Managerial Economics

BBA., I Semester   Paper-II

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BBA: Managerial Economics

FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A' grade from the NAAC in the year 2016, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 443 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the door step of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson- writers of the Centre who have helped in these endeavours.

Prof. P. Raja Sekhar
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BBA: MANAGERIAL ECONOMICS

SYLLABUS

The object of the course is to enable the students to list the different goals and constraints that firms face applies the economic way of thinking to individual decisions and business decisions use calculus (first and second order derivatives) to solve for an optimum solution

Unit-I Introduction to Managerial Economics
Nature, Scope and definition of Managerial Economics, Application of managerial economics Micro Vs Macro Economics, Basic principles of Managerial Economics, Opportunity Cost Principle, Incremental Principle, Principle of time perspective, Discounting principle

Unit- II Consumer behaviour, demand and supply analysis
Law of demand, Theory of demand, Shift in demand curves, Concept of measurement of elasticity of demand, Factors affecting elasticity of demand, Income elasticity of demand, Cross elasticity of demand

Unit -III Consumer behavior Utility Approach:
Cardinal utility approach, Diminishing marginal utility, Law of equi-marginal utility, Ordinal utility approach, Indifference curve, Marginal rate of substitution, Budget line and consumer equilibrium Law of supply, shift in supply curve

Unit – IV Theory of Production, cost and firm's behaviour:
Meaning, concept of production, Factors of production and production function, Fixed and variables factors, Law of variable proportion and law of returns to scale, Concept of cost, cost function, short run cost, long run cost, Economies and diseconomies of scale Explicit cost and implicit cost, private and social cost, Perfect competition, Monopoly, Monopolistic competition, Oligopoly, pricing in various market structures

Unit-V Macro Economics Analysis
Circular flow of income, national income concepts, Theory of income and employment: Classical, Modern (Keynesian) approach, Circular flow of income, national income concepts

Recommended Books:
Managerial Economics by Ivan Png, Blackwell Publishers
Managerial Economics in a global economy by Dominick Salvotare, Thomson South Westem Publications
Economics by Lipsey, Oxford University Press
Htanagenial Economics: Economic Tools for today's decision makers by Paul G. Keat, Philip K.Y. Young. Pearson Publications
Managerial Economics by L. Varshney and K.L. Maheshwari, Sultan Chand and Sons
Managerial Economics, D.N. Dwivedi, Vikas Publishing Co

Managerial Economics

CONTENTS

Introduction to Managerial Economics

1.0 AIMS AND OBJECTIVES:

The main aim of this lesson is to make students understand the definition of managerial economics, its nature and scope. Further the economics goals of a business firms, role of managerial economist in decision making are also explained and made understood to the student.

Contents

1.0 NTRODUCTION

This chapter deals the definition of Managerial Economics. The nature and scope of Managerial Economics is also dealt. Further a detailed analysis regarding the economic goals of business firms is explained. In every Management, the role of decision making is crucial and this is also explained in this chapter.

1.1 DEFINITION OF MANAGERIAL ECONOMIC

Economics can be divided into two broad categories namely microeconomics and macroeconomics. Macroeconomics is the study of the economic system as a whole. It deals with aggregates or totals. It includes analysis of total output, total employment, total exports or imports etc. Whereas Microeconomics deals with individuals. It mainly focuses on the individuals firms, demand, supply, price, cost etc.

Managerial Economics should be thought of as an applied microeconomics. It is an application of the part of microeconomics that focuses on the topics that are of great interest and importance to managers. They include demand; cost pricing, market structure, production etc.

Managerial Economics is a social science that combines the economic theories, concepts and business practices that are required for easy decision making. It helps the managers to make ration and correct decision when they face various obstacles in the business or in the firms. The main aim of managers in the business is to obtain maximum profits even though the resources are scarce in nature. Managerial economics is mainly concern with this concept. Managerial economics can be understood as a practical application of economic theory in using the most effective method.

Prof. Stigler says -economics is the study of the principles governing the allocation of scarce means among competing ends‖. Following his definition, it can be understood that the economics for managers is application of this study in critical business decisions. That's why some call it business economics and others as applied economics. Yet some like to say it as economics for managers.

Mansfield says, Managerial economics is concerned with the application of economic principles and methodologies to the decision process within the organization. It seeks to establish rules and principles to facilitate the attainment of the desired economic goals of management.‖

Spencer and Siegelman viewed it as, -the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.‖

E.J.Douglas defined it as, -Managerial Economics seeks to establish rules & principles to facilitate the attainment of the desired economic goals of management.‖

Prof. Evan J. Douglas defines it as -Managerial economics is concerned with the application of economic principles and methodologies to the decision-making process within the firm or organization under the conditions of uncertainty.

Therefore, "Managerial economics is a science applied to decision making. It bridges the gap between abstract theory and managerial practice. It concentrates more on the method of reasoning. In short, managerial economics is -Economics applied in decision making".

1.2 Nature & Scope of Managerial Economics

Managerial Economics is a fast growing subject. The scope of managerial economics is nothing but the area of its study. Managerial economics has its roots in economic theory. The empirical nature of managerial economics makes its scope wider. Managerial economics provides management with strategic planning tools that can be used to get a clear perspective of the way the business world works and what can be done to maintain profitability in an ever changing environment.

Managerial economics refers to those aspects of economic theory and application which are directly relevant to the practice of management and the decision making process within the enterprise. Its scope does not extend to macro-economic theory and the economics of public policy which will also be of interest to the manager. While considering the scope of managerial economics we have to understand whether it is positive economics or normative economics. Most of the managerial economists are of the opinion that managerial economics is fundamentally normative and prescriptive in nature. It is concerned with what decisions ought to be made.

Managerial Economics is not only a science but also an art. An art is defined as a subject of application. The theory will become useful if it possible for an application. It is a science in its methodology and art in its application. Thus economics is both science and art, since it has both the theoretical and applied aspects. It is both light giving and fruit bearing.

A positive science explains ˎwhat isʻ and normative science tells us ˎwhat ought to be. That means positive science describes and normative science evaluates. Positive science is expected to collect facts and draw conclusions. It has no right to pass on judgments. In the classical view, economics was a positive science. But later economists viewed that economics is fundamentally a normative science. Faced with scarce resources and unlimited wants, the choice of the final want, needs value judgment. The choice resulting from subjecting competing desires to judgment makes economics obviously a normative science. Normative economics is concerned with describing what should be the things. It is, therefore, also called prescriptive economics. It should be noted that normative economics involves value judgments. Almost all the leading managerial economists are of the opinion that managerial economics is fundamentally normative and prescriptive in nature.

It refers mostly to what ought to be and cannot be neutral about the ends. The application of managerial economics is inseparable from consideration of values, or norms for it is always concerned with the achievement of objectives or the optimization of goals.

In managerial economics, we are interested in what should happen rather than what does happen. Economics is, therefore, both a positive and a normative science. Economics is primarily a study of man. It studies man as a member of the society. Economics studies social behaviour i.e. behaviour of men in groups. The process of satisfying wants is a social process.   Hence economics is a social science.

The classical view was that economics was not concerned with solving practical problems of life. But many economists like **Adam Smith, Marshall, Keynes** have all actively interested themselves in the problems of their time.   In the present times, economics is extensively used in solving various practical problems. Economists are employed by government and private sector industries to give advice on practical problems. Thus economics is useful in solving day to day problems of life. Economics is also used for the analysis of business problems and decision - making. The scope of managerial economics is so wide that it embraces almost all the problems and areas of the manager and the firm.

A useful method of throwing light on the nature and scope of managerial economics is to examine its relationship with other disciplines. The subject has gained by the interaction with economics, mathematics and statistics and has drawn upon management theory and accounting concepts. The managerial economics integrates concepts and methods from these disciplines and bringing them to bear on managerial problems.

Managerial Economics and Economics:

Managerial Economics has been described as economics applied to decision making. It may be studied as a special branch of economics, bridging the gap between pure economic theory and managerial practice. Economics has two main branches-micro-economics and macro- economics.

Micro-economics:

Micro'means small. It studies the behaviour of the individual units and small groups of such units. It is a study of particular firms, particular households, individual prices, wages, incomes, individual industries and particular commodities. Thus micro-economics gives a microscopic view of the economy. The roots of managerial economics emerge from micro-economic theory. In price theory, demand concepts, elasticity of demand, marginal cost marginal revenue, the short and long runs and theories of market structure are sources of the elements of micro-economics which managerial economics draws upon. It also makes use of well known models in price theory such as the model for monopoly price, the kinked demand theory and the model of price discrimination.

Macro-economics:

Macro'means large. It deals with the behaviour of the large aggregates in the economy. The large aggregates are total saving, total consumption, total income, total employment, general price level, wage level, cost structure, etc. Thus macro-economics is aggregative economics. It examines the interrelations among the various aggregates, and causes of fluctuations in them. Problems of determination of total income, total employment and general price level are the central problems in macro-economics. Macro-economies is also related to managerial economics. The environment, in which a business operates, fluctuations in national income, changes in fiscal and monetary measures and variations in the level of business activity have relevance to business decisions. The understanding of the overall operation of the economic system is very useful to the managerial economist in the formulation of his policies.

The chief contribution of macro-economics is in the area of forecasting. The post-Keynesian aggregative theory has direct implications for forecasting general business conditions. Since the prospects of an individual firm often depend greatly on business in general, for-casts of an individual firm depend on general business forecasts, which make use of models derived from theory. The most widely used model in modern forecasting is the gross national product model.

Managerial Economics and Theory of Decision Making:

The theory of decision making is a relatively new subject that has significance for managerial economics. In the entire process of management and in each of the

management activities such as planning, organizing, leading and controlling, decision making is always essential. In fact, decision making is an integral part of today's business management. A manager faces a number of problems connected with his/her business such as production, inventory, cost, marketing, pricing, investment and personnel.

Economist are interested in the efficient use of scarce resources hence they are naturally interested in business decision problems and they apply economics in management of business problems. Hence managerial economics is economics applied in decision making. According to M.H. Spencer and L. Siegelman, -Managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision making up and forward planning by management‖. Managerial economics is a fundamental academic subject which seeks to understand and to analyse the problems of business decision making.

Managerial Economics and Statistics:

Statistics is important to managerial economics. It provides the basis for the empirical testing of theory. Statistics is important in providing the individual firm with measures of the appropriate functional relationship involved in decision making. Statistics is a very useful science for business executives because a business runs on estimates and probabilities.

Statistics supplies many tools to managerial economics. Suppose forecasting has to be done. For this purpose, trend projections are used. Similarly, multiple regression technique is used. In managerial economics, measures of central tendency like the mean, median, mode, and measures of dispersion, correlation, regression, least square, estimators are widely used. The managerial economics is constantly faced with the choice between models ignoring uncertainty and those that explicitly incorporate probability theory. Statistical tools are widely used in the solution of managerial problems.

Managerial Economics and Accounting:

Managerial economics is closely related to accounting. It is concerned with recording the financial operation of a business firm. A business is started with the main aim of earning profit. Capital is invested it is employed for purchasing properties such as building, furniture, etc and for meeting the current expenses of the business.

Managerial Economics and Mathematics:

Mathematics is yet another important subject closely related to managerial economics. For the derivation and exposition of economic analysis, we require a set of mathematical tools. Mathematics has helped in the development of economic theories and now mathematical economics has become a very important branch of the science of economics. Mathematical approach to economic theories makes them more precise and logical. For the estimation and prediction of economic factors for decision making and forward planning, the mathematical method is very helpful. The important branches of mathematics generally used by a managerial economist are geometry, algebra and calculus. The mathematical concepts used by the managerial economists are the logarithms and exponential, vectors and determinants, input-out tables. Operations research which is closely related to managerial economics is mathematical in character.

1.3 Subject Matter of Marginal Economics

1 Demand Analysis and Forecasting:

A major part of managerial decision making depends on accurate estimates of demand. When demand is estimated, the manager does not stop at the stage of assessing the current demand but estimates future demand as well. This is what is meant by demand forecasting. Managerial economics is concern with both present demand analysis and future demand and that is called as demand forecasting.

2 Cost and Production Analysis:

Cost analysis is another function of managerial economics. The determinants of estimating costs, the relationship between cost and output, the forecast of cost and profit are very vital to a firm. Managerial economics deals with these aspects of cost

analysis as it is the core stone for the success of any firm or industry. Production analysis is important to understand the input output combinations in the production of various goods. The factors of production and their combination help the manager to make a least cost combination. The main topics under cost and production analysis are production function, least cost combination of factor inputs, factor productiveness, returns to scale, cost concepts and classification, cost-output relationship and linear programming.

3 Pricing Decision, Policies and Practices:

Pricing is very important area of managerial economics. The control functions of an enterprise are not only productions but pricing as well. When pricing a commodity, the cost of production has to be taken into account. Business decisions are greatly influence the structure of market and the profits of the firm.

4 Profit Management:

Firms always want to make maximum profits and they design themselves to do so. The concept of profit maximization is very useful in selecting the alternatives in making a decision at the firm level. Profit forecasting is an essential function of any management. It relates to projection of future earnings and involves the analysis of actual and expected behaviour of firms, the sales volume, prices and competitor's strategies, etc. The main aspects covered under this area are the nature and measurement of profit, and profit policies of special significance to managerial decision making.

5. Capital Management:

Planning and control of capital expenditures is the basic executive function. The managerial problem of planning and control of capital is examined from an economic stand point. The capital budgeting process takes different forms in different industries. It involves the equi- marginal principle. The objective is to assure the most profitable use of funds,

1.3 Role of Managerial Economists in Decision Making

Managerial economics is concern with the enrichment of conceptual and technical skill of a manager. It is concerned with economic behaviour of the firm. It many concentrates on the decision process, decision model and decision variables at the firm

level. It is also concern with the application of economic analysis to evaluate business decisions.

The primary function of a manager in business organization is decision making and forward planning under uncertain business conditions. Some of the important management decisions are production decision, inventory decision, cost decision, marketing decision, financial decision, personnel decision and miscellaneous decisions. One of the good qualities of a manager is to make a quick decision He must have the clarity of goals, use all the information he can get, weigh pros and cons and make fast decisions.

The decisions are taken to achieve certain objectives. The main objective of a manager is to motivate his staff. He has to take a decision at the right time. Several acts are performed to attain the objectives quantitative techniques are also used in decision making. But it may be noted that acts and quantitative techniques alone will not produce desirable results. It is important to remember that other variables such as human and behavioral considerations, technological forces and environmental factors influence the choices and decisions made by managers. All these aspects of decision making are explained by the managerial economists who help and guide the manages to make most critical decisions in the management of any business.

Decision making is a process and a decision is the product of such a process. Managerial decisions are based on the flow of information. Decision making is both a managerial function and an organizational process. Managerial function is exercised through decision making. Organizational decisions are those which the executive makes in his personal capacity as a manager. They include the adoption of the strategies, the framing of objectives and the approval of plans. These decisions can be delegated to the organizational members so that decisions could be implemented with their support. A high degree of importance is attached to them. A serious mistake will endanger the company s existence. The selection of a location, selection of a product line, and decision relating to manage the business are all basic decisions. They are considered basic because they affect the whole organization.

In the business the major decisions have to be taken regarding – the level of production, inventories, cost, marketing cost, investment decision

With the advent of managerial revolution and transition from the owner- manager to the professional executive, the managerial economists have occupied an important place in modern business. In real practice, firms do not behave in a deterministic world. They strive to attain a multiplicity of objectives. Economic theory makes a fundamental assumption of maximizing profits as the basic objective of every firm. The application of pure economic theory seldom leads us to direct executive decisions. Present business problems are either too obvious in their solution or purely speculative and they need a special form of insight.

A managerial economist with his sound knowledge of theory and analytical tools can find out solution to the business problems. In advanced countries, big firms employ managerial economists to assist the management. Organizationally, a managerial economist is placed nearer to the policy maker simple because his main role is to improve the quality of policy making as it affects short term operation and long range planning. He has a significant role to play in assisting the management of a firm in decision making and forward planning by using specialized skills and techniques.

There are internal and external factors which influence the business over a period of time. The external factors lie outside the control of the firm and these factors constitute ‚Business Environment'. The internal factors lie within the scope and operation of a firm and they are known as ‚Business Operations'. The prime duty of a managerial economist is to make a study of the business environment and external factors affecting the firm's interest, viz., the level and growth of national income, influence of global economy on domestic economy, trade cycle, volume of trade and nature of financial markets, etc. They are of great significance since every business firm is affected by them.

The managerial economists have to deal with - local, regional, national and international economies, phase of trade cycle, future price and cost of production, demand forecasting, government policies, credit policies, capital markets and availability of credit to the business firms, etc. The focus of a managerial economist is on long term trends helps maximize profits and ensures the ultimate success of the firm. The role of the

managerial economist is not to take decisions but to analyze, conclude and recommend. Their basic role is to provide quantitative base for decision making. They should concentrate on the economic aspects of problems. They should analysed the nature, scope and methods of managerial economics. They should also deals with the problems of the management, giving general advice, helping in maximizing profits, make successful forecast on various business aspects.

The managerial economists are those who can put the most sophisticated ideas in simple language. It is also the managerial economist's responsibility to alert the management at the earliest possible moment in case he discovers an error in his forecast. Economists must be alert to new developments both economic and political in order to appraise their possible effects on business. The managerial economists should establish and maintain many contacts and data sources which would not be immediately available to the other members of management. In fact there is an exhausting list of duties that a managerial economists has to do to develop and help the business organizations.

1.7 Model questions

1. Explain the definitions of Managerial Economics.
2. What is the subject matter of managerial economics?
3. Discuss the nature and scope of managerial economics.
4. How is managerial economics related to other subjects?
5. In which way the managerial economists help in decision making in business?

1.7 Reference

1. D.N. Dwivedi   : Managerial Economics

2. Christopher R. Thomas & S. Charles Maurice   : Managerial Economics

3. Truett & Truett   : Managerial Economics.

4. Petersen, H. Craig & Cris, L W   : Managerial Economics

5. Chaturvedi, D.D. & Gupta S.L.   : Managerial Economics

6. Gupta, G.S.   : Managerial Economics

LAW OF DEMAND

2.0 AIMS AND OBJECTIVES:

In this part, what is demand, types of demand, determinants of demand, law of demand and exceptions are explained. By the end of this part you should understand the following points.

* What is demand, and types of demand

* Demand Function, determinants of demand

* Law of demand

* Exceptions to demand

CONTENTS:

2.1 INTRODUCTION TO DEMAND:

Demand plays a very important role in Business sectors. Because sales and profits of a business company depends upon its demand. A firm will not live without any demand of its goods in the market. Failure and success of a firm depends on demand of the goods. A firm will mobilise resources based on the demand forecastings. Hence, business economists must study the demand and its related things.

2.2 DETERMINANTS OF DEMAND:

Demand for a good depends upon various factors. They are

1. **PRICE OF GOOD:** Price of a good depends upon its demand. A change in price leads a change in demand of a good. The demand falls when the price rises and vice versa.

2. **POPULATION:** In generally, demand for a good depends upon population of a country, and number of consumers of that country. Demand is high when the population is high and the demand is low when the population is low.

3. **INCOME AND WEALTH OF CONSUMERS:** A goods decreased is based an income of the consumers. If the income changes the quantities puchased will also change.

4. **TASTES AND HABITS OF CONSUMERS:** Demand for a good is based on tastes and habits of the consumers. Demand will change if the tastes and habits of the consumer will change.

5. **PRICES OF SUBSTITUTIONAL GOODS:** Demand for a good depends upon its substitute goods. The demand is high if then are more substitutes. Moreover, the prices of its substitutises effect its demand. For example, price of coffee effects demand for Tea. Demand for tee is high when the price of coffee is high. The demand for tea is low when the price of coffee is low.

6. **COMPLEMENTARY GOODS:** Complementary good is a related good. Demand for a good depends upon prices of its complementary goods. For example, demand socks depends upon prices of shoes.

2.3 DEMAND AND LAW OF DEMAND:

In generally, the demand for a commodity in the amount bought. But in economic tenurs demand mean economic power of a commodity arises when the person has desire you it, and has the ability and willingness to pay for it. The other words, the demand for a commodity is the amount bought at a given price and at a point of time

A peson desires to buy a car. This is his desire. However, the person has the ability to pay for it. But the person has not that ability. So, this is not demand in the same way, there is no demand for a car even though he is a million as has not desire to purchase a car. Hence, we need two things to demand for a commodity. They are desire for it and ability to buy.

LAW OF DEMAND:

The law of demand refers the relationship between price of a commodity and demand for it. The law shows, other things being equal "demand rises when the price falls and demand falls when the price rises". Hence, there is inverse relationship between price and demand.

2.4 DEMAND FUNCTION:

The function explains relationship between price of a good and demand for it is called demand function. Demand for a commodity depends upon not only its price but also on prices of other goods, income of the consumer, tastes and habits of the consumer etc., Technically this is written as :

$D = f(P, \ Y, \ P_r, \ t)$ where

$D =$ Demand for a commodity

$P =$ Price of the commodity

$P_r =$ Prices of substitutes and complementary goods

$Y =$ Income of the consumer

In the above equation, it is hope that $Y_1, \ P_r, t$ are fixed. Hence,

$D = f(P)$

2.5 DEMAND SCHEDULE:

A table, which shows the relationship between price and demand is called demand schedule. The demand schedule refers the amounts purchased by a consumer at various prices.

Table No. 3.1

Demand Schedule

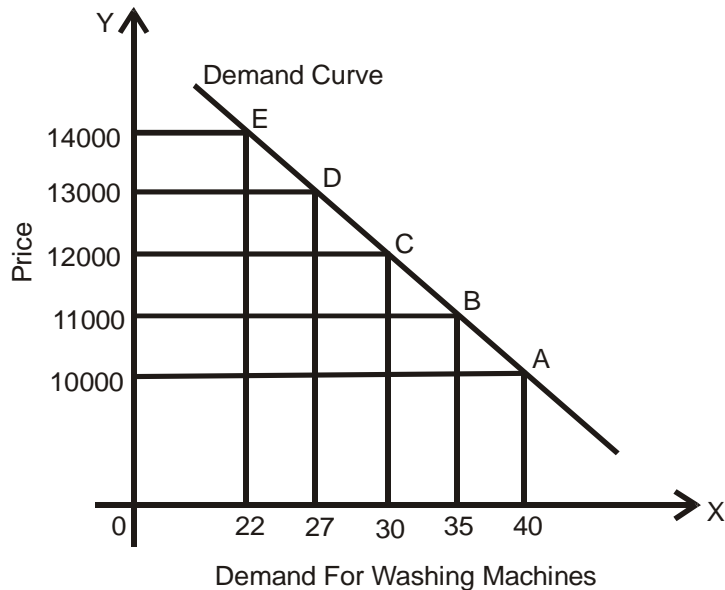| Price of Washing Machine(in Rs.)	Demand for Washing Machine
10000	40
11000	35
12000	30
13000	27
14000	22

The above Table - 3.1 shows that the consumers buy washing machines at various levels of price. Basing on the table it is said that there is inverse relationship betwen price and demand.

2.6 DEMAND CURVE:

A curve, which shows the relationships between price and demand is called Demand Curve.

Diagram - 3.1

Demand Curve

Demand For Washing Machines

In the above Diagram-3.1, we take demand for washing machines an X-axis and price of washing machines on Y - axis. It may be stated basing on the points, that the demand for washing machines are 40 at Rs. 10000 price level. If the price rises from Rs. 10000 to Rs. 110000 this demand falls from 40 washing machines to 35. In the same way the demand is decreasing when the price falls. The points A, B, C, D and E on the demand curve shows various demands at various prices. All these points are connnected by a line, is called demand curve. The demand curve slopes downwards from left to right.

2.7 TYPES OF DEMAND:

Basng on the values of the demand curves, it is divided into various types. Which the following are the main.

1.   Individual demand and market demand

2.   Company demand and industry demand

3.   Reciprocal Demand and Autonomus demand

4.   Price demand, income demand and cross demand

LET US NOW UNDERSTAND THE DEMANDS:

1.   INDIVIDUAL DEMAND AND MARKET DEMAND: The demand of a commodity at

various prices is the amount purchased during a period is called individuals demanded. The market demand is the sum totals of individual demands that are purchased at various prices.

2. **COMPANY DEMAND AND INDUSTRY DEMAND:**   A group of firms or companies producing a similar product is called industry. The demand for the products of the industry is called industry demand. For example, Demand for soaps in a country is considered as industry demand. Because manufacturing companies of soaps in a country is considered as an industry. It means combination of all firms which produce same goods or close substitution, is called an industry.

On the other hand, the demand for the product of a company is called company demand or firm's demand. For example, demand for Pears bath soap is called company demand. Because, different companies produce different soaps, all these soaps are substituties with each other. Hence, demand for all these soaps is called industry demand. Let us examine industry and company demands with an example.

For example, the demand for all bath soaps is a certain period is 100 million units. But in that the demand for in that soap is 20 millions only. Hence the Cinthal soap's share is 20%, in the total demand. The total demand 100 millions demand is industry demand and 20 millions demand is company demand.

3. **RECIPROCAL DEMAND AND AUTONOMUS DEMAND:** Any good which may be desired for personal consumption by consumers is called Autonomus Demand or Direct Demand. For example, demand for food items, houses is called autonomous demand. Where as the reciprocal demand derived from Utonamus demand, but for construction a house we require brick, cement, iron etc., The demand for these is reciprocal demand. The demand for brick, cement depend on demand for houses. The demand for bricks rises when the demand for houses is increasing. When the demand for houses is decreasing the demand for bricks falls. In generally, demand for consumer goods is called Utomous demand and demand for producer goods is called indirect demand or reciprocal demand.

4. **PRICE DEMAND, INCOME DEMAND AND CROSS DEMAND:**   Other things being constant, the relationship between price and demand is called price demand. Price demand relationship is indirect or inverse. Other things being equal, a fall in price extends developed and a rise in price contracts demand.

Other things being equal, the relationship between income and demand is called income demand. The income demand relationship is direct.

Cross demand refers the relationship between prices of substitutes and complementary goods and theiry demand, when other things being the same. The relationship between price of substitutions and its demand is directly proportional. The relationship between price of complementary good and its demand is inverse.

The following diagram - 3.2 shows income demand. Generally, demand increases when income is increasing Demand decreases when income is decreasing

Diagram - 3.2
Income Demand

Quantites of Demand
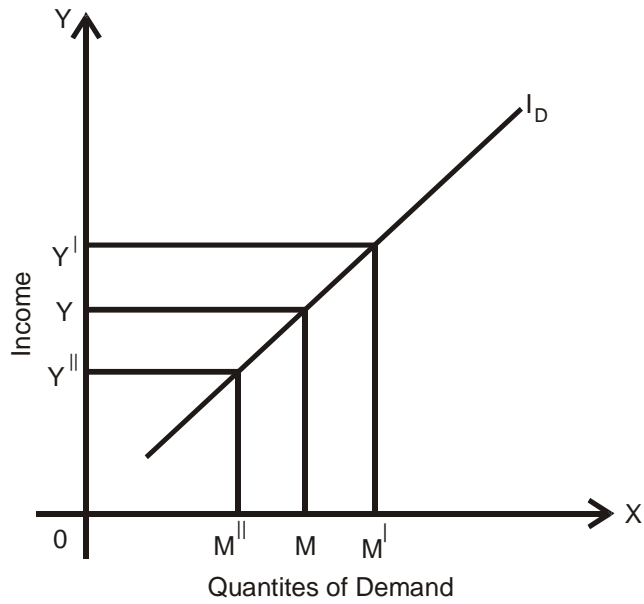
In the above diagram - 3.2, I_D is income demand curve. OM is the demand at OY level of income. The demand increases from OM to OM' as income increased from OY to OY'. If the income decreased from OY to OY'' the demand also decreased from OM to OM''.

Cross demand curve is shown in the following diagrams.

Diagram 3.2(A)   **Diagram 3.2(B)**
Substitute goods   **Complementary goods**
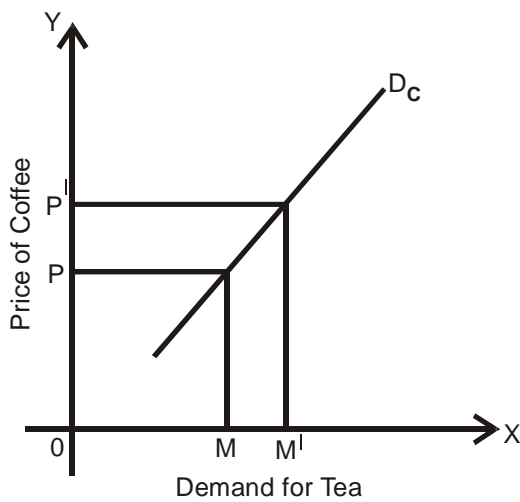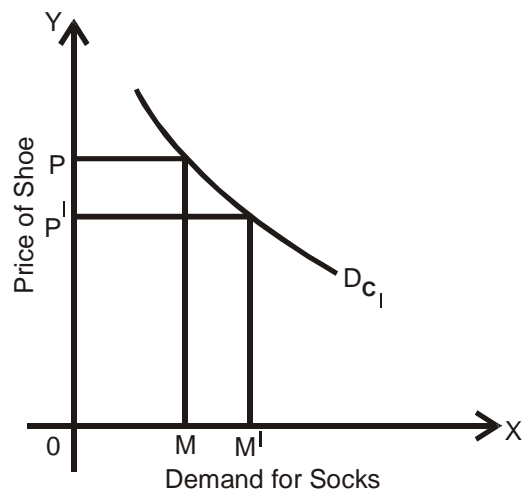

Diagram 3.2(A) shows cross demand for substitute goods and considered tea

and coffee are as substitutes. It may be observed from the diagram - 3.2(A), as the price of tea rises, demand for coffee increases as people tend to substitute coffee for tea. The cross demand curve slopes upwards from left to right in the case of substitutes. When the price of tea is P the quantities of coffee powder purchased in OM. When the price of the rise from P to P' the demand for coffee increased from M to M'.

Diagram - 3.2(B) shows cross demand for complementary goods, shoe and socks. It may be observed from this diagram - 3.2(B) as the price of shoes falls, demand for socks increase. The cross demand curve in the case of complementary goods slopes downwards from left to right. When the price of shoe in P the decrease for socks in OM. When the price shoe falls from P to P', the demand for socks increased from OM to OM' as shown in the diagram 3.2(B),

2.8 REASONS FOR DOWNWARD SLOPING FROM LEFT TO RIGHT OF A DEMAND CURVE:

Generally, the demand curve slopes downwards from left to right. We understand the function of law of demand as UK study the reasons for downward slopping of a demand curve. The reasons are as follows.

1. As there in inverse relationship between price and demand the decreased curve slopes downward from left to right.

2. The law of demand based on the law of diminishing marginal utility. According to the law of diminishing marginal utility each succeeding unit of a commodity gives less satisfaction then the preceeding unit. Hence, for each additions unit a consumer is willing to pay a lower price. As the price falls, he tends to buy more and more units. As the price falls he tends to buy less and less units. Hence, the demand curve falls downwards from left to right.

3. Further, a fall in price indules old buyers to buy more and attracts new buyers. It causes to increase in demand. A rise in price deducts purchasings of goods. It leeds to decrease in demand. This is one of the reason for downward sloping of a demand curve.

4. Substitution and income effects are considered as price effect. Income of the consumer effects the quantity of demand. This is medium effect. The real income of consumer will increase where prices of goods decreased. It leads to increase in purchasing of goods. For example, a fall in price leads to buy more milk. A rise in the price of milk leads to buy less quantity of milk. That is why the demand curve slopes downwards from left to right.

5. Changes in the policy of substitution goods effect on demand. This is called substitution effect. For example, as the price of coffee rises, keep the price of tea fixed, the demand for tea increases as people tend to substitute tea for coffee. Hence, the demand for coffee decreases. Thus, in the case of substitutes the demand curve slopes downwards from left to right.

6.   The demand may be effected may not only by the above goods but also some of the other goods. As the price of a commodity falls it is put to more and more uses. As the price of a commodity rises it is put to less and less urgent uses. For example, if the price of electricity is lowered, the households may use electricity for looking and heating purposes also.

2.9   EXCEPTIONS TO THE LAW OF DEMAND:

There are some exceptions to the law of demand. There exceptions an aganist to the law of demand. The following are the same of exceptions to the law of demand.

1.   **SUPERIOR GOODS:**   Demand for some goods is high, because of their high prices. The consumer of such goods measure their desirability may their prices. For example diamonds and jewellery etc. The consumer estimates his status by their prices. Hence, they buy less of these goods at lower prices and it leads decreases in demand instead of increase. They buy more of these goods at higher prices. It needs to increase in demand instead of decrease.

2.   **GIFTEN GOODS:**   According to Sir. Robert Giffen the law of demand does not apply to necessary goods. This is called Giffen paradox. As rise in prices of necessaries goods leads to increase in demand for then. For example, a rise in the price of rice caused a severe fall in the real income of the poor people that they were forced to curtail consumption of other expenses and buy more of it, even its price rise. Thus, the demand for rice is constant even its price rise. This is called Giften's Paradox.

3.   **SPECULATION BUSINESS:**   People even a further rise in price, buy larger quantity than before is called speculations business. A speculative person purchases larger quantitites when a rise in price and smaller quantities where a fall in price. Hence, a rise in price leads to increase in demand. Thus, speculation business is one of the exception for the law of demand.

2.10 SUMAMRY:

The demand for any thing at a given price is the amount of it which will be bought per unit of time at that price. This is effected my desire and purchasing power. The consumer buy more at lower price and less at higher price. The relationship between price and demand is inverse. Necessaries, Giffen goods and speculative business are exceptions to the law of demand. The relationship between income and demand is called income-demand. The relationship between the prices of substitute and complementary goods and its demand is called cross demand.

2.11 POINTS TO REMEMBER:

1.   The demand for anything at a given price is the amount of it. Demand requires desire and ability to buy.

2.   Demand for a commodity depends upon price of it, prices of substitutes and complementary goods, income tastes and habits, population etc.

3. The relationship between price and demand is called demand schedule. A curve which shown this relationship is known as demand cruve.

4. The relationship between price and demand in inverse. The relationship between income and demand is positive incase of superior goods and it is negative in case of inferior goods. The relationship between the price of substitute goods and its demand is positive incase of substitute goods and it is negative in case of complementaries. The relationship between this price of complementary goods and its demand is inverse.

5. Giffen goods, superior goods and speculation business are got apoplicable to the law of demand. Hence, these are exceptions to the law of demand.

2.12 KEY CONCEPTS:

1.	**DEMAND**	:	The demand for any thing at a given price is the amount of it.
2.	**LAW OF DEMAND**	:	Other things being equal, demand rises when a fall in price, and demand falls where a rise in price.
3.	**SUBSTITUTION GOODS**	:	A good which is used to represent of another good is called substitute good. For example, tea and coffee.
4.	**COMPLEMENTARY GOOD**	:	A good, which is used along with other good is called complementary good. For example milk and sugar is used to make coffee.
5.	**CROSS DEMAND**	:	The relationship between price of substitute or complementary good, and it's demand.

2.17 MODEL QUESTIONS FOR EXAMINATIONS:

I. ESSAY QUESTIONS:

1. Explain the law of demand and write its exceptions.

II. SHORT QUESTIONS:

1. What is demand? Write different types of demands.

2. Explain the law of demand.

3. Why the demand slopes downwards from left to right?

III. VERY SHORT QUESTIONS:

1. Demand Function

2. Reciprocal Demand

3. Individual Demand and Market Demand

4. Company Demand and Industry Demand.

2.14 SELECTED READINGS:

1. Watson   -   Price Theory and Its uses

2. K.K. Dewett   -   Modern Economic Theory

3. M.L. Jhingan   -   Advanced Economic Theory

4. P.A. Samuelson   -   Economics

5. Stonier and Hogue   -   Micro Economic Theory

6. G.E. Fuguson   -   Micro Economic Theory

7. R.G.D. Allen   -   Mathematical Analysis for Economics

8. R.A. Bilas   -   Micro Economic Theory

9. Telugu Academy   -   Vypara Arthesasterm

Lesson : 3

ELASTICITY OF DEMAND

3.0 AIMS & OBJECTIVES:

In the previous chapter we have studied demand for a commodity depends upon the price of it. A fall in the price, leads generally to an increase in demand. But the result is not the same in the case of all goods. Even the same goods have different demands at various times. For example, the demand for a good like salt is not very much affected by change in its price. On the other hand, change in the price of a good like Television sets exert a considerable influence on the demand for them. The elasticity of demand refers the percentage change in price leads to a percentage change in demand. By the completion of this part you can understand the following things.

*   Elasticity of demand

*   Types of elasticity of demand

*   Methods of measuring elasticity of demand

∗   Determinants of elasticity of demand

CONTENTS:

3.1   INTRODUCTION:

We have studied the law of demand, which shows that demand increases with a fall in price, and diminishes with a rise in price. It means a fall in price leads to a rise in demand and vice-versa. But we can not understand that how much change in price leads to how much change in demand. This is shown by elasticity of demand.

Some times demand varies much and at other times little due to the same change in price. There are certain goods whose demand does not contract much with the rise in their prices. While some goods whose demand contracts much with the rise in their prices. Demand increases with a fall in price, and diminishes with a rise in price. Hence, the business men determines price of his selling goods basing on demand for them. They derive profit or loss basing on price. Hence, there is a need to understand the elasticity of demand.

3.2 ELASTICITY OF DEMAND DEFINITION:

In general, elasticity means an increase. But in economics elasticity means that may be an increase or decrease. Elasticity of demand means change in price leads to a change in demand. It means that a rise or fall in price causes to a rise or fall in the demand is the elasticity of demand.

3.3 ELASTICITY OF DEMAND - TYPES:

In general, elasticity means an increase. But in Economics elasticity means that may be an increase or decrease. Elasticity of demand means change in price leads to a change in demand. It means that a rise or fall in price causes a rise or fall in the demand.

As we studied earlier there are certain factors which determines the demand. Basing on the important factors, the elasticity of demand is classified in to three types. They are:

1.   Price Elasticity of Demand

2.   Income Elasticity of Demand

3.   Cross Elasticity of Demand

3.4   PRICE ELASTICITY OF DEMAND:

Price elasticity of demand refers the ratio of percentage change in quantity demanded in response to a percentage change in price. Symbolically, it is shown as under.

$$\text{Price elasticity of demand (n)} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in price}}$$

$$= \frac{\text{Change in demand/previous demand}}{\text{change in price/previous price}}$$

The elasticity is shown in symbols. Let us take an example, oa is the price of a good. ob is the quantity demanded. If the price falls from oa to oa_1 leads to increase in demand from ob to ob_1, change in price $(oa - oa_1)$ is ∂a_1 and change in demand $(ob_1 - ob)$ is bb_1. Now substitute these symbols in the above formulae, we get

$$n = \frac{ob_1 - ob}{ob} \div \frac{oa - oa_1}{oa}$$

$$= \frac{bb_1}{ob} \div \frac{\partial a_1}{oa}$$

Symbolically change is indicated as Δ

Hence,

$$n = \frac{\Delta b}{ob} \div \frac{\Delta a}{oa} \quad \text{or} \quad \frac{\Delta b}{ob} \times \frac{oa}{\Delta a}$$

Types of Price Elasticity of Demand :

On the basis of numerical value of the elasticity of demand, we can classify the price elasticity of demand into five types. If the price elasticity of demand is equal to one, it is unitary elastic demand. The price elasticity of demand is greater than one, it is relatively elastic demand. The price elasticity of demand is less than one, it is relatively inelastic demand. The price elasticity of demand is infinite, it is perfectly elastic. The price elasticity is zero, it is perfectly inelastic. Different types of elasticity of demand are explained here under.

3.4.1   PERFECTLY ELASTICITY OF DEMAND: If a change in price of a commodity causes an infinite change in quantity demand is called perfectly elastic demand. Symbolically, it is shown as ∞ (infinite).

The perfectly elastic demand curve slopes horizontally as shown in the following diagram.
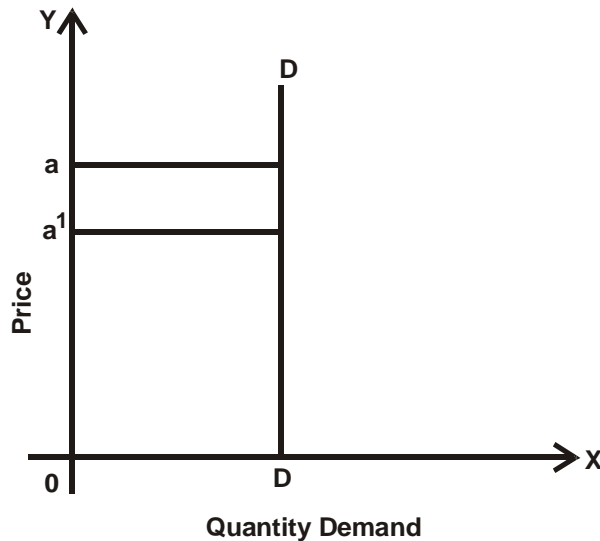
Diagram 4.1
Perfectly Elasticity of Demand
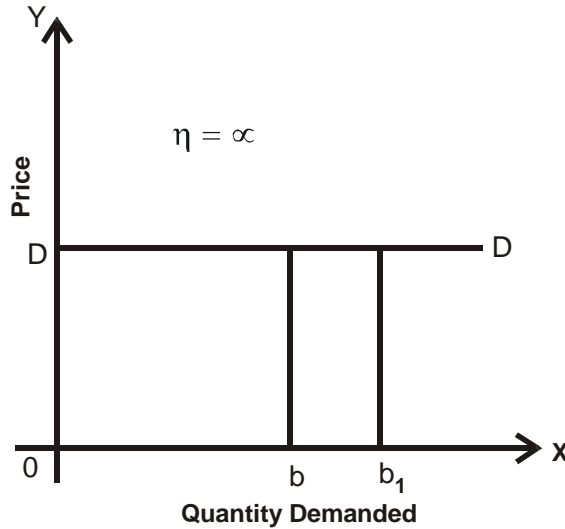
In the diagram 5.1 we take quantity demanded on OX - axis and Price on OY - axis DD is the demand curve. In the diagram 4.1 there is an infinite change in demand without any respond in price. Hence, the demand curve is a horizontal straight line parallel to OX - axis.

3.4.2 **PERFECTLY INELASTICITY OF DEMAND:** When the changes in price, does not bring any change in demand, it is called perfectly inelastic demand. It means the elasticity of demand is zero $(n = 0)$. This curve is a vertical straight line parallel to Y - axis. This is shown in the following diagram 4.2.

Diagram 4.2
**Perfectly Inelasticity of Demand**

In the diagram 4.2, we have shown quantity demanded on OX – axis, and price on OY – axis. On the diagram – 4.2. Even the price increases or decreases from OA to OA, then is no change in quantity demanded. This is called perfectly inelastic demand.

3.4.3 RELATIVELY ELASTICITY OF DEMAND: When the proportionate in demand is more than proportionate change in price, it is called relatively elastic demand. The slope of relatively elastic demand curve is less. This is shown in the following diagram - 4.3.

Diagram - 4.3

Relatively Elasticity of Demand

Quantity Demanded
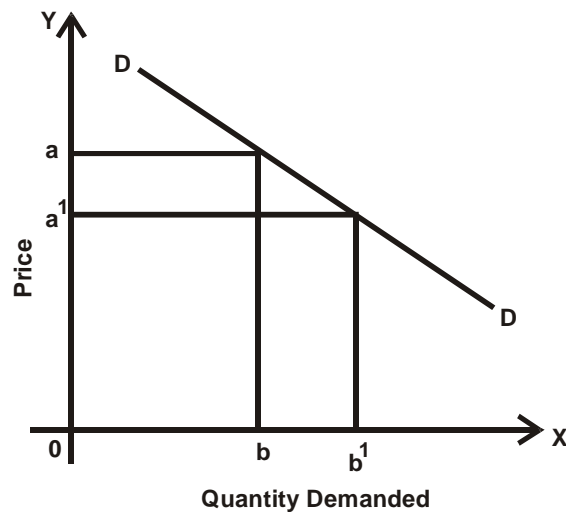
In the above diagram 4.3, DD is the demand curve, when the price falls from oa to oa_1, the demand increases from ob to ob_1. It means the proportionate change in demand (bb_1) is greater than the proportionate change in price $(a\,a_1)$. Hence, the elasticity of demand is greater than one $(n > 1)$.

3.4.4 RELATIVELY ELASTICITY OF DEMAND: If, the change in demand is less than proportionate change in price it is called relatively inelastic demand. The slope of this curve is more. This is shown in the following diagram - 4.4.
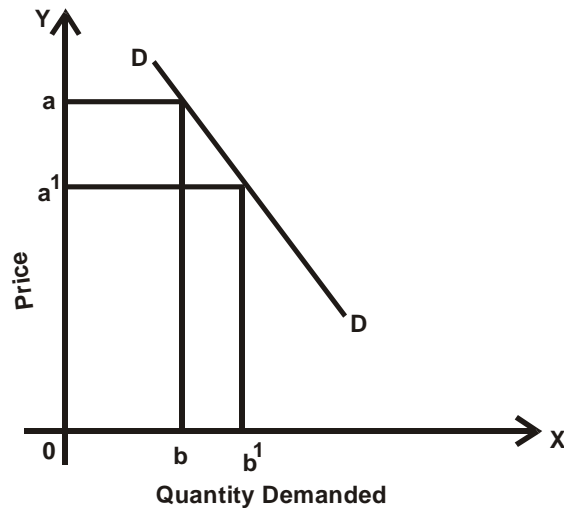
Diagram - 4.4
Relatively Inelasticity of Demand

In the above diagram - 4.4, DD is the demand curve. When the price falls from oa to oa', the demand increases from ob to ob'. It means that the change in demand (bb') is greater than the change in price (aa'). This is called relatively inelastic demand. The value of demand is less than one $(n < 1)$.

