SYLLABUS

Class – B.Com. I Year

Subject – Business Economics

UNIT – I	Historical background of economics in India with special reference to Kautilys, Definition of Economics, Concept of Micro and Macro Economics, Method of Economic study, Economics Law and their nature, Significance of Economics Basic problems of Economics
UNIT – II	Elasticity of Demand, Concept and measurement of Elasticity of Demand, Price, Income and cross elasticity, Average Revenue, Marginal Revenue and Elasticity of Demand, Determination of Elasticity of Demand, Importance of Elasticity of Denmed Q
UNIT – III	Factors of Production- Land, Labour, Division of labour, Efficiency of Labour, Capital, Organisation and Enterprises, The scale of production, Theories of Population
UNIT – IV	Production function and Law of returns, Return of scale, Equal product curve analysis, Market and their classification, Theory of cost and concept of revenue.
UNIT – V	Price determination under perfect competition and Equilibrium of the firmy Monopoly-price and output determination and monopoly control, Price determination under monopolly, Imperfect and monopolistic competition price determination
UNIT – V I	Re-concept, Recordian and modern theories of Rent, Quasi Rent, Wages concept, nominal andreal wages, theories of wage determination, Profit Nature, concept and Theories of profit Keywords/Tags:micro economics, macro economics, Production, perfect competition, Reat

Unit 1

HISTORICAL BACKGROUND OF ECONOMICS IN INDIA WITH SPECIAL REFERENCE TO KAUTILYA

Introduction to Kautilya and his Arthashastra Kautilya was a learned, ethical, wise, experienced, secular, progressive, independent and original thinker. He believed that poverty was death while living. His Arthashastra is a manual on promoting Yogakshema—peaceful enjoyment of prosperity—for all the people. It is shown that his approach is more suitable to our economy than the currently adopted western approach. He understood the economic system as an organic whole with interdependent parts. He undertook an in-depth and detailed analysis of each part at the micro level without losing sight of the macro goal of engineering shared prosperity. He believed in the power of persuasion, moral and material incentives and not in coercion or force to elicit effort. He designed material incentives in such a way that no crowding-out occurred, that is without weakening the moral incentives. He advanced a holistic yet logical and comprehensive approach to bring shared prosperity. In fact, a stakeholders-model in which the businessmen, workers and consumers share prosperity, is discernible in his Arthashastra. He relied both on the invisible hand (the market) and the direct hand (principles, policies and procedures) to enrich the people. Kautilya was deeply influenced by the Mahabharata (3102 BCE) and it appears as if it had happened in not too distant a past. Secondly, Rao (1973) points out that the measurements used in the Arthashastra are very similar to those prevalent during the Sindhu-Sarasvati Civilization (2600 BCE-1800 BCE).1 According to the new research, Chandragupta Maurya ruled around 1534 BCE and not during the 4th century BCE. The preponderance of emerging evidence indicates that Kautilya wrote his Arthashastra—science of wealth and welfare—several centuries earlier than the fourth century BCE which has been advanced by the Western Indologists. They had taken upon themselves the selfless and tortuous task of dating, without any margin of error, all the historical events, such as the Aryan Invasion Theory and providing authentic interpretations of our ancient texts. They really need their well-deserved retirement from this demanding responsibility and leave it to the native amateurs. . Kautilya was far-sighted, foresighted, ethical but not very religious, believed in designing an efficient organizational structure but was not a bureaucrat.

Kautilya: The True Founder of Economics The following table lists some of the concepts innovated and used by Kautilya. It also provides the time-periods of their re-emergence.

Table :- Concepts Developed and Used by Kautilya

S. No.	Re-emerged during the period Concepts	Originated and applied by Kautilya
1	1700-1850	Gains from trade, diversification, Division of labor, Inter-temporal choice, labor theory of property, Law of diminishing returns, moral hazard, regulation of monopoly, sources of economic growth, Duipit Curve, principles of taxation
2	1850-1900	Distinction short-run and long run, Efficiency Wages, externality, , Demand-Supply Apparatus, Opportunity cost, Producer Surplus
3	1900-1970	Principal-agent problem, Liquidity, Mean-Variance approach, non-cooperative game
4	1970- Present	Asymmetric information, piece-wise Linear income Tax, Loss-aversion, information economics, Self-protection, self-insurance, Time Inconsistency, Systemic risk

On the other hand, Adam Smith did not innovate a single concept in economics. Barber (1967, p17) observes, "Little of the content of The Wealth of Nations can be regarded as original to Smith himself. Most of the book's arguments had in one form or another been in circulation for some time."

Kautilya as a One-Man Planning Commission and More

Kautilya's Arthashastra is comprehensive, coherent, concise and consistent. It consists of three fully developed but inter-dependent parts.

(a) Principles and policies related to economic growth, taxation, international trade, efficient, clean and caring governance, moral and material incentives to elicit effort and preventive and remedial measures to deal with famines.

(b) Administration of justice, minimization of legal errors, formulation of ethical and efficient laws, labour theory of property, regulation of monopolies and monopsonies, protection of privacy, laws against sexual harassment and child labour.

(c) All aspects of national security: energetic, enthusiastic, well trained and equipped soldiers, most qualified and loyal advisers, strong public support, setting-up an intelligence and analysis wing, negotiating a favourable treaty, military tactics and strategy, and diet of soldiers to enhance their endurance.

Kautilya's Ethics-based Economics:

Ancient sages realized that genuine trust was an ethics-intensive concept since non-violence, truthfulness, honesty and benevolence were the foundation for trust. Kautilya accepted that insight wholeheartedly. That is, trust flourished only in an ethical environment. How to make sure that children grow-up to be ethical adults? Kautilya suggested teaching ethical values at an early age. Kautilya believed that dharmic (ethical) conduct paved the way to bliss and also to prosperity. That is, according to Kautilya, a society based on contracts alone is less productive and more anxiety prone than the one based on conscience and compassion. If the social environment is predominantly ethical, there is less of a need to take defensive measures to protect against opportunism. He emphasized ethical anchoring of the children for replacing the 'culture of suspicion' with a harmonious and trusting one.

Kautilya's Insights

(a) An ounce of ethics was better than a ton of laws. Ethical anchoring could be more effective in preventing systemic risk than a heap of rules and regulations.

(b) Principles were only as good as the people who practiced them, and policies were only as good as the people who formulate and implement them.

(c) Material incentives should complement and not substitute moral incentives so that there is no crowding- out.

(d) Education should include ethical education also. Secular values, such as non-violence, honesty, truthfulness, compassion and tolerance do not violate the separation between religion and state.

(e) Market failure is bad, government failure is worse but moral failure is the worst since moral failure is true cause for other failures.

(f) Ethics and foresightedness could improve governance and bring sustainable prosperity for the whole of humanity.

(g) Sound organizational design could complement the ethics-based approach by enhancing specialization and reducing the scope for conflict of interest situations.

(h) Wisdom is the most valuable asset and knowledge-management is a subset of management by wisdom.

