CHAPTER – 2 : Theory of Demand and Supply

Unit -1 Law of Demand and Elasticity of Demand

- Definition of Demand
  - Quantity of a good that buyers are willing and able to purchase at various prices during a given period.
  - More than just desire; it involves the ability to pay and the willingness to use that means for a purchase.

- Elements of Effective Demand :
  - Desire, means to purchase, and willingness to use those means.
  - Desire alone isn't enough; it must be backed by purchasing power.

- Quantity Demanded :
  - Quantity of a good that buyers are willing and able to purchase at a particular during a given period.
  - Always expressed at a given price.
  - It is a flow concept.

- Factors Determining Demand :

Remember Your Short Trick Given By Love Kaushik Sir – Tipper A CNG

1. Price of the Commodity:
   - Inverse relationship between price and demand.
   - Higher price reduces quantity demanded; lower price increases it.
   - Example: If the price of Samosa increases, people might buy fewer of them.
2. Price of Related goods:
   - Complementary goods (e.g., tea & sugar) and substitutes (e.g., pepsi & coca-cola) affects demand.
   - In case of Complementary goods' prices and demand affect each other inversely;
   - In case of substitutes' prices and demand have a direct relation.

3. Disposable Income:
   - Increase in disposable income generally increases demand for goods.
   - Normal goods' demand rises with income; inferior goods' demand falls.
   - Example: As income rises, demand for luxury goods like high-end electronics increases.
   - In case of Essential / Necessities like Food,water, Medicine etc. ↑ in Demand will be less than proportionate ↑ in income
   - As people become richer, there is relative decline in importance of non-durable goods and increase in importance of durable goods.
   - In case of Luxury / Prestige Goods --Demand increases beyond a certain level of income and keep rising as income increases.
4. Tastes and Preferences:
   - Modern or fashionable goods have higher demand.
   - External effects like demonstration, bandwagon, Veblen & snob effects influence demand.
   - Example: People buying the latest gadgets due to a demonstration effect.
5. Consumers' Expectations:
   - Expectations about future prices, income, and supply influence current demand.
   - Positive expectations lead to higher demand; negative expectations reduce it.
   - Example: Expecting increase in price of petrol tomorrow in the future may increase current demand of petrol.

■ Other Factors
   - Population size, age distribution, national income, consumer-credit facilities, government policies, and various external factors play roles in influencing demand.

■ Demand Function:

1. It refers to the functional relationship between the demand for a product (the dependent variable) its determinants (the independent variables) is called demand function

$D_x = f(P_x, Y, P_y, T, etc.)$

Where –

D_x = quantity demanded of product X

P_x = the price of the product X

Y = disposable income of the consumer

P_y = the price of its related goods

P_c = the price of its complementary goods

T = consumer's tastes and preferences

2. Law of Demand:
   - Definition: States an inverse relationship between the price of a good and the quantity demanded, assuming other factors remain constant (ceteris paribus).
   - Alfred Marshall's Definition: "The greater the amount to be sold, the smaller must be the price."
   - Illustration: When the price increases, quantity demanded falls; when the price decreases, quantity demanded rises.
   - Factors Held Constant: Prices of related goods, consumer income, tastes and preferences etc.
3. Demand Schedule:
   - Definition: A table showing quantities of a good at different prices, assuming other factors are constant.
4. Demand Curve:
   - Definition: A graphical representation of the demand schedule.
   - Slope: Negative slope (downward) indicating the inverse relationship.
5. Market Demand Curve:
   - Definition: Market demand shows the total quantity demanded by all buyers at different prices.
   - Summation: Adding individual quantities demanded at each price to obtain market demand.
   - Market Demand Curve: Horizontal/lateral summation of individual demand curves.

