Marks : 40	SYJC March' 19 Subject : Economics Demand & Elasticity of Demand	Duration : 1.5 Hours SOLUTION

Q.1. Define and Explain : (04)
1. Derived Demand
Ans: When a commodity is demanded not for its own sake but for what it helps to produce, then the commodity is said to have derived demand.
e.g. The demand for factors of production (i.e. land, labour, capital and entrepreneur) is indirect demand. Also, money has indirect or derived demand.

2. Market Demand.
Ans: Market demand refers to the total demand of all the buyers taken together. How much quantity the consumers in general would buy at a given price during a given period of time constitutes the total market demand for the product. Market demand is derived by aggregating all individual buyer's demand in the market.

Q.2. Answer the following : (Any Two) (08)
1. Write a note on Determinants of Demand.
Ans: Market demand is influenced by the following factors:
(1) Price:
Price is one of the most important factors that affect demand. When price rises, demand goes down and when price falls, demand rises.
(2) Income:
Income is yet one more important factor that affects demand. Demand depends upon income of an individual and society. Obviously, with the increase in income, one can buy more. Thus, a rich man can demand more as compared to a poor man.
(3) Population:
(a) Size of population: Larger the size of population of a country, more will be the consumers and greater the demand for various goods and services. e.g. Demand for sugar is more in India as compared to Australia.
(b) Composition of population: Composition of population like age structure and gender ratio also influence market demand for certain goods. e.g. Larger the child population, more the demand for books, toys, sweets, etc.
(4) Tastes, Habits and Fashions:
(a) Some personal factors such as tastes, habits of consumers and fashion affect demand.
(b) e.g. Some goods are demanded on account of fashion. Goods which are more in fashion command higher demand than goods which are out of fashion.
e.g. Demand for several products like ice-cream, chocolates, bhelpuri, etc. depend on individual tastes.
e.g. Demand for tea, betel-nut, tobacco, etc. is a matter of habit.
(5) Prices of Substitute and Complementary goods:
(a) Demand for a good change with changes in the price of substitute and complementary goods.

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Price of Substitute goods

Coke		Pepsi	
P (₹)	D (per day)	P (₹)	D (per day)
10/-	700	10/-	400
12/-	300	10/-	600

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(b) When price of Coke rises, demand for Coke falls, while demand for Pepsi increases even though price of Pepsi has remained the same.
∴ There is a direct relationship between demand for a commodity and the price of its substitute.

Price of Complementary Goods

Petrol		Car	
P (₹)	D (per day)	P (₹)	D (per day)
50/-	35,000 litres	2 lacs	500
75/-	30,000 litres	2 lacs	300

When price of petrol rises, demand for petrol falls, while demand for car decreases even though price of car has remained the same.

∴ There is an inverse relationship between demand for a commodity and the price of its complement.

(6) Income Distribution:

If there is unequal distribution of income (i.e. more money flows towards the rich), demand in general will be low. It means demand depends on the distribution of national income and wealth.

(7) Expectation about future prices:

If consumers expect a fall in the price of a commodity in the near future, they will demand less at the present price and vice versa.

It shows that expectation about the future price affects demand.

(8) Advertisement:

The goods which are advertised powerfully on radio, television and newspapers, etc. tend to have more demand. Thus, market demand for many products in the present day is influenced by the seller's efforts through advertisements and sales propaganda.

(9) Taxation Policy:

Government's Taxation Policy affects demand. e.g. A change in income tax, will change consumer's disposable income thereby affecting his demand.

(10) Other factors:

    (a) Climatic Condition:

    Demand for certain goods are also influenced by weather or climatic condition. e.g. Demand for woollen clothes increases during winter. Demand for sunglasses, cold drinks, etc. increases during summer.

    (b) Tradition:

    Social customs and festivals also affect the demand for some commodities. Various products like sweets, crackers are more in demand during Diwali festival.

    (c) Political Factors:

    Due to the political changes made by the government, the market demand for the commodity is affected.

    e.g. Government decided to make SET TOP BOX compulsory for cable relay which increased its overall market demand.

    (d) Social factors:

    Change in the social attitude of the people of the society affects the market demand for the commodity.

    e.g. To contribute to SWACHH BHARAT ABHIYAN, many societies started keeping dustbins in the society to keep the environment neat and clean.

