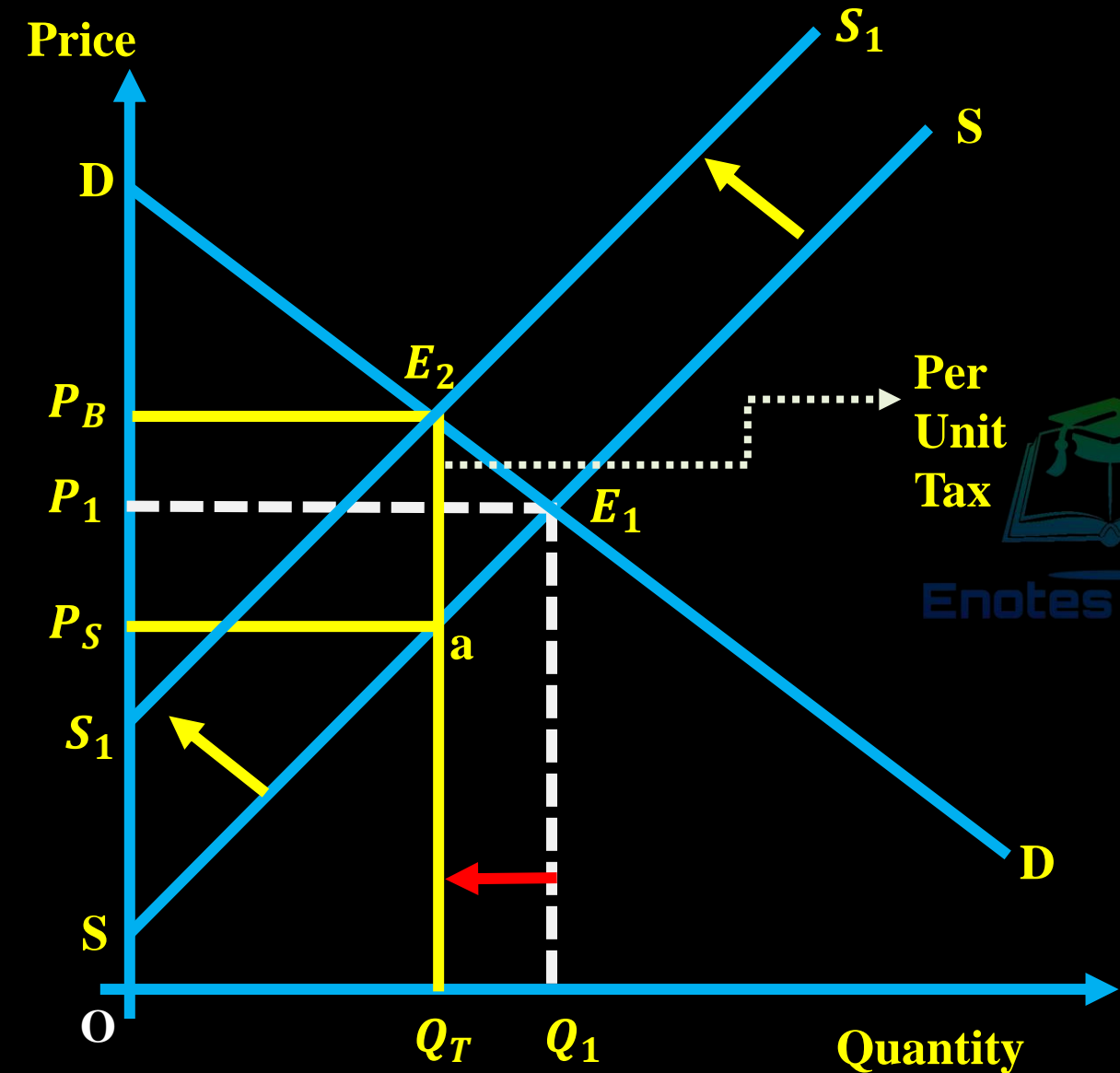
✓ E_1 is the initial equilibrium with the equilibrium price is OP_1 and the equilibrium quantity is OQ_1. OP_1 is the price paid by consumers and also the price received by the sellers.

✓ Suppose there is a per-unit tax or excise tax on the seller imposed by the government.

✓ This will increase the cost of the production and the supply curve or marginal cost curve of the seller shifts upward to the left as represented by S_1S_1.

✓ Here the demand curve does not change and as a result, a new equilibrium is formed by the interaction of DD and S_1S_1 at point E_2.

Case-I: Specific Per Unit Tax on Seller of a Product...

- ✓ At a new equilibrium position, the price payable by buyers is P_B and the price that sellers finally receive is P_S.
- ✓ The vertical distance between P_B and P_S is equal to E_2a and that is per unit tax imposed by the government.
- ✓ Thus after the implosion of tax, the new equilibrium price becomes OP_B but the price paid by consumers and received by sellers becomes different due to the imposition of taxation.
- ✓ Here consumers pay OP_B price per unit, and sellers will receive OP_S price per unit.
- ✓ Due to such, the market also shifts from E_1 to E_2 with an increase in price and a decrease in equilibrium quantity.

Case-I: Specific Per Unit Tax on Seller of a Product...

- Even though the tax is imposed on the sellers but the burden is shared by both sellers and buyers. Buyers have to bear the $P_B P_1$ amount of tax for every unit of purchase. Thus the tax makes buyers worse off. Sellers get a higher price from buyers (P_B) than they got previously (P_1), but the effective price after paying tax falls from P_1 before the tax price to P_S with the tax. Thus, they bear the $P_1 P_S$ part of the total tax and sellers also worse off.

- The new equilibrium price is P_B which is higher than the initial equilibrium price and the new equilibrium quantity is Q_2 which is less than the initial equilibrium quantity. This shows the reduction of the size of the market due to the tax imposition.