3.4.7   UNITY ELASTICITY OF DEMAND: When the change proportionate in demand is exactly equal to the proportionate change in price. It is called unitary elastic demand. Thus, the elasticity of demand in this case is unitary. Such a curve is called equilateral or rectangular hyperbola. This is shown in the following diagram - 4.7.

Diagram - 4.7
Unitary Elasticity of Demand
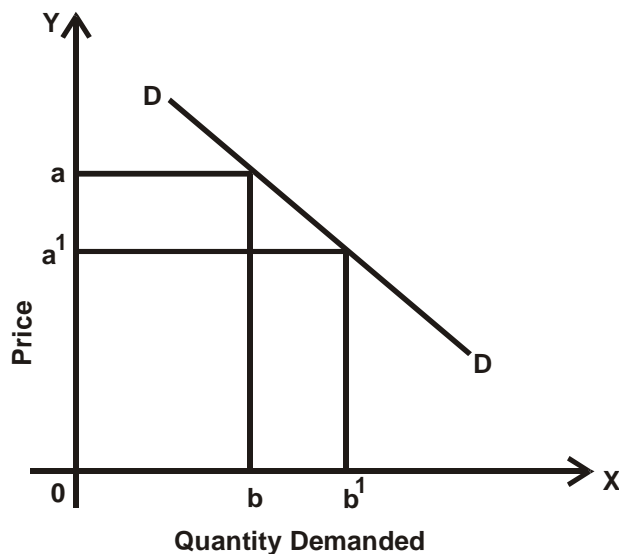
In the above diagram - 4.7, the change in price is equal to the change in quantity demanded. This is called unitary elastic demand. The value of elasticity of demand in this case is equal to one $(n = 1)$.

3.5 METHODS OF MEASURING ELASTICITY OF DEMAND:

There are five methods to measure elasticity of demand. They are

1. Slope of the demand curve method
2. Percentage method
3. Point method
4. Arc method
7. Total expenditure method

These methods are analysed here under.

3.5.1 SLOPE OF THE DEMAND CURVE METHOD: This is a traditional method. Which measurers the elasticity of demand. It is customary to measure elasticity with the gradient of a demand curve. A flat curve shows elastic demand and a step curve less elastic demand.

A curve in the form of a 45^0 line from Y - axis portarays unit elasticity. But the slope of the curve is not a reliable indicator of the degree of elasticity. The same curve may have different elasticity at the various points on a demand curve. This method of measuring elasticity is helpful only in the case of straight line curves on a graph with logarithmatic scales over a small range of price and quantity. In fact, this method speaks of the slope of the demand curve and that of the elasticity of demand. For this we pass on to the other methods.

3.5.2 THE PERCENTAGE METHOD: The percentage method is one of the most satisfactory methods of measuring elasticity of demand. According to this method, the following formula can be used to measure elasticity of demand.

$$\text{Elasticity of demand (n)} = \frac{\text{Percentage change in amount demanded}}{\text{Percentage change in price}}$$

$$= \frac{\dfrac{\text{change in amount demanded}}{\text{previous demand}} \times 100}{\dfrac{\text{Change price}}{\text{Previous price}} \times 100}$$

If, we use symbols, the above algebric formula is

$$n = \frac{\Delta q}{q} \times 100 \bigg/ \frac{\Delta p}{p} \times 100$$

In the above equation, ' Δ ' (delta) stands for a change, 'q' stands for demand and 'p' stands for price.

Let us now take an example to explain the percentage method of measuring elasticity.

Suppose 5 Kilograms of Tomatoes are priced at Rs. 10. If the price falls to Rs. 6, the amount demanded rises by 6 Kilograms. Elasticity of demand in this case as per the above formula will be

$$n = \frac{\frac{1}{5} \times 100}{\frac{4}{10} \times 100} = \frac{20}{40} = 0.5 < 1 \text{ (less elastic)}$$

From the above solution, demand for Tamatoes is inelastic as elasticity of demand is less than one $(n < 1)$.

Now, let us consider, the price falls from Rs. 10 to Rs. 6. The demand for Tomatoes increased from 5 Kilograms to 10 Kilograms. Then the elasticity of demand is

$$n = \frac{\frac{5}{5} \times 100}{\frac{4}{10} \times 100} = \frac{100}{40} = 2.5 < 1$$

The elasticity value 2.5 is greater than one. Hence, this is relatively elastic demand. Let us now suppose that the price falls from Rs. 10 to Rs. 6., the demand for Tomato is increased from 5 Kilograms to 7 Kilograms. Now the elasticity value is

$$\eta = \frac{\frac{2}{5} \times 100}{\frac{4}{10} \times 100} = \frac{40}{40} = 1$$

Hence, this is described as unitary elastic demand.

3.5.3   THE POINT METHOD: Marshall derived the point method for measuring elasticity at a point on the demand curve. This is also called geometrical method. In this method, we take a straight line demand curve which tangents X and Y axis, to measure elasticity of demand. This is explained with the help of above formula as here under.

Diagram 4.6
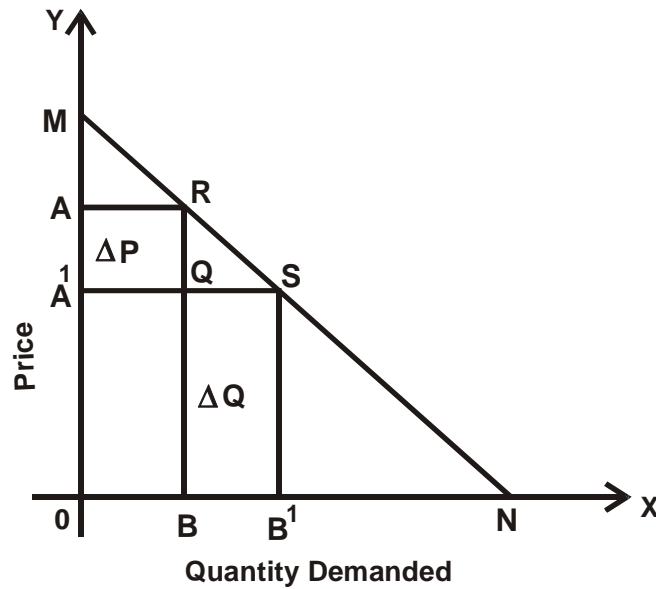
Quantity Demanded

In the above diagram 4.6, we take quantity demanded on OX axis and price on OY axis. MN is demand curve. This is extended upto X and Y axis. Demand for the commodity is OB at OA price level. If the price falls to OA'. It causes to increase in demand to OB.

$$\text{Elasticity of demand}\,(\eta) = \frac{\text{Proportionate change in demand}}{\text{Proportionate change in Price}}$$

$$= \frac{\dfrac{\text{Change in demand}}{\text{Previous demand}}}{\dfrac{\text{Change in price}}{\text{previousprice}}}$$

$$= \frac{BB'}{OB} \Big/ \frac{AA'}{OA} \quad \text{or} \quad \frac{BB'}{OB} \Big/ \frac{OA}{AA'}$$

From the above diagram, we can write the above as $BB' = QS$, $AA' = RQ$, $OA = RB$, and $OB = AR$. Thus, the above equation becomes

$$\eta = \frac{QS}{OB} \times \frac{RB}{RQ}$$

As $\lfloor RQS, \lfloor RBN$ are similar, the ratios of their sides is also equal. Hence, $QS = BN$, $RQ = RB$. Now, the above equation becomes as under

$$\frac{BN}{\cancel{RB}} \cdot \frac{\cancel{RB}}{OB} = \frac{BN}{OB}$$ is equal to the ratios of RN, RM.

Hence, $\eta = \dfrac{RN}{RM} = \dfrac{\text{Lower segment}}{\text{Upper segment}}$

It is equal to measuring the elasticity at any point along a demand curve with the help of the point mehtod. Suppose that the straight line demand curve is 6 centimeters.

Diagram 4.7
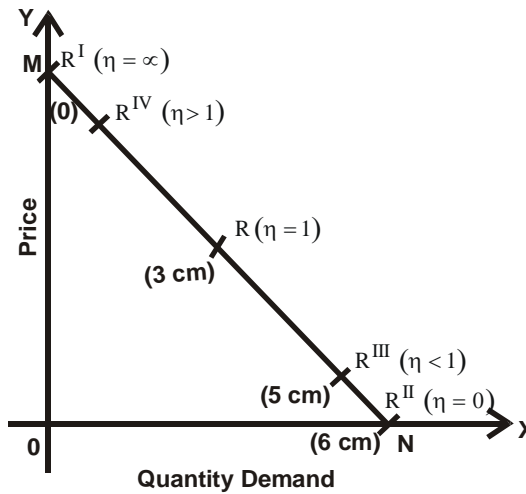
In the above diagram 5.7, point "R" be in the middle of the demand curve along with other points R^{I}, R^{II}, R^{III} and R^{IV}. So, elasticity of demand at these points are

$$R = \frac{RN}{RM} = \frac{3cm}{3cm} = 1 \text{ (Unity elasticity)}$$

$$R^{I} = \frac{R^{I}N}{R^{I}M} = \frac{6}{0} = \infty \text{ (Perfectly elastic)}$$

$$R^{II} = \frac{R^{II}N}{R^{II}M} = \frac{0}{6} = 0 \text{ (Perfectly inelastic)}$$

$$R^{III} = \frac{R^{III}N}{R^{III}M} = \frac{1}{5} = <1 \text{ (Relatively inelastic)}$$

$$R^{IV} = \frac{R^{IV}N}{R^{IV}M} = \frac{5}{1} => 1 \text{ (Relatively elastic)}$$

Basing on the lower segment and upper segments, we may measure the elasticity at various points on the demand curve.

3.5.4 TOTAL EXPENDITURE METHOD: There is another method to measure the elasticity of demand, which is known as total expenditure method. A change in demand and a change in price that causes to increase in the total expenditure. By comparing the total expenditure of a buyer both before and after the change in price. It can be known whether the demand for the good is elastic or inelastic, similarly demand for a good is elastic when the total expenditure increases, inelastic when then total expenditure falls and unitary when the total expenditure remains unchanged. With a fall or rise in the price of good. This is proved in the following table.

Table 4.1

Table Showing Change in Demand and Total Employees in Change Price

Price of Good (in Rs.) (1)	Quantity demanded (in units) (2)	Total expenditure (in Rs.) (3)=(1)x(2)	Elasticity of demand
4	100	400	$\varepsilon_d > 1$ Elastic Demand
3	200	600	$\varepsilon_d = 1$ Unitary elastic demand
2	300	600	
1	400	400	in elastic demand

We are able to understand whether the demand is elastic or inelastic or unitary with this method. However, it is possible to understand the quality of elasitcity of demand.

3.5.5 ARC METHOD: The arc method is an another method to measure elasticity of demand. The arc is a part in a curve. The elasticity of demand between two points on a demand is called arc elasticity. This is found by the following equation.

$$\text{Arc Elasticity of Demand} = \frac{\text{Change in demand}}{\text{Previous demand} + \text{Changed demand}} \div \frac{\text{Change in price}}{\text{Previous price} + \text{Changed Price}}$$

(or)

$$= \frac{\text{Changed in demand}}{\text{Previous demand} + \text{changed}} \times \frac{\text{Previous price} + \text{Changed price}}{\text{Change in price}}$$

With the help of the following diagram the arc method is analysed as under.

Diagram 4.8
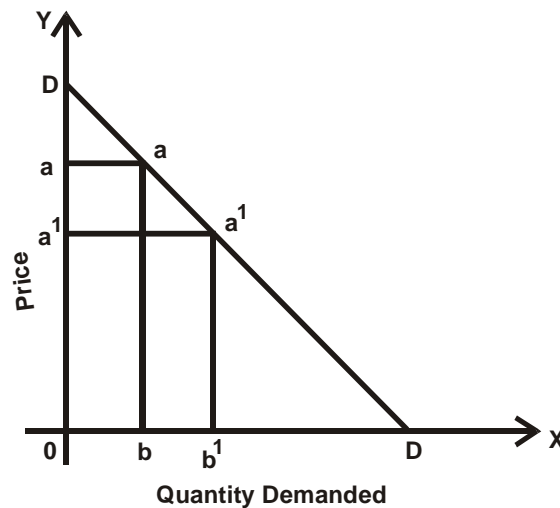
Quantity Demanded

      In the above diagram 5.8, we measure quantity demanded on OX axis and price on OY axis. DD in this demand curve. Oa is the starting price and Ob is the starting demand Oa_1 and Ob_1 are the low price and demands respectively. Now, basing the above formula, elasticity of demand is

$$\text{Arc elasticity of demand} = \frac{bb'}{ob + ob'} \div \frac{aa'}{oa + oa'}$$

      In other words, arc elasticity means average elasticity. Because, we took the previous demand and prices and changed demand and prices. The elasticity of demand in unitary when the value of elasticity is one. It is relatively elastic when the value is greater than one. It is relatively inelastic when the value is lessthan one.

3.6 INCOME ELASTICITY OF DEMAND:

      Income is one of the main determinants of demand. There is a direct relationship between income and demand. It means that if the income rises, in demand increases. If the income decreases, demand decreases. However, the income elasiticity of demand refers to change in the quantity a commodity in respone to change in in consumption of a consumer. This is explained with the help of the following formula.

$$\text{Income elasticity of demand} = \frac{\text{Proportiate change in demand for commodity}}{\text{Proportionate change in the income of consumer}}$$

$$= \frac{\text{Change in demand}}{\text{Previous demand}} \bigg/ \frac{\text{Change in income}}{\text{previous income}}$$

The income elasticity of demand is unitary when the value of income elasticity of of demand is equal to one. It is relatively elastic when the value of income elasticity of demand is greater than one. It is relatively inelastic when the value is infinite. It is perfectly inelastic when the value is zero.

3.7   CROSS ELASTICITY OF DEMAND:

Demand for a commodity depends not only its price but also on the prices of its substitutes and complementary goods. The Cross Elasticity of demand is a measure of relative change in the qantive demanded for a commodity due to a change in the prices of its substitutes and complementary goods. The cross elasticity of demand of Y for X is found as in this following whenever.

$$\text{Cross elasticity of demand} = \frac{\text{Proportionate change in the demand for good X}}{\text{Proportionate change in the price of good Y}}$$

There is direct relationship between price of Y and demand for X when X and Y are substitues. It means that if the price of good Y increases it leads to increase in the demand for good X. If the price of good Y falls, that leads to decrease in demand for good X.

There is inverse relationship between price of Y and demand for X when they are complements. It means if the price of Y increases it leads to decrease in demand for X and vice-versa.

The demand is unitary elastic when the value of cross elasticity of demand is equal to one. It is relatively elastic when the value is greater than one. It is relatively inelastic when the value is less than one. It is perfectly elastic when the value is infinite. It is perfectly inelastic when the value is zero.

3.8   DETERMINANTS OF ELASTICITY OF DEMAND:

The elasticity of demand of a commodity depends upon the following factors.

1.   **NATURE OF THE COMMODITY:**   We may say that the elasticity of demand for a commodity is based on nature of the commodity. Demand tends to be inelastic for necessaries of life. Demand tends to be elastic for luxiries. For instance, then elasticity of demand for salt is inelastic. The elasticity of demand for television is elastic.

2.   **PROPORTION OF INCOME SPENT:**   The elasticity of demand depends upon proportion of income spent by a consumer. If the proportion of one's income spend on a commodity is very small, demand for it does not change much for small changes in price. Demand in such cases tends to be inelastic.

3.   **MULTI USES:**   If a commodity can be put to several uses its demand tends to be elastic. Every fall in its price induces people to put it to less urgent uses. Demand will increase considerably for all in price. For example, electricity can be used for lighting purpose. When its price is high. If the price will fall the electricity will be used for cooking purpose also.

4.   **IF THE USE CAN BE POSTPONED:**   If the use of a commodity can be postponed we shall buy it only when its price is sufficiently low. If its price rises we shall postpone buying it. this will happen in the case of durable goods like clothes, cycles, fans etc. In such cases demand tends to be elastic. If the use of a commodity can not be postponed, its demand tends to be inelastic as it will buy even though its price rises.

7.   **TASTES AND HABITS:** If the consumer's tastes and habits are fixed, the demand for such goods to be in elastic. For example, if the price of broke bond coffee changes, its demand does not change as the consumer's takes it.

6.   **LEVEL OF PRICES:**   The level of prices determine elasticity. If the price of a thing is high its demand will be elastic. If the price is low, its demand will be inelastic.

7.   **USING TIME OF A COMMODITY:**   Using time of a commodity determines the elasticity of demand. The elasticity of demand is greater in the long run than in the short run for simple reason the consumer has more time to make adjustments in his scheme of consumption.

8.   **LIFE TIME OF GOODS:**   The demand for superior goods is elastic and the demand for inferior goods is inelastic.

3.9   IMPORTANCE OF ELASTICITY OF DEMAND:

The concept of elasticity of demand has great practical importance in economics. It is required for taking some economic decisions.

1.   **PRICE DETERMINATION UNDER MONOPOLY:** A monopolist has to study the elasticity of demand for his product. To get more profits by determining lower price for those goods which have high elasticity, high price for those goods which have inelastic demand.

2.   **PRICE DETERMINATION UNDER DISCRIMINATING MONOPOLY:** In discriminating monopoly, the monopolist will fix the price of this goods at different markets based on elasticity of demand. A monopolist will fix a higher price in the least elastic market and lower price in the higher elastic market.

3.   **PRICING OF PUBLIC UTILITIES:** The concept is useful in public utilities, which are provided by state enterprises. The Governments will fix a higher price in the case of least elasticity of goods. For example, the electricity department is fixing higher price for the supply of electricity to households as is inelastic. Whereas the electricity department is fixing lower prices in the case of higher elasticity of good to industries as is elastic.

4.   **PRICE DETERMINATION OF JOINT PRODUCTS:** The concept is useful in the price determination of joint products. It is not quite possible to estimate separate costs production of money for joint markets like wool and mutton, paddy and hay etc. Hence, the prices of such goods are fixed basing on their elasticity of demand. A high price is fixed for that product for which demand is inelastic and low price is fixed for that product for which demand is elastic.

5. **WAGE FIXATION:** Wages of labourers are low, when the elasticity of demand of labourers is elastic in a firm as trade unions are unable to raise thier wages. If the demand for labour is inelastic, the employees can raise their wages.

6. **GOVERNMENT POLICIES:** Elasticity of demand is useful to governments to take some critical decisions in different sectors. Mainly, it is useful in the determination of supporting prices for agriculture products.

7. **INTERNATIONAL TRADE:** The concept of elasticity of demand is useful in international trade. It is useful in exports, imports, exchange rates etc.

3.10 SUMMARY:

Other things being equal, the law of demand states that a fall in price increases demand and a rise in price reduces demand for a good. However, the elasticity of demand shows that the ratio of percentage change in price. It's demand is elastic when the change in demand is greater than the change in a price, in elastic when it is less than and unitary when it is equal. There are five methods to measure the elasticity of demand. They are slope of the demand curve, point method, arc method, total expenditure method, and percentage method. It is useful in price determination under monopoly, taxation, international trade etc.

3.11 POINTS TO REMEMBER:

1. The elasticity of demand is classified as price elasticity of demand, income elasticity of demand and cross elasticity of demand.

2. The price elasticity of demand are of five types. They are perfectly elastic $(\eta = \infty)$, perfectly inelastic $(\eta = 0)$, relatively elastic $(\eta > 1)$, relatively inelastic $(\eta < 1)$ and unitary elastic $(\eta = 1)$.

3. Slope of the curve, percentage method, point method, arc method, and total expenditure method are the methods to measure elasticity of demand.

4. The elasticity of demand determines by nature of commodity, proportion of income spent, multi uses, use can be postponed, tastes and habits, and using time of commidity.

7. The elasticity of demand has great practical importance in economics. It is useful in the price determination under monopoly, pricing of public utility, wage fixation, international trade etc.

3.12 KEY CONCEPTS:

1.	**Elasticity of Demand**	:	A change in the demand for a commodity in response to a change in the price of it.
2.	**Perfectly Elasticity of Demand**	:	If a change in price of a commodity causes an infintely change in quality of demand it is called perfectly elasticity of demand.

3.	**Perfectly inelasticity of Demand**	:	When what ever the change in price, there is absolutely no change in demand is called perfectly inelastic demand.
4.	**Relatively Elasticity of Demand**	:	When the change in demand is more than proportionate change in the change in price it is called relatively elasticity of demand.
5.	**Relatively inelasticity of Demand**	:	When the change in demand is less than proportionate change in the price it is called relatively inelastic demand.
6.	**Unitary Elasticity of Demand**	:	When the change in demand is exactly proportionate change to the change in price is called unitary elasticity of demand.
7.	**Arc Elasticity of Demand**	:	The elasticity of demand between two points on a demand curve is called arc elasticity of demand.

3.13 MODEL QUESTIONS FOR EXAMINATIONS:

I. ESSAY QUESTIONS:

1.   Explain the different methods to measuring elasticity of demand.

II. SHORT QUESTIONS:

1.   What is elasticity of demand? Explain different types of elasticity of demand.

III. VERY SHORT QUESTIONS:

1.   Price Elasticity of Demand

2.   Income Elasticity of Demand

3.   Cross Elasticity of Demand

4.   Percentage method

5.   Point Method

6.   Arc Method

7.   Total Expenditure Method

3.14 SELECTED READINGS:

1.	Stonier and Hange	:	A Text Book of Economic Theory
2.	Sundaram, K.P.M.	:	Business Economics
3.	Ahuja, H.L.	:	Principles of Micro-Economics
4.	Dewett, K.K.	:	Advanced Economic Theory
5.	Telugu Academy	:	Arthesastra Siddhanthalu

UTILITY ANALYSIS

4.0 AIMS AND OBJECTIVES:

      Utility analysis is an important topic in this economics. The main objective of the consumer in the purchasing of goods and services in to satisfy his wants. In this part we should understand the consumer is in equilibrium in the purchasing of goods. By the completion of this point the students understand the following things.

* What is utility
* Types of Utility Analysis
* Law of diminishing marginal utility
* Law of Equi-Marginal utility
* Theory of Consumer surplus

GONTENTS:

4.4 Theory of Consumer Surplus

4.1 CARDINAL UTILITY ANALYSIS, ORDINAL UTILITY ANALYSIS:

Utility analysis is an important topic in this economics. The main objective of the consumer

in the purchasing of goods and services is to satisfy his wants. In this point we should understand

who the consumer is in equilibrium in the purchasing of goods. By the completion of this point

the students understand the following things.

    What is utility

    Types of Utility Analysis

    Law of diminishing marginal utility

    Law of Equi-Marginal utility

    Theory of Consumer Surplus

    There are two analysis to study the consumer's behaviour. They are 1. Cardinal Utility

Analysis, 2. Ordinal Utility Analysis.

    The word utility denotes the want satisfying power of a commodity or service. In general,

the meaning of utility and usefulness is one and the same. The same good may give different

utilities to different persons.

    According to cardinal utility analysis, utility can be measured in members, or in units. By

utility in psychological concept. So it cannot be measured in terms of member or units. However,

utility can be compared. Good A gives more satisfaction or less satisfaction then good B. but we

cannol say by how much utility of one good is more or less than the utility of another.

Basing on cardinal utility analysis, law diminishing marginal utility, law of equi-marginal utility and the theory of consumer surplus were explained. These theories ire explained as under.

4.2 LAW OF DIMINISHING MARGINAL UTILITY:

A German economist, Gossen was the first to explain the law. That's way this was called as Gossen's first law. Later Alfred Marshall gave a precise explanation to the law and named as law of diminishing marginal utility.

The law shows that the relation stays between a good and its utility. Marshall says "The additional benefit which a person drives from a given increase of stock of anything diminishing with every increase in the stock that he already has'. The law based on the following assumptions.

4,2.1 ASSUMPTIONS:

1. Utility is measurable.

2. All the units of a commodity must be homogeneous.

3. There is a possibility to increase or decrease the quantity of goods.

4. The unit must be consumed in quick succession with equal time interval.

5. No change in the income of consumer

6. Then shall be not any change in the price of the commodity and the consumer Know
   the price of goods.

7. There shall be not any change in the price of its substitutes.

8. The tastes and habits of consumer must remain unchanged.

9. The consumer must be rational in his conduct. lt means consumer tries to get more satisfaction.

4.2.2 STATEMENT OF THE LAW: Based on the above assumptions the law of diminishing marginal utility was explained by Marshall. Marshall states the law thus : 'The additional benefit which a person derives from a given increase of unit stock of a thing diminishes with every increase in stock that already has'. According to Marshall marginal utility is zero when total utility maximum. At the point the consumer is in equilibrium. The same thing in explained is the following diagram.

4.2.3 ANALYSIS OF THE LAW THROUGH TABLE: Let us suppose that a consumer is f and q apples. As he consumers are apple after another he derives less and less satisfaction. We show this tendency with an imaginary table given below:

TABLE NO. 4.1

TOTAL UTILITY

Quantity of Apples	Total Utility	Marginal Utility
1	20	20
2	38	18
3	53	15
4	63	10
5	63	0
6	50	-13

From the above table it is sent that the marginal utility is decreasing when the quantity of increased. The total utility is increasing upto 5th appeal and then decreasing. At the 5th apple the marginal utility is zero when the total utility is maximum. At this stage the consumer is in equilibrium.

4.2.4 DIAGRAMMATIC REPRESENTATTON: We show the above information in the following diagram.
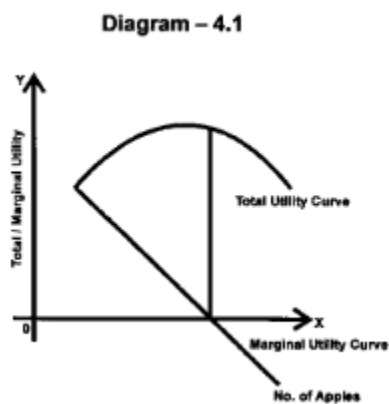
Diagram – 4.1

In the above diagram we takes No. of apples as X-axis, Total and marginal utility on y-axis. Total utility curve shows that the satisfaction derived from the whole stock. The total utility curve shows that the addition to total utility resulting from the consumption of one more unit. The marginal utility curve slopes down towards from left to right. Marginal utility is zero when total utility is maximum. At this stage the consumer is in equilibrium.

4.2.5 EXCEPTIONS TO THE LAW: The law of diminishing marginal utility has the following exceptions.

1. The law does not applicable to drinkers. A drinker thinks that the additional unit of wine gives additional satisfaction without diminishing rates. But economists say that the law is applicable to drinkers after a peak stage.

2. In the case of rare collections, the law does not hold good. If, for instance a man is collecting ancient coins, the more he is able to collect the greater will be his satisfaction. Hence, in such cases, the law does not hold good.

3. The does not applicable to misers as it is said that more money he has, the more he wants.

4.2,6 CRITICISM: Some economists criticized Marshall's law of diminishing marginal utility as the following grounds.

1. Utility is psychological concert. So, it is not measurable.

2. The law apply does in the case of one good only. But does not apply to many goods.

3. The law does apply within a certain tame and homogeneous goods. Otherwise, the law will not apply.

4. lf tastes and habits of the consumer is changed the law will not apply.

5. All goods are not independent goods.

6. The law does not explains price and substitution effects.

7. The marginal utility of money is not constant always.

4.2.7 IMPORTANCE OF THE LAW:

1. This law forms the basis of the theory and practice of taxation. Progressive system of taxation is based on this law

2. The law shows that value of goods is decreases when the quantity or supply of goods increased.

3. The law explains that why the demand curve slopes downwards. In other words, demand curve is a marginal utility curve.

4. It shows the difference between the value-in-use and value-in-exchange'

5. The law shows that the re-distribution of wealth in favour of the poor. The marginal utility to the rich of the wealth, that they might lose, is not so great as the marginal utility of the wealth which is transferred to the poor.

6. Some of the economic theory like law of demand, theory of equi-marginal utility, the theory of consumer surplus, elasticity of demand' are based on this law.

7. The law explains water demand and paradox.

4.3 LAW OF EQUI.MARGINAL UTILITY:

The law of diminishing marginal utility explains satisfaction derived by a person from successive goods. The law of equi-marginal utility shows marginal utility have been equalized, through the process of substitution that we get maximum satisfaction. This law was framed by Gossen, but later it was explained by Marshall as theory. This law is based on the following assumptions.

4.3.1 ASSUMPTIONS:

1. Utility can be measured.

2. No change in the income of consumer.

3. The prices of substitution goods are remain unchanged.

4. The law of operates based on the law of diminishing marginal utility.

5. the tastes and habits of consumer are fixed.

6. The marginal utility of money is fixed.

7. The main aim of consumer is deriving the greatest amount of satisfaction.

4.3.2 STATEMENT OF THE LAW: Basing on the above assumptions, Marshall states the law thus : "lf a person has a thing which he can put to several uses, he will distribute it between these uses in such a way that it has the same marginal utility in all". Take two goods A and B and marginal utility and prices are the same. Then the consumer is in equilibrium. This gives us the rule.

$MV_A/P_{A} = MU_B/P_B$

4.3.3 ANALYSIS OF THE LAW THROUGH TABLE: The consumer starts with Rs. 10 of income that he can spend. He is confronted with prices of A, B goods. The price of each good is one rupee. Then the consumer is ready to spend his income on these two goods by increasing his satisfaction by substituting are good for the other until the marginal utility of money is the same in both the cases. The following table gives these details.

Table 4.2

Quality	Marginal Utility of Good A	Marginal Utility of Good B
1	40(1)	34(3)
2	36(2)	28(5)
3	30(4)	26(6)
4	24(7)	20(8)
5	16(9)	14(10)
6	10	10
7	8	9

From the above table, the consumer will spent his first and second rupees on good A. But the third rupee will spend on Good B and again the fourth rupee will spend on good A. The consumer gains by pushing his purchase of commodity upto his amount becomes zero. As long as the marginal utility of two goods is equal, the consumer buys more of the commodity. lt means he will purchased 6 units of good A and 4 units of good B. Then he is in equilibrium.

4.3.4 DIAGRAMMATIC REPRESENTATION: In the following diagram, we take quantities of A, B are goods as X-axis, marginal utility of A and B goods as Y axis.

Diagram - 4.2
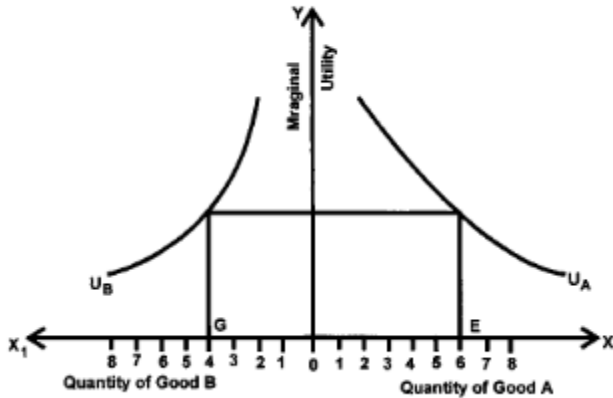
In the above Diagram U4 shwos the marginal utility curve of good A, Ug shows the marginal utility curve of good B. The consumer will buy upto the marginal utility of A and the marginal utility of B an equal. Hence, the consumer buys OE level of A good, and OG level of B good. The consumer is in equilibrium. At this stage $MU_A/P_A = MU_B/P_B$

4.3.5 CRITICISM: The law of equi-marginal utility was criticized on the following grounds.

1. Utility is psychological concept. There is no calculate.

2. Every good has complementary and substituting goods. But this law does not explain its effects.

3. This law does not apply, if the income of the consumer is changed.

4. The consumer

5. This law does not apply if the tastes and habbits of consumer is changed.

6. Marginal utility of money is not constant always.

4.3.6 IMPORTANCE: In the real world, the law of equi-marginal utility analysis is famous in the following grounds.

1. The theory explains how a consumer get maximum satisfaction.

2. The law of .... is based on the law of equi-marginal utility.

4.4 CONSUMER SURPLUS:

The theory of consumer surplus is based on the theory of demand. In other words the theory of consumer surplus is based on the law of diminishing marginal utility. The theory of consumer surplus was first developed by Duppit, a French engineer. Marshall called it as

consumers rent, later he analyzed as consumer surplus. Afterwards, Hicks criticized this theory and analyzed another utility theory known as ordinal utility analysis.

The price which we pay for certain things do not measure their real worth. It means do not measure their real worth. It means that they give satisfaction more than the prices. Thus, there is surplus satisfaction the best examples of commodity giving surplus satisfaction and salt, post card, news paper etc.

Marshall says "The benefit which he gets from purchasing at a low price thing for which he would be willing to pay a high price than go without them, may be called consume/s surplus.
Consumer's Surplus = Demand Price - Market Price (or)
Consumer surplus = Price willing to pay - Price Actually paid
The theory of Consume/s surplus is based on the following assumptions.

4.4.1 ASSUMPTIONS: Marshall's theory of consumer's surplus theory is based on the following assumptions.
1. Utility is measurable.
2. The income of the consumer is fixed.
3. Every good is an independent good. lt means utility of a good depends upon its quantity.
4. The marginal utility of money is constant.
5. Perfect competition situation exists in the economy.

4.4.2 ANALYSIS OF THE THEORI The concept is deduced from the law of diminishing marginal utility. According to this law, the price which a consumer pays for a commodity equals marginal utility. lt means that all the units of marginal utility are equal to the price which the consumer pays for commodity. Basing on this the following table is formed.

Table - 4.3

| Goods	Total Utility (in Rs.)	Marginal Utility (In Rs.)	Price actual paid in (in Rs.)
1	20	20	15
2	38	18	15
3	53	15	15
4	64	11	15

Let us suppose price of a good is Rs. 15. According to the Table 3.3, the consumer is willing to pay Rs. 20 to purchase the first good. Because the consumer gets Rs. 20 of marginal utility. But in the market price of the good is Rs. 15 and consumer pays it. So, the consumer's surplus is Rs. 5(20-15). The consumer is interested to buy the second good at the rate of Rs. 18. But the market price of the good is also Rs.15. So, on the second good the consumer's surplus is Rs. 3 (18 - 15). To purchase the third good the consumer is willing to pay Rs. 15. But this equal to market price. Hence, the consumer's surplus is nil. To purchase 4th good, the consumer is interested to pay Rs. 11 , but the market price is Rs. 15. Hence the consumer didn't purchase the 4th good. In total, the consumer is anterested to pay Rs. 531- (20 + 18 + 15) to purchase first, second and third goods. But actually he paid Rs. 451 (15+15+15) only.

Consumer's surplus = Demand Price - Market Price
Consumer's surplus = Rs. 53 - Rs.45 = Rs. 8

4.4.3 DIAGRAMMATIC REPRESENTATION: To explain the theory of consumer's surplus. We take quantity on X-axis, price on Y-axis. DD' is a curve shows the demand curve or marginal utility curve. This curve shows that the additional benefit which a person derives from additional good. The curve slopes from left to right.
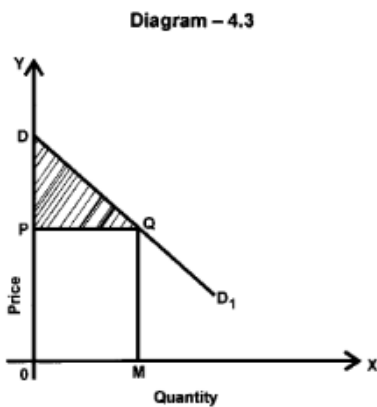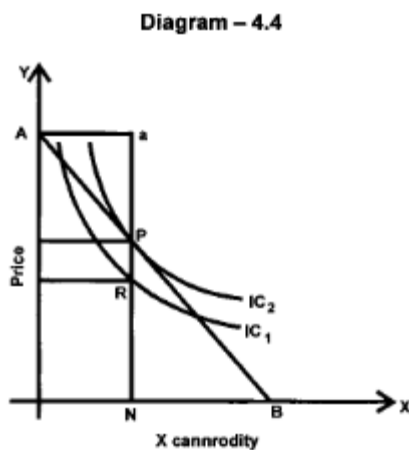

Diagram – 4.3

In the above diagram -3.3, the consumer buys OM level of quantity and pays OPQM. The total utility derived by him is ODQM. In other words the consumer is willing to pay ODQM price level but pays OPQM. So the surplus is PDQ.

Consumer's surplus = ODQM - OPQM = PDQ.

4.4.4 CRITICISM: The concept of consumer's surplus is criticized by Gobi, Tossing, Hicks, Samuleson etc. According to them theory is based some unrealistic assumptions. Moreover, there are so many difficulties to measure surplus.

4.4.5 ANALYSIS OF HICKS: Hicks analysed the theory of consumer's surplus through indifference curve analysis. The consumer's surplus is analysed in the following diagram.

Diagram – 4.4

In the above diagram, we take x commodity on X - axis, price on Y - axis. From the diagram, the consumer buys ON level of x commodity and paid QR price level. At this stage the consumer is on the lC, indifference curve. But ON level of x commodity is available at QP price level. Hence the consumer shits from lcl to lC2. Therefore the consumer's surplus is PR.

Willing price or demand price (QR) Actually paid (QP) = Consumer's surplus (PR)

4.4.6 IMPORTANCE:

1. Economic Policies: It is useful to the governments in framing and implementation economic policies.

2. Taxation Policy: The concept is of special importance in taxation. The in-position of a tax on a commodity raises its price and reduces consumer's surplus. The government applies this law in the in-position of taxes.

3. Monopoly: The concept is useful to the monopolist in fixing the price of his product. The monopolist tries to maximize his profits. Through increase prices of his goods.

4. International Trade: The consumer's surplus theory is .... in exporting and importing of goods in the international trade.

5. Value-in-use and Value-in-Exchange: The concept is useful to say difference between value-in-use and value-in-exchange.

6. Economic Welfare: The theory of consumer's surplus is useful to tax same measures to develop economic welfare.

4.5 CONCLUSTON:

The capacity of a commodity to satisfy a human want is called utility. These are two approaches to analyse a consumer's satisfaction which derives from utilization of a good. According to the first approach utility is measurable which known as cardinal utility analysis. The second approach shows utility is cost measurable but comparable which known as ordinal utility analysis.

Basing the cardinal utility analysis the law of diminishing marginal utility analysis, law of Equi-marginal utility analysis, theory of consumer's surplus was analysed. These three theories are very important in economics. But despite of same drawbacks in the theories J.R. Hicks analysed the ordinal utility approach.

4.6 POINTS TO REMEMBER:

1. Cardinal utility analysis is changed as the basis of utility is un-measurable. It is also known as Marshall's utility analysis.

2. Ordinal utility analysis is analysed as the basis of utility is not measurable but comparable. It is known as Hicks utility analysis. According to this law, utility is a psychological feeling.

3. The law of diminishing marginal utility is analysed a consumer's equilibrium with one commodity. Whereas law of equi-marginal utility analysing in explained a consumer's equilibrium with two or more commodities.

4. The theories are very important in economics. The theories are useful to from taxation policy, in international trade etc.

5. These theories are based on the cardinal utility analysis. But this approach was criticised by some economists like Hicks and developed another approach known as ordinal utility analysis.

4.7 KEY CONCEPTS:

l. Utility   : The capacity of a commodity to satisfy a human want.

2. Marginal Utility   : Additional benefit from additional good.

3. Average Utility   : Division of total utility by number of commodity

4 Consumer's Surplus   : The difference between demand price and market price.

5, Progressive Taxes   : Tax rates are increased if the income increases.

4.8 MODEL OUESTIONS FOR EXAMS:

I. ESSAY QUESTIONS:

1. Critically explains the theory of diminishing marginal utility analysis.

Ans: Write the law of diminishing marginal utility analysis, assumptions, limitations

and importance.

2. Explain the law of equi-marginal utility analysis.

3. Explain the theory of consumer's surplus.

II. SHORT QUESTIONS :

1. Marginal Utility

Ans: Write the marginal utility with diagram.

2. Explain the limitation for law of diminishing marginal utility.

Ans: Write limitations of law of diminishing marginal utility.

3. Importance of law of diminishing marginal utility.

Ans: Write the importance of law of diminishing marginal utility.

4. Assumptions the law of diminishing marginal utility.

Ans: Write assumptions of law of diminishing marginal utility.

4.9 SELECTED READINGS:

1. Stingler, G.J.   : The Theory of Price

2. Watson, D.S.   : Price Theory and its uses

3. Gould, J.P & Ferguson, C.E.   : Micro Economic Theory

                                        Micro Economic Theory.

4. Ahuja, H.L.   : Principles of Micro Economics

5. Seth, M.L.   : Principles of Economics

6. Jhingan, M.L.   : Advanced Economic Theory

7. Telugu Academy   : Economic Theory

INDIFFERENCE CURVE

5.0 Aims and Objectives

Utility analysis is an important topic in this economics. The main objective of the consumer in the purchasing of goods and services in to satisfy his wants. In this part we should understand the consumer is in equilibrium in the purchasing of goods. By the completion of this point the students understand the following things.

* What is utility
* Types of Utility Analysis
* Indifference Curve
* Properties of Indifference curve
* Budget Constraints
* Consumer's equilibrium

Structure

5.1 Indifference curve

5.2 Indifference Schedule

5.3 Indifference Curve

5.4 Indifference Map

5.5 Marginal Rate of Substitution

5.6 Slope of indifference Curve

5.7 Properties of Indifference Curves

5.8 The Indifference Curve Slopes down warded from left to right

5.9 Indifference Curves are Convex to the Origin

5.10 Any Two Indifference Curves not intersect each other

5.11 Substitution and Complementary Goods

5.12 Budget Constraints

5.13 Budget Line

5.14 Changes in Budget Line

5.15 Consumer's Equilibrium

5.16 Terminology

5.17 Model Questions for Examinations

5.18 References

5.1 Indifference Curve

The indifference curve is used to replace the neo-classical cardinal utility concept. The technique of indifference curves was invented by Edge worth, an English economist, in his Mathematical physical in 1981 to prove his theory of barter. Fisher, an American economist in 1892, was tried to analyse elaborately. Later Wilfred Parito in 1906, used this technique to explain his value theory will some modifications. Later, Prof. Hicks and R.S.D. Allen were developed the technique in terms of introspective ordinalism in their classic paper untitled "A Reconsideration of the Theory of Value". Lastly, Hicks presented its comprehensive Versia in his value and capital in 1929.

The important aspect of indifference curves analysis is the consumer desires several combinations of goods, not a single good. The arrangement of combination of goods set in the order of the level of significance is called the scale of preference. For instance, a consumer is preferred apply and manages or x and y it is called two goods scale of preference. If the consumer prefers three goods scale of preference. To analyse the indifference curve analysis we take two goods scale of preferences combination.

5.2 Indifference Schedule:

Let us assume that a consumer prefers two goods scale of preferences. An indifference curve schedule refers various combinations of two goods that are equally satisfactory to the consumer. The consumer considers the following schedule and prefers any combination. It means the consumer is indifference in choosing any combination. Let us assume that the consumer prefers two goods, X and Y, that given equal satisfactory to the consumer. We show such a schedule hereunder.

Table – .1 Indifference Schedule

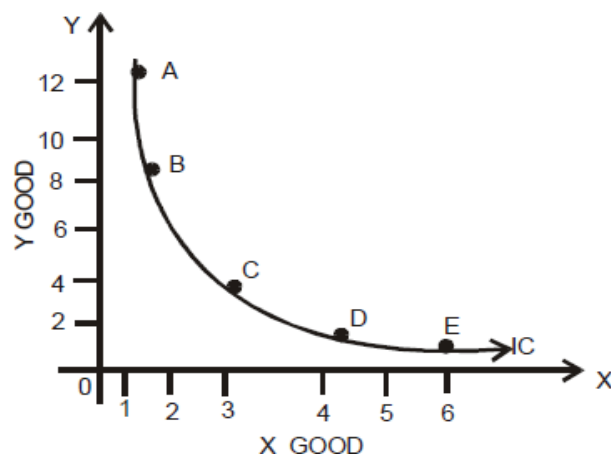| Combination	Good X	Good Y
A	1	12
B	2	8
C	2	5
D	4	9
E	5	2

From the above table- 2.1, there are four combinations. They are A, B, C, D and E.Combination A consists one x good and 12 y goods. Combination B consists 2 x goods and 8 goods. These two combinations give same satisfaction to the consumer. The

other combinations, C,D, E, are also explained in the same way. Hence, he is indifferent among these various combinations.

5.3 Indifference Curve:

An indifference curve represents equal satisfaction of a consumer from two commodities. We shall translate the indifference schedule into a diagram and they get an indifference curve in Diagram- 2.1.

Diagram– 2.1

In the above diagram 2.1, we take Good x as OX axis, Good Y on OY axis. If the various combinations are plotted on diagram — 2.1 and are joined by a line, this becomes an indifference curve as 1C in the diagram. The indifference curves shows equal satisfaction of a consumer from various combination of X and Y commodities. 1C is an indifference curve. Each point on the 1C curve is showing equal satisfaction to the consumer. The consumer is indifferent towards various combinations. That is why it is known as indifference curve.

