

Managerial Economics

RAS-501

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Unit-I

Introduction of Engineering Economics and Demand Analysis:
Meaning and nature of Economics, Relation between science, engineering, technology and economics; Meaning of Demand, Determinants of Demand, Shifts in demand, Law of Demand, Price Elasticity of Demand &Types, Income Elasticity, Cross price Elasticity, Determinants of Elasticity, uses and importance of elasticity.

UNIT-01

INTRODUCTION:

What is Economics? It is a simple question to which no simple answer can be given. Modern economics originated in 1776 when Adam Smith published his classic, *An enquiry in to the Nature and Causes of Wealth of Nations*. So he is rightly called the founder- father – of modern Economics. L.M.Fraser has classified the definitions of economics into Type A and Type B. Type A definitions are related to wealth and material welfare and Type B to the scarcity of means.

Wealth and Welfare Definitions

Economics: A Science of Wealth

Adam Smith defined economics as “the science of wealth”. Adam Smith defined it as the “nature and causes of wealth of nations,” whereby it “proposes to enrich both the people and the sovereign.” Among his followers, J.B.Say in France defined economics as “the study of the laws which governs wealth.” whereas to F.A.Walker in America, “Economics in that body of knowledge which relates to wealth.”

By wealth means not only gold and silver but also all kinds of other goods- houses and public buildings, furniture, ships, workshops, tools and machines in use at time of production of goods. Economics, which is described as the “queen of social sciences”, can not be confined to wealth earning and wealth consuming activities only. Wealth has its importance, but it can not be the end of all human activities.

Economics: Science of Material Welfare (Marshall’s Definition)

It was, however, the neo classical school led by Alfred Marshall which gave economics a respectable place among social sciences. Marshall laid emphasis on man and his welfare. Wealth was regarded as the source of human welfare, not an end in itself but a means to an end.

According to Marshall, “Political economy or Economics is the study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well being. Thus it is on the one side a study of wealth; and on the other, and more important side, a part of the study of man.”

Its Criticisms

Robbins in his *Essay on the Nature and Significance of Economic Science* finds fault with Cannan’s enunciation of the welfare conception of economics on the following grounds.

1. Distinction between Material and Non material Things Faulty.
2. Economics not concerned with material welfare.
3. Contradiction
4. Concept of Economic welfare Vague.
5. Economics not a Social Science but a Human Science.
6. Welfare Definition & Classificatory and Not Analytical.

Scarcity Definitions of Robbins

According to Prof. Robbins, “Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses.” This definition is based on the following related postulates.

1. Economics is related to one aspect of human behavior, of maximizing satisfaction from scarce resources.
2. Ends or wants are scarce. When a particular want is satisfied other crop up to take its place. Multiplicity of wants make it imperative for human beings to work ceaselessly for their satisfaction but they are usable to satisfy all.
3. The obvious reason for the non satisfaction of unlimited wants is the scarcity of means at the disposal of mankind. The time and means available for satisfying these ends are scarce or limited.
4. The scarce means are capable of alternative uses. Land is capable of being used for growing rice, sugarcane, wheat, maize, etc. Likewise, coal can be made use of in factories, railways, for generation of electricity, etc. At a time, the use of a scarce resource for one end prevents it use for any other purpose.
5. The ends are of varying importance which necessarily lead to the problem of choice—of selecting the uses to which scarce resources can be put.
6. Economics is related to all kinds of behavior that involve the problem of choice. This clearly distinguish economics from technical, historical, political or other aspects.

Criticisms of Robbins’ Definition

1. Artificial Relation between Ends and Means
2. Difficult to Separate Ends from Means
3. Economics not Neutral between Ends
4. Neglects the Study of Welfare
5. Economics not merely a Positive but also a Normative Science
6. Economics concerned with Social Behavior rather than Individual Behavior
7. Fails to Analyze the Problems of Unemployment of Resources
8. Neglects the Problems of Growth and Stability.

Growth Oriented Definition

According to Prof. Samuelson, “Economics is the study of how people and society end up choosing, with or without use of the money, to employ scarce productive resources that could have alternative use to produce various commodities, over time, and distribute them for consumption, now or in the future, among various persons or groups in society. Economic analyses the costs and the benefits of improving patterns of resource use.”

Characteristics of Samuelsson’s Definitions:

1. Like Robbins, Samuelson has emphasized the problem of scarcity of resources in relation to unlimited wants. He has also accepted the alternative uses of resources.
2. Prof. Samuelson includes time element in his definition when he refers to “over time” which makes the scope of economic dynamic. Herein lies the superiority of Samuelson’s definition over that of Robbins.

3. Prof. Samuelson's definition is applicable even in a barter economy where money measurement is not possible. A barter economy has also to face the problem of scarcity of means in relation to ends.
4. He gives importance to the problems of distribution and consumption along with that of production. He emphasizes on the consumption of various commodities produced overtime and on their distribution and for future economic growth.
5. By studying the problems of growth, Prof Samuelson also highlights the study of Macroeconomics.
6. Prof. Samuelson lays stress on the use of modern technique of "Cost Benefit Analysis" to evaluate the development programme for the use of limited resources.
7. Prof. Samuelson has linked the growth aspects with scarcity of productive resources.

Nature of Economics. Is economics Science or Art?

By nature of a subject is meant whether it is a science or an art or both a science and art. The objective of the study of the nature of economics is, therefore to know whether economics is science or an art or both. And if it is a science, whether it is a positive science or a normative science.

There is also a difference of opinion among economists regarding the nature of economics. There are many economists who consider economics as science. On the other hand many economists regarded it an art. In order to reach at a conclusion about the nature of economics we must answer the following questions:

1. Is economics a science or an art?
2. Is economics a positive or a normative science?

What is Science? - Science is a systematized body of knowledge which traces the relationship between cause and effect by observation and experimentation.

Knowledge = Science

According to Prof. M. Poincare, "Science is built up of facts as a house is built up of stones; but an accumulation of facts is no more a science than a heap of stones is a house."

For any discipline to be a science:

- (i) It must be a systematized body of knowledge,
- (ii) Have its own laws and theories;
- (iii) Which can be tested by observation and experimentation;
- (iv) Can make predictions;
- (v) Be self corrective;
- (vi) Have universal validity.

If these features of science are applied to economics, it can be said that economics is a science.

Economics as a Science- Economics is a systematized body of knowledge in which economic facts are studied and analyzed in a systematic manner. For instance, economics is divided into consumption, production, exchange, distribution and public finance which have their laws and theories on whose basis these departments are studied and analyzed in a

systematic manner. Like other science, the generalizations theories or laws of economics trace out a causal relationship between two or more phenomena.

Economics is also a science because its laws possess universal validity such as the law of diminishing returns, the law of diminishing marginal utility, the law of demand, Gresham's law, etc.

Meaning of Art- Art is the practical application of scientific principles. According to J.M.Keynes, "An art is a system of rules for the attainment of given ends."

Action =Art

According to Prof. J.K.Mehta, "Knowledge is Science, Action is Art."

Economics as an Art- Science lays down certain principles while art puts these principles into practical use. To analyze the causes and effects of poverty falls within the purview of science and to lay down principles for the removal of poverty is art. Art facilitates the verification of economic theories.