- Therefore, taxes discourage market activity. When a good is taxed, the quantity that is sold at a new equilibrium will be a lower quantity than the quantity sold before the imposition of tax.
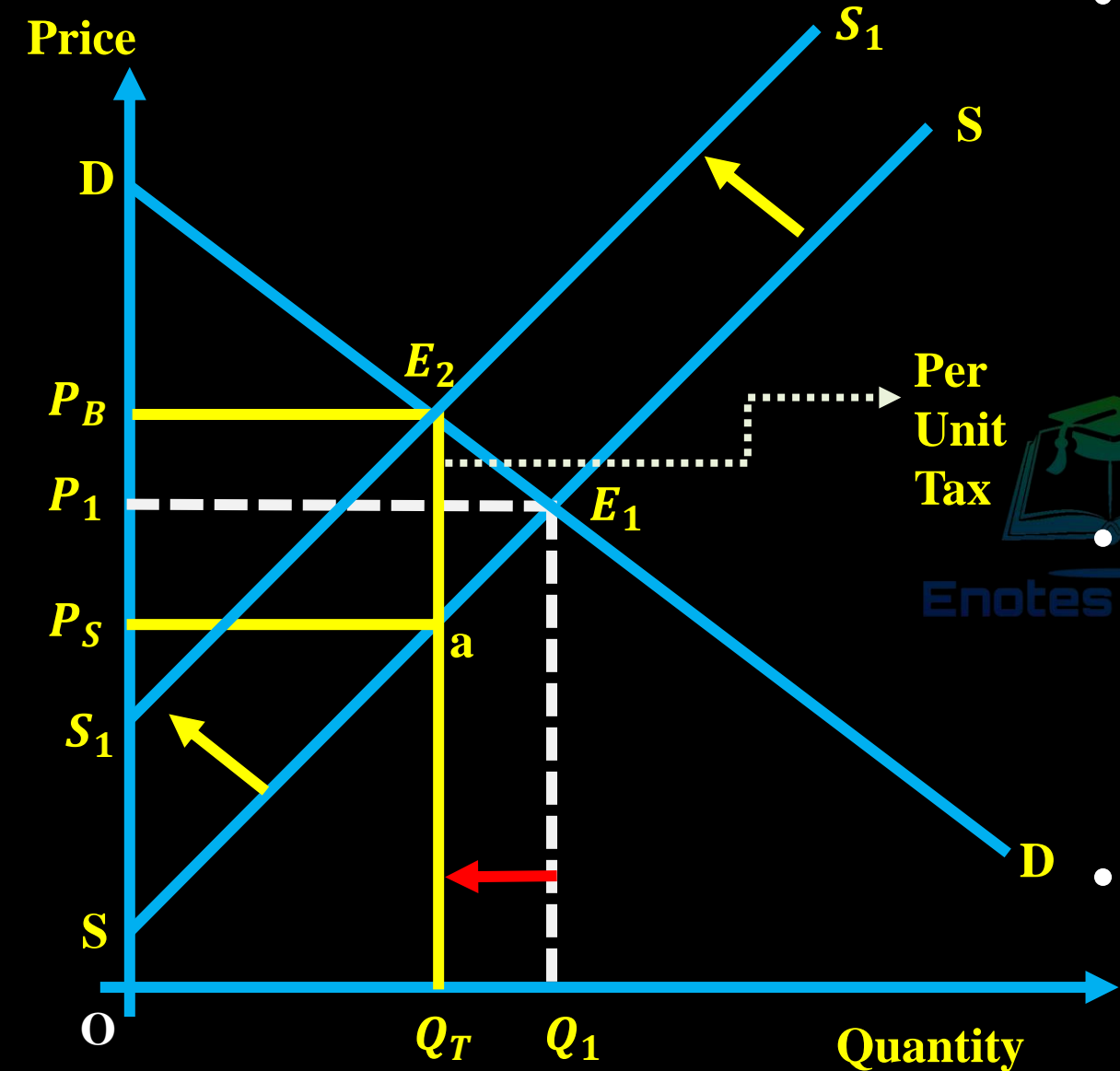
Case-II: Specific Per Unit Tax on Buyer of a Product

- ✓ E_1 is initial equilibrium with equilibrium price OP_1 and equilibrium quantity OQ_1.
- ✓ If the government imposes a tax on buyers, the tax shifts the demand curve downward from D to D_1 by the exact size of the tax.
- ✓ At the new equilibrium point E_2, the price that buyers pay is P_B and that sellers receive is P_S. The vertical gap between P_B and P_S is equal to E_2a which is a tax per unit imposed on the buyers.
- ✓ The new equilibrium price OP_S and quantity OQ_T both are lower than the equilibrium price and quantity before the imposition of tax P_1 and Q_1. Thus tax reduces the size of the market.

- ✓ Even the tax is imposed on buyers but the burden is shared by sellers too. Buyers must bear the P_1P_B part of the tax and sellers must bear the P_1P_S part of the total per unit tax.
- ✓ Here new equilibrium price seems lower than the equilibrium price before tax so we can say buyers are paying the lower market price (lower equilibrium price) than before.
- ✓ But actually, they are paying more than that. Their effective price is the new equilibrium price plus per unit tax that is equal to P_B in our diagram.
- ✓ So buyers are worse off due to tax. Similarly, sellers are also receiving a lower price than they received earlier. They are also worse off.
- ✓ Taxes discourage market activity. When a good is taxed, the quantity of the good traded in the market is smaller in the new equilibrium

Implication of Specific Tax

When the same amount of tax is imposed either on sellers or buyers the results are equivalent.

In both cases, tax load splits between the price that consumers or buyers pay and the price that sellers or producers receive.

In the new equilibrium, both buyers and sellers share a load of tax imposed.

Once the market attains equilibrium after imposition of tax by the government then both sellers and buyers share the burden of it not depending on how the tax is imposed or who has been taxed.

It shrinks the size of the market, creates deadweight loss, and worse off consumers as well as sellers

Implication of Specific Tax

Title	Before Tax Value	After-Tax Value
Tax	-	P_BP_S
Equilibrium Price	OP_1	-
Price Paid by Buyers	OP_1	OP_B
Price Received by Sellers	OP_1	OP_S
Equilibrium Quantity	OQ_1	OQ_T
Consumer Surplus	A+B+C	A (Loss by B+C)
Producers Surplus	D+E+F	F (Loss by D+E)
Tax Revenue	-	B+D
Total Surplus	A+B+C+D+E+F	A+F+B+D

Per Unit Tax/Excise Tax

Comparing the obtained information and values we get following conclusions;

- *Total surplus before tax is higher than that of after-tax,*
- *Deadweight loss=Lost surplus from the part of consumers as well as producers and it is C+E*
- *Therefore imposition of tax in the perfectly competitive free market results in the creation of deadweight loss and shrink in the market.*

Effect of Subsidy in Market Equilibrium

Enotes World

Meaning of Subsidy

- A subsidy is a financial help provided to the producers or the consumers of subsidized commodities.

- It may be in the form of a production subsidy and user subsidy.

- The subsidy is the opposite of the tax or it is also known as negative tax

✓ Under the *Production Subsidy* scheme, the producers are paid a lower price than the market price as they are encouraged by the government to supply more. ✓ It includes government assistance in the creation of the new firms, industries, in the prices of inputs supplied, for example, electricity, transportation, and materials, etc.	✓ Under the *Consumer or Buyer Subsidy* the consumers charge a lower price than the market price. ✓ The objective of consumption/consumer subsidy is to increase competition in the market. ✓ Subsidies on solar electricity, scholarship in education, free school dress, free distribution of agricultural input, etc. are examples.