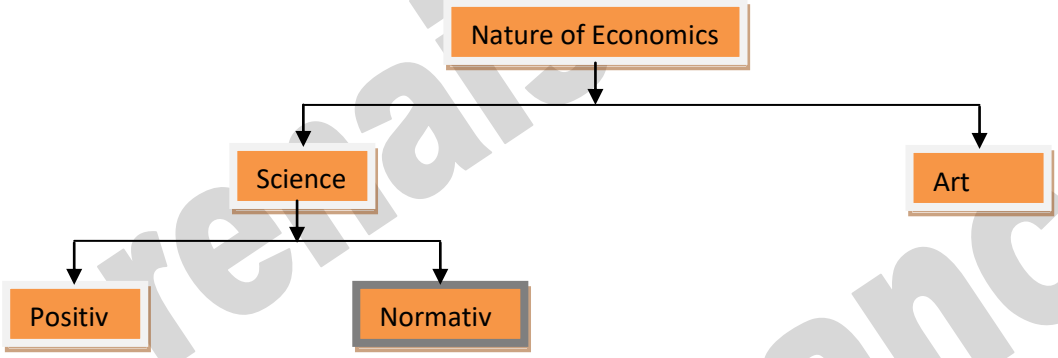
Definition of Economics

The term "Economics" was originally derived from the two Greek word "Oikos" which means household and "Nomos" which means management. Thus, it refers to managing of a household using the limited funds.

Many economists like Stigler, Samuelson, Macifie, Oscar Lange, Sciovosky, have given definition of economics –

1. "Economics is fundamentally a study of scarcity and the problems which scarcity gives rise to." **-Stonier and Hagur**
2. "Economic is a science concerned with the administration of scarce resources." **-Scitovosky**

Nature of Economics



Economics as a Science

1) In simple words, a science is commonly defined as a systematic body of knowledge about a particular branch of the universe.
2) In the opinion of Poincare who says – "A science is built upon facts as a house is built of stones."
3) Applying this is to our subject, we find economics is built upon facts, examined and systematized by economists. Further, economics like other science deduce conclusion or generalizations after observing, collecting and examining facts. Thus, it deals with (i) observation of facts. (ii) Measurement (iii) Explanation (iv) Verification. In short, it formulates economic laws about human behaviour. In this way economics has developed into a science of making and possessing laws for itself.
4) Science economics satisfies all the tests of a science, economics is regarded as a full-fledged, science. In short, it is no way less than other sciences.

The economics as a science can be divided into two parts i.e. (a) Positive Science and (b) Normative Science.

I. **Economics as a Positive Science –** A positive science establishes a relation between cause and effect. It tells us that if we do a certain thing, same result will follow.

II. **Economics as A Normative Science –** Marshall, Pigou and historical school puts the arguments that economics is normative science i.e. it states: What should be done.

Therefore a positive science describes what is and a normative science describes what should be done & what should not be done.

From the above noted discussion, we can say that economics is both positive and normative science as at present, it deals with 'what is' and 'what ought to be'. Therefore, it not only focuses why certain things happen, it also conveys whether it is the right thing to happen.

Economics as an art

Art is completely different from science.

1) In the words of Cossa – "A science teaches us to know; an art teaches up to do. In other words, science explains and expounds; art directs, art imposes precepts or proposes rules."In other words, science is theoretical but an art is political.
2) What is an Art? As J.M. Keynes has put it: "An art is a system of rules for the attainment of a given end". The object of an art is the formulation of precepts applicable to policy. This implies that art is practical. Applying this definition of art, we can say economics is an art. Its several branches like consumption, production and public finance provide practical guidance to solve economic problems. Again for example the theory of consumption guides the consumer to obtain maximum satisfaction with his given income (means). In this sense, economics can be considered as an art in the wider sense of the term art i.e. in the sense of practical science. It means creation or practical application of knowledge. It is for this reason; we treat economics as an art.

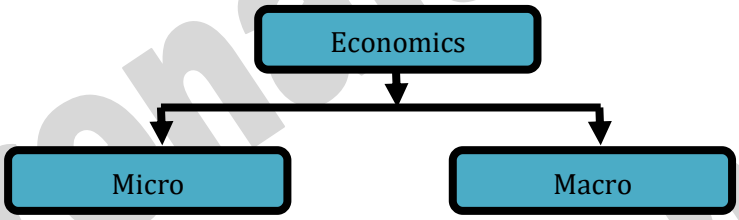
In a nutshell, we can conclude the discussion that economics is **both science and art.**

Practical uses of Economics

The main points of practical uses are discussed below –

1. Useful to the Consumer
2. Useful to the Producer
3. Helpful to Business Community
4. Solution to Economic Problems
5. Helpful to Workers
6. Helpful in Price Determination
7. Significant for Economics Development
8. Useful for Economic Planning
9. Useful for Social Workers
10. Helpful to Social Welfare Activities
11. Helpful in international Trade.

In short economics is useful for all.



Definitions of Micro Economics

Different economists have defined micro economics as under –

According to A.P. Lerner – "Micro economics consists of looking at the economy through a microscope, as it were, to see how the millions of cells in the body of the individuals, or households as consumers, and the individuals or firms as producers-play their parts in the working of the whole economic organism."

According to K.E. Boulding – 'Micro economics is the study of particular firms, particular households, individual prices, wages, incomes, individual industries and particular commodities."

According to Shapiro – "Micro economics deals with small parts of the economy.

Importance/Usefulness of Microeconomics

1. **Determination of demand pattern:** It determines the pattern of demand in the economy, *i.e.,* the amounts of the demand for the different goods and services in the economy, because the total demand for a good or service is the sum total of the demands of all the individuals. Thus, by determining the demand patterns of every individual or family, microeconomics determines the demand pattern in the country as a whole.
2. **Determination of the pattern of supply:** In a similar way, the pattern of supply in the country as a whole can be obtained from the amounts of goods and services produced by the firms in the economy. Microeconomics, therefore, determines the pattern of supply as well.
3. **Pricing:** Probably the most important economic question is the one of price determination. The prices of the various goods and services determine the pattern of resource allocation in the economy. The prices, in turn, are determined by the interaction of the forces of demand and supply of the goods and services. By determining demand and supply,
Microeconomics helps us in understanding the process of price determination and, hence, the process of determination of resource allocation in a society.
4. **Policies for improvement of resource allocation:** As is well-known, economic development stresses the need for improving the pattern of resource allocation in the country. Development polices, therefore, can be formulated only if we understand how the pattern of resource allocation is determined. For instance, if we want to analyze how a tax or a subsidy will affect the use of the scarce resources in the economy, we have to know how these will affect their prices. By explaining prices and, hence, the pattern of resource allocation, microeconomics helps us to formulate appropriate development policies for an underdeveloped economy.
5. **Solution to the problems of micro-units:** Since the study of microeconomics starts with the individual consumers and producers, policies for the correction of any wrong decisions at the micro-level are also facilitated by microeconomics. For example, if a firm has to know exactly what it should do in order to run efficiently, it has to know the optimal quantities of outputs produced and of inputs purchased. Only then can any deviation from these optimal levels be corrected. In this sense, microeconomics helps the formulation of policies at the micro-level.

