

MEFA- Syllabus

| | | | | | | |
|--|--|----------|-----|---|---|---|
| Course Code | MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (Common to All branches of Engineering) | | L | T | P | C |
| 20A52301 | | | 3 | 0 | 0 | 3 |
| Pre-requisite | NIL | Semester | III | | | |
| Course Objectives: | | | | | | |
| <ul style="list-style-type: none">To inculcate the basic knowledge of micro economics and financial accountingTo make the students learn how demand is estimated for different products, input-outputrelationship for optimizing production and costTo Know the Various types of market structure and pricing methods and strategyTo give an overview on investment appraisal methods to promote the students to learn how toplan long-term investment decisions.To provide fundamental skills on accounting and to explain the process of preparing financialstatements | | | | | | |
| Course Outcomes (CO): | | | | | | |
| <ul style="list-style-type: none">Define the concepts related to Managerial Economics, financial accounting and management.Understand the fundamentals of Economics viz., Demand, Production, cost, revenue andmarketsApply the Concept of Production cost and revenues for effective Business decisionAnalyze how to invest their capital and maximize returnsEvaluate the capital budgeting techniquesDevelop the accounting statements and evaluate the financial performance of business entity. | | | | | | |
| UNIT - I | Managerial Economics | | | | | |
| Introduction – Nature, meaning, significance, functions, and advantages. Demand-Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governingForecasting, Methods. Managerial Economics and Financial Accounting and Management. | | | | | | |
| UNIT - II | Production and Cost Analysis | | | | | |
| Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least-cost combination– Short run and Long run Production Function- Isoquants and Isocosts, MRTS - Cobb-Douglas Production Function - Laws of Returns - Internal and External Economies of scale. Cost& Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)-Managerial significance and limitations of Break-Even Analysis. | | | | | | |
| UNIT - III | Business Organizations and Markets | | | | | |
| Introduction – Nature, meaning, significance, functions and advantages. Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition–Oligopoly-Price-Output Determination - Pricing Methods and Strategies | | | | | | |
| UNIT - IV | Capital Budgeting | | | | | |
| Introduction – Nature, meaning, significance, functions and advantages. Types of Working Capital, Components, Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features, Proposals, Methods and Evaluation. Projects – Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems) | | | | | | |
| UNIT - V | Financial Accounting and Analysis | | | | | |

Introduction – Nature, meaning, significance, functions and advantages. Concepts and Conventions- Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). **Financial Analysis** - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Textbooks:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2013.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH, 2019

Reference Books:

1. Ahuja H I Managerial economics Schand, 3/e, 2013
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International, 2013.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2013.

Online Learning Resources:

<https://www.slideshare.net/123ps/managerial-economics-ppt>
<https://www.slideshare.net/rossanz/production-and-cost-45827016>
<https://www.slideshare.net/darkyla/business-organizations-19917607>
<https://www.slideshare.net/balarajbl/market-and-classification-of-market>
<https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396>
<https://www.slideshare.net/ashu1983/financial-accounting>

UNIT-I

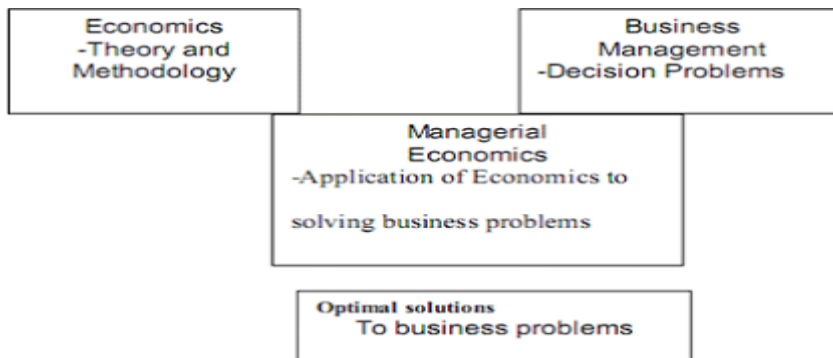
INTRODUCTION TO MANAGERIAL ECONOMICS

Definition of Managerial Economics:

According to Spencer and Siegelman have defined Managerial Economics as "The integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management."

According to McNair and Meriam, "Managerial Economics consists of the use of economic modes of thought to analyze business situation."

Economics, Business Management and Managerial Economics.



Nature/Characteristics of Managerial Economics:

1. Close to Micro-Economics: Managerial economics in character as it is concerned with smaller units of the economy. It studies the problems and principles of an individual business firm or an individual industry. It assists the management in forecasting and evaluating the trends of market.

2. **Macro touch:** Managerial economics also uses macro-economics to analysis and understand the general business environment in which the business firm must operate.
3. **Prescriptive rather than descriptive:** Managerial economics is a normative and applied discipline. It suggests the application of economic principles with regard to policy formulation, decision making and future planning. It not only describes the goals of an organization but also prescribes the means of achieving these goals.
4. **Managerial economics is pragmatic:** It is concerned with practical problems and results. It has nothing to do with abstract economic theory which has no practical application to solve the problems faced by business firms. It considers the particular environment of decision-making and not general one.
5. **Applied in Nature:** Models are built to reflect the real life complex business situations and these models are of immense help to managers for decision making the different areas where models are extensively used include inventory control optimization, project management etc.
6. **Offers scope to evaluate each alternative** - Managerial economics an opportunity to evaluate each alter native in terms of its cost and revenue. The managerial economist can decide which is the better alternative to maximize the profits for the firm.
7. **Interdisciplinary:** the concepts and tools of Managerial economics are drawn from economics, management, mathematics, statistics, accountancy, psychology etc.
8. **Assimilations and limitations:** Every concepts and theory of Managerial economics is based on certain assumptions therefore validity is not universal.

Scope of Managerial Economics: (Functions)

1. Demand Analysis and Forecasting
2. Cost and Production Analysis
3. Pricing Decisions, Policies and Practices

4. Profit Management

5. Capital Management

These divisions of business economics constitute its subject matter.

Recently, managerial economists have started making increased use of Operation Research methods like Linear programming, inventory models, Games theory, queuing up theory etc., have also come to be regarded as part of Managerial Economics.

1. Demand Analysis and Forecasting: A business firm is an economic organisation which is engaged in transforming productive resources into goods that are to be sold in the market. A major part of managerial decision making depends on accurate estimates of demand. A forecast of future sales serves as a guide to management for preparing production schedules and employing resources. It will help management to maintain or strengthen its market position and profit base. Demand analysis also identifies a number of other factors influencing the demand for a product. Demand analysis and forecasting occupies a strategic place in Managerial Economics.

