Microeconomics

Elasticity of Demand

What is elasticity of demand, and how is it different from Law of Demand?

Elasticity of demand measures the responsiveness of quantity demanded to a given change in price, income, or other factors. It tells us by "how much" the quantity changes when a factor changes. It gives us the "quantum" of change.

On the other hand, Law of demand states that "price is inversely related to quantity demanded, ceteris paribus." It tells us only the direction of the movement of demand with price changes.

Explain the concept of price elasticity of demand. What are its different variants?

It is defined as a degree of responsiveness of quantity demanded to a given change in the price of the commodity. In other words, it is the percentage change in quantity demanded as a result of one percent change in the price of the commodity. A formal definition of price elasticity of demand (ep) is given as:

$$ep = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

$$ep = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P} = \frac{\Delta Q}{Q} \times \frac{P}{\Delta P}$$

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Where:

Q= Original quantity demanded

P= Original price

Δ Q= Change in quantity demanded

Δ P= Change in price

It is important to note here that a minus sign (-) is generally inserted in the formula before the fraction to make the elasticity coefficient a non-negative value.

There are mainly five variants of price elasticity of demand:

1. *Perfectly inelastic* – Demand is perfectly inelastic when the elasticity is equal to zero. In this case, the demand curve is vertical. This means, regardless of the price, the quantity demanded remains the same.

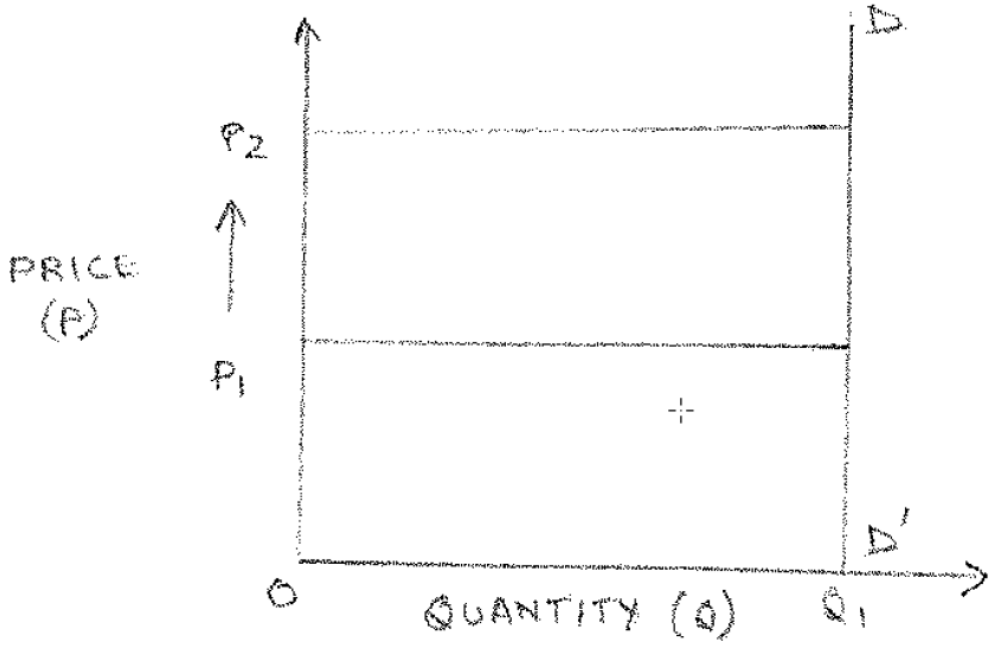

Fig 2.9 (1) Perfectly inelastic demand: Elasticity equals zero

2. *Inelastic demand* – Demand is inelastic when the elasticity is less than one. It means, one percent increase in price reduces the demand by less than a percentage. In other words, demand moves proportionately less than the price. Hence, the demand curve is steep.