As pointed out by the Italian Economist Cossa, "Art directs, art unposes, predicts or proposes rules. It solves general economic problems."

He further remarked " A Science teaches us to know, an art teaches us to do."

Conclusion- Economics is thus both a science and an art in this sense. According to Prof. Samuelson, "Economics is the oldest of the arts, the newest of sciences-indeed the queen of all the social sciences."

Scope of Economics

Economics is the social science that studies the *choices* that individuals, businesses, governments and entire societies make as they cope with *scarcity* and the *incentives* that influence and reconcile those choices.

The subject divides into two main parts

- * Microeconomics

- * Macroeconomics

Microeconomics is the study of the choices that individuals and businesses make, the way these choices interact in markets and the influence of governments. Some examples of microeconomic questions are: Why are people buying more mobile phones? How would a tax on downloading music affect the sales of CDs?

Macroeconomics is the study of the performance of the national economy and the global economy. Some examples of macroeconomic questions are: Why did production and jobs shrink in 2001? Why has Japan's economy stagnated? Can the Bank of England bring prosperity by keeping interest rates low?

An analysis of scarcity of resources and choice making poses three basic questions:

Q.1 What to produce and how much to produce?

Q.2 How to produce?

Q.3 For whom to produce?

A firm applies principles of economics to answer these questions. The first question relates to what goods and services should be produced and in what quantities. Demand theory guides the manager in the selection of goods and services for production. It analyses consumer behavior with regard to:

- Type of goods and services they are likely to purchase in the current period and in the future,
- Goods and services which they may stop consuming,
- Factors influencing the consumption of a particular good or service, and
- The effect of a change in these factors on the demand of that particular good or service.

Basic Questions & Related Concepts

Basic Questions	Related Concepts
Q1. What to produce and how much to produce?	Product decision: consumer demand, demand elasticities and demand forecasting.
Q2. How to produce?	Input-output decisions: production and cost analysis and capital budgeting.
Q3. For whom to produce?	Market segmentation decision.

Distinction between Micro and Macro Economics

The main differences between Microeconomics and Macroeconomics are the following:

1. **Importance of Letters 'I' and 'A'**- In Micro economics the letter 'I' for individuals and in Macro economics the letter 'A' for aggregate is significant. Micro economics deal with the economic behavior of individuals who are mortal, whereas Macro economics studies the economy in its totality which is immortal.
2. **Difference in the Degree of Aggregation:** Micro economics studies the individual units of economy like a firm. On the contrary Macro economics deal with aggregates like national income and total savings.
3. **Fundamental Difference:** Prof. G. Thimma named Micro economics as Price Theory and Macro economics as Income Theory.
4. **Difference in Method of Study:** In Micro economics, the assumption of 'other things being equal' or 'ceterisparibus' and the assumption of 'full employment' etc. are presumed, where these assumptions have no relevance under Macroeconomics.
5. **Difference in Subject Matter:** The subject matter of Micro economics deal with determination of price, consumer's equilibrium and welfare etc. on the other side the subject matter of Macro economics is full employment, national income, general price level, trade cycles and economic growth etc.
6. **Partial and General Equilibrium:** Micro economic method of study is known as the 'Partial Equilibrium Analysis' and Macro economic technique is called as 'General Equilibrium Analysis', because it deals with aggregates of economic analysis.
7. **Mortal and Immortal Subjects:** Micro economics deals with individuals and individuals are mortal. Man dies after passing some life time in the world. Therefore the

tool of the study of microeconomics i.e. man is mortal. On the contrary Macro economics is concerned with the aggregates. It studies the problem of whole economy. The tool of its study is society. Society never ends Man may come and may go out but the society remains forever.

8. **Metaphor of Forest:** Prof. Boulding has differentiated between two types of economic analysis with the help of a metaphor of forest. He said, “Just as the forest consists of different trees, the society is also a group of individuals. The difference between the individual and the society is similar to the difference between a tree and forest.
9. **Simple and Complex:** Micro economic analysis is simple whereas Macro economic analysis is complex.

Meaning of Science, Engineering and Technology

Meaning of Science: - Science is a systematized body of knowledge which traces the relationship between cause and effect by observation and experimentation.

Knowledge = Science

According to Prof. M. Poincare, “Science is built up of facts as a house is built up of stones; but an accumulation of facts is no more a science than a heap of stones is a house.”

From the above definition of science we can say that science must have the following features:

- (i) Science is a systematized study of a subject,
- (ii) Science establishes the relationship between cause and effect,
- (iii) The laws of science are universal,
- (iv) Experimentation and observations,
- (v) Scale of Measurement
- (vi) Be self corrective, etc.

Engineering and Technology:

The economy thrives when science and technology support the commercial interests of a country and its people. In developing nations, the lack of science and technology talent, research, the economy thrives when science and technology support the commercial interests of a country and its people. In developing nations, the lack of science and technology talent, research, development, and facilities negatively impact the economy. Since these developing nations can't compete with science and tech-laden countries, such as Switzerland or Japan, they cannot generate the same income. The importance of engineering and technology may be described as follows:

- 1) **Utilization of existing natural resources** – They provides ways for better utilization of existing natural resources.
- 2) **Increased Efficiency** – Helpful in producing more output from the same quantity of the inputs or the same amount of output can be generated by the smaller quantities of one or more of the inputs.
- 3) **Factor substitution** - Often allows the engineers to substitute one factor for another depending

upon the availability of the factors. E.g. use of plastic in place of wood.

4) Overcoming scarcity- Application of latest technology and scientific knowhow can be helpful in removing the scarcity of various goods. For example, food grains- the adoption of new technology i.e. tractors, fertilizers, high variety seeds etc. led to 'green revolution' in India.

Significance in the present context:

- 1) Basis of individual satisfaction:** Study of economics helps in securing maximum satisfaction for individuals and household's. Law of diminishing marginal utility, indifference curve analysis, consumer surplus are important laws of economics in this regard.
- 2) Demand analysis and forecasting** – A forecast of future sales serves as a guide to management for preparing production schedules and employing resources. It includes demand determinants, elasticity of demand, demand forecasting.
- 3) Cost and Production analysis-** Cost estimates and the different factors that cause variations in cost estimates help in planning. The laws of production are particularly helpful to business. E.g. an optimum factor mix in the use of the resources can be achieved through the use of the law of variable proportions.
- 4) Pricing practice and policies** – It helpful in price fixation by studying price determination in various market forms.
- 5) Profit management** – Economics gives information about nature and measurement of profits, profit policies and techniques of profit planning like break even analysis.
- 6) Analysis of external business environment-** In the modern era of economic interdependence businessman should be able to analyse the causes and effects of economic conditions not only in his own country but in the world as whole. Economics helps in it.
- 7) Helpful in determination of planning policies:** Study of economics helps in determination of planning policies for individual, a firm, an industry and a country.
- 8) Helpful in formation of taxation policy :** Study of economic laws helps government in forming a suitable taxation policy.