Limitations of Microeconomics

However, microeconomics has its limitations as well:
1. **Monetary and fiscal policies:** Although total demand and total supply in the economy is the sum of individual demands and individual supplies respectively, the total economic picture of the country cannot always be understood in this simplistic way. There are many factors affecting the total economic system, which are outside the scope of Microeconomics. For example, the role of monetary and fiscal policies in the determination of the economic variables cannot be analyzed completely without going beyond microeconomics.
2. **Income determination:** Microeconomics also does not tell us anything about how the income of a country (*i.e.,* national income) is determined.
3. **Business cycles:** A related point is that, it does not analyze the causes of fluctuations in national income. The ups-and-downs of national income over time are known as business cycles. Microeconomics does not help us in understanding as to why these cycles occur and what the remedies are.
4. **Unemployment:** One of the main economic problems faced by an economy like India is the problem of unemployment. This, again, is one of the areas on which microeconomics does not shed much light. Because, if we are to find a solution to the unemployment problem, we must first understand the causes of this problem. For that, in turn, we must understand how the total employment level in the economy is determined. This is difficult to understand from within the confines of microeconomics.

Methods of Economic Analysis

An economic theory derives laws or generalizations through two methods:

(1) Deductive Method of Economic Analysis

The ***deductive method*** is also named as ***analytical***, ***abstract*** or ***prior*** method. The deductive method consists in deriving conclusions from general truths, takes few general principles and applies them draw conclusions. **(GENERAL TO PARTICULAR)**

For instance, if we accept the general proposition that man is entirely motivated by self-interest. Then Ram (a man) is also entirely motivated by self interest.

The classical and neo-classical school of economists notably, Ricardo, Senior, Cairnes, J.S. Mill, Malthus, Marshall, Pigou, applied the deductive method in their economic investigations.

Steps of Deductive Method:

The main steps involved in deductive logic are as under:

(i) Perception of the problem to be inquired into: In the process of deriving economic generalizations, the analyst must have a clear and precise idea of the problem to be inquired into.

(ii) Defining of terms: The next step in this direction is to define clearly the technical terms used analysis. Further, assumptions made for a theory should also be precise.

(iii) Deducing hypothesis from the assumptions: The third step in deriving generalizations is deducing hypothesis from the assumptions taken.

(iv) Testing of hypothesis: Before establishing laws or generalizations, hypothesis should be verified through direct observations of events in the rear world and through statistical methods. (Their inverse relationship between price and quantity demanded of a good is a well established generalization).

Merits of Deductive Method:

The main merits of deductive method are as under:

(i) This method is near to reality. It is less time consuming and less expensive.

(ii) The use of mathematical techniques in deducing theories of economics brings exactness and clarity in economic analysis.

(iii) There being limited scope of experimentation, the method helps in deriving economic theories.

(iv) The method is simple because it is analytical.

Demerits of Deductive Method:

(i) **The deductive method is simple and precise only if the underlying assumptions are valid**. More often the assumptions turn out to be based on half truths or have no relation to reality. The conclusions drawn from such assumptions will, therefore, be misleading.

(ii) In deductive method, the premises from which inferences are drawn may not hold good at all times, and places. As such **deductive reasoning is not applicable universally**.

(iii) The deductive method is highly abstract. **It requires a great deal of care to avoid bad logic or faulty economic reasoning.**

(2) Inductive Method of Economic Analysis:

Inductive method which is also called ***empirical method*** was adopted by the "Historical School of Economists". It involves the process of reasoning from particular facts to general principle.

(PARTICULAR TO GENERAL)

This method derives economic generalizations on the basis of (i) Experimentations (ii) Observations and (iii) Statistical methods.

In this method, data is collected about a certain economic phenomenon. These are systematically arranged and the general conclusions are drawn from them.

For example, we observe 200 persons in the market. We find that nearly 195 persons buy from the cheapest shops, Out of the 5 which remains, 4 persons buy local products even at higher rate just to patronize their own products, while the fifth is a fool. From this observation, we can easily draw conclusions that people like to buy from a cheaper shop unless they are guided by patriotism or they are devoid of commonsense.

Steps of Inductive Method:

The main steps involved in the application of inductive method are:
(i) Observation.
(ii) Formation of hypothesis.
(iii) Generalization.
(iv) Verification.

Merits of Inductive Method:

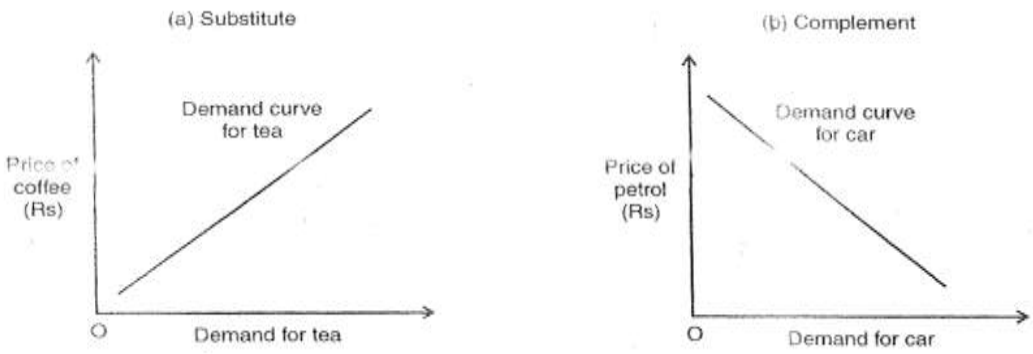
(i) It is based on facts as such the method is realistic.
(ii) In order to test the economic principles, method makes statistical techniques. The inductive method is, therefore, more reliable.
(iii) Inductive method is dynamic. The changing economic phenomenon are analyzed and on the basis of collected data, conclusions and solutions are drawn from them.
(iv) Inductive method also helps in future investigations.

Demerits of Inductive Method:

The main weaknesses of this method are as under:
(i) If conclusions are drawn from insufficient data, the generalizations obtained may be faulty.
(ii) The collection of data itself is not an easy task. The sources and methods employed in the collection of data differ from investigator to investigator. The results, therefore, may differ even with the same problem.
(iii) The inductive method is time-consuming and expensive.

Conclusion:

The above analysis reveals that both the methods have weaknesses. We cannot rely exclusively on any one of them. Modern economists are of the view that both these methods are complimentary. They partners and not rivals. **Alfred Marshall** has rightly remarked:



"***Inductive and Deductive methods*** are both needed for scientific thought, as the right and left foot are both needed for walking". We can apply any of them or both as the situation demands.