Subsidy: Effect in Market Equilibrium

When the government provides a subsidy to sellers or buyers of a particular product, the new equilibrium quantity is increased with buyers paying less and sellers receiving more than the pre-subsidy situation.

Case-I: Provision of Subsidy to Sellers of a Product

- ✓ If a subsidy is provided to sellers of a particular product it will support or motivate them and the supply curve shifts to the right such that market equilibrium quantity is increased.
- ✓ The subsidy to the seller is also known as a production subsidy.
- ✓ If we observe the overall effect of production subsidy, it can be treated as a negative tax.

Case-I: Provision of Subsidy to Sellers of a Product...

- ✓ In the at point e_1, the equilibrium price that the buyers paying and sellers receiving is P_1 and the equilibrium quantity is Q_1.
- ✓ Suppose the government provides a subsidy to the sellers of the product then as a result supply curve shifts rightward from S to S_1.
- ✓ The new supply curve intersects with the consumer demand curve (that remains constant) at point e_2.
- ✓ At the new equilibrium point, the price that buyers pay is P_B and sellers receive is P_S. The vertical gap or distance between price sellers receives (P_S) and the price that buyers pay (P_B) is the subsidy per unit provided by the government.
- ✓ Here, after providing subsidy by the government, prices buyers pay and sellers receive are different and market shifts from point e_1 to e_2 and equilibrium quantity also increases from Q_1 to Q_S.
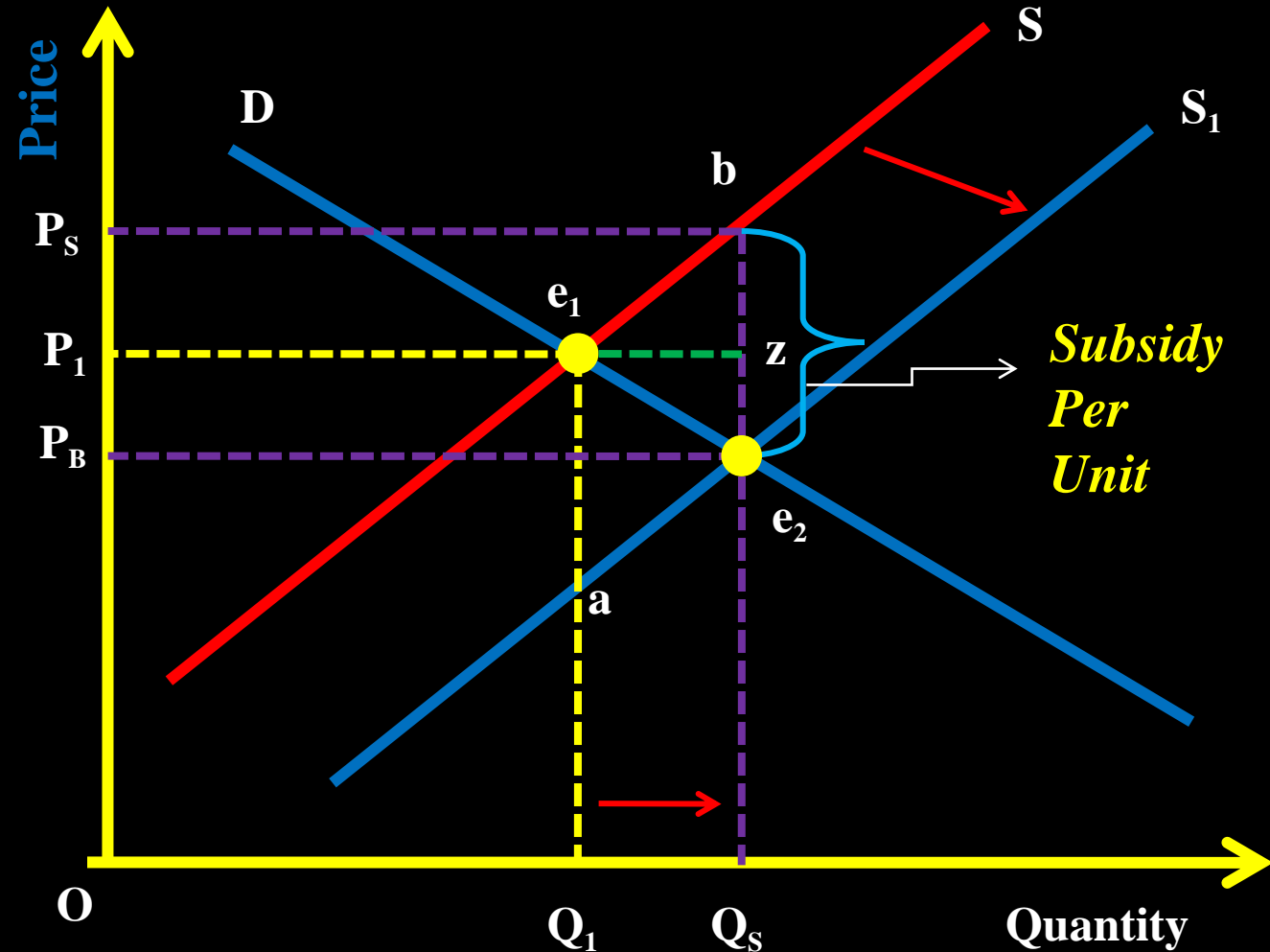
Case-I: Provision of Subsidy to Sellers of a Product…

- The new equilibrium price (P_B) less than the equilibrium price of the non-subsidies situation.

- Price receives by the seller is the summation of the new equilibrium price and amount of subsidy per unit ($PB+be_2$ or ae_1).

- Subsidy by the government has created the difference between the price that buyers pay and sellers receive by the amount of subsidy.

- After subsidy to the producers, consumers pay fewer prices than before. Thus they are benefited by ze_2. Thus the part of the subsidy goes to the consumers.

- The subsidy benefit to the sellers or producers is equal to bz.

