

UNIT 1:
INTRODUCTION TO MANAGERIAL ECONOMICS
[20%]

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(1) Introduction

Managerial Economics is a special branch of Economics which is of recent origin and therefore attempts to define it are even more recent. In modern times with the rapid development of industry trade and commerce, the importance of business economics has considerably increased and as a result this discipline has come to occupy a very significant place in the business world. It should be noted here that the term **Managerial Economics** has been used in different connections. Some call it as **Economic Analysis for Business Decisions** 'or' Economics for '**Business Management**' or '**Managerial**', while others have preferred to call it as '**Economics of Enterprise**' or '**theory of Firm**' or **economics of Firm**. However, the most accepted term is '**Managerial Economics**' and for our purposes we shall use this term.

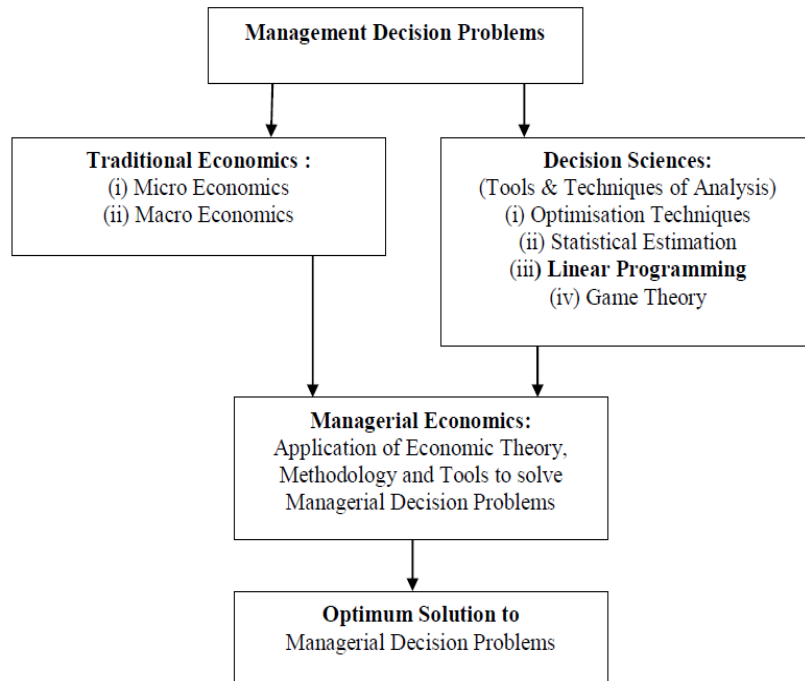
(2) Definition of Managerial Economics

- [a] According to **MC Nair and Meriam** "Managerial economics consists of the use of economic modes of thought to analyse business Situations."
- [b] In the words of **Spencer and Siegelman** "Managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision - making and forward planning by the management."
- [c] According to **Mansfield** "Managerial economics is concerned with the application of economic concepts and economic analysis to the problems of formulating rational managerial decision."
- [d] Brigham and Pappas define Managerial economics "as the application of economic theory and methodology to business administration practice."
- [e] Hague: "Managerial economics is a fundamental academic subject which seeks to understand and to analyse the problems of business decision making."

Thus, managerial economics is essentially applied economics in the field of business management. It is the economics of business or managerial decisions. It pertains to all economic aspects of managerial decision- making. Managerial economics, in particular, is the study of allocation of resources available to a business firm or organisation. It is fundamentally concerned with the 'art of economising that is, making rational choices to yield maximum return out of limited resources by making the best selection amongst the alternative courses of action.

Managerial Economics may be as principles of economics applied to problem - solving at the level of the firm. It is a fundamental academic discipline the study of which would aid and increase the executives to understand and solve the decision - making problems scientifically. The science of managerial economics is science of economic decision making. It deals economic aspects of business decisions or with those have economic content. It is a body of knowledge, techniques and practices which deals those economic concepts are useful in deciding the business strategy of a unit of management.

Managerial Economics, thus provides a link between traditional economics and the decision sciences for managerial making. It refers to the application of economic theory and decision science tools to find the optimal solution to managerial decision problems. The following chart this



(3) Subject-matter/Nature and Scope of Managerial Economics

1) Allocation of resources

The resources with a firm are scarce (rare) and have alternative uses. These have to be utilised in a most efficient and optimum manner to attain set objectives.

2) Problems of inventory control

Problems of inventory control relate to decisions about maintaining optimum levels of stock of raw materials and finished goods over a period of time. Decisions pertaining to these have to be taken in the context of demand and supply conditions.

3) Pricing problems

Another decision- making problem is the fixation of the prices of the products of the firm. These involve decisions regarding various methods of pricing to be adopted. The choice is whether prices should be related to demand or cost or both; whether to adopt 'product-line pricing' or 'marginal pricing' or 'mark-up pricing' in the fixation of prices.

4) Investment problems

Forward planning obviously involves investment problems. These relate to the problems of allocation of scarce resources, the quantum and mode of investment, sources of funds, expansion and diversification programme for the future establishing new venture or continuing with product pattern, etc.

Managerial Economics, thus, is mainly concerned with these four categories of decision-making and forward planning problems. Although there is wide area of topics which fall under Managerial Economics the following main topics will give us an area of the various types of studies and involved in Managerial Economics;

- | | |
|---------------------------------|--------------------------|
| (1) Demand analysis | (6) Marginal analysis |
| (2) Cost analysis | (7) Economic forecasting |
| (3) Pricing theory and policies | (8) Inventory problems |
| (4) Profit analysis | (9) Capital budgeting |
| (5) Break-even analysis | (10) Labour cost studies |

(4) Scope of Managerial Economics

(1) Operational issues or Internal issues

(2) Environment Issues or External Issues.

(1) Operational Issues: Operational issues are those issues which arise within the business organisation and are under control of the management.

- a) Resource Allocation:** Managerial economics like the traditional economic theory is concerned with the problem of optimum allocation of scarce resources. Business analysis is applied the problems of determining the level of output which maximises profit. In this respect, **linear programming technique** has been to solve optimisation problems. In fact linear programming is one of the most practical and powerful business decision - making tool currently available.
- b) Demand analysis and Demand forecasting:** Demand analysis plays a crucial role in business decision - making. A study of demand analysis is certainly a helpful guide to managerial executive's production and pricing deciding about '**what to produce**'? And '**how much to produce**'? Information pertaining to the nature and quantum of demand at different prices is very essential. Likewise, the demand for a product change in response to change in it's the price, price of its product substitutes or complementary goods, consumer's income, his tastes and preferences etc. These are known as demand determinants a study of which is essential for, forecasting the demand for the product as well as the present sales.
- c) Cost analysis:** A study of cost analysis is very useful for management decisions. Estimates of cost is an essential part of business decision and helps in the efficient and optimum allocation of resources. The objective of a firm is to produce a given output **at least cost** by having the optimum combination of the factors of production. Cost analysis helps in deciding about the **size of the firm, the volume of output and factor proportions**.
- d) Pricing Policies and Practices:** Pricing policy is an important sphere of Managerial Economics. The objective of a firm is **to earn maximum profits** and pricing policy is an important determinant affecting profits. In fact, the success or failure of the firm to a very large extent depends on the correctness of its pricing decisions, because price policy affects the revenue of the firm and consequently its profits.
- e) Profit Planning and Break - Even Analysis:** A business firm works for profits and in the long run profits are an important criteria to measure the success or failure of a firm. But we also know that in modern times the firm works under conditions of uncertainty - because of changes in demand and cost conditions, changes in the prices of inputs and products, changes in technology apart from political and social conditions and changes in government economic policies. Profit planning therefore, is very essential under these conditions of uncertainty.

f) Capital Budgeting and Investment: Capital is a **scarce factor of production** and is obtained at a cost. It is observed that decisions pertaining to capital are taken with great care and caution. Capital budgeting among other things involve estimate of capital requirements for the project that is the demand for capital based on its marginal productivity, cost of capital and the various sources from which it is sought to be raised profitability of capital, that is, rate of return, choice of capital investments, selection of projects and optimal allocation of capital as between different projects, etc.

g) Strategic Planning: Strategic planning provides management with a framework on which **long term decisions** can be made which have an impact on the behaviour of the firm. The firm sets certain long- term goals an objective and selects the strategy to achieve the same. Strategic planning is now a new addition to the scope of managerial economics with the emergence of multinational corporations. The perspective strategic planning is global. It is different from project planning which focuses on a specific project or activity.

(2) Environmental or External Issues: Environmental issues or external issues in business economics refer to general business environment in which the firm operates. These connected to general economic, social and political atmosphere within which the firm has to function.

The environmental factors have a far-reaching bearing upon the functioning and performance of the firms.

The business decision makers, therefore, have to take into account the **changing economic, political and social conditions in the country** and give due consideration to environmental factors in the process of decision making.

This is essential because business decision taken in isolation of environmental factors may not only prove in fructuous but may also lead to heavy losses.

To sum up, environmental or external issues relate managerial economics to macro-economic theory, while operational issues relate it to micro economic theory. The scope of managerial economics, thus, his considerably widened in modem times.

(5) Chief/Main Characteristics of Managerial Economics

- 1) **Managerial Economics is a branch and discipline of General Economics:** As said earlier Managerial Economics is the application of economic tools to practices of business the agricultural aspects of economic economics. Study of industrial aspects as industrial economics study of monetary aspects as monetary economics, so also a study of the economics aspects of the management of the firm is known as managerial economics. Thus, managerial economics is but a branch of general economic theory.
- 2) **Managerial Economics is mainly micro in character:** because, it concentrates only on the study of the firm. It is the problem of a business firm which form a part of the study of managerial economics: it does not deal with the working of the economy.
- 3) **Managerial Economics are mainly based on the theory of firm:** It analyses the problems of a firm and offers solution for the same.
- 4) **Managerial Economics also studies macroeconomics to understand and adjust to the economic environment under which the firm operates:** In other words, although managerial economics are also relevant in decision making and forward planning. Some problems of the firm are related to macro variables like national income, aggregate level of employment, general price level, etc. Likewise, a study of trade cycle, international trade and balance of payment etc., has great relevance in managerial economics for certain type of decision-making problems.
- 5) **Managerial Economics is normative rather than positive in character:** It is prescriptive rather than descriptive in nature. It deals with what should be done and how it be done. It shows get the optimal results. It is concerned with the function of an advisory nature in decision- making. It is normative in character dealing with decision-making problems - how to take business decisions in order to achieve the set objectives. It advises: “what ought to be done” and “how it should be done”.
- 6) **Managerial Economics is both conceptual and metrical:** It makes use of the various concepts in order to understand and analyse the decision – making problems. Likewise, it also uses the various quantitative techniques to measure the impact of different factors and policies.
- 7) **Managerial Economics helps business executives in taking rational decisions,** since resources with the firm are limited. They have to be allocated in the most optimum manner to achieve the set objectives. This is, then, essentially problem of choice. Managerial Economics helps analysing the various alternatives and selecting the one which would give the optimal results.
- 8) **Managerial Economics is more realistic,** pragmatic and highlights on the practical application of various economic theories to solve business and management problems.
- 9) **It is a science of decision making:** it concentrates on decision-making process, models and decision variables and their inter-relationships.
- 10) **Managerial economics also gives importance to the study of non-economic variables:** having implication of technology, environment forces, socio-political and cultural factors etc.

11) Managerial economics uses the services of many sisters' disciplines like mathematics, statistics, engineering, accounting, operation research and psychology etc. to find solutions to business and management problems.

It should be noted here that Managerial Economics does not provide ready-made solutions to all of problems faced by firm. It provides only the logic methodology to find out answers and not the answers themselves. It also depends on the manager's **ability, experience, expertise and intelligence** to use different tools of economic analysis to find out the correct answers to business problems.

(6) Significance of Managerial Economics:

The significance of managerial economics is to be traced to the **development of business corporate planning and policy decisions** which are firmly based on a closely argued analysis of all relevant data, evidence and past experience, present outcomes and future expectations. **Managerial economics does not give importance only to the study of theoretical economic concepts.** Its main concern is to apply theories **to find solutions to day-to-day practical problems faced by a firm.** **Managerial economics has a pivoted (important) place in allied business disciplines** concerned into the area of **decision making.** It provides various tools and techniques to the manager to build up various models which help in decision making process.

- **It provides the necessary conceptual tools, technical skills, toolbox of analysis and technique of thinking** and such other modern tools and instruments for the analysis of business problems. Thus, for example, concepts like elasticity of demand, opportunity cost, fixed and variable cost, short run and long-run costs, break-even analysis income and expenditure, profit and volume of production etc. helps in understanding and solving decision problems.
- **Managerial economics is also helpful making such decisions** like choice of the level of output and price of the product, choice of product - mix, choice pertaining to investment decisions, advertisement expenditure, raising of capital resources etc.
- **Managerial economics as an applied science** helps in analysing the firm's markets, industry trends and macro forces which are directly relevant to the concerned business activity.
- **Managerial economics helps the manager to understand the intricacies of the business problems** which make the problem solving easier and quicker, arrive at correct and appropriate decision at the right time, improve the quality of such decisions and so on. A major contribution of managerial economics to management pertains to guidance for optimisation and identification of key variables in the business decision-making process.
- **Managerial economics provides necessary Skills in furtherance of business goals and functions,** it is fundamentally concerned with the Interaction between internal operations of the business firm and the business and economic environment such as marketing, business development, government business policy, investment climate and finance which are all affected by the macroeconomic policies of the government.
- **In the context of Globalisation, privatization, liberalisation and a highly competitive dynamic economy,** it helps in identifying various business and managerial problems, their causes and consequences and suggests various policies and programmes to overcome them.

- **Managerial economics helps the business executives to become much more responsive, realistic and competent** face the ever-changing challenges in the modern business world.
- **Most of the managerial decisions are made under the conditions of uncertainty about the future.** To reduce this element of uncertainty it is essential to undertake research and investigation of the problem before taking any action. This process of business research involves the following main steps:

(a) Problem definition (b) research design (c) data collection (d) data analysis and (e) Interpreting the results.

Here, the knowledge of business economics along with management science and statistical techniques will be of immense help to a manager in **understanding, interpreting and evaluating** of quantified variables pertaining to market and business economy.

Thus managerial economics has become a highly useful and practical discipline in recent years to analyse and find solutions to various kinds of business and managerial problem in a systematic and rational manner. Knowledge of managerial economics has proved to be a boon to a manager, businessman and an entrepreneur. It is truly an applied economic science which is useful in the pursuit of its objectives as well as efficient functioning and performance of a business firm.

Managerial economics is basically concerned with micro rather than macro area economic analysis, which is directly relevant to the practical business economic decision making. In short, managerial economics deals directly with business realities; it deals with a thorough analysis of key elements involved in the business decision making.

(7) Fundamental Concepts in Managerial Economics

(7.1) The Concept of Opportunity Cost

The concept of opportunity cost is an important concept in business economics and is widely used in the process of **decision-making**. Opportunity cost means **the next best alternative that is sacrificed or foregone**. The opportunity cost of a product or service is measured in terms of revenue which could have been earned by employing that product or service in some other alternative uses. As **Marshall** has put it. **"The real ultimate cost of anything is the loss of that alternative which must be sacrificed when resources of a given kind are devoted to a particular object."**

In the words of **Benham** **'the opportunity cost of anything is the next best alternative that could be produced instead, by the same factors or by an equivalent group of factors, costing the same amount of money.**

We know that in the process of decision making, the manager of a firm has to choose or select one of the alternatives out of the various alternatives open to him, and obviously he would select the best alternative. Thus, when the manager of a firm selects one alternative or chooses one course of action, naturally he has to forego all other alternatives. Now, the probable return from these alternatives which could have been obtained is the **opportunity cost** of the alternative chosen or selected. In short, **the opportunity cost of a decision made is the loss of the next best alternative foregone. Thus, for example,** a firm decides to invest ₹ 50 lakhs in the setting up of a plastic unit. Now the opportunity cost of this investment is the return which this firm could have obtained had it made that investment in some other unit or units. Thus, the probable return from other alternative avenues of investment is the opportunity cost of the investment made in plastic units.

The concept of opportunity cost will be clearly understood from the following examples:

- (1) The opportunity cost of the capital investment made in business by the entrepreneur himself is the interest that could have been earned if that capital had been employed in some other business.
- (2) The opportunity cost of the time which an entrepreneur devotes to his own business is the amount of remuneration which he could have earned by working in some other occupations.
- (3) The opportunity cost of using a machine to produce one product is the loss of those products which could have been produced from that machine.

The concept of opportunity cost is related with the concepts of explicit cost and implicit cost.

Explicit costs are the actual costs incurred by a firm. These costs refer to the money payments made to the factors of production; these are contractual obligations and are recorded in the books of accounts.

Implicit costs are costs that are not recorded in the books of accounts: for example, land for the factory site provided by the owner of the firm or the capital supplied by owner himself etc., that is these are costs of self-employed and self-owned resources of the firm. **The opportunity cost includes both implicit and explicit costs and is generally higher than the accounting cost.**

Based on the distinction between explicit cost and implicit cost the concept of opportunity cost helps us to understand the difference between **accounting profit and economic profit of the firm's Accounting profit** is the difference between the total revenue and the actual cost incurred and by a firm. **Economic profit** can be known after deducting implicit cost from the accounting profit. The **implicit cost** of a firm is the difference between the actual cost and opportunity cost.

Importance of the Concept of Opportunity cost

- The concept of opportunity cost is of great importance in taking **business and managerial decisions**
- Factors of production tend to move in those employments, where they get the **maximum return**.
- In order to get the services of the **factors of production** and to retain them in employment, the payments made to them by the firm have to be in accordance with their opportunity cost.
- Thus, it is not the concept of actual cost but that of opportunity cost which is more useful in taking **managerial decisions**. The resources with the firm are limited and have alternative uses. It is essential that there should be the most **economical and optimum use of these resources** in order to achieve the firm's objective of **profit maximisation**.
- The concept of opportunity cost helps the firm in taking **rational decisions** regarding the optimum utilisation of resources and it has come to be regarded as an important fundamental concept by managerial economists.
- With an increasing application and wide and extensive **use of linear programming in business economies**.

Limitations of the Concept

- In a large number of cases, a specific factor has **no opportunity cost**. Thus, for example, a barren land has hardly any attractive alternatives.

- **Immobility** of factors of production makes this concept **limited** in application.
- The foregone alternatives may not be **quantitatively measured**.
- A landlord may not know how much of rent he would be getting by cultivation of sugarcane instead of cotton.
- The concept is based on the assumption of **perfect competition** which is hardly found in **real life**.

[7.2] The Discounting Principle

The discounting principle occupies an important place in business economics and is particularly helpful in taking **investment decisions**. While making new investments, it is necessary for the firm to have an estimate of the expected rate of return on the capital invested or to put it differently, the firm has to decide as to what should be the rate of discount to equate the future value of its capital with that of its present value in other words, the discounting principle, in a way, is an extension of the concept of time preference. Since **future is unpredictable**, there is a lot of uncertainty about it. Besides, the return in the future is less attractive than the same return of today. And so the future must discount both the elements of delay of the future.

The concept of discounting principle is based on the rational that **individuals give more importance to the present than to the future they prefer present satisfaction** to a future satisfaction of an equal amount and of equal certainty in other words, future satisfaction when viewed from the present undergoes a discount. Thus, **the concept of discounting principle is based on the fundamental fact that a rupee of today is worth more than a rupee of tomorrow**. The reason for this is that a rupee earned today can be profitably invested and one can earn interest or dividend out of it. But, if that rupee is foregone, say for year, than coming in the form of interest or dividend from its investment has also to be foregone and so it has been said that a rupee tomorrow is worth less than a rupee today.

Let us illustrate this with an example. Suppose an individual is offered a choice between a gift of ₹ 100 today or ₹100 next year, he will naturally choose to have ₹100 today rather than next year. This is because of two reasons:

- [a] **Future is uncertain**; these may be uncertain of getting ₹100 next year, if the present opportunity is not ceased.
- [b] Even if an individual is assured of receiving ₹100 next year, but then what happens is that by accepting ₹ 100 at present he can earn an interest of say 6 percent and in that case, after one year 100 of today shall become ₹ 106, whereas if he does not accept ₹100 today he will get only ₹ 100 next year- nothing more than that. Hence naturally an individual will prefer the first alternative because he gains by ₹6 in future. In other words, it can be said that ₹100 of next year is not equal to ₹ 100 today but less than that.

On the basis of the above illustration, we can explain the discounting principle. The pertinent question to be considered is how much rupees of today are equal to ₹100 one year hence. Suppose the rate of interest is 6 percent which means that ₹100 one year after should be discounted at the rate of 6 percent and this would mean that we should divide it by 1.06. The formula for this is as follows:

$$V = \frac{A}{1+r}$$

Where,

V= present value of capital

A value of capital after one year

r = rate of interest.

$$\begin{aligned}
 &\text{In the above example. } V = \frac{100}{1+r} \\
 &= \frac{100}{1.06} \\
 &= ₹ 94.33
 \end{aligned}$$

We can verify the corrections of the above calculation by multiplying ₹ 94.3 by 1.06 which will come to ₹100

Practical Importance of the Concept

The discounting principle is widely used in business economies while taking **investment decisions**. While preparing the **capital budget and in taking investment decisions**, this principle is of great practical importance. The gestation period of different capital projects is different, that the period after which returns to capital are likely to start accruing and the time perspective of returns and cost are different for each project, as a result of which, if the firm ignores the concept of discounting principle.

Thus, while taking **Investment decisions which will yield a return over a period of time, it is advisable to find out its present net worth**. Unless these returns are discounted and the present value of the returns are calculated, it is not possible to judge whether or not the cost of undertaking the investment today is worthwhile. The relevant methodology is also known as ‘**Cost-Benefit Analysis**’.

[7.3] The Equi - marginal Principle

The equi - marginal principle is a widely prevailing **economic literature** and as a **fundamental concept economies**, it is extensively used in the process of **decision-making and forward planning**.

According to this principle, those factors of production which can be put to alternative uses, must be allocated amongst various uses or various activities in such a manner that the net increase in the factor product value of the marginal unit in each use is the same he allocation of factors in this manner enables the firm to achieve optimum position.

We know that factors of production have alternative uses. For determining the allocation of a given factor amongst its alternative uses, it is essential for us to know as to what will be the marginal increase in output from the alternative uses of that factor the firm is producing more than one product or is engaged in more than one product activity, it would use its inputs or factors in the best way if the last unit of the factor in each case produces equal output. In case, however, if the value of marginal product as between different uses or different activities is not equal, the firm would continue to reallocate the factors until the value of marginal product becomes equal in all uses or activities.

Let us illustrate the equi- marginal principle with an example. Suppose a firm undertakes three types of different activities A, B and C and employs a total labour force of 500 workers. The firm can bring about an increase or decrease in any of these activities but the number of workers being fixed, it can expand one activity by diverting workers from other two activities, that is to say, in order to increase production in one activity, the additional workers required can be obtained only by shifting the workers from other Two activities. "Situation faced by more"

Now, suppose the firm decides to add one additional worker in activity A as a result of which there will be an increase in the net product value of this activity which may be called as **the marginal product value of labour**. Likewise, if one more additional worker is added to other productive activities B and C, then there would be an increase in the marginal product value of labour in these activities as well.

Now, it is obvious that the firm would allocate more workers in that activity, where the marginal product value is high. **It would be in the interest of the firm to reduce the number of workers in those activities where marginal product value is less and to increase the number of workers in those activities where the marginal product value is high.** Such allocation and reallocation of the workers between the different activities or different uses will continue till the marginal product value of labour in each of the activity becomes equal. At this point, the shifting of workers as between different activities and uses will stop, the output of the firm will be maximum and the firm would attain optimal position.

In short, **the equi - marginal principle states that the factors of production are allocated amongst different productive activities in such a manner that the value added by the marginal unit of each factor is the same in all activities or uses.** When the marginal product value in all the activities or uses is equal the firm attains optimum position. This can be expressed symbolically as follows:

$$VMPLA = VMPLB = VMPLC$$

VMP = Value of marginal product Here.

L = Labour

A, B and C = different productive activities.

This would be clear from the following diagrams:

Figure: 1

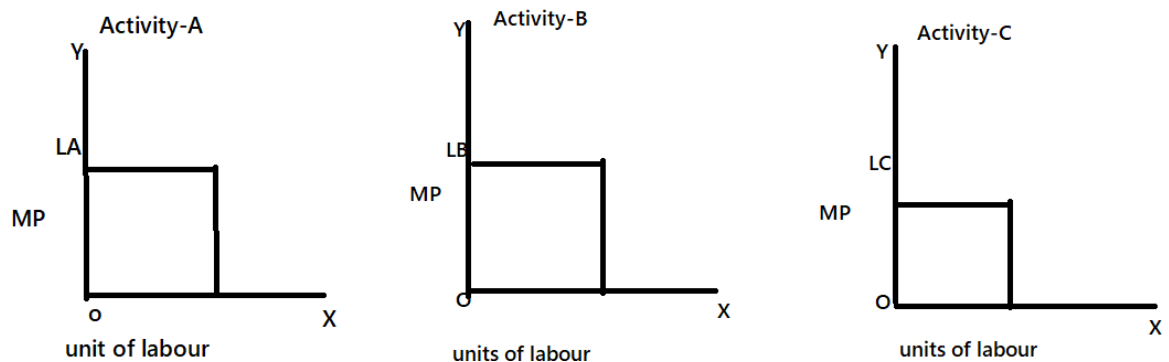
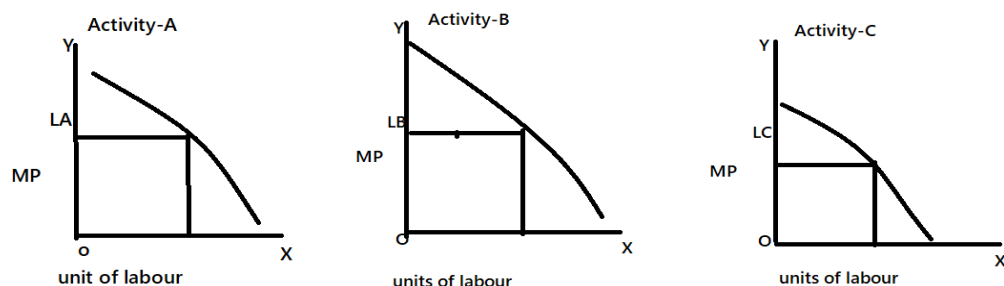


Figure: 2



In figure - 1 above, there has been an equal allocation of labour in all the three productive activities, A,B and C but the marginal product of labour is not the same in all these activities. Thus for example, in activity B, the marginal product of labour is the highest, while in activity C, it is the lowest. Accordingly, by shifting the workers from activity C to

activity B, the firm can obtain optimum output. In other words, the shifting of labour amongst the different activities shall continue till the managerial product of labour gets equalised in all the activities. At this point, the firm gets maximum output. This is shown in figure 2 above.

Points for Consideration:

However, while discussing and applying the equi-marginal principle in practice, the following points should be borne in mind:

- (1) **In equi- marginal principle, increase in the value of marginal product refers to the net increase in value of marginal product.** Thus for example, as a result of employing one additional worker in activity say A, the total output increases by 50 units. Now, if the price per unit of the product in the market is ₹ 1/ the total Revenue of firm will increase by ₹ 50. But it should also be remembered that the increased output of unit will also rep some more of raw materials, fuel and other inputs, so that these will be an increase in the variable cost and suppose this increase of the order of ₹ 20, then the marginal product value of labo will be ₹ 30 (Rs 50-20). Thus, the value of the marginal product relevant for our purpose will not be ₹ 50/- but only ₹ 30 such, in equi-marginal principle, we have to consider only the increase in the value of the marginal product.
 - (2) Again, it is also just possible that the additional revenue which is likely to be attained as a result of an employment of a additional worker may not accrue immediately, but at a future day. In such case their revenues should be discounted and only after that, comparison of revenue in the alternative activities should be made. Thus, for example, revenue in activity A may accrue immediately, while in activity B or C it may accrue after six months. Accordingly, comparisons should be made after discounting the revenue to be obtained after six months.
- It should be noted here that decisions pertaining to capital budgeting are taken on the basis of equi - marginal principle.** Allocation of capital as between different productive activities made in such a manner that the value of discounted marginal product is the same in all the activities.
- (3) Likewise, if **the increase in output in one activity requires reduction in price**, then this fact also should be taken into account while comparing the values of the marginal product in different activities and necessary adjustment be made for the fall in price.
 - (4) The phenomenon of **diminishing returns must also be considered while applying the equi- marginal principle.** According to this law, in any productive activity, as more and more units and variable factors are added to a fixed factor, after a certain stage, the increase in output obtained is not in proportion to the increase in the quantum of variable factors, that is, the output increases at a diminishing rate. Thus, it is only after taking into account this tendency to diminishing returns that the allocation of factors as between different uses should be made in such a manner that the value of the marginal product in different uses is the same.

(8) Role and Responsibilities of a Managerial Economist

In modern times, managerial economists are playing a leading role in the **solution of complex and intricate problems** of decision-making. A managerial economist with his **research and analytical tools** now occupies a prominent place in the hierarchy of industry, trade and commerce. Due to a continuous increase in the demand for managerial economists, the number of such economists working in business and research departments as also in government intuitions has shown a marked rise in recent year The growing importance of these economists can be judged from the fact that in recent times a number of national and international associations of business economists have been set up for mutual exchange for information and ideas on the subjects of common interest.

[8.1] Functions or Role of a Managerial Economist

- (1) **External factors:** The external factors affect the business decisions from outside and so these factors are outside the control of the firm. These are known as '**business environment.**'
- (2) **Internal factors:** The internal factors are within the scope and ambit of the firm and hence these are within its control. These factors are also known as '**business operations.**'

Thus, for example the decision of the firm regarding what, how and where to produce, how much and where to invest, how many workers should be employed and at what wage rate, or at what level the price of the product should be fixed are matters about which the firm can take independent decisions, and so these are called internal facto[₹]

[8.2] Analysis of the External Factors

A managerial economist has to analyse and make a **forecast** about the external factors in the context of general business conditions prevailing in the economy. These factors include **general price level, national income and output, volume of trade, etc.** These are of great importance and affect each and every firm.

- Government's economic policies and regulations.
- Changes in the degree of competition
- Over-all economic picture of the country-local, regional national and international trends.
- Potentialities of demand in the existing markets and new markets.
- Possibilities of expansion and contraction of market opportunities and consumer opportunities.
- Availability and cost of the credit.
- Money and Capital market conditions in the economy.
- Price situation regarding raw materials products.

[8.3] An analysis of the Internal Factors

A managerial economist also plays an important role in the management of the firm. He helps in deciding about the **scale of production and investment, sales and inventory schedules, price policy, expansion or contraction of the firm, etc.** These are known as internal factors or business operations and through a study of these factors, a managerial economist can offer useful guidance to management in its decision - making.

- Sales and profit budgets for the next year.

- Appropriate production schedules and inventory policy for the next six months.
- Selection of the most profitable product - mix for the firm.
- Changes in the existing wage and pricing policies, if needed.
- Cash flow available for the month and the mode of its investment.

[8.4] Specific functions of a Managerial Economist

1. Production scheduling
2. Demand forecasting
3. Market research
4. Economic analysis of the industry
5. Investment analysis and forecast
6. Pricing and related decisions
7. Advice on trade
8. Advice on foreign exchange management
 - a. Environmental forecasting
 - b. Advice on capital projects
 - c. Analysis of under-developed economies

[8.5] Some Other Functions of a Managerial Economist

- One of the main functions of a managerial economist is **to improve the quality of policy making as it affects short term operations and long-term planning**. He has to assist the management with his **specialised skill and sophisticated techniques** to determine the factors that influence the business,
- The managerial economist has to prepare the forecast for general business activity. The purpose is to provide a framework for **development of sales and profit forecasts**.
- A managerial economist also helps the firm **in product designing, product improvement and product planning** through a systematic study of consumers' income, taste and preferences.
- He has also to **estimate total market potential and the firm's perspective share** in the market in the light of past trends, present position and future expectations.
- A managerial economist can be helpful in many fields such as **production planning, sales promotion, inventory control, optimum utilisation of manpower, etc.**
- "A managerial economist can become a far more helpful member of a management group by virtue of his studies in economic analysis, primarily because, there he learns to become an **effective model builder** and because, there he requires a very rich body of tools and techniques which can help him to deal with the problems of the firm in a far more rigorous, a far more rigorous, and a far deeper manner."

[7.6] Responsibilities of a Managerial Economist

- (1) In the first place, the managerial economist must keep in mind the basic fact that the **objective of the firm is to maximise profits and secure maximum possible return on the capital invested**; So, he must direct all his energies and skill in helping the management to achieve this objective, irrespective of his own personal views. As long as the managerial economist helps the management to achieve this goal, he will be successfully discharging his responsibilities as a managerial economist or else he will lose the confidence of the management.

- (2) The second responsibility of a managerial economist is to make forecast as accurately as possible so as to **minimise the risk involved in the uncertainties of future**. He has to make this forecast on the basis of the data of the market, general economic environment, government policy and the working of the firm itself. However, in case the managerial economist finds that due to some sudden and unaccounted factors, his forecast has undergone a change or gone wrong, he should immediately bring it to the notice of the management and work out a new forecast.
- (3) **The managerial economist influence ultimate decisions**. He also seeks to reduce the range of executive decision - making by introducing relevant facts, weighing them objectively and making necessary recommendations and there by improve the chances of success of the firm.
- (4) The function of a managerial economist is **not to take decisions, but to analyse, conclude and recommend**. For this, he should have necessary autonomy and. freedom. He must not be isolated from any action taken by the firm, but should be properly acquainted with the day-to-day affairs of the firm, his basic role is to provide quantitative base for decision making. He has also to perform an educational function and in that he has to explain to the management the assistance which managerial economics can provide in the fulfilment of their duties and responsibilities.
- (5) The calibre of a **managerial economist is generally judged by his ability** to obtain necessary information quickly by personal contacts rather than by lengthy correspondence. For this, he should become member of various professional bodies and take active part in their deliberations.
- (6) A managerial economist must be able to earn full status in the business team and must be ready to **take up challenging tasks**. At times, he should offer himself to the management to take up any special assignment and it in all seriousness. It is for him to make his services indispensable to the management with the help of his ability, training and experience.
- (7) The managerial economist must possess the following qualities in order that he can discharge the responsibilities effectively and efficiently:
- **Diplomacy** - this helps him to maintain good relations with the headquarters and with executives
 - He should have a **thorough knowledge** of the working of the firm.
 - He should have a rare initiative **ability to judge what is good or bad** for the firm.
 - He should possess a **creative mind** and should have a certain measure of humility, a passion for new ideas and a desire to learn.
 - He should be **modest, firm and discreet** and should equipped to provide a basis for the considered judgement and careful thinking needed in making business decision.
 - He should be able to express himself **clearly and simply** and try to minimise the use of technical terminology in communicating with the management.
 - He should be **both conceptual and metrical**, because as has been well said, 'theory without measurement is rarely useful and measurement without theory can lead to misleading conclusions.