Macro Economics

The term macro in English has its origin in the Greek term "macros" which means large. In the context of 'Macroeconomics' means economics of the large like economy as a whole. Macro economics deals primarily with the analysis of the relationship between broad economic aggregates like national income, level of total employment, aggregate consumption, total investment, general price level, balance of payment, the quantity of money etc. Macroeconomics is also known as the theory of income & employment as it is concerned with the problems of on employment, economic fluctuation, inflation or deflation international trade and economic growth.

Definitions of Macro Economics

1) **According to culberton's-**"Macro Economics is the theory of income, employment, price and money."
2) **Accordingly to K.E. Boulding –**"Macro economics deals not with individuals quantities as such but with aggregate income, but with national income, not with individuals price but with price levels, not with individuals output but with national output."
3) **According to Edward Shapiro – "**Macro economics attempts to answer the truly 'big' question of economic life – full employment or unemployment, capacity or under capacity production."

Nature of Macro Economics

1) Macro economics studies the concept of national income and its different elements and the method of measurement.
2) It studies problems relating to employment and unemployment. It studies different factors determining the level of employment.
3) Determination of general price level is also studied under macro economics. Problems relating to inflation and deflation are an important component of macro economics.
4) Change in demand and supply of money have an important impact on the level of employment. Macroeconomics studies function of money & theories relating to it.
5) Problems relating to economic growth is another important component of macro economics like plans for overall increase in national income, output, employment are framed so the economic development of economy as a whole.
6) It also studies issues relating to international trade, export, import exchange rate and balance of payments are the principal issue in this context.

Importance of Macro Economics

1) Macro economics is helpful for getting us an idea of the functioning of an economic system. It is very essential for a proper and adequate knowledge of behavior pattern of the aggregative variable, as the description of a large and complex economic system.
2) It says about the study of national income and social accounts. It is the study of national income which enables us to know that three fourth of the world is living in object poverty without proper national difficult to formulate proper economic policies.

3) Macroeconomic approaches are of almost importance to analyze and understand the effect of inflation and deflation different sections of society are affected differently as a result of charges in the value of money.
4) Economic fluctuation is a characteristics features of the capitalist form of economy. The economic booms and depression in the level of income and employment follow one another in cyclical fashion.
5) The study of macro economics is essential for the proper understanding of Micro economics. No micro economics law could be framed without a prior study of the aggregate.

Limitations of Macroeconomics

Following are the main limitations of macro economics:-
1.***Excessive Thinking***:-Macro economics suffers from the limitations that it always excessively thinks in the terms of aggregates and presumes circumstances to be normal and homogeneous but aggregates may result into heterogeneous character. As Prof. Boulding points:
(a) Six apples+Seven apples=Thirteen apples which constitutes a meaningful aggregate.
(b) Six apples+Seven oranges=Thirteen fruits, which constitutes a fairly meaningful aggregates.
(c) Six apples+Seven shoes constitutes a meaningless aggregates.
2.***Difference in individual items***:-Sometimes while aggregating the variables, the basic characteristics of the data or the variables is left untouched because there are important differences in the items. Sometimes, the features of individual components may not be true to the aggregate so macro suffers from the danger of excessive generalization.
3.***Unable to influnce society equally***:-An aggregative tendency may not influence the entire sectors of the economy in the same way. For example, a general rise in price as inflation may not similar effects on different sectors of the economy.
4.***Contradictory***:-In aggregates, sometime the contradictory individual aspects are neutralized as in case of the estimation, prices in agriculture fall, of industrial products rise which have different affects on individual factors but as an aggregate, there may not be any effect at all. Thus, macro aggregate results may be misleading.
5.***Role of less aggregative analysis***:-Aggregates itself suffer from certain serious problems due to statistical techniques. The recently introduced computational procedures and programming techniques have reduced the role of aggregative analysis.

Microeconomics V/s Macroeconomics

S.No.	Points	Microeconomics	Macroeconomics
1	**Study**	It studies individual unit	It studies aggregate or group of individual units.
2	**Assumption**	At micro level full employment is assumed which is never found in an economy. Hence this is an unreal assumption	At macro level, full employment is not assumed. Instead equilibrium employment is assumed which is a real assumption.
3	**Subject Matter**	We study demand supply, consumer behavior production, types of market, theory of cost & revenue etc.	We study national income, theory of wage, interest & employment, Theory of money, theory of international trade etc.

4	**Applicability**	It is useful in analysis of an individual unit like cost of an individual good, demand of a single good, price of a single good.	It is useful in analysis of aggregate units such as aggregate demand, aggregate prices or inflation-deflation, aggregate or national income etc.
5	**Usefulness to Govt.**	It is less useful to Govt. in formulating economic policies.	It is more useful to Govt. in formulating economic policies.

INTERDEPENDENCE BETWEEN MICRO AND MACRO ECONOMICS

Micro and macro economics are the two sides of the same coin. There is close interdependence between the two. We cannot analyse the individual behaviour without the assuming to aggregate and likewise aggregate cannot be effective unless individual variables are kept under consideration.

Micro economics contributes towards macro economics in a number of ways as:-

1.*Study of economic fluctuations*:-Business cycles which are universal in every sector, are influenced by both individuals and aggregate factors. Unless we review both micro and aggregate variables, we cannot provide an appropriate solution to business cycles. Therefore to study trade cycles micro and macro economics contribute significantly.

2.*Basis of economic laws*:-Micro economics acts as a basis macro economics because macro is an aggregate of individual units. The success and accuracy of aggregates depends on the individual units. Similarly, macro theories are used by micro **economists.**

3.*Role in international trade*:-In international trade both the approaches are used. Economists have developed their theories on the basis of micro economics presuming full employment of resources and mobility of factors of production. However, modern economists looked on the economy as a whole and recognized the role of aggregates. So general equilibrium is nothing but an extension of equilibrium of micro economics.

4.*Balance of payments and interdependence*:-Balance of payments problem is also a burning problem for economy. An individual sector may have favorable balance of payments whereas other sectors, unfavourable balance of payments. On the other hand, the overall position of an economy is to be assessed from aggregate position of all sectors.

5.*Theory of tariffs*:-Many economists have propounded that modern macro approaches of imposing tariffs with the intention of correcting balance of payments position is virtually based on the theory of monopoly. So micro economics has influenced the modern macro economics theory.

UNIT-III

ELASTICITY OF DEMAND

Elasticity of demand is defined as the degree of responsiveness of the quantity demanded of a good to a change in its price, consumers income and prices of related goods. There are three concepts of demand elasticity – price elasticity, income elasticity and cross elasticity.

E = % change in Quantity demanded/% change in variable

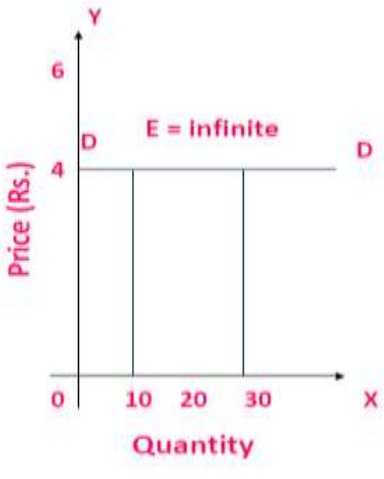
Price elasticity of demand

(**PED** or $\mathbf{E_d}$) is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price. More precisely, it gives the percentage change in quantity demanded in response to a one percent change in price (holding constant all the other determinants of demand, such as income).