- Therefore we can conclude that the proportion of benefits that goes to the producers and the buyers and its degree is based on the elasticities of demand and supply. With the lower elasticity, the higher gains from subsidy and vice versa.
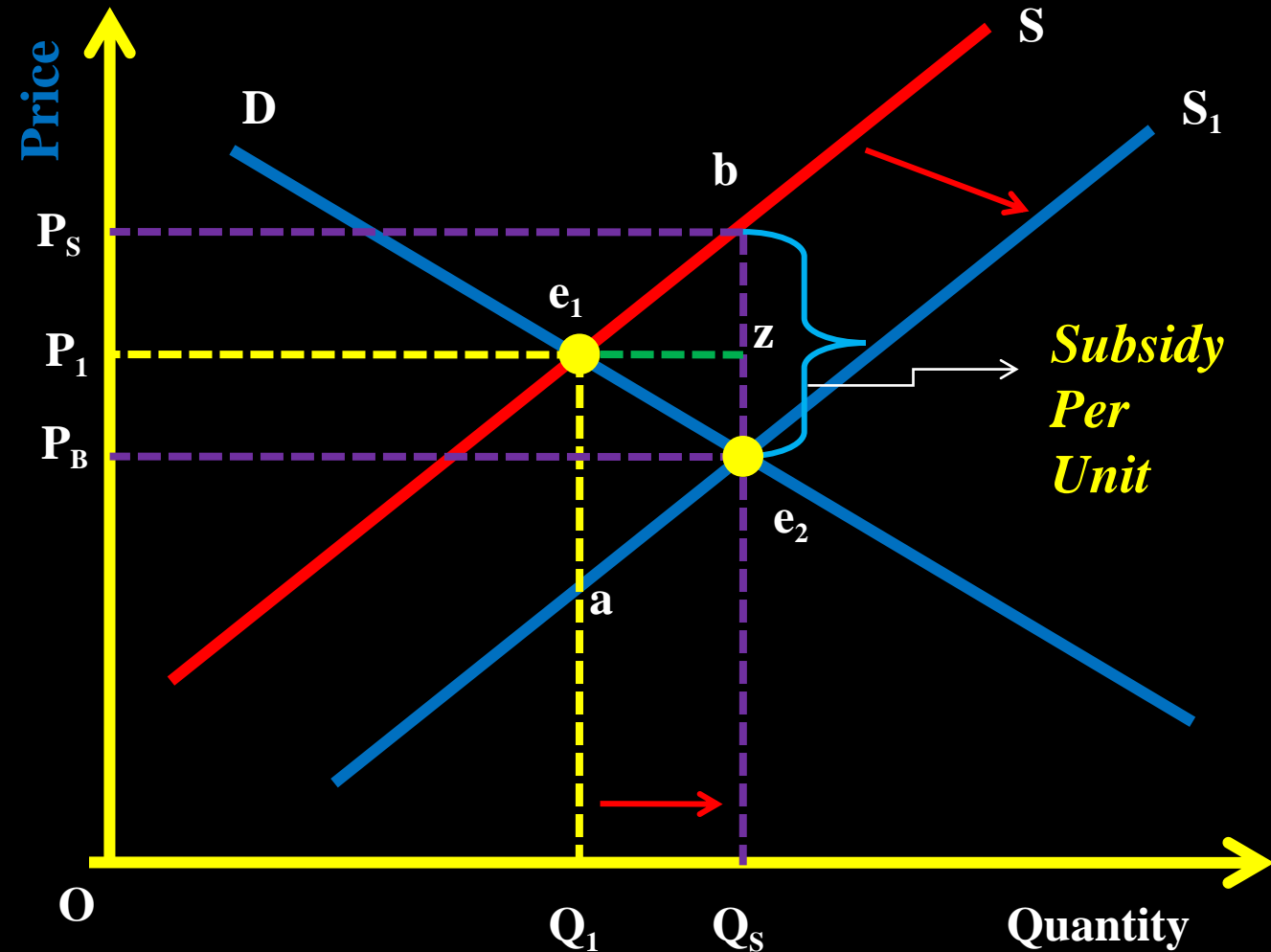
Case-II: Provision of Subsidy to Buyer of a Product
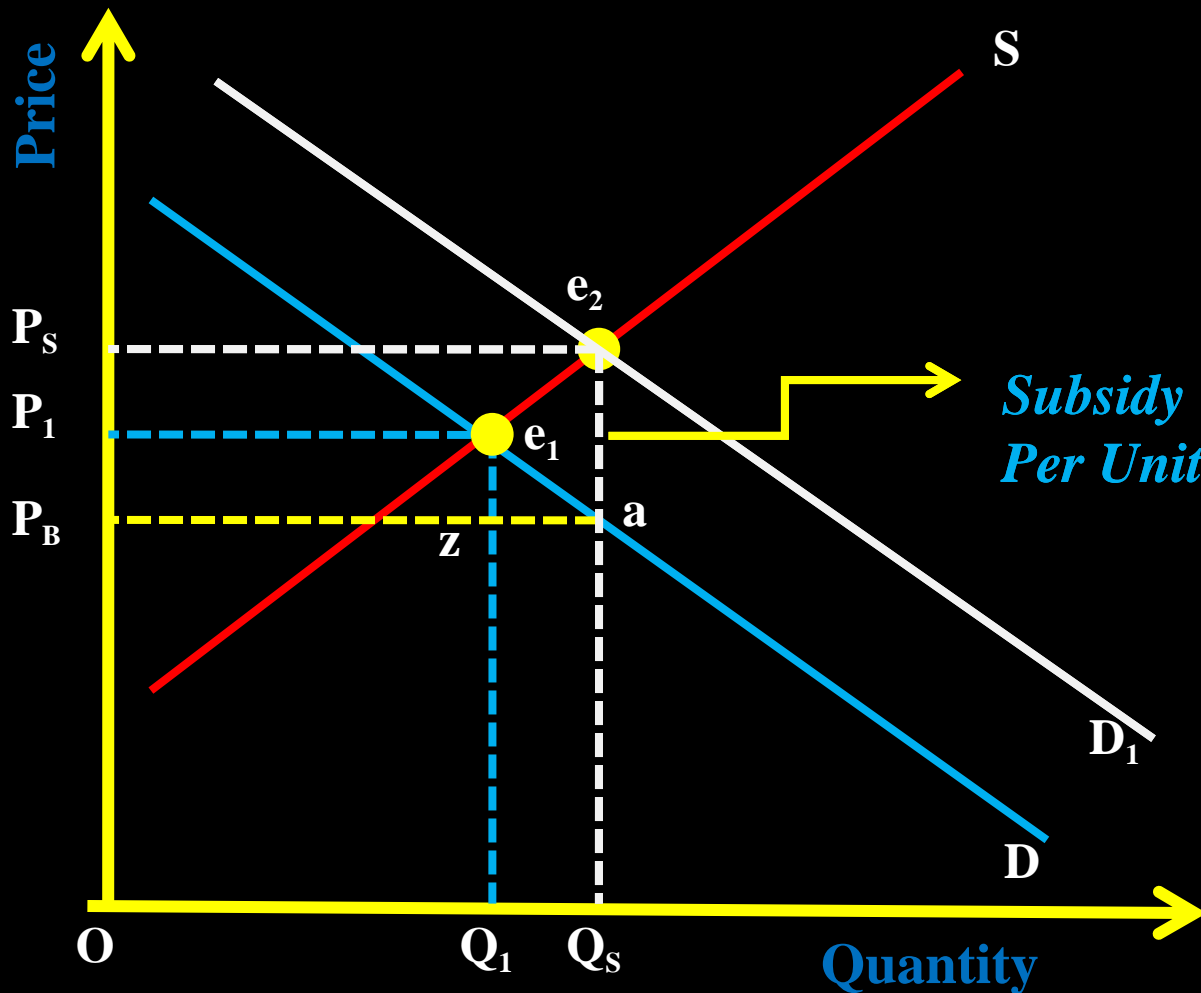
- If the subsidy is given to the buyers they can afford more than previous and the demand curve shifts towards the right. With this, the equilibrium quantity in the market will also increase.