■ Rationale/reasons/ causes of the Law of Demand:

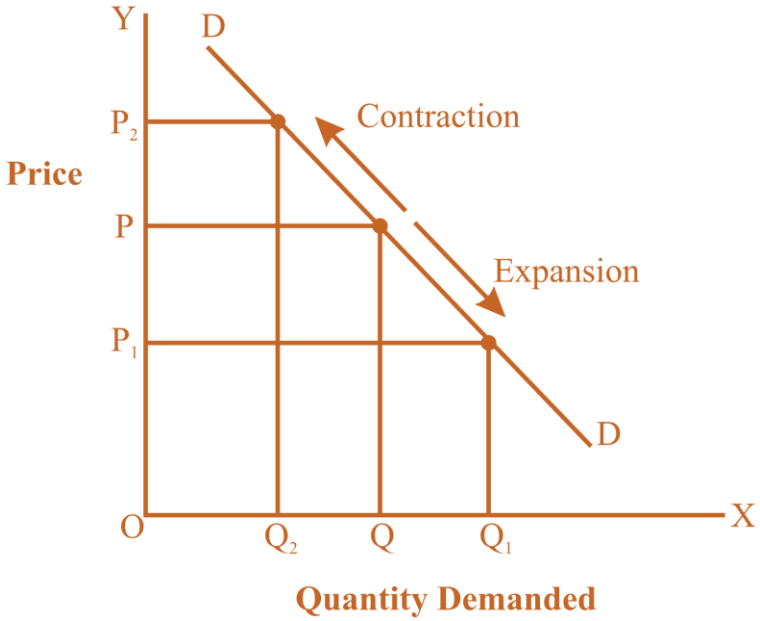
1. Price Effect of a Fall in Price:
   - Substitution Effect: Consumers substitute cheaper goods for relatively expensive ones, increasing the demand for the cheaper good.
   - Income Effect: As prices fall, real income increases, allowing consumers to buy more of the cheaper commodity.
2. Utility Maximizing Behaviour of Consumers:
   - Consumers seek equilibrium by maximizing satisfaction, leading them to buy more when prices are lower due to diminishing marginal utility.

3. Arrival of New Consumers:
   - Lower prices attract new consumers who were previously unable to afford the commodity, expanding the consumer base and increasing demand.
4. Different Uses:
   - Lower prices often result in the commodity being used for various purposes, increasing its demand. Example: Electricity.

■ Exceptions to the Law of Demand:

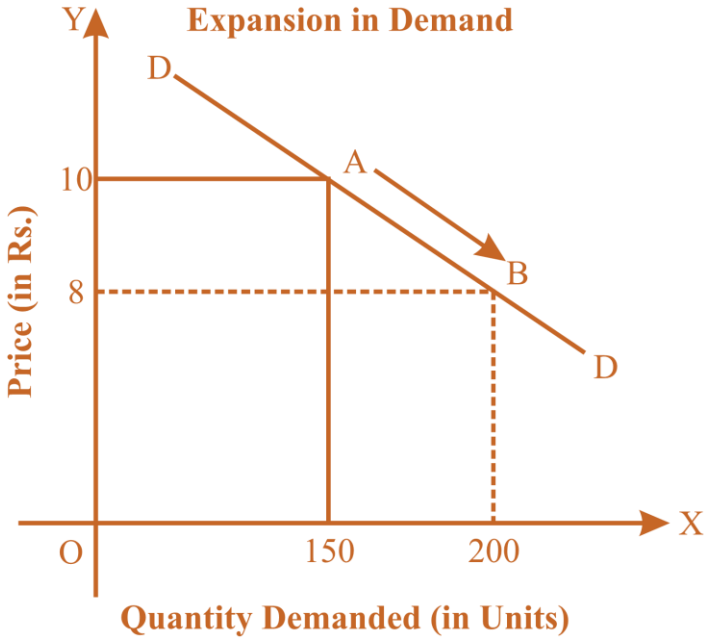
1. Conspicuous Goods (Veblen/snob/Prestige goods): Certain goods serve as status symbols or have snob appeal, and their demand increases with higher prices.
   Example: Diamonds, where higher prices enhance prestige value.
2. Giffen Goods: Such goods exhibit direct price-demand relationship. All Giffen goods are inferior goods; but all inferior goods are not Giffen goods. Giffen goods are low quality goods having no close substitutes taking a substantial portion of buyer's income.
3. Conspicuous Necessities : Certain goods, due to their constant usage and demonstration effect, become necessities and defy the usual law of demand.
   Example: Television sets, refrigerators, and air-conditioners.
4. Future Expectations about Prices: Anticipation of future price increases may lead to increased demand even as current prices rise, violating the traditional law of demand.
   Example: when there is wide-spread drought, people expect that prices of food grains would rise in future. They demand greater quantities of food grains even at the higher price.
5. Incomplete Information and Irrational Behaviour: Consumers with incomplete information or irrational behaviour may make inconsistent purchasing decisions, deviating from the expected demand-price relationship.
6. Demand for Necessaries: In the case of necessary goods, demand may remain relatively constant regardless of price changes, as people need to consume minimum quantities.
7. Speculative Goods: In speculative markets like stock market, demand may rise with increasing prices and fall with declining prices, challenging the conventional law of demand.
8. Other Significant Changes: Changes in factors like income, prices of related goods, tastes, and fashion can invalidate the inverse demand-price relationship.