Unit 2: Market Structure Analysis -1

[20%]

Course Content

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[1] Introduction to Market

The study of the market structure generally is made on the basis of the extent of competition prevailing therein. A firm produces its output with the purpose of selling it in the market. However, the price it can charge per unit of output price depends crucially on the type and structure of the market in which the firm operates. In other words, the determination of price and output of various products depends on the type of market structure in which these are produced, sold and purchased.

(i) Perfectly competitive market.

(ii) Monopoly market.

(iii) Monopolistic competitive market

(iv) Oligopoly market.

Meaning of Market

The widely accepted definition of market is as follows: **“Market implies the whole area over which buyers and sellers are in such touch with each other, directly or through middlemen, that the price of the commodity in one part influences it in the other parts of it.”**

(a) The existence of a commodity - say like cloth market The vegetable market, grain market, bullion market and so on

(b) There are buyers and sellers of the commodity who are in touch with one another either through cost, telegraph telephone, telex, e-mail, fax, interest or through middlemen.

(c) There is competition amongst the buyers and the sellers perfect or imperfect - so that through such competition the price of the concerned commodity is influenced.

Classification of Market

(i) On the Basis of Nature of the Product

(a) Product Market A product market refers to a market where goods and commodities are bought and sold. It is also known as commodity market.

(b) Factor Market It refers to a market where factors of production like land, labour, capital etc. are bought and sold.

(ii) On the Basis of Area

(a) Local Market When the commodity or product or service is bought and sold only in a particular locality, village or city, it is called as local market which is mainly dependent on local conditions.

(b) Regional Market When the commodity is bought and sold only in a particular region it is known as a regional market which is mainly influenced by regional conditions.

(c) National Market When a commodity is bought and sold all over the country, we have a national market.

(d) International Market When certain commodities are traded internationally, the market is called an international market or a world market.

Whether a market will be local, regional, national or international in character will mainly depend on the following factors:

- (1) Nature of commodities and the tastes and preferences of the people.
- (2) Availability of cheap, quick and easy transport facilities.
- (3) Availability of stage facilities.
- (4) Political stability at home and abroad.

(iii) On the Basis of Time

(a) **Very short period market** This relates to transactions in those commodities which are fixed in supply or are perishable in nature. Since supply is fixed, it is only the changes in demand that influence the price in such markets. Usually this refers to the very short time period of a few days.

(b) **Short period Market** Short period market is that where supply can be increased but only to a limited extent. In other words, in a short period market supply can be changed only within the limits of the productive capacity of the existing firms in the market. In such a market, the firm can change the scale of its operations but not the size.

(c) **Long period market** Here there is ample time for the firm to change its size. The firm can expand or contract its output as a result of changes in the demand for its product: new firms can enter or exit the industry. Hence, supply can respond fully to changes in demand.

(d) **Very long period market or Secular market** In the very long run, there are changes taking place in consumer's tastes and preferences, changes in production techniques, invention of new technology, changes in social customs and traditions etc. These changes in demand supply have their full effect on prices.

(iv) On the Basis of Nature of Transactions

(a) **Spot market:** In the spot market goods and commodities are physically exchanged on the spot.

(b) **Future market :** In the future market, there is agreement of future exchange of goods and commodities.

(v) On the Basis of Volume of Business

(a) **Wholesale market** In the wholesale market, goods are transacted in bulk and in large quantities. Wholesale markets are link between the producer and the retailer.

(b) **Retail market** In a retail market, transactions involve small quantities. A retailer is a link between the wholesaler and the consumer.

(vi) On the Basis of Regulation

(a) **Regulated market** When the government lays down certain conditions and regulations for transactions of certain goods and services, it is known as a regulated market. Regulation of markets by government becomes essential for those goods whose supply or price can be manipulated against the interests.

(b) **Unregulated market** Goods and services whose transactions are left to the market forces are called unregulated markets. There are no regulations or conditions laid down by the government in such markets.

(vii) On the Basis of status of the seller's

(a) **Primary market** The primary market consists of the manufacturers who produce and sell the product to the wholesalers. Here there is direct exchange.

(b) **Secondary market** The secondary market consists of wholesalers who are an intermediate link between the manufacturers and the retailers.

(c) Terminal market The terminal market comprises retailers who sell the goods to the ultimate consumers.

(viii) On the Basis of Competition

(a) Perfect competition (b) Monopoly (c) Monopolistic competition (d) Oligopoly

(a) Perfect Competition

(1) Existence of a **very large number of firms (sellers) and buyers in the market** so that no individual firm or a buyer can by his own independent action affect the market price of the product. This is because the output of an individual firm forms a very small part of the total output. The firm in perfect competition, therefore, is **a price taker and not a price maker**.

(2) Products of all the firms are **perfectly homogenous and identical** and therefore, from the consumer's point of view these are perfect substitutes.

(3) There is **free entry and free exit of firms**.

(4) Both the **firms and the buyers have a perfect knowledge** of the market.

(5) There is **perfect mobility** of the factors of production.

(6) **Transport costs** are assumed to be non-existent.

(b) Monopoly

(1) There must be **a single firm or single seller of the product** if there is to be a monopoly. The single producer may be **an individual owner or a partnership firm or a joint stock company**. Thus, in monopoly there is **only one firm or one producer**: the distinction between firm and industry ceases (to stop or end) in monopoly.

(2) There are **no close substitutes** available for the product of that firm; that is, there is **virtual absence of close substitutes in monopoly**. In other words, under monopoly, the cross elasticity of demand between the product of the monopolist and that of any other producer must be very low.

(3) There is a closed entry for the other rival firms. **Monopoly can exist only when there are barriers to the entry of rival firms**.

(4) The demand curve facing a monopoly firm is less than perfectly elastic; **it is a downward sloping curve from left to right**.

(c) Monopolistic Competition

(1) There are a fairly **large number of firms but no so large as in perfect competition**.

(2) There is product differentiation which means that the various firms produce **not homogeneous products but differentiated products which are close substitutes of each other**.

(3) There is the **existence of selling costs**; these are costs which a firm has to incur to increase its volume of sales.

(4) Different prices for differentiated products. Product differentiation enables a firm to get a partially independent market for its product so that it can charge a slightly **higher price than that of its rival firms**.

(5) **The firm has some control over the price**. In view of product differentiation, the firm **can charge a slightly higher price without fear of losing all its customers**.

(6) There is **free entry and free exit of firms**.

(d) Oligopoly

(1) In oligopoly, **there are a few firms which produce either homogeneous products or differentiated products**.

(2) Because of the **small number of firms**, each firm accounts for a substantial part of the total output of the industry and its policies have a notable impact on the market.

(3) There is interdependence of firms in oligopoly. The **price and output decisions of one firm are taken into account by other firms**.

(4) Advertisements and selling costs have a **strategic importance** in oligopoly.

(5) The demand curve of a firm under oligopoly is **indeterminate**.

(6) There is the presence of a **monopoly element**.

(7) There are **conflicting attitudes of firms**, one of mutual cooperation and another of conflict and antagonism.

(8) **Prices** tend to be **sticky or rigid** in oligopoly.

(9) Firms in the oligopoly market have a **kinky demand curve**.

Table 1**Classification of markets According to Different Criteria on the basis**

(1) Nature of the product	(2) Area	(3) Time	(4) Nature of Transact ions	(5) volume of Business	(6) Regulation	(7) Status of sector	(8) Competition
(1)Product market (2)Factor market	(1)Local market (2)Region market (3)National Market (4)International Market	(1) Very Short period Market (2) Short period market (3)Long period Market (4) Very long period market	(1) Spot market (2) Future Market	(1) Whole sale market (2) Retail market	(1)Regulated market (2) Unregulated market	(1)Primary market (2)Secondary market (3)Terminal market	(1)Perfect competition (2)Monopoly (3)Monopolistic competition (4)Oligopoly

Table 2**Classification of market Structure**

Firm of market Structure	Number of Firms	Nature of Product	Entry conditions	Degree Monopoly power	Degree of control over price
Perfect Competition	Very large	Homogenous Product	Free entry and Exit	Zero	None (Firms is a price - taker)
Monopoly	One	Unique Product without close substitute	Strong barriers to entry	Absolute	Very large (Firms is a price maker)
Monopolistic Competition	Fairly large	Differentiated Products which are closed Substitutes situation of each others.	Free entry in the sense that new firms can produce only close substitutes.	Limited	Some control over Prices
Oligopoly	Few firms	Homogenous Product or differentiated product which are closed substitutes of each others	Entry barriers due to Product differentiation and by a few firms dominating the Market	Considerable	High

[2] Perfect competition and Pure competition

There is a distinction is made between perfect competition in pure competition. According to American economist the three conditions of perfect competition mentioned such as **Perfect Knowledge, Perfect mobility of the factor of production and the absence of transport cost** are difficult to realise practice. Therefore, they have used term “**Pure competition.**” As Joel Dean as rightly remarked, “Perfect competition is probability does not never as exist and never can exist.” Perfect competition in fact is just **concept, suggestive norms. In real life actual competition is always imperfect.**

The term “Pure competition” has been used in restricted sense. It is said to be exist when Monopoly is absent, on the other hand perfect competition is used in wider sense involves absence monopoly and the existence of other marketing imperfections.

Thus, the fulfilment of the first three conditions namely existence of **very large number of sellers (firms) and buyers, Homogeneous products and Free entry and free exit of firms makes for pure competition in the market.** These conditions ensure the non-existence of any monopoly element in the market. Such pure competition substantiates the norm of perfect competition without fully attaining it. Thus, **pure competition does exist in reality, it is just a rare phenomenon.** Perhaps, agriculture under free trade serves as the best example of pure competition for example such as in the markets for wheat, rice, cotton, bajra and other food grains as also in the markets for fruits, vegetables, eggs, etc. there are a large number of buyers and sellers and for all practical purposes the products are identical. But outside agriculture, pure competition is rarely found.

In short, the term **perfect competition is used in a wider sense**, while **pure competition is used in a restricted sense.** Thus, pure competition implies that the first three conditions mentioned below are met with, while perfect competition implies that all the seven features mentioned below are fulfilled.

[3] Price Determination under Perfect Competition

Introduction

Perfect Competition is an extreme form of market structure in which forces of demand and supply work quite freely to determine the allocation of resources among different goods and the distribution of income among factors. In this market structure, degree of competition is so high that no individual firm can influence the price of its product. There are a large number of firms producing an identical product. Each firm produces relatively a very small part of the total production of the product with the result that increases or decreases of output of the product by it makes hardly any difference to total supply of the product. This means no firm is able to affect the price of the product by varying its level of output. The firm working under market conditions of perfect competition, therefore, takes the price of the product as, given and constant for it. It is therefore often referred to as **price taker.**

[4] Features of Perfect Competition

a) Many Buyers and Sellers

There exist a large number of buyers and sellers in a perfectly competitive market. The number of sellers is so large that no individual firm owns the control over the market price of a commodity. Due to the large number of sellers in the market, there exists a perfect and free competition. A firm acts as a price taker while the price is determined by the ‘invisible hands of market’, i.e. by ‘demand for’ and ‘supply of’ goods. Thus, we can conclude that under perfectly competitive market, an individual firm **is a price taker** and not a price maker.

b) Homogeneous Products

The product or service produced by the buyers in a perfectly competitive market should be homogenous (similar/identical) in all respects. There should be **no differentiation between them in terms of quantity, size, taste, etc.**, so that the products are perfect substitutes for each other. If a seller tries to charge a higher price for products that are so similar, they will lose their customers immediately.

c) Free Entry and Exit for Firm

Another condition of a perfectly competitive market is that no artificial restrictions prevent a firm's entry or compel an existing firm to stay put when they want to leave. There is no any legal, technical or any other barriers to their entry. It is their decision to enter, stay or leave the market depends purely on economic factors.

d) Perfect Knowledge

The buyers and sellers have perfect knowledge about the market. The buyers are aware of the details of the product sold as well as its price. At the same time, the sellers know about the potential sales of their products at different price points. Since the buyers are already informed about the product, there is **no need for advertising or sales promotion**. So firms don't have to invest a single penny in these activities. It also helps sellers save on advertising or other marketing activities which keeps the price of their products low.

e) Perfect Mobility of Factors of Production

The factors of production like **labour, raw materials and capital should have total mobility** under perfect competition. The labour should have the freedom to move from one place (industry, market or production unit) to another depending on their remuneration. Even the raw materials and capital should not have any restrictions in movement.

f) Transport Cost

In the perfectly competitive market, the costs for transporting goods, services or factors of production from one place to another is either **zero or constant** for all sellers. The assumption is that all sellers are equally near or farther away from the market. Thus, the transport cost is uniform for all of them. The result is that the overall costs for production and the selling price are the same across the board.

g) Absence of Artificial Restrictions

There is **no interference from the government** or any other regulatory body to hinder the smooth functioning of the perfect competition. There are no controls or restrictions over the supply or pricing and the price can change solely based on the demand and supply conditions.

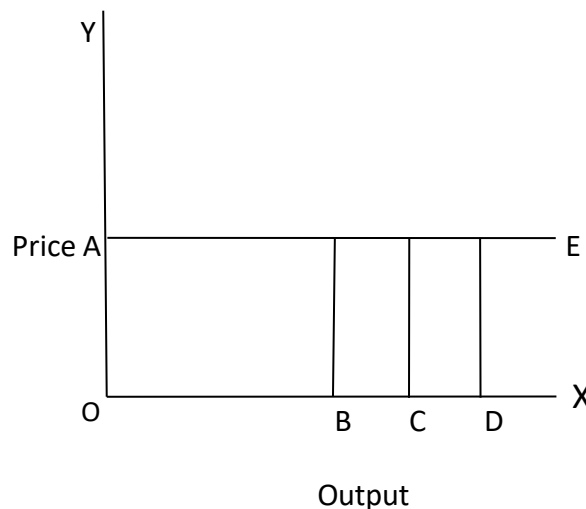
h) Uniform Price

There is a single uniform price for all products and services in a perfectly competitive market. The forces of demand and supply determine it.

Thus, Perfect competition is one of the most smoothly functioning markets, with many buyers and sellers working together in total harmony. Unfortunately, it is a **hypothetical situation that does not exist in reality**. But markets should aim to be as close as possible to this form of market to ensure a fair price for all goods and services.

[5] Demand curve of a firm under perfect competition

- The first two conditions (features) of perfect competition ensure that a single price must prevail (superior) under perfect competition and the demand curve or average revenue curve faced by an individual firm under perfect competition is **perfectly elastic** at the ruling price in the market.
- **If the firm raises its prices slightly above the ruling price, it will lose all its customers to its rivals.** Because it can sell as much as it likes at the prevailing price it has no incentive to lower it.
- Without being able to raise the price and having no incentive to lower it, the firm is content to accept the ruling price in the market.
- Once the in the market is established, the firm accepts price as a given demand and adjust its output level which gives maximum profits.
- The Average Revenue (AR) Curve is the demand curve of the firm as it can sell any quantity it wants at the market price. Since **average revenue (AR) is constant, marginal revenue (MR) will be equal** to it. If the prices changes, the demand curve facing the firm will change but it will be perfectly elastic at the new price.
- **Perfectly elastic demand curve** signifies that the firm does not exercise any control over the price of the product but can sell any amount of the product as it likes at the ruling price.
- The demand curve of firm in perfect competition is **perfectly elastic** it is a straight line parallel to x-axis this will be clear from the following diagram.



- In this diagram, Price is on the Y-axis and Quantity on the X-axis. At OA price is constant the firm can sell OB, OC or OD numbers of units. AE is the demand curve of the firm which is parallel to x-axis.

[6] Equilibrium of a Firm under perfect competition

- The term equilibrium refers to a "**state of balance**", "**position of rest**" or "**position of no change**".
- An equilibrium is a **situation in which economic forces have no tendency to change**. Thus, whenever any economic unit- say a consumer or a producer or a business firm-attains equilibrium, it means that it does not want any further change in this position.

- A firm is said to be in equilibrium when it has no tendency to change the proportion in which the factors of production are combined or to change its level of output, that is to say, **when it has no tendency to change its organisation or to increase or decrease its level of output.**
- Such an equilibrium of firm will occur when **it earns maximum profit**, for it is only then that the firm will have **no desire to change the level of its output by adding or reducing factors of production.**

[6.1] There are two important basic conditions of equilibrium of a firm under perfect competition

(a) Marginal cost must be equal to marginal revenue ($MC = MR$)

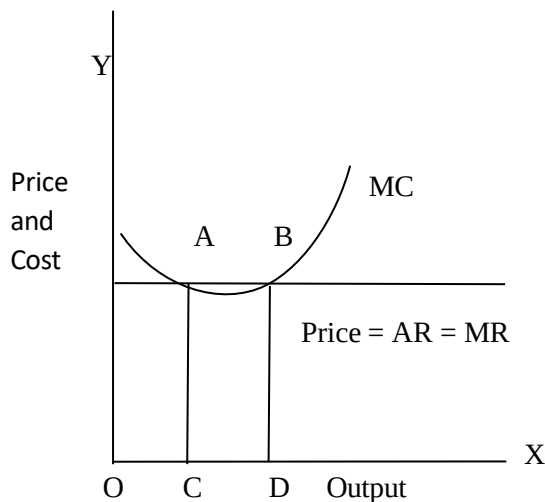
(b) The marginal cost curve should cut the marginal revenue curve from below

(a) Equality of marginal cost and marginal revenue ($MC = MR$)

- The first basic condition of equilibrium of firm is that its marginal cost must be equal to its marginal revenue.
- **Marginal revenue** means the addition made to total revenue by producing and selling an additional unit of output. **Marginal cost** means the addition made to the total cost by producing an additional unit of output.
- A marginal revenue is **greater than** marginal cost, it will pay the firms and will be in the interest to increase the output since by doing so it will add more to its total revenue than to its total cost.
- On the other hand if marginal revenue is **less than** marginal cost, the firm will reduce the output since by doing it will gain more in the shape of cost reduction than lose in the firm total reduction than lose in the firm of reduction in total revenue.
- Thus a firm will continue its output upto that point where is marginal revenue is equal to its marginal cost. If the firm stops before this point it will not able to a maximum profit. Thus, there will a point of maximum profits where a firms $MR = MC$.

(b) Marginal cost curve should cut the marginal revenue curve from below

- The second condition of equilibrium of the firm is that its marginal cost curve should cut the marginal revenue curve from below.
- If the marginal cost curve cuts the marginal revenue curve from above, the firm will not be earning maximum profits and hence it will not be in equilibrium. Equilibrium point is that at which the marginal cost curve cuts the marginal revenue curve from below.
- In this diagram, marginal cost curve cuts marginal revenue curve at two points A and B. At point A it cuts from above and at point B it cuts from below.
- The point A cannot be the equilibrium point since beyond this point, marginal cost is lower than marginal revenue and it will pay the firm to increase the output beyond OA. It is at B when marginal cost curve cuts the marginal revenue curve from below that the firm will be in equilibrium.
- This is because, if the firm increases its output beyond point, marginal cost becomes higher than marginal revenue. This equilibrium point will be B where the firm will be producing OD output and earning maximum profits.



[6.2] Equilibrium of a firms in the short run

- Short run is a period during which the firm can change the level of its output in response to change in demand only by changing the amount variable factor like labour, raw material etc. and by intensive utilisation of its existing productive capacity.
- **It shall not increase a decrease the size of a plant, machinery and other fixed equipments.** Thus, the firm shall not alter the fixed factor; it shall only change amount of variable factor in the short run can change the scale of its operations but not its size.
- The demand curve of a firm under perfect competition is **perfectly elastic**, it is a straight line parallel to X – axis. Now, the firm can sell the additional units of output at the prevailing price, marginal revenue is equal to price or average revenue of the product.
- Therefore, marginal revenue curve of the firm will coincide with average revenue curve or the demand curve.

The firm is considered to be equilibrium when,

- Marginal cost must be equal to marginal revenue. ($MC = MR$)
- The marginal cost curve should cut the marginal revenue curve from below.

However, the fulfilment of the above two conditions do not give any indication about the absolute profit or loss position of the firm.

In order to know this, we have to take into account the **average cost of the firm**. Marginal cost and marginal revenue may be equal, but it is not necessary that marginal cost and average cost are also equal. In the short run, the average cost may be more or less than the price.

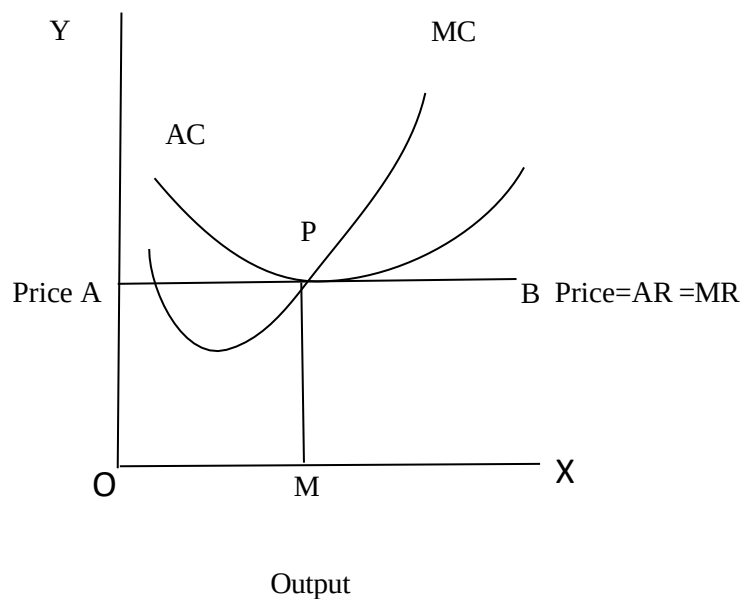
- (1) When Average cost is equal to Price and the firm is earning normal profits.
- (2) When Average cost is lower than the Price and the firm is earning abnormal or super normal profits.
- (3) When Average cost is higher than the Price and the firm incurring losses.

Let understand three situations

(1) When Average cost is equal to Price the firm earn only normal profits.

- In the short run when average cost is equal to the price. The firm earns only normal profit.

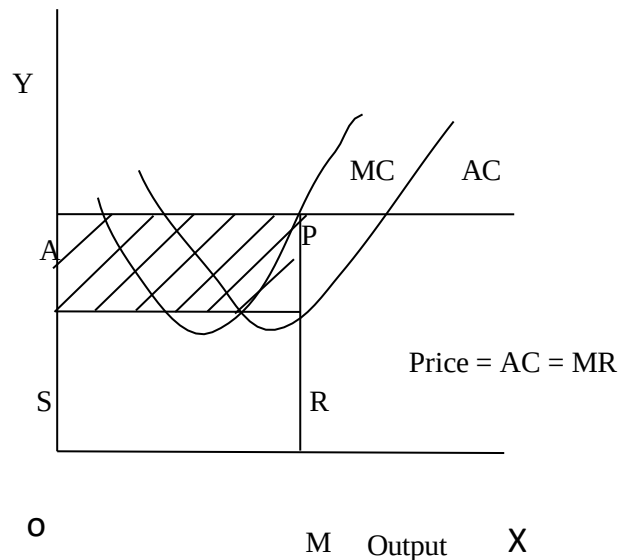
- In short run, the average cost curve is tangent (a straight line that touches a curve at a single point) to the average revenue curve. This situation represents full equilibrium of industry even in the short run all parts are earning only normal profit this will clear from this diagram.



- In this diagram the price is OA and the horizontal straight line AB represent the average revenue curve and since there is a perfect competition, it is also the marginal revenue curve the average cost and price equal at point P which indicates the firm is earning normal profits.
- The firm will be in equilibrium producing OM output.

(2) When the Average cost is lower than the Price and the firm is earning supernormal profit.

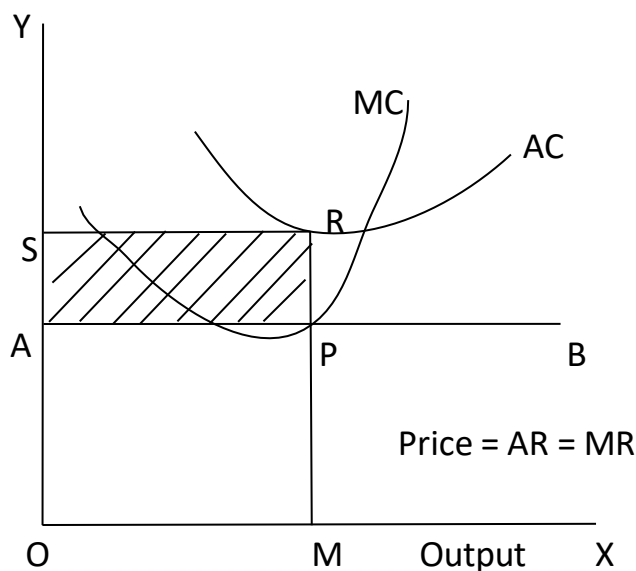
- In the short run when average cost is lower than the price, the firm earns super normal profits.
- The reason for this is that the period of time being short, new firms do not enter the industry and therefore the existing firms continue to earn super normal profit. This will clear from the following diagram.



- In this diagram the firm produces OM output at OA price. P is the equilibrium point at which marginal cost and managerial revenue are equal.
- But it should be noted here that at this point P, average cost and price are not equal; in fact price is higher than average cost therefore the firm and super normal profits to the tune of APRS which is shown in the shaded rectangle.
- In short run, under perfect competition, it is possible for firms to be equilibrium and earns super normal profits. The reason for this is that as said earlier, the period of time being short, these super normal profits are not competed away by the entry of new firms in the industry.
- It may also be pointed out here that in the short-run, although all the firms are in equilibrium producing OM output and earning super normal profits, the industry as a whole is not in equilibrium, the reason being that not all the firms are earning super normal profits.
- But as we know that one of the conditions for the equilibrium of industry is that all the firms comprising it should earn normal profits.

(3) When Average cost is higher than Price and the firm and losses

- In the short run we can also considered of a situation where the average cost of the firm is higher than the price and show the firm is not able to and normal profits that is it incurs losses.
- The equilibrium position of the firm here, therefore indicates the position of the minimum losses



- The firm will be in equilibrium at point P where its marginal cost is equal to its marginal revenue. Producing. It will be producing OM output at OA price.
- It is seen in diagram, that average cost is higher than the price OA and therefore the firm incurs losses to the extent of APRS which is shown on the shaded rectangle and this is loss incurred by it.
- Thus at the price OA, the firm is, no doubt, in equilibrium but the industry as a whole cannot be said to be in equilibrium because not all the firms are incurring losses.
- One of the conditions for the equilibrium is that all the firms comprising it must earn normal profits.
- The firms here are no doubt in equilibrium but are only in short run equilibrium.
- They are certainly not in long run equilibrium, because in the long run period, the firms will leave the industry until those who remain are able to earn normal profits.
- It should be mentioned here that in the short run the firm will continue to remain in the industry even if it does not make a normal profit the short run if the price in the market is not sufficient to cover the total average cost and the firm incurs losses it has to attend before it.

(1) Either to leave the industry

OR

(2) To remain in the industry

- Thus in the short run period of time the firm will not opt for the first alternative, that is it will not leave the industry because demand conditions are likely to improve in the long run.
- The firm therefore, will remain in the industry and continue to produce also because if the firm stops production in the short run it will have fixed cost like the rent of the building, interest charges, salary of managerial and technical personal etc.
- The firm will have to bear these cost even if it stop production in the short run.
- If it's stop production, it will lose its contact with the market and the consumers. Thus under these circumstances the firm in the short run will remain in the industry and continue its output up to that level which covers the whole of the variable firm and if possible part of the fixed cost under this situation the objectives of the firm is not maximise profit but Minimise losses this will be more than making the best of bad job.
- The price in the short run falls so low as not to cover even the variable cost, the firm will have no alternative except to close down. In short, the firm will continue to stay in the industry in the short period as long as the market price covers at least the variable cost.
- To sum up, it is possible for the firms in the short run to attain equilibrium position at that level of output which maximises profits or minimises losses. But the industry will not be in equilibrium because as we have said earlier, one of the conditions for equilibrium of the industry is that all firms must be earning normal profits.

[6.3] Long-Run Equilibrium of the Firm under perfect competition

- The long run is a period of time in which the firm can change its plant and scale of operations i.e., it may double size or reduce it to half. Thus in the long-run all costs are variable and there are no fixed costs.
- It must install new machinery and equipments and also recruit new technical and managerial personnel and it may dismantle that machinery and equipments and retrench (another way of

Terminating employees, where the reasons is not the employee's performance but the company's financial position) surplus staff.

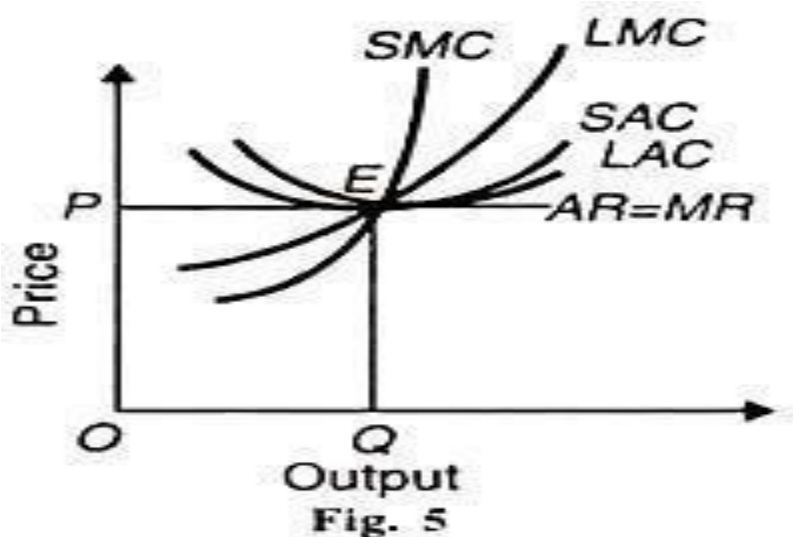
- The firm is in the long-run equilibrium under perfect competition when it does not want to change its equilibrium output.
- It is earning normal profits. If some firms are earning supernormal profits, new firms will enter the industry and supernormal profits will be competed away. If some firms are incurring losses, some of the firms will leave the industry till all earn normal profits.
- Thus, there is no tendency for firms to enter or leave the industry because every firm must earn normal profits.
- In the long-run, firms are in equilibrium when they have adjusted their plant so as to produce at the minimum point of their long-run AC curve, which is tangent (at this point) to the demand (AR) curve defined by the market price, so that they earn normal profits.

Assumptions:

- 1) Firms are free to enter into or leave the industry.
- 2) All firms are of equal efficiency.
- 3) All factors are homogenous (identical/similar). They can be obtained at constant and uniform prices.
SMC (Short-run Marginal curve)
- 4) Cost curves of firms are uniform.
- 5) The plants of firms are equal, having given technology.
- 6) All firms have perfect knowledge about price and output.

Given these assumptions, each firm of the industry will be in long-run equilibrium when it fulfils the following two conditions.

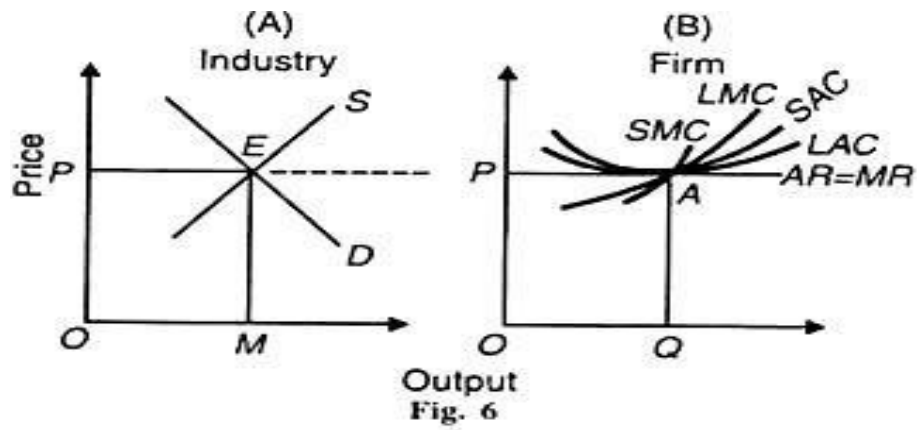
- In equilibrium, its short-run marginal cost (SMC) must equal to its long-run marginal cost (LMC) as well as its short-run average cost (SAC) and its long-run average cost (LAC) and both should equal $MR=AR=P$.
- Thus the first equilibrium condition is: $SMC = LMC = MR = AR = P = SAC = LAC$ at its minimum point, and LMC curve must cut MR curve from below.
- Both these conditions of equilibrium are satisfied at point E in **Figure 5** where, SMC and LMC curves cut from below SAC and LAC curves at their minimum point E and SMC and LMC curves cut $AR = MR$ curve from below. All curves meet at this point E and the firm produces OQ optimum output and sells it at OP price.



- Since we assume equal costs of all the firms of industry, all firms will be in equilibrium in the long-run. At OP price a firm will have neither a tendency to neither leave nor enter the industry and all firms will earn normal profits.

[7] Equilibrium of industry under perfect competition

- The industry is in equilibrium in the long - run when all firms earn normal profits. There is no incentive for firms to leave the industry or for new firms to enter it.
- With all factors homogeneous and given their prices and the same technology, each firm and industry as a whole are in full equilibrium where $LMC = MR = AR (P) = LAC$ at its minimum.
- Such an equilibrium position is attained when the long- run price for the industry is determined by the equality of total demand and supply of the industry.
- The long-run equilibrium of the industry is illustrated in Figure 6 (A) where the long-run price OP is determined by the intersection of the demand curve D and the supply curve S at point E and the industry is producing OM output.
- At this price OP , the firms are in equilibrium at point A in Panel (B) at OQ level of output where $LMC = SMC = MR = P (= AR) = SAC = LAC$ at its minimum.



- At this level, the firms are earning normal profits and have no incentive to enter or leave the industry. It follows that when the industry is in long-run equilibrium, each firm in the industry is also in long-run equilibrium.
- If both the industry and the firms are in long-run equilibrium, they are also in short-run equilibrium.

Monopoly Market

The term monopoly is derived from two Greek words "mono" which means "one" and "polist" which means "seller". Monopoly refers to **a market situation where there is only one seller or one firm with complete monopoly power**, he does not face any competition. **A monopolist has a complete control over the supply of the product for which there are no good or close substitutes.**

A monopoly firm is itself an industry and as such the distinction between firm and industry disappears under monopoly. Thus, when there is only one seller of the product for which no good or close substitutes are available and there is no competition at all, the situation is known as **monopoly situation**.