2. Explain variation in Demand.

Ans: There are many factors that determine demand. One of the important factors is price. When demand changes due to changes in price, it is known as variation in demand which implies expansion or contraction in demand.

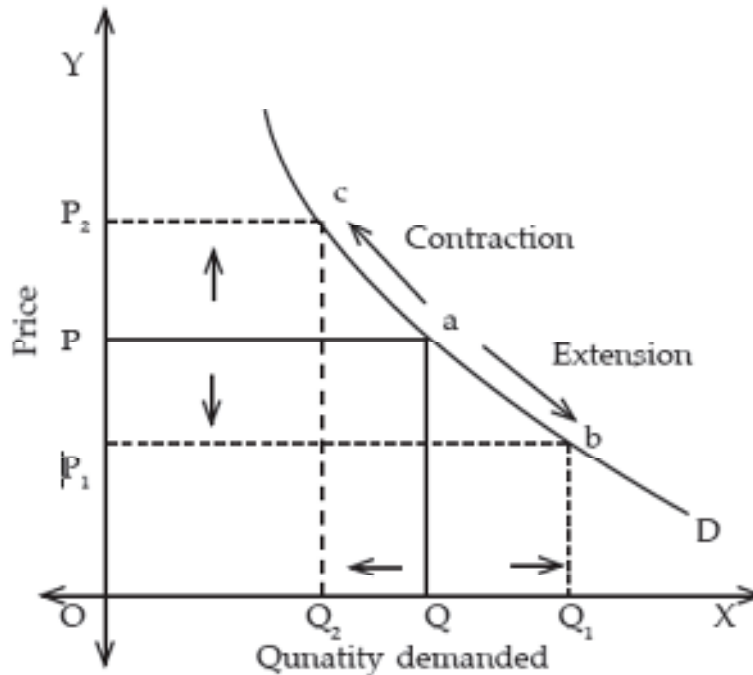**(a) Expansion or Extension or Rise in demand:**

When more is demanded at a lower price, it is said to be extension/ expansion in demand. In other words, when price falls, demand extends or expands.

Expansion of demand takes place only due to a fall in price.

(b) Contraction or Reduction or Fall in demand:

When less is demanded at a higher price, it is said to be contraction in demand. In other words, when the price rises, demand contracts or reduces.

In other words, when the price rises, demand contracts or fall. Both expansion and contraction can be shown by a movement along the same demand curve.

A downward movement on the same demand curve (from point a to point b) shows expansion (or extension) of demand. Graphically, when price falls from P to P_1, the quantity demanded rises from Q to Q_1.

An upward movement on the same demand curve (from point a to point c) shows contraction of demand. In the graph, when price rises from P to P_2, the quantity demanded falls from Q to Q_2.

3.   Write a note on change in demand.

Ans: There are many other factors that affect demand other than price, such as population, income, tastes and habits, etc. When demand changes due to change in these factors, price remaining constant, it is called change in demand.

(1)   Increase in demand:
   (a)   When more quantity of a commodity is demanded because of change in the factors determining demand other than price, it is known as increase in demand.
   (b)   In other words, when more is demanded at the same price, it is increase in demand. Increase in demand takes place when
          (i)   Consumer's income increases
          (ii)   Population increases
          (iii)   Price of substitute increases
          (iv)   Price of complementary product falls, etc.
          e.g. If income of a consumer rises, he will demand more of the commodity at the same price.

(2)   Decrease in demand:
   (a)   When demand falls due to changes in factors determining demand other than price, it is known as decrease in demand.
   (b)   In other words, when less is demanded at the same price, it is decrease in demand.
          Decrease in demand takes place when:
          (i)   Consumer's income decreases
          (ii)   Population decreases
          (iii)   Price of substitute decreases
   (iv)   Price of complementary product rises etc.

      e.g. If income of a consumer falls, he will demand less of the commodity at the same price.

(3)   Both increase and decrease in demand i.e. changes in demand cannot be shown by a movement along the same demand curve.

      When demand increases, the demand curve shifts to the upper side of the original demand curve (i.e. to the right).

      When demand decreases, the demand curve is shifted below the original demand curve (i.e. to the left).