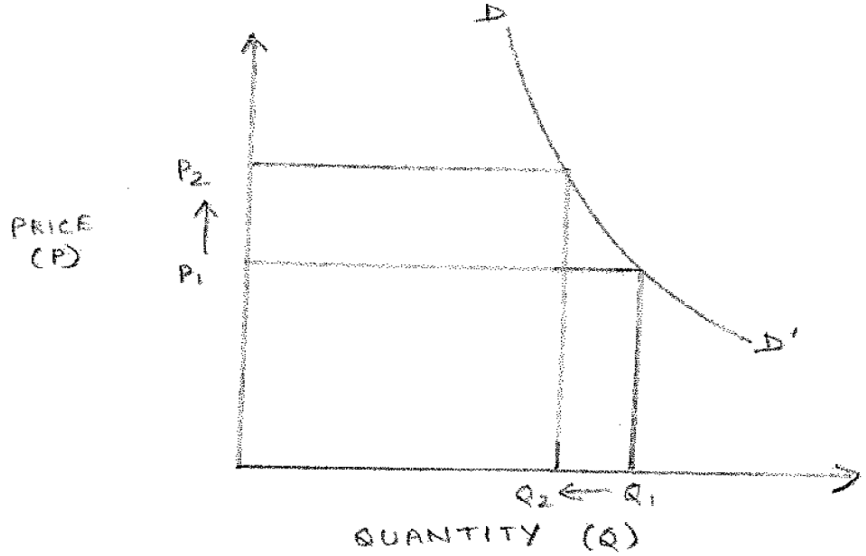

Fig 2.9 (2) Inelastic demand: Elasticity is less than one

3. *Unitary elastic* – Demand is unitary elastic when the elasticity is equal to one. It means, one percent increase in price reduces the demand precisely by a percentage. In other words, demand moves proportionately equal to the price.

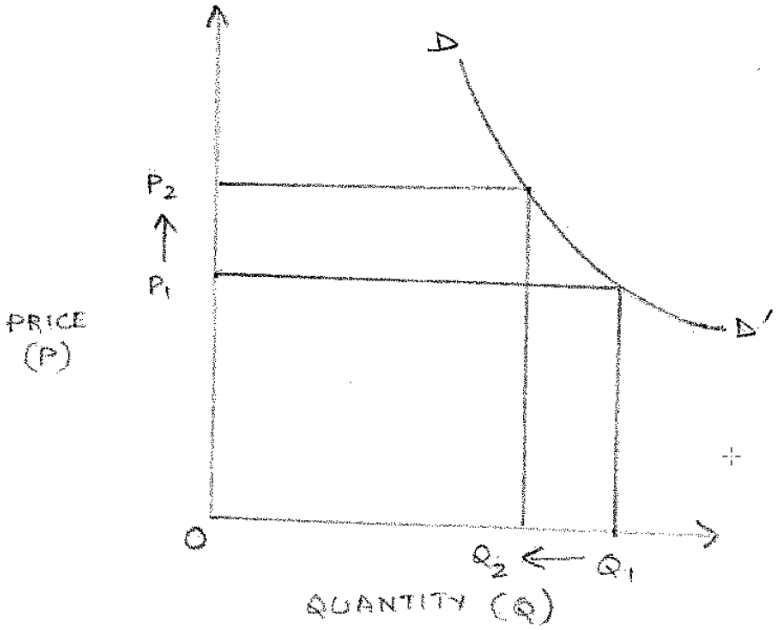

Fig 2.9 (3) Unitary elastic demand: Elasticity equals one

4. *Elastic demand* - Demand is elastic when the elasticity is more than one. It means, one percent increase in price reduces the demand by more than a percentage. In other words, demand moves proportionately more than the price. Hence, the demand curve is flatter.