When there is only one single seller of the product in the market and there is no competition at all, the situation is known as pure or perfect or absolute monopoly. However, **pure monopoly rarely exists in reality.** It is merely a **theoretical concept**, because even the product of a monopolist has to compete indirectly with all other products of which are competing for the consumers income. All the same pure monopolies are found in developing countries like India in the form of state monopolies such as Gujarat Electricity Board, Indian Railways, Post and Telegraph Department of the Government of India, Coal India, IOCL, BHEL, GAIL, ONGC, SAIL, IEX, Pidilite, CDSL, Hindustan Zinc, etc.

[8] Price and Output Determination under Monopoly

As in perfect competition, also in monopoly the aim of firm is to earn maximum profits. Under perfect competition we have seen that an individual firm has no control over the price; it has to take the market price as given; it cannot change it, that is, under perfect competition the firm is a **price taker** and it has to adjust its output accordingly.

A competitive firm, thus it is a **price taker and output adjuster**. This, however, is not so in the case of a monopoly firm. A monopolist has completely control over the supply of the product because there are **no rival firms and therefore he has control over the price also**. A monopoly firm, thus has to decide not only the total volume of output which it has to produce, but also the price which it should charge for the product

It would, appear from the foregoing discussion that monopolists have control over the supply of the product as well as over its price. But in fact it is not so.

A monopolist cannot have it both ways, he cannot fix both the price of the product as well as the output to be sold. He can either fix the price of the product or the quantum of the product; he cannot fix the price as well as the quantum of output simultaneously. Thus, for example, the Indian postal Department as a sole monopolist for the supply of postal envelopes in the country may either decide to sell one million envelopes per year or it may be the price of the envelopes at Rs. 5 each. The department can take either of the decisions. But it cannot fix the supply of envelopes at one million and at the same time expect the people to buy all the one million envelopes at the price Rs 5/- per envelope. In short, a monopolist can either fix the price of his product or its output but he cannot fix both the price and the output simultaneously. In other words, he is bound by the relation between price and demand.

[9] Characteristics of Monopoly

1. There is a single producer or seller of the product

This single producer may be in the form of an individual owner or a single partnership or a joint stock company. There are no rivals or direct competitors of the firm and so there is absence of competition. Eg. Coal India, Indian Railways, BHEL, IEX, etc.

2. **There are no good or close substitutes available for the monopolist's product**

This means that there are no other firms producing similar products which differ only slightly from that of the monopolist. In technical language, we may say that, in a monopoly the cross elasticity of demand between the product of the monopolist and the product of any other producer is zero.

3. **Monopoly can exist only when there are strong barriers to the entry of rivals**

The monopolist can maintain his position as the sole producer or seller of a product only if the rival firms are prohibited from entering his line of production. The barriers which prevent the entry of rival firms may be either economic or institutional or artificial in nature. But the existence of strong barriers to the entry of rival firms is an essential condition of monopoly.

4. **A monopoly firm is itself an industry**

The distinction between firm and industry disappears in monopoly.

5. **Pure monopoly is a single firm industry**

Where the cross elasticity of demand between its product and the products of other industries is zero.

6. **A monopolist is a price maker and not a price taker**

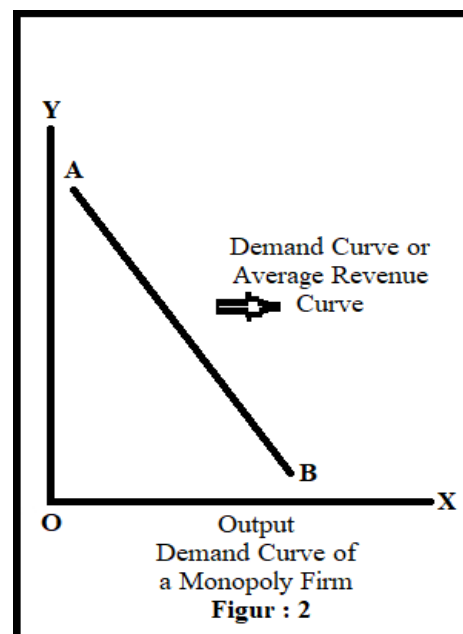
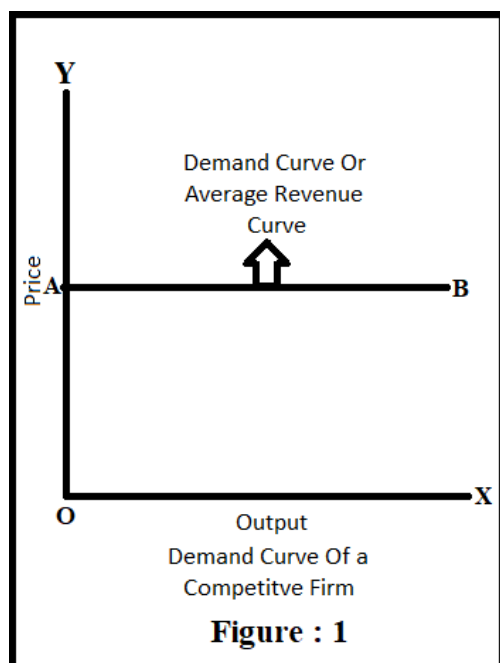
Since a monopolist has complete control over the supply of its commodity. He exercises control over its price as well. He tries to take the best of whatever demand and cost conditions exist without the fear of new firms entering to compete away his profits. Of course, a monopolist cannot have control over both the price and the supply of the commodity. If he wants to sell more, he must lower its price. Thus, a monopoly firm faces a downward sloping demand curve for its product.

[10.2] Causes of Monopoly

1. **Patents and copyrights** for the products give legal monopoly rights to firms.
2. **Government policies such as granting licences to only a few firms** or imposing tariff restrictions like import quotas result in limiting the number of firms. (Eg. Coal India, Indian Railways)
3. **Exclusive knowledge of technology** by the firm.
4. **Ownership and control** of some strategic raw materials.
5. In certain cases, the size of the market is such that **there is a scope for the operation of only a single firm and where only a large output can reap the economies of scale**. In such a case more firms will mean that none of the firms would be able to exploit the economies of scale; it would also result in unnecessary duplication of facilities. Such a monopoly is known as natural monopoly'. Examples are railways, natural gas companies, telephone firms etc.
6. **Monopoly also came into existence due to prevention of pre- venting new entry of firms**. This policy is further supple- mented by large scale advertising and continuous product differentiation so as to make the new entry unattractive.

[10] Nature of the Demand Curve (Average Revenue) under Monopoly

Under perfect competition, the demand curve or the average revenue curve is perfectly elastic: it is a horizontal straight line parallel to X-axis Indicating that the firm can sell any number of units at the prevailing market price, it has not have to lower its price to sell additional units. The reason being that an individual firm under perfect competition is but one amongst the very many firms operating in the industry and so its output firms a very small part of the total output.

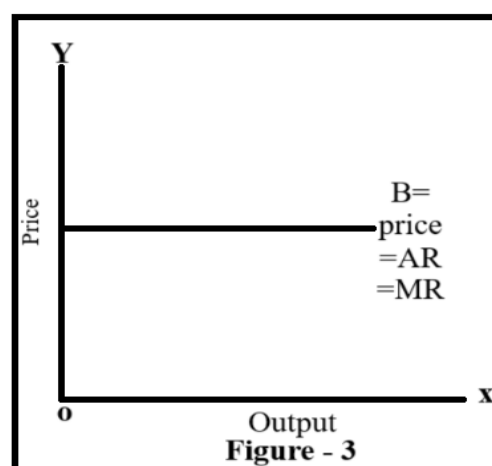


The case of a monopoly firm, on the other hand, is quite different. Here, the distinction between the firm and industry does not exist, there is only one firm which by itself constitutes the industry and its output forms the entire output. This means that a monopoly firm cannot sell any number of units at the prevailing price; if it wants to sell more units it has to lower its price. **The demand curve or the average revenue curve of a monopoly firm is not perfectly elastic but is less than perfectly elastic indicating that the firm can sell additional units only by lowering its price. This will be clear from Figure No. 2.**

[11.1] Nature of the Marginal Revenue Curve under Monopoly

Under perfect competition, we have seen that average revenue and marginal revenue are equal because the demand curve being perfectly elastic, the firm can sell additional units at the prevailing price; it is not required to lower its price in order to sell the additional units. This would be clear from the following table and graph:

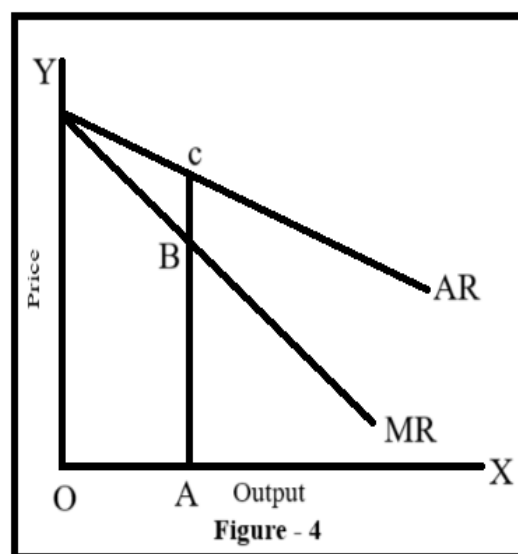
Units	Price	Total Revenue	Marginal Revenue
10	Rs. 2	RS. 20	-
11	RS.2	RS. 22	RS. 2
12	RS.2	RS. 24	RS. 2



Under monopoly, however, the demand curve average revenue of the firm is less than perfectly elastic indicating that the firm can sell additional units only by lowering its price, and this lower price is applicable not only for the marginal unit but for all the marginal units as well.

And therefore the marginal revenue is less than the price and the marginal revenue curve lies below the average revenue curve. This will be clear from the following table and graph.

Units	Price	Total Revenue	Marginal Revenue
10	RS. 2	Rs. 20	
11	RS. 1.90	Rs. 20.90	0.90
12	RS. 1.80	Rs. 21.60	0.70



It would, thus, be seen from the above tables and curves that while in perfect competition price or the average revenue and marginal revenue are equal, in monopoly price or average revenue is more than the marginal revenue or marginal revenue is less than the price.

Another thing to be noted is that since the average revenue of a monopoly firm is always falling, the marginal revenue also falls, but it falls more rapidly than the average revenue. Therefore, under monopoly conditions the marginal revenue curve lies below the average revenue curve and normally slopes downwards more swiftly than the average revenue curve.

The implication of the marginal revenue curve lying below average revenue curve is that under monopoly the marginal revenue is less than the price or the average revenue. In order to increase his sales, a monopolist has to lower its price.

Therefore, the marginal revenue must be less than the price. In the above diagram, AR is the average revenue curve which slopes downwards and MR is the marginal revenue curve which lies below the average revenue

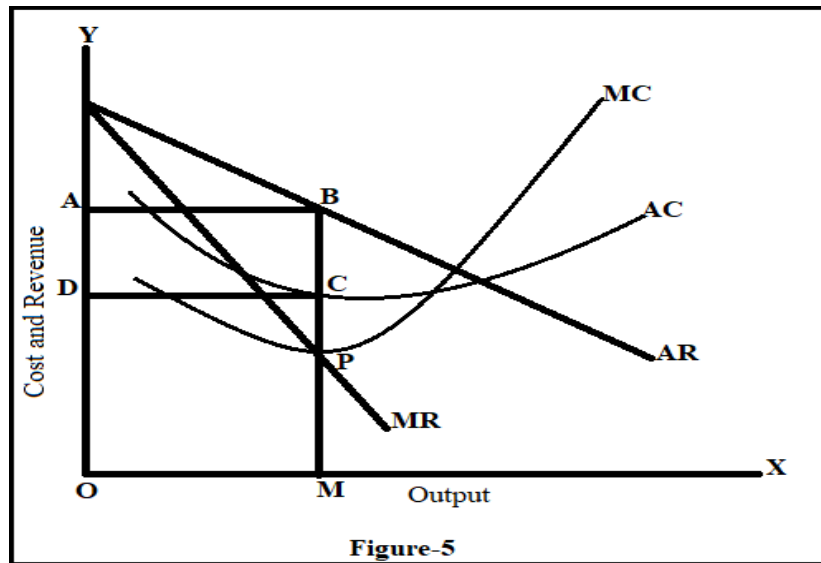
curve. Thus, when the quantity OA is produced, the average revenue or price is AC: while the marginal revenue is AB which is less than AC.

[11.2] Nature of the Cost Curves Under Monopoly

As regards the cost curves, there is practically no difference between monopoly and perfect competition. In the case of diminishing returns, both the marginal cost and the average cost show a rise, while in the case of increasing returns these costs show a fall.

[11] Price and Output Determination Under Monopoly [Equilibrium of a Firm Under Monopoly]

- As said earlier, the aim of a monopoly firm like that of a perfectly competitive firm is to earn maximum profits and therefore a monopolist will adjust his output and fix a price which will give him maximum profits.
- A monopoly firm will earn maximum profit at that level of output where its marginal revenue is equal to marginal cost.
- As long as marginal revenue is greater than marginal cost, the firm will go on expanding its output because thereby it adds more to its revenue than to its cost.
- Thus, a monopoly firm will continue to expand its production so long as its marginal revenue exceeds marginal cost.
- The firm would earn maximum profits and will attain equilibrium at that level of output where marginal revenue is equal to marginal cost.
- If the firm stops its output before this point, it would be unnecessarily foregoing some profits which otherwise it could have earned; on the other hand if the firm increases its output beyond this point marginal revenue would be less than the marginal cost and so the firm would be incurring losses.
- In short, a monopoly firm would be in equilibrium at that level of output where its marginal revenue is equal to its marginal cost. This would be clear from the Figure - 5
- In this diagram, AR is the average revenue curve or the demand curve of the monopoly firm, MR is the marginal revenue curve which lies below the average revenue curve, AC is the average cost curve and MC is the marginal cost curve.
- Marginal revenue and marginal cost are equal at point P where the firm produces OM output. The monopoly firm, therefore, is in equilibrium at OM level of output where marginal revenue is equal to marginal cost.
- It will also be seen from the AR curve that the firm will be getting the price MB or OA by selling OM output. But the average cost of OM output is MC only. Hence CB is the per unit profit. The total profit earned by the firm is indicated by the area ABCD.
- It would be interesting here to note an important difference and the equilibrium condition of a firm working under perfect competition and the one under monopoly. In perfect competition, when the firm is in equilibrium, the price is equal to marginal revenue and since marginal revenue and marginal cost are equal, price is equal to marginal revenue and marginal cost. **Thus under perfect competition, when the firm is in equilibrium :**



$$\text{Price} = \text{Marginal Revenue} = \text{Marginal Cost}$$

$$P = MR = MC$$

- However, in the case of a monopoly firm, under equilibrium conditions marginal revenue is equal to marginal cost, but price is greater than these two. The main reason for this is that the demand curve or the average revenue curve of a monopoly firm is a downward sloping curve and its marginal revenue curve lies below the average revenue curve.
- Therefore, in equilibrium, while marginal revenue is equal to marginal cost, it is less than the price or average revenue. Thus, under monopoly condition: Price is greater than marginal revenue and marginal cost, the latter two being equal $P > MR = MC$

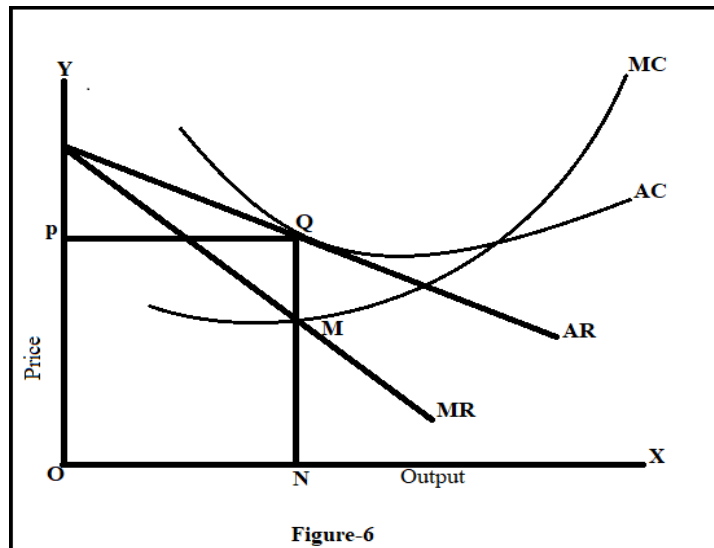
[12.1] Short-run Equilibrium of a Monopoly Firm

- Short run is a period during which the firm can change the level of its output in response to a change in demand only by changing the amount of variable factors. It cannot change the size of its plant or other fixed equipment. The firm in the short run can change the scale of its operations but not its size.
- A monopoly firm will, therefore, be in short-run equilibrium at that level of output where its marginal revenue is equal to its marginal cost and the monopoly price is equal to its average cost or more than the average cost or less than the average cost. We can, therefore, conceive of a situation where in a monopoly firm in the short-run equilibrium:
 - **earns normal profits** when the monopoly price is **equal to average cost**.
 - **earns super normal profits** when the monopoly price is **higher than the average cost**.
 - **does not even earn normal profits**, that is, the firm incurs **losses**. However, a monopoly firm in the short run will continue to produce even if the price is less than the average cost, that is, it is incurring losses. But in this case, the firm will try to minimise its losses so long as it is able to cover the whole of its variable costs and a part of its fixed costs. It will, of course, go out of business if it is not in a position to cover even the variable cost in the short run. In the long run, however, the monopoly firm must cover both the fixed and the variable costs.

- However, in all the three above mentioned cases, the basic condition of equilibrium, that is, equality of marginal revenue and marginal cost continues to operate. In case of (b) above, the firm gets maximum monopoly profit, while in (c) the aim of the firm is to minimise losses.

This can be illustrated with the help of following diagrams:

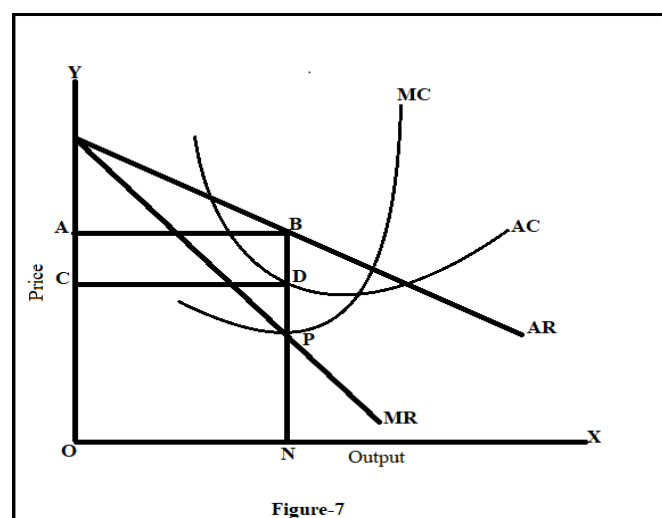
(A) Monopoly Firm Earning Normal Profit:



- In this diagram, at point M, marginal revenue and marginal cost are equal and the firm produces ON output.
- The price is OP or NQ which touch the average cost- and average revenue curves at point – Q.
- As the price is equal to average cost at - Q, the monopoly firm earns only normal profits.

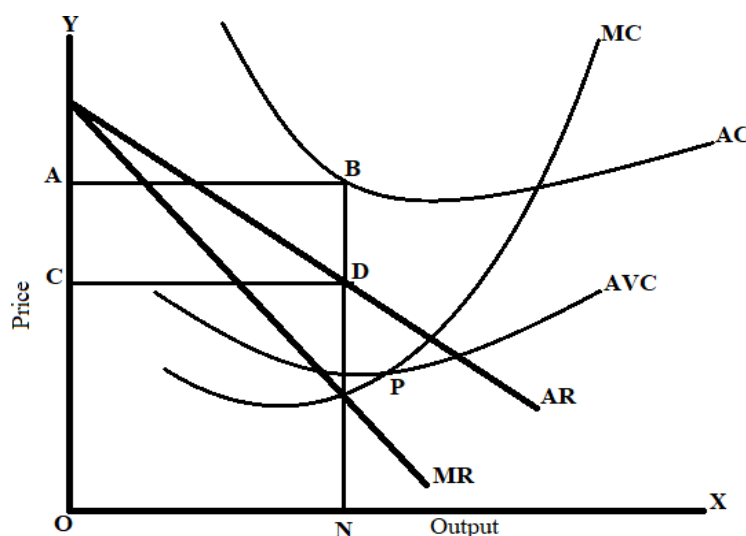
(B) Monopoly Firm Earning Super-normal profits OR Monopoly Profits

- In this diagram, at point P marginal revenue and marginal cost are equal and the firm produces ON output.
- The price is OA or NB and the average cost is ND, in other words the monopoly price NB is higher than the average cost ND and so the firm is able to earn monopoly profit as represented by the area ABCD.



(C) Monopoly Firm Incurring Losses

- In this diagram, the monopoly firm is in equilibrium at ON level of output, because the marginal revenue and marginal cost are equal at point P.
- The price is OC or ND which covers only the average variable cost. But the total average cost is NB and therefore the firm will be incurring losses to the extent of ABCD.
- This is the minimum loss which it has to suffer in case. However, the price AND falls below the average variable cost or if the loss represented by ABCD continues in the long run, the firm will go out of business.



- The price is OC or ND which covers only the average variable cost. But the total average cost is NB and therefore the firm will be incurring losses to the extent of ABCD. This is the minimum loss which it has to suffer in case.
- However, the price AND falls below the average variable cost or if the loss represented by ABCD continues in the long run, the firm will go out of business.

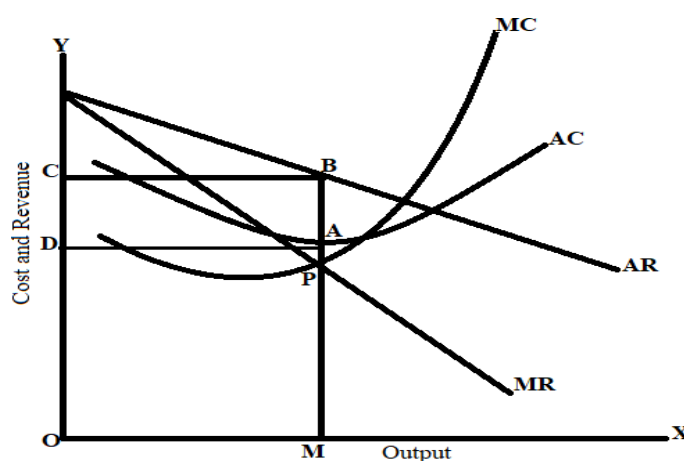
[12.2] Long-run Equilibrium of a Monopoly Firm

- The long run refers to that period of time which is sufficiently long enough to enable the firm to adjust its output to changes in the conditions of demand.
- A monopoly firm, in the long run can change the size of its fixed equipment, it can vary the output not only by changing the amount of variable factors but also by changing the amount of fixed factors like plant, machinery, other fixed equipment etc.
- Thus, in the long run, it is possible for a monopoly firm not only to change the scale of its operations but also its size
- The long run equilibrium of a monopoly firm will be attained at that level of output where its marginal cost is equal to its marginal revenue.
- It should also be noted here that in the long run equilibrium of a monopoly firm, the monopoly price may either be equal to its average cost or more than the average cost.

- But in no case, it can be less than the average cost, for this would imply that the monopoly firm is incurring losses even in the long run which cannot happen.
- However, the greater probability is that the monopoly price is higher than the average cost even in the long run and this enables the firm to earn supernormal profits or monopoly profits.
- An important reason for this is that there is no free entry for other firms to enter this field. Thus, while in perfect competition, super normal profits in the long run are competed away by the free entry of other firms, a monopoly firm can continue to earn supernormal profits even in the long run.

The long run equilibrium of a monopoly firm can be illustrated as follows:

- In this diagram, the monopoly firm is in long run equilibrium at OM Level of output. because marginal cost and marginal revenue are equal at point P.
- The monopoly price is OC or MB and the average Cost is MA. The monopoly price MB is higher than the average cost MA and as such the firm earns a monopoly profit as represented by the area ABCD.



[12] Price Discrimination

- A monopoly firm which adopts the policy of price discrimination is known as "discriminating monopoly."
- Price discrimination means charging different prices from different customers or different groups of customers for a similar product or service.
- When a monopoly firm sells the same product or service at different prices to different customers it is known as **discriminating monopoly or price discrimination**.
- In the words of **Mrs. Robinson**, the act of selling the same article produced under a single control at different prices to different buyers is known as price discrimination.
- According to **Stonier and Hague**, Discriminating monopoly or price discrimination occurs when a monopolist charges different prices for different units of a commodity even though these units are in fact homogeneous in so far as their physical nature is concerned.
- To be noted here that a perfectly discriminating monopoly rarely exists because it is difficult to come across a situation where a monopoly firm charges different prices for different units of the same commodity from the same consumer. In actual practice, when we speak of price discrimination, we

usually refer to discrimination between groups of buyers rather than discrimination between units of homogeneous product.

- Price discrimination is not possible under perfect competition, because in the first place. There are a large number of firms in the industry producing identical or homogeneous products. Besides, both the firms as well as the consumers have a perfect knowledge of the market and therefore, if any firm charges even a slightly higher price than the ruling market price. It would lose its sales and the customers would make their purchases from the rival firms. Thus, as pointed out by Stonier and Hague, "discrimination between customers is incompatible with perfect competition."
- Price discrimination is possible only when the manufacturer of a product or the availability of a service is in the hands of a monopolist who can fix his own price. This power enables him to charge different prices from different consumers or groups of consumers or in different markets. This policy of price discrimination of a monopolist is also known as discriminating monopoly.

[13] Forms of Price Discrimination

(i) Personal Discrimination

Personal discrimination occurs when different prices are charged from the different buyers according to their incomes or the intensity of their desire. Thus, for example, a surgeon may charge a high operation fees from a rich patient and lower fees from a poor patient. Likewise, lawyers may charge different fees from different types of clients depending on their income status. A teacher also discriminates between rich and poor students as regards his tuition fees.

(ii) Age Discrimination

Price discrimination may also be practiced on the basis of the age of the buyers. Usually, buyers are grouped into children, adults, senior citizens, physically handicapped etc. Thus, for example, hair dressers generally charge lower rates for children's hair cut than those for adults. Likewise, in railways and bus transport services, children up to 5 years of age are allowed free travel, upto 12 years half the rates are charged and soon. In Indian Railways, senior citizens i.e, persons above the age of 60 are given 40 to 50 percent concession in ticket fares.

(iii) Local Discrimination

When a monopolist charges different prices in different markets located at different places, it is known as location or geographical discrimination. "Dumping" is the best example of local discrimination, under which a producer sells his goods at a lower price in the foreign market than in the domestic market. Likewise, A film producer may sell distribution rights of his pictures to different firms in different territories at different prices.

(iv) Trade Discrimination

Trade discrimination is also known as use discrimination under which a monopolist may charge a lower price for one trade or use than for another trade or use. Thus, for example, an electricity distributing company may charge lower rates for industrial use and a higher rate for domestic use.

(v) Time Discrimination

On the basis of the time of service, different rates may be charged. Thus, for instance, the owner of a cinema house may charge lower rates for morning and matinee shows than for evening and night shows. Likewise, air transport companies offer discounts on air tickets during slack season.

(vi) Size Discrimination

On the basis of the size of the product, different prices may be charged. For example, an economy size tooth paste tube is usually available at a lower price than the small size tube.

(vii) Quality Variation Discrimination

When different prices are charged for the same product on the basis of some quality differences it is known as quality variation discrimination. Thus, for instance, the deluxe edition of a particular book is available at a higher price than its paper – back edition.

[14] Degrees of Price Discrimination**(a) Price Discrimination of the First Degree**

In the first degree price discrimination, the monopolist finds out the maximum price which a consumer is prepared to pay for the different units of the product or service. By charging different prices for different units the monopolist takes away the entire consumer's surplus of the buyers in other words, the buyer is forced to pay a price which is equal to the maximum amount which he is willing to pay for the product or service rather than go without it. Thus under the first degree price discrimination, the buyer is left with no consumer's surplus. For instance, a surgeon or a lawyer may charge different fees for similar different operations or civil suits even from the same consumer. And the consumer may be willing to pay a competent surgeon or lawyer the highest fee which he can afford rather than go without his services. However, in real life, this type of price discrimination is rarely found.

(b) Price Discrimination of the Second Degree

Here the monopolist takes away only a part and not the whole of the customer's surplus. He charges different prices for different quantities or "blocks" of the same product or service. In this case, the product is divided into different blocks of units and for each block, a different price is charged. Thus, for example, an electricity company may charge a higher rate for the first few units (say 100 units) of the electricity consumed, a lower rate for the next few units consumed and a still lower rate for the next few units.

(c) Price Discrimination of the Third Degree

Here the monopolist divides the consumers into separate groups or markets according to their income, location, types of uses of the product and charges different prices from each group of consumers, though the monopolist incurs the same cost in serving each group of buyers. In other words, in the price discrimination of the third degree, the monopolist has before him the existence of two or three markets and in each of these markets, elasticity of demand is different. Price discrimination of this type is most common. Thus, for example, air companies charge regular and special airline fares, likewise, certain producers offer some discount to students and senior citizens.

[15] Essential Conditions for Price Discrimination to be Possible and Profitable**(i) Price discrimination is possible under monopoly**

The discriminating firm must be a monopolist. Of course, under other forms of imperfect competition like oligopoly and monopolistic competition, if the firms agree on following a common price policy, price discrimination will be possible under such conditions also.

(ii) A monopolist can indulge in price discrimination successfully only when he has before him at least two or more than two markets for his product or service

If there is only one market or one group of buyers for the product, price discrimination will not be possible. In other words, price discrimination can take place only if it is possible for the seller to split up the total demand of the product into different markets. It is important to state here that the different markets should be completely segmented from one another so that buyers of one market cannot go to the other market. Thus, for example, the owner of a cinema house has different markets or groups of buyers like balcony, first class, second class and so on. Likewise, railways too have different markets, all conditioned, first class, second class, etc.

(iii) The elasticity of demand for the product should be different in different markets

If this happens, only then the seller would be able to charge a higher price in the market where the demand for the product is inelastic and a lower price in the market where the demand is elastic. However, if the elasticity of demand is the same in different markets at the single monopoly price, he will not be benefitted from price discrimination. It is only when elasticity of demand is different in markets, the monopolist will be benefitted from price discrimination.

(iv) The cost of keeping the different markets separate must not be too high in proportion to the differences in the elasticities of demand

If this cost is unduly high price discrimination may be possible but it would not be profitable. Thus, for example, if the owner of a cinema house has to spend a large amount of money in keeping the various classes separate, price discrimination may be possible but not profitable.

(v) The demand for the product or service must not be transferable from the high - priced market to the low - priced market. This usually happens when the markets are segmented on the basis of income and wealth. Thus, for example, a rich man will not pause to be poor in order to avail of the benefit of paying lower fees to a surgeon. Likewise, if persons in the higher income groups do not buy deluxe editions of certain popular books and wait for the paper-back editions to come out, personal discrimination in books will not be possible.

(vi) There should not be any possibility of resale of the product or service from the consumers in the low-priced market to the consumers in the high-priced market.

If it is possible to resell the product from the low-priced market to high-priced market, the firm will not be able to carry on with its policy of price discrimination. Thus, for example, if industrial users of cheaper electricity can resell it for direct consumption to domestic users, there will not be a difference in rates for the electricity consumption.

(vii) Price discrimination becomes possible on account of ignorance or laziness of the buyers.

Many times, it so happens that buyers are not aware that prices in one part of the market are lower than in another part. And even where the customers are aware of this fact, they may rather avoid going to the cheaper market because of their laziness.

(viii) Let-go Attitude of the Buyers

When price differences between the different markets are very small, the consumers do not think it worthwhile to consider such discrimination. Many times, the buyers have a tendency to ignore small differences in prices.

(ix) Consumers' Illusion

Price discrimination becomes possible when consumers have an irrational feeling that because they are paying a higher price for the product, they receive a better and a high quality product. Obviously, there is hardly any difference between seeing a film from the last row of the second class stall and the first row of the first class stall and yet a cinegoer of the first class derives greater pleasure from occupying a higher – priced seat. Preferences and prejudices, thus, make price discrimination possible.

(x) Price discrimination is often noticed when markets are separated by distance or tariff barriers, so that it becomes expensive to transfer goods from a cheaper market to be resold in the dearer market.

A monopolist may sell the same product at a higher price in Ahmedabad and at a lower price in Rajasthan or Punjab. Likewise, a producer may sell his product at a higher price in the home market which is protected by tariff and where there is no competition for his product at a lower price in the foreign market where he has to face stiff competition. This kind of price discrimination is known as dumping and is often noticed when markets are protected by tariffs on imports.

(xi) Nature of the Commodity or Service

Price discrimination is also based on the nature of the commodity or service, so that it is possible for the seller to charge different prices from different customers. This happens, particularly, when the commodity in question is a direct service. In case of direct personal services, price discrimination is easily followed due to their non-transfer ability characteristic. Obviously, a rich person cannot go on behalf of a poor man to get cheaper medical treatment from a doctor. Similar, is the case with personal services of a lawyer, a teacher, an engineer, an architect, etc. Since resale of such direct services is not possible, differences in their prices can exist for different customers. Thus, for example, a surgeon may charge different fees from rich and poor patients for performing similar surgical operations.

(xii) Legal Sanction

There may be legal sanction for price discrimination. For instance, Gujarat Electricity Board charges a lower rate of power-tariff for agricultural use and a higher tariff rate for industrial and domestic use. Likewise, there are different freight rates charged by railways for transporting different types of goods.

Price Determination Under Monopolistic Competition

Course content:

Price Determination under Monopolistic Competition.

- ☞ Features of Monopolistic competition.
 - ☞ Nature of Demand curve and Marginal Revenue (MR) Curves
 - ☞ Concept of Group Equilibrium
 - ☞ Price & output determination in Short-run & Long-run under Monopolistic competition.
-

Introduction:

The concept of monopolistic competition which is a leading form of imperfect competition has been developed by the eminent American economist **Prof. E. H. Chamberlin** in his book. "**The Theory of Monopolistic Competition**". The concept is more realistic than the concept of either pure competition or pure monopoly. According to Prof. Chamberlin, in real life there exists neither pure competition nor pure monopoly, but an admixture of both competition and monopoly to which he calls monopolistic competition. **most economic situations are composites of both competition and monopoly.**

(1) Main Characteristics of Monopolistic Competition

The main characteristics of monopolistic competition are as follows:

(i) Existence of Fairly Large Number of Firms:

In monopolistic competition there are large number of firms, but not so large as in perfect competition. As a result, no one firm controls a significant proportion of the total market supply. The output decision of an individual firm does not affect the output decision of any other firm. Here, each firm decides about its price-output policies independently without considering the possible reactions of the rival firms. In other words, since there are a large number of firms any action by an individual firm either in price-cut or price rise and in increasing or decreasing output will have no effect on other firms. Action of an individual firm does not influence other firms in any significant way. Each firm controls only a small part of the total output and as such any action on its part to increase or decrease the output and the price will have little or no effect on the rival firms. In short, the existence of fairly a large number of firms represents the element of competition.