2. Cost and production analysis: A firm's profitability depends much on its cost of production. A wise manager would prepare cost estimates of a range of output, identify the factors causing or cause variations in cost estimates and choose the cost-minimizing output level, taking also into consideration the degree of uncertainty in production and cost calculations. Production processes are under the charge of engineers but the business manager is supposed to carry out the production function analysis in order to avoid wastages of materials and time. Sound pricing practices depend much on cost control. The main topics discussed under cost and production analysis are: Cost concepts, cost-output relationships, Economics and Diseconomies of scale and cost control.

3. Pricing decisions, policies and practices: Pricing is a very important area of Managerial Economics. In fact, price is the genesis of the revenue of a firm and as such the success of a business firm largely depends on the correctness of the price decisions taken by it. The important aspects dealt with this area are: Price determination in various market forms, pricing methods, differential pricing, product-line pricing and price forecasting.

4. **Profit management:** Business firms are generally organized for earning profit and in the long period, it is profit which provides the chief measure of success of a firm. Economics tells us that profits are the reward for uncertainty bearing and risk taking. A successful business manager is one who can form more or less correct estimates of costs and revenues likely to accrue to the firm at different levels of output. The more successful a manager is in reducing uncertainty, the higher are the profits earned by him. In fact, profit-planning and profit measurement constitute the most challenging area of Managerial Economics.

5. **Capital management:** The problems relating to firm's capital investments are perhaps the most complex and troublesome. Capital management implies planning and control of capital expenditure because it involves a large sum and moreover the problems in disposing the capital assets off are so complex that they require considerable time and labour. The main topics dealt with under capital management are cost of capital, rate of return and selection of projects.

Importance of managerial economics:

The following points indicate the significance of the study of this subject in its right perspective:

1. It gives guidance for identification of key variables in decision-making process.
2. It helps the business executives to understand the various intricacies of business and managerial problems and to take right decisions at the right time.
3. It provides the necessary conceptual, technical skills, toolbox of analysis and techniques of thinking and other such modern tools and instruments like elasticity of demand and supply, cost and revenue, income and expenditure, profit and volume of production, etc to solve various business problems.
4. It is both a science and an art. In the context of globalization, privatization, liberalization and marketization and a highly competitive dynamic economy, it helps in identifying various business and managerial problems, their causes and

- consequence, and suggests various policies and programmes to overcome them.
5. It helps the business executives to become much more responsive, realistic and competent to face the dynamic challenges in the modern business world.
 6. It helps in the optimum use of scarce resources of a firm to maximize its profits.
 7. It also helps in achieving other objectives a firm likes attaining industry leadership, market share expansion and social responsibilities, etc.
 8. It helps a firm in forecasting the most important economic variables like demand, supply, cost, revenue, price, sales and profit, etc and formulates sound business policies.
 9. It also helps in understanding the various external factors and forces which affect the decision-making of a firm. Thus, it has become a highly useful and practical discipline in recent years to analyze and find solutions to various kinds of problems in a systematic and rational manner.

Managerial Economics and Other Subjects:

Managerial Economics and Financial Accounting: Managerial Economics is also closely related to accounting, which is concerned with recording the financial operations of a business firm. Indeed, accounting information is one of the principal sources of data required by a managerial economist for his decision making purpose. For instance, the profit and loss statement of a firm tells how well the firm has done and the information it contains can be used by managerial economist to throw significant light on the future course of action - whether it should improve or close down. Of course, accounting data call for careful interpretation. Recasting and adjustment before they can be used safely and effectively.

Managerial Economics and Management: Decision making is an integral part of today's business management. Making decision is the one of most difficult task faced by professional manager. A manager has to take several decisions in the management of business. Some of the important types of business decisions are

- a) Production decisions

- b) Marketing decisions
- c) Investment decisions
- d) Personal decisions
- e) Inventory decisions etc.

Thus, Managerial Economics concepts are highly useful in business management practices for taking decisions and forward planning. These decisions provide solutions to different managerial problems.

Managerial Economics and mathematics:

The use of mathematics is significant for managerial economics in view of its profit maximization goal along with optimal use of resources. The major problem of the firm is how to minimize cost, how to maximize profit or how to optimize sales. Mathematical concepts and techniques are widely used in economic logic to solve these problems. Also mathematical methods help to estimate and predict the economic factors for decision making and forward planning.

Mathematical symbols are more convenient to handle and understand various concepts like incremental cost, elasticity of demand etc., Geometry, Algebra and calculus are the major branches of mathematics which are of use in managerial economics. The main concepts of mathematics like logarithms, and exponentials, vectors and determinants, input-output models etc., are widely used. Besides these usual tools, more advanced techniques designed in the recent years viz. linear programming, inventory models and game theory find wide application in managerial economics.

Managerial Economics and Statistics:

Managerial Economics needs the tools of statistics in more than one way. A successful businessman must correctly estimate the demand for his product. He should be able to analyse the impact of variations in tastes, fashion and changes in income on demand only then he can adjust his output. Statistical methods provide a sure base for decision-making. Thus statistical tools are

used in collecting data and analyzing them to help in the decision making process. Statistical tools like the theory of probability and forecasting techniques help the firm to predict the future course of events. Managerial Economics also make use of correlation and multiple regressions in related variables like price and demand to estimate the extent of dependence of one variable on the other. The theory of probability is very useful in problems involving uncertainty.

Managerial Economics and Operations Research:

Taking effective decisions is the major concern of both managerial economics and operations research. The development of techniques and concepts such as linear programming, inventory models and game theory is due to the development of this new subject of operations research in the postwar years. Operations research is concerned with the complex problems arising out of the management of men, machines, materials and money.

Operations research provides a scientific model of the system and it helps managerial economists in the field of product development, material management, and inventory control, quality control, marketing and demand analysis. The varied tools of operations Research are helpful to managerial economists in decision-making.

Demand Analysis:

A product or service is said to have demand when three conditions are satisfied:

- a) Desire on the part of the buyer to buy
- b) Willingness to pay for it
- c) Ability to pay the specified price for it.

Unless all these conditions are fulfilled, the product is not said to have any demand.

Demand Function:

An individual demand function is the basis of demand theory. But it is the market demand function that is main interest to managers. It refers to the total demand for a good or service of all the buyers taken together. The market demand function may be expressed mathematically thus

$$D_x = f(P, P_r, I, E_i, M, T, A, U)$$

Where

D_x = Quantity demanded for commodity x

f = functional relation

P = Price of commodity

I = Income of consumer

E_i = expectations of future income

P_r = Prices of related commodities i.e. substitutes and complementariness

M = The money income of the consumer

T = The taste of the consumer

A = The advertisement effect

U = Unknown variables

By demand function, economists mean the entire functional relationship. This means the whole range of price quantity relationship and not just the quantity demanded at a given price per unit of time. The demand function expressed above is really just a listing of variables that affect the demand.