Managerial Economics

Meaning of Managerial Economics- Managerial Economics is a discipline that combines economic theory with managerial practice. It is concerned with the application of economic theory and methods of decision science to analyze decision making problems faced by business firms. The subject offers powerful tools and techniques for managerial policy making. The first and most important problem faced by a business firm is the choice of a product to be produced or service to be provided. The second important problem dealt within managerial economics is to decide by a firm about price and output of the commodity so as to maximize profits or to attain some other desired goals. A study of managerial economics enriches the analytical skills, helps in the logical structuring of problems, and provides adequate solution to the economic problems.

Many different definitions have been given but most of them involve the application of economic theory and methods to business decision-making. As such it can be seen as a means to an end by

managers, in terms of finding the most efficient way of allocating their scarce resources and reaching their objectives.

According to Mansfield, “Managerial Economics is concerned with the application of economic concepts and economic analysis to the problems of formulating rational managerial decisions.”

Spencer and Siegelman have defined the subject as “the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.”

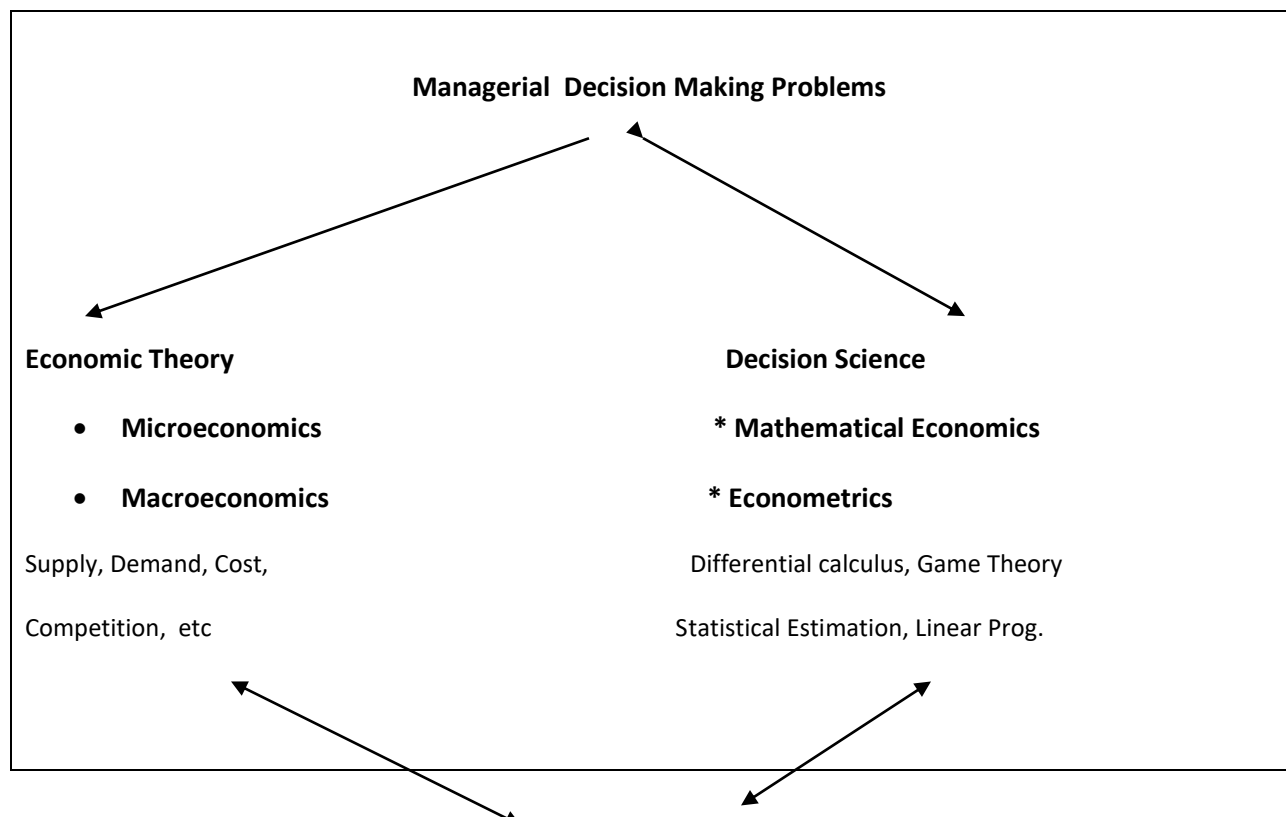
Nature of Managerial Economics

According to McNair and Meriam,” Managerial economics is the use of economic modes of thought to analyze business situation.”

A close interrelationship between management and economics has led to the development of managerial economics. Management is the guidance, leadership and control of the efforts of a group of people towards some common objective.

The science of economics is concerned with the allocation of scarce resources to alternative uses so as to achieve maximum possible satisfaction of the people. The type of decision making by managers of business firms also usually questions of resource allocation within a firm or organization. The resource at the disposal of a firm are scarce or limited. What product to be produced? What price should be fixed? How much quantity of the product should be produced?

Management Science is concerned with the allocation of scarce resources at the disposal of the firm. While economics is primarily concerned with the allocation of scarce resources so as to achieve maximum social welfare. Besides economic theory, managerial economics focus on the decision science for the techniques used for decision making.

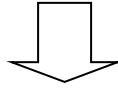


MANAGERIAL ECONOMICS

Application of Economic theory
and Quantitative techniques

to solve

Managerial Decision Problems



Optimal Managerial to Decision Making

Scope of Managerial Economics in Engineering Perspectives

Managerial Economics is concerned with the applications of economic concepts and analysis to the problem of formulating rational managerial decisions. There are four groups of problem in both decision making and forward planning.

- **Resource Planning** Scarce resources have to be used with utmost efficiency to get optimal results. These include production planning, problem of transportation etc.
- **Inventory and Queuing Problem** Inventory problems involve decision about holding of optimal levels of stock of raw material and finished goods over a period. These decisions are taken by considering demand and supply conditions. Queuing problems involves decision about installation of additional machines or hiring of extra labour in order to balance the business lost by not undertaking these activities.
- **Pricing Problems** Fixing prices for the products of the firm is an important part of the decision making process. Pricing problems involve decision regarding various methods of pricing to be adopted.
- **Investment Problems** Forward planning involves investment problems. These are problems of allocating scarce resources over time. For example, investing in new plants, how much to invest, sources of funds, etc.

The study of Managerial Economics essentially involves the analysis of certain major subjects like

- Demand Analysis and Methods of Forecasting
- Cost Analysis
- Price Theory and Policies
- Profit Analysis (B.E.P)

- Capital Budgeting
- The Business Firm and Objectives
- Competition, etc.

Managerial Economics is also concerned with the applications of engineering perspectives with the help of upgraded techniques and technology costing of the products can be minimized and helpful to the problem of formulating rational managerial decisions.

Meaning of Demand

Demand is one of the crucial requirements for the existence of any business enterprise. A firm is interested in its own profit and/or sales, both of which depend partially upon the demand for its product. The decision which management makes with respect to production, advertising, cost allocation, pricing etc. call for an analysis of demand. Demand for a commodity refers to the quantity of the commodity which an individual household is willing to purchase per unit of time at a particular price.

Demand for a commodity implies:

- (a) Desire to acquire it,
- (b) Willingness to pay for it, and
- (c) Ability to pay for it.