(ii) Product Differentiation:

Another important characteristic of monopolistic competition is the existence of product differentiation. According to **Chamberlin**, the distinguishing feature of monopolistic competition which makes it a blending of both **competition** and **monopoly** is the differentiation of products. This means that various firms produce **not identical or homogeneous products, but differentiated products which are closely related to each other**. Thus, the various products are **close substitutes and not perfect substitutes to each other**. Product differentiation means that products are different in some ways, but not altogether so. In short, under monopolistic competition **the products of the various firms are similar but not identical or homogeneous**. Thus, for example, different brands of toilet soaps like Lux Rexona, Nirma, Cinthol different brands of toothpastes like Colgate Close-up, Promise, Babul etc. are some of the examples of product differentiation.

Methods of Product Differentiation:

A product may be differentiated in several ways:

- a) Characteristics of the product itself such as exclusive patented features, trade mark, trade name, etc. Similarly, special types of packing and wrapping, differences in quality, design, color or style of the product also bring about such differentiation.
- b) Product differentiation may exist with respect to the conditions surrounding the sale of the product. Thus, factors such as the convenience of the seller's location the general appearance of his shop or attractive display of the product, his way of doing business. his reputation for fair dealing courtesy, efficient handling of sales display of the product, his way of doing business. his reputation for fair dealing, courtesy, efficient handling of sales Price Determination Under Monopolistic Competition and all the personal links which create the attachment of the customers either to himself or to those employed by him. Likewise, offer of supplementary services to the customers like home-delivery of goods, guarantee of repairs and servicing, acceptance of sold goods, credit facilities etc. also bring about product differentiation.
- c) Product differentiation is also brought about through advertisement, salesmanship, publicity and propaganda. This is known as "sales promotion". These create real or imaginary differences in the minds of the customers about the different products and they differentiate the product of one firm from that of other firms.

(iii) Selling Costs:

Along with product differentiation, firms under monopolistic competition must undertake sales promotional activity. Expenditure on this activity is known as selling costs. Such costs are not necessary in

perfect competition because of homogeneous products and perfect knowledge of the market; likewise, under monopoly, because of the existence of one firm and the non-availability of good or close substitutes for the product, selling costs are not necessary. But under monopolistic competition, as there are large number of firms and there is product differentiation, it becomes essential for the firms to incur selling costs. **These costs are incurred to alter the position or shape of the demand curve for a product.** Selling costs are incurred to persuade the buyers to buy a particular firm's product in preference to that of other firms. These costs include all media advertisements and publicity through radio, television, slides, press-publicity, hoardings, demonstrations, exhibition, displays, etc. It is interesting to study various ways of sales promotion by different producers of "similar" products like tooth pastes, washing powders, toilet soaps, talcum powders, etc.

(iv) Different Prices for Differentiated Products:

Under perfect competition there cannot prevail more than one price of the product. But under monopolistic competition, each firm produces a differentiated product and through repeated advertisements and publicity, each firm tries to create an impression on the minds of the customers that its product is superior to that of its rival firms. The differences may be real or imaginary, but the fact remains that consumers come to regard the product of one firm as superior to that of other firms. And when once this happens, **the firm gets a partially independent market for its product and can charge even a slightly higher price than that of its rivals.** That is why we find different prices prevailing for different brands of tooth pastes, washing powder, toilet soaps, talcum powder etc. The extent of this price differential depends on the degree of product differentiation. If the consumers think that there is a high degree of product differentiation, differences in the price of the products will be large and if there is a less degree of product differentiation, price differences will be small.

(v) Control over Price:

In monopolistic competition because of product differentiation, each firm has a partially independent market and therefore it has some control over the price, which a firm in perfect competition does not have. Product differentiation, thus, attaches a group of buyers to the product of a particular firm irrespective of slight price differences. Under monopolistic competition, therefore, an individual firm can exercise some control over the price: it can charge a higher price without fear of losing all its customers. It is only when price differences are very large that the customers of one firm may be attracted towards other firms by the prospects of lower prices.

In short, an individual firm under monopolistic competition enjoys some sort of monopoly power, in that it has the power to fix the price, but at the same time it is also subject to the competition of differentiated

products of the rival firms. Now, since each firm is monopolist at least in the restricted sense and yet has competitors. The situation is known as monopolistic competition.

(vi) Free Entry and Exit of Firms:

Under monopolistic competition, new firms can and do enter the industry without any restrictions whatsoever or existing firms may leave the industry as and when they like. Those firms which continue to incur losses leave the group in the long run, whereas existence of super normal profits attracts new firms in the group.

(vii) Concept of Group:

Professor Chamberlin has used the word "**group**" instead of industry. Industry refers to a number of firms producing homogeneous and identical products under perfect competition. Under monopolistic competition, as we have seen, different firms produce not identical products but **similar or differentiated** products which are close substitutes to each other. Professor Chamberlin, therefore, has used the concept of group to imply a collection of firms producing closely-related but not homogeneous products.

(2) Demand Curve of a Firm Under Monopolistic Competition:

We have seen that the demand curve of firms working under Perfect competition is perfectly elastic. It is a straight line parallel to X-axis, which indicates that the firm can sell any number of units at the prevailing market price. It has not to lower the price in order to sell additional units.

But the demand curve of a n individual firm under monopolistic competition is not a horizontal straight line parallel to X-axis, it is neither perfectly elastic as in perfect competition nor rigidly inelastic as in monopoly. The demand curve of a firm under monopolistic competition is less than perfectly elastic. This Implies that the firm cannot sell any amount of the product at the current ruling price; If it wants to sell more, it must lower the price. Thus, the demand curve AR does not run parallel to X-axis: it is a downward sloping elastic MR curve to the right, though its downward slope is rather Output gradual. Whether the demand the curve of a firm under monopolistic competition would be more elastic or less elastic would depend upon the degree of product differentiation. If the degree of product differentiation is small, the demand curve would be more elastic: and if the degree of product differentiation is large, the demand curve would be less elastic. The marginal revenue curve of the firm would lie below the average revenue curve. The slope of both these curves would be gradual and slight. The average and marginal revenue curves do not coincide, nor do they run parallel to X-axis.

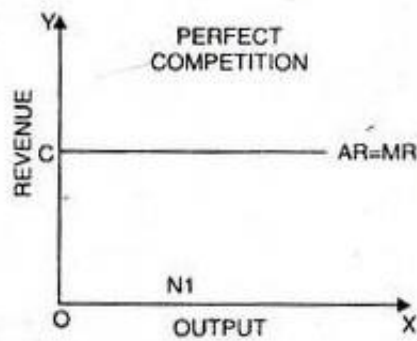


Fig.2

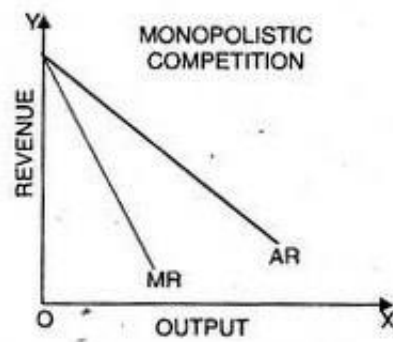


Fig.1

In the diagram, AR is the average revenue curve or the demand curve. It has a continuous downward slope throughout its length. MR is the marginal revenue curve which lies below the average revenue curve.

3] Equilibrium of a Firm Under Monopolistic Competition:

As in other market situations, the equilibrium of a firm under monopolistic competition is also attained at that point where marginal revenue is equal to marginal cost. However, in order to maximize profits, a firm under monopolistic competition has to consider three variables:

(i) Price of the product (ii) Nature of the product (iii) Advertising outlay (selling costs)

(i) Price of the Product:

We have seen that a firm under monopolistic competition exercises some control over price through product differentiation

It may raise the price of its product and still not lose all customers Likewise if it lowers the price of its product, it may attract some customers of the rival firms but cannot get all the customers Thus, price output adjustments become necessary for a firm under monopolistic competition it must choose that price-output combination which gives maximum profits. Let it be remembered that a firm under perfect competition has no such price-output adjustment problems.

(i) Nature of the Product:

The total sales of a firm under monopolistic competition also depend upon the extent to which its product is different from the products. Here product variation refers to a change in the quality of product such as technical improvement or superiority, new design, use of superior materials etc. Besides prompt and courteous service and other facilities to the customers. As in price output combination the firm will choose that type of product differentiation which will ensure maximum profits Thus monopolistic competition

involves not only the problem of price equilibrium but also the problem of equilibrium with product differentiation.

(iii) Advertising Outlay: (Selling Costs):

In monopolistic competition a firm tries to influence the volume of its sales by incurring advertising outlay or selling costs. This additional expenditure by the firm increases both its cost and the demand for its product. A firm therefore, has to adjust its advertising outlay and the demand for its product in such a way as to ensure maximum profits.

Monopolistic competition thus, involves the problems of price- equilibrium with product differentiation and equilibrium with selling costs.

(3) Equilibrium of a Firm Under Monopolistic Competition in the short-run:

Equilibrium of a firm under monopolistic competition can be studied in the short run and in the long run. It is based on the following assumptions:

- a) There are many firms and each firm is having some monopoly power due to its product differentiation.
- b) Each firm has a demand curve average revenue curve) which is less than perfectly elastic.
- c) There is free entry and exit of firms (of course not in the short period).
- d) The short run cost curves of each firm differ from each other.

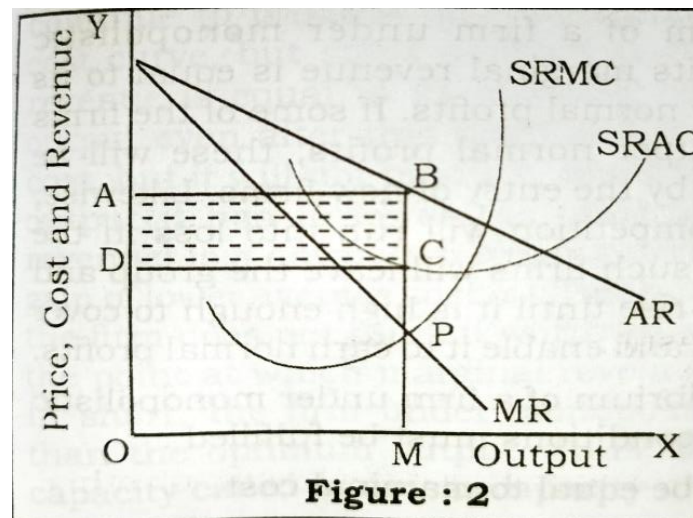
[3.1] Short-run Equilibrium of the Firm:

Prof Chamberlin, has used the word individual to connote short run equilibrium of a firm under monopolistic competition. Given the assumptions discussed above each firm will aim at that level of price output which gives it maximum profits. The equilibrium price and output of the firm in monopolistic competition will be determined at that point where its marginal cost is equal to its marginal revenue.

Another point to be noted is that in the short run equilibrium of a firm under monopolistic competition a firm may earn supernormal profits or it may incur losses or it may earn simply normal profits. Thus, for example, a firm in the short run may earn supernormal profits because other rival firms are not able to produce closely competitive substitutes, nor can new firms enter the group in the short period. Likewise, some of the firms may incur losses in the short run, but still, they will remain in business and continue production as long as they are able to cover whole of their variable costs and part of the fixed costs. Similarly, we can also conceive of a situation wherein the firm in the short run earns only normal profits. This would be clear from a study of the following diagrams:

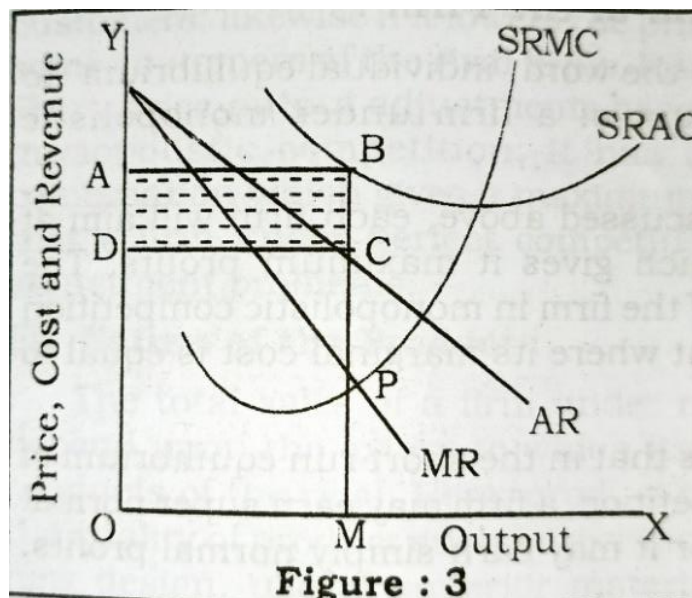
(i) Individual Firm Earning Super Normal Profits in the Short-run:

In this diagram P shows the equilibrium point of the firm where short run marginal cost is equal to marginal revenue; and it produces AN output at OD price. The average revenue BM is greater than the average cost BC and which is indicated by the rectangle ABCD. This is the super normal profit which the firm earns in the short period. As said earlier, the reason for this is that in the short-run, other firms find it difficult to bring about closely similar products and the new firms do not enter the group in the short period.



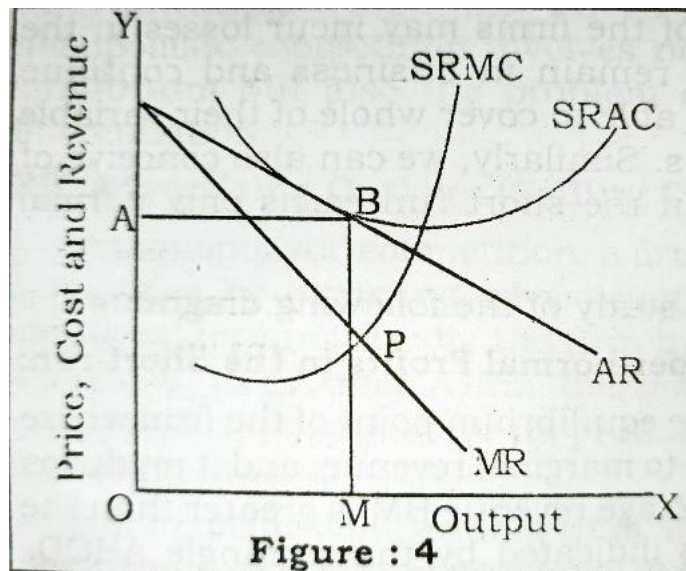
However, it is not necessary that all firms in the industry must earn supernormal profits. Since, by assumption, the cost curves of the firms differ from each other some firms may be even incurring losses because of higher costs, while some others may be earning only normal profits.

(ii) Individual Firm Incurring Losses in the Short-run:



In this diagram at point P, the short-run marginal cost curve is equal to marginal revenue and the firm produces OM output at OD price. But as this price OD or CM is less than the short-run average cost at the equilibrium level of output, the firm incurs a loss of BC which is shown by the rectangle ABCD.

(iii) individual firm earning only normal profit in the short-run:



In this diagram, at point P, the short-run marginal cost curve is equal to marginal revenue and the firm produces OM output at OA price. The demand curve or the average revenue curve is a tangent to the short-run average cost curve at point B at the level of OM output. The firm, here, earns only normal profits.

(3.2) long run equilibrium of the firm under monopolistic competition:

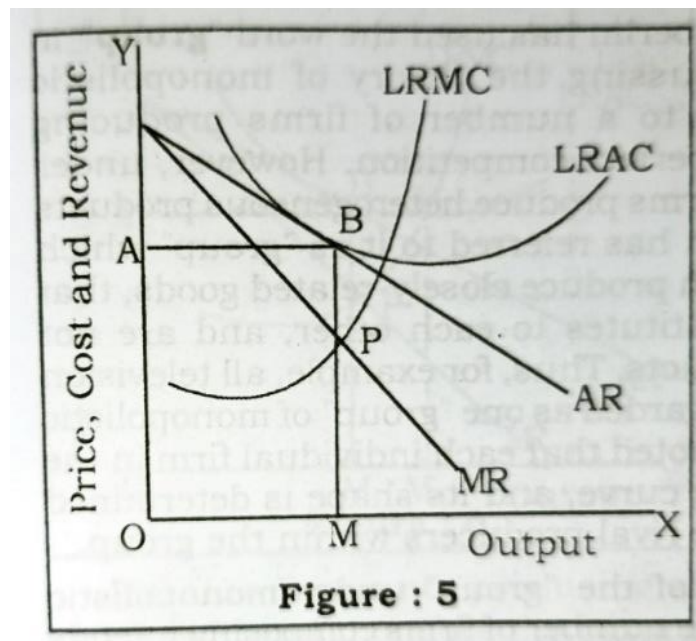
The long run equilibrium of a firm under monopolistic competition is attained when its marginal revenue is equal to its marginal cost and it earns only normal profits. If some of the firms in the group are earning supernormal profits, these will be competed away in the long run by the entry of new firms. Likewise, no firm under monopolistic competition will run into loss in the long run, because in that case such firms will leave the group and so the price of the product will rise until it is high enough to fully cover the average cost of the firm and enable it to earn normal profits.

Thus, in the long run equilibrium of a firm under monopolistic competition, the following two conditions must be fulfilled:

- a) Marginal revenue must be equal to marginal cost.
- b) Average revenue must be equal to average cost

This would be clear from the following diagram:

marginal revenue and marginal cost are equal at point P and therefore OM is the equilibrium output OA or MB is the long run equilibrium price. The demand curve or the average revenue curve is a tangent to the long run average cost curve at point B, that is, at point B average X revenue is equal to average cost and therefore the firm earns only normal profits.



It should, however, be pointed out here that the long run equilibrium of a firm under monopolistic competition is similar to that of a firm under perfect competition in one respect, namely, in both these conditions, a firm can earn only normal profits in the long run. But then there is one important difference also. Under perfect competition, when the firm is in equilibrium, it is producing its output at the minimum average cost because the average revenue curve (demand curve) of the firm is a horizontal straight line parallel to X-axis. But in monopolistic competition, the firm does not produce its output at the minimum average cost. This is because the firm's average revenue curve (demand curve) is not a horizontal line but slopes downwards to the right and hence it is impossible for it to be a tangent to a give U-shaped average cost curve at its minimum point

In other words, under monopolistic competition, equilibrium output is smaller than the optimum output. The firm does not continue to produce till the minimum or lowest point of average cost curve, but stops production at the point where its marginal revenue is equal to its marginal cost. The firm can produce the output even after this point and that too at the reduced average cost, but it will not produce, because in order to sell the additional output it has to lower the price as the demand curve (average revenue) is a downward sloping curve towards the right. Thus, the gain of lower average cost is offset by reduction in price and therefore the firm does not think it worthwhile to increase its output beyond the point at which marginal revenue and marginal cost are equal. In short, the firm under monopolistic competition produces less than

the optimum output. Thus, there remains some unutilized capacity called excess capacity under monopolistic competition.

(4) Group Equilibrium or Long-run Equilibrium of a Firm Under Monopolistic Competition:

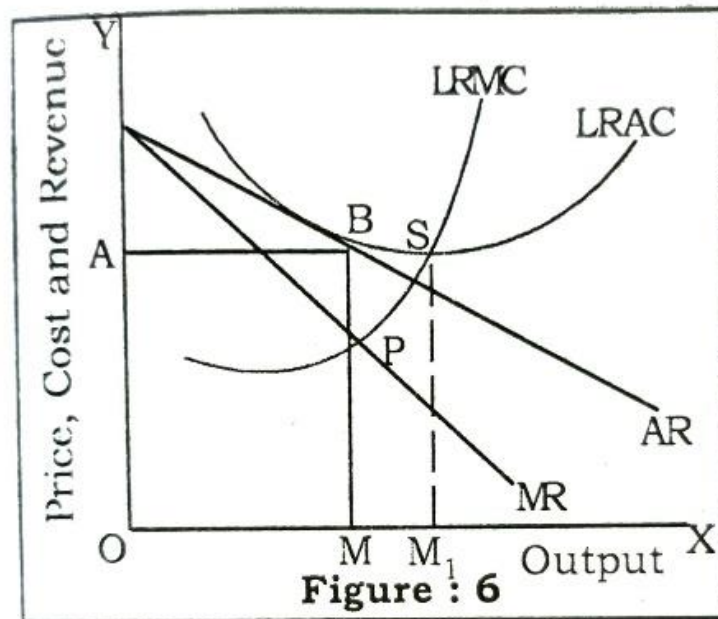
As said earlier, Prof. Chamberlain has used the word "**group**" in place of industry, while discussing the theory of monopolistic competition. Industry refers to a number of firms producing homogeneous products under perfect competition. However, under monopolistic competition, the firms produce heterogeneous products and therefore Prof. Chamberlain has referred to it as "group" which implies collection of firms which produce closely related goods, that is goods which are close substitutes to each other, and are not identical or homogeneous products. Thus, for example, all television manufacturing firms may be regarded as one "group" of monopolistic competitors. It should also be noted that each individual firm in the group has a downward sloping curve, and its shape is determined by the actions of the very close rival producers within the group.

The long run equilibrium of the group" under monopolistic competition is attained when the number of firms composing it tends to remain the same, that is, new firms have no incentive to enter the group and the existing firms have no reason to leave the group. Such a situation will happen only when all the firms in the group are earning normal profits. If some of the firm in the group are earning supernormal profits, these will be competed away in the entry of new firms in the group. Similarly, if some firms are incurring losses, that is, they are not able to earn even normal profits, they will leave the group. This process of entry or exit of the new or existing firms will continue till all the firms in the group earn only normal profits.

Again, it should also be noted here that under perfect competition, when the industry is in equilibrium, each firm produces at the minimum average cost and the firm tends to be of the optimum size, because the average revenue curve of the firm is a horizontal straight line. But in monopolistic competition, when the group is in long run equilibrium, each firm produces an output which is less than the optimum output, that is, it does not produce at the minimum average cost. The firm stops its output at the point where marginal revenue is equal to marginal cost. If the firm increases its output beyond this point, it can do so and obtain the increased output at a lower average cost. But it does not do so because the demand curve (average revenue curve) is a downward sloping curve and therefore in order to sell the additional output, it has to lower the price. Thus, a firm under monopolistic competition stops its production earlier than in perfect competition. The volume of output available to the society is less under monopolistic competition than in

perfect competition. This results in some unused capacity called excess capacity which is a salient feature of equilibrium under monopolistic competition.

This would be clear from the following diagram:



In this diagram the LRVC average revenue curve (demand curve) is a tangent to average cost curve at point B. Marginal cost and marginal revenue are equal at point P. The firm, therefore, is in long run equilibrium producing OM output at OA or MB price. As average revenue is equal to X average cost, the firm earns only normal profits. LRAC Revenue B AR MR Price, Cost and M₁ Figure Output 6 But this firm is not producing at the lowest average cost point which is S, and therefore the output OM is less than the optimum: output OM₁. In other words, there is excess capacity to the extent of MM₁ output. Thus, the firm under monopolistic competition does not utilize its full capacity which is equal to OM₁, it produces only OM output which is less than the optimum output OM₁.

REVIEW EXERCISES 2

Q. 1. What is monopolistic competition? State its main features and explain the process of price determination in monopolistic competition.

Q .2. What is meant by "group equilibrium"? How does a "firm" and "group" achieve an equilibrium position in monopolistic competition?

Q.3. Examine the following statements:

(a) Product differentiation and selling costs are important features of monopolistic competition.

(b) In monopolistic competition, the firm is not of the optimum size.

Q.4. In order to earn maximum profits in monopolistic competition, would the firm prefer price-cutting or selling costs? Why?

Q.5. Write short notes on:

(i) Features of monopolistic competition

(ii) Product differentiation

(iii) Group equilibrium

SHORT QUESTIONS WITH ANSWERS

Q.1. State the main features of monopolistic competition. OR

Give the definition of monopolistic competition. State any four characteristics of monopolistic competition. OR (April, 2015, April, 2017)

The main features of monopolistic competition are as follows: 1) There are a large number of firms in monopolistic competition but not so large as in perfect competition. 2) There is product differentiation. 3) There is the existence of selling costs. There are different prices for differentiated products. 4) The firm has some control over the price. 5) There is free entry and free exit of firms.

Q. 2. What is product differentiation? On what factors does it depend?

Product differentiation means various firms in monopolistic competition do not produce identical or homogeneous goods, but those which are close substitutes to each other. Their costs are different in some ways, but not altogether those on which product

differentiation depends are as follows Characteristics of the product itself like exclusive patented feature trade mark, trade name, etc. #Conditions surrounding the sale of the product, like convex of the seller's location, his reputation for fair dealing. Curse offer of supplementary services like home delivery of goods, acceptance of sold goods, credit facilities, etc. (Advertising and salesmanship, publicity, propaganda etc. known as sales promotion.

Q. 3. What is the nature of the demand curve of a firm under monopolistic competition? Why is it so?

The demand curve of a firm under monopolistic competition is neither perfectly elastic as in perfect competition nor is it rigidly inelastic as in monopoly. It is less than perfectly elastic which means that the firm cannot sell any amount of the product at the current ruling price: if it wants to sell more, it has to lower the price. Thus, the demand curve does not run parallel to X-axis; it is a downward sloping elastic curve to the right.

Q.4. Explain the difference between price competition and non-price competition.

When the firms enter into competition with each other by changing the price of their products. It is known as price competition. But when they compete by improving the quality of their products or through product differentiation or through incurring selling costs, it is known as non-price competition.

Q.5. When do firms attain equilibrium under monopolistic competition in the short run?

In monopolistic competition, the firms attain equilibrium in the short run at that point where marginal cost is equal to marginal revenue. Besides, in the short run, the firm may earn supernormal profits or it may incur losses or it may earn only normal profits. The firm may be able to earn supernormal profits in the short-run, because other rival firms are not able to produce closely competitive substitutes, nor can new firms enter the "group" in the short period. Likewise, some of the firms incur losses in the short run, but they will remain in business and continue production as long as they are able to cover all of their variable costs and if possible, part of the fixed costs. The equilibrium position here will be of minimum losses. Similarly, we can also conceive of a situation where some firms in the short run are earning only normal profits.

Q. 6. What is meant by "group"? State the conditions of group equilibrium.

Prof. [Chamberlin](#) has used the word 'group' in place of industry while discussing the theory of monopolistic competition. Group refers to a collection of firms which produce closely-related goods, that is, goods which are close substitutes of each other. Thus, for example, all refrigerator manufacturing units may be regarded

as a group of monopolistic competitors. The important conditions of long run equilibrium of group are as follows:

- (i) All firms in the group earn only normal profits.
- (ii) The size of the group remains the same: that is new firms have no incentive to enter the group and the existing firms have no reason to leave the group.
- (iii) The marginal cost and marginal revenue of each of the firms in the groups is equal. However, the average revenue or price is greater than marginal revenue
- (iv) Firms in the group do not produce up to the minimum average cost. They stop production at the point where marginal cost is equal to marginal revenue. The firms, therefore, are not of the optimum size: there is some unused capacity called excess capacity.

QUESTIONS ASKED AT THE VEER NARMAD SOUTH GUJARAT UNI. EXAMINATION

Q.1. State the features of monopolistic competition market. Explain the short-run and long-run equilibrium of a firm under monopolistic competition. **(October, 2011)**

Q.3. State the features of monopolistic competition. Explain how a firm under monopolistic competition attain equilibrium under the long run. **(October, 2012)**

Q. 4. Write a note on: (a) Product differentiation. **(October, 2013, April, 2017).**

(b) Features of monopolistic competition. **(October, 2013, October, 2015)**

Q.5. Write a short note on: Wastages under monopolistic competition. **(April, 2014, October, 2015)**

Q.6. Illustrate the equilibrium of a firm under monopolistic competition in the short run. **(October, 2015)**

Pricing Under Oligopoly

Course content

- **Price under oligopoly Features of Oligopoly**
- **Kinky Demand curve Price Leadership.**
- **Types**
- **Characteristics. Advantages**
 - [1] **Introduction.**
 - [2] **Characteristics of Oligopoly.**
 - [3] **Price Determination Under Oligopoly.**
 - [4] **Price Leadership.**

Introduction:

The term "oligopoly" is derived from the Greek word "oligos" which means few and the latin word "polis" which means seller. Oligopoly, thus, refers to a situation where there are few sellers or few firms in the market and which produce either homogeneous products or products which are close substitutes to each other. It is also known as competition among the few."

Oligopoly is different from both perfect competition and monopoly. The number of firms in perfect competition as also in monopolistic competition is quite large and the size of each firm is small and therefore its behavior has no influence on the decisions of other firms in the market. In the case of monopoly, there is only one firm in the industry and therefore the question of reaction from other firms does not arise. In oligopoly, however, there are only a few of these firms every firm influences and is influenced by firms of large size which compete against each other and therefore. There is an element of interdependence in the decision making of the behavior of other firms. Oligopoly is generally found in such industries like automobiles, steel, cement, aluminum, petroleum products, etc.

Characteristics of Oligopoly:

The main characteristics of oligopoly are as follows:

1. Few Firms (Sellers):

Oligopoly is a market-situation where there are few firms producing either homogeneous products or differentiated products. Sometimes, it is also referred to as "competition among the few." Because of the small number of firms, each firm accounts for a substantial part of the total output of the industry and hence its policies have a notable impact on the market. particularly on the price and the output.

2. Interdependence of Firms:

As said earlier, both in perfect competition and in monopoly. the question of interdependence of firms does not arise. This is because while in perfect competition there are a large number of firms of small size and each one produces a very small part of the total output of the industry, in a monopoly there is only one firm and so the question of interdependence does not arise.

But in oligopoly, however, there are only a few firms of large size and each firm accounts for a large part of the market demand and therefore, it is in a position to influence the price and output of the industry in a significant manner. Each firm, as such. has to take into account the action and reaction of its rival firms while deciding on its price and output policies. There is. therefore, a great deal of interdependence of firms

under oligopoly. The price and output decisions of one firm are taken into consideration by other competing firms. The cross elasticity of demand is very high between the products of the various oligopoly firms because the products are close substitutes and so there is always a fear of retaliation by rival firms to each other.

3. Importance of Advertising and Selling Costs:

Advertising and selling costs have a strategic importance to oligopoly firms. Given the high-cost elasticity of demand for products and price rigidity in oligopoly, the only way open to an oligopoly firm to increase its sales is by advertising or by improving the quality of its product. Various aggressive and defensive marketing techniques must be used by the firm to gain a larger share of the market or to survive. As Baumol has put it, "it is only under oligopoly that advertising comes fully into its own." He further adds, "under oligopoly, advertising can become a matter of life and death, where a firm fails to keep up with the advertising budget of its competitor. may find its customers drifting to rival products. This fact is amply borne out by the large-scale advertisements for products like automobiles, rubber tyre, electrical and electronic goods like T.V. Refrigerators, A.C. etc.

4. Indeterminate Demand Curve:

The demand curve of a firm working under oligopoly conditions is indeterminate, that is, it is not definite because it is difficult for the firm to predict the reactions of its rival firms pertaining to its price and output policy. Thus, no firm under oligopoly can be sure of the results of its price-output decisions. For example, it cannot say with any degree of certainty that if it reduces the price of its product say by 5 percent or increases its advertising outlay by 10 percent, what would be the effect on its sales. This is, because the rival firms may not reduce the price or reduce it to the same extent or they may also increase their advertising outlay. As such, the demand curve of the firm cannot be definite or determinate. What we generally find is that a firm under oligopoly may not have a single determinate demand curve, but rather it may have a "family of such curves", each curve being based on one possibility. (v) Presence of Monopoly Element:

In oligopoly, if the products are differentiated, the firms enjoy some sort of monopoly power as each product will have some loyal customers attached to it. In other words, product differentiation attaches a group of buyers to a particular firm irrespective of slight price differences. The firms in oligopoly, thus, get a partially independent market for their products, and thus enjoy the freedom to fix price and output at the desired level. Besides, when firms enter collusion with each other, they can work together to raise the price and earn some monopoly income.

5. Conflicting Attitudes of the Firms:

Another important feature of oligopoly is the existence of two conflicting attitudes on the part of the firms, one is that of cooperation and unified action and the other is that of conflict and antagonism. On the one hand, the rival firms realize the disadvantages of mutual competition and accordingly enter into a collusion and tacit agreement about price, output, and market. They work together to serve their common interest. It, thus, leads to monopoly within oligopoly. On the other hand, the desire of each firm to earn maximum profit tends to create conflict and antagonism among the rival firms. These conflicting attitudes of firms under oligopoly create an atmosphere of uncertainty and makes it difficult to predict any regular pattern of pricing behavior in such markets. (i) Price Rigidity:

Under oligopoly, prices tend to be sticky or rigid. If any firm resorts to price-cutting, it will attract the customers of the rival firms. The rival firms, therefore, will retaliate by cutting down their prices. This will result in a price-war which will not benefit any firm. Hence a firm under oligopoly will not take recourse to price-cut. On the other hand, if any firm increases its price to earn more profits, the rival firms will not follow it and so the firm which has raised the price may find itself out of the market. Hence, firms under oligopoly have no tendency to change the price.

Price Determination Under Oligopoly:

Due to the indeterminate nature of the demand curve under oligopoly as also because of the conflicting attitudes of the firms. There is no single and simple solution to the problem of price determination under oligopoly. There are many possible solutions of which the main ones are as follows:

1.Kinked-demand curve model.