Law of demand

There is an inverse relationship between quantity demanded and its price. The people know that when price of a commodity goes up its demand comes down. When there is decrease in price the demand for a commodity goes up. There is inverse relation between price and demand. The law refers to the direction in which quantity demanded changes due to change in price.

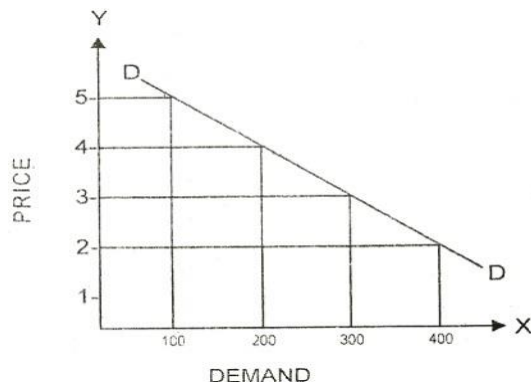
Definition

According to Alfred Marshall law of demand says that the amount demanded increase with a fall in price, diminishes with a rise in price.

Demand schedule: it is a list of quantities of a commodities purchased by a consumer at deferent price.

| Price in dollars. | Demand in Kg. |
|-------------------|---------------|
| 5 | 100 |
| 4 | 200 |
| 3 | 300 |
| 2 | 400 |

The table shows the demand of all the consumers in a market. When the price decreases there is increase in demand for goods and vice versa. When price is \$5 demand is 100 kilograms. When the price is \$4 demand is 200 kilograms. Thus the table shows the total amount demanded by all consumers various price levels.



There is same price in the market. All consumers purchase commodity according to their needs. The market demand curve is the total amount demanded by all consumers at different prices. The market demand curve slopes from left down to the right.

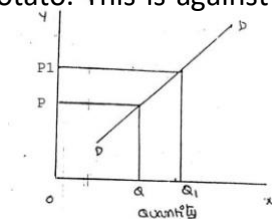
Assumptions of the law

1. There is no change in income of consumers.
2. There is no change in the price of product.
3. There is no change in quality of product.
4. There is no substitute of the commodity.
5. The prices of related commodities remain the same.

6. There is no change in customs.
7. There is no change in taste and preference of consumers.
8. The size of population remains the same.
9. The climate and weather conditions are same.
10. The tax rates and other fiscal measures remain the same.

Exceptional demand curve: The demand curve slopes from left to right upward if despite the increase in price of the commodity, people tend to buy more due to reasons like fear of shortages or it may be an absolutely essential good. 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 millets like bajra, cheaper vegetables like potato etc come under this category. Sir Robert Giffen of Ireland first observed that people used to spend more of their income on inferior goods like potato and less of their income on meat. After purchasing potato the staple food, they did not have staple food potato surplus 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 against the law of demand. This is also known as Giffen paradox.



2. Conspicuous Consumption / Veblen Effect: 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 society. The prices of these goods are so high that they are beyond the reach of the common man. The higher the price of the diamond, the higher its prestige value. 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. So the law of demand does not hold good here.

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 true, when the consumer believes that a high-priced and branded commodity is better in quality than a low-priced one.

5. Emergencies: During emergencies like war, famine etc, households behave in an abnormal way. Households accentuate scarcities and induce further price rise by making increased purchases even at higher prices because of the apprehension that they may not be available. . On the other hand during depression, , fall in prices is not a sufficient condition for consumers to demand more if they are needed.

6. Future Changes In Prices: Households also act as speculators. 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

The Elasticity of Demand | Economics

Introduction

Generally, elasticity of demand refers to price elasticity of demand which is often called own price elasticity of demand, though the notion of elasticity of demand also relates to income, cross and substitution elasticities of demand.

Types of Elasticity of Demand

1. Price Elasticity of Demand
2. Cross Elasticity of Demand

3. Income Elasticity of Demand

4. Advertising or Promotional Elasticity of Demand

Price Elasticity

The response of the consumers to a change in the price of a commodity is measured by the price elasticity of the commodity demand. The responsiveness of changes in quantity demanded due to changes in price is referred to as price elasticity of demand. The price elasticity of demand is measured by dividing the percentage change in quantity demanded by the percentage change in price.

Price Elasticity = Proportionate change in the Quantity Demanded / Proportionate change in price

Percentage change in quantity demanded

= -----

Percentage change in price

$\Delta Q / Q$ 10

----- = ----- = 0.5

$\Delta P / P$ 20

- ΔQ = change in quantity demanded
- ΔP = change in price
- P = price
- Q = quantity demanded

For example: Quantity demanded is 20 units at a price of Rs.500. When there is a fall in price to Rs. 400 it results in a rise in demand to 32 units. Therefore the change in quantity demanded is 12 units resulting from the change in price of Rs.100. The Price Elasticity of Demand is = $500 / 20 \times 12/100 = 3$

2.Income Elasticity

Income elasticity of demand measures the responsiveness of quantity demanded to a change in income. It is measured by dividing the percentage change in quantity

demand by the percentage change in income. If the demand for a commodity increases by 20% when income increases by 10% then the income elasticity of that commodity is said to be positive and relatively high. If the demand for food were unchanged when income increases, the income elasticity would be zero. A fall in demand for a commodity when income rises results in a negative income elasticity of demand.

Price Elasticity = Proportionate change in the Quantity Demanded / Proportionate change in price

Percentage change in quantity demanded

= -----

Percentage change in income

$\Delta Q / Q$

$\Delta I / I$

- ΔQ = change in quantity demanded
- ΔI = change in income
- I = Income
- Q = quantity demanded

3. Cross Elasticity

The quantity demanded of a particular commodity varies according to the price of other commodities. Cross elasticity measures the responsiveness of the quantity demanded of a commodity due to changes in the price of another commodity. For example the demand for tea increases when the price of coffee goes up. Here the cross elasticity of demand for tea is high. If two goods are substitutes then they will have a positive cross elasticity of demand. In other words if two goods are complementary to each other then negative income elasticity may arise.

The responsiveness of the quantity of one commodity demanded to a change in the price of another good is calculated with the following formula.

$$E_c = \frac{\% \text{ change in demand for commodity A}}{\% \text{ change in price of commodity B}}$$

If two commodities are unrelated goods, the increase in the price of one good does not result in any change in the demand for the other goods. For example the price fall in Tata salt does not make any change in the demand for Tata Nano

4. Advertising or Promotional Elasticity of Demand:

In the modern competitive or partial competitive market economy, advertising has a great significance. Under advertising, various visible or verbal activities are done by the firm for the purpose of creating or increasing demand for its goods or services. Informative advertising is very helpful for the consumer in making rational purchase decisions.