“Demand is effective desire. It implies three things (i) desire to purchase a thing, (ii) means for purchasing it, and (iii) willingness to use these means for purchasing it.” – Prof. Penson

“We must mean by the word of demand the quantity demanded and remember that this is not a fixed quantity but, in general various quantities according to the value.” – Prof J.S.Mill

“The demand for anything at a given price is the amount of it, which will be purchased at a time at the price.” – Prof. Benham

Various Types of Demand

Consumer Goods and Producer Goods Goods and services used for final consumption are called consumer goods. These include, goods consumed by human-beings, animals, birds etc. Producer goods refers to the goods used for production of other goods, like plant and machines, factory buildings, services of employees, raw materials etc.

Perishable and Durable Goods Perishable goods become unusable after sometimes, others are durable goods. Precisely, perishable goods are those which can be consumed only once while in durable goods, their services only are consumed. Durable goods pose more complicated problems for demand analysis than do non-durables. Sales of non-durables are made largely to meet current demands which depends on current conditions. In contrast, sales of durable goods go partly to satisfy new demand and partly to replace old items. Further, the latter set of goods are generally more expensive than the former set, and their demand alone is subject to preponement and postponement, depending on current market conditions *vis-a-vis* expected: market conditions in future.

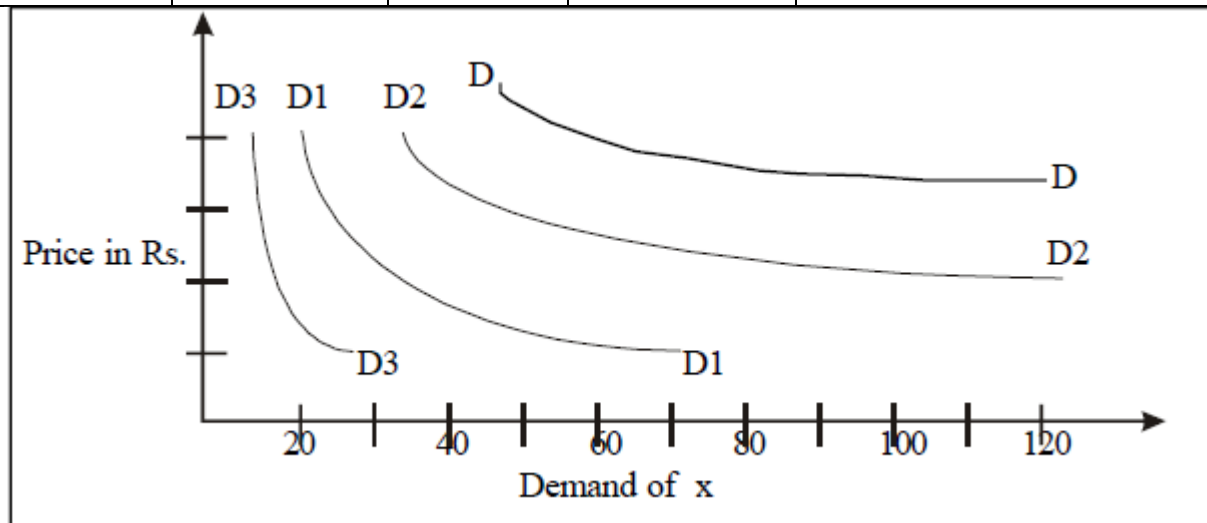
Autonomous and Derived Demand The goods whose demand is not tied with the demand for some other goods are said to have autonomous demand, while the rest have derived demand. Thus the demand for all producer goods are derived demands as they are needed to obtain

consumer or producer goods. So is money because of its purchasing power. However, there is hardly anything whose demand is totally independent of any other demand. But the degree of this dependence varies widely from product to product. Thus the autonomous and derived demand vary in degree more than in kind.

Individual's Demand and Market Demand Market demand is the summation of demand for a good by all individual buyers in the market. For example, if the market of good x has, say only three buyers then individual and market demand (monthly) could be as stated in the following table .

Qty. Demand of X

Price of X	Buyer 1	Buyer 2	Buyer 3	All Buyers Market Demand
8	5	10	0	15
7	8	12	4	24
6	12	15	7	34
5	20	19	12	51
4	30	25	20	75
3	45	30	30	105



In the above figure D1 D1 represents demand curve of buyer 1, D2 D2 of buyer 2, D3 D3 of buyer 3 and DD that of all three of them called the market demand curve. The market demand curve is thus the horizontal summation of individual demand curves. A firm would be interested in the market demand for its products while each consumer would be concerned basically with only his own individual demand.

Firm and Industry Demand

Goods are produced by more than one firm and so there is a difference between the demand facing an individual firm and that facing an industry. (All firms producing a particular good constitute an industry engaged in the production of that good). For example, Demand Analysis demand for Fiat car alone is a firm's demand and demand for all kinds of cars is industry's demand.

Demand by Market Segments and by Total Market

If the market is large in terms of geographical spread, product uses, distribution channels, customer sizes or product varieties, and if any one or more of these differences were significant in terms of product price, profit margins, competition, seasonal patterns or cyclical sensitivity, then it may be worthwhile to distinguish the market by specific segments for a meaningful analysis. In that case, the total demand would mean the total demand for the product from all market segments while a particular market segment demand would refer to demand for the product in that specific market segment.

Determinants of Demand

The demand for a commodity arises from the consumer's willingness and ability to purchase the commodity. The Demand Theory postulates that the quantity demanded of a commodity is a function of or depends on not only the price of a commodity, but also income, price of related goods—both substitutes and complements, taste of consumer, price expectation and all other factors. Demand function is a comprehensive formulation which specifies the factors that influence the demand for the product.

$$Q_d = f_x(P_x, P_r, I, A, E, T, O)$$

Where,

Q_d = Demand for item X

P_x = Price of the commodity

P_r = Price of related commodity

I = Income of consumer

E = Price expectation of the user

A = Advertisement

T = Taste or preference of user

O = all other factors.

The factors which determine the level of demand for any commodity are the following:

1. **Price** The higher the price of a commodity, the lower the quantity demanded. The lower the price, the higher the quantity demanded.
2. **Prices of other commodities** There are three types of commodities in this context
 - (a) **Substitutes**
 - (b) **Complementary commodities**
 - (c) **Unrelated goods**
3. **Income of the consumers** A rise in the consumer's income raises the demand for a commodity, and fall in his income reduce the demand for it.
4. **Price expectation of the user** If there is any expectation to change in the price of the commodity in that case quantity demanded of the commodity will increase/decrease.
5. **Taste and Preference of the Consumers** When there is a change in the taste and preference of the consumer in favour of a commodity, say due to fashion, its demand will rise, with no changes in its price, in the price of other commodities, and in the income of the consumer.
6. **Other factors** Apart from the above factors, the demand for a commodity depends on the following factors:

- (a) **Size of population** Generally, larger the size of the population of a country or a region, greater is the demand for commodities in general.
- (b) **Composition of population** If there are more old people in a region, the demand for spectacles, walking sticks, etc. will be high. Similarly, if the population consists of more of children, demand for toys, books, stationery etc. will be more.