2.price leadership model

3.collusive oligopoly price

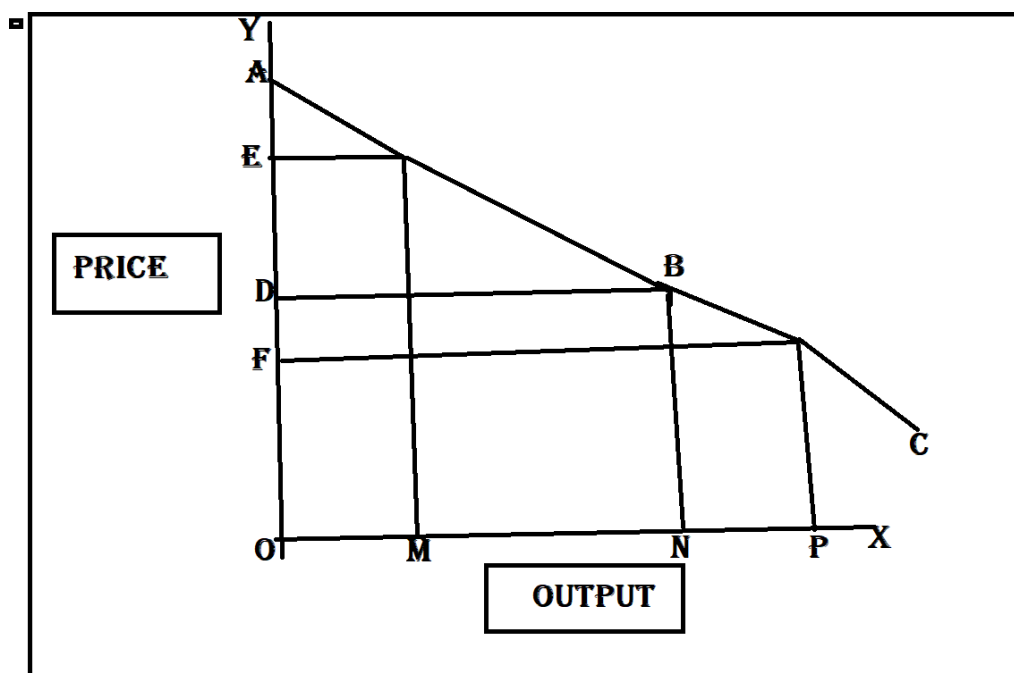
(1) Kinked - demand curve model

The kinked demand curve model was first used by Paul M. Sweezy in 1939 in his article "Demand Under Conditions of Oligopoly" to explain price rigidity under conditions of oligopoly. The assumption behind the theory of kinked demand is that each firm under oligopoly will act and react in a way that keeps conditions tolerable for all the firms in the industry. The kinked demand curve represents the pattern of business behavior of a firm which has no incentive either to lower or to raise its price. The firm believes that if it lowers the price of its product, the rival firms will also react and lower their price; on the other hand if it raises the price, the rivals will not follow suit. The oligopoly firm, therefore, has every incentive to hold prices where they are. Reduction in prices would be matched quickly by the rivals and so nobody

would gain, while increased prices would not be matched by the rivals and so the firm which has raised the price would lose.

In other words, under conditions of oligopoly, the firm finds that when it raises the price, its rivals do not follow it, but when it reduces its price, the rivals immediately follow it. The firm, therefore, prefers to stick to the existing price.

Paul Sweezy in 1939 introduced a theory of pricing in oligopolistic industries which is based on the concept of a kinked demand curve. An oligopoly firm faces a kinked demand curve on the assumption that if it decides to raise its price, its rivals will not raise their prices, but if it lowers its price, they will definitely react to its action and will lower their prices. The kink in the demand curve indicates stickiness of prices. At this kink, prices are sticky which shows that price reduction by a firm is followed by its rivals, but price increase is not. The firm, therefore, will not like to move away from this kink. This will be clear from the following diagram:



It will be seen from this diagram that the kinked demand curve ABC is made up of two segments which are separated at the price that has been established in the industry. The demand segment corresponding to lower prices is less elastic than the demand segment corresponding to higher prices. The reason is that price reduction by the firm is followed by its rivals, while price increase is not followed by the rival firms.

Thus, for example, the above diagram shows a kinked demand curve that may be faced by a firm in an oligopolistic industry. The original price is OD where the sales are equal to ON. Now, if the firm raises the prices from OD to OE, but as other rival firms do not follow this price rise, the sales are reduced from ON to OM. Thus, the AB part of the demand curve appears more elastic. Conversely, if the firm reduces its price from OD to OF, but as other rival firms also follow this price reduction, there is only a slight increase in sales from ON to OP. Hence, the BC part of the demand curve appears less elastic.

Price Leadership Model:

Price leadership model explains the upward adjustment of prices in oligopoly markets. Under this model, one of the oligopoly firms acts as price leader which determines and fixes the price and this price is accepted by all other firms in the industry. The firm taking the leadership in fixing a higher price willingly takes the risk of being the first to adjust its price and it expects other firms to follow it. If the firm taking the leadership reduces its price, it expects other firms also to reduce their prices.

In short, price leadership is said to exist when firms fix their prices in accordance with the price charged by one of the firms in the industry. The firm which takes the initiative in announcing its price changes is called the "price leader." All other firms in the industry are termed as price followers. Thus, for example, General Motors is considered the price leader of the American Car Industry.

[4.1] Types of Price Leadership : Price Leadership mainly is of three types:

(i) The Barometric Price Leadership:

In barometric price leadership, all firms agree to follow the price changes made by a firm which is supposed to have a good knowledge of the market conditions and thus can forecast future happenings in the market better than others. Thus, an experienced firm which possesses an ability to accurately predict demand conditions and knowledge of market supply, takes leadership in fixing the price. The firm chosen as leader in this manner is a kind of barometer which reflects the changes in the market. The barometric firm is not necessarily a low cost or a large firm. Generally, a firm which has earned the reputation of a good forecaster is assigned the role of a leader and other firms in the industry follow it.

(ii) The Dominant Firm Price Leadership:

The dominant firm is a relatively large firm in the sense that it accounts for a very part of the market output. Other firms are small in comparison and as such accept the price leadership of the dominant firm.

These small firms are unwilling to take the risk of being the first to make any change in price or are under fear that they may be driven out of the industry by the dominant firm. In other words, the dominant firm sets from its own point of view a profit maximizing price and allows the small firms to sell all they wish at that price. The small firms are merely price-takers; they accept the price fixed by the dominant firm and adjust their output to get maximum profit. The dominant firm fully knows that the small firms will follow its price and therefore it chooses that price where it can itself earn maximize profits.

(iii) The Low-Cost Price Leadership:

In the oligopoly market sometimes the price is set by the most efficient or the low cost firm, and although other firms are not in a position to maximize their profits at this price, yet they have no choice but to accept it. This is known as price leadership by the low cost firm. In other words, when one firm has a substantial cost advantage over the other firms. it assumes the role of a price leader. If other firms try to wage a price-war and fix their prices at a still lower level, they will lose the battle and go bankrupt because their average cost is much higher than that of the leader firm. They, therefore, choose to become price-followers.

[4.2] Essential Conditions for Price Leadership: For a firm to be the price leader, the following main conditions should be fulfilled:

(1) Low Production Cost and Adequate Financial Resources:

The price leader firm must have a clear cut advantage over other firms in production cost and productive capacity. Besides, it must have adequate financial resources to withstand the losses of a price-war.

(2) Substantial Share of the Market:

Generally, the largest firm in the industry becomes the price leader in view of its substantial share in the market.

(3) Reputation for Sound Pricing Decisions:

A firm with a reputation for sound pricing decisions based on better information and more experienced judgment than other firms is well equipped to take the price leadership.

(4) Initiative:

Quite often a firm which first develops a product or area retains the price leadership irrespective of its

share in the market.

(5) Aggressive Pricing Policy:

Sometimes, a firm may grab leadership through lower prices and thereby take away for itself large and profitable markets from the rival firms.

[4.3] Main Characteristics of Price Leadership: The following are the main characteristics of price leadership:

- 1) Usually, a price leader firm makes few, but large and dramatic price changes, because frequent price changes are likely to undermine the loyalty of the followers, besides giving an appearance of vacillating attitude on the part of the price leader.
- 2) Generally, the price leader leads only in price rise; in the case of price reduction the leader becomes a follower.
- 3) The price leader changes the price only when he feels that the change in demand and cost conditions is of a permanent nature. In case of a temporary change in price, he meets it by offering informal concessions.
- 4) The price leader must also be ready to incur the risks of a price war in order to establish and maintain his leadership.
- 5) The price leader has a significant role to play in forecasting effectively and accurately, the demand and cost conditions to inspire the confidence of its followers.
- 6) When there are significant differences in quality, service and reputation in an industry, the price leader himself provides the best of such services and charges a slightly higher price.
- 7) Once the price leadership is established, it is sustained as much by the followers as by the leader.
- 8) Usually, the price leader takes a long run point of view, that is, he is willing to sacrifice short term benefits for long-run benefits.

[4.4] Advantages of Price Leadership:

The following are some of the main advantages of price leadership:

- 1) Very often the small firms have no sufficient insight into the principles of costing. Accordingly, they safely assume that if a big firm with an efficient costing department has calculated a certain

price, it must be reasonably

- 2) correct. Price leadership, thus, proves helpful to small firms in their price fixation policy.
- 3) Price leadership is an easy method of pricing as it requires a simple casual inquiry as to the prices of other firms. Besides, it avoids the expense of production and cost studies as also market surveys to estimate the demand. It has been seen from the experience that the executives of the price leader firm are quite competent in their pricing judgements so that other firms feel quite safe in following its lead.
- 4) Price leader tends to keep the price stable and is usually keen to avoid price wars. Accordingly in times of recession, the price leader makes all possible efforts to prevent a rapid fall in prices on the part of any firm. Besides, the more inelastic the demand for a product, more efforts the leader has to put in to maintain prices.
- 5) It has also been said that price leadership has helped in reducing the intensity of cyclical fluctuations. It is perhaps due to price leadership that prices have not gone as high in boom periods or as low in depression as they would have otherwise gone.
- 6) Under price leadership, all firms know that there would be no recourse to destructive price-wars, that is, there is an implicit idea of "live and let live" in price leadership.
- 7) Due to price leadership, the number of possible reactions to a price change considerably Reduced and this imparts an animal of certainty to the pricing aspects of market forecasting.

9. 3. Write short notes on:

- (1) Interdependence of firms under oligopoly.**
- (ii) Indeterminate demand curve under oligopoly**
- (ii) Conflicting attitudes of firms under oligopoly**

9. 4. What is meant by price leadership? Discuss the essential conditions for price leadership.

9.5. Enumerate the salient features of price leadership and state its advantages.

SHORT QUESTIONS WITH ANSWERS

9. 1. Give the definition of oligopoly.

Oligopoly refers to a situation where there are few sellers or few firms in the market and which produce either homogeneous or products which are close substitutes to each other. It is also known as "competition among the few". Here each firm influences and is influenced by the behavior of other firms. Each firm accounts for a substantial part of the total output of the industry.

9.2. State the main features of oligopoly.

The main features of oligopoly are as follows:

- 1) In oligopoly there are a few firms which produce either homogeneous products or differentiated products.
- 2) Because of the small number of firms, each firm accounts for a substantial part of the total output of the industry and so its policies have a notable impact on the market.
- 3) There is interdependence of firms in oligopoly. The price and output decisions of one firm are considered by other firms.
- 4) Advertising and selling costs have a strategic importance in oligopoly.
- 5) The demand curve of a firm under oligopoly is indeterminate.
- 6) There is the presence of a monopoly element.
- 7) There is a conflicting attitude of firms, one of mutual cooperation and another of conflict.
- 8) Prices tend to be sticky or rigid in oligopoly.
- 9) Firms in the oligopoly market have a kinked demand curve.

9. 3. What is price leadership? State its main conditions.(April, 2012)

Price leadership is said to exist when firms fix their prices in accordance with the price charged by one of the firms in the industry. The firm which takes the initiative in announcing its price changes is called the price leader and other firms as price followers. The following are the main essential conditions for price leadership:

- (i) Low production cost and adequate financial resources.
- (ii) Substantial share of the market.
- (iii) Reputation for sound pricing decisions. (iv) Initiative.
- (v) Aggressive pricing policy.

9.4. Indicate the main characteristics of price leadership.

The following are the main characteristics of price leadership:

- 1) Usually a price leader firm makes few, but large and dramatic price changes.
- 2) Generally the price leader leads only in price rise; in the case of price-reduction, the leader actually becomes a follower.
- 3) The price leader changes the price only when changes in demand and cost conditions are of a permanent nature.
- 4) The price leader plays an important role in forecasting effectively and accurately the demand and cost conditions so as to inspire the confidence of its followers.
- 5) The price leader must be ready to incur the risks of price- war in order to establish and maintain his leadership
- 6) The price leader takes a long run point of view; that is, he is willing to sacrifice short term benefits for long run benefits.

9.5. What are the advantages of price leadership?

- 1) The following are some of the main advantages of price leadership:
- 2) Price leadership is helpful to small firms in their price fixation policy.
- 3) Price leader tends to keep the price stable and is usually keen to avoid price-wars.
- 4) Price leadership helps in reducing the intensity of cyclical fluctuations.

- 5) The executives of the price leader firm in general possess the necessary expertise in forecasting the demand, in under- taking production and cost studies and pricing judgements. so that other firms feel quite safe in following its lead.
- 6) Price leadership avoids destructive price-wars; there is an implicit idea of "live and let live" in price leadership.

QUESTIONS ASKED AT THE VEER NARMAD SOUTH GUJARAT UNI. EXAMINATIONS:

- 9.1. Explain the kinked demand curve model of oligopoly market. (April, 2012, October, 2016)
- 9.2. Write a short note on:
 - (i) Price Leadership. October, 2011, April, 2013, October, 2012, April, 2014
 - (ii) Kinked demand curve. October, 2012, October, 2013, April, 2016
- 9.3. State the features of an oligopoly market. Explain the kinked demand curve model with the help of a diagram. (April, 2013)
- 9.4. What is oligopoly? Explain how price and output decisions are taken under conditions of oligopoly. (Oct., 2013)
- 9.5. State the characteristics of oligopoly market. (October, 2014)
- 9.6. Explain price rigidity under oligopoly in terms of kinked demand curve.

ECONOMICS FOR MANAGERS

FYBBA (Sem-2)

UNIT 4: PRODUCTION ANALYSIS (25%)

Chapter 4.1 Production Function

Course content

- [1] Introduction - Meaning of Production**
- [2] Factors of Production.**
- [3] Production Function.**
- [4] Assumptions of Production Function.**
- [5] Short-run and Long-run Production Function.**
- [6] Forms of Production Function.**
- [7] Cobb-Douglas Production Function.**

[1] MEANING OF PRODUCTION

Production implies creation or addition of value. According to **Prof. Nicholson**, *"Production is the creation or addition. of those economic utilities which in general are the result of labour, possess exchange value and are appropriated."* In this sense, production can be defined as **creation of values**. Such values may exist in the form of goods or in the form of direct services.

Production. thus, does not mean creation of utilities but creation or addition of value. It essentially implies transformation of one set of goods into another; **production is an activity that transforms inputs into output**. Thus, for example, a textile mill uses such inputs like labour, raw materials like cotton, dyes, etc. and capital invested in textile machinery as also in factory building to manufacture cloth. This process of transformation can be:

- (i) A change in form (for example wood into furniture) which is - known as **form utility**.
- (ii) A change in space through rail, road, sea or air - goods are transported from a place of plenty to a place of scarcity; this is known as **place utility**:
- (iii) Change in time, that is, goods are kept in store till required time, say like Woolen clothes, umbrellas etc. this is known as **time utility**.

The above three types of transformation help in increasing the usability of goods and commodities.

Production, thus, involves producing, storing and distributing goods, and services both tangible (like food grains, cloth, steel, cement etc.) and intangible (like services of doctors, lawyers, teachers as services like banking, insurance etc.) In short production is an activity that increases consumers usability of goods, commodities and services.

[2] FACTORS OF PRODUCTION

To produce a given output of goods and commodities, we require the use of productive resources and these are called factors of production. **Fraser** defines *"factors of production as a group or class of original productive resources."* The term factor is used for a class of productive elements, the individual members of which are known as '**units**' of the factor and all the units of a factor are homogeneous and interchangeable.

[2.1] Classification of Factors of Production:

[2.1(1)] Land:

(A) Meaning of Land: Land is the first and primary factor of all the factors of production and the source of all material goods. In the ordinary sense, the term '**land**' means soil, but in economics it is used in a much wider sense. It refers to all natural resources like water, air, fisheries, forests, mountains, hills, mines and minerals etc. **The term land, thus, includes all that nature has created on the earth, above the earth and below the earth. In the words of Prof. Marshall, "Land means the materials and the forces which nature gives freely for man's aid in land and water, in air and light and heat."**

Land, thus, would include all gifts of nature in the form in which they exist before man begins to work upon them. It will also include all the natural resources: like rivers, mountains, oceans, climate, sunshine, air etc. In other words, land stands for all natural resources which yield an income and which are under some person's ownership and control.

(B) Characteristics of Land: Land as a factor of production possesses some important features which distinguish it from other factors of production. The following are its main features;

- (i) Land is a gift of nature.
- (ii) Supply of land is fixed.
- (iii) Land is not perishable.
- (iv) Land is an immobile factor of production.
- (v) Land differs in quality.

[2.1 (2)] Labour:

(A) Meaning of Labour: In the ordinary language, the term labour is used to mean "manual or "physical labour, but in Economics it is used in a much wider sense so as to include mental labour as well. Any work - whether physical or mental which is undertaken for a monetary consideration is called labour in Economics, while on the other hand, any work which is done for the sake of pleasure, love or hobby will not be considered as labour in Economics. According to **Dr. Marshall; Any exertion of mind on body undergone partly or wholly with a view of some good or aim other than the pleasure derived from it directly from the work is called labour"**.

In other words, the term "labour" in Economics implies two things:

- a) Labour - whether manual or mental must be undergone not for its own sake but with a view to getting some reward out of it.
- b) Labour must result in the creation of wealth. that is, something which has exchange value.

(B) Characteristics of Labour: The following the main features of labour which distinguish it from other factors or production:

- (i) Labour cannot be separated from labourer.
- (ii) Labour is the most perishable commodity.
- (iii) Supply of labour changes slowly.
- (iv) Labour is much less mobile than capital.
- (v) Labour differs in efficiency:
- (vi) Supply of labour responds slowly to changes in its price.

[2.1(3)] Capital:

In Economics, the term capital is used in a special sense. According to some writers, **"capital in that part of man's wealth other than land, which yields an income."** But this is not a correct definition of capital, because a person may lend some money to others and get an income, but this money will not be called as capital.

Similarly, securities, bonds, stocks etc. possessed by a man give him an income but these too cannot be regarded as capital because they represent titles of ownership while capital is a factor of production.

The generally accepted definition of capital is that it is a **produced means of production**. This definition indicates two aspects of capital: (a) the original aspect (b) the acquired aspect.

Only that part of wealth which is used for further production or future production is to be regarded as capital.

(A) Characteristics of Capital.

The following are the main characteristics of capital as a factor of production:

- (i) Capital is man – made
- (ii) Supply of capital is elastic.
- (iii) Capital is productive.
- (iv) Capital is the result of saving.
- (v) Capital makes it feasible to have large scale production.

2.1(4) Organisation or Enterprise:

(A) Meaning of Enterprise: In the foregoing pages, we have discussed about the three factors of production, namely, land, labour and capital. Now we shall study something about the fourth factor, that is, organisation or enterprise. Land, labour and capital are, no doubt, important factors of production, but, they by themselves cannot produce anything; they must combine, coordinated and directed so that production can take place. The person who performs this function is known as organiser or entrepreneur. Although organisation is only a kind of labour, yet it is such an important and peculiar type of labour that it must be treated separately. The organiser or the entrepreneur plays a very important role in modern production.

Functions of an Entrepreneur:

The following are the main functions of an entrepreneur

- (i) Choice of the enterprise.
- (ii) Planning and location of the enterprise.
- (iii) Co-ordination of the factors of production.
- (iv) Purchase of raw materials and marketing of finished products.
- (v) Directing and supervising the various productive operations.
- (vi) Rewards to the factors of production.
- (vii) Risk and uncertainty bearing.
- (viii) To adopt innovations - both product innovations and market innovations.

Qualities for a Successful Entrepreneur: To discharge his functions properly, an entrepreneur must possess certain essential qualities. Thus, for example:

- 1) He must possess qualities of leadership, foresight and insight, sound judgement, observation and discrimination.

- 2) He must have business shrewdness, tact, patience, ability to select the right type of personnel and inspire confidence amongst his colleagues.
- 3) An entrepreneur to be successful must have leadership qualities to lead his team. He must win and retain the loyalty of persons with whom he must work. He must understand human nature' so that he can make each person do his best.
- 4) He must have the courage to face ups and downs in the business and must be capable to take bold decisions. Besides, he must be gifted with a large measure of practical common-sense and must be fully acquainted with the worldly events.
- 5) A successful entrepreneur must be a great innovator with an earnest zeal to do something new and novel. He should have the adaptability to learn and assimilate new and ongoing trends in trade, commerce, business and industry.

An entrepreneur has been rightly called as the '**Captain of Industry**' and "like a general in command of an army he must keep one eye on internal discipline and efficiency and another on external strategy."

[3] PRODUCTION FUNCTION

3.1 Meaning:

The act of production involves the transformation of inputs into output. Production is a transformation of physical inputs into physical output. The output, thus, is a function of factors which are called inputs. The functional relationship between physical inputs and physical output of a firm is known as production function.

A production function expresses a relationship between quantities of input and output under conditions of given technology, that is, a production function exhibits a purely technical relationship which connects factor inputs and outputs. Thus, the relationship between quantities of inputs (factors of production) and output is known as production function; it includes all technically efficient methods of production.

Thus; given the technical conditions of production, the output of a particular type of goods depend on the quantity of two or more inputs. The production function can be expressed as follows:

$$Q = f(X_1, X_2, X_3, \dots)$$

Here, Q = quantity of output

X₁ = quantity of land

X₂ = units of labour

X₃ = units of capital. etc.

The above equation shows that the quantity (Q) of output depends upon the quantities of the factors used. The production function expresses the mathematical relationship between the quantity of output and the quantities of the various inputs used for production. Likewise in the words of **Prof. Douglas**, "production function is a technical specification of the relationship that exists between inputs and the outputs in the production"

process." Thus, for example, when we say that the quantity of x good is a function of labour and capital, we may write as follows:

$$Q_x = f(L, K)$$

Here, Q_x = quantity of x good

f = represents functional relationship

L = input of labour

K = input of capital

We can express this functional relationship explicitly in a equation form to find out the actual relationship between the input and the output.

- (i) The linear production function may be expressed as follows: $Q = a + bK + cL$
- (ii) The multiplicative production function (non-linear) may be expressed as below: $Q = a \cdot K^b \cdot L^c$
- (iii) The multiplicative power function becomes linear when expressed in a logarithmic form as below: $\log Q = \log a + b \log K + c \log L$ and for estimating the values of parameters in this equation, linear regression analysis is used.

Basically, the production function is a technological or engineering concept which can be expressed in the form of a table, graph and equation showing the amount of output obtained from various combinations of inputs used in production, given the state of technology.

Factor inputs are of two types:

- a) **Fixed Inputs:** Fixed inputs are those factors the quantity of which remains constant irrespective of the level of output produced by a firm. For example, land, buildings, machines, tools, equipment, senior category of personal, top management etc.
- b) **Variable Inputs:** Variable inputs are those factors the quantity of which varies with variations in the level of output produced by a firm. For example, raw materials, labour power, fuel, water, transport and communications etc.

It should be noted here that the distinction between fixed inputs and variable inputs holds good only in the short-run; in the long- run all factor inputs become variable in nature.

[3.2] Assumptions of Production Function:

The Production function is based on two main assumptions:

- 1) state of technology remains the same during a given period. If there is change in technology, it would result in an alteration of the input-output relationship depicted by the production function.
- 2) The firms utilise their inputs at the maximum levels of efficiency, that is, the production function includes all the technically efficient methods of production. It may be noted here that if a production

function includes only a single technical efficient method, it is called a one **process production function** and if it includes two efficient processes, it is known as a **two-process production function**.

Besides the above two assumptions, the following two points also must be noted in respect of production function:

- 1) Production function like, the demand function is to be considered with reference to a particular period. Production function expresses a flow of output resulting in a flow of input during a specific period.
- 2) In the event of technological advancement, the production function changes resulting in greater flow of output which can be obtained from the given inputs or smaller quantities of input can be used for producing a given quantity of output.

[4] SHORT-RUN AND LONG-RUN PRODUCTION FUNCTION

Short-run is period in which only the variable factors can be changed while fixed factors like plant, machinery, top management remains constant. Time available at the disposal of a firm to make changes in the quantum of factor inputs is very much limited in the short-run.

Thus, short-run production function is that where in the quantities of some inputs say land and capital are kept constant and the quantity of one input, say labour, is varied.

This kind of production function is known as short run production function. We know that in the short run, the technical conditions of production are rigid so that the various inputs required to produce a given output are in a fixed proportion. However, in the short-run, it is possible to increase the quantity of one input while keeping the quantities of other inputs constant to have more output. The short-run production function in the case of two inputs, say labour and capital with capital as fixed and labour as variable can be expressed as follows:

$$Q = f(L, C)$$

Here, Q = quantity of output

L = Labour

C = Capital (fixed).

In the short-run, we come across two kinds of production functions:

- a) Quantities of all inputs both fixed and variable are kept constant and only one variable input is varied. For example, law of variable proportions.
- b) Quantities of all factor inputs are kept constant and only two variable factor inputs are varied. For example, iso-quants and iso-cost curves.

Long-run is a period wherein the firm has adequate time to make any sort of changes in the factor combination.

It is necessary to note that production function is assumed to be a continuous function it is assumed that a change in any of the variable factors leads to corresponding changes in the input.

Thus, in the long-run production function, all inputs are variable:

production can be increased by changing one or more of the inputs. The firm can change the size of its plant as also its scale of operations. This can be expressed as:

$$Q = f(L, C, L_1)$$

Where, Q = quantity of output

L = Labour

C = Capital

L₁ = Land

The study of long-run production function forms the subject matter of **law of returns to scale** which too we shall discuss in the next chapter.

[5] FORMS OF PRODUCTION FUNCTION

There are three main forms of production function:

(a) Production Function Relating to Increasing Returns (or Economies of Scale): When the proportionate increase in output is greater than the proportionate increase in all inputs, it is said to be production function relating to increasing returns. To put it differently with the, given factors and technology, if more output can be obtained or if the same output can be obtained with the use of less quantity of factors than used earlier, it is known as production function with increasing returns. If the price of the factors remains the same, we get production function with diminishing cost.

(b) Production Functions Relating to Constant Returns: When the proportionate increase in all the inputs is equal to the proportionate increase in output, it is said to be production function with constant returns. If the factor prices remain the same, we get production function with constant cost.

(c) Production Function Relating to Diminishing Returns (or diseconomies of scale): When the proportionate increase in output is less than the proportionate increase in all inputs, it is said to be production function with diminishing returns. In other words, with the given factors and technology, if less output is obtained or if more factors are required to obtain the same output as earlier, it is known as production function with diminishing returns. If factor prices remain the same, we get production function with increasing cost.

Production function changes with the change in technology, state of technical knowledge, process of production or organisation of the firm. If all these factors are assumed as parameters or given, we get a stable production function.

A production function so formulated helps us to understand the laws of production or returns, popularly known as laws of increasing, diminishing or constant returns. These laws examine the change in output when there is marginal increase in one factor, all other factors remaining constant. The cost curves of the firm also are derived with the help of this technique. Alternatively, an attempt is made to find out the change in output when all the factors, i.e. inputs are simultaneously increased. This explains internal economies of scale. Thus, production function is helpful in the study of iso-quants or equal - product curves.

[5.1] Importance of the Concept of Production Function:

The concept of production function proves to be very useful in taking business decisions. It is both logical and helpful and is of immense utility to the managers and executives in the decision, making process at the firm level. It offers guidance to the firm in two directions:

- a) How to obtain the maximum output from a given set of inputs?
- b) How to obtain a given output from the minimum aggregation of inputs?

There are several possible combinations of inputs and the decision makers must choose the most appropriate amongst them.

The following are some of the important uses of production function: -

- (i) It can be used to work out the least cost input combination for a given output or the maximum output-input combination for a given cost.
- (ii) The concept of production function also helps in working out an optimum and economic combination of inputs for getting a certain level of output. The utility of employing a given unit of variable factor input in the production process can be better judged with the help of production function. Additional employment of a variable factor input is desirable only when the marginal revenue productivity of that variable factor input is greater than or is equal to the cost of employing it in the organisation.
- (iii) Production function is also useful in making long-term decisions. Thus, for example, if returns to scale are increasing, it would be advisable to employ more factor units and increase production. However, if returns to scale are diminishing, it would not be advisable to employ more factor inputs and increase output. Likewise, if production is subject to constant returns to scale, the firm will be indifferent to increase or decrease production.

Thus, production function is a useful tool both in the short- run and long-run decision making process.

Of course, it is true that with the more complex problems and with large number of inputs and outputs, the mathematics of optimisation becomes rather complicated. However, the development of linear programming in recent years has considerably helped to deal with these complex problems: Besides, progress in the sphere of electronics computers has also gone a long way in facilitating the use of complex production functions in business decision-making.

[6] COBB - DOUGLAS PRODUCTION FUNCTION

The Cobb - Douglas production function is based on the empirical study of the American manufacturing industry made by C.W.Cobb and Paul H Douglas. It is linear homogeneous production function of the first degree which considers two inputs labour and capital for the entire manufacturing industry.

The Cobb Douglas production function can be expressed as follows:

$$Q = A L^a K^b$$

Where, Q = stands for output

L= stands for input of labour

K stands for input of capital

and A, a and b are parameters of the function.

The above equation explains that output depends directly on L and K, and that part of output which cannot be explained by L and K is explained by A which is the residual and is often called effect of technical change.

Suppose the Cobb-Douglas production function. found that 75 percent of the increase in manufacturing production was due to labour input and 25 percent was due to capital input. The function, therefore, can also be stated as:

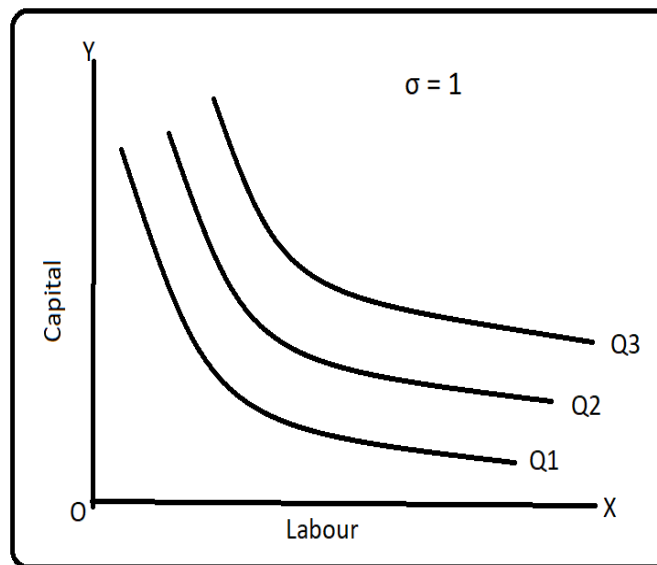
$$Q = AL^{3/4} C^{1/4}$$

This shows constant returns to scale because the total of values of L and K is equal to one ($3/4 + 1/4 = 1$).

[6.1] Properties of Cobb-Douglas Production Function: The following are the main properties of Cobb-Douglas production function:

- (i) The sum of exponents of factors, that is, $a + b$ measures the returns to scale. Thus, if:
 - $a + b = 1$, returns to scale are constant.
 - $a + b > 1$, returns to scale are increasing.
 - $a + b < 1$, returns to scale are decreasing.
- (ii) The average product and marginal product of factors is a function of the ratio of factors. Thus, for example, the marginal product of labour depends on the amount of labour used.
- (iii) The exponents of labour and capital in this production function measure output elasticities of labour and capital respectively.
- (iv) The Cobb-Douglas production function can be extended to include more than two factors. Thus, for example, farm production depends not only on the amount of labour and capital used but also on the use of other inputs such as land, irrigation, fertilisers, pesticides etc.

- (v) When the sum of exponents (a+b) in the two factor Cobb- Douglas production function ($Q = AL^a K^b$) is equal to one, it would show constant returns to scale. Likewise, when the inputs of labour (L) and capital (K) are increased by a constant g, the output (Q) also increases by g.
- (vi) The elasticity of factor substitution of Cobb-Douglas production function is equal to unity and therefore this production function is homogeneous of the first degree.



iso-quants of Cobb Douglas Production Function

- (vii) The Cobb-Douglas production function is multiplicative function, which means that if one input has zero value, the output too will be zero. This property implies that all inputs are necessary for producing a given output by the firm.

[6.2] Usefulness of Cobb-Douglas Production Function:

The following are the main uses of Cobb-Douglas production Function:

- (i) This function is very convenient and useful for international and inter- industry comparisons.
- (ii) It has the advantage of simplification of calculations by transforming the function into a linear form with the help of logarithms.
- (iii) It can be applied to investigate the nature of long-run production function.
- (iv) The function can be extended to include more than two inputs. Thus, for example, agricultural output depends not only on the quantum of labour and capital used but also on the use of other inputs, say like, irrigation, fertilizers, pesticides, farm machinery etc. If we include all these inputs in Cobb-Douglas production function, we have,

$$Q = AX_1^a X_2^b X_3^c \dots X_n^p$$

Where Q is the output and $X_1, X_2, X_3 \dots X_n$ are different inputs.

[6.3] Limitations of Cobb-Douglas Production Function:

The Cobb-Douglas production function has been vehemently criticized by writers like Arrow, Chenery, Minhas and Solow. Some of the main limitations of this function are as follows: -

- (i) The function mainly emphasises the diminishing marginal product case. It does not explain the marginal product of an input to go through all the three stages, namely, increasing, constant and diminishing marginal returns.
- (ii) It assumes constant returns to scale which is hardly possible in general. Thus, for example, certain factor say like entrepreneurship, cannot be increased in the same proportion.
- (iii) There is the problem of measurement of capital. Thus, for instance, while labour is measured in terms of labour services per hour or per week or per month, in respect of capital it is difficult to measure capital services per hour as it involves depreciation over time. Besides, this function considers only the quantity of capital available for production. But the full utilisation of capital can be made only in times of full employment which is seldom found in the economy.
- (iv) The function emphasizes more on the substitutability of factors and ignores the complementarity of factors.
- (v) The function assumes of perfect competition in the factor market which is unrealistic. If this assumption is dropped, we shall find that a and b do not represent factor shares.
- (vi) There is also the problem of aggregation. It arises when we try to apply this function to every firm in an industry and to all industries. In such a case there will be a number of production functions of high and low aggregation and the task of measuring all these functions would become extremely difficult.

However, inspite of above limitations the Cobb-Douglas function has been extensively used in empirical studies of manufacturing industries and in inter- industry comparisons.

SHORT QUESTIONS WITH ANSWERS**Q. 1. State the main functions of an entrepreneur. (October, 2013) OR****What are the functions of an entrepreneur?**

The following are the main functions of an entrepreneur:

- (i) Choice of the enterprise
- (ii) Planning and location of the enterprise.
- (iii) Co-ordination of the factors of production.
- (iv) Purchase of raw materials and marketing of finished products.
- (v) Directing and supervising the various productive operations.
- (vi) Rewards to the factors of production."
- (vii) Risk and uncertainty bearing.
- (viii) To adopt innovations - both product innovations and market innovations.

Q.2. State the classification of the factors of production? (April, 2012)

Factors of production can broadly be classified into four categories:

- (a) Land (b) Labour (c) Capital (d) Organisation or Enterprise

Q. 3. What is production function.? (Oct., 2012, April, 2015)

A production function expresses a functional relationship between input and output under conditions of given technology, that is, production function exhibits a purely technical relationship which connects factor inputs and outputs. Thus, the relationship between inputs (factors of production) and output is known as production function. It can be expressed in the form of an equation as follows:

$$Q = f(x_1, X_2, X_3, \dots)$$

Here, Q = amount of output

X_1 = amount of land

X_2 = units of labour

X_3 = units of capital.