(4)   This is made clear with the help of the following diagram.
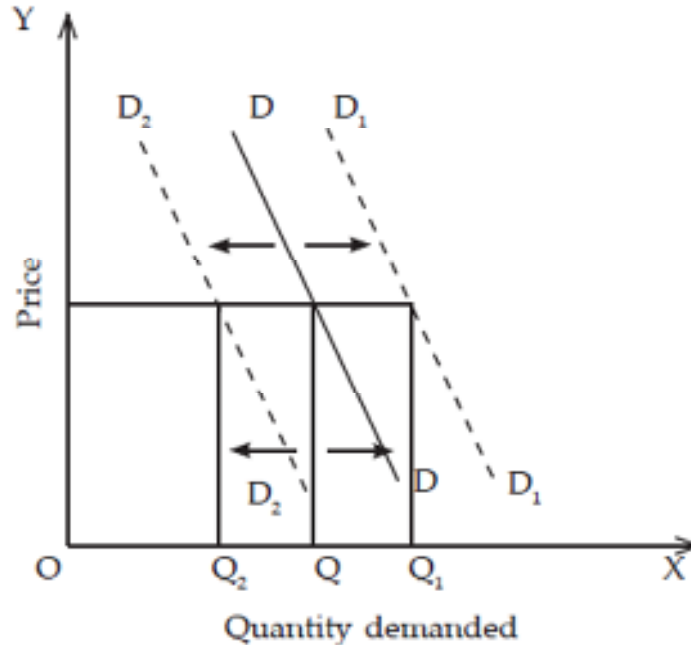
Quantity demanded

      In the above diagram, DD is the original demand curve which shows quantity Q demanded at price P.

(i)   If we assume that the income of a consumer increases, he will demand Q_1 quantity at the price P which is greater than the original demand. This is an increase in demand.

(ii)   Similarly, if income of a consumer is reduced, he will demand Q_2 quantity of the product, which is less than Q. This is decrease in demand.

Q.3. Answer the following :   **(08)**

  1.   **Explain Law of demand with assumptions.**

Ans: (1)   **Introduction of Law:**

     (a)   "The term demand is defined as the desire for a commodity backed by the ability to buy and willingness to pay for it, at a given price, during a particular period of time."

     (b)   Law of demand is one of the important basic law of consumption.

     (c)   Dr. Alfred Marshall in his book "Principles of Economics" in the year 1890, has explained the law of demand as follows:

(2)   **Statement of Law:**

     (a)   "Other things being constant, higher the price of the commodity, smaller is the quantity demanded and lower the price of the commodity, larger is the quantity demanded".

     (b)   The law of demand explains change in the behaviour of consumer demand due to various changes in price.

     (c)   Marshall's law of demand describes functional (cause and effect) relation between demand and price.

        It can be expressed as (Mathematical Representation)

        $D = f(P)$

        i.e. demand is function of price.

The relation between price and demand is inverse or negative.

(3)   Explanation of Law:

(a)   The law of demand is well explained with the help of following schedule and diagram.

Demand Schedule

Price of mangoes per kg (₹)	Demand (kgs.)
50	1
40	2
30	3
20	4
10	5

(b)   As shown in the schedule, when price of mangoes is ₹ 50/- per kg. Demand is 1 kg. But when price falls to the level of ₹ 40/- per kg, and demand rises to 2 kg. Similarly, at the price ₹ 10/- per kg, demand of mangoes is 5 kg whereas 4 kg of mangoes are demanded at price ₹ 20/- per kg. This shows inverse relation between price and demand.
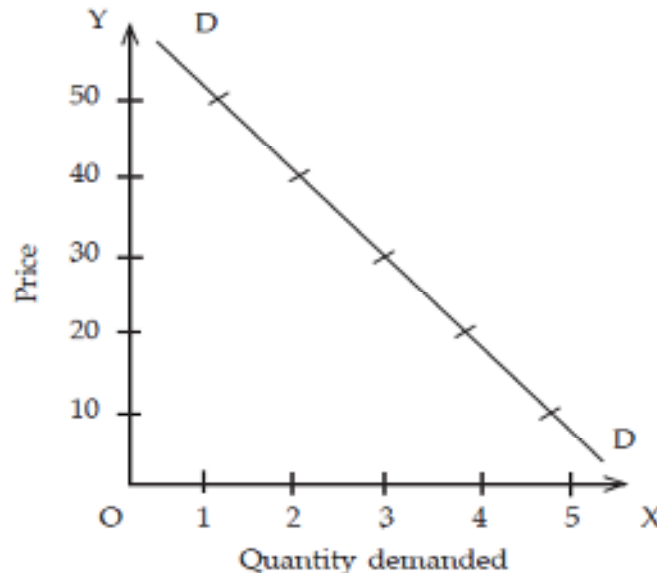
(c)   In the above diagram, X axis represents demand for mangoes whereas Y axis represents price of mangoes. DD is demand curve which slopes from left to right or top to the bottom. In other words, its slope is negative because of inverse relation between price and demand.