5.4 Indifference Map:

A set of indifference curves is called an indifference map. In this map, every indifference curve, theconsumer obtains lesser and greater satisfaction. In this map every indifference curve shows certain level of satisfaction. The right side indifference curve gives higher satisfaction. The right side indifference curves give higher satisfaction, and left side indifference curve gives lowersatisfaction. However, each point on an indifference curve gives satisfaction to the consumer. Hence, the set of these indifference curves is called an indifference map.

DIAGRAM – 2.2 INDIFFERENCE MAP
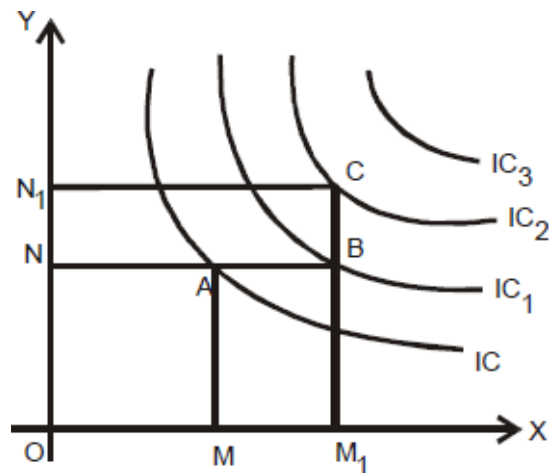
In Figure — 2.2. B point, on the 1C1 curve gives more satisfaction than A point, on the 1C curve. Because at point B the consumer getsOM1 line of x commodity and an level of of ycommodity. Thus, point B gives more satisfaction. It means every point on 1C2 curve gives more satisfaction than every point on 1C1 curve. In the same way 1C2 gives more satisfaction than 1C2 curve.

5.5 Marginal rate of Substitution:

The marginal rate of substitution shows how much of another or at what rate a consumer is willing to substitute one commodity for another in his consumption pattern. The consumer is willing to use x and y commodity and substituting good y for good x. The rate at which the consumer substitutes Y for X is called the marginal rate of substitution. Symbolically it is denoted as MRS of X for Y. Marginal rate of substitution MRS of X for $Y = \Delta Y / \Delta X$

Table – 2.2

| Combination	Good X	Good Y	MRS of X for Y
A	1	12	
B	2	8	**4:1**
C	2	5	**2:1**
D	4	9	**2:1**
E	5	2	**1:1**

In Table — 2.2, the consumer started with more Y goods and less X goods. The consumer is prepared to forgo u units of y for obtaining an extra unit of X at B combination. Later, the consumer is willing to last 2 units Y for obtaining an extra unit of X. In other words, the consumer is willing to more Y units for obtaining extra unit of

X. It means that the marginal rate of substitutiondiminishes.

5.6 Scope Of An Indifference Curve:

The marginal rate of substitution, which is explained in the Table — 2.3, is analyzed

through anindifference curve. The same thing is analyzed in the following diagram.

DIAGRAM 2.3
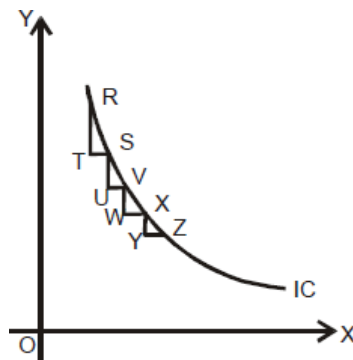
In Diagram — 2.3 R and S points on the indifference curve, shows two combinations of

X and Y commodities. If the consumer moves from R to S, he is willing to forgo RT

level of Y commodity to getting TS level of X commodity. Hence, the marginal rate of

substitution of X for Y or MRS of X for Y = RT / TS. It means that the slope of the

indifference curve shows the marginal rate of substitution. If the consumer moves from

left to right, he is forgo SU level of Y for UV levelof X, VW level of Y for WX level of

X. The levels of RS, SU, VW of Y commodity is gradually decreasing. Because the

marginal rate of substitution decreases when we move from left to right.

5.7 Properties of Indifference Curve:

The following properties of indifference curves can be deduced.

1. Indifference curve slope downwards from left to right.

2. Indifference curve is convex to the origin.

3. Indifference curves in never intersect each other.

5.8 Indifference Curve Slope Downwards from Left to Right:

Indifference curves slope downward from left to right or negatively sloped. Look at the

diagram 2.4 if an indifference curve slopes from right to left.

Diagram - 2.4
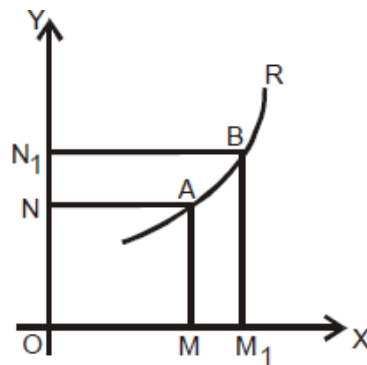
In diagram 2.4, A and B are on the RS curve. At point A, the consumer is obtaining OM level of commodity X ON level of commodity Y. At point B, the consumer is getting OM, level of commodity X and ON, level of commodity Y. It means that is obtaining more units of X and Y commodities at point B. When compared with point A. Therefore, B gives more satisfaction than A. But according to the assumption that both points on RS curve give same level of satisfaction. Hence, RS curve is not an indifference curve. Let us examine another possibility. For instance the indifference curve is a horizontal straight line as shown in the following diagram 2.5.

Diagram - 2.5
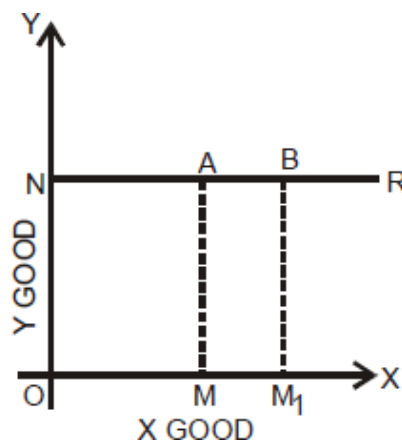
In the above diagram - 2.5, NR curve is a horizontal straight line. Point A on this curve shows that the consumer is getting OM level of commodity X and ON level of commodity Y. In the same way, at point B the consumer is getting OM1 level of commodity X, and ON level of commodity Y. A movement from A to B will increase the quantity of commodity X from OM to DM. Hence, B gives more satisfaction than A. Therefore, NR curve is not a indifference curve. Because it gives various satisfactions. Let us examine another possibility; example the indifference curve is a vertical straight line as shown in the following diagram - 2.6.
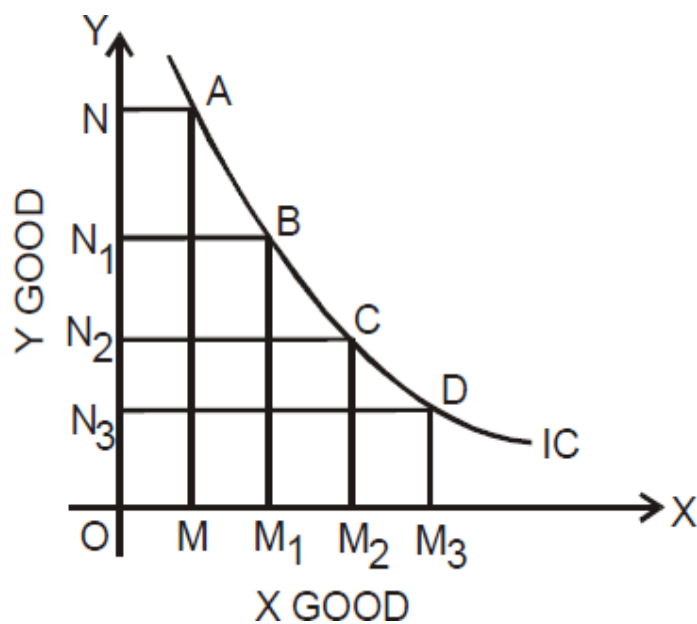
Diagram - 2.6
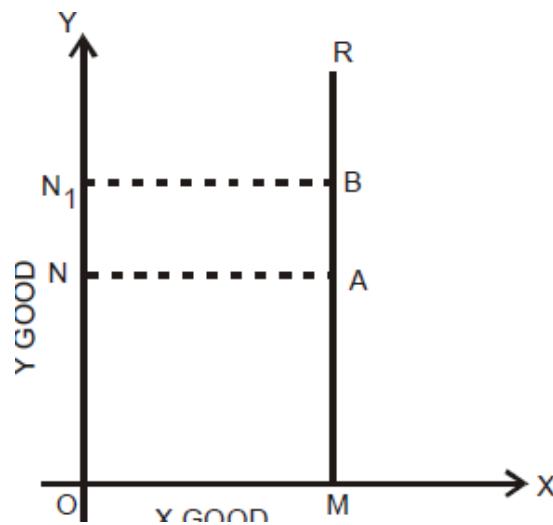
In the above diagram- 2.6, movement from A to B increases the quantity of commodity B, although the quantity of A remains fixed. Therefore B gives more satisfaction than A. So an indifference curve cannot be vertical straight line. From the above analysis, we understood that theindifference curves must slope downward from left to right.

5.9 Indifference Curve is Convex to this Origin:
The convexity rule of indifference curves implies that diminishing of marginal rate of substitution. The following diagram showed this.
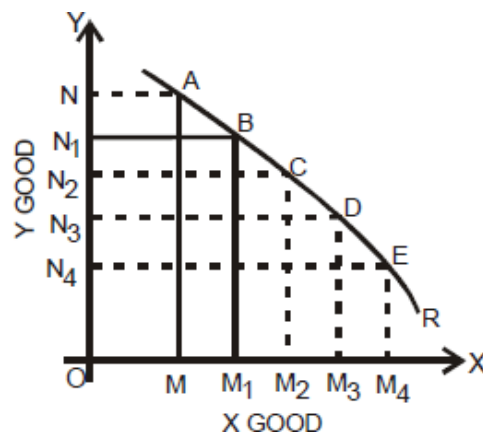
Diagram 2.7

We observed A, B, C and D points on 1C curve in diagram 4.7. OM1, MM1, MM2, M2M2 on X - axis shows various quantities of commodity X. At point A the consumer is obtaining OM level of commodity X and ON level of commodity Y. If he moves from A to B, W is forgo NN1 level of commodity Y for getting MM1 level of commodity X. The consumer is losing N1N2 level of commodity Y for obtaining M1M2 level of commodity X if he moves from point B to point C. In the same way the consumer is willing to give up N2N2 level of commodity Y for giving M2M2 level of commodity X if he moves from C to D. It means the marginal rate of substitution is decreasing. But it is possible only when the indifference curve is convex to origin.

Let us examine another possibility, for example the indifference curve is concave to the origin. The marginal rate of substitution increases instead of diminishes if the indifference curve is concern to the origin. Increasing marginal rate of substitution is impossible. The increasing marginal rate of substitution indicates various satisfactions on the 1C. Hence, it is not an indifference curve.
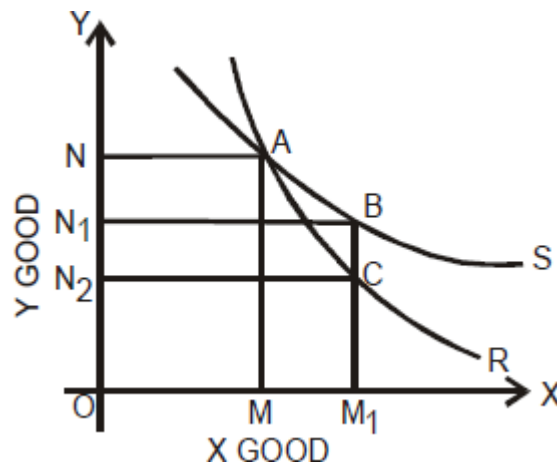
Diagram - 2.8

In Diagram - 2.8 R curve is concern to the origin. On the concern curve A, B, C, D and E pointsare then OM1, M1M2, M2M2, M2M4 on X axis shows various consumer shifts from point A to pointB, the consumer is left NN1 level of commodity Y for getting MM1 level of commodity Y for obtaining M1M2 level of commodity X. In getting additional units of commodity X, the consumer is for go N2N2, N2N4 levels of commodity Y. It means the marginal rate of substitution is increasing. Hence, the marginal rate of substitution diminishes when the indifference curve is convex to the origin. Therefore an indifference curves are convex to the origin.

5.10 Indifference Curves can never Intersect each Other:

The indifference curves can never meet or intersect for cent each other. We can prove this property by showing that if two indifference curves intersect it will lead to observed results.
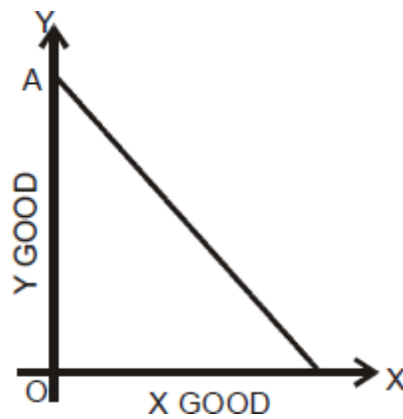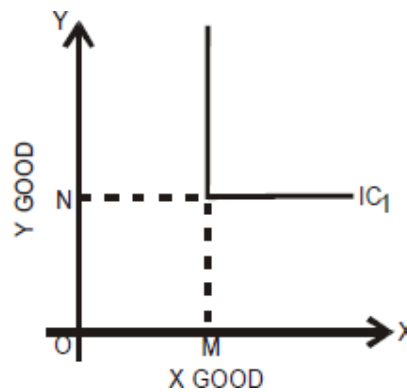
Diagram - 2.9

In the diagram-2.9, the two curves R and S are intersect each other at point A. Hence, the consumer is getting serve satisfaction at point A. Let us examine point B on S curve, and point C on R curve, point B gives more satisfaction than C to the consumer. But the quantity of Y is more at point B and less at point C. Therefore B gives more satisfaction then C. In the diagram point A and point C on the R curve which gives some satisfaction. In the same way A and B points on the S curve gives same satisfaction to the consumer. Therefore A is equal to B and A is equal to C. But B is not equal to C. Hence, R and S curves cannot intersect each other.

5.11 Substitutes Goods Complementary Goods:

Generally the marginal rate of substitution diminishes. This is a one of the characteristic of indifference curve. But in the case of substitute goods and complementary goods it is different. In the case of substitution goods the consumer substitutes one good for another. Therefore the marginal rate of substitution is constant. For example, ten paisa stamp is equal to two five paisa steps. Hence, he substitutes two five paisa stamps for ten paisa stamp. The indifference curve is shown in the Diagram - 2.10.

Diagram 2.10

In the diagram - 2.10 the slope of indifference curve is constant because of a straight line, it means that the marginal rate of substitution is fixed. It means that the marginal rate of substitution is constant if the two goods are perfect substitutes.

Diagram 2.11

The slope of the indifference curves analyzed in the diagram - 2.11, if the two goods are complementary goods. Left and right shows on the best examples for complementary goods. There is no use of one show without another. Therefore, in the case of complementary goods, the marginal rate of substitution is zero.

5.12 Budget Constraints:

An indifference map describes a consumer's preferences for various combinations of goods and services. But the preferences do not really explain all of consumer behaviour. A budget constraint also affects the individual choices, which in turn limit the consumer's ability to consume in light of the prices they must pay for various good and services.

5.13 Budget Line:

Let us consider the consumer purchases X and Y commodities with his money income. Suppose that the consumer has a fixed income, say Rs. 100, the price of X is Rs. 2 per unit, and the price of Rs. is one rupee. If the consumer spends his entire income on X, he gets 50 units of X and no Y or, if he spends it on Y alone, he gets 100 units of Y and no X. Therefore the consumer can buy various combinations of goods X and Y, with given income and given prices. This is known as budget line or price line is the following diagram –2.12.
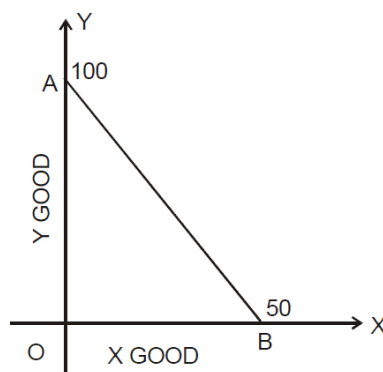
Diagram 2.12

In the diagram 2.12, we have shown co-ordinates X on X - axis, and commodity Y on - axis. OB is equal to 50 units of commodities X and OA is equal to 100 units of commodity Y. By joining points A and B, we get what is called price line or budget line or combination of commodities X and Y. This line shows all possible combinations of two goods. The slope of this curve depends upon the prices of commodity X and Y. Let us suppose, in case of consumer is M, and the prices of commodity X and Y are Px and Py. If the consumer spends his entire income on X. We get M / Px units of commodity X (or), if we spends his entire income on Y, we get M / Py units of commodity Y (OA). The power of consumer to buy these two combinations is shown by a budget curve. The slope of the budget line shows price ratios.

$$\text{Slope of Budget Line} = \frac{OA}{OB} = \frac{\text{Quantity of commodity Y}}{\text{Quantity of commodity X}}$$

$$= \frac{M}{P_Y} \Big/ \frac{M}{P_X} = \frac{P_X}{P_Y}$$

It means the slope of price line shows price ratio OA of the two commodities. Therefore the price line will be 450 straight line, if prices of the two goods are equal.

5.14 Changes in Budget Line:

The budget line depends upon income of the consumer and prices of the two goods. If the prices remain constant a rise in the income level will lead to a shift of the price line to the right in a parallel position, with a rise in income he can buy more of the two goods. For example, if the income of the consumer rises from Rs. 100 to Rs. 120, the consumer can buy 120 units of commodity Y or 60 units commodity X. With a rise in income, he can buy more of the two goods. This is shown in the following diagram-2.12.
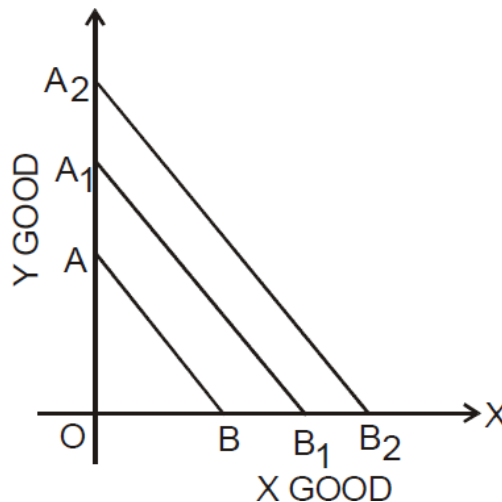
Diagram 2.12

In the diagram- 2.12 AB is the starting budget line. The prices remain constant, but rise in income of the consumer leads to shift the budget from AB to A1B1 . The changed budget line is parallel portion to the right. If this income increases again, the price line becomes A2B2 . Without any change in price level, the slope of price line does not change.

$$\frac{P_x}{P_y} = \frac{OA}{OB} = \frac{OA_1}{OB_1} = \frac{OA_2}{OB_2}$$

If there is a rise in his income, the price line will shift upward. If there is a fall in his income, the price line will shift downward. The following diagram shows result of the price of commodity X changes which the income of consumer and the price of this commodity Y remains the same.

Diagram- 2.14
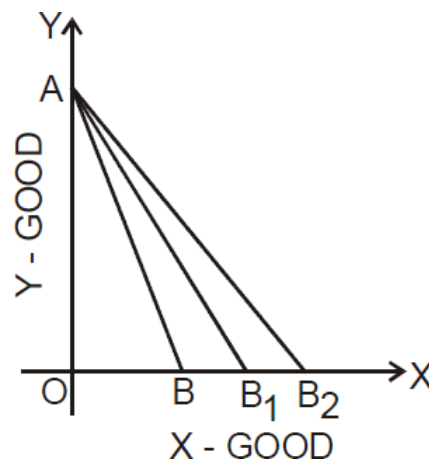
In the diagram −2.14 AB is the starting budget line. The budget line shifted to AB, if the price of commodity X is fallen. It means, if the price of X fallen, the consumer can buy more of X, while there is no any change in the price level and quantity of commodity X, while Y is constant,the slope of the price line will be changed. When compared prices of commodities of X and Y.Price Ratio of AB budget line OA / OB. The price ratio of AB1 = OA/ OB1. The price ratio of AB2 budget line = OA2 / OB . However these price ratios are not equal to each other

$$\left[\frac{OA}{OB} \neq \frac{OA}{OB_1} \neq \frac{OA}{OB_2} \right].$$

Suppose the price of commodity Y changes, while the price of commodity X remains fixedis analysed in the following diagram — 2.15.

Diagram – 2.15
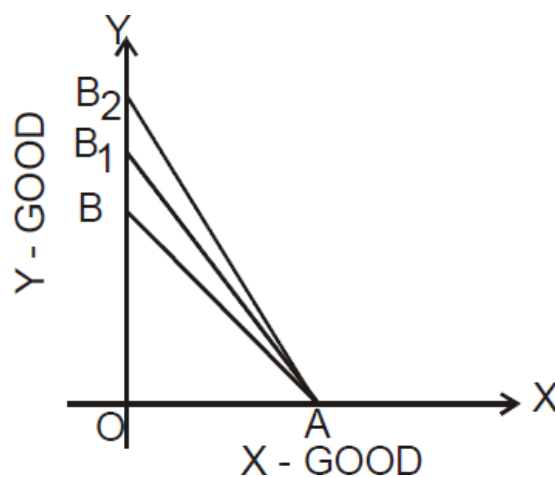
The starting budget is AB. If the price of commodity Y changes while X is constant the budget line shifted to A1B and later to A2B. However there is a change in the slope of the price line and price ratio. Here also, the price ratios are not equal to each

$$\left[\frac{OA}{OB} \neq \frac{OA_1}{OB} \neq \frac{OA_2}{OB} \right]$$

5.15 Consumer's Equilibrium:

We can explain the equilibrium of the consumer with help of indifference curves. A consumer is in equilibrium when given prices of the two goods, he spends a income on the purchase of two goods in such a way as to get the maximum satisfaction. The following assumptions are taken to explain the consumer's equilibrium.

5.16 Assumptions:

1. The consumer has a scale of preferences for various combinations of two goods.
2. The consumer has an indifference map showing his preference to purchase

commodities X andY.

3. The income of the consumer is fixed.
4. The prices of goods are remaining constant.
5. All goods homogeneous and divisible.
6. The consumer acts 'rationally' in the sense he tries to maximize satisfaction.

If there is no change in the above assumptions, the consumer spends his limited income on commodities of X and Y. At this stage the marginal rate of substitution and price ratio equal. The consumer is in equilibrium at the point when the price line tangent to an indifference curve. The same thing is analyzed in the following diagram-2.16.

Diagram 2.16
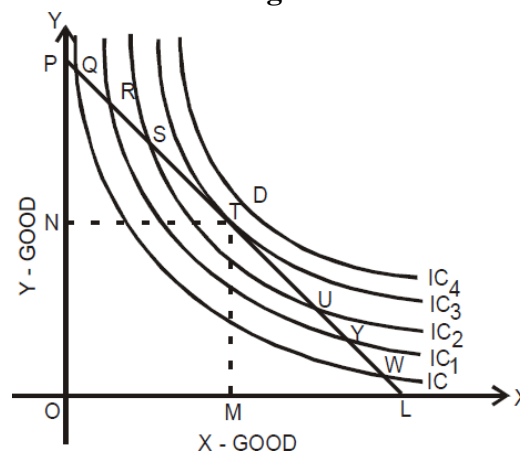
In the diagram –2.16, the indifference curve shows various satisfaction of commodity X and Y. PC is the budget line or price line which shows the consumer can

buy various combinations of commodities X and Y. The indifference map and price line are shown in the diagram 2.15.

In the diagram-2.16, 1C, 1C1, 1C2, 1C2 and 1C4 are the different indifference curves. IC1 gives more satisfaction than 1C, 1C2 gives more satisfaction that 1C1. IC2 gives more satisfaction 1C2. 1C4 gives more satisfaction than 1C2. Because, a higher indifference curve which lies to the right represents a higher level of satisfaction. Every point on budget line PL shows the consumer buys various combinations of two commodities with his limited income. It means the consumer can buy any combination out of the possible combinations P, Q, R, S, T, U, V, W and L.

The consumer does not want P, and L points. Because, at point P, the consumer gets Commodity Y only. At point L, he gets X commodity only. So, the consumers will choose combination of X and Y commodities combinations. However, he would not take combinations Q or W on indifference curve, R and V on 1C1, S or V on 1C2 curve. Because there are laying on low indifference curves. T lies on 1C2 where his budget line is tangent to 1C2 curve and buying OM level of commodities X and ON level of commodity. The consumer is in equilibrium at the point where the price line is tangent to an indifference curve. The consumer can unable to go point D which lies on 1C4 , because his limited income. Therefore, the consumer is in equilibrium at point T where the price line is tangent to the third indifference curve. In other words, the marginal ratio of substitution of X and Y must become equal to price ratio between these two goods. Thus at point T.

$$MRS_{xy} = \frac{P_x}{P_y}$$

Terminology:
1. **Indifference Schedule:** It shows schedule of various combinations of two goods that are equally satisfactory to the consumer.
2. **Indifference Curve:** It is a curve showing the various combinations of two commodities which yield equal utility of satisfaction to the consumer.
3. **Indifference Map:** It shows number of indifference curves.
4. **Marginal Rate Of Substitution:** The amount of a commodity the consumer is willing to give up in order gaining one additional unit of another commodity.
5. **Budget Line:** A graphical depiction of the various combinations of two selected products that a consumer can afford at specified prices for the products given their

particular income level.

6. Consumer's Equilibrium: The state of balance achieved by an end user of products that refers to the amount of goods and services they can purchase given their present level of income and the current level of prices. Consumer equilibrium allows a consumer to obtain the most satisfaction possible from their income.

5.17 Model Questions for Examinations:
Essay Questions:
 1. What do you understand by indifference curve ? Explain their lying and property.

2. What indifference curves? Explain their properties.

3. What are Budget Constraints?

4. How consumer attains equilibrium?

5.18 Selected Readings:
1. Watson, D.S. : Price Theory and its Uses

2. Seth,M.L. : Principles of Economics

3. Ahuja, H.L. : Advanced Economic Theory

4. Jhingan,M.L. : Advanced Economic Theory

5. Dewett K.K.: Modern Economic Theory

PRODUCTION FUNCTIONS

6.0 Objectives:

The objectives of this lesson are:

* To Introduce Production Function

* To understand basic concepts in production function

* To understand how production decisions are taken in the long-run.

Structure:

6.1 Introduction:

Production of goods and services is an important economic activity in any country. If nothing is produced, nothing can be consumed. Every nation tries to produce as much as possible with the use of as few resources as possible. The resources used in the production are owned by households and each household wants to get as much for its resource as possible in the form of remunerations for offering its resources.

Production refers to the transformation of inputs or resources into outputs or goods and services. Inputs are the resources used in the production of goods and services. The terms 'inputs' and 'factors of production' are used interchangeably. The factors of production used in production are broadly classified into land, labour, capital and entrepreneurship. Broadly, inputs are divided into two categories - fixed and variable inputs. A fixed input is the one whose quantity cannot be varied during the period under consideration. Examples are plant and equipment.

Variable inputs are those whose quantity can be changed during the period under consideration. Raw materials, labour, transportation etc., are examples of variable inputs. Production is the act of converting or transforming inputs into output. In the production process, a firm combines various inputs in different quantities and proportions to produce different levels of outputs.

Factors of Production:

Production of wealth is done by factors of production. These factors of production have been divided into four : Land, Labour, Capital and Organisation.

Land represents free gifts of nature. It includes agricultural land, building sites, mines, fisheries, forests etc. Only those free gifts which are subject to human ownership and control are included under 'Land'.

Labour represents human element in production. It includes physical and mental effort. All efforts undertaken to earn income is called labour. Labour includes all workers from street sweepers to professors and engineers.

Capital represents man made instruments of production-machines, plants, tools, factory buildings etc. All wealth which is used to produce wealth is called capital.

Organisation consists of combining factors and undertaking uncertainties of modern production. The organiser starts production units. He controls production. He decides what to produce and how much to produce. He bears risks and uncertainties of production.

Production is carried on by these four factors of production. Land supplies raw material. Labour works on it with the help of tools and implements. The organiser organises production. Land and labour cannot produce any thing without capital. Labour cannot create utilities without capital. All these four factors are equally important.

6.2 Production Function:

The term "Production Function" refers to the relationship between the inputs and the outputs produced by them.

Definition: A production function refers to the functional relationship, between physical units of inputs and output of a firm, per unit of time and under the given technology.

The production function is purely a technological relationship which expresses the relation between output of a good and the different combinations of inputs used in its production. The production function can be deficted as in fig.2.1.
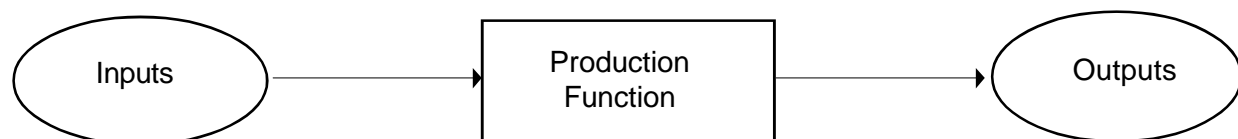
Inputs → Production Function → Outputs

Figure 2.1

Inputs are transformed into outputs via a set of production processes that constitutes the production process. Mathematically, the production function can also be shown as

$$Q = f(x_1, x_2, \ldots\ldots\ldots x_k)$$

where Q = Output ; $x_1\ldots\ldots\ldots x_k$ = Inputs used

A production function can be stated in the form of a statement or a table or schedule or mathematical equation.

Assumptions of Production Function: 1. Technology is invariant,   2. Firms utilise their inputs at maximum levels of efficiency.

The production function in the form of a schedule is presented Table 2.1. It shows two inputs : Labour (x) i.e. the number of men hired and Capital (y) i.e. size of machine and the output (Q) i.e. the number of tonnes produced with the various combinations of inputs.

Table 2.1 Production Function

Capital (y) - Size of Machines (in horse power) / Labour (X) No. of workers	250	1000	1500	2000
1	2	20	32	26
2	4	48	58	88
3	8	88	110	100
4	12	110	120	110
5	32	120	124	120
6	58	124	126	124
7	88	126	128	128
8	100	126	130	132
9	110	126	130	132
10	104	124	130	134

The relationship between the amount of various inputs used in the production process and the level of output is called a production function. Production functions describe only efficient levels of output, that is, the output associated with each combination of inputs is the maximum output possible with that set of inputs, given the existing level of technology. Production Functions may be presented in tabular, graphic, or algebraic form, and may consists of one, two or more variable inputs.

6.3 Types of Production Functions:

In order to analyse the relationship between factor inputs and outputs, economists classify time periods into short run and long run.

The short-run is that period of time over which the input of only one factor can be increased, the other factors of production cannot be varied. This function is also called single variable production function or law of variable proportion.

Long-run Production Function or Returns to scale. Long run is defined as a period of time during which the quantities of all inputs are adjusted in response to changes in output.

In Economic theory we are concerned with three types of production functions, viz.,

1. Production function with one variable input

2. Production function with two variable inputs, and

3. Production function with all variable inputs.

6.4 Returns to a Factor:

In economic theory, we are interested in two types of input-output relation. **First**, we study the production function when the quantities of some inputs are kept constant and quantity of one input are varied. This type of input-output relations which forms the subject matter of the law of diminishing returns which is also called law of variable proportions. **Secondly,** we study the input-output relation by varying all inputs. The latter forms the subject-matter of the law of returns to scale. The concept of returns to a variable factor is relevant for the short-run, because in the short-run some factors such as capital, equipment, machines, land remain fixed and factors such as labour, raw materials are increased to expand output. Thus the short-run production can be written as

$Q = f(L,K)$

Where Q stands for output, L for labour and K for capital which is held constant in the short-run.

The concept of returns to a factor is concerned with the study of how output (Q) changes when the amount of a variable factor, such as labour, is increased. We will first explain some concepts of physical product that are generally used for the study of returns to a variable factor i.e. short-run production function,

The following hypothetical numerical table illustrates the operation of the law of diminishing returns.

TABLE 2.2

Number of Workers	Total Product	Average Product	Marginal Product
1	10	10	10
2	22	11	12
3	36	12	14
4	52	13	16
5	66	13.2	14
6	76	12.7	10
7	82	11.7	6
8	85	10.6	3
9	85	9.5	0
10	83	8.3	-2

Table 2.2 illustrates several important features of typical production function with one variable input. Here both average product (AP) and marginal product (MP) first rise, reach a maximum and then decline. Average product is the product for one unit of labour. It is arrived at by dividing the total product (TP) by the number of workers. AP = TP $\div$ No. of Workers. Marginal product is the additional product resulting from additional labour. MP = ΔTP $\div \Delta$L It is found out by dividing the change in total product by the change in the number of workers. The total output increases at an increasing rate till the employment of the 4th worker. The rate of increase in the marginal product reveals this. Any additional labour employed beyond the 4th labour clearly faces the operation of the law of diminishing returns. The maximum marginal product is 16 after which it continues to fall, ultimately, becoming negative. Thus when more and more units of labour are combined with other fixed factors the total output increases first at an increasing rate, then at a diminishing rate and finally it becomes negative.

6.5 Total, Average and Marginal Physical Products:

Regarding physical production of factors, there are three concepts:

1. Total Product   2. Average product and   3. Marginal product.

Total Product (TP): Total Physical product of a factor is the amount of total output produced by a given amount of a variable factor, keeping the quantity of other factors such as capital, land fixed. As the amount of the variable factors increases, the total output increases. But the rate of increase in total physical product varies at different levels of employment of a factor. In the fig.6.2 we can see the total product curve. In the beginning total product curve rises at an increasing rate i.e., the

shape of the TP curve is rising in the beginning, after a point that product curve starts rising at a diminishing rate as the employment of the variable factor is increased.

Average Physical Product (AP): Average physical product of a variable factor (labor) is the total physical output (Q) divided by the amount of labour employed with a given quantity of capital (fixed) used to produce a product. Thus

$$AP_L = \frac{Q}{L}$$ where AP_L represents the average physical product of labour.

Q represents the total output produced by using a given quantity of labour employed. L stands for the Quantity of labour employed.

Marginal Product : The marginal product of labour is defined as the change in total product per unit of change in labour. That is

$$MP_L = \frac{\Delta Q}{\Delta L}$$

Marginal physical product of a variable factor is the addition to the total production by the employment of an extra unit of factor. Suppose when ten workers are employed to produce bags in a factory and they produce 200 bags for month. If, eleven workers are employed, and as a result total product increases to 214 bags, then the eleventh worker has added 14 bags to the total production. Thus 14 bags are the marginal physical product of the eleventh worker.

In general, if employment of labour increases by Δ L units yielding increase in total output by Δ Q units, the marginal physical product of labour is given by

$$\frac{\Delta Q}{\Delta L}, \text{ i.e. } MP_L = \frac{\Delta Q}{\Delta L}$$

6.6. Production with One Variable Input (or) Short-run Production Function or Law of Variable Proportions (or) Law of Diminishing Returns:

Introduction: In economics, the production function with one variable input is illustrated with the well-known law of variable proportions. The law of variable proportion is one of the fundamental laws of economics. It is also called as the Law of Diminishing Marginal Returns.

Law of Variable Proportions: Law of variable proportions occupies an important place in economics. This law examines the production function with one factor variable, keeping the quantities of other factors fixed. The law of variable proportion has played a vital role in the history of economic thought and occupies an equally important place in modern economic theory. It is stated as the proportion of one factor in a combination of factors increased, after a point, first the marginal and then the average product of that factor will diminish. It may also stated "As the quantity of a variable input usage goes on increasing, marginal productivity of that input eventually diminishes and becomes zero".

6.6.1　Assumptions of the Law of Variable Proportions/Diminishing Returns:

1) The state of technology is assumed to be given and unchanged. If there is a change in technology, then marginal and average product may change.

2. There must be some inputs whose quantity are held constant.

3) The law is based upon the possibility of varying the proportions in which the various factors can be combined to produce a product. The production function with fixed inputs and with one variable input is illustrated in Figure 6-1.
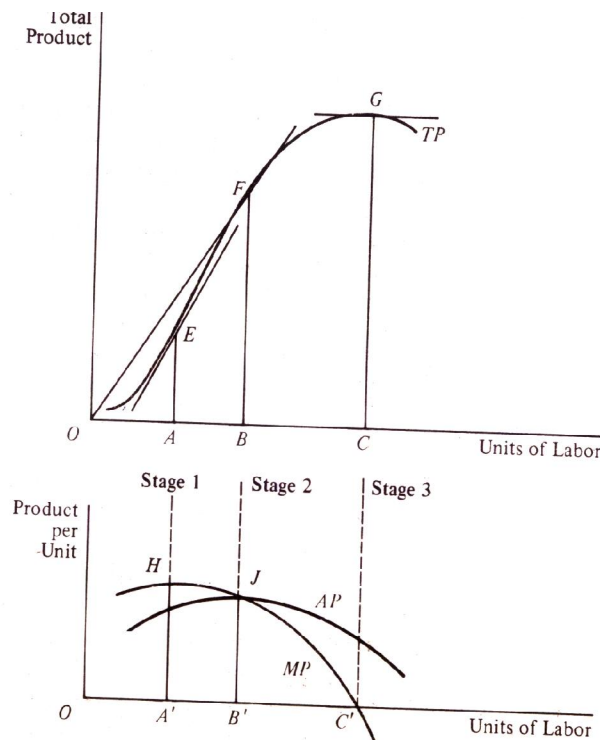

Fig.2.2 : Variable Proportions

The curve of total product (TP) rises first at an increasing rate and then at a diminishing rate to its maximum after which it declines. The slope of the TP curve $\Delta TP / \Delta L$ (where L is labour) is marginal product. The slope of the curve continuously varies; at any point the slope is measured by drawing a tangent line at the point. Figure 6-2 shows three points of tangency. At point E, slope is a maximum. In the lower panel of the diagram, point H is the maximum of the curve of marginal product (MP). At point G, the slope of TP is zero; MP is zero at point C' in the lower panel.

At point F, the tangent line is drawn from the origin. The slope of TP at point F is FB/OB. But FB/OB is also the average product (AP) of OB workers that is, their total product FB divided by their number OB. Point F has still another meaning - here, average product per worker is at a maximum. The steepest line that can be drawn from the origin to any point on TP is the line OF. The slope of this line is equal to the slope of the tangent at this point. The equality of MP and AP is shown at point J in the lower panel.

Table 2-3 is intended as a guide to the study of Figure 2.1.

TABLE 2.3 Properties of the Curves of Total Product, Marginal Product and Average Product

Figure 2.2	Total Product	Marginal Product	Average Product
Stage 1: To Point E	First increases at increasing rate	Increases	Increases
At points E and H	Then the rate of increase switches from increasing to diminishing	At a maximum, and begins to diminish	Continues to increase
Stage : 2 At points F and J	Continues to increase at diminishing rate	Continues to diminish	At a maximum (=MP) and then begins to diminish
At points G and C'	Eventually reaches a maximum and begins to diminish	Becomes zero	Continues to diminish
Stage : 3: To right of points G and C'	Diminishes	Is negative	Continues to diminish

6.7 Three Stages of Production:

The short-run production function can be divided into three stages of production. In fig. 2.3 we divided the graph into three parts. Labeled as stage 1, stage 2, and stage 3.

Stage 1: Stage 1 includes the region from the origin to the level of labour input at which the average product of labour reaches its maximum. In this stage, the TPP curve rises first at an increasing rate and at a diminishing rate in stage 2. Through out stage 1, average product (AP) is rising. Law of increasing return is in operation at this stage.

State 2: It includes the region between the maximum point on the average product function and the point at which marginal product falls to zero. During this stage, both marginal and average products are falling, but both are positive. Law of diminishing returns starts operating from second stage onwards. TP continues to increase but at a dimishing rate. Stage 2 comes to an end where TP becomes maximum and MP becomes zero.

Stage 3: It is the entire region for which the marginal product of labour is negative. MP becomes negative at labour input rate beyond L_3. This corresponds to the point where the total product curve reaches a maximum. 'Marginal becomes zero when total reaches maximum.

RATIONAL DECISIONS IN STAGE 2: No firm will choose to operate either in Stage 1 or stage 3. In stage 1 the marginal physical product is rising i.e. each additional unit of the variable factor is contributing to output more than the earlier units of the factor, Therefore it is possible for the firm to

keep on increasing the use of labour. In stage 3, marginal contribution to output of each additional unit of labour is negative, therefore, it is advisable not to use any additional labour. Thus, stage 2 is the only relevant range for a rational firm in a competitive situation.

6.8 Summary:

Production refers to the transformation of inputs or resources into outputs or goods and services. The production function is an engineering or technological concept that specifies the maximum rate of output obtainable with given rates of inputs of capital and labour. The short run is that period of time for which the rate of input use of a least one factor of production is fixed. In the longrun, the input rates of all factors are variable. The firm operates in the short run but plans in the long runs. The concept of returns to a factor is concerned with the study of how output (Q) changes when the amount of a variable factor, such as labor is increased marginal product is the change in output associated with a one-unit change in the variable input. Average product is the rate of output produced per unit of the variable input employed. Law of variable proportions occupies an important place in economic theory. This law examines the production function with one factor variable, keeping the quantities of other factors as constant.

6.9 Key Words:

Production Function

Short Run Production Function

Long-Run Production Function

Total Product

Average Product

Marginal Product

Law of Diminishal Returns.

6.10 Self-Assessment Questions:

1. What is a production function? What is its useful non in the analysis of the firms production.

2. What is the law of Diminishing Returns? Why does it operate? How does it help in short run between decisions making?

3. Explain the law of variable proportions.

4. Bring out the relationship between the average and marginal products of labor.

5. State and explain the law of diminishing returns. What are its causes and effects.

6. Are diminishing returns to a factor insuitable? Explain.

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PRODUCTION FUNCTION WITH ALL VARIABLE INPUTS OR RETURNS TO SCALE

7.0 Objectives:

* To understand how production decisions are taken in the long-run.

* To understand the concept of Linearly Homogeneous Production Function & Cobb-Douglas Production Function.

Structure:

7.1 Introduction:

In general, the cost of producing and marketing products depends both on the amount of labor and capital employed and the array of different products and services produced.

The relationship of per unit costs to changes in these two factors are referred to as economics of scale and economics of scope.

The law of returns to scale always refers to the long run because in the long run all the factors of production vary. A given rate of input of capital and labor defines the scale of production. Proportionate changes in both inputs result in a change in that scale. The term returns to scale refers to the magnitude of the change in the rate of output relative to the change in scale.

Returns to scale are classified as follows:

1) Increasing Returns to Scale (IRS): If output increase more than proportionate to the increase in all inputs fig.7.1

2) Constant Returns to Scale (CRS): If all inputs are increased by some proportion, output will also increase by the same proportion. Fig. 7.2.

3) Decreasing Returns to Scale (DRS): If increase in output is less than proportionate to the increase in all inputs Fig.7.3.
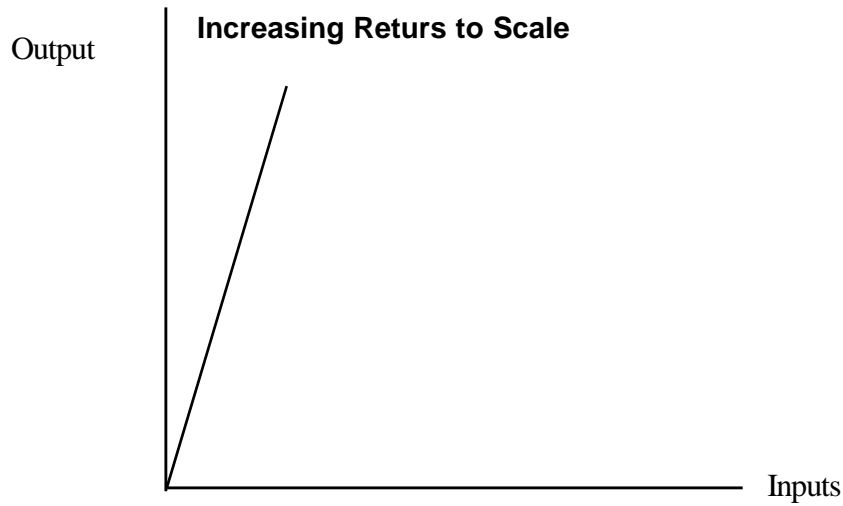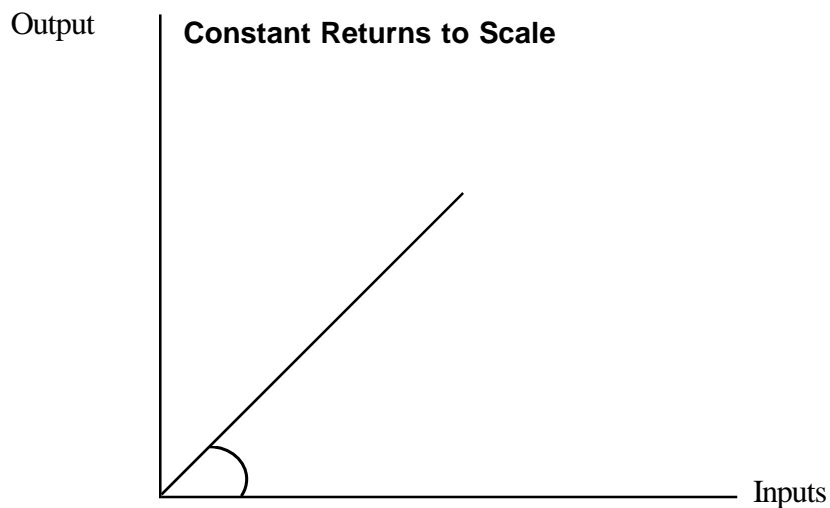
Output

Increasing Returs to Scale

Inputs

Figure 7.1 : Increasing Returs to Scale

Output

Constant Returns to Scale

Inputs

Figure 7.2 : Constant Returns to Scale

Output

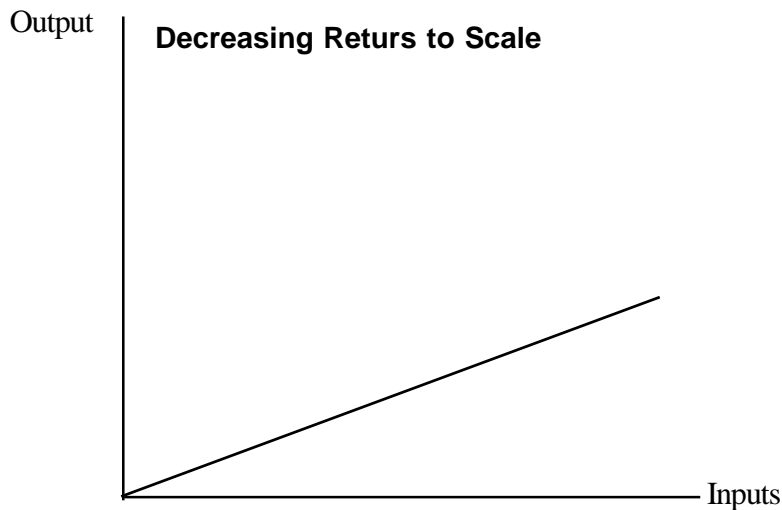**Decreasing Returs to Scale**

Inputs

Figure 7.3 : Decreasing Returs to Scale

Alternatively, all the three input - output relations can also be shown in a single diagram as shown below in Fig.7.4.