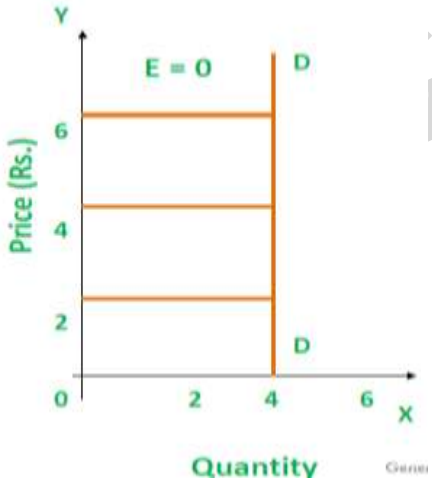
Price elasticity of Demand = Proportionate change in purchases of commodity X / Proportionate change in price of commodity X

Types/Degrees of Price Elasticity of Demand

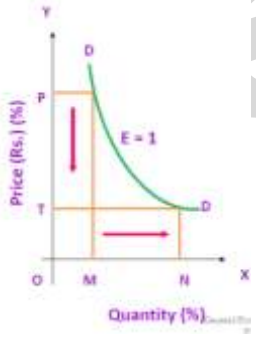
A) **Perfectly Elastic Demand:** A perfectly elastic demand refers to the situation when demand is infinite at the prevailing price. It is a situation where the slightest rise in price causes the quantity demand of the commodity falls to zero.



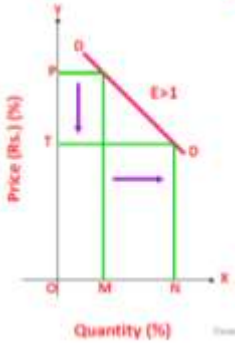
B) **Perfectly Inelastic Demand:** A perfectly inelastic demand refers to a situation when change in price causes no change in the quantity demanded. Even a substantial change in price does not impact quantity demanded.



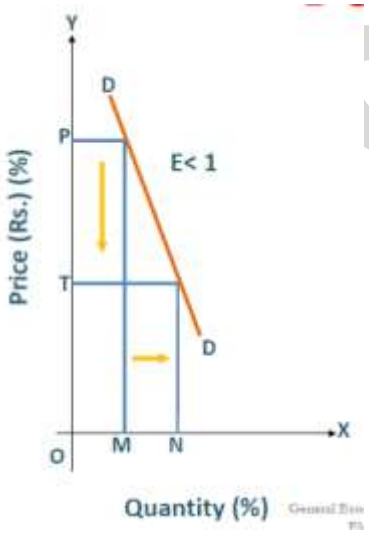
C) **Unitary Elastic Demand:** It is a situation when change in quantity demanded in response to change in own price of the commodity is such that total expenditure of the quantity remains constant. In short % change in quantity demanded is equal to % change in price.
This type of demand curve is called Rectangular Hyperbola



D) **Greater than unitary Elastic Demand:** Demand is greater than unitary elastic when change in quantity demanded in response to change in price of the commodity is such that total expenditure of the commodity increases when the price decreases, and total expenditure decreases when price increases. In short % change in quantity demanded is greater than % change in price.



E) **Less than Unitary Elastic Demand:** Demand is less than unitary elastic when change in quantity demanded in response to change in price of the commodity is such that total expenditure on the commodity decreases when price falls, and total expenditure increases when price rises. In short % change in quantity demanded is less than % change in price.



Methods to measure Price Elasticity of demand

There are three methods of measuring price elasticity of demand:
(1) Total Expenditure Method.
(2) Geometrical Method or Point Elasticity Method.
(3) Arc Method.

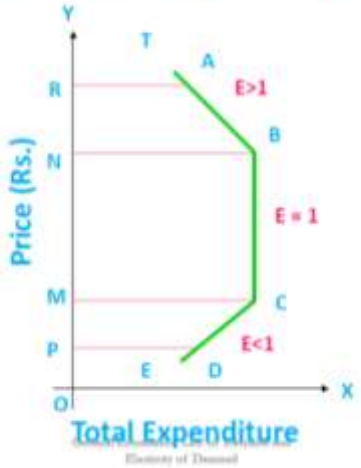
Total Expenditure (Outlay) Method:

This method is evolved by Dr. Alfred Marshall. According to this method, to measure the elasticity of demand it is essential to know how much & in what direction the total expenditure has changed as a result of change in the price of good.

Total Expenditure (Outlay) Method

Elasticity of Demand	Price	Total Expenditure
Greater than Unity i.e. $E_p > 1$	↑ ↓	↓ ↑
Unity i.e. $E_p = 1$	Same Same	Unchanged Unchanged
Less than Unity i.e. $E_p < 1$	↑ ↓	↑ ↓

Total Expenditure (Outlay) Method



For Example:

Price Per Unit ($)	Quantity Demanded	Total Expenditure ($)
20	10 Pens	200.0
10	30 Pens	300.0

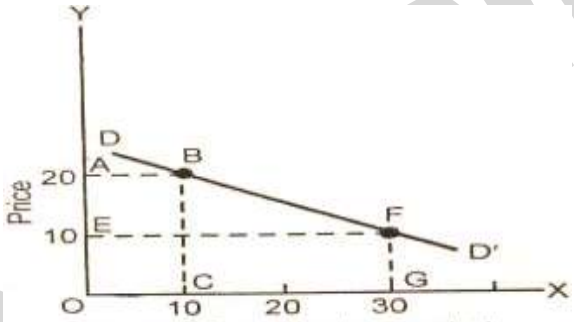
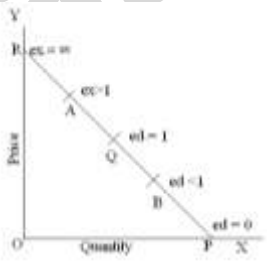


Fig. 6.6 Quantity demanded

Point Method or Geometrical Method:

This method was also suggested by Alfred Marshall. It explains the elasticity of demand at a particular point of the demand curve if the demand function is linear one (or when demands curve is straight line sloping down from left to right). The point method is not applicable on curvilinear demand curves. This method is based on the proposition that each point of the straight line demand curve has different elasticity of demand. Different elasticity of demand. We have already shown (under the heading slope and elasticity) that every point on demand curve does not have the same elasticity. This has been explained by point method, also known as Geometrical Method. The basic formula for this method is :

Ep = Length of Lower segment/Length of Upper segment



Now we can calculate elasticity of demand at different points R,A,Q, B and P, As per the ratio of the lower part to upper part.