- Expansion of Demand & Contraction of Demand Both are the types of Movement Along Demand Curve:



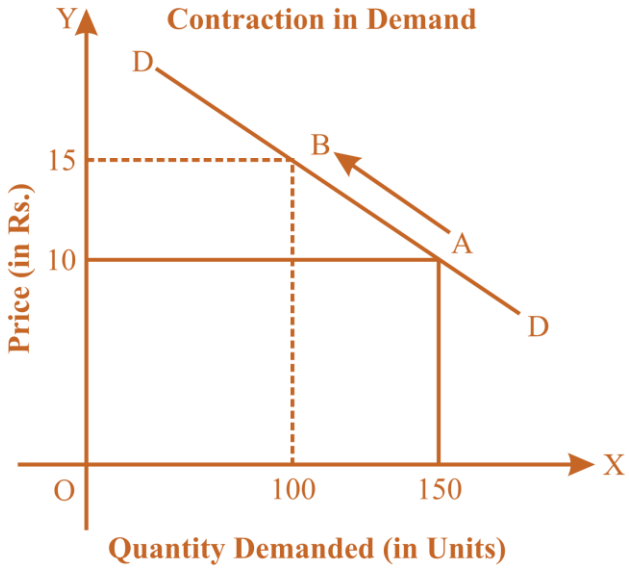
1. Expansion of Demand – It is rise in demand due to fall in price. Also, known as increase in quantity demanded. It shows downward movement along the demand curve.

Price (₹)	Quantity (Units)
10	150
8	200



2. Contraction of Demand – It is fall in demand due to rise in price. Also, known as decrease in quantity demanded. It shows upward movement along the demand curve.

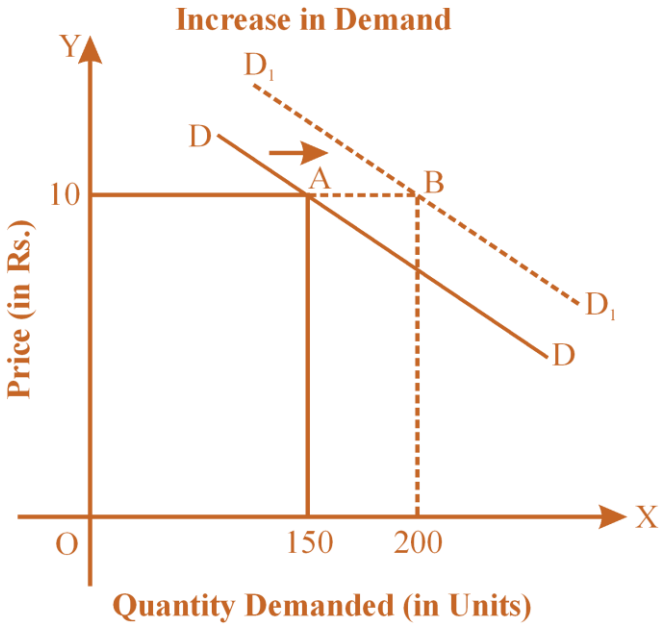
Price (₹)	Quantity (Units)
10	150
15	100



Increase and Decrease in Demand both are the types of shift in demand curve.