- In the figure, e_1 is the pre-subsidy equilibrium with price OP_1 and quantity OQ_1. The price receives by sellers and pays by buyers is similar.

- Let us now suppose that a subsidy of e_2a has granted to the buyers of the product.

- If the government provides a subsidy to buyers, the demand curve shifts to the right as D_1 and equilibrium occurs at point e_2.

- At a new equilibrium point, the price that buyers pay is P_B and the price that sellers receive is P_S. The gap between price receives by sellers (P_S) and price pays by buyers (P_B) is subsidy per unit provided to buyers.

Case-I: Provision of Subsidy to Sellers of a Product…
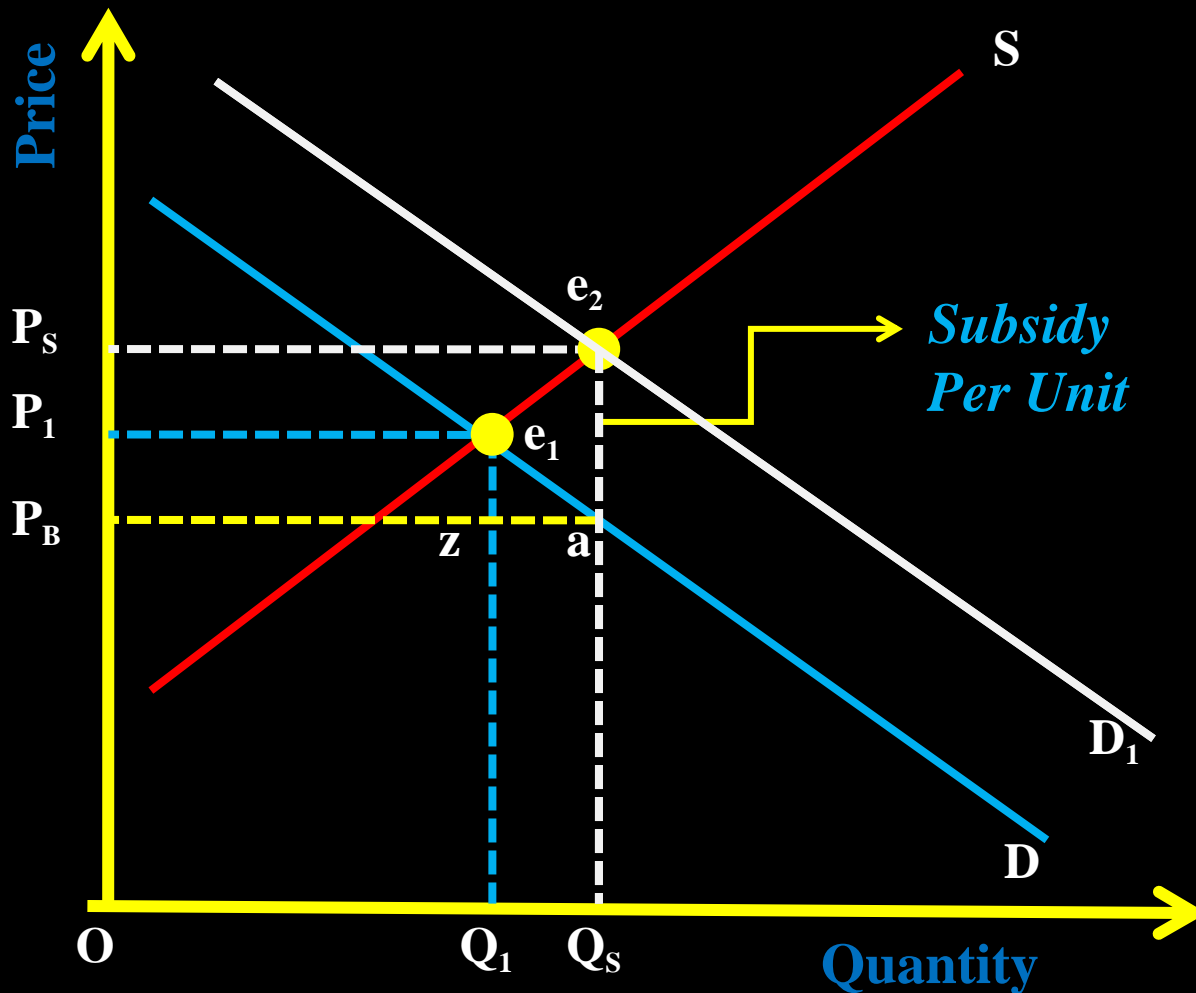
- The new equilibrium price is more than the equilibrium price of the non-subsidies situation. That is P_S.
- The price pays by the buyers is the deduction of the new equilibrium price and amount of subsidy per unit (P_S-ae_2).
- Subsidy by the government has created the difference between the price that buyers pay and sellers receive by the amount of subsidy.
- After subsidy to the buyers, consumers pay fewer prices than before. Thus they are benefited by ze_1. The subsidy benefit to the sellers or producers is equal to P_1P_S. Thus the subsidy provided to consumers or buyers goes to the part of sellers as well.

Implication

- If we compare both of the cases we can say that whether the same amount of subsidy is provided to sellers or buyers, the ultimate effect is the same. It means when the government provides a subsidy (either to the buyers or sellers) then the buyer pays less than pre-subsidy and the seller receives more.

- Buyers pay less amount than pre-subsidized prices and sellers also receive more prices than the pre-subsidized price because of subsidy in both of the cases.

- Market size is also increased in the case of subsidies provided by the government.