e_p at Q = $\frac{QP}{RQ}$ = 1

e_p at A = $\frac{AP}{AR}$ < 1

e_p at B = $\frac{BP}{RB}$ > 1

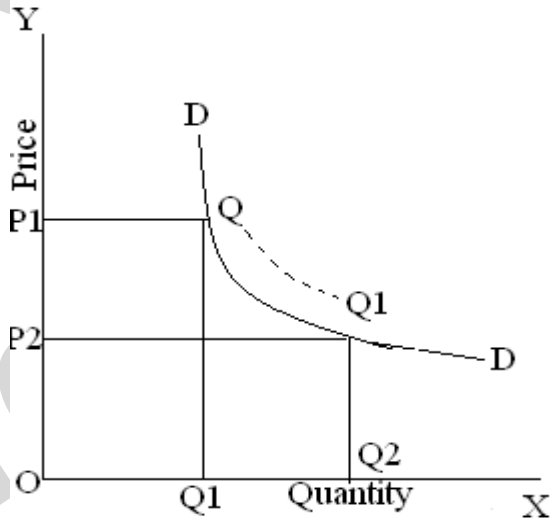
e_p at R = $\frac{RP}{0}$ = ∞

e_p at P = $\frac{0}{RP}$ = 0

Therefore, we can say that at the mid-point on a straight line demand curve, elasticity will be unitary, at higher points (such as A and R) elasticity will be greater than one; at lower points (B and P) the elasticity will be less than one. At points R and P the elasticities will be infinite and zero respectively. Point method is very useful in economics. It helps us measuring elasticity with very small changes in price and quantity demanded. It also tells us that slope and elasticity are two different things.

Arc Method:

As we have seen that point elasticity method can be used to determine the elasticity of demand at different points when infinitesimal changes in price are taking place. If the price change is somewhat large or we have to measure elasticity between two different points rather than at a specific point we use Arc Method. When we have to measure the price elasticity over an arc of the demand curve, such as between points Q and Q1 on the demand curve in figure the point elasticity method cannot yield true picture. In measuring arc elasticity we use the average of the two prices and average of two quantities at these prices in the following manner.



Suppose commodity X's position is like this- At price of Rs. 10 (P1) its, quantity demanded is 100 (Q1) and at price of Rs. 5 (P2) its quantity demanded is 300 (Q2). The elasticity of demand as per Arc Method will be

$$ed = \frac{\triangle q}{\triangle p} \times \frac{p_1+p_2}{q_1+q_2}$$

$$= \frac{200}{} \times \frac{10+5}{}$$

$$= \frac{200}{5} \times \frac{15}{400} = 1.5$$

Income elasticity of demand

Income elasticity of demand measures the percentage change in demand caused by a percent change in income. A change in income causes the demand curve to shift reflecting the change in demand. IED is a measurement of how far the curve shifts horizontally along the X-axis. Income elasticity can be used to classify goods as normal or inferior. With a normal good demand varies in the same direction as income. With an inferior good demand and income move in opposite directions

Income Elasticity = Proportionate change in the quantity purchased /Proportionate change in Income

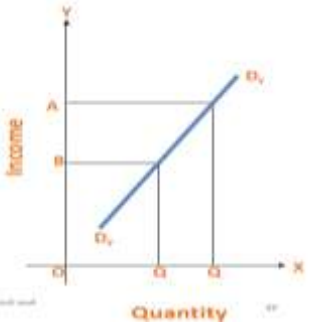
$$Ey = \frac{\text{\% Change in Quantity Demanded}}{\text{\% Change in Income}}$$

Degree of Income Elasticity of Demand

1. Positive Income Elasticity of Demand
   a. Unitary income elasticity of demand
   b. Less than unitary income elasticity of demand
   c. More than unitary income elasticity of demand
2. Negative income elasticity of demand
3. Zero income elasticity of demand

1. Positive income Elasticity of Demand

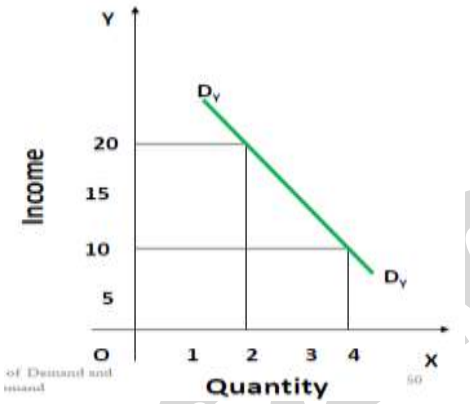
Income elasticity of demand for a good is positive, when with a increase in the income of a consumer his demand for the goods is increases and vice-versa.



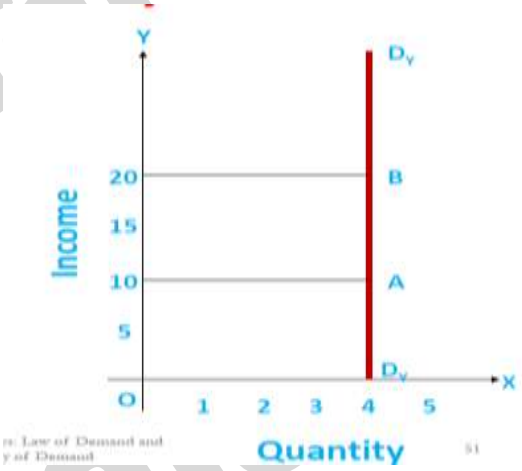
2. Negative Income Elasticity of Demand:

Income Elasticity of Demand is negative when increases in the income of the consumer is accomplished by fall in demand of good.

It is negative in case of inferior goods which are known as Giften goods.



3. **Zero Income Elasticity of Demand**:
Income Elasticity of demand is zero, when change in the income of consumer evokes no change in his demands. Demands for necessaries like oil, salt, etc., have zero income elasticity of demand



CROSS ELASTICITY OF DEMAND

Cross price elasticity of demand measures the percentage change in demand for a particular good caused by a percent change in the price of another good. Goods can be complements, substitutes or unrelated. A change in the price of a related good causes the demand curve to shift reflecting a change in demand for the original good. Cross price elasticity is a measurement of how far, and in which direction, the curve shifts horizontally along the x-axis.

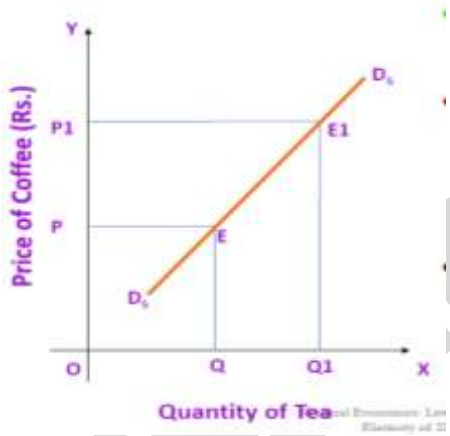
Cross elasticity of Demand for X and Y = Proportionate change in purchases of commodity X / Proportionate change in price of commodity Y

The numerical value of cross elasticity depends on whether the two goods in question are substitutes, complements or unrelated.