Law of Demand

Law of Demand:-

The price demand relationship is called 'the law of demand' in economic theory. The law states, other things remaining the same, on a rise in the price of a commodity or services its demand decreases and with a fall in price the demand increases. This inverse relationship between the demand and price is known as the 'law of demand'. According to Prof. Marshall, "The greater the amount is to be sold, the smaller must be the price at which it is offered in order that it may find purchasers, or in other words, the amount demanded increases with a fall in price and diminishes with a rise in price."

According to Ferguson, "According to the law of demand, the quantity demanded varies inversely with price."

Example: The following table shows the relationship between the price and demand for oranges in a market:

Prices of Oranges (Rs. Per Kg.)	Qty. demanded for Oranges
5	10
4	15
3	20
2	25
1	35

It is apparent from the above table that as the price of oranges is falling down their demand is rising. When the price of oranges is Rs. 5 per kg its qty. demanded is 10 kg. and when the price is Rs. 1 per kg. its qty. demanded is 35 kg. this thing shows the inverse relationship between the quantity demanded and prices of oranges.

Assumptions of the law of demand

According to Prof. Meyer the law of demand is based upon the following assumptions:

- The income of the consumers remain constant.
- No change in the nature and preference of the consumers
- No change in the price of the related goods.
- A new substitute of the commodity must also not be invented.
- No expectation of changing the price in near future.
- The commodity should also not be a prestigious one.

Exceptions to the law of demand

The law of demand does not apply in every case and situation. The circumstances when the law of demand becomes ineffective are known as exceptions of the law. Some of these important exceptions are as under.

1. Giffen goods: Some special varieties of inferior goods are termed as Giffen goods. Cheaper varieties of this category like bajra, cheaper vegetable like potato come under this category. Sir Robert Giffen of Ireland first observed that people used to spend more their income on inferior goods like potato and less of their income on meat. But potatoes constitute their staple food. When the price of potato increased, after purchasing potato they did not have so many surpluses to buy meat. So the rise in price of potato compelled people to buy more potato and thus raised the demand for potato. This is also known as Giffen paradox.

2. Prestigious goods (Conspicuous Consumption): This exception to the law of demand is associated with the doctrine propounded by Thorsten Veblen. A few goods like diamonds etc are purchased by the rich and wealthy sections of the society. The higher the price of the diamond the higher the prestige value of it. So when price of these goods falls, the consumers think that the prestige value of these goods comes down. So quantity demanded of these goods falls with fall in their price.

3. Conspicuous necessities: Certain things become the necessities of modern life. So we have to purchase them despite their high price. The demand for T.V. sets, automobiles and refrigerators etc. has not gone down in spite of the increase in their price. These things have become the symbol of status. So they are purchased despite their rising price.

4. Ignorance: A consumer's ignorance is another factor that at times induces him to purchase more of the commodity at a higher price. This is especially so when the consumer is haunted by the phobia that a high-priced commodity is better in quality than a low-priced one.

5. Emergencies: Emergencies like war, famine etc. negate the operation of the law of demand. At such times, households behave in an abnormal way. Households accentuate scarcities and induce further price rises by making increased purchases even at higher prices during such periods. During depression, on the other hand, no fall in price is a sufficient inducement for consumers to demand more.

6. Future changes in prices: When the prices are rising households tend to purchase large quantities of the commodity out of the apprehension that prices may still go up. When prices are expected to fall further, they wait to buy goods in future at still lower prices. So quantity demanded falls when prices are falling.

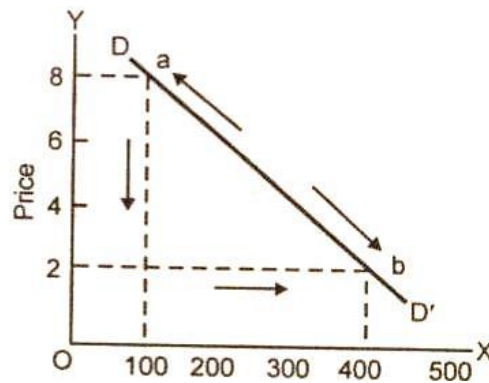
7. Change in fashion: A change in fashion and tastes affects the market for a commodity. When a broad toe shoe replaces a narrow toe, no amount of reduction in the price of the latter is sufficient to clear the stocks. Broad toe on the other hand, will have more customers even though its price may be going up.

Shifts in demand Curve

Movement along a demand curve

There is movement along a demand curve when a change in price causes the quantity demanded

to change. Movements along a demand curve happen only when the price of the good changes. When, as a result of change in price, the quantity demanded increases or decreases, it is technically called extension and contraction in demand. Extension in demand is due to reduction in price. Increase in demand occurs due to changes in factors other than price.



Here the price of a commodity falls from Rs. 8 to Rs. 2. As a result, therefore, the quantity demanded increases from 100 units to 400 units per unit of time. There is extension in demand by 300 units. This movement is from one point price quantity combination (a) to another point (b) along a given demand curve. On the other hand, if the price of a good rises from Rs. 2 to Rs. 8, there is contraction in demand by 300 units.

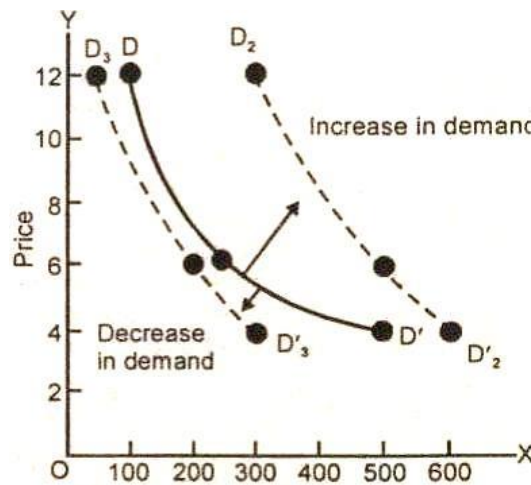
We, thus, see that as a result of change in the price of a good, the consumer moves along the given demand curve. The demand curve remains the same and does not change its position.

Shifts in Demand Curve:

Demand, as we know, is determined by many factors. When there is a change in demand due to one or more than one factors other than price, results in the shift of demand curve.

For example, if the level of income in community rises, other factors remaining the same, the demand for the goods increases. Consumers demand more goods at each price per time period (rise or Increase in demand). The demand curve shifts upward from the original demand curve indicating that consumers at each price purchase more units of commodity per unit of time.

If there is a fall in the disposable income of the consumers or rise in the prices of close substitute of a good or decline in consumer taste or non-availability of good on credit etc., there is a reduction in demand (fall or decrease in demand). The fall or decrease in demand shifts the demand curve from the original demand curve to the left. The lower demand curve shows that consumers are able and willing to buy less of the good at each price than before.



At a price of Rs.12 per unit, consumers purchase 100 units. When price falls to Rs.4 per unit, the quantity demanded increases to 500 units per unit of time. Let us assume now that level of income increases in a community. Now consumers demand 300 units of the commodity at price of Rs.12 per unit and 600 at price of Rs.4 per unit.