Assumptions of the Law of Demand

(1)   No change in size and composition of population:

There should not be any change in the size and composition of population because a change in population, will ultimately change the demand irrespective of any change in price.

(2)   No change in income of the consumer:

Throughout the operation of the law, the consumer's income should remain the same. If the level of a buyer's income rises, he may buy more even at a higher price, invalidating the law of demand.

(3)   No change in tastes and habits:

Tastes, habits of consumer, customs, traditions and fashions should remain unchanged. Due to change in tastes and preferences, people's demand for goods undergoes changes, irrespective of any change in price.

(4)   No expectation of future price changes:

There should not be any change in the expectations about the prices of goods in future. If consumers expect that price will rise or fall in future, they will change their present demand although price is constant.

(5) No changes in price of substitutes and complementary goods:
Prices of substitutes and complementary goods remain unchanged. If the prices of other related goods changes, the consumer's preferences would change, this may invalidate the law of demand.

(6) No change in Government's policy:
Taxation and fiscal policy of government does not change. A change in income tax, for instance may cause changes in consumer's disposable income and hence demand.

(7) No change in fashion:
If the commodity concerned goes out of fashion, buyer may not buy more of it even if the price falls substantially.

(8) No change in Distribution of Income:
There is no change in the distribution of national income and wealth of the community.

Q.4. Answer the following: (08)
1. Write a note on geometric method.
Ans: (a) Point Elastic method was suggested by Dr. Marshall. The simplest way of explaining the point method is to consider a linear (straight line) demand curve.
(b) Let the straight line demand curve be extended to meet the two axes as shown in the diagram.
(c) At any point on the demand curve, the point elasticity is measured by the ratio of the lower segment of the demand curve (below the given point) to the upper segment of the demand curve, (above the given point).

Point elasticity of demand = $\frac{\text{Lower segment of the demand curve below the given point}}{\text{Upper segment of the demand curve above the given point}}$

or Point Ed = $\frac{L}{U}$

(e) Suppose, PB measures 3 cm and PA measures 2 cms.
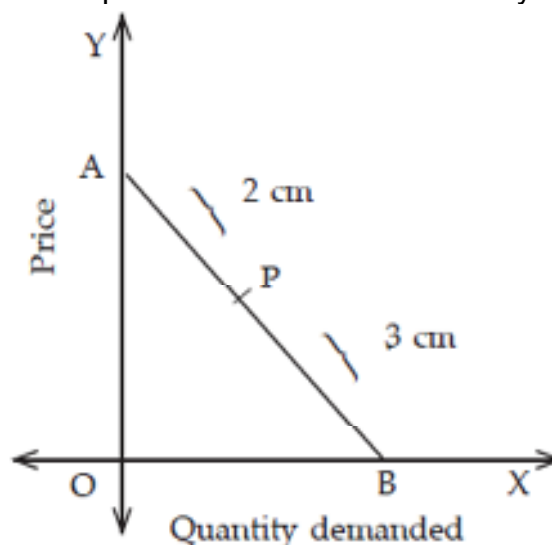For instance, in the given diagram AB is a straight line demand curve.
P is a point on demand curve elasticity at point P can be measured by the following formula, Ed = $\frac{L}{U}$
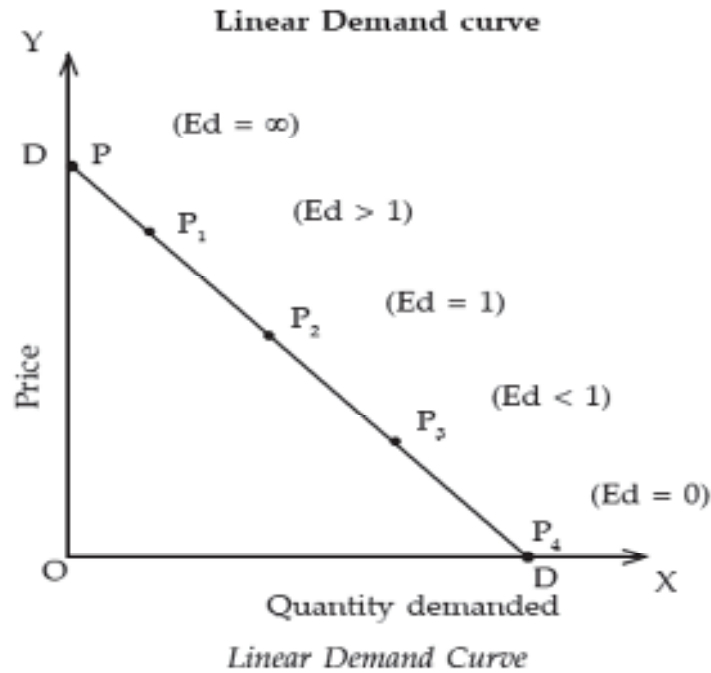
Where, L = Lower segment, U = Upper segment.