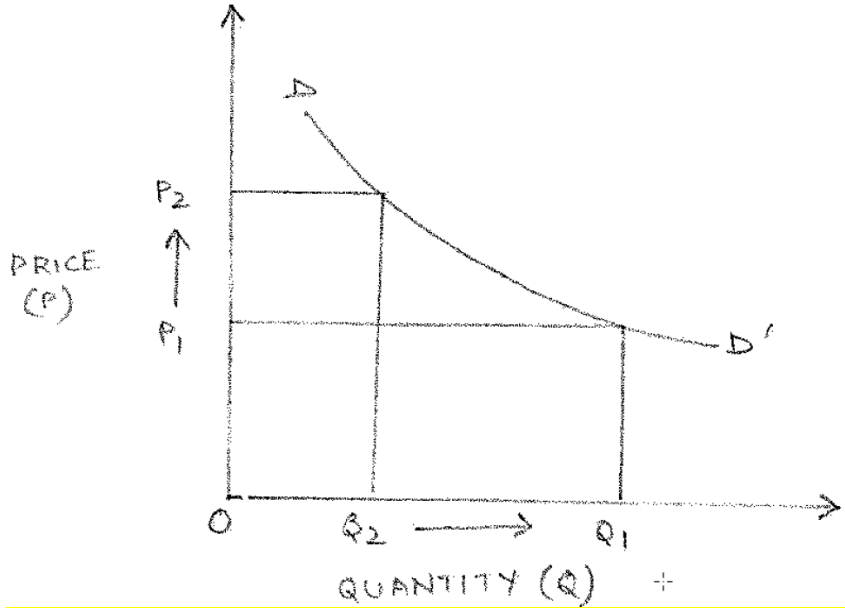

Fig 2.9 (4) Elastic demand: Elasticity greater than one

5. *Perfectly elastic* – Demand is perfectly elastic when the elasticity is equal to infinity. In this case, the demand curve is horizontal. It means minimal changes in the price lead to considerable changes in the quantity demanded.

The Fig.2.9.5 shows that at any price above P1, the quantity demanded is zero. At exactly P1, the consumers will buy any quantity of the product. At any price below P1, the quantity demanded is infinite.

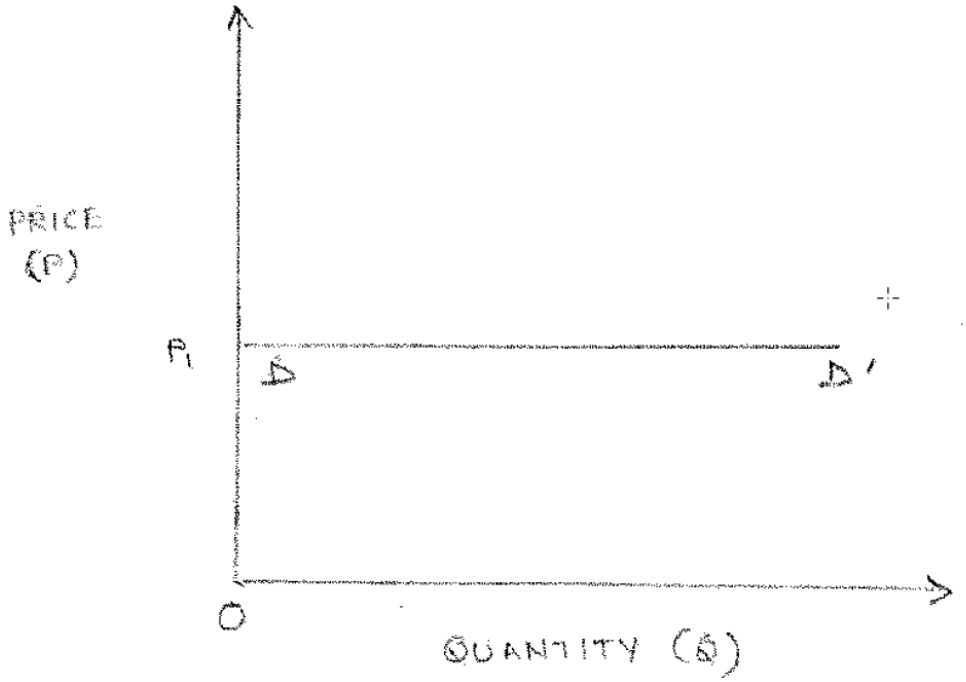

Fig 2.9 (5) Perfectly elastic demand: Elasticity equals infinity

Why is elasticity of demand important for businesses in pricing their products?

Elasticity of demand helps businesses understand how consumers will react to changes in price, allowing them to make informed pricing decisions. If demand is elastic, lowering prices may increase total revenue, while if demand is inelastic, raising prices may increase total revenue.