Output

Increasing

Constant

Decreasing

Inputs
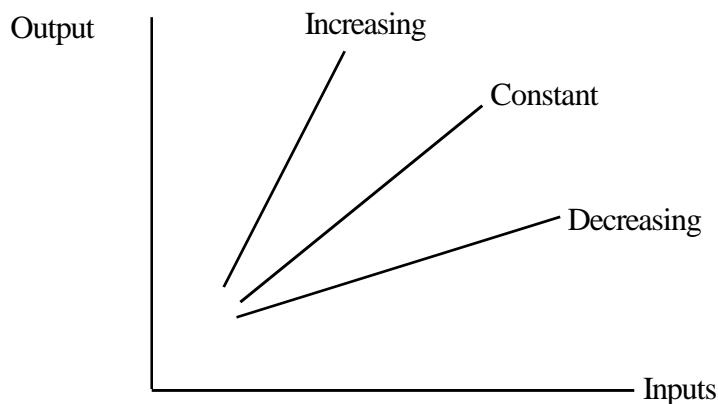
Fig.7.4: Increasing, constant and decreasing Returns

7.2 Increasing Returns to Scale:

IRS arises when the scale operation increase, a greater division of labor and specialisation can take place and more specialised and productive machinery can be used. As we stated above, Increasing returns to scale means that output increases in a greater proportion than the increase in input, for example, if all inputs are increased of 35% and output increases by 45% then the increasing returns to scale will be prevailing.

Factors Responsible for IRS:

Causes of increasing Returns to Scale:

1. Indivisibility of the Factors: Economists such as Joan Robinson, Kaldor, Lerner and Knight ascribe increasing returns to scale to the indivisibility of factors, for ex, some factors are available in large units and they can be utilised efficiently and some factors are indivisible and they are better utilised when output is increased from a small level to a large level.

2. Greater Possibilities of Specialisation of Labor and Machinery: According to Chamberlain, the returns to scale increase because of greater possibilities of specialisation of labor and machinery even if the factors were perfectly divisible.

3. Dimensional Economics: This point was emphasized by Professor Baumol. According to him increasing returns to scale his in dimensional relations, for example, a wooden box of 3 foot-cube contains a times greater wood than the wooden box of 'foot-cube. Because 3 foot-cube wooden box contains 9 times greater input.

A
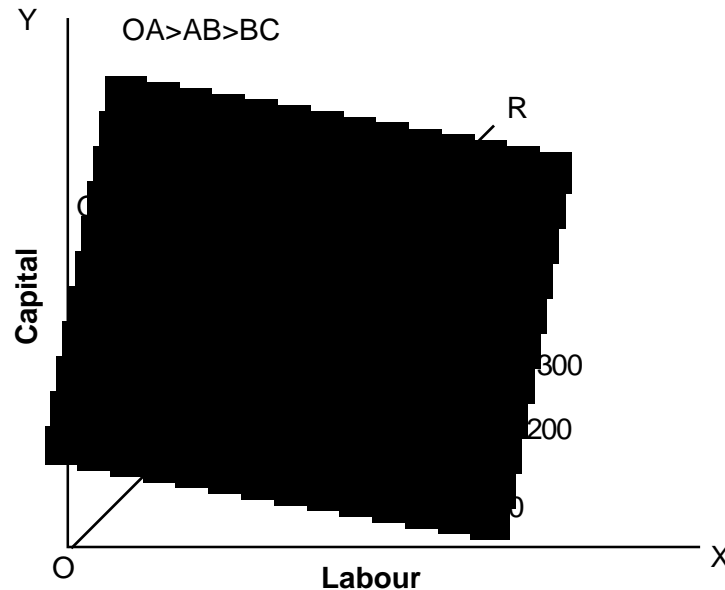
Figure 7.5 : Increasing Returns to Scale

Increasing returns to scale can be shown through isoquants. In fig.7.5 the successive isoquants Q_1, Q_2, Q_3 which represent 100, 200, 300 units of output, come closure.

Increasing return and the economies of scale are the two sides of the same coin. Hence the 'economies of scale' are presented below:

When a firm increases all the factors of production it enjoys some advantages of economies of production. The economies of scale are classified as;

1. Internal economies, and

2. External Economies

1. Internal Economies:

Internal economies are economies which are available to a particular firm and this will be different for different firms. This is due to the expansion of the size of the firm. Internal economies may be classified as:

(i) Technical Economies:

A large size firm can afford right type of machinery or various specialised machineries. A

small firm cannot afford modern highly specialised machines and reap the advantages of modern advanced technology. Though its installation involves a high cost, it helps to bring out more output at a lesser cost thus reducing the cost per unit.

(ii) Labour Economies;

When the firm expands its scale of operation it absorbs more and more workers with different qualifications. Thus these workers can be divided according to their qualification and skill and can be placed at the proper operations. This division of labour leads to specialisation which increases efficiency. Moreover, mechanisation of operations also help to reduce labour ratio.

(iii) Managerial Economies:

A large size firm can employ specially qualified persons to look after various sections like, production, financing, marketing, personnel etc. This specialisation in managerial staff increases the efficiency of management. Moreover the sales co-ordination through wholesale will be more effective and less cheap. Thus the large size firm can reap the advantage in both buying and selling.

(iv) Marketing Economies:

The large size firm can make bulk purchases of raw materials etc. at better terms. It can enjoy the discount on bulk purchasing which smaller firms cannot enjoy. It can appoint expert buyers and expert salesmen. It can secure the economies of large scale selling. An increase in production need not increase the advertisement expenditure. Moreover the sales co-ordination through wholesale will be more effective and less cheap. Thus the large size firm can reap the advantage in both buying and selling. (last of marketing economies)

(v) Economies in Transport and Storage:

The large size firm can borrow money at a cheaper rate. It can issue debentures and raise money from the public. As the large size firm can offer better securities it can secure credit from bank more easily and at better terms.

2. External Economies:

An individual firm is not responsible for this. When many firms in an industry expand in a particular area they all may share in some advantages. The expansion of all the firms in a region may make possible the development of transport and communication of that region. Cheaper systems of transportation like railway may be introduced. Better power supply can be ensured at a cheaper rate. New firms may be set up to supply raw materials. These are some of the external economies.

Diseconomies of Scale:

The economies of scale will not continue for ever. An expansion in size of the firm after a certain level will result in diseconomies only. Too much division of labour may bring in inefficiency. The increase in the number of workers may reduce the efficient use of machines and tools etc. The co-ordination of various processes also may prove difficult. Supervision may become inefficient. Red-tapism may increase. The proper maintenance of labour relations also may become difficult. The management altogether may show signs of inefficiency.

7.3 Constant Returns to Scale:

As we started above, the constant returns to scale leads to a proportionate increase in output, i.e. doubling of all inputs doubles the output. This can be shown through isoquants. In fig. 8.6, we can see that successive isoquants are equidistant from each other along each straight line drawn from the origin. The distance between the successive equal product curves being the same along any straight live through the origin.
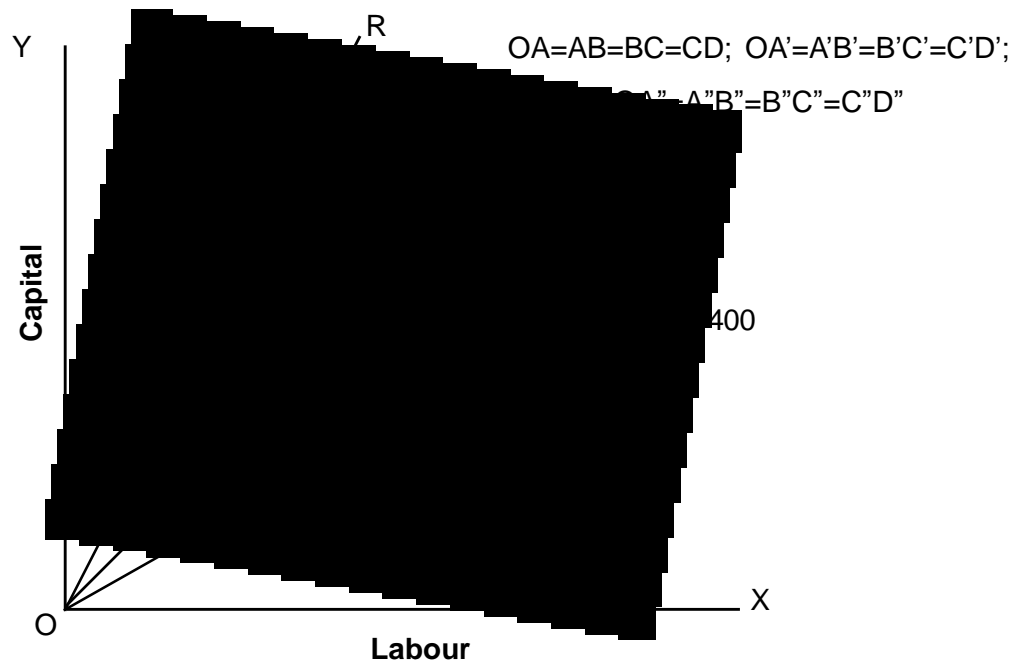

OA=AB=BC=CD; OA'=A'B'=B'C'=C'D';

OA"=A"B"=B"C"=C"D"

400

Figure 7.6 : Constant Returns to Scale

7.4 Decreasing Returns to Scale:

If increase in output is less than proportionate to the increase in all inputs, it is known as Decreasing returns to scale. When a firm goes on increasing its scale of operations eventually decreasing returns to scale will occur. Decreasing returns to scale can be presented with Isoquant map as shown in Fig. 8.7

For most production functions, returns to scale can be evaluated easily. Assume that output (Q) is a function of n inputs.

$$Q = f(x_1, x_2, ...x_n)$$

If all inputs are increased by a factor P, the new level of output Q* can be written as

$$Q^* = P'Q = f(Px_1, Px_2, ...Px_n)$$ and Q* - Q = r = increase in output.

If r >1, there are increasing returns to scale, If r = 1 there are constant returns to scale, and if r < 1, there are decreasing returns to scale.

In figure 8.8 we have an isoquant map for a production function that exhibits increasing, constant and decreasing returns to scale. Along the strait line from the origin, input proportions remains

constant. In other words, as we move along the straight live, we increase the inputs in the same proportions.
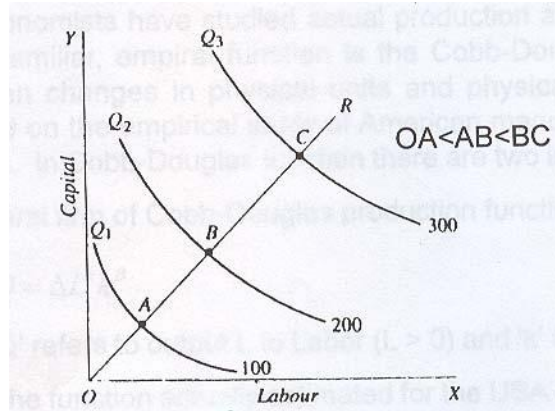
Figure 7.7 : Decreasing Returns to Scale

Initially, the production function has increasing returns to scale. As we move from point R to point d, inputs rise by 14 percent and output increases by 20 percent. Subsequent increases in output are associated with constant returns to scale. As we move from B to A, output and inputs increase by 14 percent. Constant returns to scale are also found as output increases to 90. When there are constant returns to scale, the average products remain constant. At higher output levels. The production function exhibits decreasing returns to scale. Inputs increase by 22 percent, but output increases by only 11 percent as we move from L to W.

Fig.7.8: Increasing, Constant and Decreasing returns to scale

7.5 Linearly Homogeneous Production Functions:

There is a class of production function that exhibits constant returns to scale over the entry range of output. These production functions are called linearly homogeneous or homogeneous of degree one.

There are many examples of linearly homogeneous functions. But one important example is Cobb-Douglas function.

7.6 Cobb-Douglas Production Function:

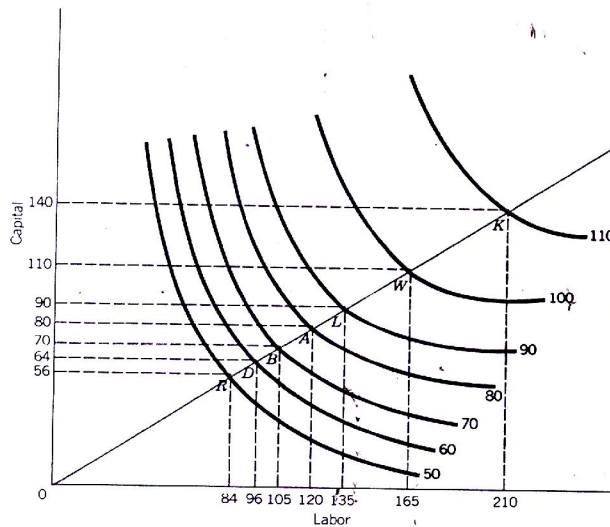Many economists have studied actual production and have used statistical methods but one important, familiar, empiral function is the Cobb-Douglas production function to find out relations between changes in physical units and physical outputs Cobb-Douglas production function is based on the empirical study of American manufacturing industry by C.W. Cobb and Paul H. Douglas. In Cobb-Douglas function there are two inputs, labor and capital.

The general firm of Cobb-Douglas production function can be expressed as

$$Q = \Delta L^{\alpha} k^{B}$$

Where 'Q' refers to output L to Labor (L > 0) and 'k' to capital (k > 0)

The function actually estimated for the USA by Cobb and Douglas is

$$Q = 1.01 . L^{0.75} k^{0.25}$$

or

Log Q = Log 1.01 + 0.75   Log L + 0.25   Log k

This is a linearly homogenous production function indicating constant returns to scale. The Cobb-Douglas function shows that a 1 percent change in labor input (Capital remaining constant) is associated with a 0.75 percent change in output. Further, a 1 percent change in capital input (labor remaining constant is associated with a 0.25 percent in output.

Homogeneous production function of the first degree implies that if all factors of production are increased in a given proportion, output also increases in the same proportion. Hence, linear homogenous production function represents the case of constant returns to scale for example. If there is an increase in inputs say 10%, then output also increase by 10% - which is called as linearly homogenous of 1st Degree.

It is stated as

$$Q = kL^{\alpha} C^{1-d}$$

$$\alpha = 0.75$$

$$Q = kL^{0.75} C^{0.25}$$

Where Q is manufacturing output of USA

L is labor

L^{α} labour contributes to 75% of manufacturing output in US

$C^{1-\alpha}$ Capital contributes the rest of 25% of output.

$$Q = kL^{\alpha} C^{1-\alpha}$$

If there is g increase in L and C.

$$Q = k(gL/\alpha(gc)^{1-\alpha}$$

$$= kg^{\alpha}L^{\alpha}, \ g^{1-\alpha}.C^{1-d}$$

$$= k.L^{\alpha}.g^{1},C^{1-\alpha}$$

$$= gk.L^{\alpha},C^{1-d}$$

We know that $= k.L^{\alpha}C^{1-\alpha} = Q$

$$Q = g.Q$$

Hence output also increased by g times.

7.6.1 Properties of Cobb-Douglas Production Function:

Cobb-Douglas production function applies to the entry manufacturing industry.

1. Returns to Scale: The sum of the components $(\alpha + \beta)$ in the Cobb-Douglas function seemed to be unity. This implies constant returns to scale.

2. Multiplicative Function: Cobb-Donglas function is a multiplicative function, the output becomes zero if any input takes the value zero. It implies that all the inputs considered in the function are necessary for the production process to take place.

3. Exponents $\alpha \ \& \ \beta$ represent the labor and capital shares of output. It implies that not only do the factors share in total income tend to be constant.

4. Factor Intensity: In a Cobb-Douglas production function the factor intensity is measured by the ratio α/β. The higher is the ratio, the more labor intensive is the technique. Similarly, the lower is this ratio, the more capital intensive is the technique.

5. Marginal Rate of Technical Substitution: The marginal rate of technical substitution of labor for capital ($MRTS_{LK}$) is the rate at which the labor will be substituted for the capital at the margin.

6. Elasticity of Factor Substitution: The Elasticity of factor substitution (σ) is defined as the percentage change in the capital labor ratio (K/L) divided by the percentage change in the marginal rate of technical substitution.

$$(\sigma) = \frac{\text{Percentage change in } K/L}{\text{Percentage change in MRTS}}$$

7.6.2 Essential Features of Cobb-Douglas Production Function:

Some of the essential features of linearly homogenous production function with special reference to Cobb-Douglas function are

1. Average product of factors and Cobb-Douglas production function: The first important feature of Cobb-Douglas production function as well as linearly homogenous production function is that the average and marginal products of labor depend upon the ratio in which factors are combined for the production of a commodity.

2. Marginal Product of factors and Cobb-Douglas Production Function: The marginal product of a factor of a linearly homogenous function depends on the ratio of the factors and is independent of the absolute quantities of the factors used. The marginal product of labor from Cobb-Dougles production can be obtained as $Q = AL^a K^{1-a}$

3. Cobb-Douglas Production Function and Marginal Rate of Substitution: Marginal rate of substitution between factor is equal to the ratio of the marginal physical products of the factors. Therefore in order to derive marginal rate of substitution from Cobb-douglas production function. We need to obtain the marginal physical products of the two factors from the Cobb-Douglas production function.

4. Cobb-Douglas Production Exhibits Constant Returns to Scale: If the inputs of Labor (L) and Capital (k) are increased by a constant g, then the quantity of output will be increased to g.

5. Cobb-Douglas Production Function and Labor share in National Income: Cobb-Douglas production function has been used to explain labor share in national income.

7.7 Summary:

The law of returns to scale is concerned with the study of production function in the long-run. A change in scale means that all inputs or factors are varied in the same proportion, keeping the factor proportion constant. The concept of returns to scale refers to the change in output associated with proportionate changes in all inputs such returns are increasing, decreasing, or constant depending on whether output increases more than in proportion, less than in proportion or in proportion to the input changes. A linearly homogeneous production function has constant returns to scale, and its expansion path is a straight line.

7.8 Keywords:

Returns to Scale

Increasing Returns to Scale (IRS)

Constant Returns to Scale (CRS)

Decreasing Returns to Scale (DRS)

Linearly Homogeneous Production Function.

7.9 Self-Assessment Questions:

1. Discuss the law of returns to scale. When does a production function show increasing returns to scale?

2. Explain the law of constant returns to scale.

3. State and explain the law of diminishing returns.

4. The operation of the law of diminishing returns is due to the scarcity of the factors of production. Explain.

5. State and illustrate the Cobb-Douglas production function.

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ECONOMICS OF LARGE SCALE PRODUCTION

8.0 AIMS AND OBJECTIVES:

In this section, economics of large scale production is explained. By the end of this section one could understand the following things :

* Internal Economies

* Optimum Size of a firm

* External Economies

* Short-run Costs

* Long-Run Costs

* Importance of Costs

CONTENTS:

8.1 INTRODUCTION:

Cost of production of a firm is determined by its scale of production. According to the advantages that accrue to a firm as a result of increase in its size are called economies of scale. Such economics of scale are classified by Marshall as :

1. Internal Economics and

2. External Economics

8.2.1 INTERNAL ECONOMICS: Internal economics arise because of increase in the size of a particular firm. Increase in size gives more output and in turn some economics. These economics are dependent on the resources of concerned business house, their organisation and the efficiency of their management. The internal economics of a firm are five types. They are :

1. Technical Economics

2. Managerial Economics

3. Financial Economics

4. Marketing Economics

5. Risk bearing Economics

1. TECHNICAL ECONOMIES : These economics arise as a result the use of big machinery and new scientific process, which can only be carried on big firms. Big machines are more productive. Technical economics are of four kinds. They are :

a) Large Quantity : A large firm can derive economies of superior technology by using new machines. It means that the number of labourers are fixed even the size of machinery is increased. If you can double the size of machinery the output would be more than doubled. But the cost is same. Hence, the firm derives technical economies.

b) Linked Industries : A large firm derives economies of linked process. A larger firm can make use of waste materials by manufacturing by-products. For example, a sugar industry makes alchohal by its by products. The linking of process also leads to saving in time and transport costs. Most of the factories have their own repair, testing and box-marketing departments.

c) High Technology : A large firm can buy modern and costly machines and can use that machinery upto its full capacity. A large firm can produce goods with the help of computers.

d) More Specialisation : When, the firms grows, it may split up the process of manufacture so that it can specialise in each stage. By the specialisation and division of labour, it derives more economies. It leads to decrease in costs and increase in revenues.

2.   **MANAGERIAL ECONOMIES :** Large firms can introduce minute division of labour and derive several advantages. The work of factory management is divided into several departments, each of which is put under the incharge of an expert. Each department concretes on a small operation in the manufacture of an article. It improves in skill and saves time and promotes invention. In a large firm details may be delegated to responsible paid officials. The entrepreneur can devote his time and energy to the fundamental problems of policy making. The cost off management falls as output increases.

3.   **FINANCIAL ECONOMIES :** A large firm derives many financial advantages. It is better known in the market. It can borrow from banks on better terms. It can sell its shares and debentures easily and quickly. For example, TATA company.

4.   **MARKETTING ECONOMIES :** A large firm derives economies in the purchase of materials and sale of goods. It can buy new materials at lower prices because it buys bulk quantities. A large firm can maintain better selling organisation. It can spend huge sums of money on advertising and can establish new markets.

The sales staff can be used fully. It can spend more money on research about sales and demand.

5.   **RISK-BEARING ECONOMIES :** The large firm is in a better position than a small one to bear risks. The policy of diversification can be followed by a large firm in order to spread risks. If the firm manufactures a wide variety of products, losses that arise on account of decline in the demand for one of them can be offset by gains resulting from increased demand for another. If the manufacture of one commodity for any reason is interupted, it is possible to carry on with the manufacture of the others. There is the diversification of risks because a large firm sells in different markets. If the demand slackens in one market it may increase in another. The large firm can spread its risks by obtaining raw materials, power etc., from more than one source.

8.2.2   OPTIMUM SIZE: Internal economics of a firm can be realised only upto a certain stage. Beyond, that stage, they give way to dis-economies. At one stage all the factors are being fully employed. The average cost will be at minimum. That size is known as optimum size of a firm. For example, the internal economics of a firm occur upto 10,000 units of production. From 10,0001 units of production the diseconomies will arise. Then 10,000 units of production is called optimum size in the optimum size, all the factors of production are actively participated in the production process. Average cost falls as output increases. Cost of production increase if the optimum size will increase or decrease. Hence, the average cost curve of a firm is U-shaped. The firm will reach as the optimum level at the lowest point of the U-shaped average cost curve. The U-shaped average cost curves are discussed in the following chapter.

8.2.3   EXTERNAL ECONOMICS: Because of growth of the industry, the firms will derive some economies. These economics are called external economics. A firm derives some economics when some other firm grows larger, are called external economies.

For example, as the number of textile mills increases, more textile machinery is produced. This may reduce the cost of machines. Such advantages will accrue to all the firms in the industry.

The external economies are divided into four types. They are

1. Economies of concentration

2. Economies of information

3. Economies of specialisation

4. Economies of welfare

1. **ECONOMIES OF CONCENTRATION :** When a number of firms are started in one area they derive mutual advantages through the provision of transport facilities, training of skilled workmen, the stimulation of improvements, establishment of financial and commercial institutions and so on. Subsidary and ancillary industries will be started based on these advantages.

2. **ECONOMICS OF INFORMATION :** When the number of firms in an industry increases collective action and co-operative efforts become possible. Firms need not carry on independent research. They can carry it on collectively. Scientific and trade journals are published. Gathering of information is easy and advantegeous to the industry. There is possibility for exchange of ideas among the industries.

3. **ECONOMIES OF SPECIALISATION :** When the industry grows, the firms may agree to split up the process of manufacture so that they can specialise each stage. The firms may divide between themselves the stages of production. For example, in the cotton textile industry, some firms specialise in spinning, same in weaving and so on.

4. **ECONOMIES OF WELFARE :** When the industry grows, the firms may implement various welfare programmes for the welfare of the its labourers. The firms may construct houses, provide health and sports facilities, establish educational institutions and technical institutions. These facilities increased the labourers skill.

8.2.4 **LIMITATIONS FOR LARGE SCALE PRODUCTION :** The economies of large scale production is not a continuous process. After a point firm derives diseconomies. The following are the limitations to the large scale production.

1. A too big firm cannot borrow huge funds in time.

2. Management of a firm can be manageable only upto a certain stage. Beyond that stage, it is difficult to coordinate and organise, the activities of a large number of departments. There will be endless delays in arriving at any decission. There will be a loss of contact between owners and workers.

3.   Growth of a firm beyond a stage creates some problems. Non-availability of raw materials is one of them. Production of large firm can not be changed according to the tastes and habits of the people.

4.   The risk increases when a firm becomes too big. It leads to losses.

5.   If industry grows to big of production also increases the prices of raw material, capital, labour etc., in the factors market may increase.

8.3 SUMMARY:

Economies of scale have been classified as (1) Internal economies and (2) External economies. Internal economies arise because of increase in the size of a firm. Because of growth of industry, the firms will derive some economies which are called as external economies. Internal economies of a firm can be realised only upto a certain stage. This is called optimum size. Beyond that stage, they give way to diseconomies.

8.4 POINTS TO REMEMBER:

1.   Internal Economies arise because of increase in production of a firm. They are : (a) Technical economies, (b) Managerial economies,   (c) Financial economies, (d) Marketing economies and (d)   Risk-bearing economies

2.   A firm derives some economies because some other firms grow, are called external economies. They are (a) Economies of concentration (b)Economies of information (c) Economies of specialisation and (d) Economies of welfare.

8.5 KEY CONCEPTS:

1. Internal Economies	:	Internal economies can arise because increase in production of a firm.
2. External Economies	:	A firm derives some economies because some other firm grown, are called external economies.
3. Optimum Size	:	A firm grows with minimum costs.

8.6 MODEL QUESTIONS FOR EXAMINATIONS:

I. ESSAY QUESTIONS :

1. What are the economies of large scale production ?

Hints : Write internal and external economies

II. SHORT QUESTIONS :

2. Explain various internal economies

3. Discuss various external economies.

III. VERY SHORT QUESTIONS

4. External Economies

5. Internal Economies

6. Optimum size of a firm

8.7 SELECTED READINGS :

1. Watson D.C.   :   Price theory and its uses

2. Dewett K.K.   :   Price Theory

3. Koutsoyianmis   :   A Modern Micro Economics

4. Ahuja, H.L.   :   Principles of Micro Economics

5. Seth M.L.   :   Principles of Economics

6. Jhingan M.L.   :   Advanced Economic Theory

7. Telugu Academy   :   Arthesastra Siddhantham

ANALYSIS OF COSTS

9.0 AIMS & OBJECTIVES:

Different concepts of costs are analysed in this part. You can understand the following things my the end of this chapter.

* What is cost ?

* Types of costs

* Different concepts of costs

* Different cost curves and its nature.

CONTENTS:

9.1   INTRODUCTION:

Costs are very important in business economics. Producer determines price of his goods based on the cost of production. Moreover, the costs are useful in taking business divisions. Producer utilises various factors of production, land, labour, capital and organisation and pay remuneration to all factors in money terms. The remuneration or prices of factors which are paid by the producer in money terms, are called costs or cost of production. In other words costs means expenditure on factors of production.

9.2   TYPES AND CONCEPTS OF COSTS:

There are analysed in different types of costs and different cost concepts. Some of them are discussed here under.

9.2.1   EXPLICIT COSTS: Explicit costs are those expenses which are paid to the owners of factors of production.

9.2.2   IMPLICIT COSTS: Implicit costs are the costs that can be attributed to factor units which are owned and supplied by the entrepreneur. For example, salary of the owner, etc.

5.2.3   MONEY COSTS: Money costs are the total money expenses incurred by a firm in producing a commodity. For example, wages of labourers, cost of raw materials, etc.

9.2.4   REAL COSTS: Efforts and scarifies undergone by the producer in producing a commodity are the real costs. All the costs interms of efforts and scarifies but not in money terms are considered real costs. However it is difficult to derive final real costs as it depends upon psychological factors. There is no importance to real costs in the price analysis.

9.2.5   OPPORTUNITY COST: The concept of opportunity cost was introduced by "Davenford". Since some resources are scare, they cannot be used to produce all things simultaneously. Therefore, if they are used to produce, one thing, they have to withdraw them from other uses. So, we must pay to that factor of production at least as much as it earns in alternative occupation. This is called opportunity cost. For example, a labour is working in a cotton industry at the wage rate of Rs. 1000 per month. He can get Rs. 1000, or more, if he is employed in Jute industry. But the labourer agrees only if the Jute industry offers more salary than this amount. Thus, the income from the second best the alternative is called opportunity cost.

9.3   ANALYSIS OF COST OF PRODUCTION OF A FIRM:

Cost of production of a firm is divided into two types. They are:

1. Fixed Costs and
2. Variable Costs

9.3.1   FIXED COSTS: The expenditure incurred on fixed factors of production is called fixed cost. Fixed costs remain the same whatever the level of output. They have to be incurred even where the firm stops production temporarily. Fixed costs includes wages and salaries of permanent staff, rent, interest, insurance, depreciation charges etc. Fixed costs are

distributed among all the units of production. Hence, it is called over head costs. Quantity of production does not depends on these costs directly. Hence, they are also called as supplementary costs.

Cost incurred on the fixed factors of production to produce some quantity of goods is called total fixed cost (TFC). Average fixed cost is obtained by dividing the total fixed cost by number of goods produced. Technically,

$$\text{Average fixed cost (AFC)} = \frac{\text{Total fixed cost}}{\text{No.of goods}} = \frac{\text{TFC}}{\text{Q}}$$

9.3.2 VARIABLE COSTS: Variable costs vary with the output. These costs vary with the every change in output. They includes wages of temporary workers, payments for raw materials, fuel, power, transport, etc.. These are also known as direct costs.

Costs which are incurred on all variable factors of production to produce some quantity of goods is called Total Variable Cost (TVC). Average variable cost is obtained by dividing the total variable cost by number of goods. Technically,

$$\text{Average variable cost (AVC)} = \frac{\text{Total variable cost}}{\text{number of goods}} = \frac{\text{TVC}}{\text{Q}}$$

9.3.3 TOTAL, AVERAGE AND MARGINAL COSTS: Fixed and Variable Costs are included in totals cost. Hence, the total cost is obtained by adding the total fixed cost and totals variable cost. In other words, total money cost that is incurred on all factors of production to produce goods is called total cost. For example, if a firm decides to produce soaps and amount incurred on buildings, land, raw material, machinery, wages of employers etc are called total costs.

Average cost in the cost of each good. The average cost is obtained by dividing the total cost with number of units produced. Technically,

$$\text{Average Cost (AC)} = \frac{\text{Total Cost}}{\text{Number of Units}} = \frac{\text{TC}}{\text{Q}}$$

$$= \frac{\text{TVC} + \text{TFC}}{\text{Q}} = \frac{\text{TVC}}{\text{Q}} + \frac{\text{TFC}}{\text{Q}}$$

$$= \text{AVC} + \text{AFC}$$

Marginal cost is additional cost resulting from additional unit of production. The marginal cost includes variable costs only but not fixed costs. Because fixed cost may not vary whereas variable cost may vary in the short-run period. Hence, the marginal cost affected by variable costs. The following formula is helpful to understand this marginal cost.

$$\text{Marginal Cost (MC)} = \frac{\text{Change in total cost}}{\text{Change in number of goods}} = \frac{\Delta \text{ TC}}{\Delta \text{ Q}}$$

(or)

Marginal cost = Total cost of production of 'n' units - Total cost of production (n -1) units

$$= \text{TC}_n - \text{TC}_{n-1}$$

9.4   COST OF PRODUCTION OF A FIRM IN SHORT-RUN:

The following table 5.1 shows various costs of a firm in the short-run period.

Production in units	Total fixed cost(TFC)	Total variable cost (TVC)	Total cost (TC)	Average fixed (AFC)	Average variable (AVC)	Average total (AC)	Marginal cost (MC)
0	100	-	100	0	-	-	-
1	100	30	130	100	30	130	30
2	100	48	148	50	24	114	18
3	100	62.5	162.5	33.3	20.8	54.1	14.5
4	100	116	116	25	19	44	13.5
5	100	90	190	20	18	39	14.0
6	100	109	209	16.11	18.1	34.8	19
7	100	150	250	14.3	21.4	35.11	41

It is observed from the above table that the total production is 7 units. It can be observed that the total fixed cost is remains the same even when output increases,   while the total variable cost is increasing. The average fixed cost is decreasing when the production is increasing. Average variable cost and average total costs are decreasing upto 5th unit of production and afterwards increasing. Marginal cost decreasing upto 4th unit and later increasing. However, increase in marginal is greater than increase in total variable cost and average cost.

It may be observed from the above table that except total fixed cost all are increasing upto a point as it is caused by changes in the marginal cost. These costs are analysed in following diagrams.

9.5   SHORT-RUN COST CURVES:

The total cost curves are analysed in the diagram. 5.1(A). The total fixed cost curve is parallel to X – axis as the TFC remain fixed even when the production increases or decreases. The total variable cost is zero if the firm is not produced any thing. The TVC curve is increasing at decreasing rate and later rising at an increasing rate. Hence, the TVC curve starts from the origin. The total cost curve starts from Y – axis as shown in the diagram and rises with decreasing rate and later on rises with increasing rate.

Average and marginal cost curves are shown in the diagram – 5.1(B). In the diagram, the average fixed cost curve AFC is decreasing. Because the total fixed cost remain the same with a rise in output. Hence the AFC is distributed among various units of production. Therefore the AFC curve slopes downward to the right and is a rectangular hyperbola. The AVC curve is gradually decreasing, beyond a point; it is increasing. Hence, the AVC will be 'U' shaped. The AC curve is also 'U' shaped. The AC curve is also 'U' shaped as AVC. But it is above AVC. The marginal cost curve (MC) falls at first and then it slopes upward.

These are explained in the following diagrams.
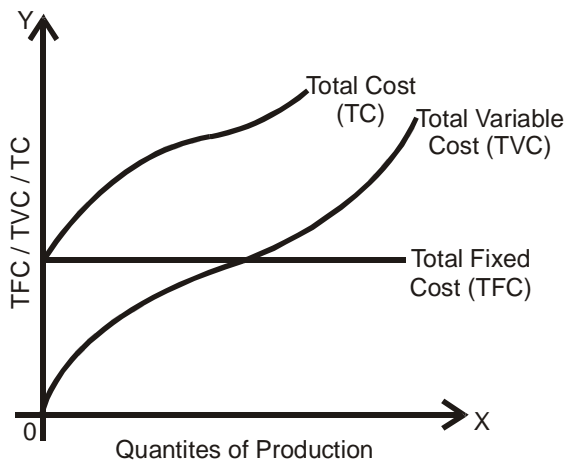
Diagram 5.1 (A)   **Diagram 5.1 (B)**
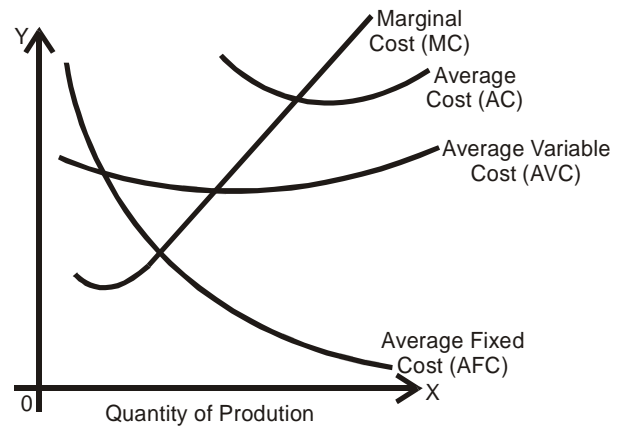
9.6   RELATIONSHIP BETWEEN MARGINAL COST AND AVERAGE COST:

Lippsey, an economist, analysed the relationship between average cost and marginal cost. The relationship between these two costs are analysed hereunder.

1.   Int he begining average cost in greater than the marginal cost.

2.   The marginal cost is decreasing more while average cost is decreasing.

3.   The marginal cost is increasing while the average cost increases. But increasing rate in marginal cost is greater than increasing rate in the average cost.

Diagram 5.2
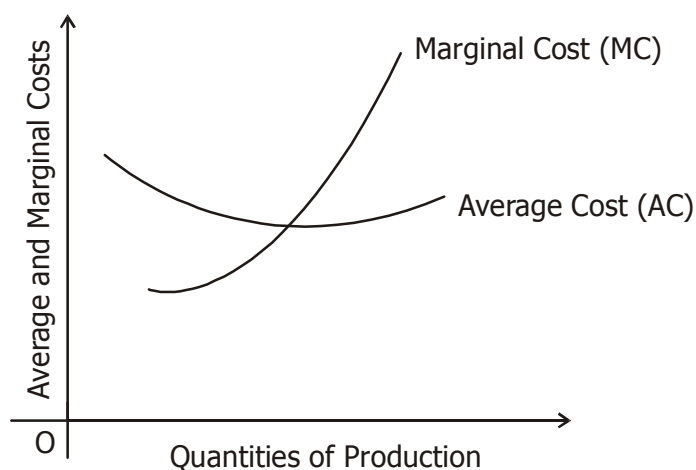
The relationship between average and marginal costs is shown in the above diagram 11.2. it depicts that, the average and marginal costs are decreasing at first. Later, while the marginal cost is increasing, the average cost declines and then increases. Because of this reason, the marginal cost curve intersects the average cost curve from below.

9.7 LONG-RUN COST CURVES:

In the short-run variable factors of production vary. But in the long-run all the factors of production including fixed factors of production vary. Hence, all the factors of production are variable factors in the long run. In this long-run we can construct new buildings, purchase new machinery, recruit additional employees etc.

Hence, all costs that are incurred in the long-run are called long-run costs. Long-run average cost is obtained by dividing the long-run total cost by quantity of goods. It is shown in the formula.

9.7.1 LONG-RUN AVERAGE COST CURVE: Any firm will try to increase its profits by increasing production and tries to minimise its costs of production. Fixed factors of production may vary if the firm decides to increase production in the long-run, along with variable factors of production. Hence, all the factors of production are variable in the long-run. Thus, all the costs are variable and there are no fixed costs. Hence, we draw long-run cost curves by adding all the short-run curves.

$$\text{Long} - \text{run Average Cost} = \frac{\text{Long run Total Cost}}{\text{Quantity of Goods}} = \frac{\text{LTC}}{\text{Q}}$$

Diagram - 5.3
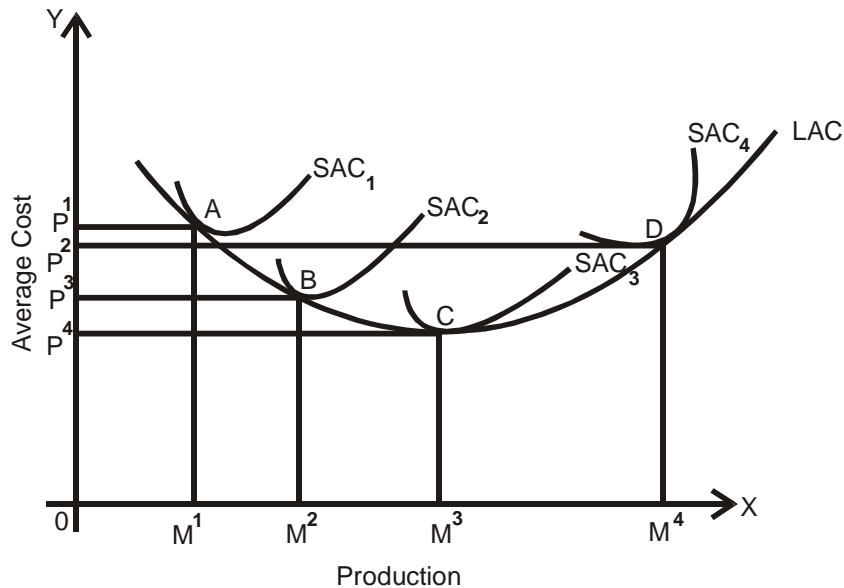
SAC_1, SAC_2, SAC_3 and SAC_4 are the various short-run average curves in the above diagram-11.3. The long-run average curve (LAC) is drawn by adding the all short-run average curves. This is called 'envelop' curve. Points M^1, M^2, M^3 and M^4 shows various productions and points P^1, P^2, P^3 and P^4 shows its costs respectively on the LAC curve. The LAC curve is drawn by adding the minimum points P^1, P^2, P^3 and P^4 on various short-run average curves.

The firm is in equilibrium at OM^3 level of output with OP^3 level of cost of production as the firm has least cost.

9.8   SUMMARY:

The remuneration or prices of factors of production is called costs. Those costs are divided into several types. Explicit costs, implicit costs, opportunity costs, long-run costs, short-run costs, fixed costs and variable costs. Expenditure incurred on fixed factors of production is called fixed cost. Expenditure incurred on variable factors of production is called variable cost. Hence, fixed and variable costs are included in total cost. Average cost is obtained by total cost divided by number of goods. Additional cost for producing additional product is called marginal cost. In the long-run all factors may be varied. Hence, all factors in the long-run are variable. Thus, all costs are variable costs.

9.9   POINTS TO REMEMBER:

1. Concept of cost play an important role in production process. Basing on the costs the business men take some decisions.

2. Total money expenses incurred by a firm in producing goods is called money cost. Efforts and sacrifices undergone by the various members of the policy are the real costs.

3. Total fixed cost may not be changed where as total cost and total variable cost may varied along with production.

4. Average cost curve and average variable cost curve are 'U' shaped. But average cost curve is beyond the average total cost curve.

5. The marginal cost curve Is Hockey bat shaped.

6. The long-run average curve is also known as 'envelop curve'.

9.10   KEY CONCEPTS:

1.	**Cost of Production**	:	Cost incurred by a firm in producing a commodity.
2.	**Money Cost**	:	Cost interms of money.
3.	**Real Cost**	:	Cost interms of efforts and sacrifices.
4.	**Total Cost**	:	Total cost incurred in producing same quantity of Output.
5.	**Variable Cost**	:	Cost may varied along with production.
6.	**Fixed Cost**	:	Cost may not changed along with production.
11.	**Short-run**	:	Short-run is a period in which all the factors cannot be varied.
8.	**Long-run**	:	Long-run is a period in which all the factors can be changed.
9.	**Average Cost**	:	Cost per unit of production.
10.	**Marginal Cost**	:	Additional cost for producing additional unit.

9.11   MODEL QUESTIONS FOR EXAMINATIONS:

I.   Essay Questions

1. Discuss various concepts of costs.

2. Explain short-run cost curves.

3. Explain long-run cost curves.

II. Short Questions

1.   Fixed and variable costs.

2.   Money and real costs

3.   Short-run cost curves

4.   Long-run cost curves.

9.12   SELECTED BOOKS FOR READING:

1. Watson D.S.   :   Price theory and its uses

2. K.K. Dewett   :   Modern Economic Theory

3. Ahuja, H.L.   :   Advanced Economic Theory

4. Jhingan, M.C.,   :   Advanced Economic Theory

5. Telugu Academy   :   Vyapara Arthasasthram

UNIT 4 Lesson : 1

CLASSIFICATION OF MARKETS

10.0   AIMS AND OBJECTIVES:

The aim of this chapter is to study the classification of markets and factors imfluencing the extent of market. We also generally observe the importance of time element in the determination of price and differences between market price and normal price.

CONTENTS:

10.1   INTRODUCTION:

In general sense market is a place where the sellers and buyers gather in order to sell and buy a particular commodity. But in Economics market is not related to only a particular place. Selling and buying transactions may take place from distant places with the help of telephone. Posts etc... or Market is a place where the buying and selling transactions take place. The market as per chapman, "the term market refers not necessarily to a place but always to a commodity and the buyers and sellers who are in direct competition with one another". The market must have a commodity. There must be the existance of buyers and sellers. More over there must be a competition among the buyers and sellers.