- Thus the ultimate effect of the subsidy is the same regardless to whom it has dispatched by the government

- The following figure shows the overall implication of subsidies in the market equilibrium
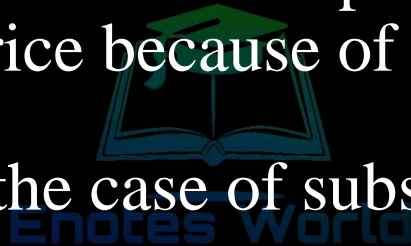
Implication...
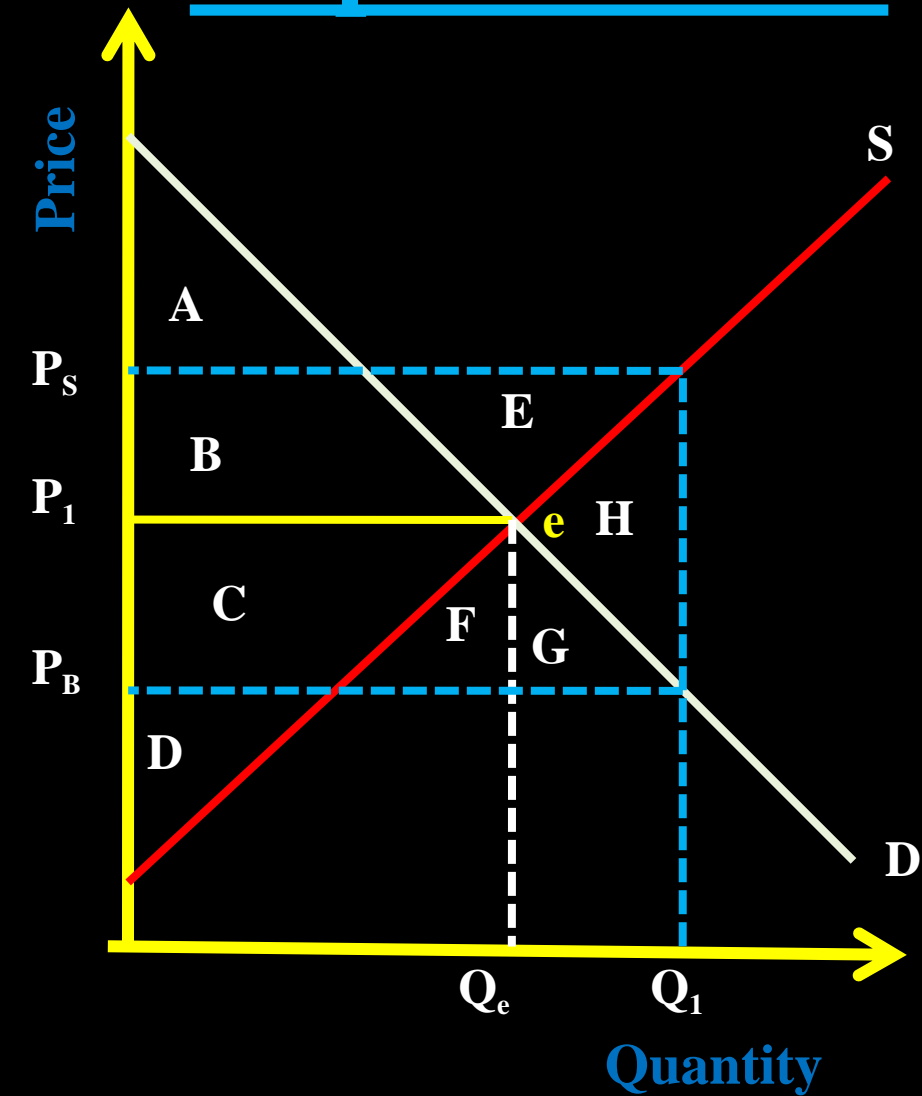
Title	Before Subsidy	After Subsidy
Subsidy	-	$P_B P_S$
Equilibrium Price	OP_1	-
Price Paid by Buyers	OP_1	OP_B
Price Received by Sellers	OP_1	OP_S
Equilibrium Quantity	OQ_e	OQ_1
Consumer Surplus	A+B	A+B+C+F+G (Gain by C+F+G)
Producers Surplus	C+D	B+C+D+E (Gain by B+E)
Government Expenditure or Subsidy	-	B+C+E+F+G+H
Total Surplus	A+B+C+D	A+B+C+D-H

*Total Surplus Before Subsidy=CS + P S; *Total Surplus After Subsidy=CS + PS – GE or Subsidy*

Comparing the obtained information and values we get following conclusions;

- Total surplus before subsidy > Total surplus after subsidy[(A+B+C+D)> *than A+B+C+D-H)]*
- Deadweight loss= Burden to the government/Overproduction is H

Conclusion: Therefore the provision of government subsidy in the perfectly competitive free market results in the creation of deadweight loss and inefficiency in the market. The subsidy has thus a negative effect on the welfare of the consumer. But we also can say that the programs like subsidy are designed for helping the poor not for hurting the participants of the free market.

Price Ceiling and Effect in Market Equilibrium

What is Price Ceiling?...

- A price ceiling is a maximum price fixed by the government at a level below equilibrium price for a particular product produced by a firm.

- It is upper limit of price fixed by the government and no producers are allowed legally to charge a price higher than the price ceiling.

- The ceiling price or legally fixed maximum price is also known as a fair price or control price. In general, the price ceiling lies below the equilibrium price

- Due to the price ceiling of the government, the quantity demand for the goods and services exceeds quantity supply and that leads to a shortage in the market.