Degree of Cross Elasticity of Demand

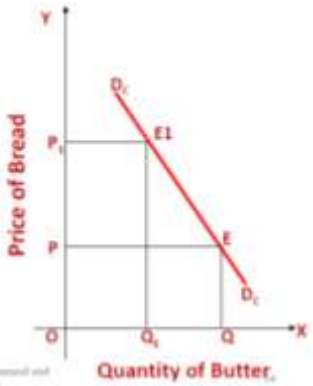
1. **Positive Cross Elasticity of Demand:**

It is positive in case of substitute goods for example, Rise in the price of coffee will lead to increase in Demand for Tea. The curve slopes upward from left to right



2. Negative Cross Elasticity of Demand:

It is negative in case of complementry goods. For example rise in price of bread will bring down the demand for butter.the curves slopes downward from left to right.



3. Zero Elasticity Of Demand:

Cross elasticity of demand is zero when two goods are not related to each other . for example, Rise in the price of wheat will have no effect on the demand for shoes.

Types of Cross Elasticity

(i) Substitute Goods. When two goods are substitute of each other, such as coke and Pepsi, an increase in the price of one good will lead to an increase in demand for the other good. The numerical value of goods is positive.

For example there are two goods. Coke and Pepsi which are close substitutes. If there is increase in the price of Pepsi called good y by 10% and it increases the demand for Coke called good X by 5%, the cross elasticity of demand would be:

$\mathbf{E_{xy} = \%\Delta q_x / \%\Delta p_y = 0.2}$

Since E_{xy} is positive (E > 0), therefore, Coke and Pepsi are close substitutes.

(ii) Complementary Goods. However, in case of complementary goods such as car and petrol, cricket bat and ball, a rise in the price of one good say cricket bat by 7% will bring a fall in the demand for the balls (say by 6%). The cross elasticity of demand which are complementary to each other is, therefore, 6% / 7% = 0.85 (**negative**).

(iii) Unrelated Goods. The two goods which a re unrelated to each other, say apples and pens, if the price of apple rises in the market, it is unlikely to result in a change in quantity demanded of pens. The elasticity is zero of unrelated goods.

PRODUCTION FUNCTION

1) Production is the process of conversion of inputs into outputs.
2) It is the creation of utility and addition of value
3) Production function is the relationship between inputs & output of a commodity
4) The mathematical expression of production function is –

$Q_x = f(x_1, x_2, x_3, \ldots\ldots x_n)$

$O_x \rightarrow$ Output of commodity X.

f = Function of

$x_1, x_2, x_3, \ldots\ldots x_n \rightarrow$ Inputs

5) The inputs/resources used for production are called factors of production. These are namely land, labour, capital & entrepreneur.

Attributes of production function

1. It indicates a functional relationship between physical inputs and physical outputs. For example, if we have two factors, say, labour (L) and capital (K) then the production function
   Q = f (L, K)
2. The production function is always in relation to a period of time. It denotes the flow of inputs resulting in a flow of outputs during a particular period of time. This is due to the fact when the firm wants to increase the production, it can either employ "some factors" additionally or increase "all the factors" in accordance with availability of the time period. Later we will study it as short period and long period.
3. The production function can specify either the maximum quantity of output that can be produced by a given set of input or the minimum quantity of inputs required for producing certain level of output.
4. The quantity of inputs is dependent upon the state of technology available and firm's managerial ability to use them. In order to simplify things the state of technology is considered to be given.
5. Production function takes into account the most efficient technology and methodology available at a time.
6. Production function is purely a technology relationship between input and output. It has nothing to do with the nominal relationship between input and output. It has nothing to do with the nominal price of factors; or value of quantity produced by them.

Fixed factors & variable factors:

1) **Fixed Factor (FF)**
   a. Fixed factors refer to those factors of production which cannot be changed during short run.
   b. These are used in a fixed quantity in the short run.
   c. These factors can be changed only in the long run.
   d. Example-land, plant and machinery, factory building etc.
2) **Variable Factor (VF)**
   a. Variable factor refer to those factors of production which can be changed during short period.
   b. The quantity of variable inputs varies according to the level of output.
   c. Example-labour, raw material etc.

Time Element in Production Function

Short Run and Long Run

Short Run: Short refer to a period of time in which a firm cannot change its fixed factors of production only variable factors can be changed.

Long Run: Long run refers to a time period during which a firm can change all the factors of production. In the long run, all inputs are variable. Therefore the distinction between fixed factors and variable factors will disappear.

Basic Concepts of Production

1. **Total product or Total physical product (TP or TPP)**
   Total product refers to the total volume of a commodity produced by a firm with given inputs during a given period.
2. **Average product or Average physical product (AP or APP)**
   Average product is per unit product of a variable input
   It is obtained by dividing the total product (TP) by the units of a variable factor.
   Symbolically, $\boldsymbol{AP = \frac{TP}{L}}$
3. **Marginal product or Marginal physical product (MP or MPP)**
   Marginal product is an addition to the total product when an additional unit of variable factor (labour) is employed.

Law of Variable Proportions

The Law of Variable Proportions (also called as returns to factor or Laws of Returns) is discussed under the situation of having one factor variable and another factor being used in fixed quantity if there are only two factors of production. This alters the proportions between factors; therefore, it is called as Law of Variable Proportions. The law is applicable for short run. Here Q_x=f(L).

The law can be explained with the help of below table:

Units of Capital (K)	Units of Labour (L)	TP (Units) (Q)	AP $\left(\frac{Q}{L}\right)$	MP $\left(\frac{\Delta Q}{\Delta L}\right)$	
1	0	0	0	0	
1	1	70	70	70	Stage I
1	2	160	80	90	
1	3	270	90	110	
1	4	360	90	90	
1	5	430	86	70	
1	6	498	83	68	Stage II
1	7	546	78	48	
1	8	546	68.25	0	
1	9	522	58	-24	
1	10	470	47	-52	Stage III

First Stage- Stage of Increasing Returns

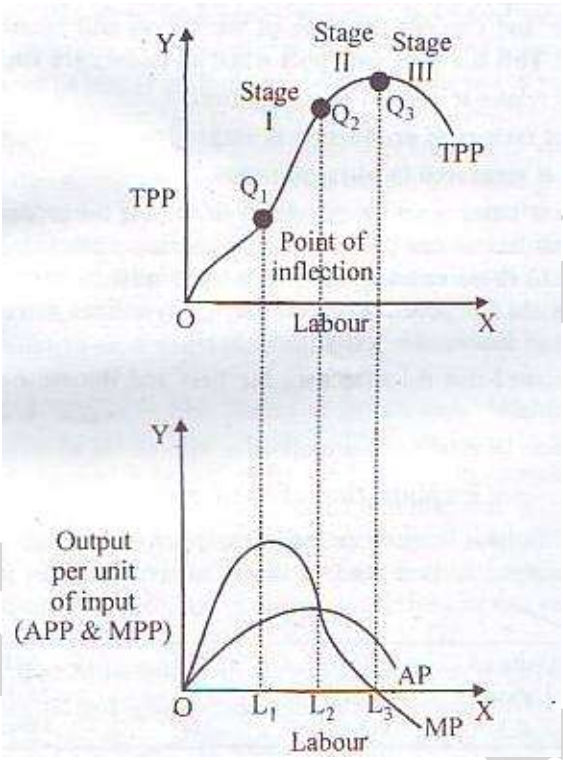
- In this stage as the input of variable factor (labour) increases, marginal product (MP) tends to increase and total product (TP) increases at increasing rate because there is underutilization of the fixed input
- MP also tends to rise alongwith AP.