But the extension of demand through advertising can be measured by advertising or promotional elasticity of demand (E_A) which measures the expected changes in demand as a result of change in other promotional expenses. The demand for some goods is affected more by advertising such as the demand for cosmetics. Following is the formula for advertising elasticity,

Price Elasticity = Proportionate change in the Quantity Demanded / Proportionate change in price

Percentage change in quantity demanded

= -----

Percentage change in advertisement cost

$\Delta Q / Q$

$\Delta A / A$

- ΔQ = change in quantity demanded

- ΔA = change in advertisement cost
- A = advertisement cost
- Q = quantity demanded

Types of Price Elasticity of Demand

1. Perfectly Elastic Demand:

When a small change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand. In perfectly elastic demand, a small rise in price results in fall in demand to zero, while a small fall in price causes increase in demand to infinity. In such a case, the demand is perfectly elastic or $e_p = \infty$.

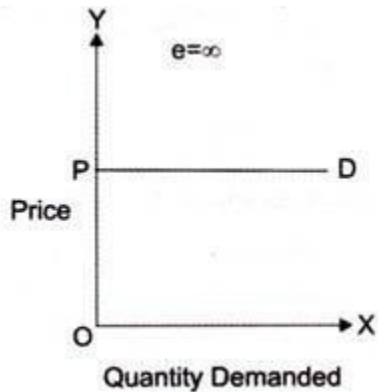


Figure-2: Perfectly Elastic Demand

Perfectly Inelastic Demand:

A perfectly inelastic demand is one when there is no change produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero ($e_p = 0$).

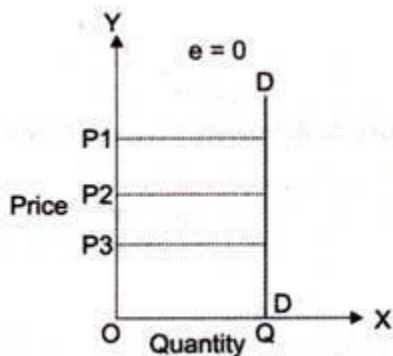


Figure-3: Perfectly Inelastic Demand

Relatively Elastic Demand:

Relatively elastic demand refers to the demand when the proportionate change produced in demand is greater than the proportionate change in price of a product. The numerical value of relatively elastic demand ranges between one to infinity.

Mathematically, relatively elastic demand is known as more than unit elastic demand ($e_p > 1$). For example, if the price of a product increases by 20% and the demand of the product decreases by 25%, then the demand would be relatively elastic.

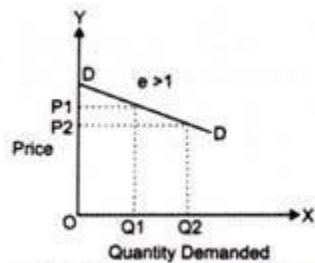


Figure-4: Relatively Elastic Demand

4. Relatively Inelastic Demand:

Relatively inelastic demand is one when the percentage change produced in demand is less than the percentage change in the price of a product. For example, if the price of a product increases by 30% and the demand for the product decreases only by 10%, then the demand would be called relatively inelastic. The numerical value of relatively elastic demand ranges between zero to one ($e_p < 1$). Marshall has termed relatively inelastic demand as elasticity being less than unity.

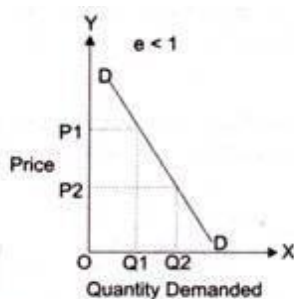


Figure-5: Relatively Inelastic Demand

5. Unitary Elastic Demand:

When the proportionate change in demand produces the same change in the price of the product, the demand is referred as unitary elastic demand. The numerical value for unitary elastic demand is equal to one ($e_p=1$).

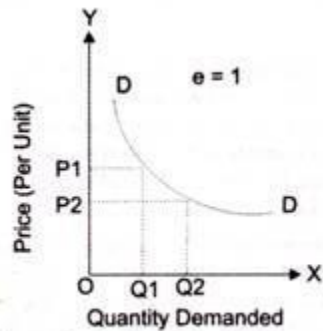


Figure-6: Unitary Elastic Demand

Point Elasticity Method of Measurement:

When the change in price is infinitesimally small, Marshallian method may not provide accurate estimate of elasticity of demand. In that case, a geometrical method may be employed. This method aims at measuring elasticity of demand at a particular point on a demand curve.

So long, we tried to calculate the elasticity over certain area or segment of a demand curve and the terms elastic, inelastic and unit elastic had been applied to the whole demand curve. However, such is not true. It may happen that the demand for a product can be elastic in one price range and inelastic in another. In fact, the degree of elasticity varies from one price range to another. So, it is better to calculate elasticity at particular

2.51.

The formula for elasticity of demand is:

The slope of the demand curve is:

$$\therefore \Delta Q / \Delta P = M_1 F / M_1 E$$

$$P/Q = M_1E / OM_1$$

Note that EM_1F , CP_1E and COF are similar triangles, the elasticity of demand curve DD_1 at point E can be measured as:

Thus, elasticity of demand at point E on a curvilinear demand curve DD_1 is approximately equal to

On the basis of this method of measurement, one can estimate elasticity of demand on a linear demand curve, shown in Fig. 2.52.

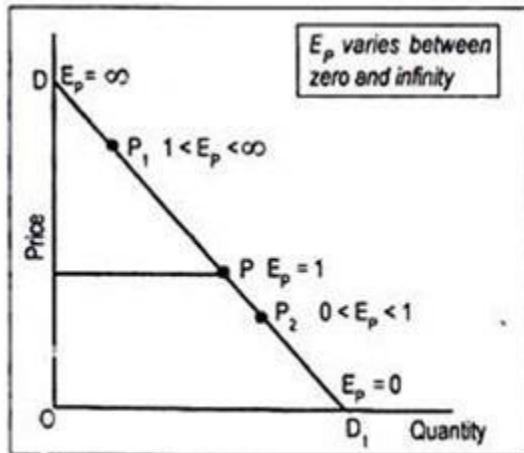


Fig. 2.52: Elasticity of Demand ($0 \rightarrow \infty$)

Here, DD_1 is a linear demand curve. Elasticity of demand varies from point to point on a demand curve. At point P , elasticity of demand is PD_1/PD . As the distance between PD_1 and PD is the same, it is unit elastic (i.e., $E_p = 1$). As we move downwards along the curve DD_1 from the mid-point, say point P_2 , elasticity declines. At P_2 it is, inelastic (i.e., $0 < E_p < 1$) since $P_2D_1 < P_2D$.