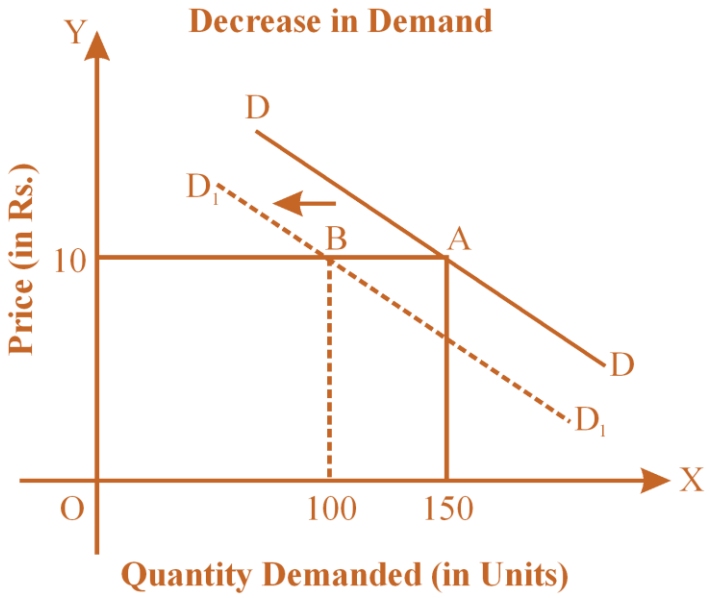
1. Increase in demand – it is increase in demand due to change in the factors other than price of own good. It leads to rightward shift in demand curve.

Price (₹)	Quantity (Units)
10	150
10	200



2. Decrease in demand – it is decrease in demand due to change in the factors other than price of own good. It leads to leftward shift in demand curve.

Price (₹)	Quantity (Units)
10	150
10	100



ELASTICITY OF DEMAND

- Elasticity of demand measures how much people change their buying habits in response to changes in certain factors. It's calculated by dividing the percentage change in quantity demanded by the percentage change in a relevant factor.

Types of Elasticity:

1. Price Elasticity: Measures sensitivity to changes in the product's own price.
2. Cross Elasticity: Measures response to changes in other product prices.
3. Income Elasticity: Measures response to changes in income.
4. Advertisement Elasticity: Measures response to changes in expenditure on advertising.

Price Elasticity of Demand :

- Importance: Crucial for firms to predict sales impact and make profit-maximizing pricing decisions.
- Calculation:

$$E_p = \frac{\text{Percentagechangeinquantitydemanded}}{\text{Percentagechangeinprice}} = \frac{\frac{\text{ChangeinQuantity}}{\text{OriginalQuantity}} \times 100}{\frac{\text{ChangeinPrice}}{\text{OriginalPrice}} \times 100}$$

$$E_P = \frac{\Delta q}{q} \times \frac{p}{\Delta p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

Where –

q = Original quantity demanded

p = Original price

Δ = Indicates change

E = Price elasticity

Understanding Price Elasticity:

- Negative Sign: it shows the law of demand - as price rises, quantity demanded decreases.
- Magnitude Focus: Only absolute value matters; ignore the negative sign.