As production functions refers to relation between input and output it is sometimes also known as input-output relation. The production function aims at obtaining maximum output from the given resources.

Q. 4. What are the two main assumptions on which production function rests? (October, 2014)

Production function rests on two main assumptions:

- a) State of technology remains the same during a given period. If there is a change in technology, it would result in an alteration of input-output relationship depicted by the production function.
- b) It is assumed that the various firms utilise their inputs at the maximum levels of efficiency.

Q. 5. Indicate the forms of production function.

There are three main forms of production function:

- a) **Production Function Relating to Increasing Returns:** With the given factors of production and technology, if more output can be obtained or if the same output can be obtained with the use of less quantity of factors than used earlier, it is known as production function with increasing returns. If the price of the factors remains the same, we get production function with diminishing cost.
- b) **Production Function Relating to Constant Returns:** When the equiproportionate increase in all the inputs leads to an equally proportionate increase in output, it is known as production function with constant returns. If the factor prices remain the same, we get production function with constant cost.
- c) **Production Function Relating to Diminishing Returns:** When the proportionate increase in output is less than the equiproportionate increase in all the inputs, it is said to be production function with diminishing returns. If the factor prices remain the same, we get production function with increasing cost.

Q.6. What is the importance of the concept of production function? (October, 2013)

The concept of production function is very useful in taking business and managerial decisions. It provides guidance to the firms in two directions:

- a. how to obtain the maximum output from a given set of inputs?
- b. how to obtain a given output from the minimum aggregation of inputs?

In recent years, the development of linear programming and progress in the sphere of electronic computers has considerably helped to deal with the complex production functions in business decision making.

Q.7. How does a long-run production function differ from a (April, 2017)

short-run production function? The short-run production function is that where in the quantities of some inputs, say, land and capital are kept constant and the quantity of one input, say labour, is varied. Thus,

$$Q = f(L_1, C, L)$$

Where, Q = quantity of output

L = Land (Constant)

C = Capital (Constant).

On the other hand, in the long-run production function, all inputs are variable; production can be increased by changing one or more of the inputs. Thus,

$$Q = f(L, C, L_1)$$

Where,

Q = quantity of output

L = labour

C = capital

L_1 = land

Q. 8. What is linear homogeneous production function? (April, 2016)

Linear homogeneous production function states that if all the factors of production are increased in each proportion, output would also increase in the same proportion. Thus, for example, if there is a two-fold or threefold increase in all inputs, it will result in a twofold or threefold increase in output. This function represents a case of constant returns to scale. If there are two factors x and y , then the homogeneous production function of the first degree can be expressed as below:

$$mQ = f(mx, my)$$

Where, Q total product and m is any real number.

Q.9. What is Cobb-Douglas production function? State Cobb-Douglas production function symbolically? (April, 2013, October, 2016).

The Cobb - Douglas production function is a linear homogeneous production function of the first degree which considers two inputs labour and capital for the entire manufacturing industry.

It can be expressed as follows:

$$Q = A L^a K^b$$

Where,
 Q = Stands for output
 L = Stands for input of labour
 K = Stands for input of capital
 A = a and b are parameters of the function.

The above equation explains that output depends directly on L and K . and that part of output which cannot be explained by L and K is explained by A which is the residual and is often called effect of technical change.

Q.10. Describe the types of 'factor inputs'.

There are two types of 'factor inputs'.

- a) Fixed Inputs: Fixed inputs are those factors the quantities of which remain constant irrespective of the level of output produced by a firm e.g. land, buildings, machines, tools, equipment etc.
- b) Variable Inputs: Variable inputs are those factors, the quantities of which vary with variations in the level of output produced by a firm. e.g. raw materials, power, fuel, labour etc.

QUESTIONS ASKED AT THE VEER NARMAD SOUTH GUJARAT UNIVERSITY EXAMINATION
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- Q. 1. Explain Cobb - Douglas Production Function. (**April, 2011, October, 2012**)
- Q.2. Define production function. Discuss the nature and managerial importance of the same. (**October, 2011**)
- Q. 3. What is production function? Explain its significance in managerial decision making. (**April, 2012, April, 2013**)
- Q.4. Write a short note on: Cobb - Douglas production function and Linear homogeneous production function. (**April, 2012, October, 2013**)
- Q.5. What is production function? State the assumptions and forms of production function and explain its managerial uses. (**April, 2014**)
- Q. 6. What is linear homogeneous production function? Discuss its various uses. (**October, 2014**)
- Q.7. Write a short not on: Cobb-Douglas production function. (**October, 2014**)
- Q. 8. Write a short note on: Production function. (**October, 2015**)
- Q.9. Write an explanatory note on: Managerial uses of production function. (**October, 2016**)

Chapter 4.2 Theory of Production

Course content

- [1] Concept of Total Product, Average Product, Marginal Product.**
- [2] Law of variable proportion**
- [3] Return to scale**

[1] CONCEPTS OF PRODUCT

There are three broad concepts of product relating to physical production function.

(i) Total Product (ii) Average Product (iii) Marginal Product.

(i) Total Product: The total product of a factor is the amount of total output produced by a given amount of the factor, other factors being kept constant. As the quantity of a factor increases, the total output too increases. Thus, for example, when with a fixed length of a factor, save capital, as more and more units of a variable factor are used, the total product in the beginning rises at an increasing rate, but after a point it increases at a diminishing rate as the use variable factor is increased.

(ii) Average Product: Average product of a factor is the output produced per unit of a factor employed.

Thus,

$$\begin{aligned} \text{Average Product} &= \frac{\text{Total product}}{\text{Number of units of factor employed}} \\ &\text{or} \\ AP &= \frac{Q}{L} \end{aligned}$$

where Q = Total Product

L = Number of units of a variable factor employed.

It has generally been observed that as more and more units of variable factors are employed for producing a given output, the average product first shows an increase and then starts falling. The average product curve is, thus, U-shaped.

(iii) Marginal Product: The marginal product of a factor is the additional output obtained by the employment of an additional unit of variable factor. It is the net addition to the total product when one additional unit of a variable factor (say labour) is employed.

Thus, for example, when 3 workers are employed to produce a given output and they produce, say, 200 units of an article. Now an additional 6th worker is employed and as a result, total product increases to say 230 units, this means that the 6th worker has added 30 units to the total product and so 30 units will be the marginal product of the 6 workers.

Thus,

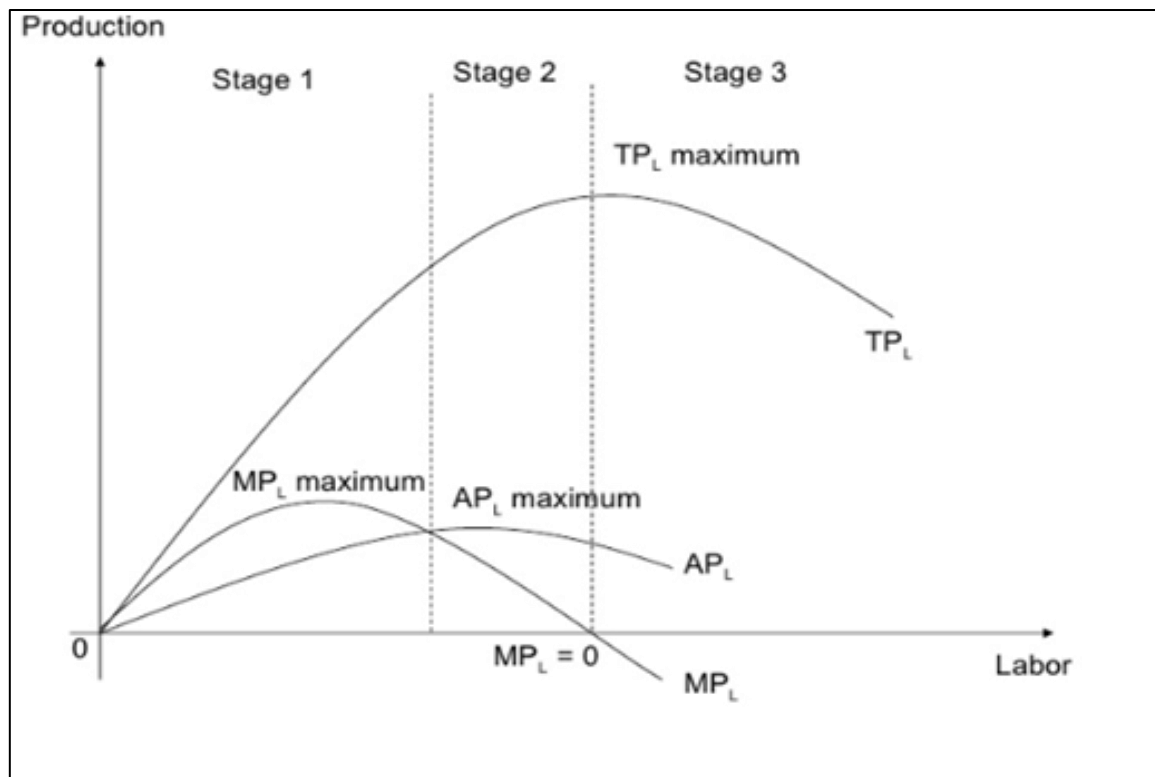
$$\text{Marginal Product of a variable factor - labour} = \frac{\Delta Q}{\Delta L}$$

Where ΔQ = Change in the total product

ΔL = Change in the units of labour.

The above three concepts of product shall be clear from a study of the following table:

Variable Input (Labour)	Total Product	Marginal Product	Average Product
1	16	16	16
2	40	24	20
3	72	32	24
4	96	25	24
5	110	14	22
6	120	10	20
7	120	00	17.2
8	112	(-)8	14



Relationship between marginal average and total product:

- (i) When the marginal product is increasing, the total product increases at an increasing rate.
- (ii) When the marginal product is zero, the total product is maximum.
- (iii) When the marginal product becomes
- (iv) Negative, the total Product starts falling

- (v) The average product rises if the marginal product is higher than the average product.
- (vi) The average product starts falling when the marginal product becomes less than the average product.
Average product never becomes zero, hence the average product curve does not touch the x-axis.
- (vii) The marginal product curve cuts the average product curve at its maximum.

[2] LAW OF VARIABLE PROPORTION

The law of variable proportions occupies an important place in economic theory and the barrier relationship with the production function. It is also known as the law of non-proportional output. The law expresses a functional relationship between the change in variable factors and the change in output. It states that when one factor of production is held constant and the quantities of other variable factors are increased, then the output would not respond in a proportionate manner.

In the beginning, production would increase at an increasing rate and after a certain stage, it would increase at a diminishing rate.

In other words, the relationship between the variable input and output would not be the same during the entire process of production. Thus, when more and more units of the variable factor are used, keeping the quantities of fixed factors constant, a point is reached beyond which the marginal product, then the average product finally the total product will diminish.

Some of the important definitions of the law of variable proportions:

- (i) **G. J. Stigler:** As "equal increments of one input are added to the inputs of other productive services being held constant; beyond a certain point the resulting increments of product will decrease that is, the marginal product will diminish.
- (ii) **F. Benham:** As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then average product of that factor will diminish.
- (iv) **P.A. Samuelson:** "An increase in some inputs relative to other fixed inputs will in a given state of technology, cause output to increase but after a point the extra output resulting from the same addition of extra inputs will become less.

(3.1) Assumptions of the Law:

The law of variable proportions is based on the following assumptions:

- (i) The state of technology should remain the same. If there is a change in technology, the law may not operate.
- (ii) There is at least one factor which should be held constant while other factors are variable.
- (iii) All the units or doses of the variable factors are identical or homogeneous, that is, they are the same size, Quality, Efficiency etc.
- (iv) Factor – combination is flexible.

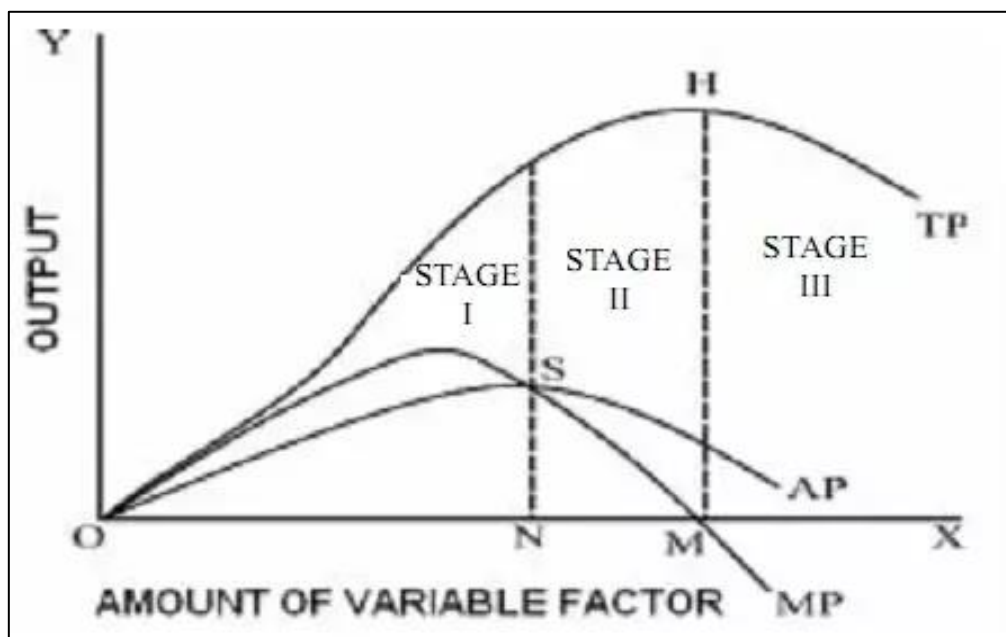
(3.2) Tabular and Graphical Representation of the Law:

The law of variable proportions can be illustrated with the help to a table and a curve as follows:

Combination	Fixed factor + Unit of variable factors	Total product	Marginal Product	Average Product
1	X+1	20	20	20
2	X+2	50	30	25
3	X+3	90	40	30
4	X+4	120	30	30
5	X+5	135	15	27
6	X+6	144	9	24
7	X+7	147	3	21
8	X+8	148	1	18.5
9	X+9	148	00	16.4
10	X+10	145	(- 3)	14.5

The following observations may be made from a study of the above table:

- 1) Increase in variable factors to the fixed factor (x). leads to a continuous increase in marginal product up to the third combination (x+3).
- 2) Marginal product is maximum at the third combination (x+3) and thereafter it declines.
- 3) Marginal product is zero at the ninth combination (x+9): total product, however, is maximum at this point.
- 4) Marginal product becomes negative after the ninth combination and the total product also begins to decline.
- 5) Average product increases up to fourth combination and thereafter it declines.



Graphical Representation

From the table given on the left side and the diagram, we can explain the interrelationship between marginal production (MP), average product (AP) and total product (TP) as follows:

- 1) When the marginal product goes on increasing, the total product increases at an increasing rate.
- 2) When the marginal product is zero, the total product is maximum.
- 3) When the marginal product becomes negative, the total product starts declining.
- 4) The average product rises as long as the marginal product lies above it.
- 5) The average product starts declining when the marginal product becomes less than the average product and therefore, the marginal product curve cuts the average product curve at its maximum point.

(3.3] Explanation of the Various Stages of the Law of Variable Proportions:

(i) First Stage: Stage of Increasing Returns:

During the first phase, there is simultaneous increase in marginal product, average product, and total product. All these go on increasing during this stage. However, the first stage draws towards its end, when the marginal product curve intersects the average product curve at its maximum point. At this point the average product is maximum; this phase is known as the phase of increasing returns.

The two main causes of increasing returns are:

- (a) Indivisibility of the factors of production.
- (b) Internal economies like technical economies, managerial economies, marketing economies, financial economies, risk-bearing economies etc.

(ii) Second Stage: Stage of Diminishing Returns:

During the second stage, total product increases at a diminishing rate. Besides, both average output and marginal output also show a decline, though marginal output declines at a faster rate than average output. The

total output is maximum and the marginal product is zero. In short, when the fixed factors reach the point of optimum utilisation, the increase in variable factors leads to diminishing returns. This is mainly because of two factors.

- (a) Diseconomies of scale.
- (b) Imperfect substitutability of the factors of production.

(iii) Third Stage: Stage of Negative Returns:

During the third stage, additional doses of variable factors lead to a fall in total production; that is, the marginal product becomes negative. Such a situation arises when the use of excessive variable factors adversely affects the efficiency of both the fixed as well as variable factors. Thus, for example when excessive fertilisers, that is, an overdose of fertilisers is used on a given plot of land to improve its quality, it may result in negative returns, that is, falling and productivity.

This is because, as more and more units of variable factors are added to a fixed factor, beyond a certain point, output increases at a diminishing rate and ultimately turn out to be negative. Disguised Unemployment in Indian Agriculture may be cited as an example of negative returns. Even if the surplus manpower is diverted from agriculture and other sectors, will not have any adverse effect on productivity, because the marginal productivity of extra labour engaged in agriculture is practically zero.

It may, however, be noted that the third stage is merely a theoretical possibility as no producer would desire to enter this stage. An idea of the behavioural pattern the total product, marginal product during the three stages of production, can be had at a look at the following table.

Stage	Total product	Marginal product	Average product
stage I	increases at an increasing rate	increases and reach its maximum	increases, but at a lower rate, then marginal product and reach its maximum
stage II	increases at a diminishing rate and become maximum	start diminishing and become zero	start diminishing
stage III	reaches its maximum, become constant and then start falling	continues to decline and become negative	continues to decline but not up to zero level

Conclusion

It is therefore to conclude that economic efficiency changes during the stage more and more output is open and per unit of product and variable factors. The form therefore will cross the first stage and work in the second stage during the stage, average product, and marginal product decline. But the total product continues to increase. The third stage is ruled out as all the three outputs, namely, total product, marginal product and average product are declining marginal product become negative. Hence, the firm will have to decline where exactly it should operate in the second stage the exact point however, will depend on the price ratio of land and labour which outside the scope of our present decision

(3.4) Causes of Initial Increasing Returns Then Diminishing Returns and Finally Negative Returns to a Factor:

We may now discuss in brief the main causes of initial increasing returns. then diminishing returns and the final negative returns factor.

(a) Causes of Initial Increasing Returns to a Factor: In the initial stages, the quantity of fixed factor is abundant as compared to quantity of variable factor and so when more and more units of variable factor are added to the fixed factor, there is more intensive and effective utilisation of the fixed factor, that is, efficiency increases as more and more additional units of variable factors are added to it. Besides, there is also the indivisibility of the fixed factor Indivisibility of factor implies that due to technological requirements a certain minimum amount of that factor must be employed whatever: the level of output. Thus, as more units of a variable factor are added to an indivisible factor, the output greatly increases due to fuller and effective utilisation of that factor.

(b) Causes of Diminishing Returns to a Factor: Once the point is reached when the amount of the variable factor is sufficient to ensure the fullest and effective utilisation of the fixed factor. then any further increase in the variable factor will cause marginal and average product of that variable factor to decline because a fixed factor then becomes inadequate relative to the quantity of the variable factor. Besides, here also the indivisibility of fixed factor works. Beyond a point, further increase in variable factor to fixed factor will cause the marginal product and average product to diminish because the indivisible factor is used intensively a n d used in non-optimal proportion.

(c) Phenomenon of Negative Returns to Factor: The explanation of negative returns in stage three lies in the fact that the use of variable factor becomes too large in number relative to the lived tractor so that they obstruct each other with the result that the total output falls instead of rising. In other words, as more and more units of a variable factor are added to a fixed factor. a stage is reached When the total product declines and the marginal product becomes negative.

[4] RETURNS TO SCALE

We shall now turn our discussion to returns to scale and study the difference between laws of returns and returns to scale.

(4.1) Distinction Between Laws of Returns and Returns to Scale:

It would be interesting here to note the difference between laws of returns and returns to scale. These two are not one and the same, but have different meanings.

By returning to scale, we mean the behaviour of production scale or returns when all the factors are increased or decreased simultaneously in the same proportion. Thus, while discussing returns to scale we study the effects of doubling or trebling of all inputs (factors) on the Output of the product. The percentage or proportionate increase in output when all inputs are changed in the same proportion is known as returns to scale.

Returns to scale are due to an increase in the scale of operations, namely, increase in the size of the plant and machinery, recruitment of additional technical and managerial personnel etc.; in other words, all factors are changed. In short, an increase in scale means that all inputs or factors are increased simultaneously in a given proportion. The study of changes in output because of changes in all inputs is generally known as returns to scale.

On the other hand, In the law of variable proportions, one factor is kept constant while other factors of production are increased or decreased. Thus, for example, Indian agriculture or an entrepreneur in industry is a constant factor, while the proportion of other factors is changed and then we study how returns or output is affected. However, in the returns to scale, as said above, all the inputs or factors are increased or decreased in the same proportion.

(4.2) Three phases of Returns to Scale:

There are broadly three distinct phases of returns to scale:

(i) Increasing Returns to Scale: When the output increases in a greater proportion than the increase in input, it is known as increasing returns to scale. Thus, for example, if all the inputs are increased by 10 percent and the output increased by 15 percent. It is a case of increasing returns to scale. The main causes for increasing returns to scale are as follows:

- (a) Indivisibility of the factors.
- (b) Division of labour leading to specialisation.
- (c) Dimensional economics.

(ii) Constant Returns to Scale: When output increases in the same proportion as increase in all inputs, it is known as constant returns to scale. Thus, for example, if a two-fold increase in inputs (factors) results in a two-fold increase in output, returns to scale are said to be constant. The concept of constant returns to scale refers to a linear and homogeneous production function or homogeneous function of the first degree and is important in explaining Euler's theorem in the theory of distribution.

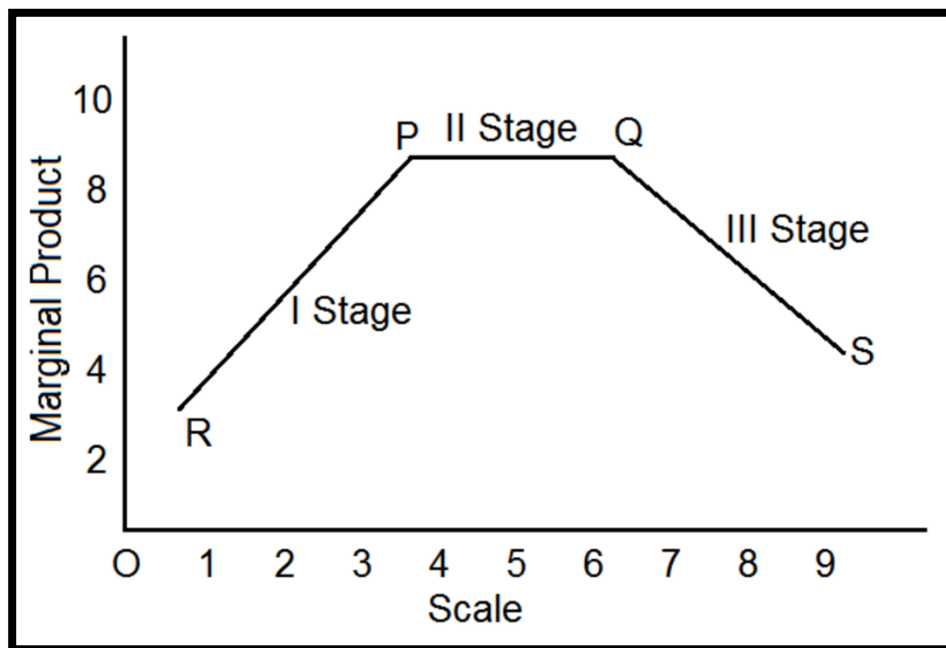
(iii) Diminishing Returns to Scale: When output increases in a smaller proportion than increase in all inputs, it is known as diminishing returns to scale. The main causes for this are: (a) The operation of the law of variable proportion which states that as more and more units of a variable factor are used, while keeping the quantity of fixed factor constant. beyond a point marginal product, then the average product and finally the total product start diminishing.

(b) The increasing difficulties of management, supervision, co-ordination, and control. When the firm continues to expand and attains too gigantic a size, it becomes unwieldy and difficult to manage with the same efficiency. The Returns to scale can be illustrated with the help of a table and a diagram

Returns to scale

Sr. No.	Skill of product	Total returns	Marginal returns
1	One unit + 2 acres of land of labour	8 units	8 units
2	Two unit + 4 acres of land of labour	17 units	9 units
3	Three unit + 6 acres of land of labour	27 units	10 units
4	Four unit + 8 acres of land of labour	38 units	11 units
5	Five unit + 10 acres of land of labour	49 units	11 units
6	Six unit + 12 acres of land of labour	59 units	10 units
7	Seven unit +14 acres of land of labour	68 units	9 units
8	Eight unit + 16 acres of land of labour	76 units	8 units

It would be clear from the above table that there has been an increase in the quantity of both the factors labour and capital simultaneously in a given proportion. The study of change in the total output as a result of change in all inputs is known as return to scale. This can also be shown with the help of diagram.



Stages of return to scale

SHORT QUESTIONS WITH ANSWERS**Q.1 Explain simply the gist of the law of variable proportions.**

The law of variable proportion expresses a functional relationship between the change in variable factors and the change in output. It states that if one factor of production is held constant and the quantities of other variable factors are increased, then the output would not respond in a proportionate manner. There are three phases of this law- increasing returns, constant returns and diminishing returns. Thus, for example, if one factor (land) is kept constant and to this more and more variable factors (labour, capital etc.) are added, in the initial phase, production would increase at an increasing rate, then at a constant rate and afterwards it would increase at a diminishing rate. As the output changes disproportionately. This Law is also Known as the law of non-proportional output.

Q.2 What are the main assumptions of the law of variable proportions?

The following are the main assumptions of the law of variable proportions:

- (a) The state of technology should remain the same. If there is a change in technology, the law may not operate.
- (b) There should be at least one factor which is held constant, while other factors are variable.
- (c) All the units or doses of the variable factors are identical or homogeneous, that is, they are of the same size, quality, efficiency etc.
- (d) Factor - combination is flexible.

Q.3 What are internal and external economies?

Internal economies are those economies which arise within the firm itself, as a result of the expansion of its size and are not shared

by other firms operating in that industry. These economies are independent of the general growth of the industry and are the result of the efficiency of management in any firm. External economies, on the other hand, are those economies which become available to all the firms in an industry because of the growth of the industry. As an industry grows, a number of economies become available to all the firms. These are called external economies and arise mainly as a result of the localisation and growth of industries and are shared by all the firms operating in an industry.

Q.4 Explain the concepts of total product, average product, and marginal product? Define total product and average product. OR differentiate between average product and marginal product.

(a) Total Product: The total product of a factor is the amount of total output produced by a given amount of the factor, other factors being kept constant. As the quantity of a factor increases, the total output too increases. Thus, for example, when with a fixed quantity of a factor, say capital, as more and more units of a variable

factor are used, the total product in the beginning rises at an increasing rate. but after a point it increases at a diminishing rate as the use of variable factors is increased.

(b) Average Product: Average product of a factor is the total output produced per unit of a factor employed.

Thus,

$$\text{Average Product} = \frac{\text{Total product}}{\text{Number of units of factor employed}}$$

or

$$AP = \frac{Q}{L}$$

Q.5 What is a marginal product?

Marginal Product: The marginal product of a factor is the addition to the total product by the employment of an additional unit of a variable factor. It is the net addition to the total product when one additional unit of a variable factor (say labour) is employed.

Thus.

$$\text{Marginal Product of a variable factor - labour.} = \frac{\Delta Q}{\Delta L}$$

Where ΔQ = Change in the total product

ΔL = Change in the units of labour.

Q.6 State the relationship between marginal, average and. total product.

- (a) When the marginal product increases, the total product increases at a n increasing rate.
 - (b) When the marginal product is zero, the total product is maximum.
 - (c) When the marginal product becomes negative, the total product starts falling.
 - (d) The average product rises as long as the marginal product is higher than the average product.
 - (e) The average product starts falling when the marginal product becomes less than the average product.
- Average product never becomes zero. Hence every product curve does not touch X axis
- (f) the marginal product curve cuts the average product curve at its maximum.

Q.7 What are returns to scale?

By returns to scale we mean the behaviour of production scale or returns when all the factors are increased or decreased simultaneously in the same proportion. Thus, while discussing the returns to scale, we study the effects of doubling or trebling of all inputs on the output of the product. The percentage or proportionate increase in output when all inputs are changed in the sample proportion is known as returns to scale. In short. The study of changes in output as a result of changes in all inputs is generally known as returns to scale.

QUESTIONS ASKED AT THE VEER NARMAD SOUTH GUJARAT UNIVERSITY EXAMINATION
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Q.1 write a short note on law of variable proportions.

Q.2 explain the law of variable proportions, what is its importance in business.

Q.3 explain the stages of returns to scale and expansion path.

Q.4 explain in detail the law of variable proportions substantiates your answer with proper illustration and diagram.

Q.5 write a short note on: law of returns to scale

Q.6 discuss the law of diminishing return to scale.

Q.8 write a short note: on the stages of production.

Q.9 discuss the law of constant return to scale and increasing return to scale.

Q.10 explains the law of variable proportion with the help of total product, average product, and marginal product calls. Give reason behind each stage of production. Mention the significance.

4.3. Production function with two variable inputs

Course content

- [1] Meaning & General properties of Iso-Quants.**
- [2] Marginal Rate of Technical Substitution (MRTS).**
- [3] Return to scale**

[1] INTRODUCTION

In the earlier chapter, while discussing production function, we had explained it with the help of a single variable factor while keeping other factors constant. In this chapter, we shall study production function when two factors are taken as variable factors and which are substitutes for each other. For this, a new technique has been developed in recent years to study the theory of production with two variable factors. This technique is known as iso-quants ne ion. product curves which are like indifference curve tec the theory of consumption.

[2] WHAT ARE ISO-QUANTS?

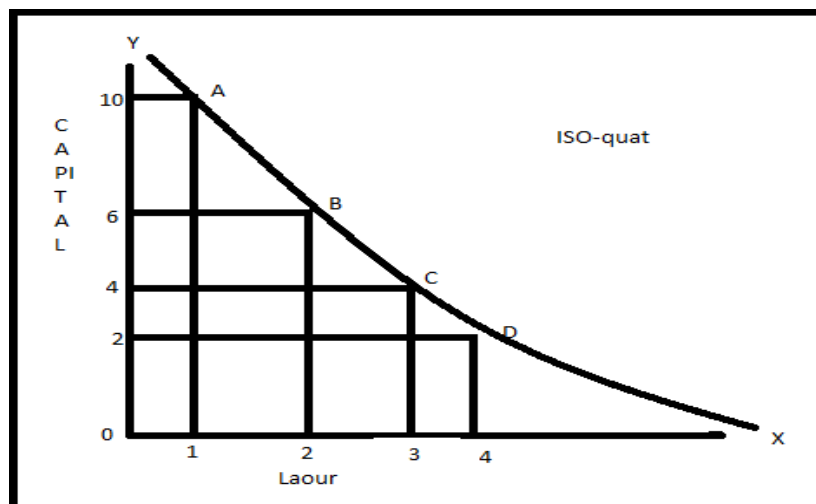
An iso-quant may be defined as a curve representing various combinations of two inputs that produce the same level of output. An iso-quant is also known as an iso-product curve or an equal product curve or production indifference crave. Just as every point on an indifference curve shows the same level of satisfaction to the consumer, every point on an iso-quant would indicate the same amount of output. In short, **an iso-quant may be defined as a cure which shou's different combinations of the two inputs producing the same level of output.**

We may illustrate an iso-quant with the help of a table and a curve

Combination	Units of labour	Units of Capital	Total Output (in inputs)
A	1	12	100
B	2	8	100
C	3	5	100
D	4	3	100
E	5	2	100

It will be seen from the above table that factor combination A with one unit of labour and 12 units of capital produce 100 units of output. Likewise, combination B with two units of labour and 8 units of capital, combination C with three units of labour and 5 units of capital, combination D with four units of labour and 3 units of capital and combination E with five units of labour and 2 units of capital all give the same amount of output, that is, 100 units.

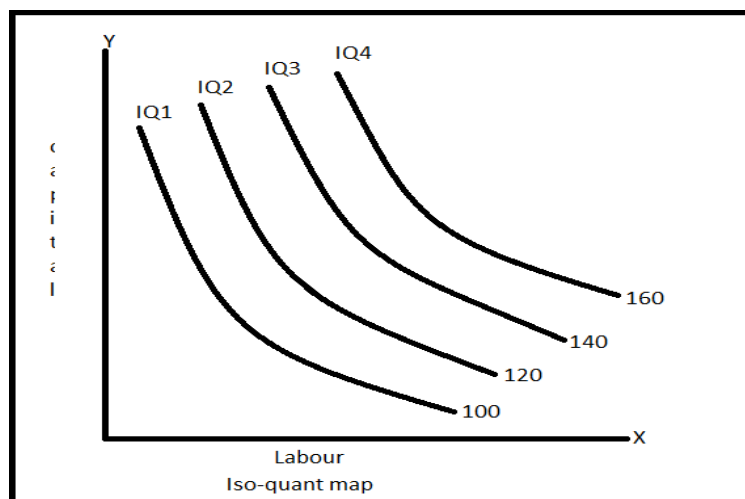
This can also be illustrated with the help of a diagram



In the diagram on the left side, we have shown all the combinations - A. B.C D and E and by joining them we obtain an iso- quant indicating that every combination gives 100 units of output.

[2.1.] Iso-quant Map

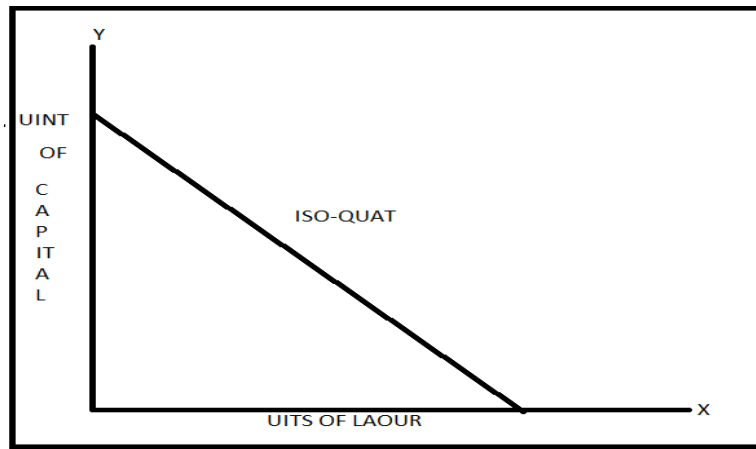
An iso-quant map is a set of iso-quants representing different levels of output. A higher iso-quant indicates higher level of output. A lower iso-quant indicates lower level of output. This can be illustrated as follows.