At point D_1 , elasticity is zero since $0/DD_1$ is equal to zero. Further, as we move upwards from the mid-point, elasticity increases. At P_1 , it is elastic (i.e., $1 < E_p < \infty$) since $P_1D_1 > P_1D$. On the other hand, at point D , it is infinite since $DD_1/0$ is equal to infinity. Thus, at lower prices it is inelastic, and at higher prices it is elastic.

Thus, elasticity of demand on a straight line demand curve varies from zero to infinity ($0 \leq E_p \leq \infty$).

3. Arc Elasticity Method:

For very small movements in price and quantity, point elasticity method is an appropriate one. In other words, point elasticity method measures (price) elasticity of demand at a particular point on the demand curve. However, if price change is somewhat of a larger magnitude then geometrical method may give misleading estimate.

To avoid this problem, elasticity is measured over an arc of the demand curve. In other words, when we intend to estimate (price) elasticity of demand over some portion (i.e.,

the arc) of the demand curve, we then have arc elasticity method. Sometimes we know two prices and two quantities.

Under the circumstance, the point elasticity method may not provide good estimate. What is required in this case is the average elasticity of two prices and two quantities. This is called 'arc' elasticity, because it measures the average elasticity on an arc of a demand curve.

Suppose we have the following information about two prices and quantities:

| Price (P) | Demand (Q) |
|---------------------|---------------|
| Rs. 60.00 (P_1) | 400 (Q_1) |
| Rs. 50.00 (P_2) | 800 (Q_2) |

Here changes in both price and quantity are much larger. Using old price (P_1) and old quantity (Q_1), one finds the value of elasticity of demand as:

$$E_P = \Delta Q / \Delta P \cdot P_1 / Q_1 = -400 / 100 \cdot 60 / 400 = -6.0$$

When new price (P_2) and new quantity (Q_2) are taken into account, the coefficient becomes

$$E_P = \Delta Q / \Delta P \cdot P_2 / Q_2 = -400 / 100 \cdot 50 / 800 = -2.5$$

Thus, estimation of elasticity in accordance with the formula for point elasticity method gives vastly different results. In other words, since elasticity of demand varies depending on the base, one should consider average price and average quantity demanded to calculate elasticity of demand.

That is to say, we want to measure average elasticity over an arc of the demand curve (i.e., mid-point or average, price and quantity):

$$\begin{aligned}
 E_{arc} &= -\frac{\Delta Q}{\left(\frac{Q_1 + Q_2}{2}\right)} \div \left(\frac{\Delta P}{\frac{P_1 + P_2}{2}}\right) \\
 &= \frac{\Delta Q}{\left(\frac{Q_1 + Q_2}{2}\right)} \times \left(\frac{P_1 + P_2}{\Delta P}\right) \\
 &= -\frac{\Delta Q}{\Delta P} \left(\frac{P_1 + P_2}{Q_1 + Q_2}\right)
 \end{aligned}$$

In our above example, the arc elasticity is

$$E_{arc} = -\frac{400}{10} \cdot \frac{60+50}{400+800} = -\frac{400}{10} \cdot \frac{110}{1200} = -3.66$$

In terms of Fig. 2.53, we want to compute arc price elasticity of demand over the arc AB of the demand curve DD₁. In other words, we want to measure elasticity between points A and B. The above formula measures arc elasticity over the straight line AB.

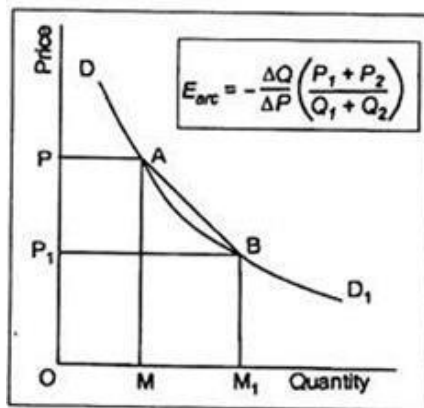


Fig. 2.53: Arc Elasticity

To do so, we have to take the average of prices (OP and OP₁) and average of quantities (OM and OM₁). Greater the convexity of the demand curve between A and B, one obtains almost perfect estimate of elasticity. Or greater the concavity of the demand curve between points A and B, the poorer the approximation of measurement of arc elasticity. As we go on making the price change smaller and smaller, the arc of the demand curve may vanish or converge to a point. So, as a special case of arc elasticity, the concept of point elasticity becomes relevant.

Importance of Elasticity of Demand:

1. In Price Determination of Factors of Production:

The concept of elasticity for demand is of great importance for determining prices of various factors of production. Factors of production are paid according to their elasticity of demand. In other words, if the demand of a factor is inelastic, its price will be high and if it is elastic, its price will be low.

2. Price fixation:

The elasticity of demand for a product is the basis of its price determination. The ratio in which the demand for a product will fall with the rise in its price and vice versa can be known with the knowledge of elasticity of demand.

3. Government Policies:

The knowledge of elasticity of demand is also helpful for the government in determining its policies. Some of them are discussed here

- A) Tax policy
- B) Rising bank deposits
- C) Public utility
- D) Revaluation or devaluation of currencies
- E) Formulate government policy

4. Demand Forecasting:

The elasticity of demand is the basis of demand forecasting. The knowledge of income elasticity is essential for demand forecasting of producible goods in future. Long- term production planning and management depend more on the income elasticity because management can know the effect of changing income levels on the demand for his product.