As a result, there is an upward shift of the demand curve DD^2 . In case the community income falls, there is then decrease in demand at price of Rs.12 per unit. The quantity demanded of a good falls to 50 units. It is 300 units at price of Rs.4 unit per period of time. There is a downward shift of the demand to the left of the original demand curve.

Law of Diminishing Marginal Utility

The market demand curve for a commodity is derived by adding the individual's demand curves for the commodity. We also saw that each individual's (and thus the market) demand curve for a commodity is downward sloping because of the substitution and income effects. However, an individual demands a particular commodity because of the satisfaction, or utility, he or she receives from consuming it. The more units of a commodity the individual consumes per unit of time, the greater is the total utility he receives. Although total utility increases, the extra, or marginal, utility received from consuming each additional unit of the commodity decreases. This is referred to as the *law of diminishing marginal utility*.

Marshall, who was the exponent of the marginal utility analysis, stated the law as follows:

"The additional benefit which a person derives from a given increase in stock of a thing diminishes with every increase in the stock that he already has."

Put in other words, it means other things being equal, as the consumer has more and more of a commodity; the extra utility (satisfaction) which he derives from an additional unit of commodity goes on falling. The more we have, the less importance we attach to successive units of consumption.

It is important however, to bear in mind the qualification, 'other things being equal' since the law may not hold if factors other than the consumption are changing.

The assumptions are as follows:

1. First it is assumed that successive units consumed are homogenous. If a consumer is consuming chocolates, all bars of chocolates must be identical in size, & quality etc.
2. The consumption of successive units should not affect the consumer's basic attitude towards them.

3. There should not be any time gap or interval between the consumption of one unit and another unit.
4. The taste of consumer should remain constant. The law may not hold to articles like rare stamps' collection, metallic or cash.

Example For purposes of illustration, we assume in the following table that satisfaction can actually be measured in terms of units of utility called utils. The first two columns of the following table give an individual's hypothetical total utility (TU) schedule from consuming various quantities of commodity X (say oranges) per unit of time.

(1) q_x	(2) TU_x	(3) MU_x
0	0	10
1	10	8
2	18	6
3	24	4
4	28	2
5	30	

Note that as the individual consumes more units of X, TU_x increases. Columns 1 and 3 of the table give this individual's marginal utility (MU) schedule for commodity X. Each value of column 3 is obtained by subtracting two successive values of column 2. For example, if the individual's consumption of X rises from 1 unit to 2 units, TU_x rises from 10 to 18, and the MU of the second unit of X is 8.

Remember Utility models can be used to predict how consumers will act even if the consumers do not specifically think in terms of units of utility.

Elasticity of Demand

The law of demand states the relationship between the price and quantity demanded. However, it does not tell anything about the extent of change in demand due to a change in price. In case of some commodities the change in demand is much greater than the change in price while in other cases it can be quite less also. The responsiveness of demand to change in any one of its determining factors is called the elasticity of demand. The concept of elasticity of demand was first developed by Prof. Marshall to analyze the quantitative aspect of the responsiveness of demand due to change in any one of the determining factors of demand. However, in practice it is used to assess the impact of price variation on the demand because price is the most important factors which brings about a change in the quantity demanded.

Elasticity of Demand

The demand for a commodity is influenced by many factors. Hence, there may be elasticity of demand of each factor but out of these, the effect of many such factors may be negligible. Hence, in practice, the effect of only those factors on elasticity of demand is measured which have

significant effect on the demand of the commodity. On this basis, elasticity of demand is classified as under:

- Price elasticity of demand
- Income elasticity of demand
- Cross elasticity of demand
- Advertisement of Promotional elasticity of demand
- Demand elasticity of substitution

Price Elasticity of Demand

The elasticity of demand is the degree of responsiveness of demand to change in price. In other words, it equals the percentage change in the quantity demanded divided by the percentage changes in the price of the product. It explains the quantitative aspect of price demand relationship. It provides the measurement of change in demand due to a small change in price.

According to Prof. Marshall, “The elasticity (or responsiveness) of demand in a market is great or small according as the amount demanded increase much or little for a given fall in price, diminishes much or little for a given rise in price.”

In the words of Prof. Boulding, “The elasticity of demand may be defined as the percentage change in the quantity demanded which would result from one percent change in price.”

It is measured with help of the following formula:

$$\text{Price Elasticity} = \frac{\text{Proportionate change in quantity}}{\text{Proportionate change in price}}$$

Or,

$$E_p = \frac{\Delta Q_x / Q_x}{\Delta P_x / P_x}$$

Since price and quantity are inversely related, price elasticity is always negative. But for comprehending the values of elasticity we normally ignore the negative sign and consider the numerical values only. Thus, if a 2% increase in the price of steel is associated with 1% decrease in the quantity of steel demanded and 2% increase in the price of coal is associated with 2% decrease in the quantity of coal demanded, we get elasticity of steel and coal as half and one respectively, showing the coal is more elastic than steel. But if we have considered the minus sign then we would have concluded that steel is more elastic than coal [Since minus half is greater minus one] which is not correct.

Degrees or Types of Price Elasticity of Demand

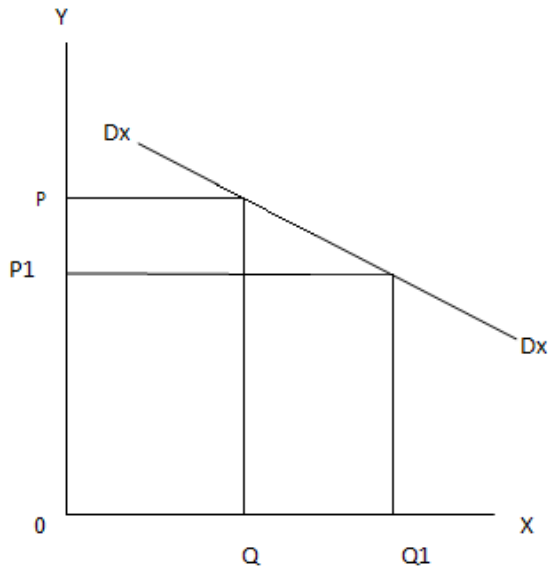
The price changes affect the demand for different commodities differently; accordingly the elasticity of demand is divided into five categories. Which are as follows:

1. Elastic Demand
2. Inelastic Demand
3. Unit Elastic Demand
4. Perfectly Elastic Demand
5. Perfectly Inelastic Demand

Elastic Demand

When the changes in the qty. demand for a commodity is more than the proportionate change in its price then the demand for that commodity is said to be elastic demand.

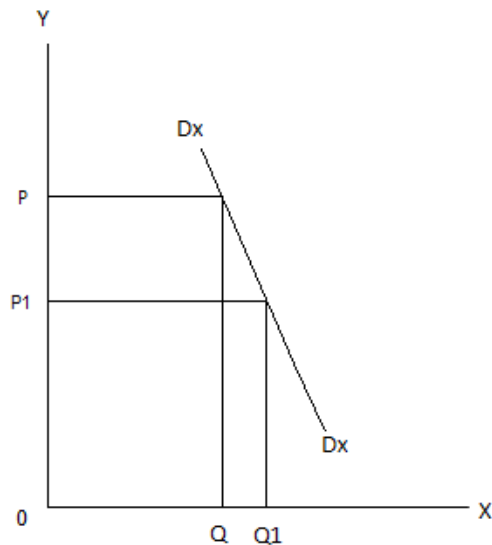
Example: If a 10% fall in the price of oranges increase its demand by 20% then the demand for oranges will be termed as elastic demand. Mathematically, it is expressed as $E_p > 1$. It can be explained with the help of the following figure:



Inelastic Demand

When the changes in the qty. demand for a commodity is less than the proportionate change in its price then the demand for that commodity is said to be inelastic demand.