10.2   CLASSIFICATION OF THE MARKETS:

Markets can be classified in different ways:

1.   **ON THE BASIS OF COMPETITION:** On the basis of comeptition, the markets can be classified into two - (a) Perfect Competition, (b) Imperfect Competition.

(a)   **PERFECT COMPETITION:** Perfect competition is a market in which there are many firms selling identical products with no firm is large enough relative to the entire market to be able to influence the market price. Therefore, a perfectly competitive market is said to exist, when there is a large number of producers producing the identical products. The prevailing price in known to all buyers and sellers.

        FEATURES OF PERFECT COMPETITION: Perfect Competition is having the following features:

(i)   In this competition there are large number of buyers and sellers.

(ii)   In this market the goods, produced by all the firms are homogeneous or identical.

(iii)   In perfect competition every firm has the freedom to enter the market and exit from the market.

(iv)   The buyers and sellers must have perfect information with regard to the prices of commodities at different supplies and demand forces.

(v)   There must be perfect mobility of factors of production.

(vi)   The prices of the commodities are uniform in perfect competition.

(vii) The transport costs should not be included in the cost of production.

(viii) There is a difference between firm and industry in perfect competition.

(b)   **IMPERFECT COMPETITION:** The concept of imperfect competition was mainly propounded by Mrs. Joan Robinson. In this market the individual firms exercise their control over the price to a small extent or greater extent.

        FEATURES OF IMPERFECT COMPETITION: The following are the main features of imperfect competition.

(i)   There is imperfect mobility of the factors of production in imperfect competition.

(ii)   Product differcutiation is another feature of imperfect competion.

(iii)   There is no perfect information about market conditions.

(iv)   Selling costs play an important role in imperfect competition.

(v)   Generally in imperfect competition each firm is a price - maker and it can determine the price of its own brand of the product.

(vi)   In imperfect competition the transport costs are included in price level.

        KINDS OF IMPERFECT COMPETITION: Theare are different kinds of imperfect competition.

(i)   Monopoly   -   In this market there is only one seller or firm.

      (ii)   Duopoly   -   Two sellers are there in this market.

      (iii)   Monopolistic Competition   -   There are large number of sellers but producing differential products.

      (iv)   Oligopoly   -   There are only few sellers in this market.

2.   ON THE BASIS OF AREA: On the basis of area, markets can be classified into local, national and international markets.

    (a)   LOCAL MARKET: If a commodity is sold within a small or local area, then it is said to have a local market.

    (b)   NATIONAL MARKET: In the case of national market the buying and selling transactions are under taken with in the country. The entire nation may be regarded as one market.

    (c)   INTERNATIONAL MARKET: When the commodities are sold all over the world, then it is said to be international market.

3.   ON THE BASIS OF TIME: On the basis of time the markets can be classified into four types.

    (a)   VERY SHORT PERIOD MARKET: This is also known as market period. In this market, time is very short for firms to increase the supply.

    (b)   SHORT PERIOD MARKET: In this market supply of goods can be changed to only some extent. The price which prevails in the short run market is called short run price.

    (c)   LONG PERIOD MARKET: In this period the firms can install new capital equipment and new firms can enter the market. Supply of the goods can be changed to a great extent due to changes in the fixed cost and variable cost.

    (d)   VERY LONG PERIOD MARKET: There are tremendous changes in supply and demand in this very long period and it is difficult to identify those changes in this market. This period is also known as secular period.

10.3 FACTORS DETERMINING THE EXTENT OF MARKET:

    The extent of market may be different in the case of different goods. A market may be local, confined to a village, or it can cover a whole country or even the world. There are different factors which determine the extent of market. They are as follows.

1.   SIZE OF PRODUCTION: Large scale production leads to widening of the market. The commodities can have a wider market provided the product can fully meet the market demand. Markets have been expanded after the industrial revolution.

2.   NATURE OF DEMAND: Generally the goods which have world wide demand will have wider market. For example gold has a world wide market. If the demand for the product is relating to only particular area, then there is a local market for that product.

3. **NATURE OF THE COMMODITY:** Durable goods have wider market. For example, market for gold is wider because it is more durable and its value is very high in relation to its size.

4. **TRANSPORT AND COMMUNICATION:** The development of transport and communication facilities will increase the extent of market. In modern days air crafts and other communication facilities are contributing a lot for expansion of market.

5. **CURRENCY AND CREDIT SYSTEM:** A well developed currency and credit system will promote the extent of market. For example, after the establishment of International Monetary Fund, World Bank and other international institutions, world trade has expanded.

6. **TRADE POLICIES OF THE GOVERNMENT:** This is the most important factor influencing the extent of market for a domestic product in foreign countries. If the government imposes more restrictions on exports and imports, then the market will be narrow.

7. **PEACE AND SECURITY:** International peace and security provide better and favourable conditions for the expansion of world market. At the time of war, the extent of market will be limited.

8. **POSSIBILITY OF SAMPLING AND GRADING:** Availability of more samplying and grading facilities will increase the extent of market.

10.4 IMPORTANCE OF TIME ELEMENT IN FORCES OF DETERMINATION:

Generally prices are determined with the help of demand and supply. But according to Marshall time element also plays an important role in the price determination along with demand and supply forces. Marshall broadly divided the markets on the basis of time into four 1. Very Short Period, 2. Short Period, 3. Long Period, 4. Very Long Period.

1. **VERY SHORT PERIOD:** Very short period is also known as market period. In this period supply does not change in accordance with the demand. The supply more or less remains constant due to no changes in both fixed cost and variable cost. Market period depends on the nature of commodities. the supply and demand curves are as follows in the very short period.
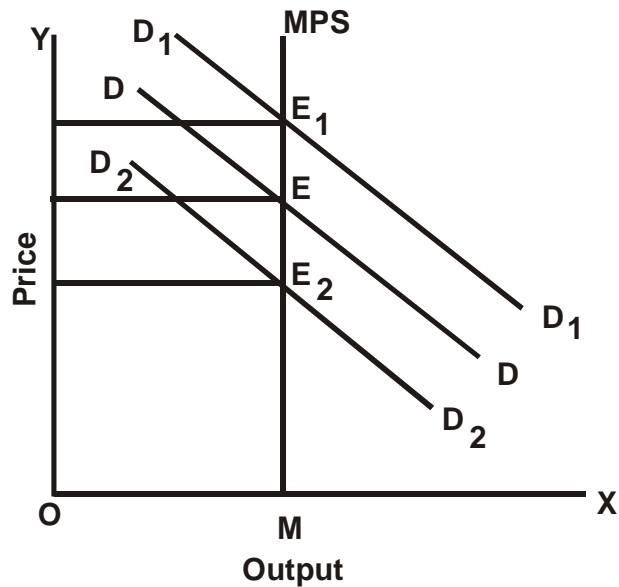
In the above diagram on the X - axis output and on the Y - axis price are shown. In this diagram MPS is the market supply curve and DD is the demand curve. Both intersect at point E. E is the equilibrium point and OP equilibrium price and OM is the equilibrium output. The market period supply curve i.e. MPS is constant. The demand curve is shifted from DD to D_1D_1. Therefore, the price increases from OP to OP_1 and later decreases from OP to OP_2 with the decrease of demand from DD to D_2D_2.

2.   **SHORT PERIOD:**   In this period due to change in the variable cost, the supply of goods can be adjusted to some extent. We can know this with the help of following diagram.
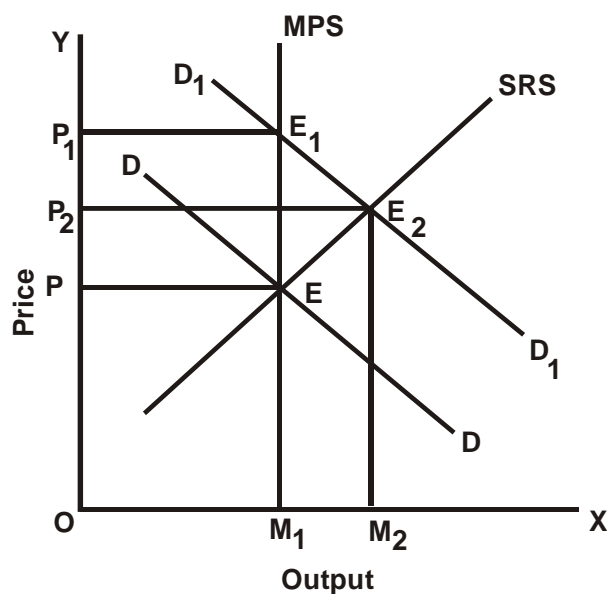
In the diagram SRS is the short run supply curve. The market period supply curve (MPS) and the increased demand curve $\left(D_1D_1\right)$ are equal at point E_1. So the price is determined as OP_1. In the short period the supply curve is changed from MPS to SRS. Now the short run supply curve and increased demand curve D_1D_1 are equal at point E_2. Therefore, the output increases from OM_1 to OM_2 and the price decreases from OP_1 to OP_2. Short period price $\left(OP_2\right)$ is less than the price of very short period $\left(OP_1\right)$ and the short period output $\left(OM_2\right)$ is more than the output of very short period $\left(OM_1\right)$.

3.   **LONG PERIOD:**   Long Period price is also known as normal price. In this long period both fixed cost and variable cost can be changed. Therefore it is possible to increase the supply of goods to a great extent. We can not analyse the price determination in the long period under different cost conditions.

(a)   LONG PERIOD PRICE AND INCREASING COSTS: When all the firms in the industry are experiencing diminishing returns to scale, then the additional output is secured only at the increasing costs. This can be explained in the following way with the help of the following diagram.
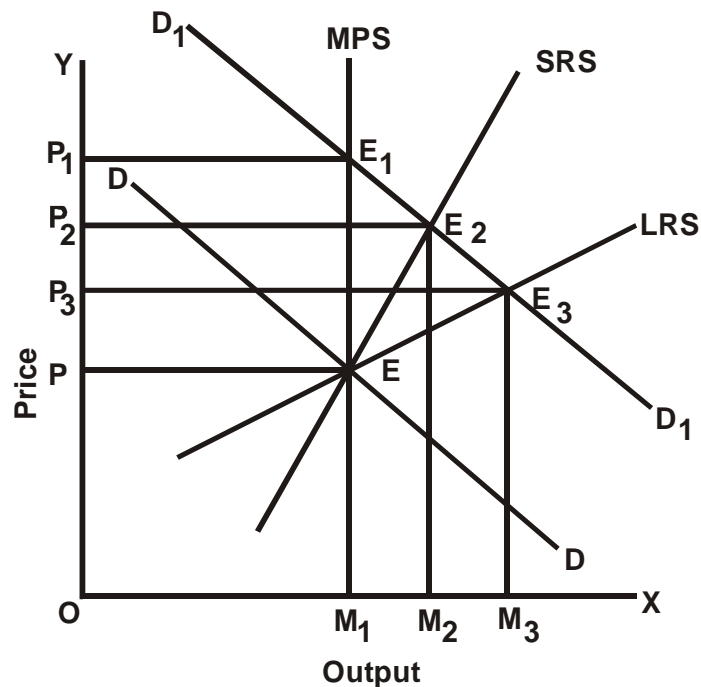
In the above diagram the long run supply curve LRS and the increased demand curve D_1D_1 are equal at point E_3. So the price is determined as OP_3 and the

output is OM_3. The long period price (OP_3) is less than the short period price (OP_2) and the very short period price (OP_1). The long period output (OM_3) is more than the short period output (OM_2) and very short period output (OM_1).

(b) LONG PERIOD PRICE AND DIMINISHING COSTS: At the time of diminishing costs, the net external economies are so powerful therefore, the normal price will be less than the original market price. This can be explained with the help of following diagram.

Demand
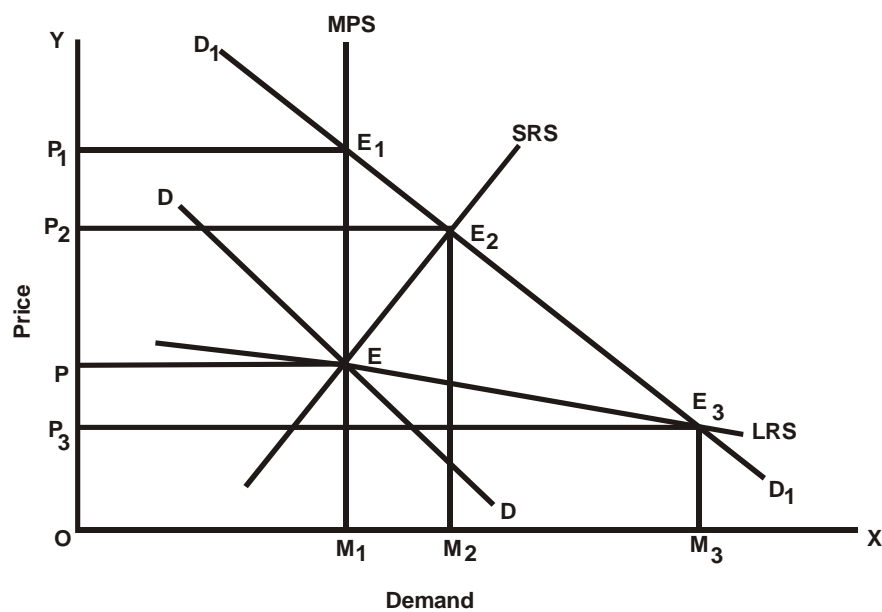
In the diagram OP is the original market price and OM_1 is the output. In the long period the price falls to OP_3. Since the industry is subject to increasing returns to scale, the net external economies cause results in the decline in the cost per unit. As a result the long run normal price i.e. OP_3 is lower than even te original market price i.e. OP.

(c) LONG PERIOD PRICE AND CONSTANT COST: The industry which experiences constant returns to scale is called constant cost industry. The price determination under constant cost is explained with the following diagram.
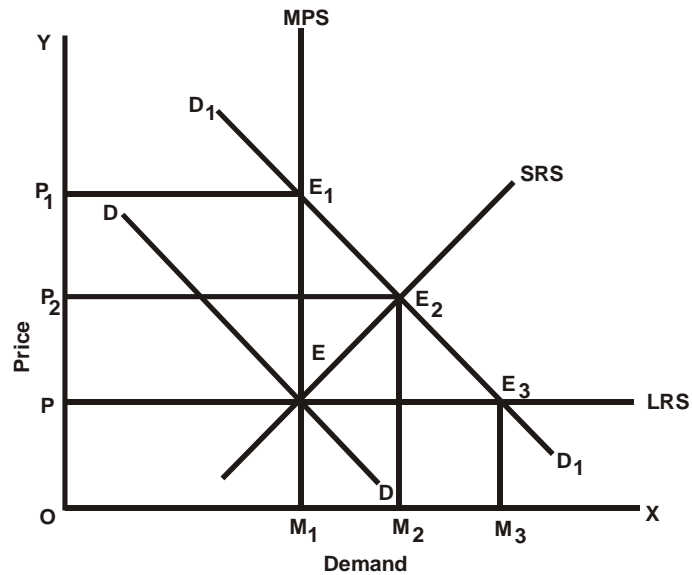
In the diagram at OP original market price the output is OM_1. In the long period the of output is increased to OM_3 and the price falls from OP_2 to OP. Therefore, the long period normal price is equal to the original market price i.e. OP.

4. **VERY LONG PERIOD:** In very long period, the economic factors like size of population, supply of raw materials, general conditions of capital supply etc. have been changed very rapidly. The demand supply of the goods will be changed rapidly and frequently in this period. Therefore, it is not possible to determine the price and output. We can call this very long period as secular period.

10.5 MARKET PRICE AND NORMAL PRICE:

In the study of micro economics the concept of price plays an important role. The value of the commodity is expressed in terms of money is known as price. The concept of price can be analysed in two ways - 1. Market price, 2. Normal price. The differences between market price and normal price can be analysed in the following way.

1. Market price is related to short run and normal price is related to long run. Therefore, market price is a short run equilibrium price and normal price is a long run equilibrium price.

2. The demand plays an important role in the determination of market price. Supply cannot be increased or decreased in a market period. Market price is increases with the increase of demand and decreses with the decrease of demand. Supply plays are important role in the determination of normal price. Some times the normal price falls even below the original previous price level due to the increase of supply to a greater extent.

3. Market price may be less or more than the cost of production. Therefore, the market price is not influenced by the cost of production on the other hand normal price always remains equal to the average cost of production. so, normal price is influenced by the cost of production.

4. Market price is actually established andtherefore it is an actual price. But in actual life, the normal price does not exist. It is only an imaginary one.

5. Market price is a temporary price and it is determined by temporary equilibrium between the forces of demand and supply at a particylar time. Normal price is a permanent price and it is the result of long run equilibrium between demand and supply. Market price may change continuously from time to time. But the normal price is stable in the long period.

6. The producer may enjoy abnormal profits if the market price is more than the average cost. Some times he may bear losses if the market price is less than the average cost. But in the long period the producer always gets only normal profits. Normal price is always equal to the average cost of prodution and therefore the producer gets nromal profits in the long run.

7. All the commodities have market price. The goods which are reproducible are have normal price. There is no normal price in the case of non - reproducible goods. For example diamonds are not reproducible goods and therefore, these goods do not have normal price.

10.6 CONCLUSION:

Market is a situation where the buying and selling transactions are under taken. On the basis of competition, time and area, markets are classified into different ways. In economics, the classification of markets on the basis of competition is the most important one. There are some fundamental differences between market price and normal price.

10.7 POINTS TO REMEMBER:

1. In economics market is a situation where buying and selling transactions are under taken.

2. On the basis of competition, markets are classified into perfect competition and imperfect competition.

3. On the basis of area, markets can be classified into local national and international markets.

4. On the basis of time the markets are brodly classified into very short period market, short period market, long period market and very long period market.

5. There are various factors which determine the extent of market.

6. According to Marshall the time element is also plays an importnat role in the determination of price.

7. The concept of price plays an importaant role in the study of micro economics. There are some differences between market price and normal price.

10.8 KEY CONCEPTS:

1.	**Market**	:	In economics market is a situation where the buying and selling transactions are under taken.
2.	**Local Market**	:	If a commodity is sold with in a small or local area, then it is said to have a local market.
3.	**National Market**	:	In the case of national market, the buying and selling transactions are undertaken with in the country.
4.	**International Market**	:	When the commodities are sold all over the world, then it is said to be international market.
5.	**Price**	:	If the value of commodity is expressed in terms of money it is known as price.
6.	**Fixed Cost**	:	Fixed Cost is that cost which is not changed with the change of output and it remains constant.
7.	**Variable Cost**	:	Variabale cost is that cost which is changed wit the change of output. There is a direct relationship between output and variable cost.

10.9 MODEL QUESTIONS:

I. Essay Questions:

1. Write about the importance of time element in price determination.

II. Short Essay Questions:

1. What is market and explain the clasification of markets.
2. What are the factors influencing the extent of market.

III. Very Short Questions:

1. Classification of the markets on the basis of competition.
2. Classification of the markets on the basis of area.
3. Classification of the markets on the basis of time.

10.10 REFERENCE BOOKS:

1.	R.A. Bilas	:	Micro Economic Theory
2.	K.K. Dewet	:	Modern Economic Theory
3.	H.C. Ahuja	:	Principle of Micro Economics
4.	M.L. Jhingon	:	Micro Economic Theory

MODULE :4 Lesson : 2

PERFECT COMPETITION

11.0 AIMS AND OBJECTIVES:

The main aim of this chapter is to study the features and determination of price under perfect competition. We will also observe the equilibrium of the firm in the short run and long run under perfect competition. We can also observe the equilibrium of the industry in perfect competition in this chapter.

CONTENTS:

11.1 INTRODUCTION:

The concept of market is playing an important role in study of economics. The determination of price of any commodity is mainly depending on the market. more over, the decisions with regard to production and purchase are also mainly dependent on the nature of market. On the basis of competition the markets can be classified into two - 1. Perfect Competition, 2. Imperfect Competition.

DEFINITIONS: There are various definitions with regard to perfect competition.

According to Left witch "Perfect competition is a market in which there are many firms selling identical products with no firm is large enough relative to the entire market to be able to influence market price."

According to Bilas, "The perfect competition is characterised by the presence of many firms; they all sell identically the same product. the seller is a price - taker."

Mrs. Joan Robinson has defined perfect competition as "it prevails when the demand for the output of the each product is perfectly elastic."

11.2 FEATURES OF PERFECT COMPETITION:

The following are the main features of perfect competition.

1. **LARGE NUMBER OF BUYERS AND SELLERS:** There are large number of buyers and sellers in perfect competition. the activity of one buyer or seller may not influence the market price. The output of single firm and demand of a single buyer are very much less in the total output and demand respectively.

2. **HOMOGENEOUS PRODUCTS:** Under perfect competition the goods produced by different firms are homogeneous or identical. The commodities are uniform in respects of quantity and quality. There is no product differentiation in this market. Therefore, the customers prefer all commodities equally.

3. **FREE ENTRY AND EXIT:** There is a free entry and exit of the firms in perfect competition. Every firm has the freedom to enter the market and exit from the market. If the firms are getting abnormal profits then the new firms may enter the market. If the firms are getting losses, then the firms have the freedom to leave the industry. So, in the long run under perfect competition all the firms gets normal profits.

4. **PERFECT INFORMATION ABOUT MARKET CONDITIONS:** In perfect competition the buyers and sellers must have the perfect knowledge with regard to the prices of various commodities and different supply and demand forces. Therefore, it is possible to avoid price discrimination in this market.

5. **PERFECT MOBILITY OF FACTORS OF PRODUCTION:** There is a perfect mobility of factors of production with in the country. This situation leads to uniform cost of production in the whole economy. It implies that different factors of production are free to seek employment in any industry they may like to do.

6. **UNIFORM PRICE LEVEL:** All commodities under perfect competition are uniform in respect of quantity and quality. Therefore, the prices of the commodities are also same.

7. **NO TRANSPORT COSTS:** In perfect competition in order to maintain uniform price level, the transport costs should not be included in the price level.

8. **DIFFERENCE BETWEEN FIRM AND INDUSTRY:** Under perfect competition there is a difference between firm and industry. Firm is a production unit and industry is a group of firms producing some commodities.

11.3 PRICE DETERMINATION:

Generally prices are determined with the help of supply and demand forces. In perfect competition the price and output are determined at that point where the demand and supply both are equal. The following table explain the price determination under perfect competition.

Price (Rs.)	Demand	Supply
5	200	600
4	300	500
3	400	400
2	500	300
1	600	200

In the table above when the price of the commodity is Rs. 5 then this is a demand for 200 commodities and the supply is 600 commodities. If the price is decreases from Five rupees to One rupee, then the demand is increases to 600 commodities and the supply in decreased to 200 commodities. There is an inverse relationship between price and demand and there is a positive or direct relationship between price and supply. In the above table at Rs. 3 price level, there is demand for 400 commodities and the supply is also 400 commodities. Therefore, the price is determined as Rs. 3 in the above example.

DIAGRAMMATIC EXPLANATION:

The price and output determination under perfect competition can be explained with the help of following diagram.
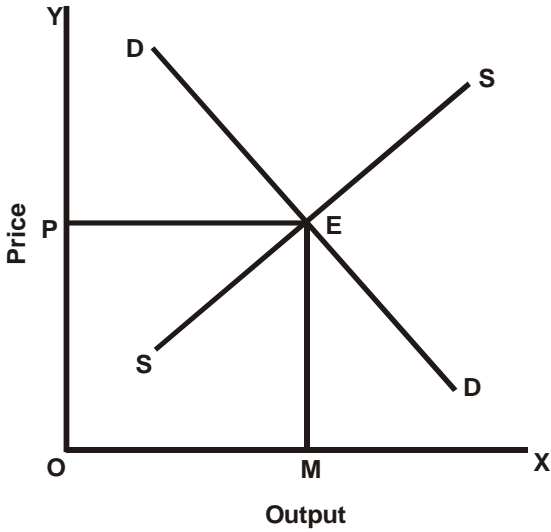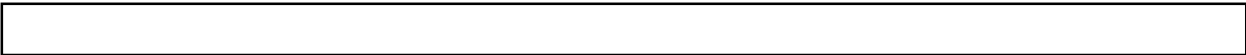
In the above diagram on the X axis output and on the Y axis price are shown. DD is the demand curve and it is falling down from left to right due to inverse relationship between price and demand. SS is the supply curve and it is increasing from left to right due direct relationship between price and supply. Both demand and supply curves are equal at point E. Therefore, the price is determined as OP and output is OM.

11.4 PRICE DETERMINATION WHEN DEMAND CHANGES AND SUPPLY REMAINS CONSTANT:

Under perfect competition supply being constant the equlibrium price rises with the increase in demand and price decreases demand with the decrease in Demand. This can be explained with the help of following diagram.
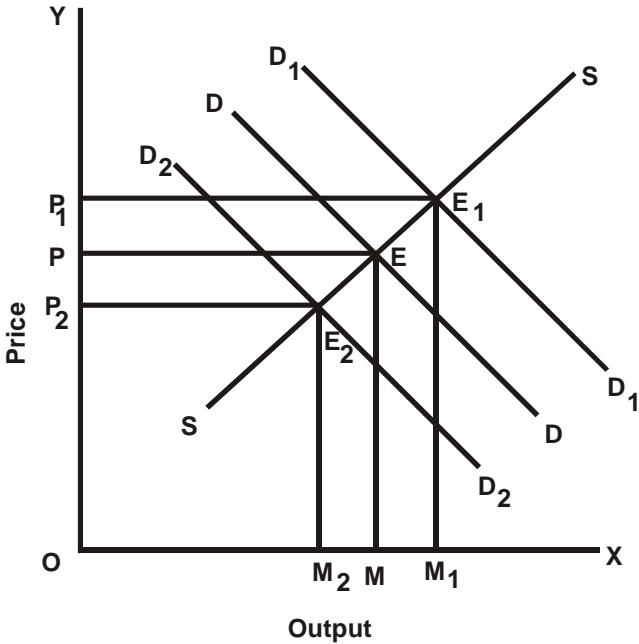
In the diagram output is shown on X axis and price is shown on Y axis. DD is the demand curve and SS is the supply curve. In this diagram we can find how the price determined when demand changes and supply remains constant. The demand is increased from DD to DD_1 and this increased demand curve and constant supply curve intersect each other at point E_1. Therefore, the equilibrium price is increased from OP to OP_1 and later the output is increased from OM to OM_1. when the demand is decreased from DD to D_2D_2, then this decreased demand curve and constant supply curve both are equal at point E_2 and therefore, the price is decreased from OP to P_2 and output is decreased from OM to OM_2.

11.5 PRICE DETERMINATION WHEN DEMAND REMAINS CONSTANT AND SUPPLY CHANGES:

Under perfect competition the demand being constant, the equilibrium price will rise when the supply decreases and price falls when supply increases. This can be explained with the help of following diagram.
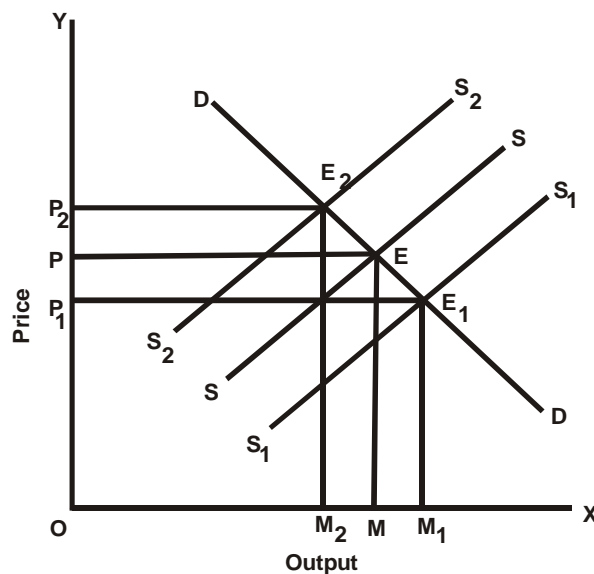

In the diagram on the X - axis output and on the Y axis price are shown. DD is the demand curve and SS is the supply curve. When the supply is increased from SS to S_1S_1, then the constant demand curve and the increased supply curve both are equal at point E_1. So the output is increased from OM to OM_1 and the price is decreased from OP to OP_1. when the supply is decreased from SS to S_2S_2, then the decreased supply curve S_2S_2 and the constant demand curve DD both are equal at point E_2. Therefore, the output is decreased from OM to OM_2 and the price is increased from OP to OP_2.

11.6 PRICE DETERMINATION WHEN BOTH DEMAND AND SUPPLY ARE CHANGED:

In perfect competition when the demand and supply both are changed in the same direction and in the same rate, then the equilibrium price may not be changed. This can be explained with the help of following diagram.
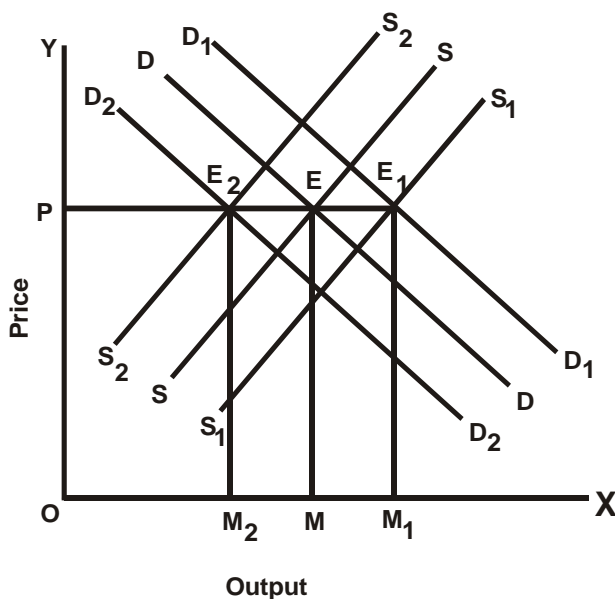
Output

In the diagram on the X - axis is output and on the Y - axis the price are shown. DD is the demand curve and SS is the supply curve both are equal at point E and therefore, the price is determined as OP and the output is determined as OM. Suppose the demand and supply both are increases from DD to D_1D_1 and from SS to S_1S_1 respectively. The increased demand and supply curves are equal at point E_1. At this point even though the output is increased from OM to OM_1 the price remains constant as OP. In the same way if the demand and supply both decreases from DD to D_2D_2 and from SS to S_2S_2 respectively, then also the price remains constant as OP even though the output is decreased from OM to OM_2. Therefore, under perfect competition, there will be no change in price if demand and supply both are changed in the same direction.

11.7 EQUILIBRIUM OF THE FIRM AND INDUSTRY UNDER PERFECT COMPITION:

Market is a condition where buying and selling transactions are undertaken. On the basis of competition the markets are classified into perfect competition and imperfect competition. According to Liftwitch, perfect competition is a market in which there are many firms selling identical

products with no firm in large enough relative to the entire market to be able to influence the market price. According to Mrs. Joan Robinson perfect competition prevails when the demand for the output of the each product is perfectly elastic.

In perfect competition there are large number of buyers and sellers. All the products are homogeneous in the quantity and quality. In this market there is free entry and exit of the firms and perfect availability of information. There is a perfect mobility of factors of production. There is a uniform price and the transport costs are not included in the price level in perfect competition.

There is a difference between firm and industry under perfect competition. Firm is a production unit and where as industry is a group of firms. Equilibrium is a balancing position or resting point. A firm can get an equilibrium where it has no desire to increse or decrease its output. A consumer is in equilibrium position where he gets maximum satisfaction with the help of his limited income. The producer gets an equilibrium if he gets maximum production with the available resources. According to Bilas, "where profits are maximised we say the firm is in equilibrium."

11.8 EQUILIBRIUM OF THE FIRM UNDER PERFECT COMPETITION:

The following conditions are necessary for the attainment of equilibrium of the firm under perfect competition.
1. The firm must try to get maximum profits.
2. Marginal cost must be equal to marginal revenue and at that equilibrium point price price & output are determined.
3. The marginal cost curve must cut the marginal revenue curve from below or from left side. At that equilibrium point the MC curve is at rising stage.

11.9 EQUILIBRIUM OF THE FIRM IN SHORT PERIOD WITH ABNORMAL PROFITS:

Under perfect competition the firm can get abnormal profits or losses in the short period. The following diagram explains how the firm can get abnormal profits and reaches the equilibrium position in the short run.
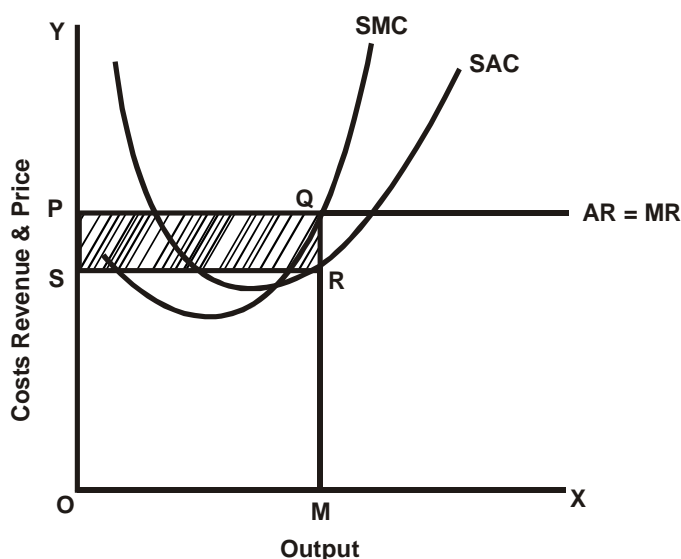
In the above diagram on the X - axis output and on the Y - axis cost, revenue and price are shown. In perfect competition the average revenue and marginal revenue curves are equal and therefore, AR and MR curves are equal and parallel to X axis due to uniform price level. In this diagram SMC curve is equal to MR curve at point Q. So, at that equilibrium point the output is determined as OM and the price is OP. Moreover at that equilibrium marginal cost curve is at rising stage. OPQM is the total revenue and OSRM is the total cost. IF we deduct the total cost from the total revenue, then we can get the total profits. Therefore -

OPQM - OSRM = PQRS = Profits.

11.10 EQUILIBRIUM OF THE FIRM IN SHORT PERIOD WITH LOSSES:

Under perfect competition in the short run some firms may get losses. We can know this with the help of following diagram.
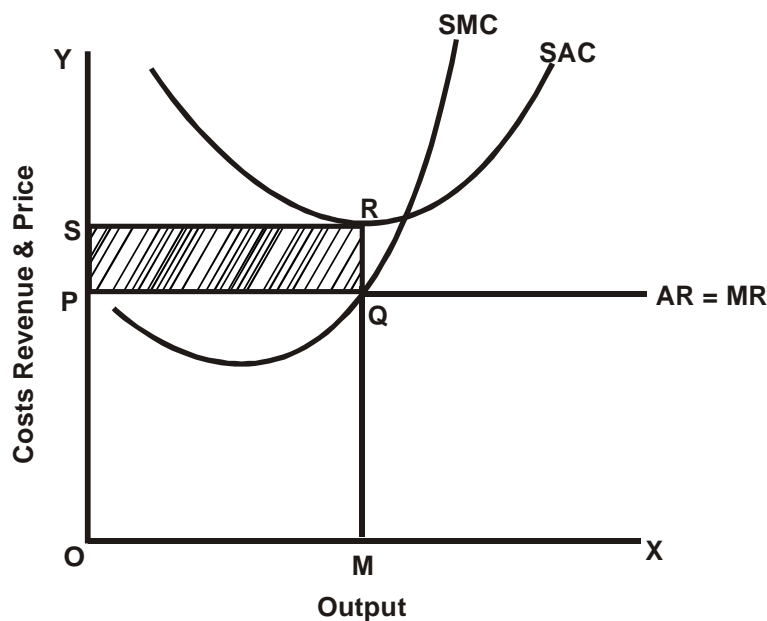

In the diagram on the X - axis output and on the Y - axis costs, revenue and price are shown. The marginal cost and marginal revenue are equal at point Q and therefore it is an equlibrium point. At this point average cost (SAC) is more than average revenue (AR). In the diagram OM is the output OP is the price. OPQM is the total revenue and OSRM is the total cost. In this diagram total cost is more than total revenue and therefore, the firm is getting losses. In this diagram -

OSRM - OPQM = PQRS = Losses

11.11 EQULIBRIUM OF THE FIRM IN THE LONG RUN:

Under perfect competiton in the long run the firm does not get abnormal profits or losses because of free entry and exit of the firms. In the long run all the firms get only normal profits. In this period both AC and AR become equal and therefore, thefirms get only normal profits. This can be explained with the help of following diagram.
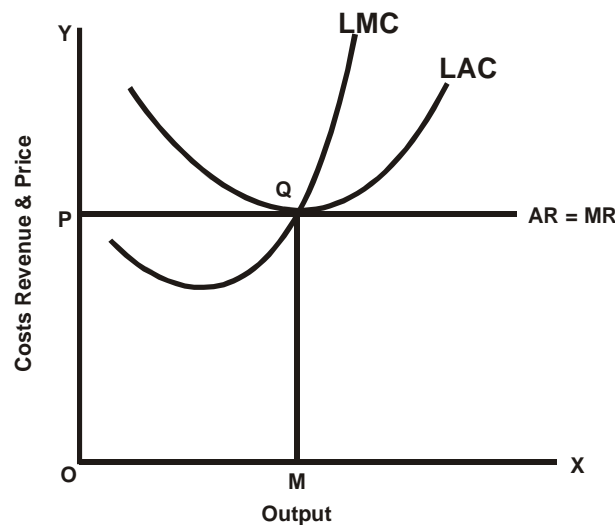
In the diagram on the X axis output and on the Y axis costs, revenue and price are shown. Both marginal cost and marginal revenue are equal at point Q and it is an equilibrium point. At this equilibrium point average cost (LAC) and average revenue (AR) both are equal. OPQM is the total revenue and also total cost. Therefore, the firm is getting only normal profits in the long run. These normal profits are included in the cost of production.

11.12 Equilibrium of The Industry Under Perfect Competition:

Industry is a group of firms producing similar products. In fact the concept of industry exists only under perfect competition. The industry is in equilibrium where it has no tendency to increase or decrease its level of output. Therefore, equilibrium of the industry means that firms are neither moving in or nor moving out.

Under perfect competition the industry will be in equilibrium when the following conditions are satisfied.

1. All firms in the industry get only normal profits.

2. The industry gets an equilibrium position where the marginal cost is equal to marginal revenue.

3. When the industry is in equilibrium the marginal cost, average cost, marginal revenue and average revenue are equal.

DIAGRAMMATIC EXPLANATION:

Under perfect competition in the short run the firm short run can get either abnormal profits or losses. But in the case of industry, there is no possibility of getting of abnormal profits or losses. The industry gets only normal profits. This can be explained with the help of following diagram.
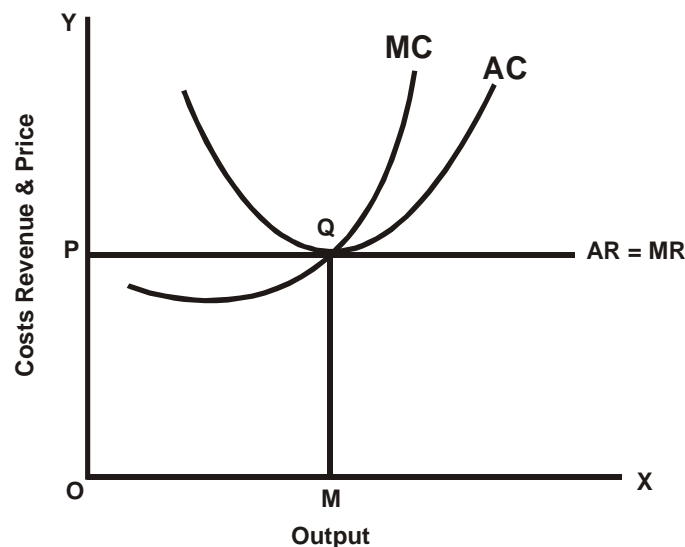
Output

In the diagram on the X axis output and on the Y axis costs, revenue and price are shown. In this diagram MC and MR are equal at point Q. At this point the MC, MR, AC and AR are equal. The output is determined as OM and theprice is OP. OPQM is the total revenue and also total cost. So, there are no abnormal profits or losses. The industry is getting only normal profits. These normal profits are included in the cost of production.

11.13 CONCLUSION:

In perfect competition the price, average revenue and marginal revenue are the same. There is a uniform price in perfect competition. Actiually the concept of perfect competition is only a myth. It is not a realistic concept. the most important essential condition for equilibrium of the firm or industing under perfect competition is the marginal cost must become equal to marginal revenue.

11.14 POINTS TO REMEMBER:

1. There are various definitions with regard to perfect competition.

2. Perfect competition is having some features.

3. In perfect competition the price is determined at that point where demand and supply are equal.

4. Equilibrium is a resting point or balancing position.

5. Certain conditions are necessary for the attainment of equilibrium of the firm under perfect competition.

6. In the short period under perfect competition some firms may get abnormal rofits and some firms may get losses also.

7. In the long run all firms get only normal profits.

8.   For the attainment of equilibrium of the industry certain conditions are to be satisfied.

9.   All the firms in the industry get only normal profits.

11.15 KEY CONCEPTS:

1.	**Firm**	:	Firm is a production unit. Goods produced by a single unit of production unit is known as firm.
2.	**Industry**	:	Industry is a group of similar firms. The group of firms which are producing similar products is known as industry.
3.	**Equilibrium**	:	Equilibrium is a balancing position or resting point.
4.	**Marginal Cost**	:	Marginal cost is the additional cost due to production of one more unit of output.
5.	**Average Cost**	:	Average Cost is the cost per unit. If we divide the total cost by the total quantity of output, then we get average cost.
6.	**Marginal Revenue**	:	Marginal revenue is the additional revenue which we get selling an additional commodity.
7.	**Average Revenue**	:	Average Revenue is the revenue per unit. If we divide the total revenue by the total number of goods sold, then we get average revenue.

11.16 MODEL QUESTIONS:

I.   Essay Questions:

1.   What is perfect competition and how the price is determined under it.

2.   Explain the equilibrium of the firm and industry under perfect competition.

II.   Short Essay Questions:

1.   Write about the features of perfect competition.

2.   Explain the equilibrium of the firm under perfect competition.

3.   Write about the equilibrium of the industry under perfect competition.

III.   Very Short Questions:

1.   Conditions for the equilibrium ofthe firm under perfect competition.

2.   Condition for the equilibrium of the industry under perfect competition.

3.   Features of perfect competition.
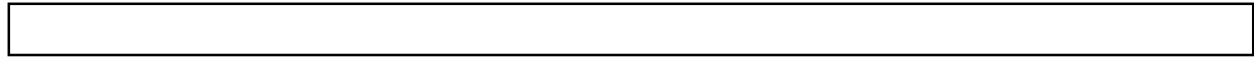
11.17 REFERENCE BOOKS:

1. R.A. Bilas : Micro Economic Theory
2. Stonier & Hague : A Text Book of Economic Theory
3. H.L. Ahuja : Principles of Micro Economics
4. M.L. Jhingan : Micro Economic Theory

MONOPOLY AND DISCIMINATING MONOPOLY

12.0 AIMS AND OBJECTIVES:

The main aim of this chapter is to study the price and output determination under monopoly and disciminating monopoly. We also observe the main differences between perfect competition and monopoly market in this chapter.

CONTENTS:

12.1 INTRODUCTION:

The word monopoly has been derived from the conbination of two words like 'mono' and 'poly'. Mono means 'single' and 'poly' means 'seller'. Therefore, monopoly means single seller. It is the ordinary meaning of monopoly. In economics monopoly is said to exist when there is a single seller or producer of a product where there are no close substitutes for it.

DEFINITIONS:

According to Ferguson, "pure monopoly exists when there is only one producer in the market. There are no dire competitions."

According to Mc. Connel, "pure or absolute monopoly exists when a single firm is the sole producer of a product for which there are no lose substitutes."

12.2 FEATURES:

The following are the main features of monopoly market.

1. **SINGLE PRODUCER:** Under monopoly there is only one seller or producer. He controls the entire supply of the commodities. Monopoly may be an individual or firm or a partnership or a joint stock company or a state. There is no competition in monopoly market.

2. **NO CLOSE SUBSTITUTES:** In monopoly market there are no close substitute products. There are no other firms producting the similar or near commodities for the product of monopoly.

3. **NO FREE ENTRY:** The new firms under monopoly have no freedom to enter the market. Therefore, the monopoly firm can get abnormal profits in both short run long run.

4. **NO DIFFERENCE BETWEEN FIRM AND INDUSTRY:** In monopoly market there is no differernce between firm and industry. There is only one firm in this market and the other firms do not produce the similar products which are produced by the monopoly firm. Therefore, in monopoly market, the firm and industry are same.

5. **REVENUE CURVES FALLDOWN FROM LEFT TO RIGHT:** The revenue curves down from left to right in monopoly market. The monopolist can control either price or output. If the monopolist wants to sell more, he must reduce the price level and if he wants to fix high price, he must reduce the output.

6. **PRICE MAKER:** In monopoly market, the monopolist has complete control over the supply of the commodity. Due to large number of buyers, demand of any one buyer constitutes a small part of the total demand. Therefore, buyers have to pay

the price fixed by the monopolist.

12.3 DETERMINATION OF PRICE AND OUTPUT UNDER MONOPOLY:

The following conditions are necessary for the determination of price and output under monopoly market.