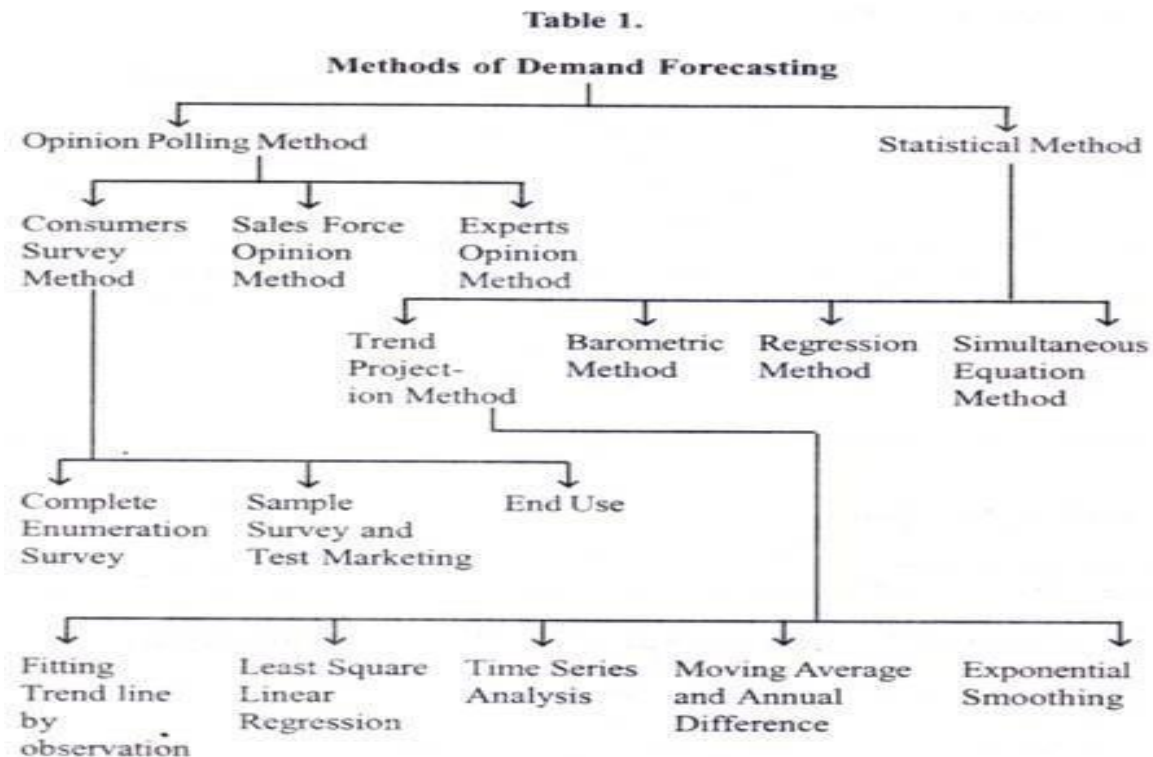
5. Planning the Level of Output and price:

For making production profitable, it is essential that the quantity of goods and services should be produced corresponding to the demand for that product. Since the changes in demand is due to the change in price, the knowledge of elasticity of demand is necessary for determining the output level.

Demand forecasting: Demand forecasting refers to an estimate of future demand for the product. It is an 'objective assessment of the future course of demand'. In recent times, forecasting plays an important role in business decision-making. Demand forecasting has an important influence on production planning. It is essential for a firm to produce the required quantities at the righttime.

Definition:

According to Evan J. Douglas, "Demand estimation (forecasting) may be defined as a process of finding values for demand in future time periods."



Opinion Polling Method:

In this method, the opinion of the buyers, sales force and experts could be gathered to determine the emerging trend in the market.

The opinion polling methods of demand forecasting are of three kinds:**(a) Consumer's Survey Method or Survey of Buyer's Intentions:**

In this method, the consumers are directly approached to disclose their future purchase plans. This is done by interviewing all consumers or a selected group of consumers out of the relevant population. This is the direct method of estimating demand in the short run. Here the burden of forecasting is shifted to the buyer. The firm may go in for complete enumeration or for sample surveys. If the commodity under consideration is an intermediate product then the industries using it as an end product are surveyed.

(i) Complete Enumeration Survey:

Under the Complete Enumeration Survey, the firm has to go for a door to door survey for the forecast period by contacting all the households in the area. This method has an advantage of first hand, unbiased information, yet it has its share of disadvantages also. The major limitation of this method is that it requires lot of resources, manpower and time.

In this method, consumers may be reluctant to reveal their purchase plans due to personal privacy or commercial secrecy. Moreover, at times the consumers may not express their opinion properly or may deliberately misguide the investigators.

(ii) Sample Survey and Test Marketing:

Under this method some representative households are selected on random basis as samples and their opinion is taken as the generalised opinion. This method is based on the basic assumption that the sample truly represents the population. If the sample is the true representative, there is likely to be no significant difference in the results obtained by the survey. Apart from that, this method is less tedious and less costly.

A variant of sample survey technique is test marketing. Product testing essentially involves placing the product with a number of users for a set period. Their reactions to the product are noted after a period of time and an estimate of likely demand is made from the result. These are suitable for new products or for radically modified old products for which no prior data exists. It is a more scientific method of estimating likely demand because it stimulates a national launch in a closely defined geographical area.

(iii) End Use Method or Input-Output Method:

This method is quite useful for industries which are mainly producer's goods. In this method, the sale of the product under consideration is projected as the basis of demand survey of the industries using this product as an intermediate product, that is, the demand for the final product is the end user demand of the intermediate product used in the production of this final product.

The end user demand estimation of an intermediate product may involve many final good industries using this product at home and abroad. It helps us to understand inter-industry' relations. In input-output accounting two matrices used are the transaction matrix and the input co-efficient matrix. The major efforts required by this type are not in its operation but in the collection and presentation of data.

(b) Sales Force Opinion Method:

This is also known as collective opinion method. In this method, instead of consumers, the opinion of the salesmen is sought. It is sometimes referred as the "grass roots approach" as it is a bottom-up method that requires each sales person in the company to make an individual forecast for his or her particular sales territory.

These individual forecasts are discussed and agreed with the sales manager. The composite of all forecasts then constitutes the sales forecast for the organisation. The advantages of this method are that it is easy and cheap. It does not involve any elaborate statistical treatment. The main merit of this method lies in the collective wisdom of salesmen. This method is more useful in forecasting sales of new products.

(c) Experts Opinion Method:

This method is also known as “Delphi Technique” of investigation. The Delphi method requires a panel of experts, who are interrogated through a sequence of questionnaires in which the responses to one questionnaire are used to produce the next questionnaire. Thus any information available to some experts and not to others is passed on, enabling all the experts to have access to all the information for forecasting.

The method is used for long term forecasting to estimate potential sales for new products. This method presumes two conditions: Firstly, the panellists must be rich in their expertise, possess wide range of knowledge and experience. Secondly, its conductors are objective in their job. This method has some exclusive advantages of saving time and other resources.

2. Statistical Method:

Statistical methods have proved to be immensely useful in demand forecasting. In order to maintain objectivity, that is, by consideration of all implications and viewing the problem from an external point of view, the statistical methods are used.

The important statistical methods are:**(i) Trend Projection Method:**

A firm existing for a long time will have its own data regarding sales for past years. Such data when arranged chronologically yield what is referred to as ‘time series’. Time series shows the past sales with effective demand for a particular product under normal conditions. Such data can be given in a tabular or graphic form for further analysis. This is the most popular method among business firms, partly because it is simple and inexpensive and partly because time series data often exhibit a persistent growth trend.

Time series has got four types of components namely, Secular Trend (T), Secular Variation (S), Cyclical Element (C), and an Irregular or Random Variation (I). These elements are expressed by the equation $O = TSCI$. Secular trend refers to the long run changes that occur as a result of general tendency.