∴ Ed = $\frac{PB}{PA}$ = $\frac{3}{2}$ = 1.5

Ed > 1

∴ Elasticity of demand at point P is 1.5 i.e. It is relatively elastic demand. (Ed > 1)

Linear Demand curve

Linear Demand Curve

(a) In above figure DD is demand curve and we assume that its length is 4 cm. At point P, demand is infinite elastic, whereas at point P_4 elasticity of demand is zero. Therefore we have to measure elasticity of demand on points, P_1, P_2 and P_3.

(b) At point P_1 elasticity of demand = lower segment of the demand curve below the given point P_1 upto P_4 ÷ upper segment of the demand curve above the point P1 upto P. Therefore, Ed = P_1 P_4 ÷ P_1 P. Ed > 1. It means demand is elastic or elasticity of demand is greater than one at point P_1, elasticity of demand is equal to one at pont P_2 whereas at point P_3 demand is less than one.

Non - Linear Demand Curve

Non - Linear Demand Curve
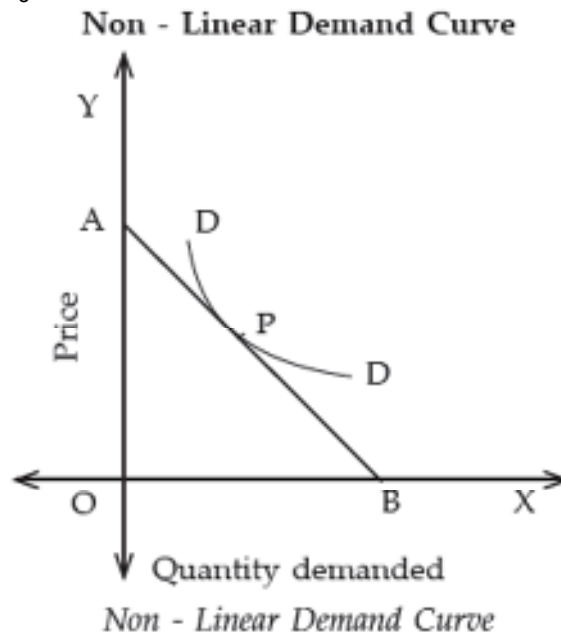
If the demand curve is non-linear, then a segment is drawn to the demand curve at the given point 's'. The tangent should touch both the axes - OX and OY axis. The price elasticity is measured by the ratio of lower segment to the upper segment

Ed = $\frac{L}{U}$

Elasticity = $\frac{PB}{PA}$

2. What are the factors affecting elasticity demand ?

Ans: Following are the factors which influence elasticity of demand.

(a) Nature of commodities:

Commodities may be either necessities or luxuries. Normally, elasticity of demand for necessities is inelastic and for luxuries demand tends to be elastic.

e.g. the demand for foodgrains, salt, cloth, etc. is generally inelastic, while that for radio, furniture, car, etc. is elastic.

(b) Durability:
The demand for durable goods is elastic (e.g. cupboard) whereas the demand for perishable goods is inelastic.

(c) Substitute Goods:
Availability of substitutes also determine elasticity of demand. The larger the number of substitutes for a commodity in the market, greater will be the elasticity of demand.

(d) Use of a commodity:
When a commodity can be put to several uses, its demand is elastic. The demand for electricity is elastic. Single use goods eg. chalk have relatively inelastic demand.

(e) Price:
In case of goods which are very highly priced, or very low priced demand is normally inelastic. e.g. The demand for match box is inelastic.