Price Ceiling and Its Consequences
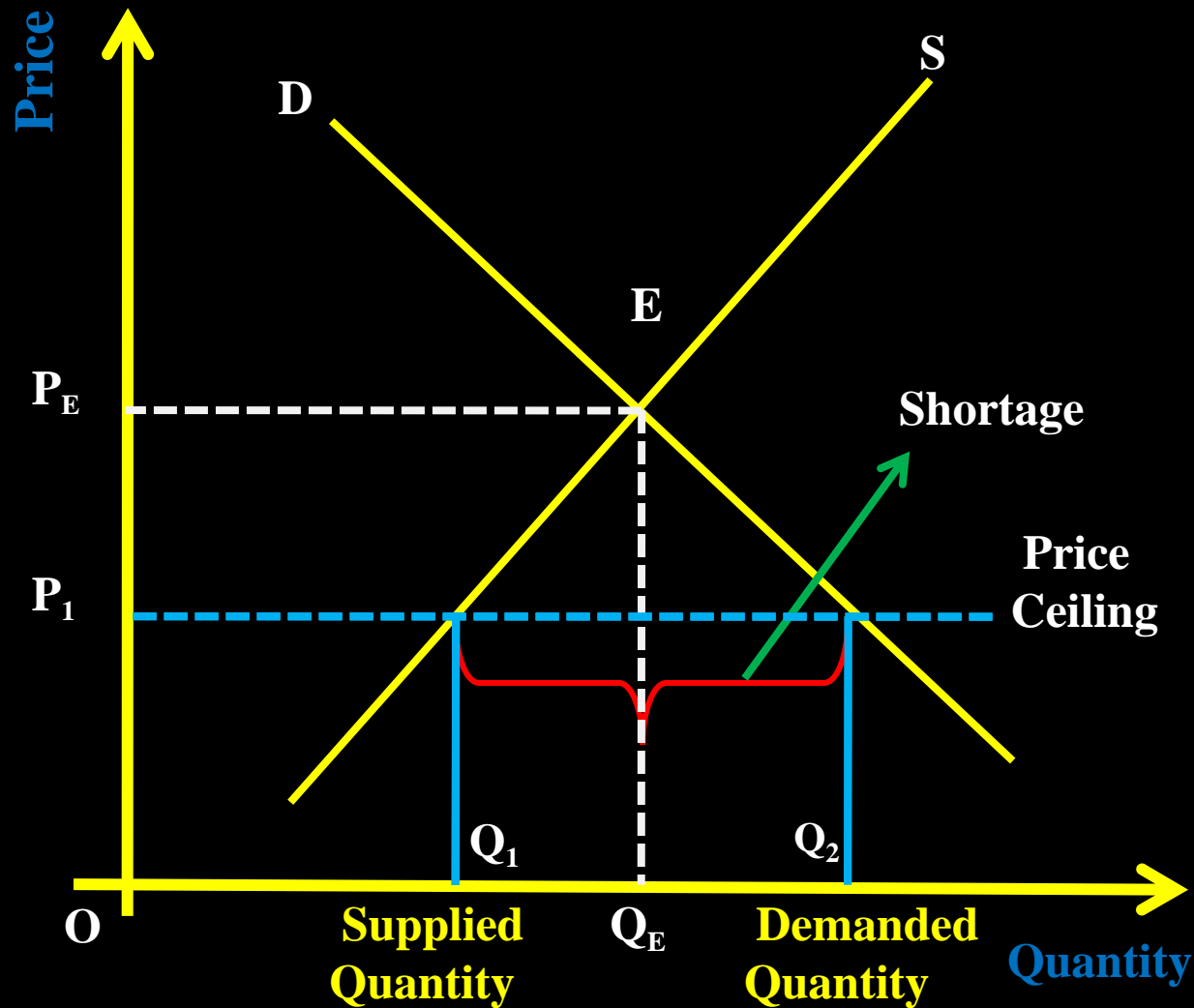
- In the figure the demand and supply curve intersects with each other at point E.

- When there is no government policy in action then the free market price of the product is P_E and quantity is Q_E.

- There is demand-supply equality in the market. It means and all the wants are being satisfied.

- Suppose the government presumes that the price determined by the free market is too high for poor or targeted people of the society or nation.

- Now the government has set a price below the equilibrium price as P_1. This is the case of a price ceiling.

Price Ceiling and Its Consequences…
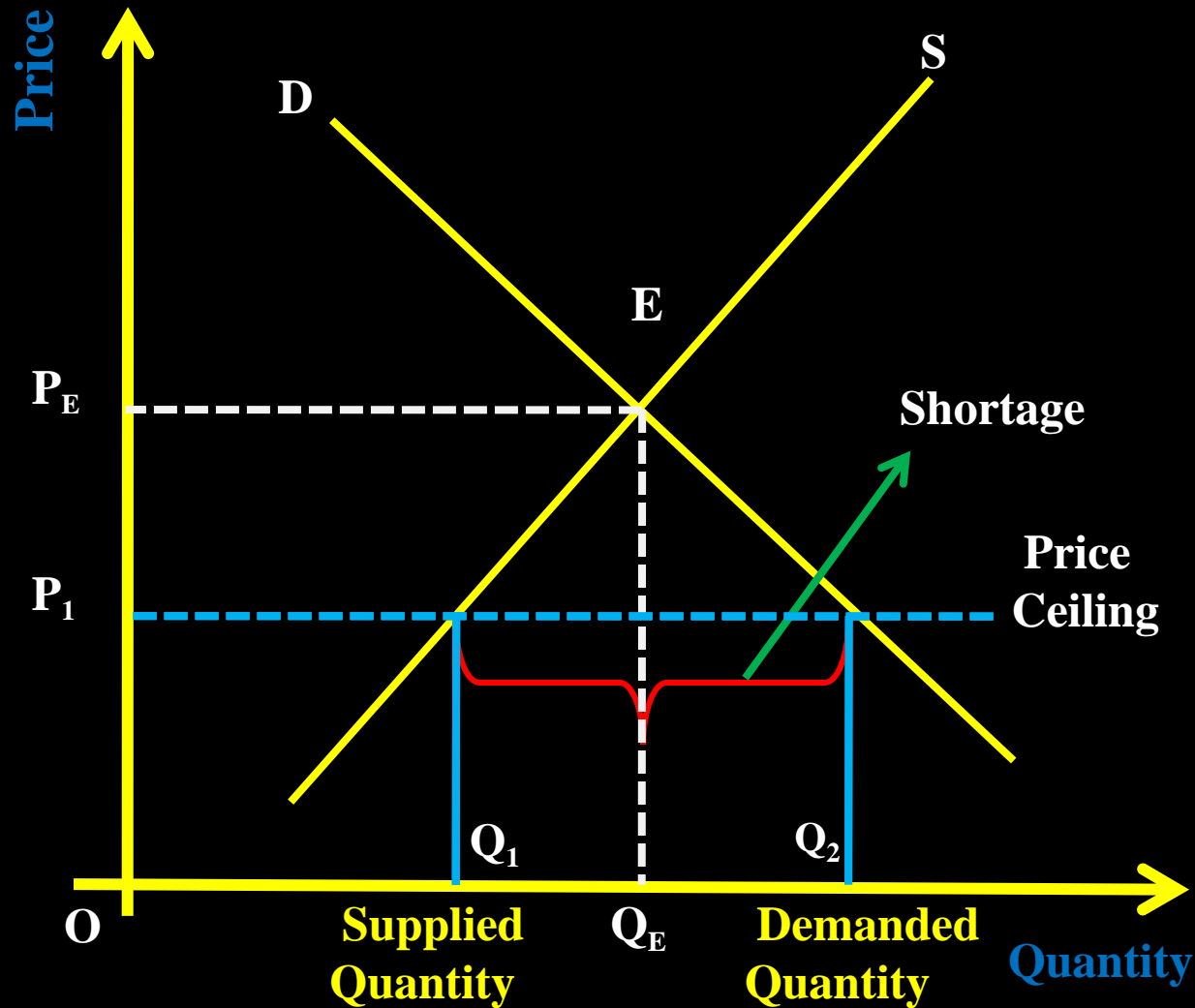
✓ Now due to the price ceiling the price of the product in the market is less than the equilibrium price and as a result, consumers demand increase.

✓ So they are demanding OQ_2 quantity while the producers are willing to supply less (because of lower price) equal to OQ_1.

✓ Therefore, there is a shortage/demand exceeds supply in the market by the amount of Q_1Q_2

Implication of Price Ceiling

- Excess demand or shortage of goods and services is an immediate outcome or implication of price ceiling or control pricing.

- If such a price ceiling persists in the long run, the shortage will be deeper and it will invite black marketing in the market.