Seasonal variations refer to changes in the short run weather pattern or social habits. Cyclical variations refer to the changes that occur in industry during depression and boom. Random variation refers to the factors which are generally able such as wars, strikes, flood, famine and so on.

When a forecast is made the seasonal, cyclical and random variations are removed from the observed data. Thus only the secular trend is left. This trend is then projected. Trend projection fits a trend line to a mathematical equation.

The trend can be estimated by using any one of the following methods:

- (a) The Graphical Method,
- (b) The Least Square Method.

a) Graphical Method:

This is the most simple technique to determine the trend. All values of output or sale for different years are plotted on a graph and a smooth free hand curve is drawn passing through as many points as possible. The direction of this free hand curve—upward or downward— shows the trend. A simple illustration of this method is given in Table 2.

Table 2: Sales of Firm

| Year | Sales (Rs. Crore) |
|------|-------------------|
| 1995 | 40 |
| 1996 | 50 |
| 1997 | 44 |
| 1998 | 60 |

| | |
|------|----|
| 1999 | 54 |
| 2000 | 62 |

In Fig. 1, AB is the trend line which has been drawn as free hand curve passing through the various points representing actual sale values.

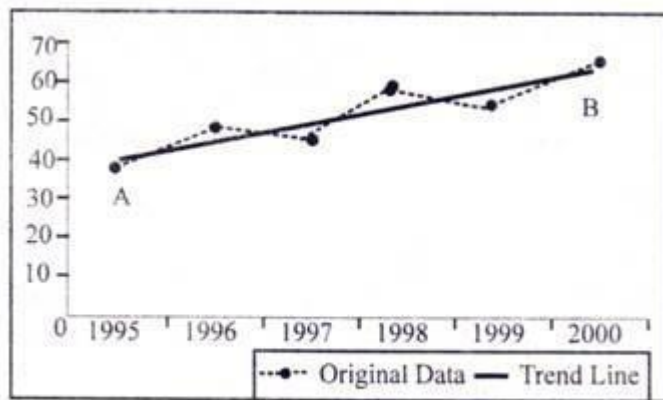


Fig. 1

(b) Least Square Method:

Under the least square method, a trend line can be fitted to the time series data with the help of statistical techniques such as least square regression. When the trend in sales over time is given by straight line, the equation of this line is of the form: $y = a + bx$. Where 'a' is the intercept and 'b' shows the impact of the independent variable. We have two variables—the independent variable x and the dependent variable y . The line of best fit establishes a kind of mathematical relationship between the two variables x and y . This is expressed by the regression y on x .

In order to solve the equation $y = a + bx$, we have to make use of the following normal equations:

$$\sum y = na + b \sum x$$

$$\sum xy = a \sum x + b \sum x^2$$

(ii) Barometric Technique:

A barometer is an instrument of measuring change. This method is based on the notion that “the future can be predicted from certain happenings in the present.” In other words, barometric techniques are based on the idea that certain events of the present can be used to predict the directions of change in the future. This is accomplished by the use of economic and statistical indicators which serve as barometers of economic change.

Generally forecasters correlate a firm's sales with three series: Leading Series, Coincident or Concurrent Series and Lagging Series:

(a) The Leading Series:

The leading series comprise those factors which move up or down before the recession or recovery starts. They tend to reflect future market changes. For example, baby powder sales can be forecasted by examining the birth rate pattern five years earlier, because there is a correlation between the baby powder sales and children of five years of age and since baby powder sales today are correlated with birth rate five years earlier, it is called lagged correlation. Thus we can say that births lead to baby soaps sales.

(b) Coincident or Concurrent Series:

The coincident or concurrent series are those which move up or down simultaneously with the level of the economy. They are used in confirming or refuting the validity of the leading indicator used a few months afterwards. Common examples of coinciding indicators are G.N.P itself, industrial production, trading and the retail sector.

(c) The Lagging Series:

The lagging series are those which take place after some time lag with respect to the business cycle. Examples of lagging series are, labour cost per unit of the manufacturing output, loans outstanding, leading rate of short term loans, etc.

(iii) Regression Analysis:

It attempts to assess the relationship between at least two variables (one or more independent and one dependent), the purpose being to predict the value of the dependent variable from the specific value of the independent variable. The basis of this prediction generally is historical data. This method starts from the assumption that a basic relationship exists between two variables. An interactive statistical analysis computer package is used to formulate the mathematical relationship which exists.

For example, one may build up the sales model as:

Quantum of Sales = a. price + b. advertising + c. price of the rival products + d. personal disposable income + u

(iv) Econometric Models:

Econometric models are an extension of the regression technique whereby a system of independent regression equation is solved. The requirement for satisfactory use of the econometric model in forecasting is under three heads: variables, equations and data.

The appropriate procedure in forecasting by econometric methods is model building. Econometrics attempts to express economic theories in mathematical terms in such a way that they can be verified by statistical methods and to measure the impact of one economic variable upon another so as to be able to predict future events.

Factors governing demand forecasting:

Some of the factors that influence demand forecasting are shown in Figure-2:

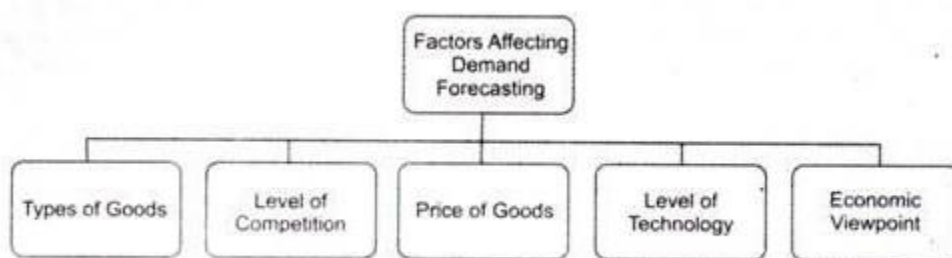


Figure-2: Factors Affecting Demand Forecasting

The various factors that influence demand forecasting (“as shown in Figure-2) are explained as follows:

i. Types of Goods:

Affect the demand forecasting process to a larger extent. Goods can be producer’s goods, consumer goods, or services. Apart from this, goods can be established and new goods. Established goods are those goods which already exist in the market, whereas new goods are those which are yet to be introduced in the market.