1. The aim of the monopolist is to get maximum profits. He must produce the goods to that extent where the marginal cost becomes equal to marginal revenue. At that level he will get an equilibrium position and gets maximum profits.

2. The average revenue and marginal revenue curves fall down from left to right with the increase of output in monopoly market. If the monopolist wants to sell more, he must reduce the price level and therefore, the revenue curves fall down from left to right with the increase of output.

3. In monopoly the average revenue is equal to price and therefore, the AR curve is the demand curve.

4. Under monopoly market the MR falls more rapidly than the AR with the increase of the output. Hence MR lies below AR.

5. In monopoly market, the monopolist fixes the output at that point where the marginal cost is equal to marginal revenue. On the basis of this, he will fix the price on the average revenue line and this is more than MR and AC. The difference between AR and AC is the amount of profit.

DIAGRAMMATIC EXPLANATION:

In monopoly market the output is determined at that point where MC and MR are equal and on the basis of this the price is determined on AR line. This can be explained with the help of following diagram.
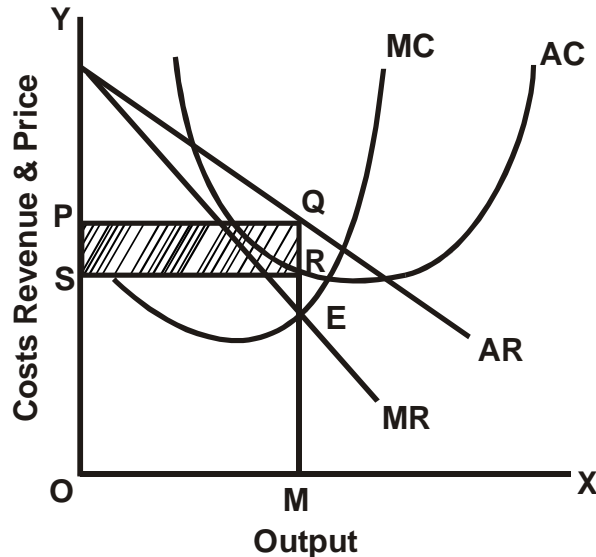
Output

In the above diagram on the X - axis the output and on the Y - axis the costs, revenue and price are shown. In this diagram AR is the average revenue, MR is the marginal revenue, AC is the average cost and MC is the marginal cost. In monopoly market where MC and MR are equal and at that point only the output is determined. On the basis of this equilibrium point the price is determined on AR line. In the above diagram the MC and MR are equal at point 'E'. Therefore, the output is determined as OM. on the basis of this the price is determined on AR line at point Q. Therefore, the price is OP or QM. The difference bwetween AR and AC is the amount of abnormal profit per one unit. Therefore, QR is the profit per unit. If we deduct the total revenue from the total cost, we can get the total amount of profit. Therefore -

OPQM - OSRM = PQRS = Profit

In the above manner the monopoly firm may get abnormal profits in the short run. In the short run the monopoly may get normal profits or losses. In the long run also the monopoly firm may get abnormal profits because of no free entry of new firms in the market.

12.4 PRICE DETERMINATION WHEN COSTS ARE INCREASING OR CONSTANT OR FALLING:

Regarding price and output determination, there is a difference between perfect competition and monopoly. In perfect competition at equilibrium point the cost curves especially the marginal cost curve is at rising stage. But in monopoly market the cost curves may be increasing or constant or decreasing at equilibrium point. We can know these things with the help of following diagrams.
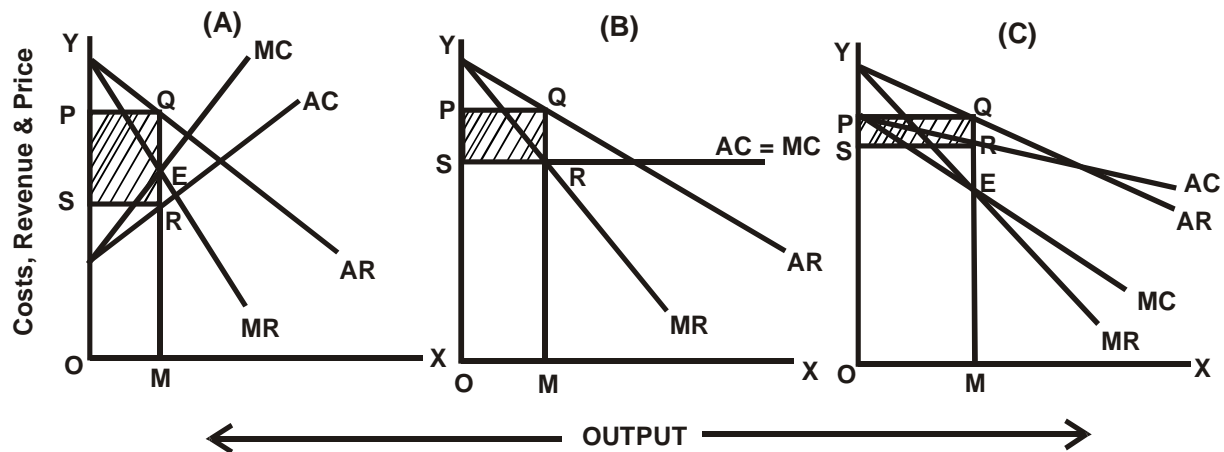
In the above diagrams on X axis the output and on Y axis the costs, revenue and price are shown. In diagram A the cost curves are increasing MC and MR are equal at point E and therefore, the output is determinedas OM and on the basis of this the price is determined on AR line at point Q. Therefore, OPQM is the total revenue and OSRM isthe total cost. So, PQRS is the total amount of profit.

In diagram (B) the marginal cost and marginal revenue (MC and MR) are equal at point R. OPQM isthe total revenue and OSRM is the total cost and therefore PQRS is the total amount of profit. In this diagram AC and MC are constant and therefore, they are parallel to X axis.

In the diagram C the cost curves ar e falling. Marginal cost (MC) and marginal rvenue (MR) are equal at point E and therefore it is equilibrium point. In this diagram OPQM is the total revenue and OSRM is the total cost and therefore PQRS is the total amount of profit.

12.5 MONOPOLY PRICE AND ELASTICITY OF DEMAND:

There is a relationship between monopoly price and elasticity of demand. The concept of elasticity of demand is more helpful to monopolist determining. The main motive of monopolist is to get maximum profits. In order to get maximum profits the monopolist fixes more price in the case of those goods for which the demand is inelastic and fixes less price in the case of goods those which demand is elastic. If the monopolist fixes the price on the basis of elasticity of demand, then only he will get maximum profits.

12.6 PRICE DISCRIMINATION UNDER MONOPOLY:

Price discrimination refers to the changing of different prices from different buyers by the monopolist for the same type of products. Therefore, the practice of selling the same commodities at different prices to different buyers is known as price discrimination. Price discrimintion is possible only in monopoly market.

DEFINITIONS:

Mrs. Joan Robinson has defined the price discrimination as "the act of selling the same

article produced under single control at different prices to different buyers."

According to Stigler, " price discrimination refers to the sale of technically similar products at prices which are not proportional to their marginal cost."

12.7 KINDS OF PRICE DISCRIMINATION:

1. **PERSONAL DISCRIMINATION:** In personal discrimination the monopolist charges different prices from different customers for the same type of product on the basis of ability to pay. For exmple a doctor may charge more fee from a rich patient and less fee from a poor patient for the same services rendered.

2. **PLACE OR LOCAL DISCRIMINATION:** The monopolist charges different prices in different markets for the same product under plae discrimination. Dumping is the best example for place discrimination. According t o this the producer may sell the same commodity at one price at home market and at the other price abroad. Place discrimination is also known as local discrimination or geographical discrimination.

3. **TRADE OR USE DISCRIMINATION:** In this trade discrimination the monopolist will charge different prices for different types of uses of same commodity. For example, electricity will be sold at the lower price for agriculture purpose and at higher price for domestic purpose.

12.8 CONDITIONS FOR PRICE DISCRIMINATION:

The price discrimination is possible when the following conditions are prevailing.

1. **MORE THAN ONE MARKET:** There must be two or more than two seperate markets, otherwise theprice discrimination is not possible. For charging different prices from different persons, different markets must exist.

2. **DIFFERENT ELASTICITIES:** The elasticity of demand in each market must be different. It means if one market is less elastic then the other market must be more elastic. This condition is very important condition for price discrimination. There will be no scope for price discrimination if the elasticity of demand is equal in all markets.

12.9 PRICE AND OUTPUT DETERMINATION UNDER DISCRIMINATING MONOPOLY:

The main aim of price discrimination under monopoly is to get maximum profits. The following conditions must be observed for getting of maximum profits and for price and output determination under discriminating monopoly.

1. The monopolist must fix more price in the case of inelastic demand and less price in the case of elastic demand.

2. All the marginal revenues in different markets must be equal to the marginal cost.

DIAGRAMMATIC EXPLANATION:

The following diagrams explain the price and output determination under discriminating monopoly where there are two markets.
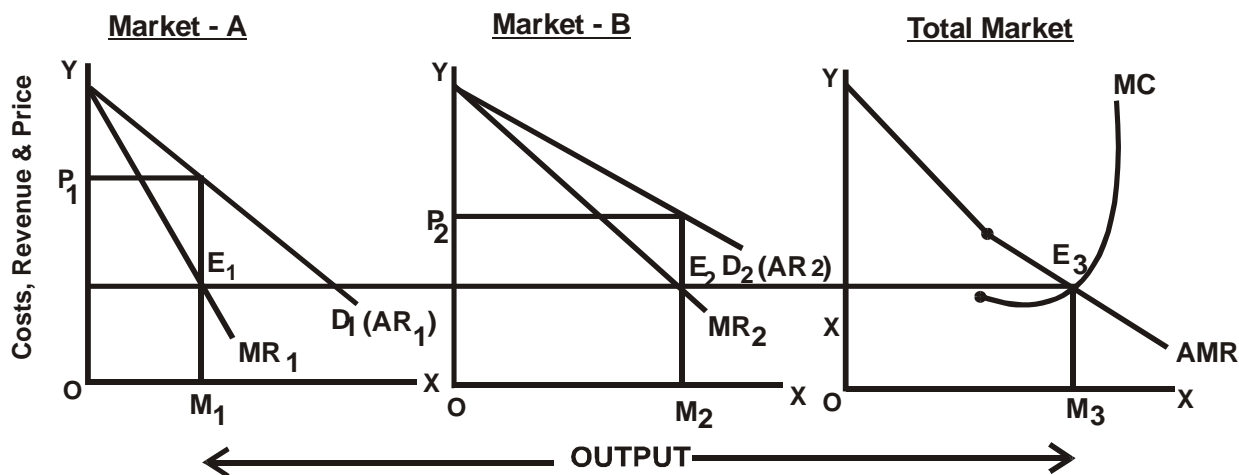
In the above diagrams on X axis output and on Y axis costs, revenue and price are shown. In market A, MR_1 is the marginal revenue and D_1 is the demand or average revenue curves. In this market the demand is inelastic. In market B, MR_2 and D_2 are the marginal revenue and demand curves respectively. The demand curve is also known as average revenue curve. In this market the demand is elastic. If we combine the marginal revenue curves of these two markets $(MR_1 + MR_2)$, then we can get the aggregate marginal revenue curve (AMR) in the total market. At point E_3 the marginal revenue is equal to marginal cost. Therefore, the output is OM_3. This equilibrium point is extended to market A and market B. The price in market A i.e. OP_1 is more than the price in market B i.e. OP_2.

12.10 DEGREES OF PRICE DISCRIMINATION:

A.C. Pigon hs distinguised the degrees of price discrimination into three on the basis of the degree or extent of price discrimination. He charges maximum that each buyer is able and willing to pay leaving him and consumers surplus. Under first type of price discrimination the monopolist will fix different prices to different buyers. This type of price discrimination is called perfect price discrimination.

In thesecond type of price discrimination the monopolistic fixies different prices to different buyers that he allows a part of consumeri surplus but not the complete consumer's surplus.

In third degree of price discrimination the monopolist divides the buyers into two or more classes or groups or markets and charges different prices in different markets. In this type the markets are divided on the basis of the elasticity of demand. This degree of price discrimination isthe most common one.

12.11 IMPORTANCE OF PRICE DISCRIMINATION:

1. There are several services such as rail transportation etc.. which cannot be worked profitably unless the price discrimination is allowed. Uniform price for such services will lead to low income or losses to entrepreneur. In order to avoid those losses the price discrimination must be implemented.

2. Some times, for promoting the welfare of the community the price discrimination is compulsory. For example, if the doctor charges more fee from rich and low fee from the poor, then the public welfare can be promoted.

3. The government can reduce the economic inequalities to some extent with the help of price discrimination.

4. Price discrimination enables the monopolist to obtain a higher total revenue and larger output. Here the output would be identical with the perfectly competent output. Therefore, the society at large is benifitted, since output under discriminating monopoly is larger than with a single price.

5. When the monopolist fixes higher price in the case of inelastic goods which is demand and lower price for those goods and then the demand and output will not be badly effected for which demand is elastic.

12.12 DIFFERENCES BETWEEN PERFECT COMPETITION AND MONOPOLY:

Perfect competition and monopoly are the two concepts. There are some difference between perfect competition and monopoly. Perfect competition is that type of market where there are large number of sellers selling similar products and where the activity of single seller or buyer cannot influence the market price, monopoly is said to be existed when the firm is the sole producer or seller of the product where there are no close substitutes for this product.

In perfect competition there are large number of buyers and sellers and all products are homogeneous. In this market there is a free entry and exit of the firms and also there is perfect information about market conditions. There is also perfect of mobility of factors of production. In perfect competition, there is a uniform price level. In this competition the transport costs should not be included in the price level. There is a difference between firm and industry under perfect competition.

In monopoly market there is only one seller or producer. There are no close substitute products for monopoly products. In this market there is no difference between firm and industry. The new firms have no right to enter the market. The monopolist can control the price either output. In this market the revenue curves fall down from left to right with the increase of output.

DIFFERENCES:

The following are the main differences between perfect competition and monopoly.

1. **NUMBER OF SELLERS:** In perfect competition there are large number of sellers who are producing homogeneous products. Therefore, the activity of single seller may not influence the market price. But in monopoly there is a single seller. He controls entire supply of the commodities. In this market there is no competition.

2. **NATURE OF REVENUE CURVES:** In perfect competition because of uniform price the average revenue and marginal revenue are equal. They are parallel to X axis. But in monopoly the average and marginal revenue curves falldown from left to right. We can know these things with the help of following diagrams.
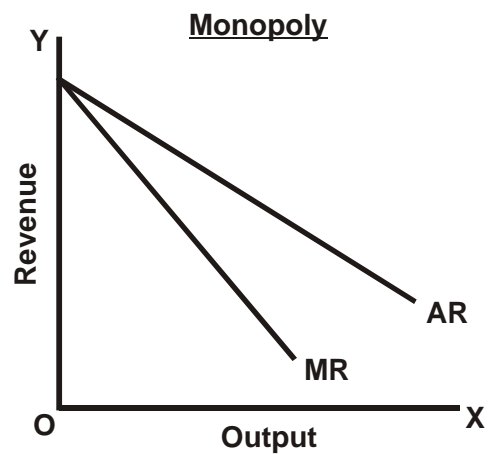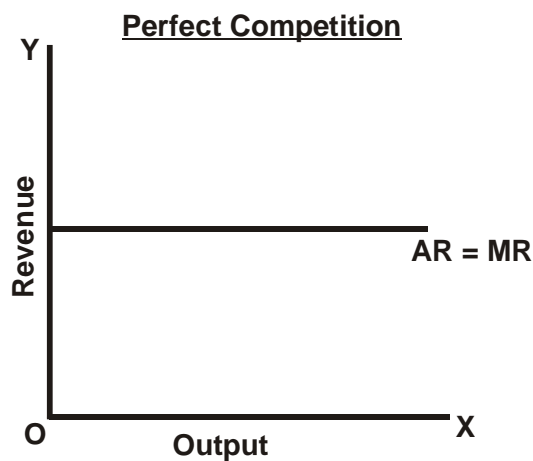
In perfect competition AR and MR both are the same and they are parallel to X axis. In monopoly market AR and MR both are falling down from left to right. If the monopolist wants to sell more, he must reduce the price level and if he wants to fix more price he must reduce the output.

3. **PRICE AND OUTPUT DETERMINATION:** In perfect competition the price and output are determined at that point where MC and MR are equal. But in monopoly where MC and MR both are equal and at that equilibrium point the price is determined on AR line. We can know these things with the help of following diagrams.

Perfect Competition
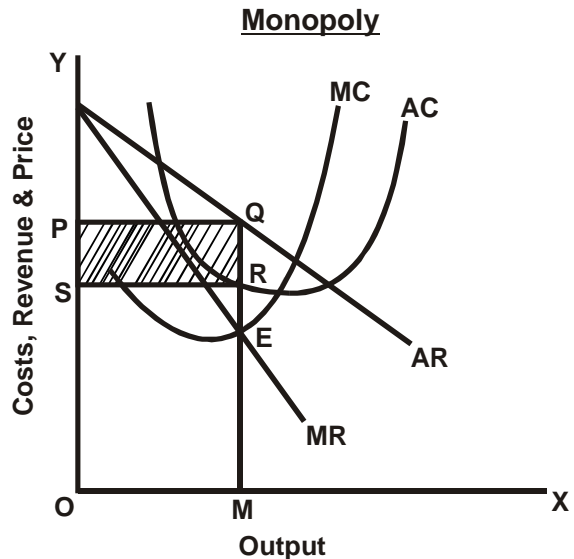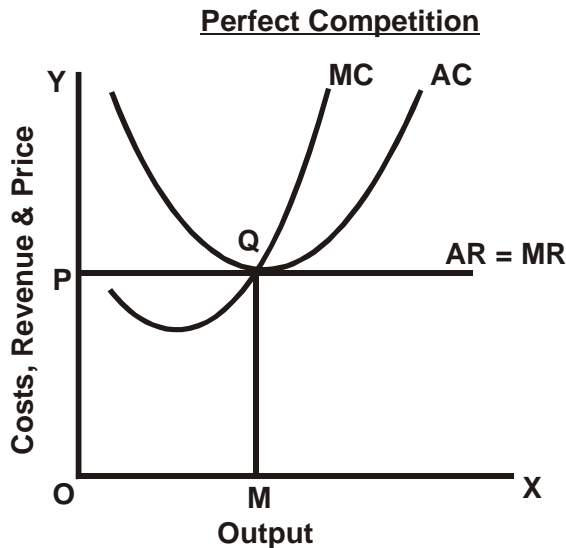
Monopoly

In the case of perfect competition MC and MR bothe are equal at point Q and therefore at that point output is determined as OM and prices OP. In monopoly market where MC and MR both are equal and at that equilibrium point only the output in determined and on the basis of this price is determined on AR line at point Q. So, the price is determined as OP.

4. **ENTRY AND EXIT OF THE FIRMS:** In perfect competition there is free entry and exit of firms. The new firms may enter the market when the firms are getting abnormal profits and leave the market when they are getting losses. But in monopoly the other firms have no freedom to enter the market.

5. **NATURE OF COST CURVES:** In perfect competition the firm gets an equilibrium position where the marginal cost is rising. If the marginal cost curve falls down, then there is no possibility of equilibrium between MC and MR Under monopoly the firm may get equilibrium position where the MC is at a rising stage or constant or falling stage.

6. **DIFFERENCE BETWEEN FIRM AND INDUSTRY:** There is a difference between firm and industry under perfect competition. Firm is a production unit and industry is a group of similar firms. But in monopoly market, there is no difference between firm and industry and both are same.

7. **NORMAL PROFITS AND ABNORMAL PROFITS:** Under perfect competition in the short period the firm may get abnormal profits. But in the long run because of free entry and exit, the firm gets only normal profits. But in monopoly the firm may get abnormal profit in the short period as well as in the long period becuase of no free entry of new firms.

8. **NATURE OF AVERAGE COST AT EQUILIBRIUM POINT:** Under perfect

competition the average cost becomes minimum at equilibrium point. In the above diagram in the case of perfect competition the average cost becomes minimum at point Q. But in monopoly market the firm attains equilibrium where the average cost is falling. In the diagram in the case of monopoly the average cost curve i.e. AC is falling at the equilibrium point i.e. at point E.

9. **PRICE AND OUTPUT:** In perfect competition the output is more and the price is less where as in monopoly the output is less andthe price is more.

10. **UNIFORM PRICE AND PRICE DISCRIMINATION:** In perfect competition there is a uniform price and there is no price discrimination. Fixing of different prices to different customers for the same commodity is said to be price discrimination. But in monopoly, there is a possibility for price discrimination. Monopolist can fix different prices to different customers for the same commodities.

11. **PRICE TAKER AND PRICE MAKER:** In perfect competition the firm is a price - taker where as in monopoly the firm is a price maker. In perfect competition the firms must follow and take the existing price. Under monopoly, the monopolist has full control over the supply of the commodity and therefore, the monopolist is price - maker.

12. **EQUILIBRIUM :** Under the perfect competition at the equilibrium point MC = MR = AR = AC = P under monopoly at the equilibrium point MC = MR < AR = P.

12.13 MONOPSONY:

Monopsony is a market condition were there is only one buyer for a product or service from a large number of sellers. In other words, there is only one customer for a company's products. It is also called as buyer's monopoly. So monopsony may be defined as a market of one buyer and many sellers.

The word Monopsony is derived from two Greek words namely - monos means single and opsonia means purchase. Therefore the literally meaning of monopsonly is single purchaser. In the imperfect competitive market monopsonly is a typlical type of market which is not much in discussion.This market is an important idea in economics but not discussed very often.

The term was first introduced by Joan robinson in her book "The Economics of Imperfection Competition", which was published in 1933. In fact monopsonly is a state in which demand comes from only one source. If there is only ne customer for a good that customer has a monopsonly in the market for that good.

The concept can be explained with an example. In Bangladesh, a dozen of power generating companies have been established in the private sector since 2009. It is only the Government of Bangladesh who purchaes from these companies, power. So in this case the government of Bangladesh is monopsonly in the market as it is the only buyer for the power which is been produced by many private producers in the country. A monopsonist has buying power in the market. This buying power means that a monopsonist can exploit their bargaining power with a supplier to negotiate lower prices. The reduced cost of purchasing inputs increases their profits margins.

12.14 CONCLUSION:

In this chapter we discussed the price and output determination under monopoly and discrimination monopoly. Monopoly is said to exist when a firm is the single seller or producer of a product where there are no close substituter for it. The practice of selling the same commodities at different prices to different buyers is known a s price discrimination. the monopolist will get maximum profits if he will fix prices on the basis of elasticity of demand.

12.15 POINTS TO REMEMBER:

1. Monopoly is a mrket where there is a single seller in which there are no clsoe substitutes.

2. There are some features with regard to monopoly.

3. Certain conditions are necessary for price and output determination under monopoly.

4. Price and output are determined in monopoly at the time of increasing costs, constant cost and diminishing costs.

5. There is a relationship between monopoly price and elasticity of demand.

6. The practice of selling the same type commodities at different prices to different buyers is known as price discrimination.

7. There are various kinds of price discrimination.

8. The price discrimination under monopoly is possible when certain conditions are prevailing.

9. According to A.C. Pigou there are three degrees of price discrimination.

10. Price discrimination is supported on varius grounds.

11. There are some differences between perfect competition and monopoly.

12.16 KEY CONCEPTS:

1.	**Monopoly**	:	Monopoly is that type of market where there is a single firm producing the goods for which there are no close substitutes.
2.	**Price Discrimination**	:	The practice of selling the same commodities at different prices to differnt buyers is known as price discrimination.
3.	**Personal Discrimination**	:	If the monopolist charges different prices from different customers for the smae type of product on the basis of ability to pay, then it is known as personal discrimination.

4.	**Place or Local Discrimination**	**:**	In this monopolist charges different prices in different places for the same product. It is also known as geographical discrimination.
5.	**Trade or Use Discrimination**	**:**	The monopolist will charge different prices for different types of uses of the same commodity.

12.17 Model Questions:

I.   Essay Questions:

1.   What is monopoly and how the price and output are determined under it.

2.   What is menat by price discrimination and howthe price and output are determined under discriminating monopoly.

3.   Expalin the main differences between perfect competition and monopoly.

II.   Short Essay Questions:

1.   Write about the features of monopoly.

2.   Explain the price and output determination under monopoly under different costs.

3.   Write about the importance of price discrimination.

III.   Very Short Questions:

1.   Monopoly price and elasticity of demand.

2.   Types of price discrimination.

3.   Conditions for price discrimination under monopoly.

12.18 Reference Books:

1.	R.A. Bilas	:	Micro Economic Theory
2.	Stonier & Hegue	:	A Text Book of Economic Theory
3.	M.L. Jhingan	:	Micro Economic Theory
4.	K.K. Dewett	:	Moderen Economic Theory

MONOPOLISTIC COMPETITION

13.0 AIMS AND OBJECTIVES:

The main aim of this chapter is to analyse the equilibriumm of he firm and industry in monopolistic competition.

CONTENTS:

13.1 INTRODUCTION:

Prof. E.H. Chamberlin developed the concept of "Monopolistic Competition" in his book "The Theory of Monopolistic Competition" published in 1933. Monopolistic Competition refers to a market situation where there are many sellers of a commodity, but the product of each seller differs from one another. It in one type of imperfect competition. It is also some times referred as 'group equilibrium'. There are some features of perfect competition and some features of monopoly in this monopolistic competition. Therefore, it is the midway of perfect competition and monopoly.

DEFINITIONS:

According to lieftwitch, "Monopolistic Competition is a market situation in which there are many sellers of a particular product, but the product of each seller is in some way differentiated in the minds of consumers from the product of every other seller."

According to Joe S. Bain "Monopolistic Competition" is found in the industry where there are a large number of small sellers selling differentiated but close substitute products."

13.2 FEATURES:

1. **EXISTENCE OF LARGE NUMBER OF FIRMS:** There are large number of firms in monopolistic competition. The output of each firm is very small in the total output. Each firm acts independently without bothering about the reactions ofthe rivals because of existence of large number of firms.

2. **PRODUCT DIFFERENTIATION:** Under monopolistic competition there is a product differentiation. In this competition products are not homogeneous as in perfect competition and they are not remote substitutes as in monopoly. These products may be close substitutes. For example, colgate tooth paste, promise tooth paste, close-up tooth paste etc... are close substitutes. Product differenciation can be brought about in so many ways.

3. **FREE ENTRY AND EXIT:** In monopolistic competition there is a free entry and exit of the firms. There are no restrictions for a new firm to enter the market or to leave the market under monopolistic competition. Because of existence of large number of firms there is a free entry and exit.

4. **LACK OF PERFECT KNOWLEDGE:** There is no perfect knowledge with regard to prices, quality ofthe products and quantity of the product produced in the market. The buyers do not know about all these products. The sellers do not know the exact preferences of buyers and unableto get advantage out of the situation.

5. **EXCESS CAPACITY:** In monopolistic competition the firms produce the goods upto that level where the average cost is at falling stage. The firms do not produce the output upto that point where the long run average cost is minimum. In monopolistic competition the amount of output that is produced by the firm is less than the ideal output. This is called excess capacity.

6. **SELLING COSTS:** Generally the costs on advertisements are commonly known as selling costs. According to chamberlin selling cost is that cost which shifts the demand curve towards the right side. Therefore, the selling costs are useful to the increase the demand for the product. The producer spends on selling costs until the additional revenue becomes zero. In real sense the selling cost will not promote the welfare of the consumers with the help of advertisements the firms may change the tastes and preferences of the consumers.

13.3 SHORT RUN EQUILIBRIUM OF THE FIRM UNDER MONOPOLISTIC COMPETITION:

In the short run some firms may get abnormal profits and attains equilibrium position in the following way.
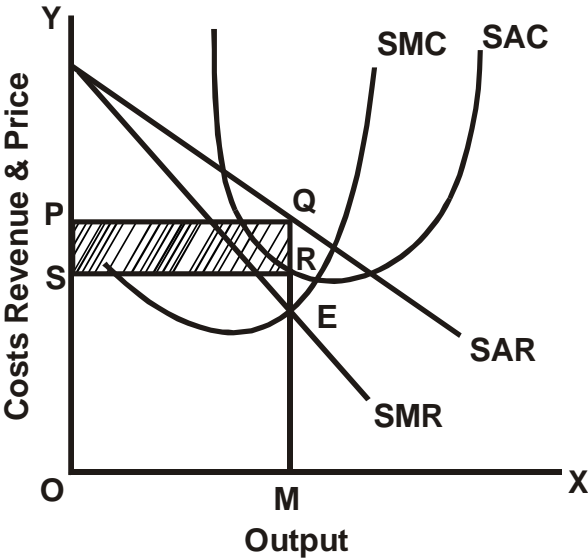
In the diagram on X axis the output and on Y axis the costs, rename and price are shown. SAR is the short run average revenue curve and also demand line. SMR is the short run marginal revenue curve. SAC is the short run average cost curve. Marginal cost revenue curves are equal at point 'E'. Therefore, the output is determined as OM and price is OP. OPQM is the total revenue and OSRM is the total cost. QR is the amount of abnormal profit per unit. PQRS is the total amount of profit.

In the short period it is possible that some firms may get abnormal profits like in the above manner. In the same shortperiod some firms may get normal profits and some other firms may get losses also in the following way.
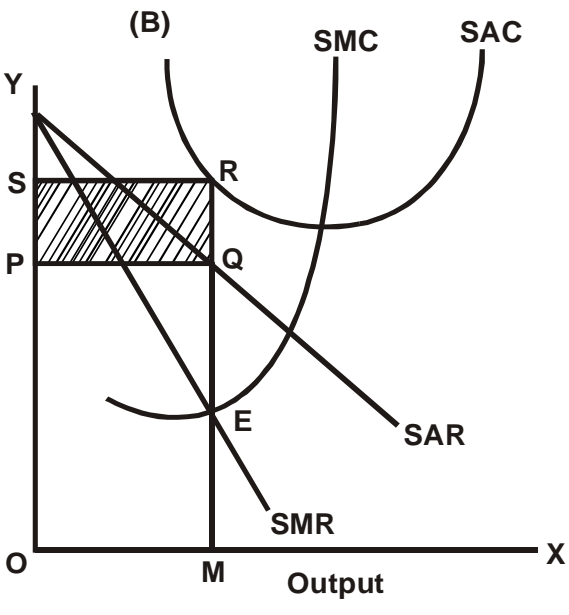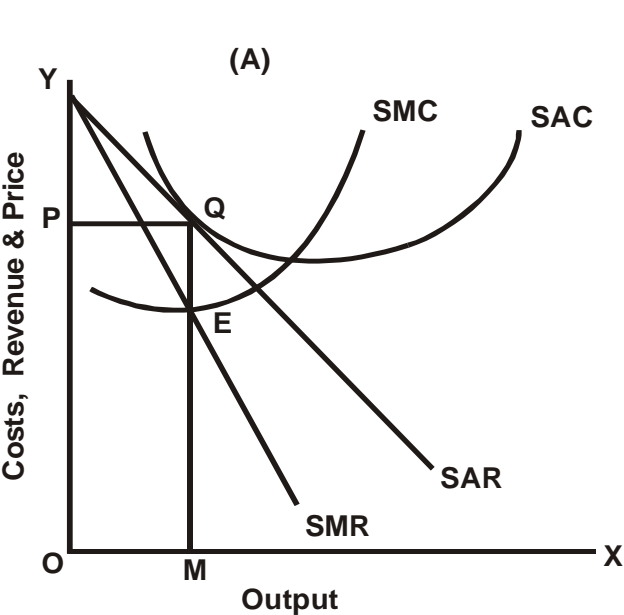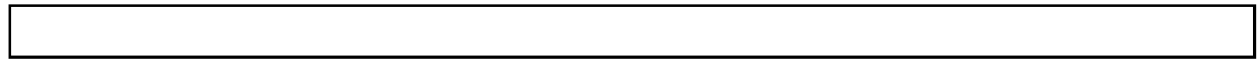
In the diagram 'A' the firm is getting only normal profits which are included in the cost of production. The equilibrium output is OM. At OM output level the price is OP which is also equal to average cost. In the diagram OPQM iste total revenue and also total cost. Therefore the firm gets only normal profits.

In the diagram 'B' the firm is getting losses. In this diagram at OM output level theprice is OP. But the average cost is OS. So the firm is getting SP or QR amount of loss OPQM is thetotal revenue and OSRM is the total cost. So PQRS isthe total amount of loss. Therefore -

$$OSRM - OPQM = PQRS = Losses$$

13.4   LONG RUN EQUILIBRIUM:

There is a free entry and exit under monopolistic competition. If the existing firms are getting abnormal profits, then the new firms may enter the market and if the firms are getting losses, then they have freedom to leave the market. Therefore, in the long period the firms get only normal profits. This can be explained with the help of following diagram.
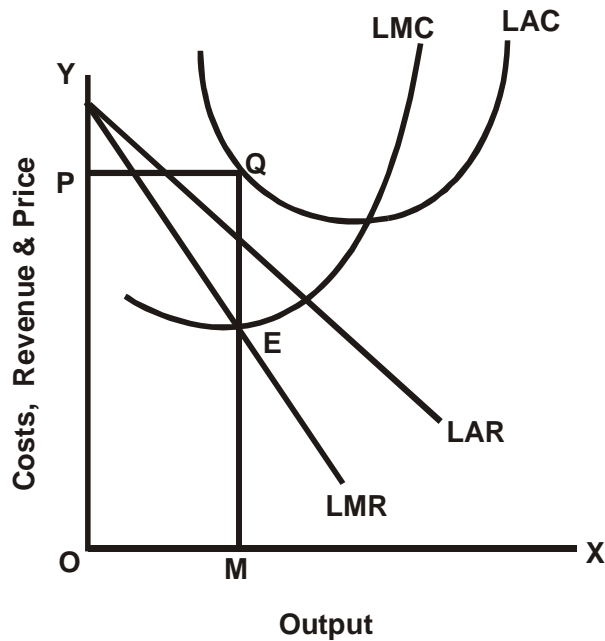
In the above diagram on the X axis output and on Y axis costs revenue and price are shown. LAC isthe long run average cost curve and LMC isthe long run marginal cost curve. LAR isthe long run average revenue curve and LMR isthelong run marginal revenue curve. The LMC and LMR are equal at point E. So the output is determined as OM and price as OP. In the diagram at equilibrium point the average cost is equal to average revenue. so thefirm is getting only normal profits in the long run. These normal profits are included in the cost of production.

13.5 DIFFERENCE BETWEEN PERFECT COMPETITION AND MONOPOLISTIC COMPETITION:

There are some differences between perfect competition and Monopolistic Competition.

1. Under perfect competition in the long run the firm gets an equilibrium position at that level where the AC isthe minimum and where as in monopolistic competition thefirm gets an equilibrium position where the AC is at falling stage. Therefore, in monopolistic competition, there is an excess capacity.

2. In perfect competition the revenue curves are parallel to X axis due to uniform price. In monopolistic competition therevenue curves are falling down from left to right.

3. In perfect competition all products are homogeneous in quantity and quality. But in monopolistic competition there is a product differentiation.

4. There is a perfect information about market conditions in perfect competition. But in monopolistic competition there is no perfect information about market conditions.

13.6 DIFFERENCE BETWEEN MONOPOLY AND MONOPOLISTIC COMPETITION:

Even though there are some similarities between monopoly and monopolistic competition, there are some differences between these two markets.

1. In monopoly there is a single seller and in monopolistic comeptition there are large number of sellers.

2. In monopoly, the firm may get abnormal profits in the short period as well as in the long period. But in the case monopolistic competition, the firm may get abnormal profits or normal profits. In monopoly, there is no free entry of new firms and therefore, the monopoly firm may get abnormal profits in the short run as well as in the long run. In monopolistic competition there is a free entry and exit of new firms and therefore, thefirms in the monopolistic competition can get only normal profits in the long run.

3. The absolute monopoly market is some what not a realistic one in practical life. The monopolistic competition is very nearer to practical and real life.

13.7 POINTS TO REMEMBER:

1. Monopolistic Competition is a midway of both perfect competition and monopoly.

2. Existence of large number of firms, product differentiation importance of selling costs are some of the main features of monopolistic competition.

3. Under monopolitic competition in the short run some firms may get abnormal profits, some others get normal profits and some more firms may get even losses. But in the long run all firms get only normal profits.

4. There are some differences between perfect competition and monopolistic competition and monopoly and monopolistic competition.

13.8 IMPORTANT CONCEPTS:

1. **PRODUCT DIFFERENTIATION:** Product differntiation is the main feature of monopolitic competition. In this market the products are different but close substitutes.

2. **SELLING COSTS:** Generally the costs on advertisement are known as selling costs. Selling costs are useful to increase the demand for the product.

3. **EXCESS CAPACITY:** In monopoly and monopolistic competition the output is not produced upto that level where the average cost is minimum. Therefore, the amount of output that is produced by the firm is lessthan the ideal output. this is called excess capacity.

13.9 MODEL QUESTIONS:

I   ESSAY QUESTIONS:

1. Explain the short run and long run equilibrium of the firm under monopolistic competition.

II   SHORT ESSAY QUESTIONS:

1. Write about the features of monopolistic competition.

13.10 REFERENCE BOOKS:

1. Stonier & Hague   :   A Text Book of Economic Theory
2. R.A. Bilas   :   Micro Economic Theory
3. M.L. Jhingon   :   Micro Economic Theory
4. K.K. Dewett   :   Modern Economic Theory

OLIGOPOLY & DUOPOLY

14.0 AIMS AND OBJECTIVES:

The main aim of this chapter is to analyse the equilibriumm of he firm and industry in monopolistic competition. We can also observe the nature and price determination under duoply market. In this chapter we study the nature, features and types of price determination under Oligopoly market.

CONTENTS:

14.1 INTRODUCTION:

Duoply market is that type of market where we find only two sellers. A brief description of duopoly is explained in this chapter. Further Oligopoly market is also explained. Oligopoly is that kind of market were we find only few sellers.

14.2 DUOPOLY:

Duo means two and poly means sellers. Therefore, duopoly refers to that type of market situation in which there are two sellers. There are two types of price determination under duopoly market - 1. Pricing under duopoly without product differentiation, 2. Pricing with product

differentiation.

1. **PRICING WITHOUT PRODUCT DIFFERENTIATION:**

A. COLLUSIVE PRICE: when there are two sellers producing or selling idential products, there may be collusion between these two sellers. They may come to an agreement and divide the market between them and fix the price collectively. In such case it will be similar to that of monopoly market.

B. INDEPENDENT PRICING: There may be continuous price-war between the two sellers if there is no agreement between these two sellers. Each firm in its way try to drive out the other seller from the market by reducing the price. Some times te price may be lower than the average cost and it may lead to losses also.

C. LONG RUN PRICE: Under duopoly market if there is no product differentiation, the consumers do not have any special preference for any producer. So in the long run the two producers may charge the same price. Therefore, these two sellers may earn only normal profits.

COURNOT MODEL: A model of Oligopoly, projecting duopoly was first put forth by cournot, a French economist in 1838. This model isdeveloped on the basis of certain assumption -

1. There are two sellers selling idential products.

2. There are large number of buyers.

3. The total output must be sold out.

4. The cost of production is assumed to be zero.

5. Each seller knows the demand curve of his product.

6. Each seller takes the supply of his rival to be constant and ignorant about his rival's plans about it.

7. Each seller wants to acquire maximum net revenue.

On the basis of above assumptions cournot developed his model. Cournot model tells us that each producer will be supplying exactly equal qualities of output and the price charged will be the same.

EDGEWORTH MODEL: Edgeworth also developed his model on the basis of the same assumptions of cournot - except one assumption. Edgeworth did not take the assumption of constant supply of rivals. He has taken the assumption of constant price of his rivals. There will not be any price stability under duopoly, according to Edgeworth. According to this model, the price changes continuously between competitive price and monopolistic price. According to Edgeworth duopoly situation is unstable and indeterminate equilibrium.

CHAMBERLIN MODEL: Prof. Chamberlin advocated a stable equilibrium model. He recognised the mutual interdependence of the two sellers. According to chamberlin each seller is intelligent and recognises the importance of natural agreement between the two sellers. This will lead to a spirti of stable monopoly

equilibrium.

2. PRICING WITH PRODUCT DIFFERENTIATION: Under duopoly market, if there is product diffrentitaion, each seller may act as monopoly andis having his own market. Like in monopoly each seller decides his price and output. The seller who sells the superior quality of the product may earn abnormal profits when compared to the other seller.

14.3 OLIGOPOLY MARKET:

The term 'Oligopoly' is derived from two Greek words namely 'Oligoi' which means 'a few' and 'pollein' which means 'to sell'. Therefore, Oligopoly refers to that form of imperfect competition where there will be only few sellers producing either homogeneous products or products which are close substituites. So Oligopoly market prevails when an industry is made up of a few firms producing either identical products or differentiated produts. Oligopoly may also be referred as competition among the few.

DEFINITIONS:

According to Mc. Connel, "Oligopoly is a market situation in which number of firms in an industry are so small that each must consider the reaction of rivals in formulating its price policy".

In view of P.C. Dooley, "An Oligopoly is a market of only a few sellers offering whether homogeneous or differentiated products."

14.4 FEATURES OF OLIGOPOLY:

1. INTERDEPENDECE: Existence of interdependence of firms in the main feature of Oligopoly market. The price and output decissions of one firm will effect the other firms.

2. INDETERNINATE DEMAND CURVE: In Oligopoly market no firm can fore cast with fair degree of certainity about the nature and position of its demand curve. The firm can not make an estimation of sales of its products if it reduces its price.

3. ELEMENT OF MONOPLOLY: Monopoly element may be prevailed in the Oligopoly market. In this market there are only few firms andeach firm controls a large share of the market and therefore, we can findout the element of monopoly even in oligopoly to some extent.

4. IMPORTANCE OF SELLING COSTS: In Oligopoly market each firm employs various techniques of advertisements. Indeterminate demand leads to making of advertisements to make the average revenue curve more favourable.

5. PRICE RIGIDITY: In Oligopoly there is price rigidity. The price will be kept unchanged due to fear of retaliation and the price will tend to be inflexible. Every firm knows the ultimate out come ofthe price change and therefore no firm is willing to change its price. In order to avoid the retaliation among the consumers and to

discourge the entry of new firms the existing firms want to maintain the stable price.

14.5 PRICE DETERMINATION UNDER OLIGOPOLY:

There are mainly three types of price determination under Oligopoly market -

A. Independent Pricing

B. Pricing under collusion

C. Price leadership

A. **INDEPENDENT PRICING:** In Oligopoly market, the firms may produce either identical products or products with close subtitutes. If there is a product differentiation under Oligopoly each firm can act as a monopoly and fixes the price independently. If these firms produce identical products, it is difficult to know the price determination in an accurate manner. There may be heavy competition among these firms and finally they may fix the common reasonable price which can not be changed. But this policy of independent pricing can not withstand in the market.

B. **PRICING UNDER COLLUSION:** Most of the firms have the opinion that independent price determination leads to uncertainity. To avoid this defect there is a tendency among the oligopoly firms to act collectively by collusion. In this method these few firms may make 'cartel' arrangements. The firms may agree to share the market even though they are producing identical products. Generally the untralised cartel determines the output produced by different frms and the price is determined which is most accetable by all the firms.

C. **PRICE LEADERSHIP:** When the other firms follow the price which is determined by one firm in oligopoly then we can say that there is a prie leadership. There are various ways of taking of leadership in price determination in oligopoly market. A dominant firm orthe firm with lowcosts or a well established firm or a old firm may take the leadership and fixes the price. Generally the other firms will follow this price.

14.6 COURNOT'S MODEL:

Augustin Cournot was a French Economists. His model is rival's output model which is assumed by an Oligopolist to remain fixed at the present level, while he contemplates a certain change in his own output. To explain his model Cournot has taken the case of two identical mineral springs operated by two owners who are selling the mineral water in the same market. Their waters are identical. Therefore, his model relates to the duopoly with homogeneous products. It is assumed by Cournot that the owners operate mineral springs and sell water without any cost of production. Thus, is Cournot's model, cost of production is taken as zero; only the demand side of the market is analyzed. The duopolists fully know the market demand for the mineral water; they can see every point on the demand curve.
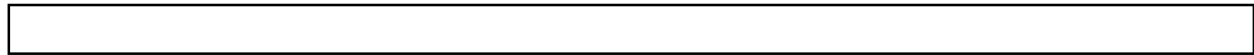
The market demand for the product is assumed to be linear. Cournot makes another assumption that each duopolist believes that regardless of his actions and their effect upon market price of the product, the other will go on producing the same amount of output which he presently producing. In other words, for determining the output to be produced, he will not take into account the reactions of his rival in response to his variation in output.