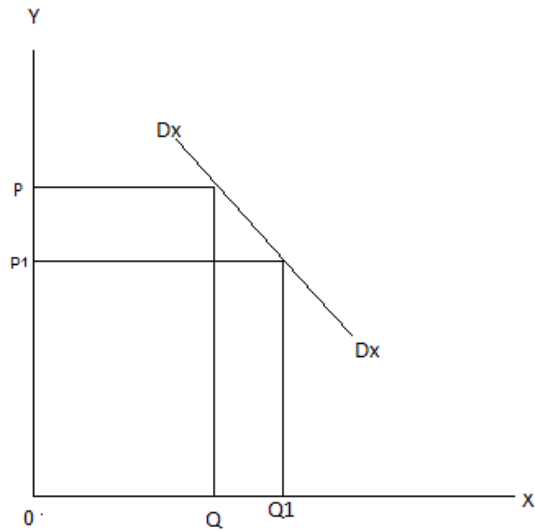
Example: If a 10% fall in the price of steel increase its demand by 5% then the demand for steels will be termed as inelastic demand. Mathematically, it is expressed as $E_p < 1$. It can be explained with the help of the following figure:



Unit Elastic Demand

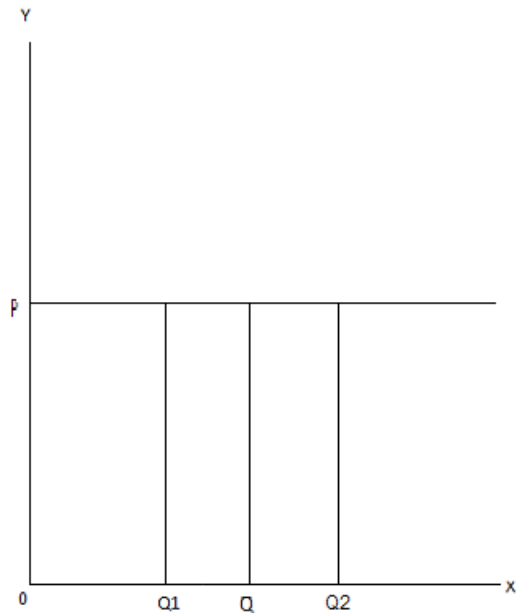
When the changes in the qty. demand for a commodity is equal to the proportionate change in its price then the demand for that commodity is said to be unit elastic demand.

Example: If a 10% fall in the price of coffee increase its demand by 10% then the demand for coffee will be termed as unit elastic demand. Mathematically, it is expressed as $E_p=1$. It can be explained with the help of the following figure:



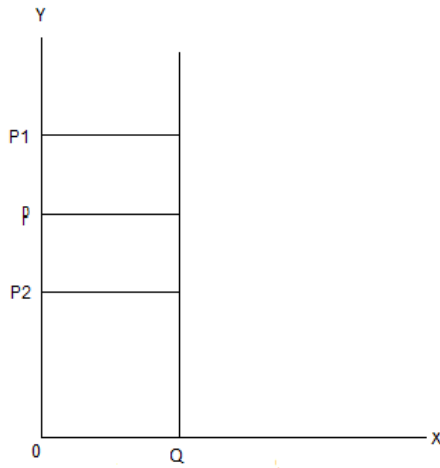
Perfectly Elastic Demand

When a negligible or no changes in the price brings about a very large or infinite change in quantity demanded then the demand for such a commodity is said to be perfectly elastic demand. Mathematically, it is expressed as $E_p = \infty$. It can be explained with the help of the following figure:



Perfectly Inelastic Demand

It is just opposite to the former one in this case the demand remains unaffected by the price movements. Mathematically, it is expressed as $E_p=0$. This category of price elasticity is also purely hypothetical and has only a theoretical significance.



Income Elasticity

Income elasticity of demand is the rate at which quantity bought changes, as a result of change in the income of the consumer, other things being equal. It shows how the quantity demanded will change, when the income of the consumer changes, other things remaining constant.

According to Watson, “Income elasticity of demand means the ratio of the percentage change in the quantity demanded to the percentage change in income.”

In the words of Richard G. Lipsey, “The responsiveness of demand to changes in income is termed as income elasticity of demand.”

Measurement of Income Elasticity

$$E_y = \frac{\text{Proportionate change in the qty. demand}}{\text{Proportionate change in the income}}$$

Or,

$$E_y = \frac{\Delta Q/Q}{\Delta Y/Y}$$

Where,

Y = Original income

ΔY = Change in the income

Q = Original quantity demanded

ΔQ = Change in the quantity demanded

Example: A numerical example will explain the concept further. Let a household demands 30 litres of milk per month when his income is Rs. 3000. If the household’s income increases to Rs.

5000, his demand for milk increases to 40 litres per month. The income elasticity of demand will be measured as follows:

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

$$= \frac{10}{2000} \times \frac{3000}{30}$$

$$= 0.50$$

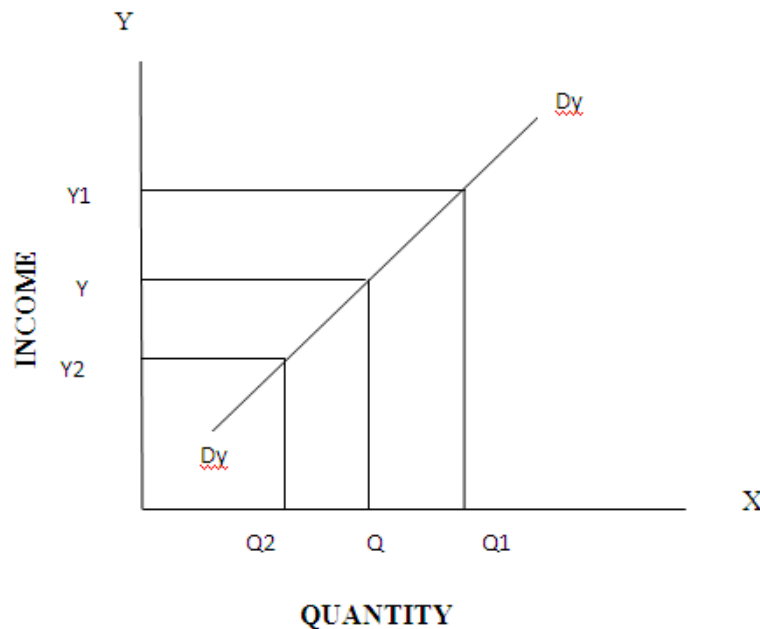
Hence, households demand for milk is income inelastic

Types of Income Elasticity of Demand

Income elasticity of demand is of three types:

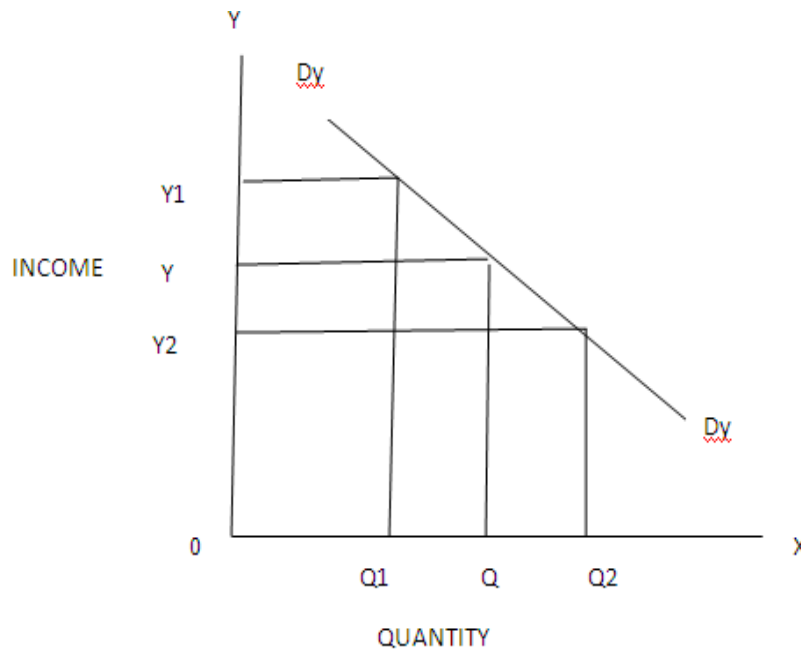
1. **Positive Income Elasticity of Demand** When the amount demanded of a commodity increases with an increase in income of the consumer and decreases with a decrease in income, the income elasticity of demand is positive.

Income elasticity of demand is positive in case of normal goods. Symbolically, it can be represented as $E_y > 0$. It can be explained with the help of the following figure



2. **Negative Income Elasticity of Demand** When the amount demanded of a commodity diminishes with an increase in income of the consumer and increases with a decrease in income, the income elasticity of demand is said to be negative.

Income elasticity of demand is negative in case of inferior goods known as Giffen goods. Symbolically, it can be represented as $E_y < 0$. It can be explained with the help of the following figure



3. **Zero Income Elasticity of Demand** When the qty. demanded of a commodity does not respond to changes in income of the consumer, the income elasticity of demand is zero. **Generally**, goods which are cheap and important like salt, post card, newspapers, candles, buttons, kerosene etc. the demand is completely inelastic. Symbolically, it can be represented as $E_y = 0$. It can be explained with the help of the following figure

Degree of Income Elasticity of Demand

There are three degrees of income elasticity of demand:

1. **Income Elasticity of Demand Equal to Unity** Income elasticity of demand is unitary when a given percentage changes in demand is equal to percentage change in income. For example if income changes by 100% and demand also changes by 100%. Thus,

$$E_y = \frac{100\%}{100\%} = 1 \text{ (Unity)}$$
2. **Income Elasticity of Demand More than Unity** Income elasticity of demand is more than unity when a given percentage changes in demand is more than percentage change in income. For example if income changes by 100% and demand changes by 200%. Thus,

$$E_y = \frac{200\%}{100\%} = 2 \text{ (Greater than Unity)}$$

3. **Income Elasticity of Demand Less than Unity** Income elasticity of demand is less than unity when a given percentage changes in demand is less than percentage change in income. For example if income changes by 100% and demand just changes by 50%. Thus,

$$E_y = \frac{50\%}{100\%} \\ = 0.50 \text{ (Less than Unity)}$$

Cross Elasticity of Demand

Meaning of Cross Elasticity of Demand

When the demand for a commodity changes with a change in the price of another related commodity, the case is of cross demand. Cross elasticity of demand is the rate at which quantity bought of X commodity changes, as a result of changes in price of Y commodity, other things being equal.

In other words, cross elasticity of demand measures the responsiveness of demand for a commodity, say tea, when the price of other related commodity, say coffee changes by a small amount.

The concept of cross elasticity was initially evolved by Mr. Moore in his famous book ‘Synthetic Economics’.

According to R.G.Lipse, “Cross elasticity of demand is the responsiveness of demand for good ‘A’ to changes in the price of good ‘B’.”

In the words of Leibhafs, “The cross elasticity of demand is a measure of responsiveness of purchase Y to change in the price of X.”

According to Ferguson, “The cross elasticity of demand is the proportional change in the quantity of X good demanded resulting from a given relative change in the price of the related good.”

Measurement of Cross Elasticity of Demand

Cross elasticity of demand can be measured with the help of the following formula:

$$E_c = \frac{\text{Proportionate change in the demand of good 'X'}}{\text{Proportionate change in the price of good 'Y'}}$$

Writing in symbols:

$$E_c = \frac{\Delta Q_x / Q_x}{\Delta P_y / P_y}$$

Or

$$E_c = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

Where,

P_y = Original price of good Y

ΔP_y = Change in the price of good ‘Y’

Q_x = Original quantity demanded of good ‘X’

ΔQ_x = Change in the quantity demanded of good ‘X’

Example: A numerical example will explain the concept further. Let the price of coffee per cup rises from Rs. 2.00 to Rs. 3.00 as a result, consumer demand for tea, an immediate substitute rises from 100 cups to 200 cups. Then the cross elasticity of demand of tea for coffee can be calculated as follows:

$$\Delta Q_x = 200 - 100 = 100 \text{ cups}$$

$$Q_x = 100 \text{ cups}$$

$$\Delta P_y = 3.00 - 2.00 = \text{Rs. } 1.00$$

$$P_y = \text{Rs. } 2.00$$

$$\begin{aligned} E_c &= \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x} \\ &= \frac{100}{100} \times \frac{2}{1} \\ &= 2 \end{aligned}$$

Use of concept of Elasticity of Demand in Managerial Decisions

The concept of the elasticity of demand is of major significance in different areas of economics. It has practical applications in managerial decision making also. In this regard Lord Keynes has said that the biggest contribution of Marshall had been the theory of elasticity of demand without which it would not have been possible to analyze the theories of values and distribution. The important aspects of its practical significance are as follows:

1. Useful in managerial decision making: Decision making is the most important function of a manager. The concept of elasticity of demand is very useful in the performance of various functions. Following are the main aspect of use

- **Helpful in price determination.**
- **Price determination under monopoly.**
- **In case of price discrimination.**
- **Dumping.**
- **Price determination in joint supply.**
- **Pricing of factors of production.**
- **Basis of promotional elasticity.**
- **From protection point of view.**

2. Importance to the government:

- **Guiding in taxation**
- **Helpful in determining the tax burden.**
- **Helpful in formulation of economic policy.**
- **Helpful in the determination of public utilities.**

3. Other importance

- **Helpful in the determination of foreign exchange rate.**
- **Importance in international trade.**
- **Importance in transport industry.**
- **Importance at the time of law of increasing returns.**