Information regarding the demand, substitutes and level of competition of goods is known only in case of established goods. On the other hand, it is difficult to forecast demand for the new goods. Therefore, forecasting is different for different types of goods.

ii. Competition Level:

Influence the process of demand forecasting. In a highly competitive market, demand for products also depend on the number of competitors existing in the market. Moreover, in a highly competitive market, there is always a risk of new entrants. In such a case, demand forecasting becomes difficult and challenging.

iii. Price of Goods:

Acts as a major factor that influences the demand forecasting process. The demand forecasts of organizations are highly affected by change in their pricing policies. In such a scenario, it is difficult to estimate the exact demand of products.

iv. Level of Technology:

Constitutes an important factor in obtaining reliable demand forecasts. If there is a rapid change in technology, the existing technology or products may become obsolete. For example, there is a high decline in the demand of floppy disks with the introduction of compact disks (CDs) and pen drives for saving data in computer. In such a case, it is difficult to forecast demand for existing products in future.

v. Economic Viewpoint:

Play a crucial role in obtaining demand forecasts. For example, if there is a positive development in an economy, such as globalization and high level of investment, the demand forecasts of organizations would also be positive.

Objective Questions and Answers

| S.No. | Objective Questions |
|-------|--|
| 1 | Who is the father of economics? (a)Adams' smith. (b)Marshall(c)Robins (d)Amartya sen |
| 2 | Managerial economics is also called macroeconomics (b)industry economics (c) business economics (d) None |
| 3 | _____states that the relationship between price and quantity demanded. (a) Demand determinant (b) law of demand (c)cost analysis (d)profit analysis |
| 4 | Giffen goods are also known as_____goods. (a)inferior goods (b)superior goods (c)speculative goods(d)none |
| 5 | Short term demand forecasts are generally for a period of _____ (a) less than one year (b)<5years(c)between 5-10 years (d)more than 10 years |
| 6 | Least squares method is part of _____ (a)statistical methods (b)survey methods (c)c-v-p analysis (d)none |

| | |
|----|---|
| 7 | Which of following pairs is example of sub statute goods? (a)car& petrol (b)tea &sugar(c) tea& coffee (d)shirt& pant |
| 8 | Demand forecasting enables the management to strengthen market position and enlarge_____. (a) Cost (b)Loss (c) Profit (d) None |
| 9 | If the price raises, the demand (a) Rises (b) Falls (c) First fall then rised) First rise then falls |
| 10 | There are_____types of price elasticity. (a) 2(b) 3 (c) 4 (d) 5 |
| 11 | of the following is not a example for Complementary goods _____ and coffee (b) Tea and sugar and petrol(d)Bred and bun |
| 12 | In case of perfectly elastic demand the shape of demand curve is_____ (a) Horizontal (b) Vertical (c) Flat (d)Hyper bola |
| 13 | In case of unity elastic demand the shape of demand curve is_____ (a)Horizontal (b) Vertical (c) Flat (d)Hyper bola |
| 14 | Sales force opinion method is part of (a) statistical methods (b) survey methods (c) BEP (d)None |
| 15 | Who explained the elasticity of demand concept? |

| | |
|--|---|
| | (a)Adams' smith. (b)Marshal (c)Robins (d)Amartya sen |
|--|---|

2 Marks Questions and Answers

1) Define managerial economics?

a) The integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management **(Spencer)** The managerial economics is the application of economic theory and methodology to business administration practices **(Brigham and Pappas)**

2) What are the main areas of managerial economics?

a) The main areas of applications in managerial economics include demand decision, input output decision, price output decision, profit related decision, investment decision and economic forecasting and forward planning

3) What is the meaning of micro and macro economics?

a) Micro economics is the study of an individual, a firm or an industry. it is also called theory of firm or price theory ,Macro economics is the study of aggregates of individuals or firms. It is the important tool for national income analysis, balance of payments

4) What is demand?

a)Every want supported by the willingness and ability to buy constitutes demand for a particular product or service .in other words ,if I want a car and I cannot pay for it .there is no demand for the car from my side .

Demand conditions are

*desire to buy

*Willingness to pay

*Ability to pay

5) Define law of demand and its exceptions?

a) The law of demand states: other things remaining the same ,the amount of quantity demanded rises with every fall in the price

Exceptions: necessities, Giffens' paradox

6) Define demand function and write mathematical formula of demand function?

a) Demand function is a function which describes a relationship between one variable and its determinants

Mathematical formula $Q_d = f(P, I, T, PR, EP, EI, SP, D_c, A, O)$

7) Define elasticity of demand?

a) The term elasticity is defined as the rate of responsiveness in the demand of a commodity for a given change in price or any other determinants of demand. In other words, it explains the extent of change in quantity demanded because of a given change in the other determining factors

8) Explain price elasticity of demand?

a) Price elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the price of X. Price demanded for a particular product may be elastic ($E_{dp} > 1$) or inelastic ($E_{dp} < 1$)

9) Explain income elasticity of demand?

a) Income elasticity of demand refers to the ratio of proportionate change in quantity demanded for product X to the proportionate change in the income of the consumer. Income demand for a particular product may be elastic ($E_{di} > 1$) or inelastic ($E_{di} < 1$)

10) What is the need of demand forecasting?

a) Forecasting helps to assess the likely demand for products and services and to plan production accordingly. Demand forecasting is helpful not only at the firm level but also at national level.

11) What is the meaning of test marketing?

a) Test marketing means releasing the product on a test basis in a well-chosen, limited but representative market. Based on the result of the test marketing, the manufacturer can assess the rate of success for his product.

12) Explain controlled experiment method?

a) Controlled experiments, as the name itself suggests, the company can experiment with different homogeneous markets releasing its products with different types of appeal such as different prices, packing, models and so on

13) What is the meaning of normative statement?

a) : A normative statement usually includes or implies the words 'ought' or 'should'. They reflect people's moral attitudes and are expressions of what a team of people ought to do

14) Define law of demand

a) Law of demand shows the relation between price and quantity demanded of a commodity in the market. In the words of Marshall, "the amount demand increases with a fall in price and diminishes with a rise in price".

15) Define demand forecasting ?

a) The information about the future is essential for both new firms and those planning to expand the scale of their production. Demand forecasting refers to an estimate of future demand for the product.

16) Explain about short term demand forecasting ?

a) Short-term demand forecasting is limited to short periods, usually for one year. It relates to policies regarding sales, purchase, price and finances. It refers to existing production capacity of the firm.

17) Explain about short term demand forecasting ?

a) In long-term forecasting, the businessmen should know about the long-term demand for the product. Planning of a new plant or expansion of an existing unit depends on long-term demand

18) Define survey method ?

a) Under this method, information about the desires of the consumer and opinion of experts are collected by interviewing them

19) Define statistical methods ?

A) Statistical method is used for long run forecasting. In this method, statistical and mathematical techniques are used to forecast demand. This method relies on past data.

20) Define cross elasticity of demand ?

a) A change in the price of one commodity leads to a change in the quantity demanded of another commodity. This is called a cross elasticity of demand. The formula for cross elasticity of demand is:

Proportionate change in the quantity demand of commodity “X”

Cross elasticity = -----

Proportionate change in the price of commodity “