Cournot's concept can be explained with the help of a diagram. In the diagram below DB is the demand curve that is confronting to the two producers of the mineral water. Suppose OA = AB is the maximum daily output of each mineral spring. Therefore the total output of both the springs is OA+ AB = OB. The output OB of both the springs is offered for sale in the market, the price will be zero.
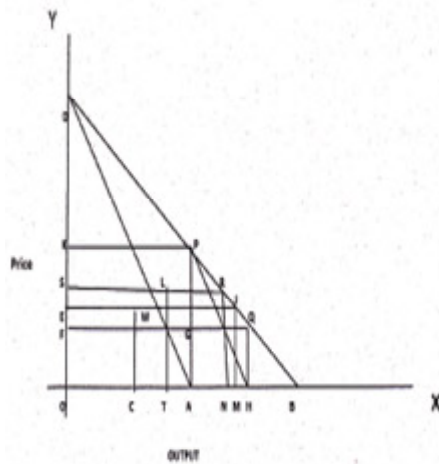
Assume that one producer of the mineral water is a monopolist and he starts the business first. He will then produce daily OA output which is his maximum daily output for his profits will be maximum at output OA and will be equal to OAPK. The price which that producer will charge will be AP or OK. Suppose now the owner of the other spring comes into the business and starts his operation. According to Cournot's basic assumption, this new producer believes that the former producer will continue to produce at the old amount of output that is OA, regardless of what output he himself decided to produce. With the demand curve PB, the producer will produce AH or ½ AB amount of output. So the total output will be now OA + AH = OH. The price will fall to HQ per OF unit. The total profits made by the two producers will be only OHQG.

First producer will gain OAGF and the second producer will earn AHQG profits. Now if compared the first producer has reduced his profits from OAPK to OAGF. Now the first producer will reconsider the situation and the second producer producing AH output. But the first producer will assume that the second producer will not change his production level and will continue to produce at Ah level. First producer would now produce OT. He therefore, reduces his output from OA to OT. With output OT of the first producer and AH of the second producer the total output now will be OT + AH = ON and the price of the product will b now NR and the total profits of the two producers will be ONRS. The first producer will have OTLS profits, which is greater than his previous profits of OAGF and the second producer will have TNRL profits which is more than his previous profits of AHQG.

Now seeing the profits of first producer, the second one will realize that his profits are less than the first producer. So he will reappraise his situation. Believing that the first producer will continue producing at OT the second producer will find his maximum profits by producing output equal to ½ of TB which is greater than ½ of AB. With this move of second producer, the first producer will find that his profits are reduced. So he would reconsider his position and will find that he can increase his profits by producing output that is equal to ½ OB-output of the second producer. These adjustments will continue till each produce the same amount of output. In the final position, first producer produces OC amount of output and the second producer will produce CM amount of output and OC = CM.

Through out this process of adjustments and readjustments, each producer assumes that the other ill keep his output constant at the present level and then always finds to his maximum profits by producing output that is equal to ½ i.e. OB – the present output of the other producer. So in this way Cournot has explained his model of oligopoly which is more duopoly in nature.

14.7 DIAGRAMMATIC EXPLANATION - KINKY DEMAND CURVE :

In Oligopoly the popular method with regard to price and output determination is the method of 'Kinky demand curve'. This concept was introduced by Paul M. Sweezy. We can know the price and output determination with the help of following diagram.
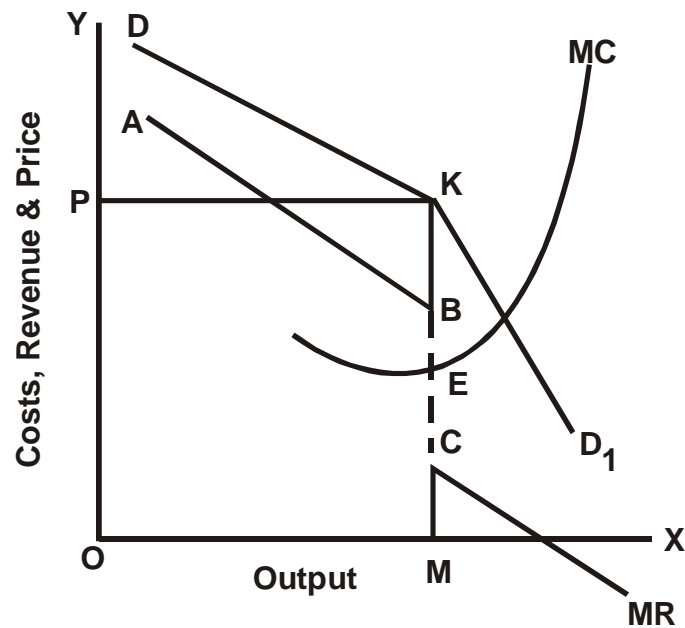
In the diagram on X axis output and on the Y axis costs, revenue and price are shown. The demand curve DD_1 has kink at point 'K'. It is the average revenue curve. The point 'K' divides the demand curve into two parts i.e., DK and KD_1. DK part of demand curve is more elastic one and KD_1 part of demand curve is less elastic one. There is a price rigidity at point K because of several reasons. If particular firm rises its price, the other firms do not follow. Therefore, the demand for the particular product will be reduced on the otherhand, if the particular firm cuts its price, its rivals will react and they will also reduce their prices. So, no firm has the desire to increase or decrease the price level. Therefore, there is a price rigidity in Oligopoly market. In the diagram the marginal revenue curve is discontinuous between B and C . AMrginal cost is equal to marginal revenue at point E. Therefore, the output is determined as OM and the price as OP.

In inperfect competition, the monopolistic competition duopoly and oligopoly are the most important concepts. In monopolistic competition there are large number of firms and there is a product differentiation. In this market we can findout somefeatures of perfect competition and some otehr features of monopoly. In duopoly there are only two sellers. In Oligopoly market there

are only few sellers. Price rigidity in the main feature of oligopoly market. Monopolistic competition and oligopoly market situations are very nearer to the real life.

14.8 POINTS TO REMEMBER:

1. In duopoly market there are two sellers. In this market prices are determined without product differentiation and with product differentiation.

2. Oligopoly market refers to that type of imperfect competition where there will be only few sellers producing either homogeneous products or products which are close substitutes.

3. Interdependence, price rigidity etc... are some ofthe features of Oligopoly market.

4. In Oligopoly market the popular method with regard to price and output determination is the method of 'Kinked demand curve'.

14.9 IMPORTANT CONCEPTS:

1. **DUOPOLY:** 'Duo' means 'few' and 'poly' mans 'sellers'. Therefore, duopoly is that type of market where there are only two sellers.

2. **OLIGOPOLY:** Oligopoly refers to that type of imperfect comeptition where there will be only few sellers producing either homogenous products or differential products.

3. **PRICE RIGIDITY:** It is the main feature of Oligopoly market. The price will be kept un changed due to fear of retaliation from rivals. Every firm knows the ultimate out come oftheprice change and therefore, no firm is willing to change its price.

4. **KINKEY DEMAND CURVE:** This concept was introduced by paul M. Sweezy. We can find this Kinked demand curve in Oligopoly market. Knked demand curve method represents the price rigidity.

14.10 MODEL QUESTIONS:

I   ESSAY QUESTIONS:

1. Explain the short run and long run equilibrium of the firm under monopolistic competition.

2. Write about the features and price determination under Oligopoly market.

3. Explain Cournot's model

II   SHORT ESSAY QUESTIONS:

1. Explain the features of Oligopoly.

2. Write about the features of monopolistic competition.

3. Write about the price determination with help of Kinked demand curve in Oligopoly market.

III   VERY SHORT QUESTIONS:

1. Duopoly Market

2. Product Differentiation

3. Kinky Demand Curve

4. Price Rigidity

14.11 REFERENCE BOOKS:

1. Stonier & Hague   :   A Text Book of Economic Theory

2. R.A. Bilas   :   Micro Economic Theory

3. M.L. Jhingon   :   Micro Economic Theory

4. K.K. Dewett   :   Modern Economic Theory

LESSON –

CIRCULAR FLOW OF INCOME

AIMS AND OBJECTIVES

The main aim of this lesson is to make students understand the circular flow of income in various sectors. Students will get knowledge as how the income flows in two sector, three sectors and four sectors of the economy.

Structure

Introduction

Circular Flow of Income

Circular flow of income in two sector model

Circular flow of income in three sector model

Circular flow of income in four sector model

Summary

Model Questions

References

INTRODUCTION

The concept of circular flow of income explains how income flows between the sectors. The concept can be explain in a two sector model, three sector model and four sector model. In a two sector model the flow of income is explained between the household sector and business sector. In a three sector model apart from the household and business sector, government sector is also seen and in the four sector model there are household sector, business sector, government sector and the rest of the world is the fourth sector.

CIRCULAR FLOW OF INCOME

The circular flow of income is a neoclassical economic model that depicts how money flows through the economy in various sectors. In the simplest version, the economy is modeled as consisting only of households and firms. This is a two model sector. Money flows to workers in the form of wages, and money flows back to firms in exchange for products. The concept of circular flow of income is extended to a three tier and a four tier economy where by government sector and foreign sector are introduced.

The circular flow of income refers to the process where the national income and expenditure of an economy flows in a circular manner continuously throughout the time. The circular flow shows both income and expenditure of the economy. It includes both national income and national expenditure of the country. Various components in the national income and expenditure are – Saving, Investment, Taxation, exports, imports, etc. In this flow the national income is equal to the national expenditure.

CIRCULAR FLOW OF INCOME IN TWO SECTOR MODEL

The concept of circular flow of income can be explained in a simple hypothetical economy where there would be only two sectors namely-household sector and business sector. The circular flow is shown in the figure 2.1 below.

The household sector owns all the factors of production namely land, labour, capital etc. This sector would sell these factors of production to the business sector. And in turn receive income. The business sector consists of producers who produce the products and sell them to the household sector or the consumers. Thus the household sector would buy the products from the business sector and pay the price. The circular flow of income and expenditure in this two sector model is show in figure 2.1 where the product market is shown in one side and the factor market in the other side.

In the product market the household sector purchase goods and services from the business sector. In the factor market the household sector receives income from the business sector for rendering services. Thus the household sector purchases the good s and service that are produced by the business by making payment to them. The business sector also makes payments to the household sector for the services rendered by them in the form of wage payments for the services of the labourers, interest for supplying the capital, rent for the use of land etc. Thus the payments go around in a circular manner from business sector to household sector and from household sector to business sector.

Goods flow from the business sector to the household sector in the product market and services flow from the household sector to the business sector in the factor market.

Figure 2.1

Circular Flow of Income in a Two Sector Economy
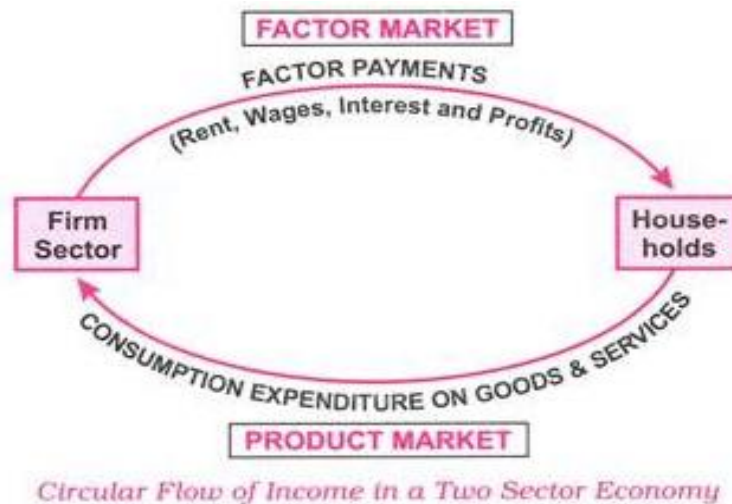
CIRCULAR FLOW OF INCOME IN THREE SECTOR MODEL

It includes household sector, producing sector and government sector. It will study a circular flow income in these sectors excluding rest of the world i.e. closed economy income. Here flows from household sector and producing sector to government sector are in the form of taxes. The income received from the government sector flows to producing and household sector in the form of payments for government purchases of goods and services as well as payment of subsides and transfer payments. Every payment has a receipt in response of it by which aggregate expenditure of an economy becomes identical to aggregate income and makes this circular flow unending.

In this model there are three sectors namely- household sector, business sector and government sector and three markets namely -product market, factor market and financial market. It shows a continuous flow of payments for goods and services between the producers and the consumers with particular emphasis on taxes and government purchases. Main highlight in this model is on the key role of government sector.

The Household Sector includes everyone, all people, seeking to satisfy unlimited wants and needs. This sector is responsible for consumption expenditures. It also owns all productive resources or the factors of production. The business sector includes the institutions that undertake the task of combining resources to produce goods and services. Government sector includes the ruling bodies of the federal, state, and local governments. Regulation is the prime function of the government sector, especially passing laws, collecting taxes, and forcing the other sectors to do what they would not do voluntary. It buys a portion

of GDP as government purchases. The government sector buys a portion of gross domestic product flowing through the product markets to pursue its assorted tasks and functions, such as national defense, education, and judicial system. These expenditures are primarily financed from taxes collected from the household sector. However, when tax revenue falls short of expenditures, the government sector is also prone to borrow through the financial markets.

The product market is the combination of all markets in the economy that exchange all the final goods and services. The resource or the factor market is the combination of markets that exchange the services of the factors of production. The Financial Market deals with the commodity exchanged through financial markets are legal claims.

Figure 2.2 shows the three-sector, three-market circular flow. At the household sector contains the consumers. The business sector is the production sector, responsible for the production part. The product market deals with the exchange of final goods and services and the factor market deals with the exchange of the services of scarce resources. We have the government sector that highlights the financial markets which divert saving to investment expenditure.

The government sector derives taxes from the household sector. Taxes in the form of personal income tax or commodity taxes are paid by the consumers in the household sector are it outflows from the circular flow of income. But the government purchases the services of the household and makes transfer payments in the form of old age pensions, unemployment relief etc, all such expenditures by the government are injected into the circular flow of income.

Figure 2.2
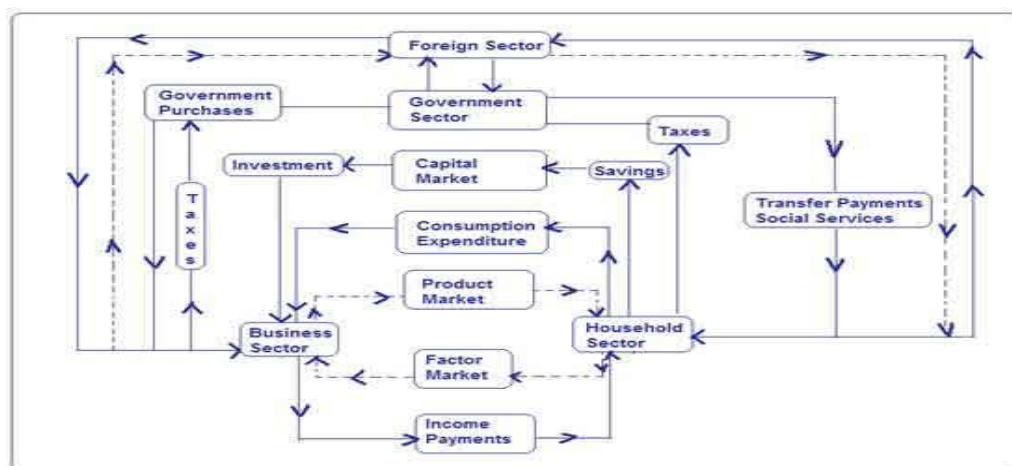
The circular flow between the business sector and the government sector deals with all types of taxes paid by the business sector to the government and these are the leakages from the circular flow. On the other side, the government purchases all its requirements of goods of all types from the business sector and gives subsidies and makes transfer payments to the firms in order to encourage their production. These government expenditures are injected into the circular flow.

The flow between the business sector and household sector remains same as it is discussed in the two sector economy. Taxation trends to reduce the consumption and saving of the household sector. That in turn reduces the sales and income of the firms or the business sector. Taxes on the business firms trend to reduce their investment and production. The government offsets these leakages by making purchases from the business sector and also by buying services from the household sector to equal it to the amount of taxes. Thus the government activities bring equilibrium between the income and expenditure flow in the economy.

2.1.1   CIRCULAR FLOW OF INCOME IN FOUR SECTOR MODEL

A modern monetary economy comprises a network of four sectors these are-1.Household sectors 2.Firms or Producing sector 3.Government sector 4.foreign sector or external sector. The four sector model become more important, because almost all the countries are opened and they are actively participating in foreign trade (export and import). So, the four sector model representing an open economy.

Household sector consist of consumers and they provide factors for productions like labour, land, building, capital etc. The industries provide goods and services to satisfy the demand of households. Firms hire the factor services supplied by households and reward them in various forms like wages for labour, rent for land and building etc. The main function of government sector includes policy making, implementation of policies, law and order etc. The government may make fiscal policy or monetary policy. They adjust policy instruments to stabilize the economy. The instruments may in the form of tax, subsidies, factor payments etc. Foreign sector is an integral one for any open economy. Since the international trade become more active every country take it as a vital one to make policy, improve national growth etc. in an open economy, factor rewards are flowing both in to the economy and out to the economy.

Foreign sector plays a vital role in an open economy. When household sector demand more, the import will increase and lead to a deficit foreign trade account. On the other hand foreign sector make payments on services provided by household sector in abroad. Foreign sector pays on commodities exported by firms to abroad. So, it is an injection to the economy. When a tourist visits domestic economy, they will spend money, so it is also an inflow to the economy. Similarly government sector also interact with government. If government makes any trade with foreign sector, there will be inflow or outflow of income.

Figure 2.3 shows the circular flow of income between the four sectors of the economy. The flow is similar between the households, business sector and the government sector. In this model the new entry is only the foreign sector which plays a vital role in the income and expenditure flow.

Figure 2.3

Four Sector Model Economy
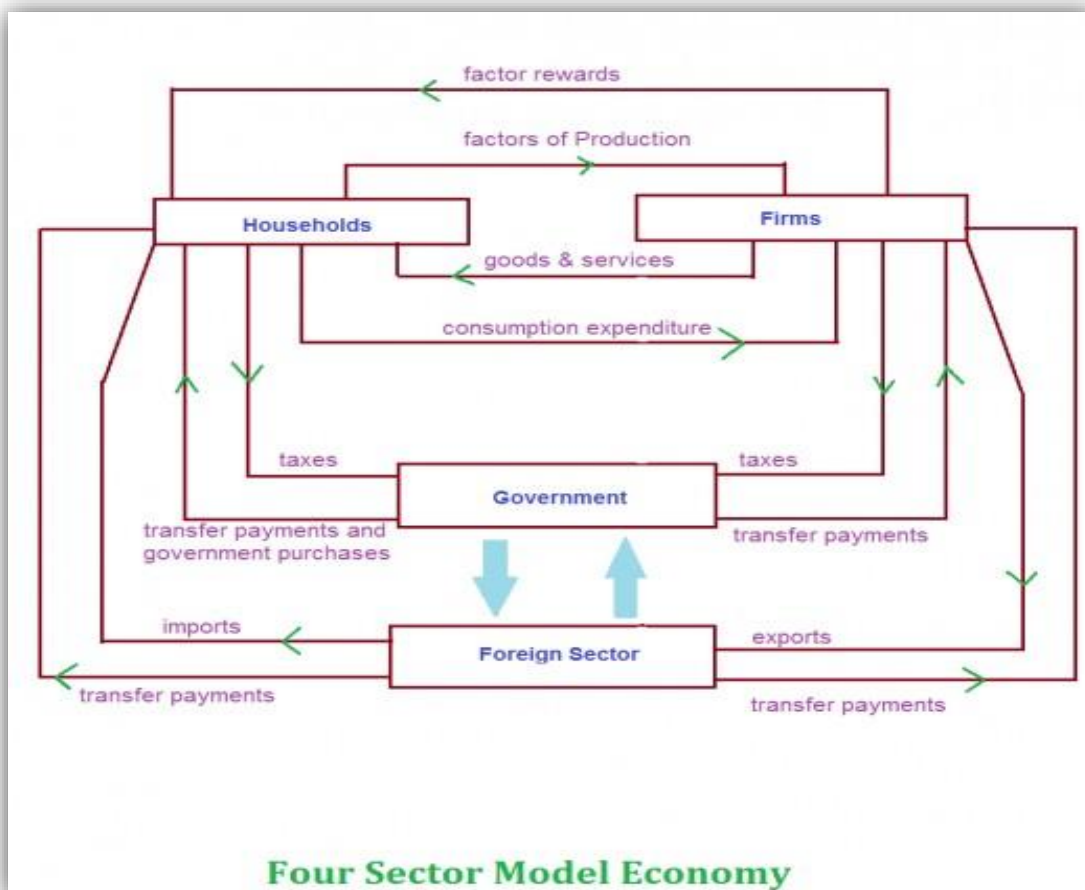
SUMMARY

The concept of circular flow of income explains how income flows between the sectors. The concept can be explain in a two sector model, three sector model and four sector model. In a two sector model the flow of income is explained between the household sector and business sector. In a three sector model apart from the household and business sector, government sector is also seen and in the four sector model there are household sector, business sector, government sector and the rest of the world is the fourth sector.

MODEL QUESTIONS

1. What is circular flow of income?

2. Explain circular flow of income in a two model economy.

3. Explain circular flow of income in a three model economy.

4. Explain circular flow of income in a four model economy.

5. Which model of circular flow of income is perfect for the modern economies?

2.1 REFERENCES:

1) Macro economics – P.N. Chopra

2) Macro Economics – D.M. Mithani

3) Macro Economics – A.V.R. Chary

4) Macro Economic Theory – M.C. Vaish

NATIONAL INCOME

The concepts of National Income and Product are most significant in macro accounting. Both these macro economic concepts are frequently used to measure the economic performance of an economy because they serve as better yardsticks of economy's performance than the other aggregative concepts. Both income and product are simple and familiar concepts. Both national income and product are flow quantities related to a given time and dimensions. While national product refers to a flow of goods and services over any given period of time, national income represents the flow of total factor earnings available to purchase the net flow of goods and services in the economy during any given time period.

2.2 Views of Prominent economists

The idea of `National Income' has attracted the attention of economic thinkers and policy markets since the inception of Economics. Following are the views of prominent economists before Keynes.

2.2.a National Income – Marshall's View : "The labour and capital of a country, acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial, including services of all kinds..... and net income due on account of foreign investments must be added in. This is true net national income or revenue of the country or the national dividend".

Marshall's concept of national dividend suffers from the following practical difficulties :

1. Difficulty in conducting a detailed census of production : It is really very difficult to make a statistically correct estimate bf the production of all the commodities and services turned out in a country during a specific period.

2. Difficulties in Aggregation: The aggregation of the outputs of goods and services is not easy. The different commodities and services constitute heterogeneous statistical units i.e., wheat in tonnes cloth in meters, cotton in bales, petroleum in gallons and electricity in kilowatts.

3. Difficulty in monetary evaluation of goods and services: There are a number of commodities which are produced but whose output is not evaluated before

consumption. For instance, a farmer retains a part of total produce for self consumption. This portion of produce is not evaluated by normal market operations.

4. Double Counting : The major difficulty in adopting Marshall's definition was the possibility of double counting of the products.

2.2.b   Pigou's views on National Income :

Pigou defined the National Income or dividend as "That art of the objective income of the community including, of course, income derived from abroad which can be measured in money".

According to it, all the goods and services which are transacted in a specific year in exchange of money may be included in the national dividend of the country. Pigou's emphasis upon monetary exchange was thus a definite advance over the Marshallian concept of national income.

Pigou's definition however suffered from the flaw that the distinction between the goods exchanged for money and those not exchanged for money was artificial. And. all the known illustrations given by Pigou about the maid servant marrying her master and continuing the same services, since her services will no longer be paid, they become excluded from the national dividend of the country.

2.2.c   Fisher's Views on National income:
Fisher made a very significant effort from the line followed by Marshall and Pigou. He adopted the level of satisfaction as the basis for measurement of national income in place of the stock of goods and services produced during a year. In his words, "…The national dividend for income consists solely of services as received by ultimate consumers, whether from their material or from their human environments. Thus, a Piano or an overcoat made for me this year is hot a part of this years income but an addition to capital. Only the services rendered to use during this year by these things are income". This definition gave a new perspective to the concept of national income as it measured the welfare of the community rather than it's economic performance in respect of the production of goods and services.

2.2.d Keynes's Concept of National Income :
Keynes also explained the concept of national income and made a departure from the earlier thinkers on the concept. He

adopted an approach which helped in the aggregative analysis of income and employment. Keynes had suggested three approaches to national income in his book known as the General Theory.

1. Aggregate expenditure (on consumption and investment goods) approach.
2. Factor Incomes approach.
3. Sale proceeds minus cost approach.

1. Aggregate Expenditure Approach :

Keynes had explained the aggregate expenditure approach through the following equation $(A - A_1) + (G^1 - B^1 - G) = Y$.

$A - A_1$ = the purchases made by the consumers from the entrepreneurs or consumer's only outlay.

$G^1 - B^1 - G$ = capital consumption during the current production period, i.e., Net investment out lay.

Thus $(A - A_1) + (G^1 - B^1 - G) = Y$ or consumption + Investment = National Income.

2. The Factor Income Approach:

The second approach of Keynes to national income is in terms of the incomes by all the factors of production. He has expressed the national income aggregate as the sum of the receipts of factors of production like land, labour and capital plus the earnings or profits accruing to the entrepreneurs i.e., $Y = F + Ep$

Where F denotes payments received by land, labour and capital.

Ep shows the entrepreneurial profits.

3. Sale Proceeds Minus Cost Approach :

The view implies that national income of a community lies some where between he gross national product and net national product. National Income falls short of GNP but exceeds. NNP Keynes does not deduct the whole of depreciation and replacement cost, but only a part of it which he terms 'user's cost.

If the users cost calculated for all the individual business units is aggregated, it will determine the aggregate users cost. Keynes observed that the income of the community can be calculated by deducting user's cost from the aggregate sale proceeds. Income is denoted as $Y = A$.

For estimation of net national income, it is necessary to deduct the supplementary cost also.

Thus $Y = A - U - U => Y = A - (U + V)$

By deducting users' cost plus supplementary cost from the aggregate sales, the net national income of the community can be estimated.

In a two-sector economy national income equals national product can be expressed in the form of the following equation.

National Product = Value of Final = Wages
Goods & Services +
Rent
+
Interests
+
Profits

From the above analysis it is evident that national income and national product are one and the same thing. Prof.J.R.Hicks rightly writes. "The value of the net social product of the community and the sum of the incomes of its members are exactly equal. The net social product and the social income are one and the same thing".

2.1 Concepts of National Income:
There are various concepts of national income :

2.1.1 Gross National. Product (GNP) :

This is the basic national accounting measure of the total output or aggregate Supply of goods and services. Gross national product is defined as the total market value of all final goods and services produced in a year in a country. Two things must be noted in this concept. First it measures. the market value of annual output. In order to know accurately the changes in physical output, the figure for GNP is adjusted for price changes.

Secondly, for calculating GNP accurately, all. goods and services produced in any years must be counted once, and not more than once. To avoid counting several times. GNP includes, the market value of only final goods and ignore transactions involving intermediate goods.

2.1.2 . Gross Domestic Product (GDP):

Another important concept of national income is gross domestic product. GDP is the money value of all final goods and services produced by normal residents but does not include net factor income earned from abroad. Thus

different GDP and GNP at market prices arises due to the existence of 'net factor income from abroad.'

GDP_{MP} = GNP_{MP} - net factor income from abroad

GNP_{MP} = GDP_{MP} + net factor income from Abroad

2.1.3 Net National Product (NNP) or National Income at market prices (NNP_{MP})

The other important concept of national income is that of net national product (NNP). In the production of gross national product of a year, we use up some fixed capital, i.e., equipment, machinery etc. The capital. goods like machinery, will wear out or fall in value as a result of it's use in production process. This consumption of fixed capital or fall in the value of fixed capital due to wear and tear is called depreciation. The 'market value to final goods and services after providing depreciation is called national income at market prices.

Therefore,

Net National Product
    Or   =   Gross National Product Depreciation
National Income at Market Price

2.1.4 National Income at Factor-Cost (NNP_{FC})

National Income at factor cost which is also simply called national income. It is the sum **of all incomes earned** by land, labour, capital and entrepreneurial ability which go into the years' net production. In other words, national income at factor cost shows how much it costs society in terms, of economic resources to produce net output. The difference between, national income at factor cost and nation income at market price arises from the fact that indirect taxes and subsidies.

National Income
    Or
National Income = National Income at market prices – Indirect Taxes + Subsidies
at factor cost
National Income = Net National Product – Net Indirect Taxes.

2.3.5 Net Domestic Product (NDP)

GDP provides the measure of the total production of final goods and services in the economy. It includes some producer goods which are made to replace the existing produce goods that are depreciating or wearing out. If a machine lasts for ten years, we can say that one-tenth of it is used every year. The machine must be replaced by a new machine immediately after its life, time. If cost of replacement is

deducted from the GDP, we will get the net domestic product. Net domestic product measures the total production of goods and services for current consumption and for adding to the stock of producer's goods While calculating net national product, the balance of payments position must also be taken into account. Exports are a part of the NNP because they have to be paid for. Any surplus in the balance of payments must be added to and deficit must be deducted from the domestic product.

NDP + Net Foreign Income = NNP.

2.3.6 Personal Income (PI)

Personal Income is the sum of all incomes actually received by all individuals during a given year.

Personal Income = National Income – Social Securing Contributions – Corporate Income Taxes – Undistributed Corporate Profits + Transfer Payments.

From National Income to Disposable Income

2.3.7 Disposable Income (DI)

Even whole of the incomes which are actually received by the people are not available to them for consumption. This is because government levy some personal taxes such as income tax, personal property taxes. Therefore after a part of personal income is paid to government in the form of personal taxes like income tax, personal property tax etc, what remains of personal income is called disposable income.

Disposable Income = Personal Income – Personal Taxes.
Disposable Income can be said in the following way.
Hence disposable income = consumption + saving.

Methods of Estimating National Income

To get national income we have to count all those goods and services produced in the country and exchanged against money during a year. The produced goods are used for consumption or for saving purpose. Thus National output can be calculated at any three levels viz Production, in come and expenditure. Accordingly we have three methods of estimating National income (i) Production method or Value added method (ii) Income method and (iii) Expenditure method.

Production method or Value Added Method

To obtain National Product of a Country we aggregate the Money Value of all gods & services finally produced in a country in a year. Then, we can get GNP or

GDP (At present we won't make any difference between these two concepts). The two important words money value and final product require a little explanation.

We can't add up the physical qualities of all goods & services produced in a year. It is meaningless to compute the sum of 20 Maruthi cars+80 Liters of petrol +100 meters of cloth+….. hence we have to transform these physical quantities into money values by multiplying the quantity of each goods produced by the Price per unit of each good. That is price per car X 20 cars+ price per liter X 80 liters of petrol + price of cloth per meter X 100 meters of cloth. When this is happened we got money value of all goods & services.

The word 'final' produce needs explanation only final goods are to be taken in to account. Intermediate goods are not suppose to use to compute national product to avoid the problem of multiple counting. Thus, the final goods approach to national income adds up the total money value of all final goods and services produced.

We can also adopt value added method which is considered as alternative method. In this method we add up all the values at each stage of production. It measures each firms own contribution to value added. Each firms value added is the value of its out put minus the value of inputs that it purchases from other firms. Thus value added=firms revenue-costs of intermediate goods. In brief value added is increase in the value of goods as a result of the production process.

The point may be clarified further with the help of an example as given here under.

Table

S.No	Production stages	Firm	Sales receipts	Cost of intermediate goods	Value added (Net Income)
	1	2	3	4	5. =3-4
1	WHEAT	FARMER	500	0	500
2	FLOUR	FLOUR MILL	800	500	300
3	BREAD	BAKER	1100	800	300
4	TRADING	MARCHANT	1300	1100	200
Total Value Added 1300					

In the table above we have assumed a simplified model of an economy, producing only a single final product, bread. There are four stages of production first, a farmer cultivates wheat and sells it at Rs 500. this Rs 500 is the value added to the economy's output. Let us assume that this wheat is purchased by the floor mill to make floor. The mill sells the floor to the baker and gets Rs 800 so net income Rs800-Rs500=Rs300. Thus, in turning wheat into floor the value added is Rs300; the baker bakes a quantity of bread out of the floor and sells it to the merchant at Rs1100. in the Process the value added is RRs300. The merchant renders the trading service of creating place and time utility and thus sells the stock of bread to the final consumer at Rs1300. The net income of the merchant is Rs200, which is his profit for merchandise business- a "productive activity" activity. Obviously the sum total of value added to each stage of Production Rs500+300+300+200=1300 is the final value. Thus the value of the final product is derived by the summation of all the values added in productive process. To avoid double counting we have to consider either the value of the final product or the sum of values added. Then only we estimate GNP.

The calculation of GNP by value added method is however not popular due to its tedious procedure. Mostly the final goods method is adopted.

Precautions

While computing GNP or GDP one has to take certain precautions.

1. Avoiding double counting:

While calculating National Income one must avoid double counting since outputs of some firms are inputs of other firms. For this reason either value added of each stage of Production needs to be recorded by only final goods not intermediate goods are to be taken in to account. As intermediately goods are partly final goods which form inputs to another firms production process these are not included in national income accounting.

2. Current year production only:

Value of goods and services produced in the current year is to be taken. If we consider the value of goods and services produced in the earlier year or second hand

goods are reported into account we would then either overestimated or underestimated the value of the country's total output.

3. Self Consumption:

Agriculture products kept for self consumption by the farmers should be estimated by a guess work and calculated at the prevailing market prices,

4. Quality of the Product:

National income data do not take into account an improvement in the quality of the Product. The quality of washing Machine manufactured in 1998 has improved definitely in the current year. Same is true about cars. But these are not taken into account while calculating national product.

5. Changes in the price level must be taken:

While measuring output changes in the price levels between the years must be taken in a account. It is a regular practice to estimate nation income while reference to prices of a particular year.

6. Value of exports to be added and imports to be subtracted:

While using output method to measure national income we must taken in to account those goods and services that go out of the country and move in the country. The value of exports needs to be added like wise a county imports many goods from outside the country. Since this is being outflow the value of imports need to be subtracted from the output figures.

7. Indirect taxes to be deducted and subsidies should be added:

Indirect taxes, included in prices are to be deducted to get exact market value of the products. Similarly subsidies given by government to certain products such products should be added in calculating the product.

8. Rent value should be included:

Imputed rent values of self occupied houses should be included in the value of output. Though these payments are not made to others their values can be easily evaluated from prevailing values in the market.

Income Method

In this method, the total of all money incomes such as wages. Salaries, rent & profits received by all persons and enterprises in the country during the year are added up. How ever transfer payments like gifts, subsidies etc are to be deducting from the total factor income. Thus National income is equal to the factor incomes minus transfer payments. In regular practice income figures are obtainable mostly from income-tax returns account books. Published accounts & reports.

This method is also called the factor cost method the National income of a country at factor cost, is equivalent to the sum of the disbursements of their factor income. To this, net income accrued from the foreign sector is added i.e., net differences between exports and imports as well as net income form abroad the following equation denoted this method.

$Y = \sum(W+R+I+N+)+(X-M)+(R-P)$

WHERE

W=WAGES

R=RENT

I=INTEREST

N=PROFITS

R= Receits from other countries, P=payments to other countries

How ever certain precautions are necessary while following this method:

1. All transfer payments such as social security benefits like unemployment allowances, personal gifts, pension charity are not to be included. The reasons in they do not represent earning from production services. Similarly scholarships received by students are also transfer incomes and hence should not be included. In addition to the above, earnings from gambling, Lottery prize-wining etc are also transfer incomes. So these are to be excluded.

2. All unpaid services (like services of house wife) are not to be included. Thus only those services for which payment are made should be included.

3. Financial investments, such as equity shares etc and sales of property (land etc) are to be excluded, as they do not come under the real national income. Thus all capital gains and losses which are related to wealth, but not real income should be excluded.

4. Government subsidies should be deducted from profits of the subsidized industries.

5. Direct Tax revenue to the government should be subtracted from total income as it is only transfer income.

6. We have to add undistributed profits of companies income from government property and profits from public enterprises.

7. In case of self owned inputs such as owners own capital and labour required to produce goods may create problem while calculating national income. Even if no money is paid for these items an imputed value is assigned to each of all these and included in national income.

8. The voluntary work done by NGOs and social institutions are not counted in national income statistics. These institutions expanded their activities phenomenally. For example environment related or health related voluntary organizations are doing remarkable jobs. Constitutions from these organizations are ignored, this leads to under reporting of the value of output produced in a country.

Expenditure Method

We can derive National income by adding up all expenditures made on goods and services during a year. People may spent their income either on consumer goods or capital goods. Again expenditure incurred by private individuals and households or by government and business enterprises. People of foreign countries spend on goods and services which a country export to them. Similarly people of a country spend on imports of goods & services from other countries. We add up the following types of expenditure by households, Productive enterprises to obtain national income.

1. Expenditure on consumer goods and services by individuals & households. This is also known as final private consumption expenditure and is denoted by C.

2. Government's expenditure on goods and services to satisfy the wants of people.

3. The expenditure by productive institutions on capital goods and inventories. This is called Gross domestic capital formation. (gross domestic investment) and is denoted by I.

4. The expenditure made by foreigners on goods and services of a country exported to other countries which are called exports and are denoted by X. We deduct from exports (X) the expenditure by people enterprises, government of a country on imports (M) of goods & services from other countries. In this way we have to estimate the net exports i.e., exports-imports or (X-M).

By adding above four types of expenditure to get final expenditure on gross domestic product at market prices (GDPMP) thus,

GDPMP= Private final consumption expenditure+ gross domestic capital formation + Govt's final consumption Expenditure.

$$\text{GDPMP}= \frac{+\text{Exports-Imports}}{C+I+G+(X-M)}$$

While calculating gross domestic product through expenditure method, the following precautions should be taken.

1. Expenditure on purchase of old shares and bonds from other people and from business institutions should not be included while calculating GDP through this method.

2. The expenditure on second hand goods should not be included because this don't contribute to the current year production.

3. Expenditure on intermediate goods such as wool, cotton and yarn by manufactures of garments should also be eliminated. The reason is we have to avoid double counting.

4. Expenditure on through payments by government such as old age pension, unemployment benefits should not be included. This is because no goods or productive services are produced in exchange by the recipients of these payments.

Problems While Measuring National Income

There are many problem faced by so many countries in the world in measuring national income. Broadly we can classify these problem into two heads (i) conceptual and (ii) statistical. Some of these difficulties are mentioned below.

1. **Non-monetised sector:**

While treating non-monetary transactions, the general agreement is to exclude their services in the estimated of national income for example the services of house wife's and farm output consumed at home. This however leads to certain anomalies for instance if a man employs a maid servant for household work, payment to her will appear a positive item in GNP. In a couple of days the man were to marry the maid servant she would be performing the same services as before bit without any salary payment. In this case the value of national income would go down.

2. **Income from foreign countries:**

The second problem arises in relating to the treatment of income arising out of activities of the foreign firms in a country. Now the question is should their belong to the country in which they are located or should it relate to the national income of the country of the firms? On the event the IMF view point which is generally accepted in that production and income generating from a foreign enterprise should be ascribed to the country in which production takes place. However profits earned by foreign firms are credited to the parent country.

3. The administrative functions of the government like justice, administration and deference being indirectly productive and must be included in national income. These service will be equal to the amount of wages and salaries paid by he government. There are statistical problems too. Enough care is required to avoid double counting. Otherwise there will be an exaggerated estimation of national output. Again statistical data may not be accurately available. Skill and efficiency of the statistical staff and co-operation of people at large are also equally important in calculating national income. In developing economics like India. We face so many difficulties in estimating national income.

1. A great difficulty in estimating national income in LDCs like India arises because of the estimate is made on the basis of primary data with regard to incomes and value

of goods produced. Many produces particularly small producers and trader do not maintain any accounts of their earnings and even goods produced. The reason behind this is illiteracy. In addition to this many people are reluctant to co-operate with the enumerators. So estimates of production are based on guess work. If this information is considered to be the basis of Judgment then the inferences will suffer from inaccuracy.

2. There is another important problem in estimating national income is prevalence of non-monetized transactions. In developing countries a considerable part of output is not brought to the market. In agricultural sector a major part of output is consumed at the farm itself. The statistician therefore has to face the problem of measure of value for this part of national product.

3. Occupational specialization is not completed due to under development so there is no differentiation in economic functioning. For instance agriculturists in India are not engaged in this sector round the year. Obviously they get some portion of their income from other than agricultural operations. In such a case it is difficult to identity then earnings from a particular occupation.

4. There is another difficulty in estimating national income in less developed countries. The output from both agricultural and industrial sectors is unorganized. Further these sectors are scattered in these countries. Agriculture cottage industries and indigenous banking are some of the production sectors in India are examples for the unorganized sectors. An assessment of output in the unorganized sectors requires an element of guess work which makes the data for national income unreliable.

5. There is no correct information available in relating to consumption savings and investment expenditure of either rural or urban population.

6. Finally illegal incomes are not taken into consideration to measure national income. Accounts in other words. Illegal economic activities, or agencies are not reported to government authority to pay taxes are left out from the preview of national income statistics. This is called black money or unaccounted money. Illegal forms economic activities such as gambling, and smuggling prevailing in some corners of the country. They do their activities by given bribes to the authorities. These income are not

reported national income accounts, the reason is these are illegal incomes. In India the black money occupied around the third of GDP. Such type of transactions under estimate the true value of goods & services in a country.

Importance of National Income

Even though there are so many problems faced by statisticians while calculating national income in all countries, there are estimating national income every year. The reason is these countries are getting advantages by using nation income estimations.

1. Economic growth of any country is measured by its growth of national and percapita incomes. Hence we understand that national income is the yard stick of measuring the growth performance of any economy. Further by reading the national income accounts one gains clear knowledge about the working of the economy.

2. We can understand the performance of different sectors viz agriculture, industry & teritiary in the economy.

3. The national income estimates in relating to percapita income, the rate of saving and capital are very important for preparing economic plans in the country.

4. It is very important instrument for farming economic policies such as agricultural policy, wage policy, industrial policy, foreign trade policy etc.

5. Study of national income is useful in making budgetary allocations to different public sector units.

6. By seeing precipitate income we can estimate the standard of living of the people in the country. In edition to this the percapita income is useful to estimate human development index.

7. The national income statistics helps us to compare economic growth with other countries. Hence we can understand where India stands for.

8. It is essential to calculate percapita income to identity the regional inequalities among different regions.

9. By observing national income at factor cost i.e., earning through rent, wages, interest & profits we can see the income inequalities among different sectors of the people in the society.

10. It also enable us to know the role and performance of public and private sectors in the economy.

11. It is also useful to formulate fiscal policy to reduce inequality and to monetary policy to control inflationary tendencies.

12. It explains how allocation of resources is made to different sectors of production activity.

13. National income trend clearly reveals the basic changes in the country's economy in the past and suggest trends for the future.

14. In short all allied problems of poverty, inequality, unemployment, performance of the plan, plan of growth and economic development, achievement of economic welfare etc are studied and estimated with the help of national income analysis.

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INCOME AND EMPLOYMENT THEORY CLASSICAL THEORY OF EMPLOYMENT

AIMS AND OBJECTIVES:

After completing this lesson, you will be able to learn the following.
*   What is meant by unemployment and different kinds of unemployment.
*   Full Employment
*   Say's Law of Markets
*   Classical Theory of Employment
*   Shortcomings in Classical Theory

Structure

3.1 INTRODUCTION

There is close relationship between national product and general employment. In short run, employment level changes according to the changes in the national product classical economists put forth their opinions relating to income, and output and employment. They expressed that there is positive relationship between quantity of labour and national product.

Economists such as Adam Smith, David Ricardo, Mathues, J.B. Say, A.C. Pigou are considered as classical economists by Keynes. These classical economists always assumed a state of full employment. They believed that less than full employment is an abnormal situation. As such, they have not propounded a separate theory for employment. However, the classical theory of employment is a collection of the opinions of classical economists on employment.

3.2 DIFFERENT KINDS OF UNEMPLOYMENT

Unemployments are different kinds. The following are the various kinds of unemployments.

A) **VOLUNTARY UNEMPLOYMENT :** A worker is said to be voluntarily unemployed when he refuses to work at the current wage rate or one refuses to work at all. For example, a worker who goes on strike demanding higher wages was considered by Classicals to be voluntarily unemployed, for he can be employed if he is just prepared to accept the current wage rate. Similarily, voluntary unemployment exists when the potential workers are unwilling to accept less wages; they include persons who have enough to depend upon the income derived from the large property which they happen to possess.

B) **INVOLUNTARY UNEMPLOYMENT :** A worker is said to be involuntary unemployment when he is not able to get employment even he ready to work into the existing wage rate.

C) **FRICTIONAL UNEMPLOYMENT :** Frictional unemployment exists because the workers do not possess the necessary skills or are located in the wrong places or unsuitable jobs. Frictional unemployment is caused on account of the immobility of labour, seasonal nature of work, temporary shortages of raw materials, breakdowns of machinery, ignorance about job opportunities etc.,

D) **TECHNICAL UNEMPLOYMENT :** Technological unemployment is the result of changes in the techniques of prdouction. This type of unemployment is caused when machines replace men.

E) **SEASONAL UNEMPLOYMENT :** Seasonal unemployment arises in a particular industry through seasonal variations in its activity brought about by climatic conditions or by changes in fashions. This is the simplest and most obvious type. The effects of the weather and of customary buying patterns are implicit. Many consider it to be a kind of frictional unemployment. The dimenssions of seasonal unemployment, despite its apparent simplicity are by no means clear.

F) **STRUCTUAL UNEMPLOYMENT :** Structural unemployment is said to exist when large number of persons are unemployed or underemployed not because they want to remain idle or underworked, but because the co-operant factors of production to engage them fully are not sufficiently available. There may be scarcity of land, capital, or skill in the national economy causing structural disequilibrium (unemployment) in the labour sector. This type of unemployment, while commonly recognized, is one of the most difficult to define clearly and consistently.