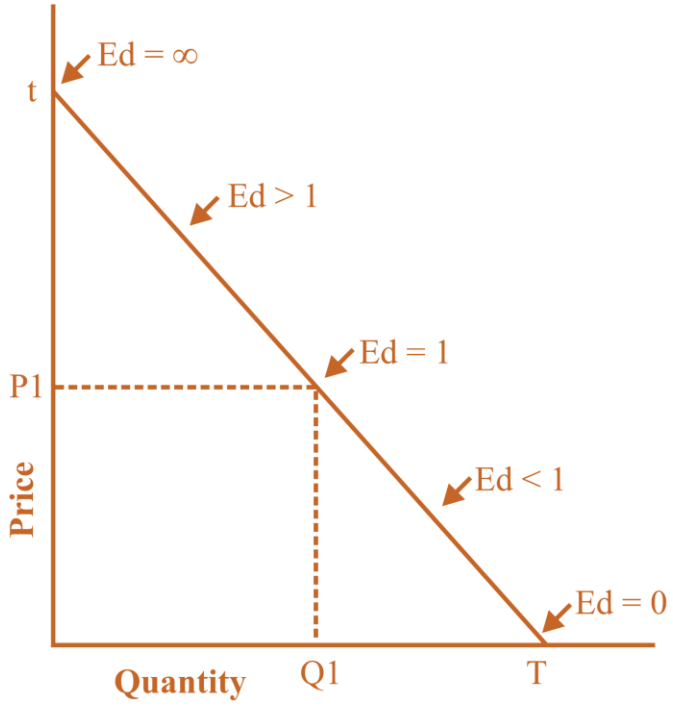
POINT ELASTICITY

The point elasticity of demand is the price elasticity of demand at a particular point on the demand curve. The concept of point elasticity is used for measuring price elasticity where the change in price is infinitesimal (negligible or very small).

$E_D = \frac{-dq}{dp} \times \frac{p}{q}$ (derivative method of point elasticity)

Measurement of Elasticity on a Linear Demand Curve– Geometric Method :

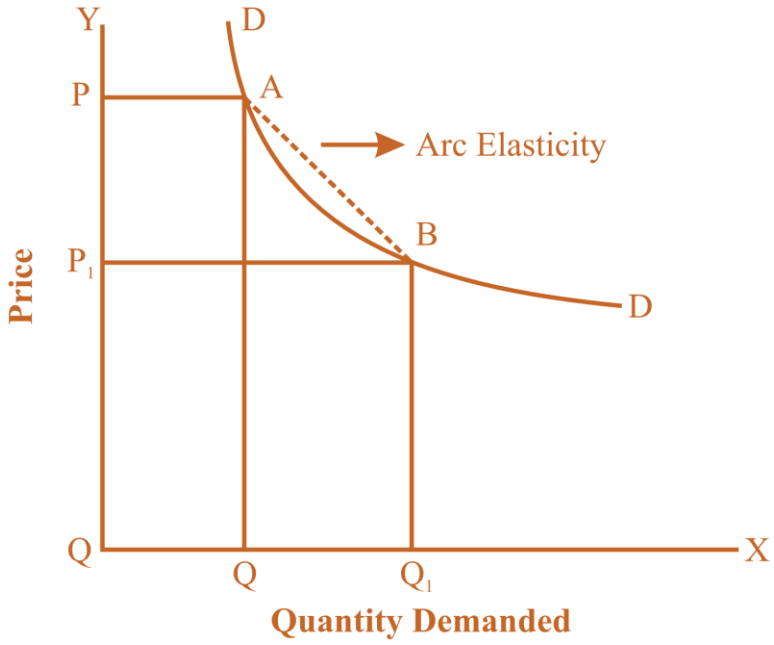
$E_p = \frac{\text{LowerSegmentoftheDemandCurve}}{\text{UpperSegmentofDemandCurve}}$



- Arc-Elasticity (mid-point method)

$$Ep = \frac{\frac{Q_2-Q_1}{(Q_2+Q_1)/2}}{\frac{P_2-P_1}{(P_2+P_1)/2}}$$

$$Ep = \frac{Q_2-Q_1}{Q_2+Q_1} \vee \frac{P_2+P_1}{P_2-P_1}$$



$$E_d = \frac{\Delta Q}{\Delta P} \times \frac{P+P_1}{Q+Q_1}$$

Total Outlay (Expenditure) Method of Calculating Price Elasticity.

If Price and Total Expenditure are :–

(I) Indirectly related $\Rightarrow E_P > 1$

P↑TE↓ P↓TE↑

(II) Directly Related $\Rightarrow E_P < 1$

P↑TE↑ P↓TE↓

(III) Not related $\Rightarrow$ TE $\rightarrow$ Constant $\Rightarrow E_p = 1$

Total Revenue

Total revenue (TR) = Price × Quantity sold

Except in the rare case of a good with perfectly elastic or perfectly inelastic demand, when a seller raises the price of a good, there are two effects which act in opposite directions on revenue.