Second Stage- Stage of Diminishing Returns

- In this stage, increase in the input of variable factor (Labour) is followed by a decrease in MP but it remains positive and TP increases at decreasing rate because there is pressure on fixed input.

Third Stage- Stage of Negative Returns

- In this stage, increase in the units of variable factor (labour) renders MP negative and TP starts declining because there is too much of variable input in relation to the fixed input.



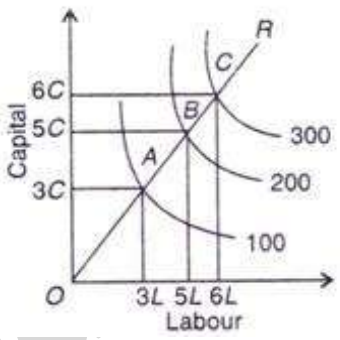
THE LAWS OF RETURNS TO SCALE: PRODUCTION FUNCTION WITH TWO VARIABLE INPUTS

The laws of returns to scale refer to the effects of a change in the scale of factors (inputs) upon output in the long run when the combinations of factors are changed in the same proportion.

If by increasing two factors, say labour and capital, in the same proportion, output increases in exactly the same proportion, there are constant returns to scale. If in order to secure equal increases in output, both factors are increased in larger proportionate units, there are decreasing returns to scale. If in order to get equal increases in output, both factors are increased in smaller proportionate units, there are increasing returns to scale.

Increasing Returns to Scale:

Below figure shows the case of increasing returns to scale where to get equal increases in output, lesser proportionate increases in both factors, labour and capital, are required.



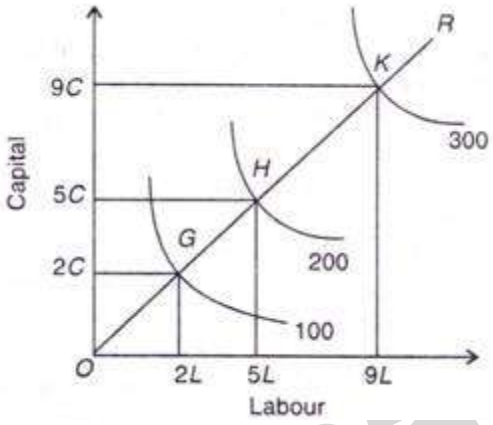
It follows that in the figure:

100 units of output require 3C + 3L
200 units of output require 5C + 5L
300 units of output require 6C + 6L

So that along the expansion path OR, OA > AB > BC. In this case, the production function is homogeneous of degree greater than one. The increasing returns to scale are attributed to the existence of indivisibilities in machines, management, labour, finance, etc. Some items of equipment or some activities have a minimum size and cannot be divided into smaller units. When a business unit expands, the returns to scale increase because the indivisible factors are employed to their full capacity.
Increasing returns to scale also result from specialisation and division of labour. When the scale of the firm expands there is wide scope for specialisation and division of labour. Work can be divided into small tasks and workers can be concentrated to narrower range of processes. For this, specialized equipment can be installed.

Thus with specialization efficiency increases and increasing returns to scale follow:
Further, as the firm expands, it enjoys internal economies of production. It may be able to install better machines, sell its products more easily, borrow money cheaply, procure the services of more efficient manager and workers, etc. All these economies help in increasing the returns to scale more than proportionately.
Not only this, a firm also enjoys increasing returns to scale due to external economies. When the industry itself expands to meet the increased long-run demand for its product, external economies appear which are shared by all the firms in the industry. When a large number of firms are concentrated at one place, skilled labour, credit and transport facilities are easily available.
Subsidiary industries crop up to help the main industry. Trade journals, research and training centres appear which help in increasing the productive efficiency of the firms. Thus these external economies are also the cause of increasing returns to scale.

Decreasing Returns to Scale:
Below Figure shows the case of decreasing returns where to get equal increases in output, larger proportionate increases in both labour and capital are required.

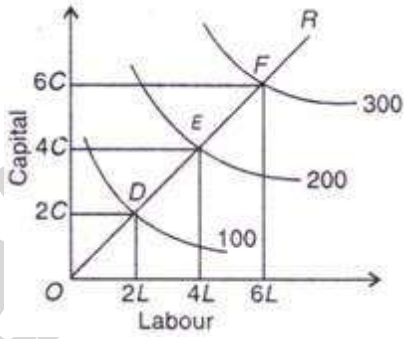


It follows that:
100 units of output require 2C + 2L
200 units of output require 5C + 5L
300 units of output require 9C + 9L
So that along the expansion path OR, OG < GH < HK.
In this case, the production function is homogeneous of degree less than one. Returns to scale may start diminishing due to the following factors. Indivisible factors may become inefficient and less productive. Business may become unwieldy and produce problems of supervision and coordination.
Large management creates difficulties of control and rigidities. To these internal diseconomies are added external diseconomies of scale. These arise from higher factor prices or from diminishing productivities of the factors. As the industry continues to expand the demand for skilled labour, land, capital, etc. rises.
There being perfect competition, intensive bidding raises wages, rent and interest. Prices of raw materials also go up. Transport and marketing difficulties emerge. All these factors tend to raise costs

and the expansion of the firms leads to diminishing returns to scale so that doubling the scale would not lead to doubling the output.

Constant Returns to Scale:

Below Figure shows the case of constant returns to scale. Where the distance between the isoquants 100, 200 and 300 along the expansion path OR is the same, i.e., OD = DE = EF. It means that if units of both factors, labour and capital, are doubled, the output is doubled. To treble the output, units of both factors are trebled.



It follows that:

100 units of output require
1 (2C + 2L) = 2C + 2L
200 units of output require
2 (2C + 2L) = 4C + 4L
300 units of output require
3 (2C + 2L) = 6C + 6L

The returns to scale are constant when internal economies enjoyed by a firm are neutralised by internal diseconomies so that output increases in the same proportion. Another reason is the balancing of external economies and external diseconomies.

Constant returns to scale also result when factors of production are perfectly divisible, substitutable, homogeneous and their supplies are perfectly elastic at given prices. That is why, in the case of constant returns to scale, the production function is homogeneous of degree one.