- Whenever there are unsatisfied wants because of shortage created due to legal restrictions, the emergence of black markets is almost sure

- Thus, the price ceiling leads the market to inefficiency in three ways namely; *an inefficient distribution of goods among buyers, wasted resources trying to buy goods and inefficiently low quality of the goods.*

Solving the Issue of Excess Demand or Shortage

- To solve the problem of shortage, rationing is one of the probable alternatives available to the government.

- Rationing is a technique adopted by the government to sell a minimum quota of essential commodities at a price less than equilibrium price to supply goods to poor and marginalized people.

- So, through rationing the quantities, the buyers can buy only a limited quantity so that their total rationed demand is equal to OQ_1.

- Thus the government can implement its policy of *rational price or fair price or control price or ceiling price* through the implementation of rationing rule.

Price Floor and Its Effect in Market Equilibrium

Introduction to Price Floor

- Like the price ceiling, the price floor is also an attempt by the government to maintain the price at other than the equilibrium level for the benefit of the people

- The price floor or support price or minimum support price policy is another price control policy of the government.

- When the government feels that the price fixes by the free market system are too low for a certain class of people or for a certain group of individuals, at that time government can implement *price support or floor price policy* to support them or encourage them to continue their economic activities.

- This policy is specially designed for farmers or the agriculture sector and for workers who are unskilled and working on a daily wage basis.

What is Price Floor Policy?

- A price floor is a minimum price fixed by the government for a particular product at any particular level beyond the equilibrium price.

- Government believes that equilibrium price is low or not sufficient so it fixes the minimum level of price or floor price and it lies above equilibrium price measured by the market.

- The most important example of a price floor is minimum wage legislation implemented in almost all the nations for the labour market.

Price Floor: Effects
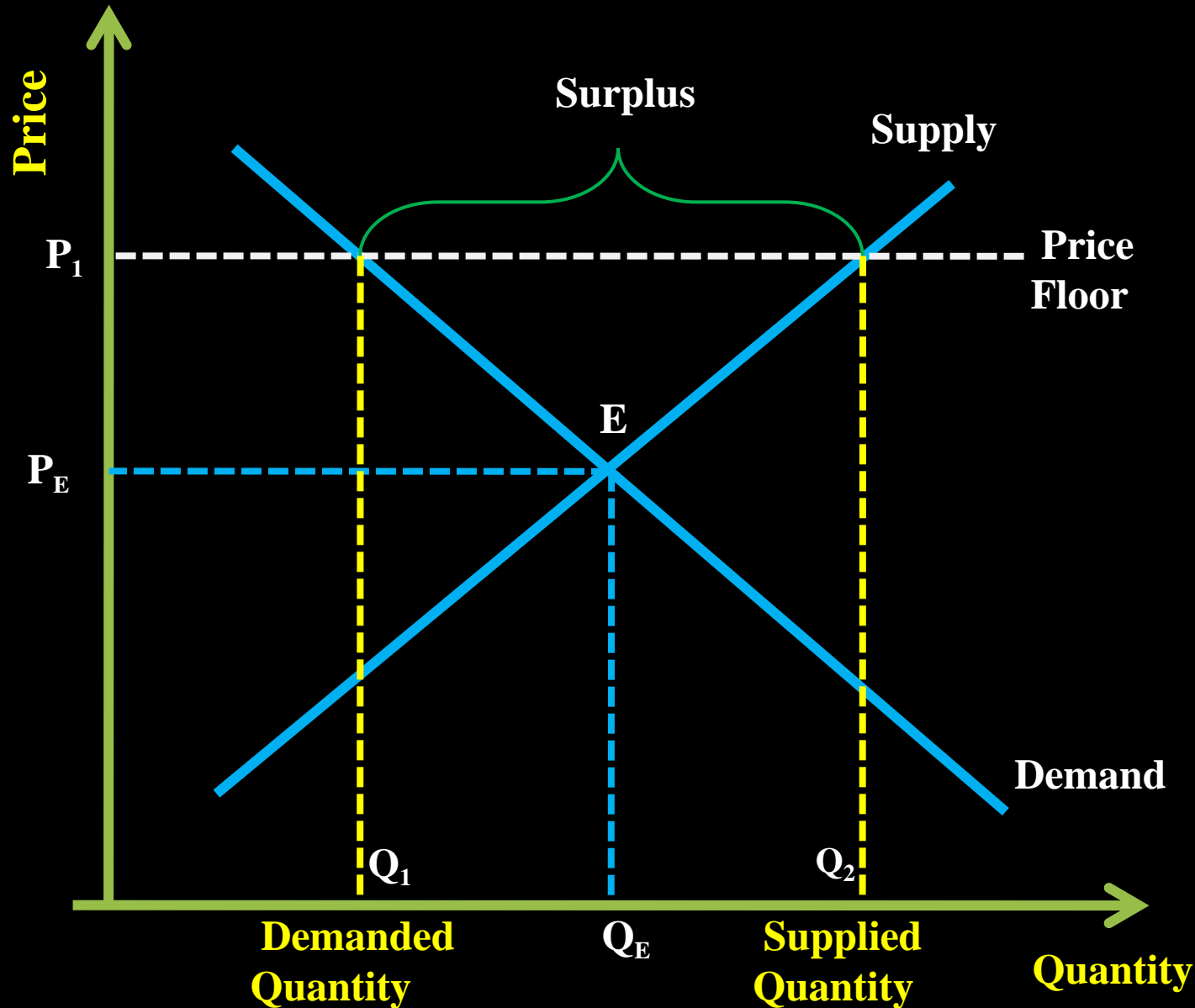
- The equilibrium '*E*' with the intersection of demand and supply curve with equilibrium price P_E and quantity Q_E.

- Suppose there is an implementation of support price or floor price policy from the government and the government imposes the floor price of P_1 lying above the equilibrium price,

- Now at the floor price, supply of the commodity exceeds demand in the market. This is the case of a price floor.

- At this floor price, quantity supplied is higher than that of demand by the amount of Q_1Q_2.

- This binding price floor has resulted in a surplus of excess or overproduction in the market.

Implication of Price Floor Policy

- Thus the main aim of the price floor is to support poor, marginalized farmers and unskilled workers.

- But it may generate excess supply in the product market and excess supply of labor in the labor market (unemployment).

- The stock available in the economy over the demand is typically stored by the government. The stock of output that the government stores from the market by purchasing at floor price are *buffer stock*.

- If in a particular year or season, the production is low, the buffer stock can be released or the required quantities can be drawn from the buffer stock to meet the demand at a reasonable price.

- Thus, floor pricing will create over-production or surplus in the economy and the government will have to bear the cost to keep floor price in implementation by purchasing the excess supply of the market.

Thank You