Discuss the implications of elastic and inelastic demand for government taxation policies.

If demand is elastic, increasing taxes may lead to a decrease in total tax revenue, as the decrease in quantity demanded due to the higher price outweighs the increase in revenue per unit. If demand is inelastic, increasing taxes may lead to an increase in total tax revenue, as the decrease in quantity demanded is proportionately less than the increase in revenue per unit.

Explain the significance of elasticity of demand in managerial decision-making.

Elasticity of demand helps managers make decisions about pricing, production, and marketing strategies. It allows them to predict how changes in factors such as price, income, or competitor actions will affect demand for their products.

What factors determine the elasticity of demand for a product?

Determinants of Price Elasticity of Demand

1. *Availability of substitutes* – One of the crucial factors determining the elasticity of demand for a commodity is the availability of its close substitutes. **The higher the degree of closeness of the substitutes, the greater the elasticity of demand for the commodity**. For example, coffee and tea can be considered as close substitutes for each other. If the price of tea increases, other things remaining constant, the price of coffee will become relatively cheaper. Therefore, consumers will buy more of coffee and less of tea. Thus, the elasticity for both these goods will be higher. Also, **the wider the range of the substitutes, the greater the elasticity.** For example, toothpaste, soaps, cooking oil are available in different brands, each brand being a close substitute for the other. Therefore, the elasticity of demand for each brand is higher than that for the generic commodity. On the other hand, sugar and salt do not have close substitutes, and hence their elasticity is lower.

2. *Nature of the commodity* – Commodities can be categorised into luxury goods, normal goods and necessity goods depending on their nature. Demand for luxury good (refrigerator) is more elastic than the demand for normal (table) or necessity (vegetables) good. It is so because consumption of luxury goods can be postponed when their price increase, but the consumption of necessity goods cannot be postponed, making their demand inelastic. Normal goods have more elastic demand than necessity goods and less elastic than luxury goods.

3. *Weightage in the total income* – One of the factors that influence the elasticity of demand is the proportion of income consumers spend on a particular commodity. If the proportion of income spent on a commodity is large, the demand will be more elastic. For example – The demand for televisions, refrigerators, air conditioners will be elastic because a substantial amount of income is spent on the purchase of these goods. So, if the price of these goods goes up, the consumers might postpone the purchase. On the other hand, if the proportion of income spent on a commodity is small, its demand is less price elastic. Classic examples of such commodities are salt, matches, books, pens, toothpaste. Demand for these goods is generally inelastic because the increase in the price of such goods does not substantially affect the consumer's budget. Therefore, consumers continue to purchase the same quantity even if their price increases.

4. *Time factor* – The price elasticity of demand also depends on the time consumers need to adjust their consumption pattern to a new price: the longer the time available, the greater the price elasticity. It is so because, over a period, consumers can adjust their expenditure patterns to price changes. For example, if the price of an air conditioner decreases, the demand for the air conditioner will not increase overnight unless people possess excess purchasing power. However, over time, people will be able to adjust their expenditure pattern so that they can buy a new air conditioner at a lower price. On the contrary, the shorter the time available, the lower the price elasticity of demand. If in the above example, the decrease in the price of the air conditioner is for a month only, the demand will not increase and will be inelastic as people will not have enough time to adjust their budget accordingly.

Now try to solve a real-world connection problem:

Problem 1.

The following data were collected to show the impact of a recent price war during which all the airlines serving the Delhi/Bangaluru market lowered their prices. Your assignment is to calculate the implied (own-price) elasticity of demand for air travel between Delhi and Bangaluru:

Passengers 12 months before price war 246,555

Passengers in 12 months after price war 1,053,139

Increase in passengers 806,584

Average one-way fare before price war Rs 86.50

Average one-way fare after price war Rs 44.69

Decrease in one-way fares Rs (-41.81)

Market revenue in 12 months before price war Rs 21,327,008

Market revenue in 12 months after price war Rs 47,064,782

Increase in market revenue Rs 25,737,774