(f) Habits:
Habits influence elasticity of demand. The demand for goods which are demanded due to habit is normally inelastic. For instance, the demand of cigarettes is inelastic.

(g) Income of Consumer:
When income level is high demand is normally inelastic. But demand is elastic at low level of income. e.g. the demand pattern of a millionaire is rarely affected even by significant price changes.

(h) Proportion of expenditure:
Items that constitute a smaller amount of expenditure in a consumer's family budget tend to have a relatively inelastic demand, e.g. matches, sugar, kerosene, etc. Thus cheap or small expenditure items tend to have more inelastic demand than expensive or large expenditure items.

(i) Complementary goods:
By and large, demand for complementary goods is inelastic. Because, complementary goods such as motor car and petrol are demanded jointly.

Q.5. Answer the following in detail.   (08)
1.   Explain the types of price elasticity of demand?
Ans: (a)   Elasticity of demand refers to the responsiveness of demand to a change in price.
It is common that all the commodities respond to a change in the price of a commodity.
   (b)   The responsiveness is not same in case of all the commodities. Some are more responsive, while certain others are less responsive.
   (c)   Depending on the degree of responsiveness, there are five categories of elasticity of demand. They are:
      (i)   Perfectly elastic demand. (Ed = ∞)
      (ii)   Perfectly inelastic demand (Ed = 0)
      (iii) Unitary elastic demand (Ed = 1)
      (iv)   Relatively elastic demand (Ed > 1)
      (v)   Relatively inelastic demand (Ed < 1)
   (1) Perfectly Elastic Demand. (Ed = ∞)
      (a)   "When a slight change in the price of a commodity brings about an infinite (tremendous, immeasurable) change in the quantity demanded then it is called Perfectly Elastic Demand."
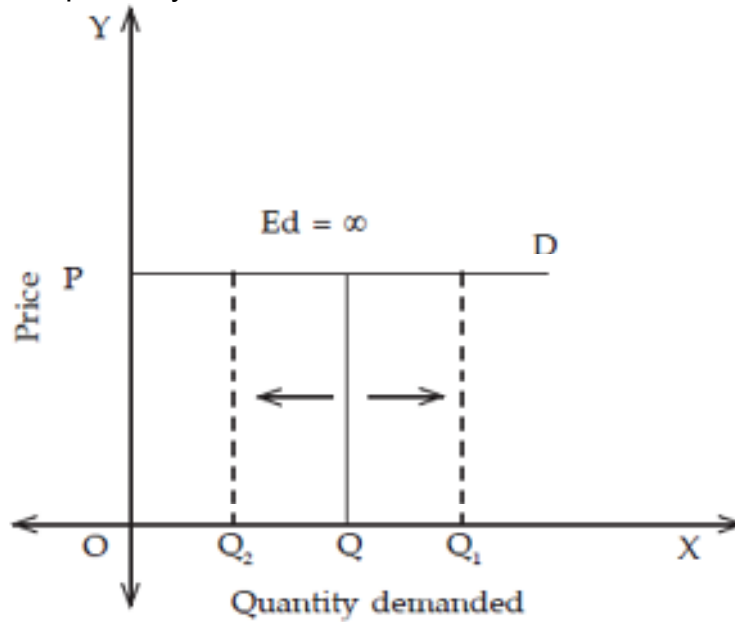   Here Ed = ∞
      (b)   Perfect elastic demand cannot be measured.
   (c)   It is also called infinite elasticity of demand.
      (d)   Demand curve is represented by a horizontal straight line parallel to x-axis

(e)   In real life, perfectly elastic demand does not exist.

(2)   **Perfectly Inelastic Demand (Ed = 0)**

     (a)   "When the change in the price of a commodity brings about 'No Change' in the quantity demanded then it is called perfectly inelastic demand".

     (b)   It is also known as zero elasticity of demand.

         Here, $Ed = 0$

     (c)   In this case, the demand curve would be a vertical straight line parallel to Y axis

     (d)   Perfectly inelastic demand occasionally occurs in real life.

     (e)   In the diagram, even if the price rises from P to P_1 (50%), the quantity demanded does not change (0%), i.e. it remains constant at Q.

         At the most salt may be regarded as the only commodity with perfectly inelastic demand for most of the consumers.