3.3 DEFINITION :

It is rather difficult to give a precise and yet generally acceptable definition of full employment; It is a concept of which has often been misunderstood and requires explanation. Prof. Gardner Ackley calls it "slippery concept" for it does not mean zero unemployment. American Economic Association Committee defines full employment as follows :

"Full employment means that qualified people who seek jobs at prevailing wage rates can find them in productive activities without considerable delay. It means full-time jobs for people who want to work full time... it does not mean that unemployment is ever zero". In a dynamic economy in which new industries are developing and old ones are declining, there is bound to be a high degree of labour mobility and transitional unemployment. Even with an excess demand for labour some workers are idle for seasonal reasons, some workers having

lost a job have not yet moved to fill avacncy, new entrants in the labour force need some time to settle down, some workers cannot hold a steady job on account of mental, physical, and emotional handicaps. Thus, full employment is a concept which is compatible with a certain amount of unemployment.

In short, full employment is a situation when there is no involuntary unemployment, through there may be frictional, structural or voluntary unemployment.

3.4 CLASSICAL THEORY OF EMPLOYMENT :

According to classicals the normal situtation in any economy is stable equilibrium at full employment. As this theory was enuntiated by classical economists. This theory was called classical theory. The following are various, assumptions that keeps the economy at full employment level. The following discussion gives at broad idea of classical theory.

ASSUMPTIONS :

The classical theory is based, more or less, on the following assumptions.
(i)   That the free enterprise system based on price mechanism provides a place for growing population and an increase in capital.
(ii)   In an expanding economy new firms and workers find their way into the productive process, not by displacing others but by offering their own products in exchange.
(iii) The extent of the market is not limited i.e., incapable of expansion. The extent of the market is as big as the volume of products offered in exchange.
(iv)   No necessity on the part of the government to intervene in business matters so that the attainment of automatic adjustment is facilitated.
(v)   Flexibility of interest rates and wage rates and long period were considered essential for its succesful working.
(vi)   Perfect competition exists in the economy.
(vii) Classicals assumed that savings will always equal to investment.

3.5 SAY'S LAW OF MARKETS

Say's law of markets, named after the French economist, J.B. Say (1767 - 1832) can be readily summarised as "supply creates its own demand". The obvious implication of Say's law is that any increment in output (supply) will by itself generate an equivalent increase in income and in spending (demand). Thus income and output will always be at a 'full employment' level. If they are somehow at a lower level, implying that some resources are unwillingly idle or 'umemployed', additional production will immediately take place and this will generate an equivalent amoutn of additional income which will all be spent in turn, on the purchase of the added product. Moreover, since no one will be content with less than 'full employment', it becomes obvious that additional production will always be undertaken until the 'full employment' level is actually reached.

The basic argument underlying Say's law can be expressed in greater detail in the following way – people work not for the sake of doing work but only to obtain goods and services that give them the required satisfaction. In an economy characterized by the division of labour and exchange, one does not obtain most of these goods and services directly by producing all of them with one's efforts. Instead everyone generally produces only those goods in which his efficiency is relatively the greatest and exchanges the surplus that remains after his own use for the products of others. The very act of production, therefore, constitutes the demand for other goods - a demand equivalent to the value of the surplus goods each man

produces. Under these conditions it is evident that there can never be a general overproduction of goods and hence the aggregate demand must in some sense equal the aggregate supply. Total output may suffer because at some point, an individual may prefer to sacrifice material benefits for leisure, but such 'unemployment' will be 'voluntary' rather than 'involuntary'.

The essence of the argument which was more explicitly put forward by David Ricardo while adopting Say's law is that if all individual supplies and demands are exactly balanced, demand and supply in the aggregate must also necessarily balance. However, it may be noted that Ricardo's formulation of Say's law quite explicity admits that temporary imbalances in specific lines of production might arise because individuals may not correctly direct their production in accordance with the wants of others. Thus for instance, we may have situations where a man producing wooden chairs might produce more than people want to buy at the price (in terms of other goods) he had assumed would exist when he brought the product to the market. As a result the surplus wooden chairs would buy fewer potatoes and less milk than he had anticipated. His adjustment to this would involve either a decision in favour of more leisure or a decision to produce some other product, more in demand. But this is merely the temporary maladjustment of relative outputs which the market will promptly correct.

The maladjustment of relative output is viewed as an essentially short-term 'temporary' phenomenon because it is felt that a supply in excess of demand of one commodity is more or less exactly balanced by a supply below demand of another commodity. This, in turn implies that at the aggregate level there is no overproduction or a 'general glut of commodities'. Moreover, in the long run the market mechanism would tend to correct whatever internal imbalances exist in the short run in some sectors of the economy.

It is significant to note htere that although the basic argument of Say's law was framed in terms of a barter economy, Ricardo and his followers extended its application to the case fo the money using capitalist economy without making any modifications. The cllassical economists assumed that the law also held true for an economy using money, perhaps because they believed that apart from the 'occasional accentric miser', people do not desire money for its own sake. This implied that if they sold their output or services for money, the money so earned would in turn be promptly spent for other goods. In other words they regarded money as merely a convenient medium of exchange, introduced primarily with a view to avoiding the awkwardness and inconvenience of barter, and nothing more.

It follows from the above discussion that according to the classical economists, under conditions of general equilibrium the economy operates at the full employment level of output. To understand the theoretical foundation of this important result it is necessary to examine the macro-economic system implicit in the writings of the classical economists.

3.6 THE CLASSICAL SYSTEM

The classical economists held the view that the economy consists of three markets : for labour, goods and money. It was argued that the operation of the forces of supply and demand in each of these markets would finally result in full employment. The classical system can be represented by the following set of equations:

$$y = f(N) \quad \text{----------} \quad (1)$$

$$\frac{dy}{dN} = \frac{W}{P} \quad \text{----------} \quad (2)$$

$$N^D = f^4\left(\frac{W}{P}\right) \quad \text{----------} \quad (3)$$

$$N^3 = f^3\left(\frac{W}{P}\right) \quad \text{----------} \quad (4)$$

$$N^D = N^S \quad \text{----------} \quad (5)$$

$$M = kpy \quad \text{----------} \quad (6)$$

where y = real output
N = employment
W = money wage rate
P= general price level
M = quantity of money
k = fraction of income that is deemed to be held in cash balances.

Equation (1) is the aggregate production function of the economy relating output to employment. Output increases with an increase in employment. However, the rate of increase in output decreases as employment increases because of the operation of the law of diminishing returns. Equation (2) expresses the profit maximisation condition which states that under a competitive system real wages equal the marginal product of labour. Equation (3) treats the demand for labour as a function fo the real wage rate. More and more employment is offered only as the real wage rate is lowered. This is so because the marginal product of labour decreases as output increases with the increase in employment. The demand function for labour is the slope of the production function embodied in Equation (1). Equation (4) treats the supply of labour as an increasing function of the real wage rate because the marginal disutility of work rises as the amount of work done increases. Equation (5) specifies the equilibrium condition for the labour market. Equation (6) represents the quantity theor of money. The total quantity of money is treated as a constant proportion of money income.

GENERAL EQUILIBRIUM
It is easy to see how these equations constitute a self-contained system. Equations (3), (4) and (5) determine the equilibrium quantity of labour employed and the corresponding equilibrium level of real wage rate.

Once the equilibrium level of employment is known, we can derive from Equation (1) the total output that will be produced at that level of employment. It is obvious that the output level so determined represents the full employment level of output consistent with the given equilibrium level of real wage rate. From Equation (6), given the quantity of money we can find out the amount of money income that would correspond to the full employment level of output. Since the real income or the full employment level of output is already known, the level of price can be obtained easily from the same equation.

The downward sloping demand curve for labour is derived from the prodcution function. The supply curve for labour is upward sloping in relation to the real wage rate. Diagram (b) shows the production function depicting the relationship between employment and output. In diagram (c) the relationship between the quantity of money and the money

income is represented. The line kpy, shows the level of money income, which each possible quantity of money can support. The slope of the line is 1/k.

The intersection of the demand curve and the supply curve for labour determines the equilibrium quntity of employment, which is shown as in diagram (a). From diagram (b) it can be seen that at an employment of the real output is . Diagram (c) shows that at , which is the given stock of money, the money income that can by supported is P.. Since is known from diagram (b), can be derived.

The classical system also comprises another segment in which investment and savings are treated as functions of the interest rate. The following three equations constitute this segment:

$$S = S(r) \qquad (7)$$
$$I = I(r) \qquad (8)$$
$$S = I \qquad (9)$$

Equation (7) expresses savings as an increasing function of the interest rate, given the full employment level of output. Equation (8) expresses investment as a decreasing function of the interest rate. Both S and I are defined in real terms. Equation (9) represents the equilibrium condition in the capital market.

In Fig. 22.2 the upward sloping saving function depicts the direct relationship between the amount of saving and the rate of interest, and the downward sloping investment function depcits the inverse relationship between the amount of investment and the rate of interest. Since the equilibrium level of output is already determined at the full employment level through the earlier system of equations, the saving function shows the amount of saving out of the full employment level of income that will correspond to alternative rates of interest. The intersection of the saving and investment on the one hand and the equilibrium rate of interest on the other.

It is evident from the above discussion that the determination of the equilibrium level of saving and investment in the classical system is not in any way linked with the determination of total output, employment and price level. The earlier system of equations, (1) to (6) can be solved independently of the ohter system of equations, (7) to (9). Thus the latter system only determines the distribution of total output between investment goods and consumption goods.

In the entire classical analysis the labour market plays a crucial role. It is assumed that wages are flexible and that the wage rate will rise only if there is an excess demand for labour. The analysis fails tot ake into account the institutional rigidities in lowering the wage rate. In addition, another serious weakness of the system is that it fails to incorporate the impact of a reduction in the wage rate on the demand for labour. Wage is not only an element in the cost of production but also an element in income. If a cut in wage rate causes the aggregate demand to fall proportionately, employment may not change.

3.7 CLASSICAL EMPLOYMENT THEORY - KEYNES' ATTACK

The classical theory of employment is no more easily accepted because few people really believe that there is any automatic tendency for the economic system to be in equilibrium at full employment level. The classical theory, as such, collapsed on account of great 1930 depression, economists confirmed the classical theory and its conclusion that full employment was a normal condition but after thirties till the beginning of forties, for ten long

years, serious and prolonged unemployment became the normal condition of the economy, thereby giving a rude shock to the classical belief and the theory proved incapable of coping with the situation and an alternate theory developed by Keynes became more acceptable.

1. **Money Wages No Way to Reduce Real Wages :** According to Keynes we cannot reduce real wages by reducing money wages, however hard we may try, as this would lead to a reduction in aggregate demand prices and profits. Moreover, workers are under what Keynes calls "Money Illusion", i.e., they are very sensitive to changes in money wages and are more concerned with given money wages than with given real wages. Keynes rejected the classical theory of unemployment, which, in his view, asserted that (1) wage bargains between workers and employers determine real wages, and (2) the level of (real) wages thus arrived at determines the amount of employment. He agreed-basically on the assumption of diminishing returns - that an increase in employment can only occur to the accompaniment of a decline in the rate of real wages. His basic difference with the classical theory lay rather in his argument that there was no expedient which later as a whole can reduce its real wage to a given figure by making revised money bargains with the entrepreneurs.

2. **No Full Employment (Underemployment Equilibrium):** According to Keynes, the tacit assumption of full employment by the classicals is not wholly warranted by actual facts, as there always exists some unemployment in the economy based upon the philosophy of laissez faire capitalism Booms and depressions are common features of capitalist economies and investments are not only inadequate but also often fluctuate. In such economics less than full employment is the rule, and full employment equilibrium only an exception. Thus, Keynes felt that underemployment equilibrium (equilibrium at less than full employment) is the normal situation in such economies.
The classical assumption of full employment in the economy is based on Say's Law of Markets, according to which whatever is produced is automatically consumed. Keynes, however, held that level of employment at a time is determined by effective demand.

3. **Say's Law Ineffective:** Say's Law of Markets, which was the core of classical theory became the subject matter of special attack from Keynes. Keynes particularly condemned Say's Law for its exhortation that 'supply' creates its own demand and that there is no general overproduction and unemployment. According to Keynes, income is not automatically spent at a rate which will keep all the factors of production employed. Unemployment, according to Keynes, is on account of the failure to spend current income on consumption and investment goods. In a free enterprise economy, Keynes states that supply does not automatically create enough demand within the economy.

4. **Neglecting Role of Money:** Keynes linked the theory of money to general theory. Money, In Keynesian system is the link between the present and the future. Denouncing the classical theory of value and distribution as partial theory, Keynes remarked that treatises with little or no attention paid to money are not likely to be popular unless they deal with income formation also. Keynes integrated the theory of employment and money with the theory of income. He took strong exception tot he veil attitude of classical and denied that money is an illusion.

5. **Interest-Not Equilibrating Mechanism:** According to classicals rate of interest brings automatic adjustment between saving and investment at full employment

level. This is because they believed that savings depend upon the rate of interest and rise and fall with a rise and fall in the rate of interest (in other words, to them savings are highly interest-elastic and flow automatically to equal investment at full employment level). Keynes, however, challenged the assumptions of the classicals and pointed out that the functional equality between saving and investment is brought about by changes in income (rather than by the rate of interest). He, therefore, concluded that the equilibrium between S and I is reached considerably below the full employment level, called the underemployment equilibrium. According to Keynes, as long as the shapes of investment schedule, saving schedule and liquidity (demand for money) schedule are as shown further, savings will not automatically flow to equal investment at full employment level; however, flexible wages, prices and costs may be. Therefore, what we have in the economy is the underemployment equilibrium and not the full employment equilibrium.

6. **State Intervention:** Keynes also denounced the free enterprise, economy and its automatic and self-adjusting nature through the 'invisible hand and price mechanism'. Actually Keynes made a strong plea for state intervention in economic matters. As a result of the depression of the 'thirties', Keynes started doubting the basic principle of 'enlightened self-interest', on which capitalism was supposed to function. Whatever served the interest of businessmen did not serve the interest of the community. Keynes was in favour of giving relief to the unemployed people to boost up effective demand, besides advocating deficit financing and large-scale public expenditure on public works to increase employment. According to Keynes, the policy of laissez-faire capitalism might have held sway in good old days, but its weaknesses were thoroughly exposed in recent times, especially during the depression when it failed to deliver the goods and services. Keynes, therefore, favoured governmental intervention and viewed government spending, taxing and borrowing as the most important weapon against unemployment.

7. **Wages and Propensity to Consume:** Classical economists laid stress on the stimulating effects of wage-cuts on the propensity to consume. Their argument was that a general reduction in wages will result in a general reduction in prices (because marginal costs fall on account of the pressure of lower wage rates). The lower prices will increase consumption. But such an approach represents a vague attempt to apply certain principles relating to the price and demand for a particular product to the problem of total consumption. Actually, the effects of wage-cuts are likely to be more unfavourbale on the propensity to consume. It is, therefore, clear that wage cuts, by redistributing the income in favour of the groups, with lower marginal propensity to consume (and high MPS), will cause income and output, as also the employment, to decline.

8. **Liquid Assets and Pigou Effect:** Liquid assets (currency, bank deposits, government bonds and so on) and changes therein also affect the propensity to consume. Prof. Pigou argued that a general fall in prices induced by the general wage-cut will increase the real value of cash balances and other forms of saving thereby leading to a higher rate of consumption. This later relationship (between the real value of liquid assets and consumption) has come to be known as the 'Pigou Effect'. 'Pigou Effect' in brief, means that the real value of money assets rises as a result of general wage-cut and prices. The rise in the real value of money assets shifts the consumption function upwards. It is also called 'Real Value of Money Assets Effect'. But the validity of the 'Pigou Effect' has been

questioned by modern economists, partly on the ground that a large number of persons do not possess money assets and partly on the ground that those who possess such assets want to possess still more. Under such circumstances, it is highly doubtful whether propensity to consume will be raised through 'Pigou Effect'. Hence, justification of Keynes criticism of classical is done.

3.8 CONCLUSION

In the opinion of classical economists, unemployment is not at all an important problem. In their view, unemployment general over production are short run problems and the problems will automatically settled in the long run. She says Land's supply creates its own demand, Pigoue's flexible wage rates brings the economy to full employment level. But the classical economists solutions for unemployment did not solve the great depression of 1930's. Hence, Keynes enunciated a separate theory criticized the classical views and short-run problems better integrat ethe theory of money, income and output, make theory more useful in the area of public policy, be more concerned with general demand, thrift and expectations, and be less certain on the relation of wage-cutting and employment". Keynes was perfectly conscious of his debts to the early writers as well as his own contributions. Keynes himself makes pertinent remarks in the preface of the 'General Tehory', "Those who are strongly wedded to what I call the classical theory will fluctuate, I expect, between a belief that I am quite wrong and a belief that I am saying nothing new". His judgements of the typical shapes of the various functions are indeed revolutionary. No other economist had ever worked out a complete and determinate model based on the propensity to consume, marginal efficiency of capital and liquidity preference.

3.9 IMPORTANT POINTS TO BE REMEMBERED

1. The main feature of the classical theory of employment is that it denies the deficiency of aggregate demand and hence unemployment.
2. It is difficult to define full employment. It can coexist with various type of unemployment.
3. Classical economists took full employments as a situation where there is no 'involuntary unemployment'. Attainment of full employment has become the chief objective of economies.
4. There are three building blocks in the classical theory of employment. Relationship between money-wage, real-wage and employment. Total aggregate demand which is never deficient and the theory of price level in which $MV = PT$. These relationships have been shown in the classical model with and without saving and investment.
5. Classical equilibrium was always a full employment equilibrium.
6. Classicals and Keynes agreed for a reduction in real wage in order to increase employment but they differed as regards the way it was to be done.
7. A particular wage cut in a single industry or firm may increase employment there but a general wage cut does not increase employment.
8. Keynes rejected without qualification the classical plea of increase in employment through wage reduction.
9. His conclusion was that wages should be left intact and other measures should be resorted to generate full employment.

10. The classical theory of employment collapsed on account of depression and Keynes' alternate theory.

11. Keynes attacked the classical theory of employment on the grounds that real wages cannot be reduced, there is no full employment; Say's Law is ineffective, they neglect the role of money; interest rate is not equilibrating mechanism. Wage cuts, not favourable to consumption or real balances, there is state intervention etc.

12. Despite the above criticism, Keynes debts to classical economists cannot be denied, though his own contributions could be described in the nature of a revolution.

3.10 GLOSSARY:

1. Full Employment: Absence of involuntary unemployment.
2. Say's Law of Markets: Supply creates its own demand.
3. Lesseiz-faire Economy: Non-intervention of government in economic affairs.

3.11 MODEL QUESTIONS:

I. Essay Type Questions
1. Critically examine the classical theory of employment.

II. Short Essay Type Questions
1. J.B. Say's Law of Markets
2. Is wage-cuts improve the employment level ?

III. Short Questions
1. Full employment
2. Leiseiz-faire Economy.

3.12 SUGGESTED READINGS:
1. McDongal & Dernburg : Macro Economics
2. Jhingan M.L. : Advanced Economic Theory
3. Vaish M.C. : Macro Economics
4. Gupta R.D. : Keynes and Post Keynesian
5. Dewett K.K. : Modern Economic Theory

KEYNES THEORY OF INCOME AND EMPLOYMENT

AIMS AND OBJECTIVES

After completing this lesson, you will be able to understand the following :
* Keynesian view on employment
* Effective Demand
* Aggregate Supply Function
* Aggregate Supply Function
* Determination of Employment

Structure

INTRODUCTION

The publication of J.M. Keynes *The General Theory of Employment, Interest and Money,* in 1936 is usually referred to as the *The General Theory* in economic literature.

Keynes in his book "*The General Theory of Employment, Interest and Money"* contrast his theory of employment with that of classical economists. He argued that the postulates of the classical theory are applicable to a special case of full employment only, but not to the general case of less than full employment.

Keynesian theory is "general" in terminology also. Keynesian analysis is a macro-economic one which deals with the economic system as a whole. Where as the classical theory is a micro-economic one relating primarily to the individual economic entities in the system. In his theory, Keynes refers to concepts such as demand, consumption, investment, saving, employment, income and output in the aggregate sense or as pertaining to economic system as a whole.

4.2 EFFECTIVE DEMAND

The logical starting point of Keynesian Theory of Employment is the principle of effective demand. According to Keynes, the level of income and output in an economy is determined by the level of employment (that is, the employment of workers along with the exploitation of other given resources, such as land, and capital) which, in turn, is determined by the level of effective demand.

ASSUMPTIONS

Keynesian theory of employment based on the following assumptions :

Firstly, the Keynesian theory concentrates on the short-period only. In the long run, Keynes said, "we are all dead." He assumed that during this short period, the techniques of production and the quantity of fixed capital remained constant. This was an important assumption with him and it considerably simplified his analysis. As a result of this assumption, employment became *proportional* to output (or, income).

Secondly, the Keynesian theory proceeds throughout on the assumption that there is perfect competition in the market or at least there is no change in the degree of monopoly in the market.

Thirdly, the Keynesian theory assumed the operation of the law of diminishing returns or increasing costs in production. This assumption had become essential for him in view of the earlier assumption of unchanging techniques in industry.

Fourthly the Keynesian theory is based on the assumption of a closed economy. In other words, Keynes did not take into account the effects of foreign trade on the volume of employment created within the economy.

Fifthly, the Keynesian theory deals exclusively with the aggregative, and not the relative concepts, such as relative wages and prices.

It would not be correct to say that Keynes was very rigid with these assumptions. But these assumptions do underline a major portion of his analysis.

In a money economy, effective demand is revealed by the total expenditure incurred by the people on real goods and services, meant for both consumption and investment. The flow of expenditure, in turn, determines the flow of income, as one man's expenditure becomes another man's income in the economic system. It thus follows that : Total Expenditure = Total Income.

23.3 DETERMINANTS OF EFFECTIVE DEMAND

According to Keynes the level of effective demand in an economy is determined by the interaction of the aggregate supply function and the aggregate demand function. These two are determinants of effective demand. Now we will learn about these two determinants.

4.4 AGGREGATE SUPPLY FUNCTION

The supply price for any given quantity of a commodity refers to that price at which the seller is willing to or is induced to supply a given amount in the market. Hence, the supply schedule of a commodity shows the varying levels of quantities of the commodity the seller offers for sale at alternative prices. Similarly, the aggregate supply schedule for the economy, as a whole, refers to the total supply of output of all entrepreneurs in the economy. Keynes measured the total output of the economy in terms of the amount of labour employed with a given marginal productivity. He therefore concluded that the level of output varies with the level of employment. Obviously, each level of employment leads to a corresponding level of output of commodities, that is, real income along with the money income generated in the process of investment expenditure.

Each level of employment (of labour) necessitates the use of certain quantities of other factors of production, such as land, capital, raw materials, to assist the labour employed. All

these factors of production are to be paid according to the prevailing factor prices, which is known as the cost of production. Each level of employment involves certain money costs (including profits). Every prudent entrepreneur must at least seek to recover the total cost of production, including normal profit. The entrepreneurs must get some minimum amount of sales revenue to cover the total costs incurred at a given level of employment. Only if the sales proceeds are high enough to cover the total costs of production, at a given level of employment and output, the entrepreneur will be induced to provide that particular level of employment.

This minimum price of revenue – proceeds entrepreneurs must get from the sale of output, associated with different levels of employment – is defined as the aggregate supply price schedule or the aggregate supply function. Thus the aggregate supply function refers to a schedule of the various minimum amounts of proceeds, or revenues which must be expected to be received by the entrepreneurs from the sale of output, corresponding to various levels of employment.

By using employment as the single measure of total output of the economy, the supply price of employment can be determined in terms of labour cost. We may illustrate the Keynesian aggregate supply function, hypothetically, in Table 23.1.

Table – 4.1
AGGREGATE SUPPLY FUNCTION

Level of Employment (in lakhs of workers)	Money wages (per annum in 1,000)	Aggregate supply Price (ASF) (in crores of Rs.)
(N)	(W)	(N x W)
1	10	100
2	10	200
3	10	300
4	10	400
5	10	500
6	10	600

As the flow of expenditure varies, the level of income also varies accordingly. That is to say, if the total expenditure flow in an economy increase, the flow of income will also increase in the same proportion. And, if the aggregate expenditure flow decreases, income flow will also decrease.

In Table 4.1 it is assumed that on an average the amount of money wages, to be paid per year, is Rs. 10,000. Thus, the schedule shows for each alternative level of employment how much minimum sales proceeds must be realized by the entrepreneurial class to undertake the level of employment. It can be seen that to employ one lakh workers for a year, entrepreneurs should expect to get a minimum of Rs. 100 crores from the economy, by selling the output produced. Similarly for two laksh workers to be employed, the minimum expectation of sales proceeds is Rs. 200 crores, and so on.
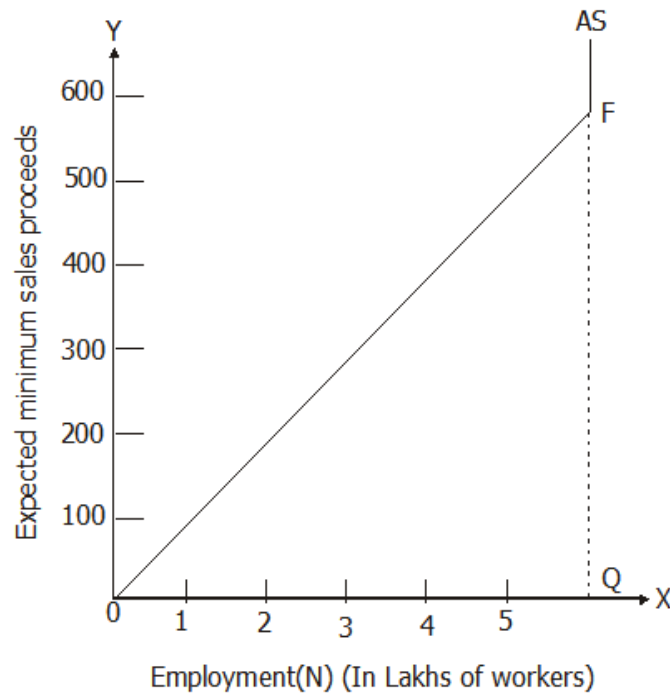
Graphical Presentation : The AS curve in Fig. 23.1 graphically represents the data given in Table 4.1.

economy, households and firms are the two major economic sectors, which spend on consumption and investment. What these sectors are expected to spend in the next period is viewed as aggregate demand price – the expectation of sales revenue – for the given level of output and employment by the entrepreneurs. In two sector economy aggregate demand covers consumption (C) and investment (I).

AD = C + I

A more simplified presentation of the aggregate demand function is illustrated in Table 4.2.

Table – 4.2
AGGREGATE DEMAND FUNCTION (SCHEDULE)

Level of Employment (N) (in lakhs of workers)	Expected Maximum Sales Proceeds (expected total expenditure) (AD) (in crores of Rs.)
1	175
2	250
3	325
4	400
5	475
6	550

The aggregate demand schedule (AD) links real income or output (which Keynes measured in terms of the quantity of employment) and expenditure flow in the economy as a whole. Evidently, the aggregate demand schedule shows the aggregate demand price for each possible level of employment.
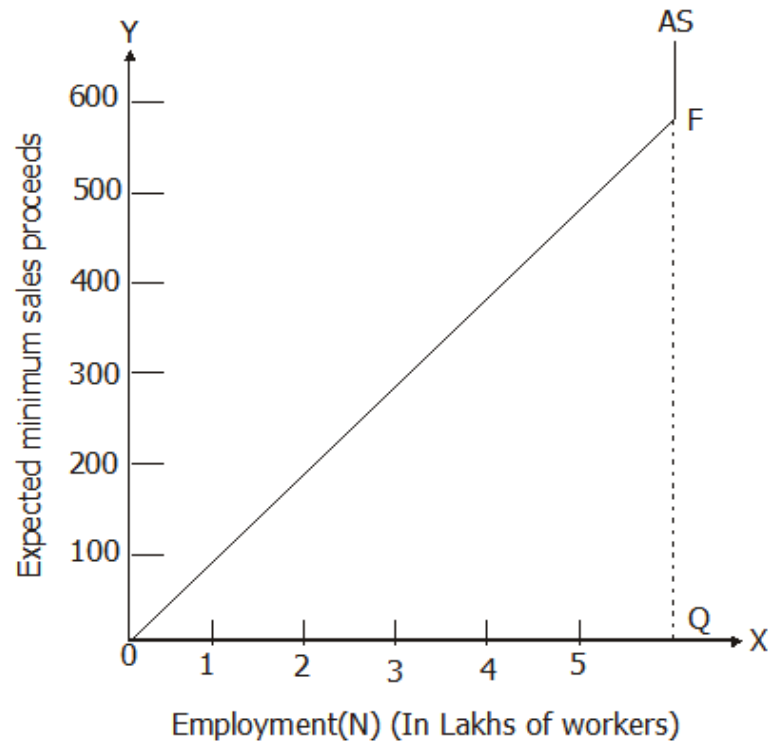
Graphical Presentation : The aggregate demand function is represented graphically in Fig. 4.2.

In Fig. 4.2 the curve AD represents the aggregate demand schedule. It shows that aggregate demand price is a direct or increasing function of the volume of employment. In symbolic terms
$$AD = f(N)$$
Where

    AD = expected sales receipts by entrepreneurs
        N = the Volume of employment, and
        f = the functional relationship

The AD curve drawn in Fig. 4.2 (a) is linear. It can be non-linear too, as in Fig. 4.2 (b). Its shape and slope depend upon the assumptions and nature of data relating to the aggregate only. As pointed out earlier a statement showing the varying levels of aggregate demand prices, that is, expected sales revenue by the entrepreneurs for the output, associated with different levels of employment is called the aggregate demand price schedule or the aggregate demand function.

(a)

(b)
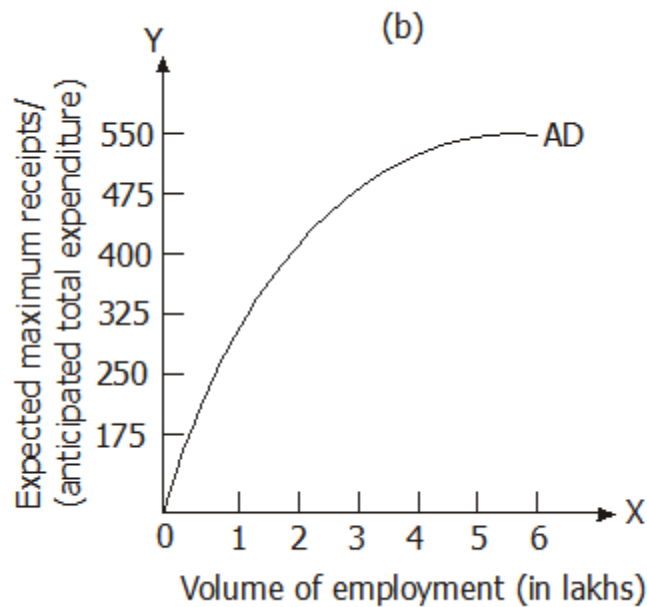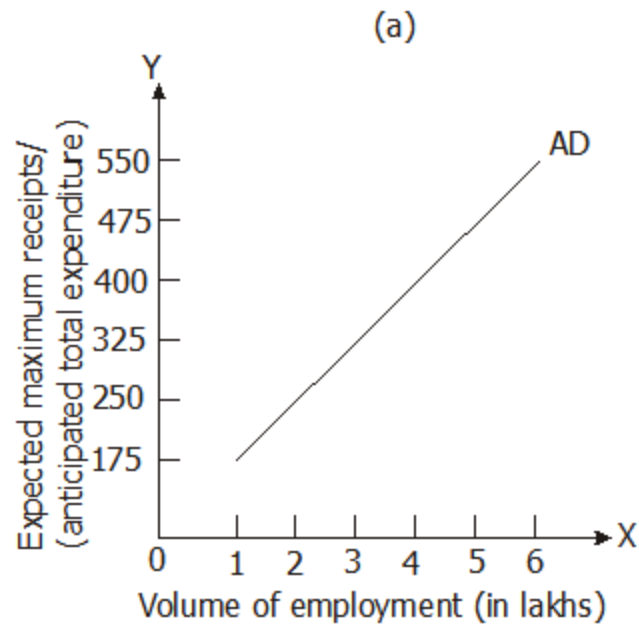
4.6 EQUILIBRIUM OF THE ECONOMY

The intersection of the aggregate demand function with the aggregate supply function determines the level of income and employment. The aggregate supply schedule represents costs involved a each possible level of employment. The aggregate demand schedule represents expectation of maximum receipts of the entrepreneurs at each possible level of employment. Therefore, so long as receipts exceed costs, the level of employment will go on increasing. The process will continue till receipts become equal to cost. When costs exceed receipts, the

employment level will tend to decrease. This is what we can observe by comparing the two functions as represented in Table 4.3.
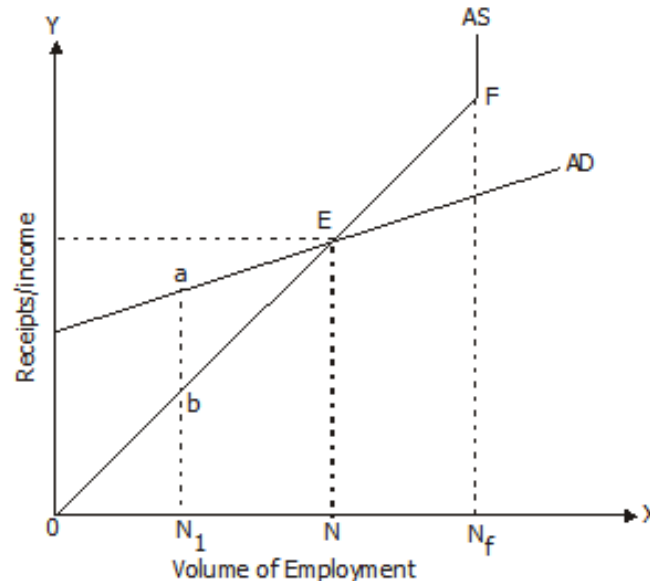
So long as the aggregate demand price (AD) is greater than the aggregate supply price (AS), the level of employment tends to increase. The economy reaches equilibrium level of employment when the aggregate demand function becomes equal to the aggregate supply function. At this point, the amount of sales process which entrepreneurs expect to receive is equal to what they must receive in order to meet their total costs. In table 4.3, it is Rs. 400 crores which is the entrepreneurs' expected minimum, as well as maximum sales proceeds – this is the point of effective demand. Equilibrium is reached where four lakh workers are employed – this is the point of effective demand.

Graphical Presentation. In Fig. 4.3, the point of effective demand and the equilibrium of the economy, can be represented in graphical terms.

Table – 4.3
Equilibrium Level of Employment

Employment (in lakhs) of workers) (N)	Aggregate Supply Price (in crores of Rs.) (AS)	Aggregate Demand Price (in crores of Rs.) (AD)	Comparison	Direction of Change in Employment (DN)
1	100	175	AD > AS	Increase
2	200	250	AD > AS	Increase
3	300	325	AD > AS	Increase
4	400	400	AD = AS	Equilibrium
5	500	475	AD < AS	Decrease
6	600	550	AD < AS	Decrease

The two curves AD and AS intersect at the point E, which is the point of effective demand. In fact, the value OR, that is, the sales proceeds which entrepreneurs expect to receive at the point where the aggregate demand function intersects the aggregate demand function intersects the aggregate supply function is called the point of effective demand because it is at this point that the entrepreneurs' expectation of profits will be maximised. When aggregate demand prices are equal to aggregate supply prices, the entrepreneurs will earn the highest normal profits as their sale proceeds equal their total costs at this point. It goes without saying that so long as the aggregate demand function lies above the aggregate supply function, that is AD > AS, indicating that costs remain less than the revenue, the entrepreneurs will be induced to provide increasing employment till both of them are equalised.

After the point of intersection of the aggregate demand function and the aggregate supply function, for a further rise in employment, aggregate supply prices become higher than aggregate demand prices – that is AS > AD – indicating that total costs exceed total revenue expected, and that the entrepreneur would incur losses and refuse to employ that particular number of workers. Diagrammatically, only ON number of men will be employed where the aggregate demand function (AD) equals the aggregate supply function (AS). ON_1 number of workers still provide some possibility of maximising profits by increasing the employment further, since AD < AS by ab, whereas any number of men exceeding ON, cannot be employed because, in that case AS would exceed AD – which would mean losses for the entrepreneurs. It is only at point E, where AD = AS and normal profit is maximum, that the equilibrium level of employment is ON. Hence, employment in an economy increases till AD = AS.

The point of effective demand E, is called the point of equilibrium which determines the actual level of employment and output. Though E is the point of equilibrium, it does not imply that the economy has reached full employment at this point. According to Keynes, the equilibrium between the aggregate demand function and the aggregate supply function can, and often does, take place at a point of less-than-full employment. At full-employment level, AD = AS only if investment spending is sufficient to fill the gap emerging between income and consumption. This is not usually the case. More often induced investment outlay is insufficient to fill the gap between income and consumption, with the result that AD = AS at less-than-full employment. This is what is referred to as the point of underemployment equilibrium in a economy.

Of these two determinants of the level of effective demand, Keynes, however, assumes aggregate supply function as given in the short run. Thus, he speaks little about the aggregate supply function.

23.7 A SUMMARY OF KEYNESIAN THEORY

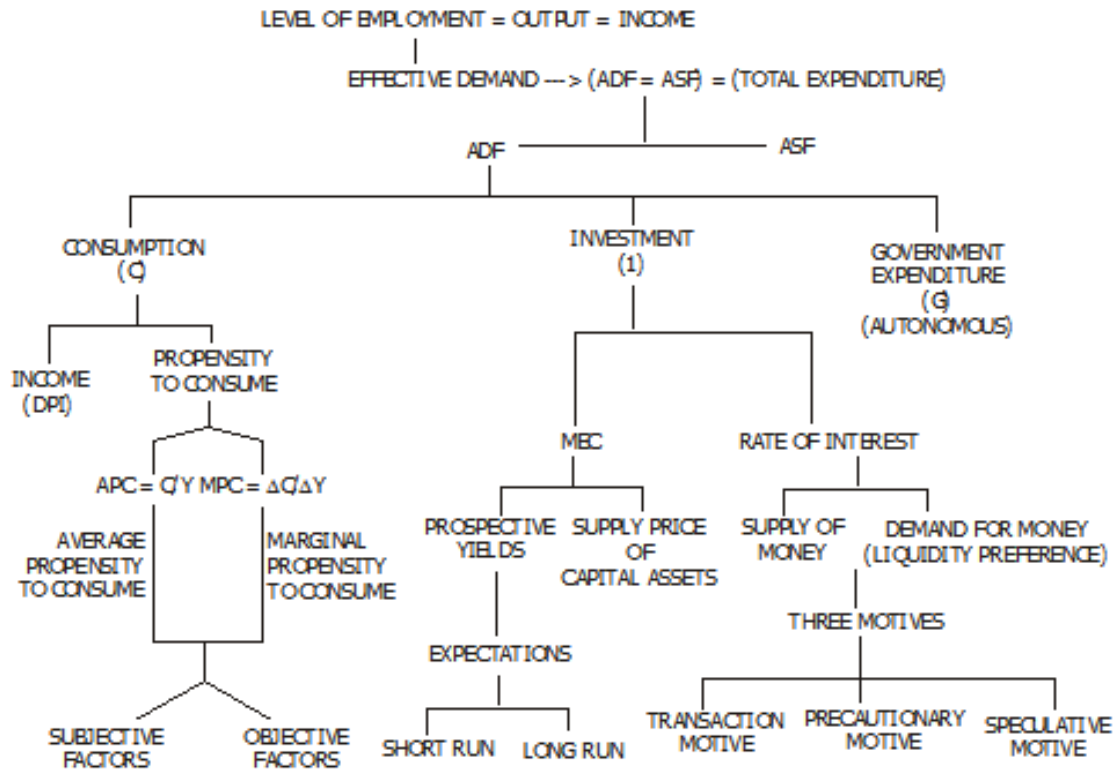The summary of the Keynesian Theory is presented in Fig. 4.4.

LEVEL OF EMPLOYMENT = OUTPUT = INCOME

EFFECTIVE DEMAND ---> (ADF = ASF) = (TOTAL EXPENDITURE)

ADF ———————————— ASF

CONSUMPTION (C)

INVESTMENT (1)

GOVERNMENT EXPENDITURE (G) (AUTONOMOUS)

INCOME (DPI)

PROPENSITY TO CONSUME

MEC

RATE OF INTEREST

$APC = C/Y$ $MPC = \Delta C/\Delta Y$

AVERAGE PROPENSITY TO CONSUME

MARGINAL PROPENSITY TO CONSUME

PROSPECTIVE YIELDS

SUPPLY PRICE OF CAPITAL ASSETS

SUPPLY OF MONEY

DEMAND FOR MONEY (LIQUIDITY PREFERENCE)

THREE MOTIVES

EXPECTATIONS

SUBJECTIVE FACTORS

OBJECTIVE FACTORS

SHORT RUN   LONG RUN

TRANSACTION MOTIVE

PRECAUTIONARY MOTIVE

SPECULATIVE MOTIVE

Fig. 4.4 Outline of the Keynesian Theory of Income and Employment.

Fig. 4.4 Outline of the Keynesian Theory of Income and Employment.

4.8 SUMMARY

The classical economists believed that the operation of the market forces would automatically result in full employment. However, the recurrence of business cycles and more particularly the depression of the 1930s destroyed the belief in automatic adjustment. The modern theory of income determination largely developed by Keynes concentrates on aggregate demand as the key to understanding the behaviour of an economy. Effective demand must be kept at a high level of income. Keynes, therefore, focussed on the two important components of aggregate demand : consumption and investment, and tried to explain the factors influencing these variables. He linked these variables with those in the monetary sector and thus presented a complete model of an economy. Given the consumption function and a level of investment, the appropriate level of income in an economy can be determined. The equilibrium income may be defined as that income where the total consumption expenditures and the investment expenditures will be equal to the aggregate output.

.9 POINTS TO BE REMEMBERED

1. Effective Demand = Total Output = Total Income = Employment. The effective demand naturally results in output. Output creates income and also provide employment. All these four quantities are equal to each other. In other words, employment depends upon and originates from effective demand.

2. The effective demand is governed by A.S.F. and A.D.F. Keynes assumes A.S.F. to be given in the short-period and concentrates wholly upon A.D.F.

3. The A.D.F. in its turn, is governed by consumption expenditure, investment expenditure and government expenditure. (Let it be remembered that Keynes, in his statement of the theory, ignored Government Expenditure).

4. The Consumption Expenditure is determined by, (a) size of the income and (b) the community's propensity to consume. Since the Keynesian theory is a short-term theory the expenditure on consumption may be assumed to be stable because the propensity to consume does not change in short-run.

5. The expenditure on investment is governed by, (a) the marginal efficiency of capital, and (b) the rate of interest. Unlike consumption expenditure, it is highly unstable.

6. The marginal efficiency of capital, in its turn, is determined by, (a) the supply price of capital assets, and (b) the prospective yield from the capital assets. The M.E.C. is unstable because expectations regarding the prospective yield from capital assets are subject to the psychological factors.

7. The rate of interest is determined by (a) community's liquidity preference, and (b) supply of money. The liquidity preference is determined by three motives : (a) Transactions motive, (b) Precautionary Motive, and (c) Speculative Motive, while the supply of money is directly controlled by the banking system.

8. Finally, Government Expenditure is 'autonomous' in the sense that it does not depend, like private investment, on independent economic variables, such as, the M.E.C. or the Rate of Interest. It is governed more by political than by economic considerations.

The above summary can also serve to spotlight the action which may have to be taken to curve deflation and unemployment. The Keynesian theory furnishes a practical programme of action to fight deflation and unemployment. Since Keynes assumes Aggregate Supply Function to be given. He concentrates his entire attention upon increasing the Aggregate Demand Function.

4.10 GLOSSARY

1. **Aggregate Supply Function :** It is a schedule of the various amounts of money which the entrepreneurs in an economy must receive from the sale of output at varying levels of employment.

2. **Aggregate Demand :** It is a schedule of the various amounts of money which an entrepreneur in an economy expect from the sale of their output at varying levels of employment.

3. **Effective Demand :** It is a level of demand where the aggregate demand is equal to aggregate supply.

4. **Equilibrium Level of Employment :** The level of employment where aggregate demand is equal to aggregate supply.

5. **Equilibrium Level of Income :** Level of Income where aggregate demand is equal to aggregate supply.

4.11 MODEL QUESTIONS

I. ESSAY QUESTIONS
1. Examine the Keynesian theory of Income and Employment ?

   or

   What is meant by Effective Demand ? How it determines the income and employment ?
2. Explain the determinants that determine the equilibrium level of income and employment.

II. SHORT ESSAY QUESTIONS
1. Write a note on aggregate supply function.
2. Write a note on Aggregate Demand Function.
3. Define effective demand and its role to improve the employment.

III. SHORT QUESTIONS
1. Aggregate Demand
2. Aggregate Supply
3. Effective Demand
9. Equilibrium Level of Employment
4. Assumptions of Keynesian Theory

4.11 SUGGESTED READINGS

1.	Dillard .D	:	Economics of J.M. Keynes
2.	Thingan M.L.	:	Advanced Economic Theory
3.	Vaish M.C.	:	Macro Economics
4.	Gupta R.D.	:	Keynes – Post Keynesian Economics
5.	Dewett K.K.	:	Modern Economic Theory