- Price effect: After a price increase (decrease), each unit sold sells at a higher (lower) price, which tends to raise (lower) the revenue.
- Quantity effect: After a price increase (decrease), fewer (more) units are sold, which tends to lower (increase) the revenue.

■ Determinants of Price Elasticity of Demand :

Remember Your Short Trick Given By Love Kaushik Sir – (PUNCH BSTT)

Factors influencing whether demand for a product is elastic or inelastic.

1. Availability of Substitutes:

   Example: Butter, cars, soft drinks have substitutes. Price changes lead to substantial substitution. More substitutes, greater elasticity.

2. Position in Consumer's Budget:

   Example: Goods like salt have inelastic demand; spend a small fraction of income. Elastic goods like clothing absorb a significant part of income.

3. Nature of the commodity:

   Example: Luxury goods (e.g., home theatre) are elastic, necessities (e.g., food, housing) are inelastic.

4. Number of Uses:

   Example: Milk has multiple uses. Price drop extends consumption; price rise limits use to essential purposes. More uses, greater elasticity.

5. Time Period:

   Example: Longer time allows adjustments as compared with Short-term. Long-term: changes habits. Hence, elastic demand in long run and inelastic demand in the short run.

6. Consumer Habits:

   Example: Habitual consumers show inelastic demand. Rigid preferences make demand less price elastic.

7. Tied Demand:

   Example: Goods tied to others (e.g., printers and ink cartridges) have inelastic demand.

8. Price Range:

   Example: Very high or low-priced goods have inelastic demand. Middle-range goods have elastic demand.

9. Minor Complementary Items:

   Example: Demand for cheap complementary items for costlier products tends to be inelastic.

Income Elasticity of Demand :

- The income elasticity of demand measures the degree of responsiveness of quantity demanded to changes in income of the consumers
- The income elasticity is defined as a ratio of percentage change in the quantity demanded to the percentage change in income

  Income Elasticity = $\frac{\%ChangeinQuantityDemanded}{\%ChanceinIncome}$

  Symbolically – $E_y = \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q}$

The income elasticity of demand is Positive for all normal or luxury goods and the income elasticity of demand is Negative for inferior goods. Income elasticity can be classified under five heads:

1. Zero Income Elasticity:
   - It means that a given increase in income does not at all lead to any increase in quantity demanded of the commodity.
   - In other words, demand for the commodity is completely income inelastic or Ey < 0.
   - Commodities having zero income elasticity are called Neutral Goods.
   - Example – Demand in case of Salt, Match Box, Kerosene Oil, Post Cards, etc.
2. Negative Income Elasticity;
   - It means that an increase in income results in fall in the quantity demanded of the commodity or E_y <0.
   - Commodities having negative income elasticity are called Inferior Goods. Example – Jawar, Bajra, etc.
3. Unitary Income Elasticity:
   - It means that the proportion of consumer's income spent on the commodity remains unchanged before and after the increase in income or E_y = 1. This represents a useful dividing line.

4. Income Elasticity Greater Than Unity:
   - It refers to a situation where the consumers spends Greater proportion of his income on a commodity when he becomes richer. $E_y > 1$,
   - Example – In the case of Luxuries like cars, T.V. sets, music system, etc.
5. Income Elasticity Less Than Unity:
   - It refers to a situation where the consumer spends a Smaller proportion of his income on a commodity when he becomes richer. $E_y < 1$,

There is a useful relationship between income elasticity for a good and the proportion of income spent on it. The relationship between the two is described in the following three propositions:

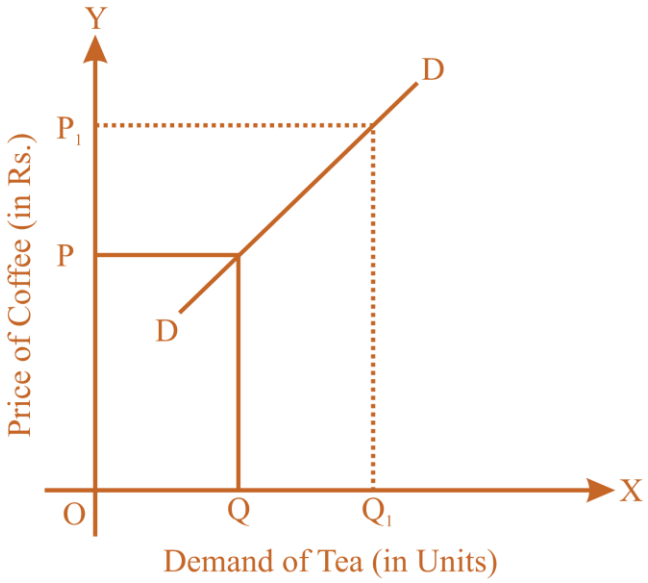
1. If the proportion of income spent on a good remains the same as income increases, then income elasticity for the good is equal to one.
2. If the proportion of income spent on a good increase as income increases, then the income elasticity for the good is greater than one.
3. If the proportion of income spent on a good decrease as income rises, then income elasticity for the good is less than one.

Cross-Price Elasticity of Demand

Cross Demand Definition: Examines how changes in the prices of related goods impact the demand for a specific commodity. Focuses on complementary and substitute goods.

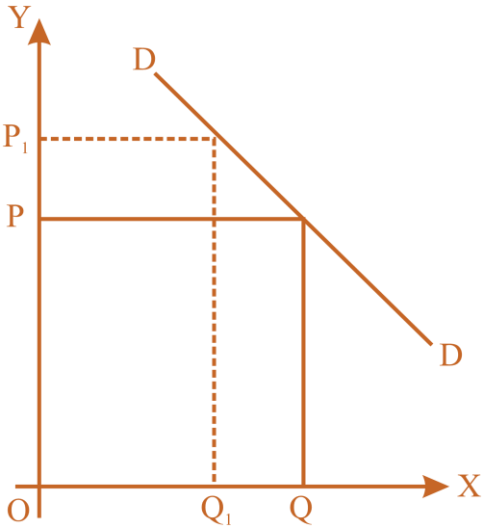
1. Substitute Products and Demand: If two goods are substitutes, an increase in the price of one leads to an increase in the demand for the other.

   Example: If the price of tea (X-axis) rises, people buy more coffee (Y-axis), a substitute. The cross-demand curve slopes upwards.



2. Complementary Goods : For complementary goods, a change in the price of one affects the demand for the other in the opposite direction.

   Example: If the price of solar panels rises, demand for batteries (complementary) falls. In the case of bread and butter, an increase in bread prices reduces the demand for butter.



3. Real-Life Application:

- Scenario: Consider smartphones and mobile data plans. If the price of smartphones increases, the demand for cheaper phones or alternative communication devices may rise, indicating a substitute relationship. On the other hand, a rise in mobile data plan prices may lead to decreased demand for smartphones, showcasing a complementary relationship.

Advertisement Elasticity

Advertisement elasticity of sales or promotional elasticity of demand is the responsiveness of a good's demand to changes in the firm's spending on advertising. The advertising elasticity of demand measures the percentage change in demand that occurs given a one percent change in advertising expenditure. Advertising elasticity measures the effectiveness of an advertisement campaign in bringing about new sales.

Advertising elasticity of demand is typically positive. Higher the value of advertising elasticity greater will be the responsiveness of demand to change in advertisement.

Advertisement elasticity varies between zero and infinity. It is measured by using the formula;

$$Ea = \frac{\%Changeinquantitydemanded}{\%Changeinspedingonadvertising}$$

$$Ea = \frac{\Delta Qd/Qd}{\Delta A/A}$$

Where Δ Qd denotes increase in demand

Δ A denotes additional expenditure on advertisement

Qd denotes initial demand

A denotes initial expenditure on advertisement

Elasticity	Interpretation
Ea = 0	Demand does not respond at all to increase in advertisement expenditure
Ea > 0 but < 1	Increase in demand is less than proportionate to the increase in advertisement expenditure
Ea = 1	Demand increase in the same proportion in which advertisement expenditure increase
Ea > 1	Demand increase at a higher rate than increase in advertisement expenditure