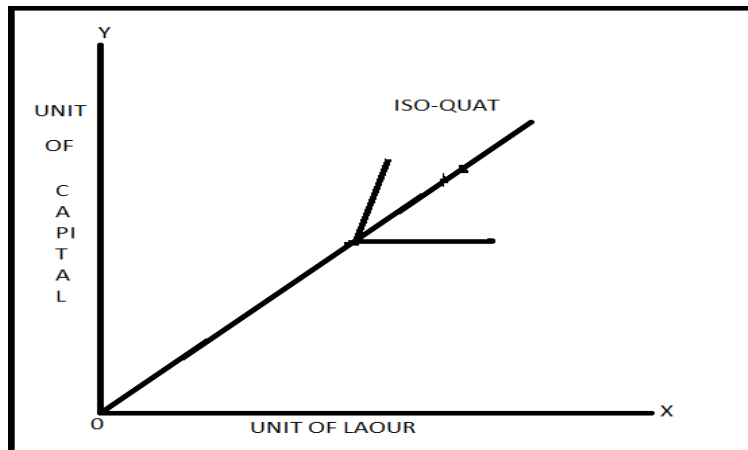
[2.2] Types of Iso-quants

Iso-quants may be of different shapes depending on the degree or elasticity of substitutability of inputs. The main types of iso- quants are as follows:

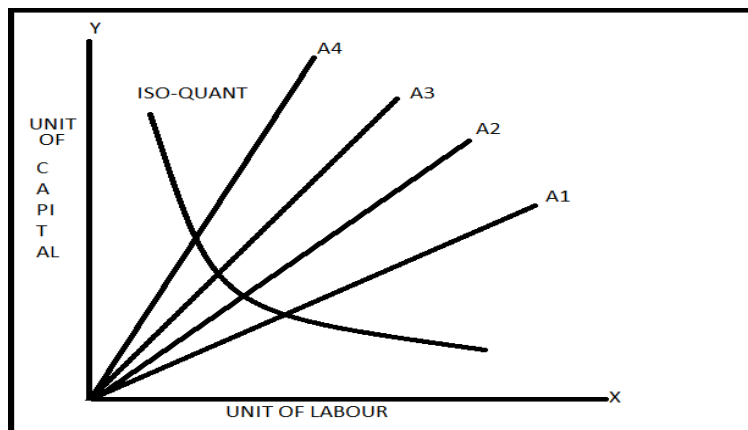
- A) Linear Iso-quant:** This type of iso-quant perfect substitutability between different factors of production. Thus, for example, a given output, say 100 units, may be produced by using only labour or only capital. The shape of such an iso-quant shall as on the left side



B) Input-Output Iso-quant: This type of iso-quant assumes perfect complementarity or zero substitutability between the inputs. When there is only one method of production for any product, its iso-quant is of right-angled shape. This type of iso-quant is also known as Leontief iso-quant.

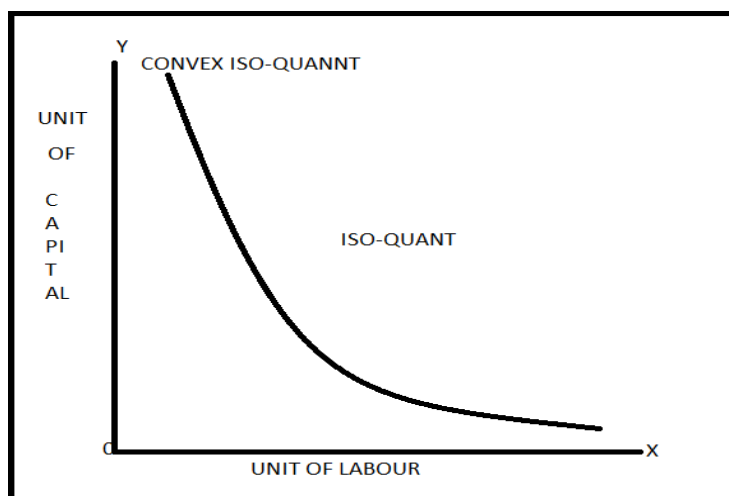


C) Kinked Iso-quant: This is also known as liner programming iso-quant. It assumes limited substitutability of labour and capital. As there are only few processes which are available for producing any commodity (say A1, A2, A3, A4) substitutability of factors is possible only at kinks. This can be illustrated below.



(d) Smooth Convex Iso-quant

It assumes continuous substitutability of labour and capital only over a certain range, beyond which factors cannot be substituted for each other. This iso-quant appears as a smooth curve convex to the origin. It can be illustrated as, on the left side.

**[3] Marginal Rate of Technical Substitution (MRTS)**

The principle of marginal rate of technical substitution is based on the production function where two factors can be substituted in variable proportions in such a way as to produce a constant level of output. Marginal rate of technical substitution indicates the rate at which factors can be substituted at the margin without any change in the level of output. Thus, for example, the marginal rate of technical substitution of labour for capital is the number of units of capital which can be replaced by one unit of labour without changing the level of output. The concept of marginal technical substitution can be easily understood from the table given below. We reproduce below the same table to find out the marginal rate of technical substitution.

Marginal Rate of Technical Substitution

Factor Combination	Units of labour	Units of Capital	Marginal Rate of Technical Substitution of labour for Capital (MRTS)
A	1	12	-
B	2	8	4:1
C	3	5	3:1
D	4	3	2:1
E	5	2	1:1

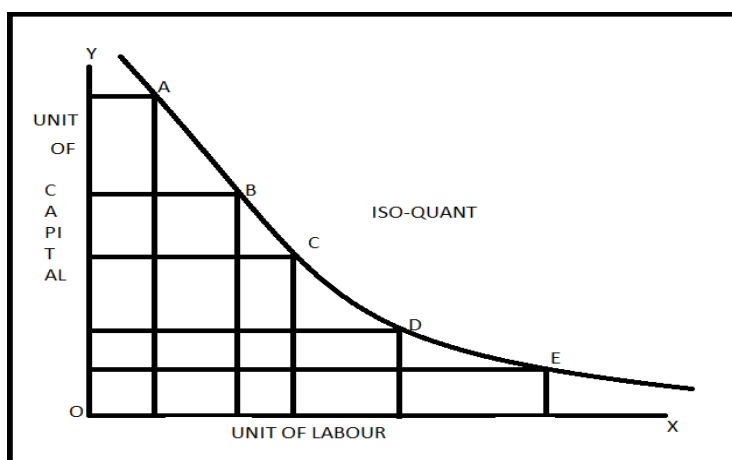
It will be seen from the above table that the marginal rate of technical substitution shows a decline. Thus, for example in factor combination B. 4 units of capital can be replaced by 1 unit of labour without change in output. So, 4:1 is the marginal rate of technical substitution at this stage.

Likewise, in factor combination C. 3 units of capital can be replaced by 1 unit of labour without any loss of output and as such the marginal rate of technical substitution is 3:1. Similarly, the marginal rate of technical substitution for combinations D and E is 2: 1 and 1:1 respectively.

Algebraically, we may put it like this

$$\text{Marginal Rate of Technical Substitution} = \frac{\Delta \text{ Labour units}}{\Delta \text{ Capital Units}}$$

Where, Δ is for change



The principle of diminishing marginal rate of technical substitution can be illustrated with the help of a diagram also: It should be noted here that we can know the marginal rate of technical substitution at a point on an iso-quant curve from the slope of the iso-quant at that point.

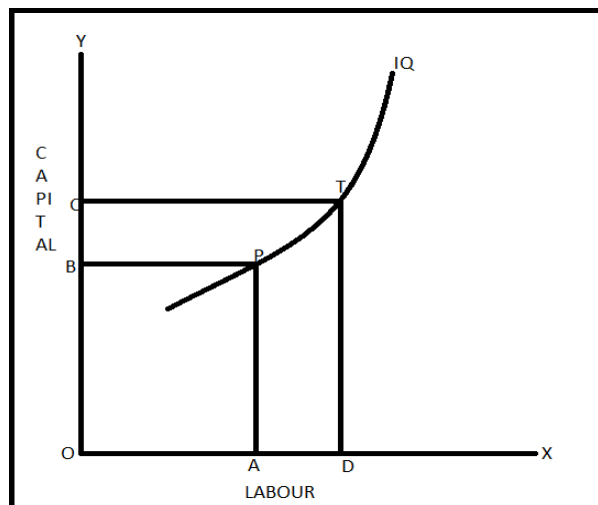
3.1] Why the Marginal Rate of Technical Substitution Diminishes?

It will be seen from the above table and diagram that the marginal rate of technical substitution diminishes and this is its one important feature. In other words, a salient characteristic of the marginal rate of technical substitution is that it diminishes as more and more units of labour are substituted for capital. Thus, as the quantity of labour used is increased and the quantity of capital employed is decreased, the units of capital that are required to be substituted by an additional unit of labour diminishes. This is known as the principle of diminishing marginal rate of technical substitution. As more and more units of labour are used to compensate for the loss of the units of capital to maintain the same level of output, the marginal physical productivity of labour diminishes and the marginal physical productivity of capital increases and therefore less and less units of capital will be required to replace one unit of labour to maintain the same level of output. Thus, the marginal rate of technical substitution diminishes as labour is substituted for capital. It means that the iso-quantity must be convex to the origin at every point.

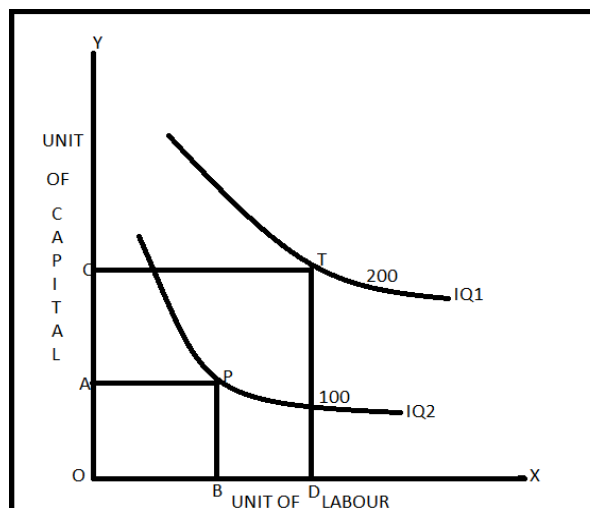
[4] PROPERTIES OF ISOQUANTS

(1) **An iso-quant curve like an indifference curve is a downward sloping curve towards the right**, that is, it has a negative slope. This implies that if more than one factor is used, less of other factors are needed for producing the same output. Thus, when the quantity of say labour is increased, the quantity of other factors, say capital, must be reduced to keep the output constant on a given iso-quant.

The downward slope of an iso-quant follows from a valid assumption that the marginal physical products of factors are positive, that is, the use of additional units of factors give positive increments in output. And so, when one factor is increased yielding positive marginal products, the other factor must be reduced to hold the level of output constant or else the total output will increase and we will be switching over to a higher iso-quant. It would be interesting to note here that iso-quants do not have a negative slope.

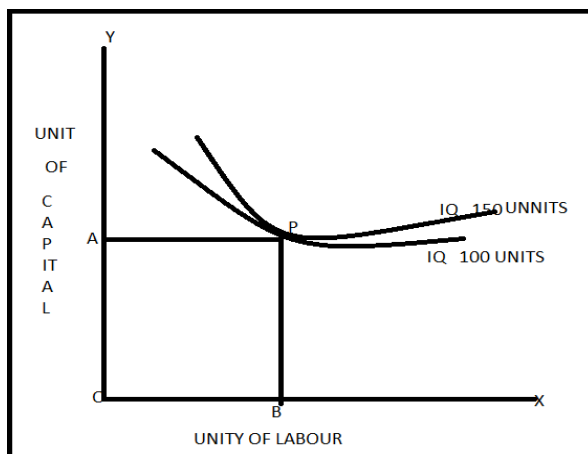


(2) **A higher iso-quant represents larger output**: that is higher the iso-quant, greater the output and vice-versa. This can be illustrated in the following diagram.



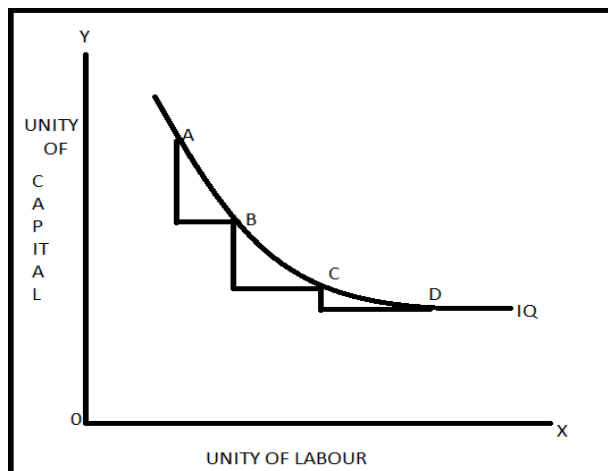
In the diagram on the left side combination Ton iso-quant curve shows larger output (200 units) than point P on iso-quant curve (100 units). Thus, the combination of OA capital and OB of labour produces 100 units of output, while OC units of capital and OD units of labour produce 200 units. As such 19, which lies above 10, to the right represents a large level of output.

(3) No two iso-quants can intersect each other: If two iso- quants intersect or touch each other, this means that there will be a common point on the two curves as shown in the following diagram. This implies that the same factor combination. (Labour and capital which can produce say 100 units of output at one iso-quant can also produce 150 units of output at the other isoquant. This is quite absurd because the same factor combination cannot produce two different levels of output.



In the diagram on the left- side when the two iso- quants 10 and 19- intersect each other at point P. this means that the same combination at P which gives 100 units of output at 19 can also give 150 units of output at 19.. This is simply absurd. The same combination cannot give two different levels of output.

(3) Iso-quant are convex to the origin: The convexity of an Economics for Managers iso-quant curve implies that the slope of the iso-quant curve moves downwards from left to right along the curve. Thus, for example, as more and more units of labour are employed to produce 100 units of the product. lesser and lesser units of capital are used. This is because the marginal rate of technical substitution between two factors diminishes. This would be clear from the diagram.



In the diagram on the left-side in order to produce 100 units, the firm moves along iso-quant from combination A to B and to C and D. It gives up lesser and lesser units of capital for additional units of labor. Therefore, iso-quant is convex to the origin.

- (4) In between two iso-quants there may be a number of iso- quants** showing various levels of output which the combination of two factors can give. Thus, for example, in between the 100 units and 200 units of output shown on 19 and 19, respectively, there may be many iso-quants showing 120, 135, 150, 175 units of output
- (5) Units of output shown on iso-quants are purely arbitrary:** Thus, for example, the various units of output like 100. 150, 220. 300 etc. shown on iso-quant map are arbitrary. Instead of these units, any other number of units of output say like 10, 25, 35, 45 or 1000, 1500, 2000 etc. can also be assumed.

4.4 Optimum Factor Combination

Course content

- [1] Iso-cost Line**
- [2] Least-cost combination of Factors (Choice of Inputs)**
- [3] The Economic Region of Production (Rigid Lines)**
- [4] Expansion Path.**

[1] ISO-COST CURVES

An iso-cost curve is also known as the price line or outlay line showing the price of the factor in terms of another factor. Each iso- cost curve represents the different combinations of two inputs which a firm can buy for a given amount of money at the given price of each input. In other words, ***the iso-cost curves represent the locus of all combinations of the two input factors which result in the same total cost.*** Thus, for example, if the unit cost of labour (L) is p and the unit cost of capital (C) is q , then the.

$$\text{Total Cost (TC)} = pL + qC$$

[2] ISO- COST LINE

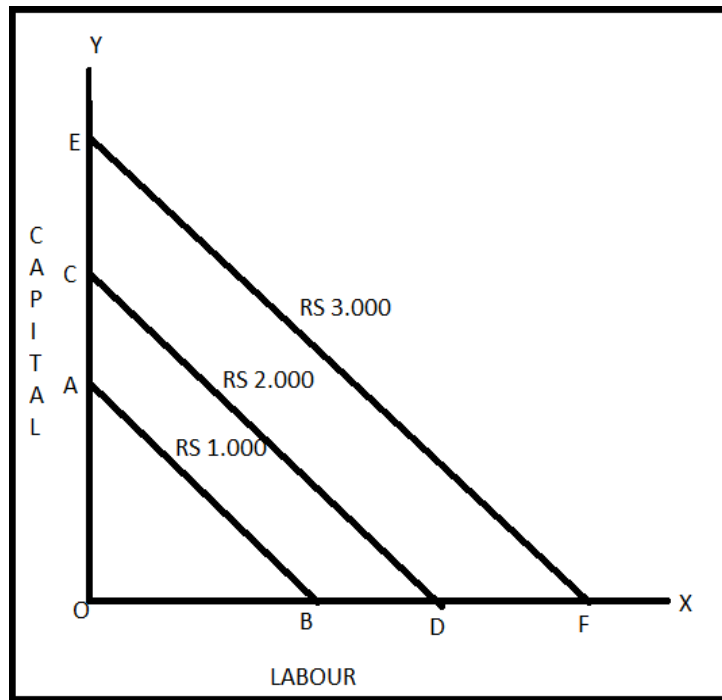
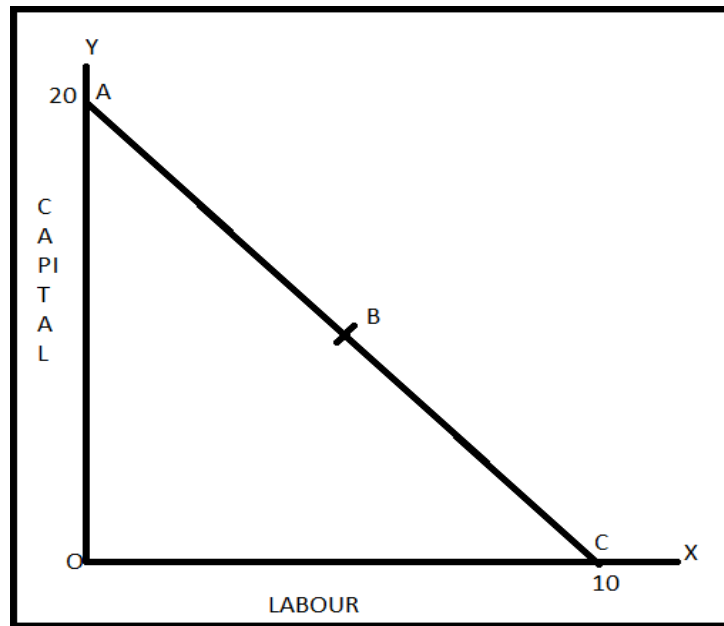
The combination of the factors, say labour and capital - with which a firm produces a given output depends on the prices of the factors and the amount of money which a firm is willing to spend. An iso-cost line indicates the prices of factors and the total sum of money which a firm wants to spend. Each iso-cost line shows various combinations of two inputs which can be purchased with a given amount of money. ***An iso-cost line may, therefore, be defined as the locus of various combinations of factors which a firm can buy with a constant outlay. As said earlier, the iso-quant line is also known as price line or outlay line.***

Suppose, for example, a firm has Rs. 1.000/- to spend and the price per unit of labour and capital is Rs. 50 and Rs. 100/- respectively. Now, if the firm spends the entire amount on labour has a combination of 20 units of labour. Alternatively, if it spends the entire amount on capital it has a combination of zero (0) labour and 10 units of capital. There are many other possible combinations of these two factors representing eq expenditure. The following table will illustrate this point

Combination labour	Units of	Units of Capital	Total Expenditure
A	20 +	0	Rs 100000
B	10 +	5	Rs 100000

This can be illustrated with the help of a diagram: Plotting the points. A. B. C. etc. we get a line AC which is a budget line or an iso-cost line.

Every point on the iso-cost curve shows the same amount of expenditure, the total outlay (expenditure) of the firm and the prices of the factors are given, and the cost curve indicates possible combinations of the two factors which the firm can have. Clearly the budget line or an iso-cost is the counter-part of the price-line in indifference curve analysis.



Now, if the firm decides to increase the total expenditure on two factors. to Rs. 2.000/- it can purchase more of both the factors. Thus, as a result of the increase in total outlay to Rs. 2.000/- the iso-cost line will shift towards the right. Like with a total outlay be increased to Rs. 1000 the most men will move to the right

The diagram on the left side shows the shift in the cost line from a CD to EF resulting from increase in outlay or total cost. The Slope of the iso cost line is the ratio of the price of a unit of labour to the price of a unit of capital in case, the price of any of the input changes, there would be a corresponding change in the slope of the cost curve, and the equilibrium position too would shift.

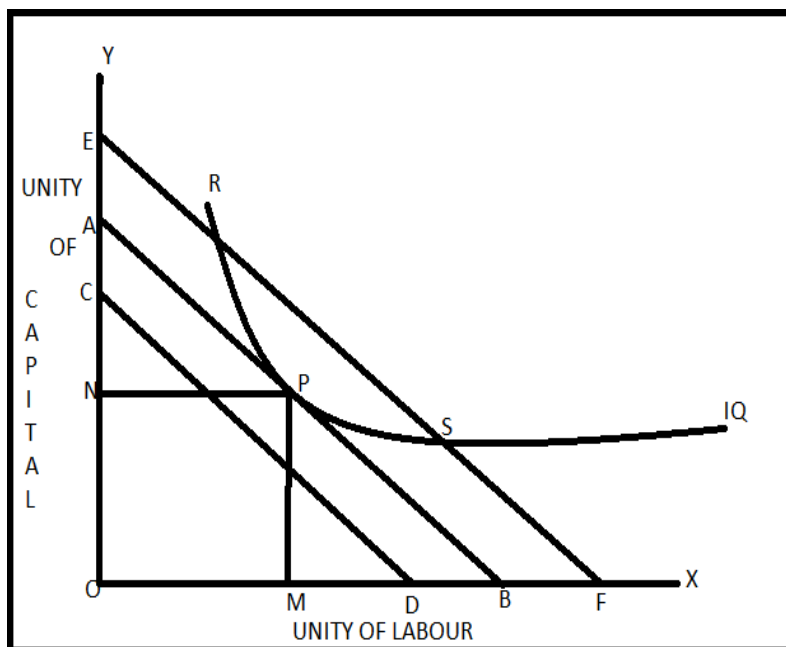
[3] LEAST COST COMBINATION OF FACTORS

We know that a firm tries to attain equilibrium position by ranking for the most economical or least cost combination of the factors of production. Just as a consumer when faced with making a choice between different combinations of two commodities aims to achieve maximum satisfaction. so also, a firm aims at attaining maximum profits. And for this purpose, the firm has to choose the factor combination in a most economic or optimum manner, that the firm would try to attain least cost combination of the factors production.

In other words, it may be said that in order to produce a given output, there are various combinations of the factors of production and the firm, naturally, would choose that combination of factors which minimizes its cost of production, for only then that the firm gets maximum profits. Thus, the firm will try to produce a given amount of output with the least cost combination of factors. This least cost combination will be the optimum point for the firm.

[4] WHICH WILL BE THE LEAST COST COMBINATION?

Now the pertinent question is which will be the least cost combination of factors. For this, we shall illustrate with an example. Suppose a firm decides to produce 100 units of a product which is represented iso-quant 10. This output can be produced by any combination of units of labour and capital such as A, B and C which are on the iso-quant or iso- product curve 19. It will be seen from the diagram that for producing 100 units of output the firm will choose that combination on iso- quant 19 which gives him the lowest cost of production for producing 100 units and this point is P on the so-cost line AB at which the this iso-quants line All is a tangent to the so product B Combustion with OM units of labour and ON capital is the least cost combination for the firm to produce 100 units of output.



The firm will not choose any other combination on the so- 19. such as R or S because they lie on the higher iso-cost line than iso-cost line AB and will, therefore, mean higher cost for producing 100 units of output.

Likewise, the firm will not go to the left of P because in that case it will not be able to produce 100 units of output by any factor combination which is left of P.

To sum up, therefore, the firm will be in equilibrium by choosing the factor combination P to produce 100 units of output which is the least cost factor combination. P is thus, the optimal combination for the firm.

It should also be noted here that the least cost factor combination of the firm can also be explained with the help of the principle of marginal rate of technical substitution and the price ratio of two factors. Thus, for example, if the marginal physical product of factor x and its price is more than the marginal physical product of Y and its price, the firm will continue to substitute x for y, that is, it will use more units of x and less units of y, till the ratio of marginal physical product of both these factors to their price become equal the condition of least cost-combination may, therefore, be expressed as follows:

$$\frac{\text{Marginal Physical Product of X}}{\text{Price of X}} = \frac{\text{Marginal Physical Product of Y}}{\text{Price of Y}} = \frac{\text{Marginal Physical Product of Z}}{\text{Price of Z}} \dots \frac{\text{Marginal Physical Product of n}}{\text{Price of n}}$$

It follows from this that the least cost combination of the factors is attained when the ratio of marginal physical products of two factors used is equal to their price ratio. Thus, the firm will be in equilibrium in regard to its use and purchase of two factors or more than two factors when the marginal physical product of these factors are proportional to factor prices. Just as in the case of consumer's equilibrium, the consumer equates the marginal rate of substitution (or the ratio of marginal utilities between the two goods with the price - ratio of goods; similarly, the firm to be in equilibrium would equate the marginal rate of technical substitution for the ratio of marginal physical products of the two factors) with the price-ratio of the factors.

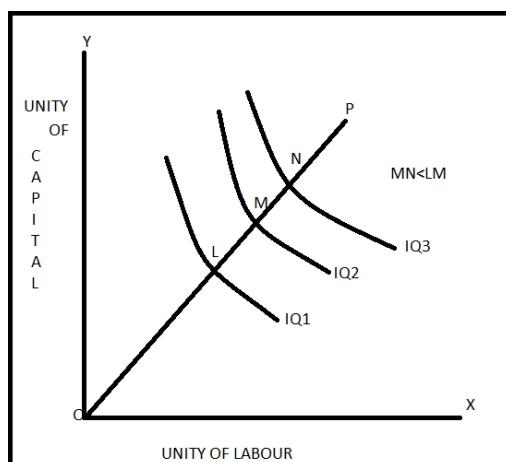
[5] RETURNS TO SCALE: ISO-QUANTS:

To understand, returns to scale, i.e. increase in scale of operation of the firm, we have to vary not only the variable factors but also fixed factor(s). If all factors are increased in same proportion and output increases in the same proportion, we have a case of constant returns to scale; if output increases more than proportionately, we have a case of increasing returns to scale and if output increases less than proportionately, we have a case of diminishing returns to scale. When increasing returns to scale are available, the firm is reaping certain advantages of large-scale operation; in the opposite case there are disadvantages. When the advantages and the disadvantages of scale are balanced, there are constant returns to scale.

This can be explained by the technique of iso-quants. An iso-quant is an equal quantity curve on which all points show the same level of output. A higher iso-quant shows higher level of output and lower level iso-quant lower level of output.

In the diagrams below 10, 10, 10, etc. are iso-quants, showing for example, 1000 units, 2000 units and 3000 units of output Line OP shows the output at different levels on various iso-quant curves

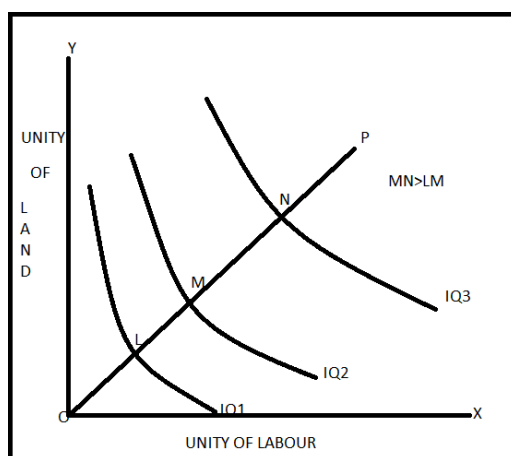
(I) Increasing to Scale: Returns Units of Land



In Fig. $MN < LM$, which means that with less increase in inputs, same increase in quantity of output can be achieved; in other words, if factors of production are doubled, the output will be more than doubled. The returns to scale increase. The firm enjoys increasing returns to scale.

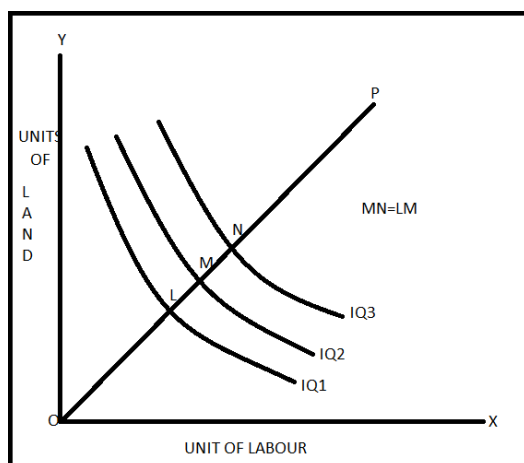
(II) Diminishing Returns to Scale:

In Fig. OP is the scale line. In this case $MN > LM$, which shows that the inputs, are rising faster, but the increase in output is the same. In other words, the doubling factors will result in less than double the amount of output.



[III] Constant Returns to scale:

If the factors production vary in the same proportion and output also varies in the same proportion, there a constant return to scale $MN = LM$ indicates that increased inputs is the same at every stage, and the consequent increase in output is in the same proportion. Thus, if the factor is double output also is doubled. This is known as the operation of the law



It may be noted that increasing returns to scale are due to internal economies accruing to the firm on account of increasing the scale of operation of the firm. Diminishing returns are due to internal diseconomies which is nothing but increasing efficiency in operation beyond the optimum size of the firm. Similarly, if economies and diseconomies are balanced, we have a case of operation of constant returns to scale.

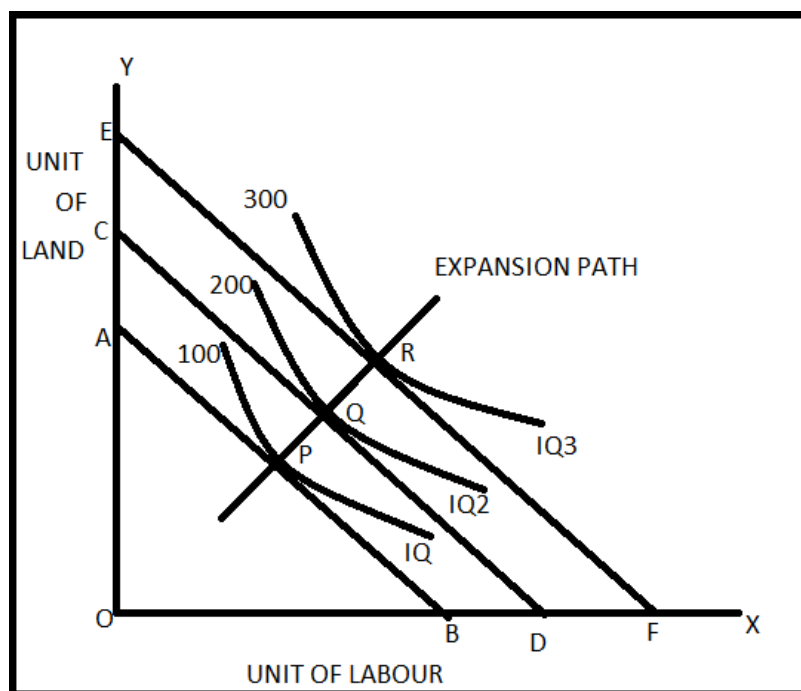
[6] EXPANSION PATH

The indifference curve analysis and the Iso-quant/Iso-cost analysis come to identical conclusions. A consumer attains equilibrium when the marginal rate of substitution between the commodities is equal to the price ratio of the two commodities. Similarly, the firm attains equilibrium when marginal rate of a technical substitution between two factors is equal to the price ratio of the two factors. This is the condition of equilibrium of a consumer and a firm.

Now let us explain the expansion path of a firm with the help of iso-quant/iso-cost curves. Expansion path is a line or a curve which every point is an equilibrium point, i.e., minimum cost combination of two factors at various levels of output. As the firm tries to expand its output, it will try to see that it attains equilibrium at the lowest cost of that output level. This is nothing but the concept of minimizing cost and maximizing profit.

We assume that the prices of two factors are given and iso-quants (i.e., equal quantity curves) is also given. Each high iso-quant represents a higher level of output. Each higher is

line shows higher level of cost (outlay) but the prices of two various factors remain constant. The tangency between the isocost line and iso-quant curve indicates equilibrium. As the firm moves from lower to higher level of production, a firm receiving maximum profit will produce at one or the other point on the expansion path because at any other point, not on it, will mean less than maximum profit.



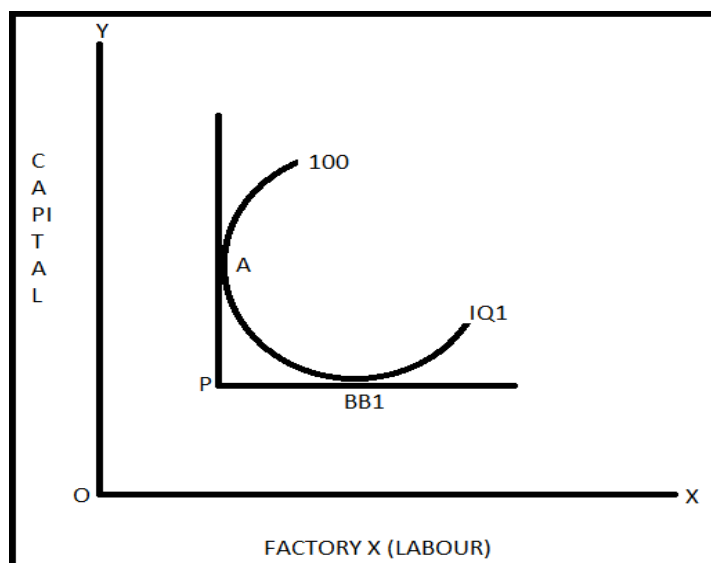
In the above diagram, iso-quants are given as IQ_1 , IQ_2 , IQ_3 , etc and iso-costs are presented as AB, CD, EF etc. The slopes of iso-costs are constant because the prices of two factors remain constant. Iso-quants are indicated by figures 100, 200, 300 etc. Points P, Q and R show equilibrium positions of the firm at different levels of output i.e. 100, 200, 300 etc. By joining these points, we get a line OFR which shows Expansion path of the firm. It shows minimum cost combinations, of the two factors X and Y, at various levels of output. As the firm expands its output, the combination of two factors will change as indicated by points on the expansion path. It may be noted that the expansion path shown above assumes that the prices of two factors remain constant.

If the price of any one factor changes or if both the prices change, in different proportions, the expansion path too will change. Hence, the shape of the expansion path will not be necessarily the same as shown above.