Perfectly Inelastic Demand
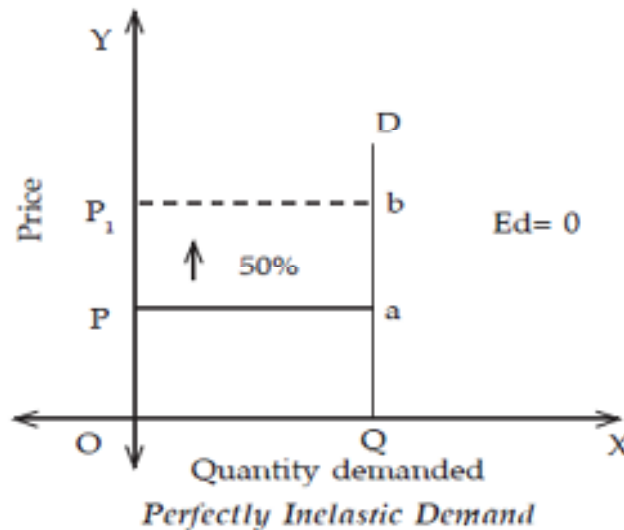
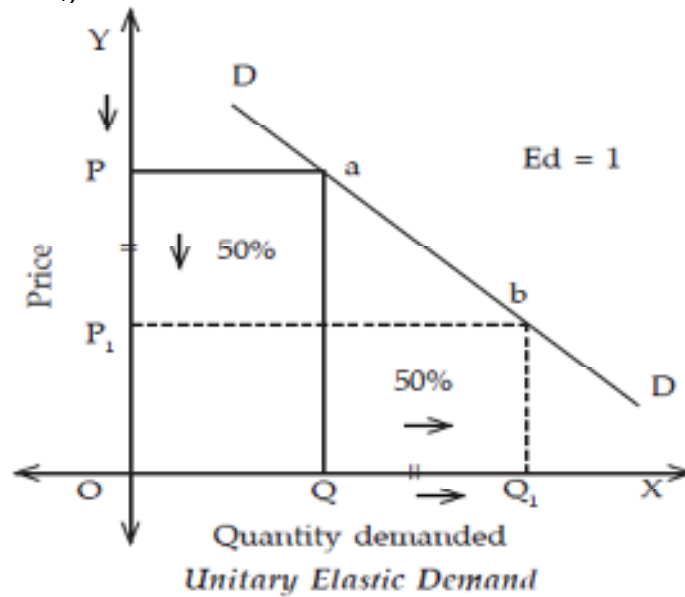**(3)**   **Unitary Elastic Demand (Unit Elasticity of Demand) (Ed = 1)**

     (a)   "When a change in the price of a commodity brings about an 'Exactly Equal' (and proportionate) change in the quantity demanded, then is said to be unitary elastic demand."

     (b)   The numeric value of co-efficient of elasticity of demand here is equal to 1.

         Here, $Ed = 1$

     (c)   The demand curve in this case is a rectangular hyperbola curve.

     (d)   In the diagram, when price falls by 50% i.e. from P to P_1, quantity demanded rises by 50% i.e. from Q to Q_1, which is in the same proportion to the change in price.

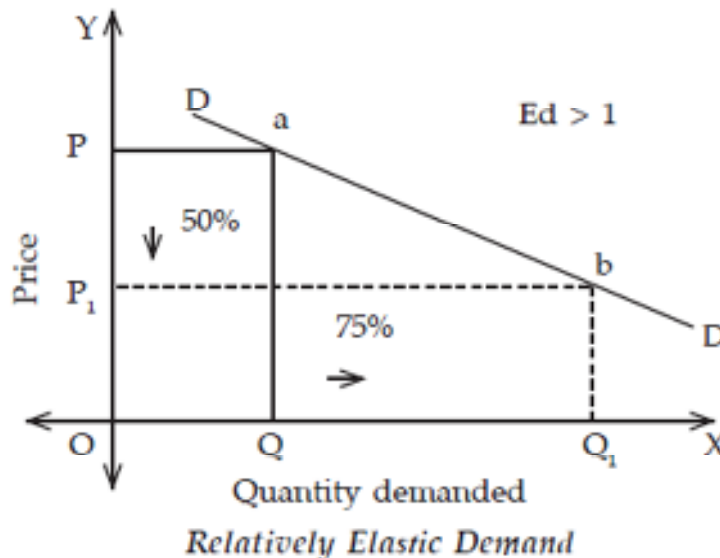$Ed = \dfrac{\%\Delta Q}{\%\Delta P}$

$= \dfrac{50\%}{50\%}$

$\therefore Ed = 1$

$(P\ P_1 = Q\ Q_1)$

Unitary Elastic Demand

(4) Relatively Elastic Demand (Ed > 1)

(a) "When a change in the price of a commodity brings about 'More Than Proportionate' change in the quantity demanded for it, then it is the case for relatively elastic demand."