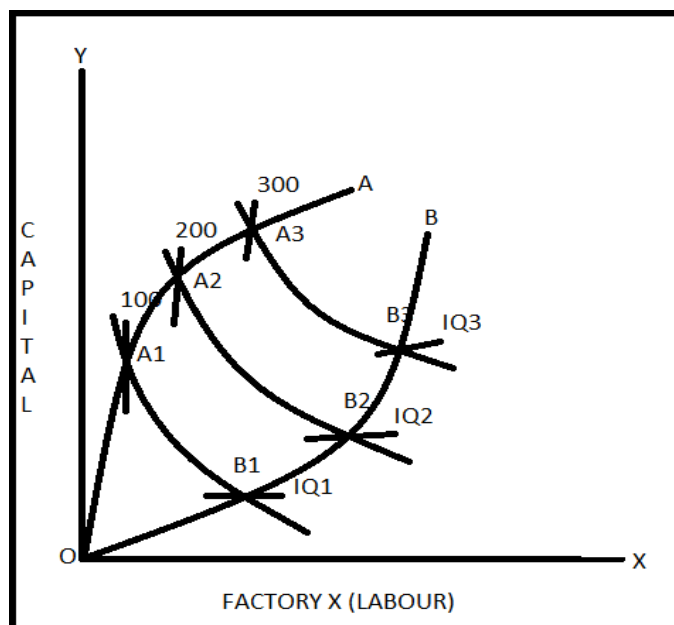
Similarly, if the iso-quants are more or less convex to the origin than what they are shown in the above diagram, the tangency points will change and hence the expansion path too will change. The shapes of iso-quants depend on the degree of substitutability or complementarity between the two factors.

[7] ECONOMIC REGION AND RIDGE LINES

We are familiar with the shape of an iso-quant it is generally convex to the origin. But there may be exceptional iso-quant, which may bend backwards at the upper end and shape upwards at the lower end, as shown below:



In this diagram, the iso-quant is abnormal between points A and B. Between these two points, it is normal (convex to the origin). The firm produces only between A and B. If the firm uses more of factor X or Y, or more of both the factors, it will produce less than the output indicated by the iso-quant, i.e., 100 units. In the left-side diagram below, we have different iso-quant curves indicating different levels of output. In the diagram, OA and OB are called Ridge-lines. Ridge-lines show the limits within which the firm will operate for production because outside the Ridge lines, production will be uneconomic. It may be noted that the area within the Ridge-lines is the area wherein the iso-quant curves are normal, i.e., convex to the origin. Outside this area, the iso-quant curves are not convex. The area between the Ridge lines OA and OB is called the economic region.



In the economic region, certain units of labour and capital can be employed to produce 100, 200 or 300 units as shown by respective iso-quants. Any point outside the economic region is called uneconomic because less output will be produced by a combination of two factors, one or both of which are more than required for production. This is clearly a waste and therefore the firm will always try to remain in the economic region which lies within the two Ridge-lines. Obviously, the firm will not produce at any point above OA or below OB lines. The above analysis shows relevance of that portion of the iso-quants which the firm would always like to keep in mind while taking production decisions.

REVIEW EXERCISES

Q.1 What are iso-quants? Discuss their main types. Production Function with Two Variable Inputs

Q.2. What is meant by marginal rate of technical substitution? Why does it tend to diminish? Illustrate your answer with a table and a diagram.

Q.3. Explain the main properties of iso quants.

Q.4. Differentiate between iso quants and indifference curves.

Q.5. What are iso-cost curves and iso-cost lines?

Q.6 Explain the equilibrium of a firm with the help of iso-quants and iso-cost curves.

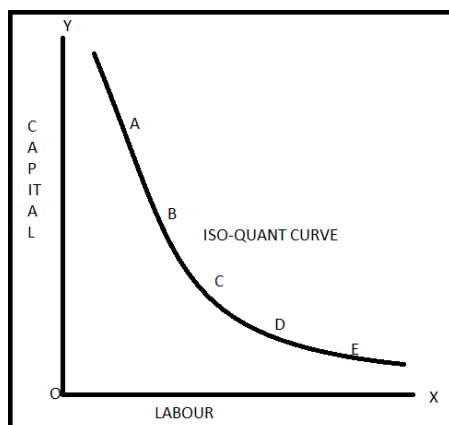
Q.7. What is least cost combination? How a firm attains least cost combination?

Q.8. What is expansion path? Explain expansion path with the help of iso-quants and iso-cost curves.

Q.9. What are ridge lines? What does economic region meet? Why the firm would not like to operate outside the economic region?

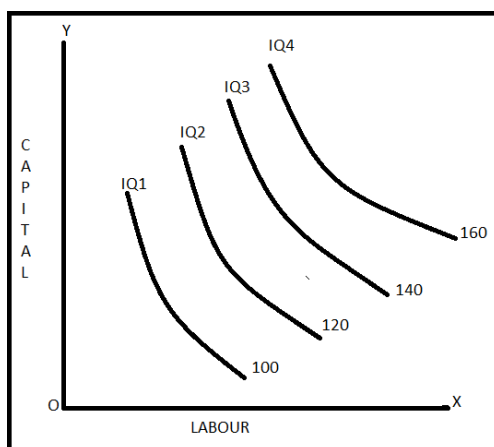
Q.10. Write short note on:

- (1) Iso-quants and their types.
- (ii) Iso-quants Map.
- (iii) Marginal rate of technical substitution.
- (iv) Properties of Iso-quants.
- (v) Iso-cost curves.
- (vi) Iso-cost line.
- (vii) Least cost combination of factors.
- (viii) Returns to scale.
- (ix) Expansion path
- (x) Economic region and Ridge lines.

SHORT QUESTION WITH ANSWER**Q.1. What are iso-quants? OR Define the term Iso-Quants. (October, 2010, April, 2015)**

An iso-quant may be defined as representing a curve in various combinations of two inputs that produce the same level of output. An iso-quant is also known as an iso-product curve or an equal product curve. An iso-quant is a curve which shows the different combinations of the two puts producing the same level of output

In the above diagram, we have shown all the combinations-A B. C. D and E and by joining them we get an iso-quant curve madia casting that every combination gives equal level of output

Q.1 What is an iso-quant map?

An iso-quant map is a set of iso-quants representing different levels of output. A higher iso-quant indicates higher level of output

It should be noted here that each combination on the same iso-quant gives the same level of output, However, a higher iso- level of output. Thus, for example, all combinations on 10, give 100 units of output. 19, 150 units and 19, 200 units. In short, higher the iso-quant, higher the level of output Labour Iso-quant map

Q.3 Name the different types of iso-quants.

The following are the main types of iso-quants:

[1] Linear isoquants (iii) Kinked iso-quant

[2] Input-output iso-quant. (iv) Smooth convex iso-quant

Q.4 State the main properties of iso-quants.

The following are the main properties of iso-quants:

An iso-quant curve is a downward sloping curve towards the right.

fill A higher level of iso-quant represents larger output.

(i) No two iso-quants can intersect each other. (iv) Iso-quants are convex to the origin.

iv) In between two iso-quants, there may be a number of iso-quants showing various levels of output which the combination of two factors can give. (vi) Units of output shown on iso-quants are purely arbitrary.

Q.5 What is an iso-cost curve?

An iso-cost curve is also known as price line or outlay line showing the price of one factor in terms of another. Each iso-cost curve represents the different combinations of two inputs which a firm can buy for a given amount of money at the given price of each input. In other words. iso-cost curves represent the locus of all combinations of the two input factors which result in the same total cost.

Q.6 What is an iso- cost line

which a firm wants to spend. Each is cost line An iso-cost line indicates the prices of factors and the total shows various combinations of two inputs which can be purchased with a given amount of money w with a given sum of money. An iso-cost line, may therefore, be defined as the locus of various combinations of factors which a firm can buy with a constant outlay. iso-quant line is also known as price line or outlay line

Q.7 Differentiate between Iso-quants and Iso-cost lines. Out key line. (October, 2013)

An Iso-quant is a curve representing various combinations of two inputs that produce the same level of output. An isoquant is also known as an iso-product curve or an equal product curve On the other hand, an iso-cost line indicates prices of factors and the total amount of money which a firm desires to spend.

Each iso-cost shows various combinations of two inputs which can be purchased with a given sum of money. An to-cost line this is a

locus of various combinations of factors which firm carbery with a constant outlay,

Q. 8. Define marginal rate of technical substitution. (April, 2011)

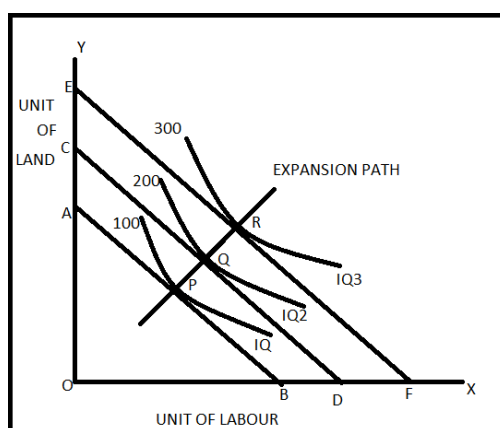
The concept of marginal rate of technical substitution is based on the production function where two factors can be substituted in variable proportions in such a way as to produce a constant level of output. Thus, marginal rate of technical substitution indicates the rate at which factors can be substituted at the margins without any change in the level of output. For example, the marginal rate of technical substitution of labour for capital to the number of units of capital which can be replaced by one unit of labour without changing the level of output. Algebraically we may put it as before Marginal Rate of Technical Substitution A Labour units A Capital Units

Q. 9. Why does the marginal rate of technical substitution diminish? OR Why is MRTS downward sloping? (April, 2012, October, 2013, April, 2014, April, 2016)

The marginal rate of technical substitution diminishes as more and more units of a factor (say labor) are substituted for another factor (say capital). Thus, as more and more units of Labour are used to compensate for the loss of the units of capital to get the same level of output the marginal productivity of labour diminishes and the marginal physical productivity of capital increases, and therefore less and less units of capital will be required to replace one unit of labour to maintain the same level of output. Thus the marginal rate of technical substitution diminishes as labour is substituted for capital. This implies that the iso-quant must be convex to origin at every point.

Q.10. What is least cost combination of factors? (Oct., 2014) The prime objective of a firm is to maximize its profits and for this purpose the firm has to choose factor combination in a most economical or optimum manner, that is, the firm would try to attain least cost-combination of the factors of production. In order to produce a given output there are various combinations of the factors of production and the firm would naturally choose that factor combination which diminishes its cost of production: for only then that the firm can get maximum profits. Thus, the firm will try to produce a given level of output with least cost combination of factors.

Q.11. What is the expansion path?

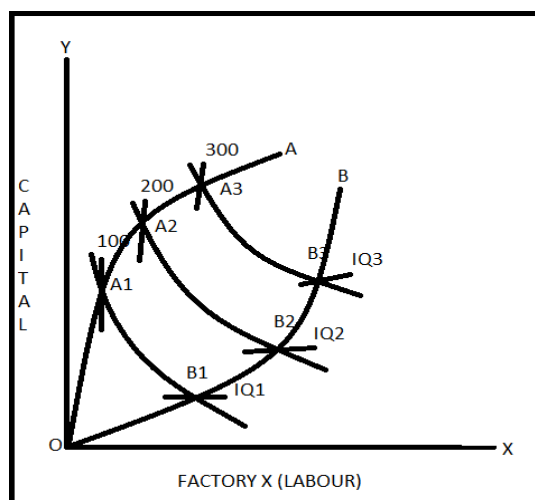


This least cost-combination will be the optimum point for the firm

The expansion path may be defined as the locus of different points of a firm's equilibrium when it changes its total outlay to expand the output while relative factor prices remain constant. Thus the expansion path shows how factor proportions change, when output changes, relative factor prices remaining constant. With given factor prices and given production function, the optimal expansion path is determined by the points of tangency of successive iso-cost lines and successive iso-quant. In other words, the between iso-quants and the iso-cost line.s The expansion path is also known as scale- line because it shows how a firm will change the quantities of two factors when it increases the level of output. This will be clear from the diagram on the Expansion Path expansion path is the locus or Scale Line of the points of tangency Labour

Q.12. What are Ridge lines? What do they Signify? (April, 2012. April, 2013, October, 2016)

A ridge line is the locus of points of iso-quants where the marginal product of input is zero. Ridge lines show the limits within which the firm will operate for production. because outside the ridge lines production will become uneconomical. It should be noted that the area within the ridge lines is the area where in the iso-quants are normal. that is, convex to the origin. Outside this area, the iso- quants are not convex. The area between the ridge lines, that is. OA and OB in the following figure on the left side is called the economic region.



In the economic region, certain units of labour and capital can be used to produce 100, 200 or 300 units as shown by the respective iso-quants. Any point outside the economic region is called uneconomic because less output will be produced by a combination of two factors, one or both of which are required for production. This is clearly a waste and therefore the firm will always try to remain in the economic region which lies within the two ridge lines. This analysis signifies the relevance of that portion of the iso-quants which the firm would always like to keep in mind while taking production decisions.

QUESTIONS ASKED AT THE VEER NARMAD SOUTH GUJARAT UNIVERSITY

EXAMINATION

Q. 1. Write a short note on: Ridge Lines. **(April, 2011)**

Q.2. What is Iso-Quant? Explain properties. **(April, 2011)**

Q.3 What is the difference between Iso-Quants and Iso-Cost lines. Explain the least cost combination of factors with the help of these lines **(April, 2012, April, 2013, April, 2016)**

Q.4 What are iso-Cost curves and Iso-Cost lines. **(April, 2014)**

Q.5 Explain and illustrate isoquants and iso-cost curves. **(October, 2014)**

Q 6 Write a short note on: Expansion Path **(October, 2014, April, 2015)**

Q.7 Discuss the properties of iso-quants. **(October,2014)**

Q.8. What is meant by economic region Explain the concept with the help of ridge lines. **(October, 2014) (April. 2016)**

Q.9 Write an explanatory note on: Producer's equilibrium. **(October, 2016)**

Q.10 Explain the producer's aquarium with the help of Isoquants and isocost: lines. **(April, 2017)**

UNIT 5: INFLATION

[10%]

Course Content

[1] Meaning of Inflation

[2] Causes of Inflation

[3] Types of Inflation (Demand pull and Cost push inflation)

[4] Effects of Inflation

[5] Anti Inflationary Measures

[1] Meaning of Inflation

Inflation means a general rise in prices. In technically terms as “a chronic and sustained rise in prices rather than a once for rise in prices. (Example By a bad weather leading to destruction of crops)

Inflation' is the situation where amount of money in the country is in excess of the volume of goods available so that too much money is chasing too few goods.'

Thus, during Inflation the general price level rises or it is the same thing as saying that the value of money falls.

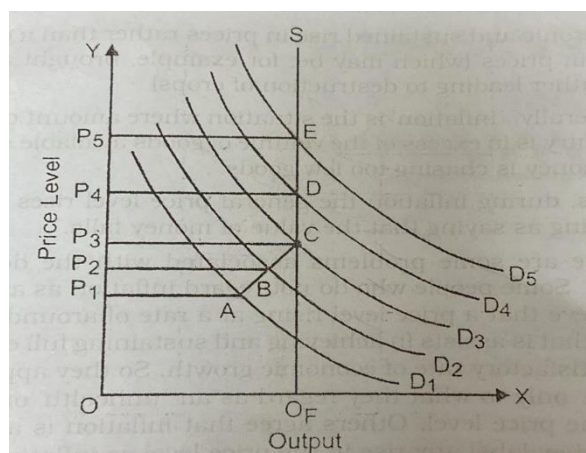
[2] Causes of Inflation

There are many theories explaining the cause of inflation like the theory of demand-pull inflation, cost push inflation, mixed demand-pull and cost-push inflation, sectoral theory of inflation, structural theory of inflation, mark-up inflation etc. out of which two important and well known theories of inflation are discussed below:

(A) Demand pull Inflation or Monetary Theory of Inflation

Demand pull inflation occurs when there exists an excess demand over the available supply at the existing prices, As shown In the figure below, the aggregate demand function shifts upwards to the right but the supply function does not shift.

In the figure given below OF is the level of output at full employment level, so output can not exceed OF/Beyond OF, increase in price does not result in Increased output. So the supply curve So comes a straight vertical line/As demand Increases from D₁ to D₅, the price level also rises from P₁ to P₅. P₁, P₂, P₃, P₄, and P₅ respectively.



The following are the factors that contribute to Demand - pull inflation

(1) Money Supply: This is the major source of inflation, as it results in an increase in demand deposits and expansions of loans and investments by the commercial banks.

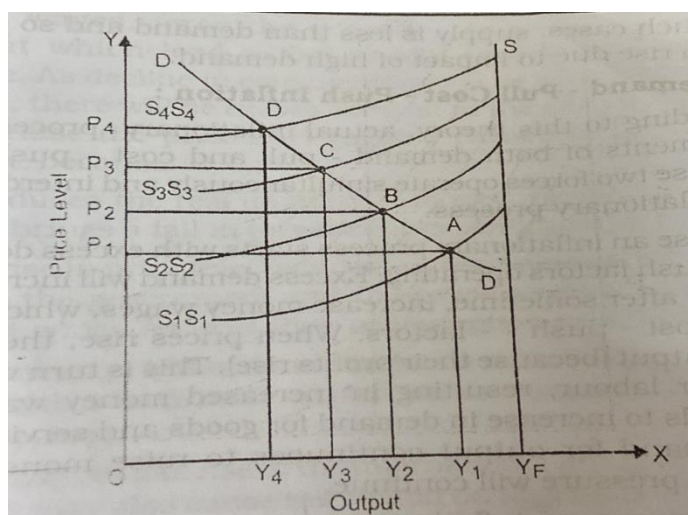
(2) Disposable Income: Income payments made to the factors after personal taxes have been paid is called disposable income'. Naturally, an increase in disposable income' lead to an increase in the consumption expenditure and any increase in consumption expenditure is inflationary in nature.

(3) Increase in Business Outlays: Increase in business outlays or capital expansion with speculative motive also contribute to inflation.

(4) Increased Foreign Demand: Increased foreign demand is another factor contributing to inflation. This factor is significant if a country maintains an export surplus on its balance of trade.

(B) Cost - Push Inflation

Increase in cost of production, is considered as the second major cause of inflation which is also known as cost push inflation'. When the cost of production increases aggregate supply schedule shifts to the left which shows that a smaller volume of output is supplied at the prevailing prices.



When the aggregate demand schedule remains unchanged, a fall in supply increases the price level. Downward shift of the supply curve from S1 to S2, S3, S4 results in continuous and progressive increase in the price level.

The following are the factors that cause the cost-push inflation:

(1) Higher Wage Rates : There is presence of organized trade unions in any modern economy. So, whenever the employers (producers) are forced to increase the wage rates, they try to shift its burden on the consumers by increasing prices of the commodities they produce.

(2) Higher Taxes : Another important cause of cost - push inflation is various taxes levied by the government and indirect taxes like excise duty contribute more to rise in prices. The producers always try to shift the higher burden to taxes on the consumers by increasing prices by the amount of tax.

(3) Fall in the Availability of Basic Inputs : When the supply of raw materials like cement, iron and steel, cotton, jute, etc. falls (they are widely used in almost all production processes), it will result in raising the prices of the manufactured goods.

(4) Higher Profit Margin: Another important factor contributing to inflation is the higher profit margin fixed by the producers. This is especially true in the case of "sellers market". In such cases, supply is less than demand and so prices tend to rise due to impact of high demand.

(C) Mixed Demand - Pull Cost - Push Inflation

According to this theory, actual inflationary process includes some elements of both demand - pull and cost - push inflation. In fact, these two forces operate simultaneously and interdependently during inflationary process.

Suppose an inflationary process starts with excess demand with no cost - push factors operating. Excess demand will increase prices, which will, after sometime, increase money wages, which is not the result of cost - push - factors. When prices rise, the producers increase output (because their profits rise). This in turn will increase demand for labour, resulting in increased money wages, which further leads to increase in demand for goods and services. So long as the demand for output continues to raise money incomes, inflationary pressure will continue.

Now, suppose an inflationary process starts from the supply side, due to increase in money wage rates. The cost push inflationary process resulting from this increase will be self - sustaining only when every wage - push is accompanied by a corresponding increase in aggregate demand. Since every cost - push is accompanied by a fall in output and employment along with a price increase, it is likely that the government will adopt expansionary monetary and fiscal policies to check the fall in output and employment. Thus, cost-push leads to sustained inflationary process, because the government will try to achieve full employment by raising aggregate demand, which in turn will lead to further wage-push and so on.

[4] Effects of Inflation

The effects of inflation can broadly be studied under the two heads

(A) Effects of Inflation on the Different Classes of Society

(B) Effects of Inflation on the Economy as a Whole

(A) Effects of Inflation on the Different Classes of Society

Inflation affects different classes of society in different ways. Some people gain and earn windfall profits, while others have to suffer adversely for no fault of theirs, Thus:

(1) Entrepreneurs, Producers, Traders etc. Gain during Inflation

Because of the emergence of wind fall profits. In fact, inflation proves to be a boon to them because the prices of goods and services rise at a much faster rate than the cost of production. Thus, cost of labour (wages), raw materials and equipment, interest and premium charges do not catch up with the rise in the prices of the products.

This enables the producers and traders to reap large profits, besides, the money value of the stock and other inventories kept by the businessmen also increase with a rise in general price level. Thus, producers and traders as a class gain enormously during inflation.

(2) Fixed - Income Groups

Inflation hits hard on persons in the fixed-income groups, that is, those who live on past savings, fixed interest and rent, pensioners and fixed - income groups. This is because, while their money incomes are fixed, it's purchasing power is greatly reduced- due to rising prices.

(3) Wage and Salary Earners

Inflation also adversely affects wage and salary earners because wages and salaries do not rise in the same proportion in which the cost of living rises. Besides, there is also a time - lag between rise in prices and rise in wages and salaries. However, in modern times, where workers and salary earners are well organised into powerful trade unions, they may not suffer much during inflation because they are able to secure an increase in their wages and salaries due to their organised strength. However, if they are unorganised or ill-organised like the farm workers, unskilled and daily wage workers, workers in the unorganised sector, etc. They suffer a lot during periods of inflation.

(4) Debtors and Creditors

During inflation, debtors generally gain while creditors lose. This is because debtors had borrowed when the purchasing power of money was high and now they repay their debt (loan) when the purchasing power of money is low. In other words, although debtors repay the same amount of money together with the interest there on, yet in terms of purchasing power they pay less as the same money now purchases less amount of goods and services because of rising prices. Creditors, on the other hand, are losers in times of inflation because they receive less in real terms, that is, less in terms of goods and services.

(5) Investors

Investors can be classified into two groups: (1) investors in equities (shares) and (2) investors in fixed interest yielding bonds and debentures. During inflation investors in equities and shares gain because dividends on equities increase with increase in prices and corporate earnings. On the other hand, investors in fixed interest yielding securities like bank deposits, bonds, debentures etc. have to remain content with the fixed income as they do not get the benefit of increased income from their investments in fixed yielding securities, accordingly they tend to lose during inflation.

It may, therefore, be said that inflation redistributes income and wealth in favour of entrepreneurs, producers, traders, debtors etc. and adversely affects the interests of consumers, creditors, small investors, poor class and persons in the fixed- income groups.

(B) Effects of Inflation on the Economy as a Whole : Inflation and Economic Development

There are two divergent views as to whether inflation is conducive or obstructive to economic development or whether inflation promotes or retards economic development. Thus, while Keynesians believe that inflation is conducive to economic growth, Milton Friedman and others hold the opposite view.

(a) Inflation Promotes Economic Development

(1) Inflation leads to the redistribution of income and wealth in favour of entrepreneurs, producers, traders and other high – income groups. As this class has a high propensity to save, it leads to increase in aggregate savings of the community which when used for investment promotes economic development.

(2) Inflation results in the generation of an "atmosphere of optimism" in the economy which leads to increased investment and consequently to increased production, employment and income.

(3) In underdeveloped economies a policy of inflation can be used as a means of financing economic development. As we know, an underdeveloped economy faces serious 'resource crunch' because of its low per capita income and low rate of saving. A policy of deficit financing (issue of new money supply) can help in raising resources which can be used for productive purposes.

It has been said that, if this policy is used with caution, it can help in raising capital formation and accelerate the process of economic development.

Some economists are of the opinion that inflation is the result of economic development. According to them, inflation to an extent is inevitable during the initial stages of economic development because of a 'time-lag' between the increase in purchasing power leading to an increase in aggregate demand on the one hand and the production and availability of 'wage-goods' on the other. Besides, a mild and controlled dose of inflation proves to be conducive to economic development in that it tends to divert productive resources of the economy to the developing sectors and thereby promote their growth and development. According to Arthur Lewis 'functional price rise' aims at securing a more and better optimum allocation of resources and is therefore conducive to economic development.

(b) Inflation is Obstructive to Economic Development

(1) **Inflation is not inevitable during the process of economic development.** If in the past, it was so, that was because of the fact that inflation was then unanticipated and unplanned. But it is not so in modern times. In these days, where people come to know that the government is going to adopt a policy of inflation, they become conscious to prevent. Its adverse effects on the redistribution of income and wealth.

(2) **Inflation adversely affects peoples' ability and willingness to save** and thereby results in slowing down the rate of capital formation. During periods of inflation, people find that the value of their past savings has been greatly eroded due to rising prices and consequently there is no incentive on their part to save, Likewise, Inflation also adversely affects peoples' willingness to save : during inflation people do not like to keep their savings in the form of money for the simple reason that the value of money rapidly diminishes, and therefore they keep their savings in the form of gold, land, urban property and other assets. Besides, inflation results in the flight of capital from the country and reduces the flow of foreign Investments. All this tends to hamper the process of economic development.

(3) **Inflation also distorts the pattern of investment.** It encourages investments in those sectors of the economy which are likely to give quick profits rather than in essential and productive sectors, Inflation, thus, leads to speculative investments and brings about the allocation of resources which is far from optimum.

(4) Inflation tends to reduce exports and increase imports and thereby causes a "fundamental disequilibrium" in the balance of payments of the country. Due to rising money incomes of the people and the shortage of wage goods in the domestic market, imports tend to increase; on the other hand due to inflationary price - rise which is all pervading, prices of exports also increase which reduce their competitive strength in the international markets leading to a fall in exports. Besides, as exporters get fairly high prices for their products in the domestic market, there is very little incentive on their part to export in the foreign markets. All this results in declining exports. Thus, rising imports and falling exports lead to a fundamental disequilibrium in the balance of payments of the country.

(5) Inflation as a source of raising finance is costly and is a form of a regressive tax which hits hard the poor and down trodden. Inflation encourages the production of luxurious and semi-luxurious goods at the cost of essential goods of mass consumption and thus it brings about mal-allocation of resources.

(6) Inflation increases income inequalities in the society by widening the gulf between the higher and the lower income groups. Inflation brings about a redistribution of income in favour of the rich. The adverse effects of inflation are felt more by the poor than by the rich. Inflation, thus, causes a great social injustice and breaks down public morale. People are arbitrarily robbed of their savings accumulated through hard work. In this connection Prof. C. N. Vakil has aptly said that, "Inflation may be compared to a robber.

Both deprive the victim of some possession, with the difference that the robber is visible, inflation is invisible, the robber's victims may be one or few at a time, the victim of inflation is the whole nation: the robber may be dragged to a court of law, inflation is legal."

In short, inflation is economically unsound, politically dangerous, socially unjust and morally indefensible. As Robertson has put it, thus, money which is a source of so many blessings to mankind becomes also, unless we can control it, a source of peril and confusion."

[5] Control of Inflation [Anti - Inflationary Policy]

Inflation is indicative of a situation where aggregate demand (aggregate expenditure) exceeds aggregate supply of goods and services. Measures to control inflation, therefore, should aim at controlling aggregate demand on the one hand and increasing the production and supply of wage-goods on the other hand. Let us discuss these measures in detail.

(A) Measures to Control Aggregate Demand

Measures to control aggregate demand or aggregate expenditure occupy a very important place in any scheme of anti-inflationary policy. These measures include the following:

(1) Monetary policy

(3) Wage – Freeze Policy

(2) Fiscal Policy

(4) Price Controls and Rationing

(1) Monetary Policy : Monetary policy is the policy of the central bank of the country relating to currency and credit and involves the regulation and control of the volume of currency and credit in accordance with the requirements of the economy. Monetary policy to control inflation is based on the assumption that an inflationary price rise is due to the excess of monetary demand which is made possible by the expansion of bank credit. Consequently, in order to control inflation, the central bank adopts a 'tight money policy' or a 'dear money policy' which aims at contraction of bank credit.

Under the dear money policy, some measures are adopted

- (a) The central bank Increases the bank rate with a view to make credit costly and there by prevent speculative and nonessential investments.
- (b) The central bank sells securities in the open market and thereby brings about a reduction in the cash reserves of the commercial banks.
- (e) The central bank raises the cash reserve ratio which the commercial banks have to keep with the central bank.
- (d) The central bank imposes stringent credit control measures like credit rationing, increase in margin requirements, etc.

Limitations of Monetary policy

1. When the economy is in full boom and the marginal efficiency of capital is high, both short and long term investments are indifferent to changes in interest rates.
2. The effectiveness of the monetary policy also depends upon the existence of a well - organised and well - integrated money market in the country.
3. The failure of the government to come to grips with real investment aslo makes monetary policy ineffective.
4. Very often the policy applied is so soft that it ceases to be effective in practice.
5. If this policy is used moderately with a light dose, it may fail to bring about the desired result and if used very strictly or with a heavy dose, it may have adverse effects on the economy, As Hansen puts it, "moderately used monetary policy courts the failure or ineffectiveness, and pushed to fanatical extremes, it courts disaster."

(2) Fiscal Policy: Fiscal policy is the policy of the government with regard to taxation, public expenditure and public borrowing. To combat inflation, fiscal measures would involve increase in taxation. reduction in public spending and increase in public borrowing.

(a) Reduction in public expenditure

During inflation, the government should reduce its expenditure as much as possible to counteract an increase in private spending Utmost economy in public spending must be observed and all inflation avoidable expenditure should be pruned. As Kurihara has aptly observed, "by reducing its spending, the government can partly offset he inflationary pressure arising from unregulated private spending." forever, there are certain limitations of this policy:

(a) Modern State is a Welfare State and it incurs large expenditure on schemes of economic development and social welfare. No body would plead for a drastic cut in this type of expenditure.

(b) It is not so easy to reduce government expenditure on defence.

(c) Likewise, any drastic cut in public expenditure to cure

inflation may actually land the economy in a slump: it may even prove to be counter productive.

Thus, a policy of reduced government spending, howsoever important, has its limitations. However, efforts should be made to contain public expenditure within reasonable limits during periods of inflation.

(b) Increase in Taxes

Besides a cut in public expenditure, the government should also increase taxes to effect a cut in private expenditure. The problem during inflation is to reduce the size of disposable income in the hands of the general public in view of the limited supply of goods and services in the market. It is, therefore, necessary to take away the excess purchasing power from the public in the form of taxes.

This would mean the raising of the rates of existing taxes as also the imposition of new taxes. In other words, as an integral part of anti-inflationary policy, there should be an increase in taxation in both 'depth' and range. Thus, by reducing the purchasing power and thereby reducing the demand through taxes, inflationary pressures can be held in check.

The main limitations of this policy are as follows :

1. Indiscriminate increase in taxes on income and property may have an adverse effect on the ability, willingness and enthusiasm of the people to save, invest and enterprise.
2. Likewise, heavy dose of indirect taxation by pushing up the prices may cause cost-push & wage-push inflation in the economy.

(c) Public Borrowing

A policy of public borrowing can also help in containing inflationary pressures in the economy. Here too, the objective is to mop up the excess purchasing power from the public. Thus, for example, raising of market loans and other borrowing programme of the government is likely to have a disinflationary effect. The government may offer various types of bonds and saving schemes, and may take special measures to promote private savings.

Compulsory saving, deferred pay scheme or forced saving may also be introduced. Besides, public debt may be managed in such a way that money supply in the economy remains under control. Public debt in money terms may not be repaid during inflation.

(3) Wage - Freeze Policy

It has been said that during times of inflation, wages cannot be left free to chase prices upwards. Wages have to be controlled and regulated to contain inflationary pressures in the economy through a system of 'income-freeze.' This will keep in check the disposable income and consequently the aggregate demand. However, the main limitation of this policy is that trade unions will never agree to a policy of wage-freeze, particularly during peace-time inflation, unless there is a simultaneous freezing of prices, profits and dividends.

(4) Price Control and Rationing

Price control and rationing are also important instruments to contain inflationary pressures and have been widely used in the various countries of the world during and after the second world war. The objective of price control is to lay down the upper limit beyond which the price of a particular commodity or commodities would not be allowed to rise. Under price control measures, producers

and traders are not allowed to charge more than the legally fixed price; any violation of it is construed as a penal offence.

Along with price control, rationing of certain essential goods which are in short supply, is also introduced. The main purpose of rationing is to ensure a fair and equitable distribution of goods in short supply to all the sections of the society and in particular to the weaker sections and persons in the lower-income groups. In fact, price control and rationing generally go hand in hand.

However, there are certain limitations of this policy :

1. The success of price control and rationing depends upon the efficiency and integrity of the administrative machinery which has to handle these measures.
2. The government should have, at its disposal, adequate stock of the commodity concerned. Fixing the price without having adequate stock will result in failure of the policy.
3. It is not possible for the government to control the price of each and every commodity. Normally, the government restrict price control on certain essential items. The result of this will be that price rise will find its outlet in the case of those articles whose prices are not controlled.
4. As has been the experiences, controls breed corruption and give rise to anti-social activities like hoarding, black-marketing, profiteering, etc.
5. Price control measures generally result in turning an 'open inflation into a repressed one.'
6. Price control and rationing lead to a loss of consumer's freedom.
7. Keynes too has not favoured a policy of price control on the ground that it failed to bring about an equilibrium between the purchasing power and the available output. He has, therefore, advocated a policy of reducing the volume of purchasing power in the hands of the public via taxation and forced savings and then allow the public to exercise a free choice in the purchase of wage-goods.

(B) Increase in Production and Supply of Wage-goods

As said earlier, inflation is the result of an excess of aggregate demand over a given supply of goods and services. Measures to control inflation, therefore, while laying stress on containing aggregate demand should also aim at increasing the supplies of goods and services. For this, the following measures may be suggested :

- (1) In the short run, supplies of essential articles, particularly of wage-goods, may be increased by arranging for their imports well in time. Likewise, reduction in exports of essential goods may increase the domestic supplies and help to contain inflationary pressures under check. However, the feasibility of these measures will depend on the balance of payments situation of the country.
- (2) In the long run, efforts should be made to raise agricultural and industrial production, particularly of the wage-goods. The pattern of public and private investment as also the monetary and fiscal policies should be so designed as to secure a substantial increase in the production of essential goods of mass consumption.