(b) The change in quantity demanded is more than the change in price.
Here, Ed > 1

(c) The relatively elastic demand is represented by a gradual sloping demand curve (i.e. flatter demand curve).

(d) Relatively elastic demand does exist in real life.

Relatively Elastic Demand

(e) In the diagram when price falls by 50% i.e. from P to P_1, the demand rises by 75% i.e. from Q to Q_1.
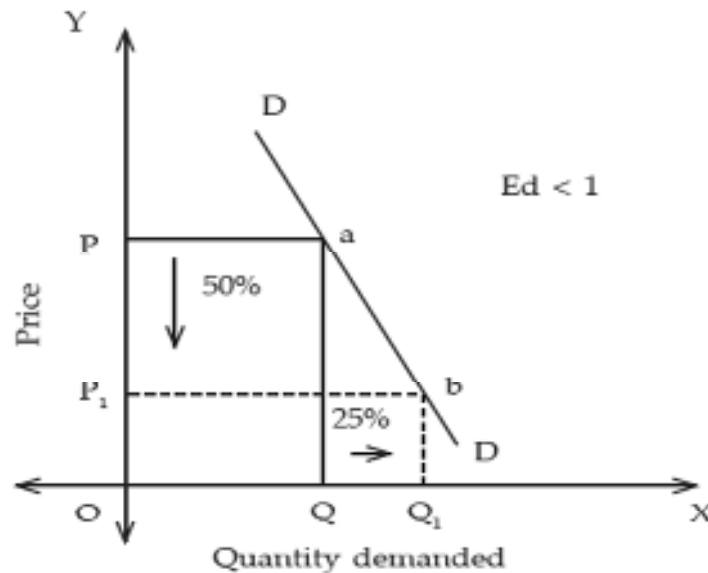
$Ed = \dfrac{\%\Delta Q}{\%\Delta P}$

$= \dfrac{75\%}{50\%}$

$\therefore Ed > 1$

$(P P_1 < Q Q_1)$

(5) Relatively Inelastic Demand (Ed< 1)

(a) "When a change in the price of a commodity brings about a less than proportionate change in the quantity demanded it is called relatively inelastic demand."

(b) The change in quantity demanded is less than the change in price.
Here, Ed < 1

(c) The relatively inelastic demand is represented by a sharply sloping (steeper) demand curve.
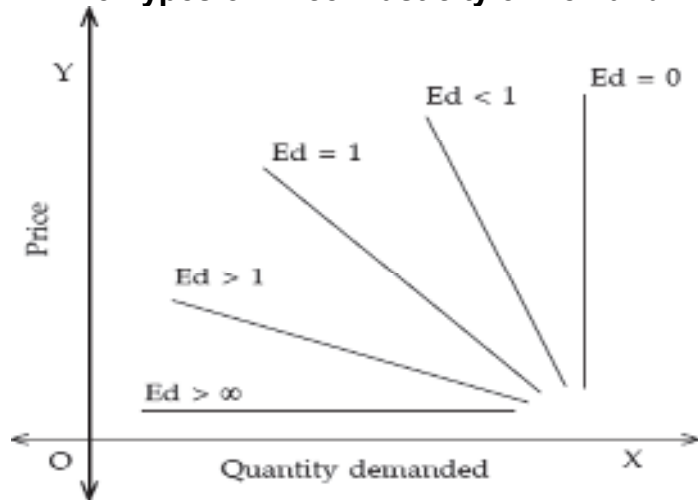
(d) Relatively inelastic demand exists in real life.

Relatively Inelastic Demand

(e) In the above diagram, when prices falls by 50% i.e. from P to P_1, the demand rises only by 25%, i.e. from Q to Q_1.
This also exists in real life.

$$Ed = \frac{\%\Delta Q}{\%\Delta P}$$

$$= \frac{25\%}{50\%}$$

∴ Ed < 1

$(P P_1 > Q Q_1)$

All 5 Types of Price Elasticity of Demand:

All 5 types of price elasticity of Demand